LIFE12 NAT/EE/000871
LIFE HAPPYRIVER

Improving the Ecological Status of Riverine Habitats on the Alam-Pedja Natura 2000 Site – Restoring the Natural State of the Lower Reaches of the Laeva River

After-LIFE Conservation Plan

Wildlife Estonia

2018

CONTENT

BACKGROUND INFORMATION

This work has been compiled by Wildlife Estonia as an independent part of the final report of the project funded by the European Union LIFE+ Programme and the Environmental Investment Centre (hereinafter referred to as the project). The plan describes the results of the project and makes recommendations for organising the protection of watercourses, waterbodies of alluvial meadows, and aquatic fauna of the Alam-Pedja Natura 2000 bird site and the special area of conservation (hereinafter referred to as the Alam-Pedja Natura 2000 site) and for ensuring the sustainability of the project's results. The data collected, and analyses carried out during this project can be used for designing area management plans, as well as for the development of action plans for the conservation of several protected species.

CHARACTERISTICS

FORMATION AND STATUS OF THE PROTECTED AREA

The Alam-Pedja Nature Reserve was established in 1994 by a regulation of the Government of the Republic of Estonia (RT I 1994, 15, 250). Protected area has increased from 26,000 hectares to 34,671.2 hectares since its creation. Alam-Pedja is enlisted as a bird site [Environmental Register (hereinafter ER) code RAH0000123, international code EE0080374] and as a special area of conservation (ER code RAH0000577, international code EE0080374) of the Natura 2000 network; it is in Central Estonia, north-east of Lake Võrtsjärv (Figure 1).

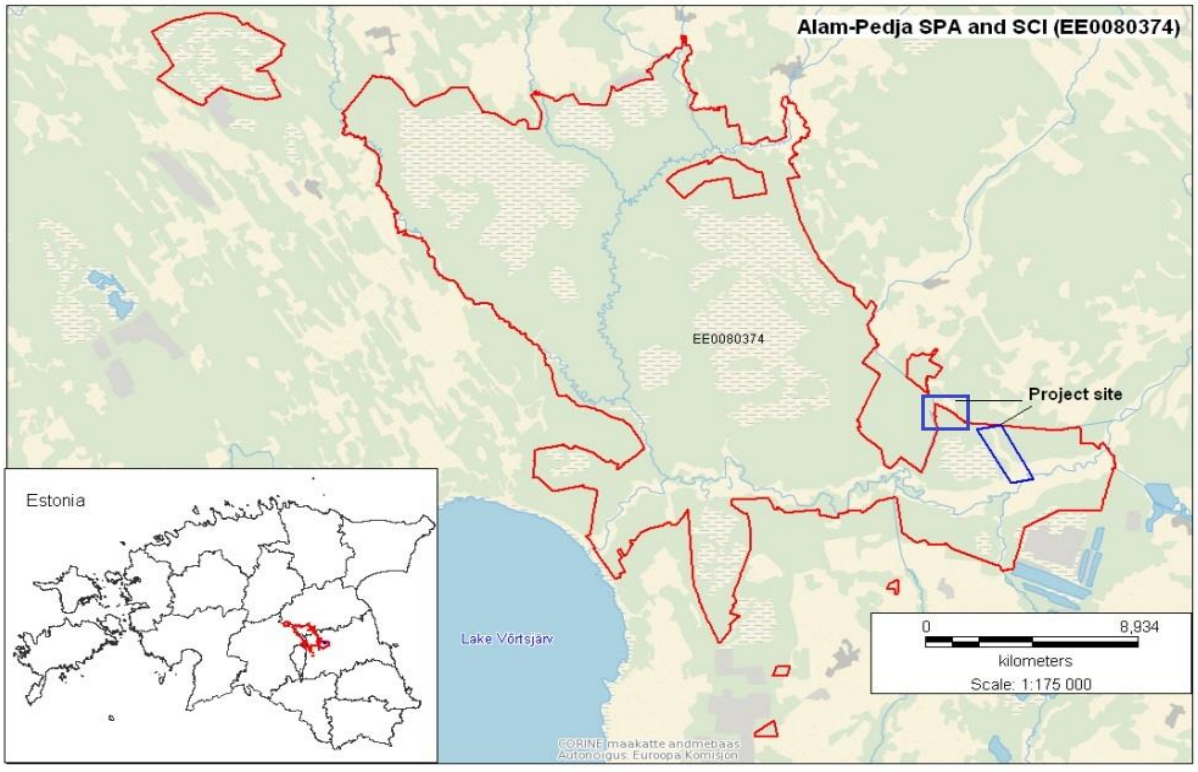

Figure 1. Alam-Pedja Natura 2000 site and LIFE Happyriver project area

The first Alam-Pedja Nature Reserve Protection Policy was approved by Regulation No. 92 of 1995 of the Government of the Republic of Estonia. (RT I 1995, 30, 381). The current regulation was last updated on May 18, 2007 by Regulation No. 153 (RT I 2007, 38, 273).

The Management Plan of the Alam-Pedja Natura 2000 site for the period 2016–2025 was approved by Decree No. 1-4.2/15/363 of the Director General of the Environmental Board on August 11, 2015.

Due to high species and habitat richness, the site has been protected under the most important international conventions and directives: it is a Ramsar Site (June 17, 1997), meaning it is a wetland site of international importance under the Ramsar Convention, it is also a bird site and a special area of conservation of the Natura 2000 network (August 5, 2004), and a bird area of international importance (IBA , BirdLife).

AIM OF PROTECTION

The significance of the Alam-Pedja Natura 2000 lies in the protection of many collected natural areas with low human impact that provide habitat for numerous protected species. The value of Alam-Pedja Nature Reserve lies in the fact that it is a single landscape complex of bogs, forests, alluvial meadows and rivers surrounded by intensively managed agricultural and forest areas. Bogs and bog woodlands cover about 72% of the protected area. Alluvial forests, riparian forests and swamp forests grow on 18% of the territory, ruderal and cultivated plants, and alluvial meadows and grasslands cover 11% of the protected area (Paal, 1997). About 30,700 hectares of the reserve have been designated as Annex I habitat types of the Habitats Directive. The network of rivers running through the protected area connects Lake Peipus and Lake Võrtsjärv and is unique both in Estonia and in Europe.

The species associated with the waterbodies listed in Annex II to the Habitats Directive are protected in the area: thick shelled river mussel (*Unio crassus*), pond bat (*Myotis dasycneme*), asp (*Aspius aspius*) that are also category II protected species; as well as spined loach (*Cobitis taenia*), European bullhead (*Cottus gobio*), European weatherfish (*Misgurnus fossilis*) and otter (Lutra lutra) that are also category III protected species. In addition, habitat types listed in Annex I to the Habitats Directive are also protected: rivers and streams (here and hereinafter Habitats Directive habitat code in brackets; 3260), dry heaths (4030), species-rich grasslands on noncalcareous soils (*6270), alluvial plains (6450), lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) (6510), wooded meadows (*6530), raised bogs (*7110), degraded raised bogs still capable of regeneration (7120), transition mires and quaking bogs (7140), depressions on peat substrates of the Rhynchosporion (7150), species-rich mires (7230), old natural forests (*9010), old deciduous forests (*9020), spruce forests rich in grasses (9050), swamping forests and deciduous swamp forests (*9080), transition mire woodlands and bog woodlands (*91D0), swamp forests on flood plains (*91E0), deciduous riparian forests (91F0).

CONSERVATION VALUES, RISK FACTORS AND ACTIONS FOR PREVENTING THEM

TABLE 1. LIFE HAPPYRIVER PROJECT'S PROTECTED AREA TABLE WITH SUMMARISED VALUES

Value	Conservation aim (30 years)	Risk factors	Measures	Expected results (10)
Rivers and streams (3260)	Habitat type 3260 (rivers and streams) has survived in a favourable state "A" on at least 485 ha.	• The process of oxbow lake isolation continues. This damages fish fauna, in particular due to the loss of spawning grounds, but also as a result of mass die-off events caused by oxygen deficiency and because there is no possibility of leaving the area. • Chopped hay from alluvial meadows enters the river. When chopped hay from alluvial meadows enters the river, it may negatively impact the rivers and fish fauna (juvenile fish), but so far there is no research that supports this or shows otherwise. • The movement of fish from the river to the spawning grounds on alluvial meadows and back into the river is limited by reed strips. Fish fail to spawn.	• Open the mouths of oxbow lakes and keep them open. In this way, fish migration opportunities are improved and water exchange takes place, which will improve the quality of water. • Continue hydro-chemical monitoring of the Emajõgi River within the framework of the national program. • Removal of reed strip from the areas that connect spawning grounds with the river.	Habitat type 3260 (rivers and streams) has survived in a favourable state "A" on at least 485 ha. The natural streambed of the Karisto Brook has been restored.
Alluvial meadows (6450)	Habitat type 6450 is represented on 3,835 ha and the status continues to be graded as "A". 2,000–2,300 ha of alluvial meadows have been restored and are annually managed or managed at a suitable interval.	• The volume of management and restoration work depends on funding and on the interest from managers, which determines, irrespective of the needs, on how large of an area semi-natural communities can be managed. Human population density in the protected area is low; therefore, the contribution of locals to the management of meadows is low. • Weather conditions. In years that are rainy or when large floods occur, it is not possible to manage all the areas. Mowed hay does not dry, and it cannot be collected. A layer of old hay builds up in areas that	• Motivating grant applicants to manage/restore alluvial meadows. • Immediate (first in line) management of the meadows that have been left unmanaged due to excessive water upon the arrival of suitable weather conditions. Also, making efforts (policy targeting) in order to be able to modify management based on natural conditions. • Motivating to buy suitable equipment for managing meadows – mowing machines, gyrorake, baler, transportation cart with low ground pressure (e.g., longer contracts for larger areas).	The habitat type is present on 3,835 ha and its condition is graded as "A": Targeted management of alluvial meadows is taking place on 2,000 hectares.

Value	Conservation aim (30 years)	Risk factors	Measures	Expected results (10)
		haven't been managed in a long time or where hay has not been collected in a while, making the area a less suitable feeding area for sandpipers. • Absence or lack of suitable management equipment. Lack of technical equipment may begin to curtail management capacity. • Because the hay cannot be used anywhere, it is a major obstacle to the management of larger areas. Therefore, the focus should be on finding sustainable management options (grazing, using hay for biofuel, biogas production, etc.). • Low quality of management work. Maintenance techniques that are unsuitable include techniques where hay is cut too high from the ground (> 5–7 cm), hay is not collected for a long time, a layer of old hay builds up. Alluvial meadows therefore become unsuitable for many sandpipers and the populations of many species requiring protection suffer. • Uninventoried alluvial meadows that hinder applying for grants • Lack of access roads or bridges or their poor condition. In areas with narrower or unmaintained access roads, transporting hay off the sites is difficult because of the risk of machines sinking into the ground. In the absence of access roads, management work cannot be carried out in all priority areas. This will cause the more remote and hard-to-reach alluvial meadows to overgrow.	• Interacting with potential users of hay (livestock breeders, heat producers, etc.) and actively looking for uses for harvested hay. Collaboration with universities and entrepreneurs involved with researching bioenergetic applications of hay and that are using it in practice (Laboratory of Biochemistry and Environmental Chemistry of the Estonian University of Life Sciences, Institute of Heat Technology of Tallinn University, etc.). Grazing on meadows. This would create an opportunity to manage areas where mowing is not possible or very complicated and the problem of finding a use for hay will also be solved. • Monitoring the success of alluvial meadow management. Design and order relevant applied research. Research projects looking at the effects of alluvial meadow management on meadow communities and bird fauna need to continue. It is advisable to compare vegetation diversity indicators of the areas where hay was harvested and where it was chopped. Also, monitor the impact of management of floodplains on important breeding birds. • Inventory of alluvial meadows that are being managed/restored if no previous inventories of vegetation and meadow condition exist. • Establishing or reconstructing access roads to alluvial meadows requiring management/restoration.	

Value	Conservation aim (30 years)	Risk factors	Measures	Expected results (10)
Asp (*Aspius aspius*)	The species continues to exist in the Alam-Pedja Natura 2000 site.	• Deterioration of the physical quality of water bodies. Establishment of migration barriers (e.g., dams), changes to the natural riverbeds of the waterbodies (dredging, channeling, straightening, etc.), sediment diversion into waterbodies. • Worsening of the hydrological regime of waterbodies. Major changes to the water level and discharge that prevent fish migration and successful breeding. • Beaver dams block asp migration routes and thereby reduce reproduction success and the distribution and reproduction of the species. • Reduction in river water quality. Wastewater is discharged into waterbodies, agricultural toxic substances and sediments enter the water. • Catching. Both professional and recreational fishing, as well as illegal fishing are risk factors.	• Preventing activities that damage habitats. The current protection regime should also assure that the risk factor can be avoided. • Prevention of constructing buildings and carrying out work that can have a significant effect on the water level and discharge of waterbodies. The current protection regime should also assure that the risk factor can be avoided. • Removal of beaver dams from habitats and limiting beaver numbers. • Check that no wastewater is discharged directly into waterbodies and that agricultural practices ensure the safe use of chemicals. • Introducing the conservation status and status of the species in order to raise the awareness of fishermen and increasing surveillance in the fishing season.	Species continues to exist in the Alam-Pedja Natura 2000 site.
Spined loach (*Cobitis taenia*)	The species continues to exist in the Alam-Pedja Natura 2000 site.	As a result of net fishing, the populations in oxbow lakes are damaged or destroyed. • Habitat damage and destruction. Water quality and waterbody status deteriorates (water quality as well as water regime changes, including changes in water level and discharge and physical obstacles on migration routes). • Distribution data is not available, which makes it difficult to set conservation goals and make management decisions.	• Continued temporal ban on net fishing in oxbow lakes. • Avoiding activities that damage habitats – implementation of the action is possible after specifying the distribution of the species. The current protection regime should also assure that the risk factor can be avoided. • Conducting a study on the distribution and abundance of the species. Take the species into account when coordinating different (development) activities.	Species continues to exist in the Alam-Pedja Natura 2000 site.
European weatherfish (*Misgurnus fossiilis*)	Species continues to exist in the Alam-Pedja Natura 2000 site.	• Distribution data is not available, which makes it difficult to set conservation goals and make management decisions.	• Conducting a survey to explain the distribution and abundance of the species.	Species continues to exist in the

Value	Conservation aim (30 years)	Risk factors	Measures	Expected results (10)
		As a result of net fishing, the populations in oxbow lakes are damaged or destroyed. • Destruction of habitats, in particular due to the dredging of waterbodies and the removal of bottom sediments. • The distribution of the alien species Chinese sleeper extends, which may have a significant effect on the European weatherfish.	• Continued ban on net fishing in oxbow lakes. • Avoiding activities that damage habitats – implementation of the action is possible after specifying the distribution of the species. The current protection regime should also assure that the risk factor can be avoided. • Specifying a monitoring methodology for the Chinese sleeper and, if necessary, developing a management plan to control this alien species.	Alam-Pedja Natura 2000 site.
European bullhead (*Cottus gobio*)	Species continues to exist in the Alam-Pedja Natura 2000 site.	• Habitat damage and destruction. Water quality and waterbody status deteriorates (water quality as well as water regime changes, including changes in water level and discharge and physical obstacles on migration routes). • Distribution data is not available, which makes it difficult to set conservation goals and make management decisions.	• Avoiding activities that damage habitats – implementation of the action is possible after specifying the distribution of the species. The current protection regime should also assure that the risk factor can be avoided. • Conducting a study on the distribution and abundance of the species. Take the species into account when coordinating different (development) activities.	Species continues to exist in the Alam-Pedja Natura 2000 site.

THE OBJECTIVES AND RESULTS OF THE LIFE HAPPYRIVER PROJECT

The diversity and representativeness of the Alam-Pedja Nature Reserve is based on the existence of different habitats, the preservation of their interconnectedness and the achievement and maintenance of a good ecological status. A key part is played by various waterbodies, one of which, the Laeva River – a tributary of the Emajõgi River, which used to be an important fish-rich river for locals – was deteriorated. Laeva River used to drain into Emajõgi River almost 5 km towards Lake Võrtsjärv from the Tallinn-Tartu highway, but after the river was diverted into a straight ditch several tens of kilometres long, the flow of water in the natural riverbed seized, and over time it filled with sediment and vegetation. A meandering fish-rich river was turned into a series of ponds with stagnant water.
The aim of the project was to restore the flow of Laeva River in its natural riverbed and to reconnect it with Emajõgi River. A recovering meandering river increases the number of habitats needed by both aquatic and terrestrial species, allows aquatic fauna and fish to migrate to suitable locations, and strengthens the populations of fish in the Emajõgi system, including populations of many protected species.

The objectives of the project were:

- To clear a 5.2 km long stretch (Karisto Brook) of the old riverbed in the lower reaches of the Laeva River and to restore the natural flow.
- To restore 12 hectares of alluvial meadows that are suitable for spawning for fish that spawn on alluvial meadows. To create 300 m^2 of stretches of rivers with rapids that are suitable as spawning grounds.
- Strengthen the population of the protected asp in the Emajõgi system, stocking the river with 12,000 asp summerlings.
- Inform the public about project activities and increase people's awareness. Organise children and youth study camps for a total of 100 children.
- Carry out research on habitat restoration and changes in fish status.
- Increase the region's ability to provide various ecosystem services.

Project objectives were achieved. In addition to the restoration of the 5.2 km long former river section of the Laeva River located on the Aiu alluvial meadow (Karisto Brook in the environmental register), a 2.8 km long river section on the Älevi alluvial meadow, located 1 km upstream, was also restored. In total, **8 km** of restored riverbeds have flowing water and movement routes are open; the oxygen content of the water and the temperature readings correspond to the natural properties of watercourses, flora and fauna that is characteristic to watercourses is recovering. Fish species diversity has increased, fish fauna characteristic to the area has recovered, including protected fish species. As a result of the restoration work, more than 6 hectares of riverine habitats in good condition were added. Fish migrations can be hampered by beaver dams, the locations of which are recorded by hunters and local people in the area. These people also remove them, if necessary.

A total of **13 hectares** of semi-natural alluvial meadows, which are also important fish spawning grounds, were restored. Recovered meadows will join and extend the Aiu alluvial meadow that is under regular management. In order to improve the access to the managed alluvial meadow, a

bridge over the Laeva channel and a 270 m long road within the protected area were reconstructed as part of the project. RMK reconstructed a 570 m long road section outside of the protected area. This means that management equipment can move around, and vegetation collected from the alluvial meadows can be transported in the future.

During river restoration, fast-flowing river sections with gravel substrate were created; these are suitable spawning grounds for fish that spawn on rapids, such as asp. In total, over **300 m^2** of such sections were created.

To strengthen the population of asp, a protected fish species, in the Emajõgi system and for the populations in the restored river sections to recover faster, Laeva River was stocked with a total of 12,000 asp summerlings. The restoration of the river and the stocking of asp have been successful. Studies of fish fauna have captured both adult specimens and juvenile fish of different ages.

Informing the public and awareness raising has been broad and comprehensive. For children and youth, three study camps were organised for introducing project actions, Alam-Pedja natural values and aquatic biota, especially fish. 100 young people participated in camps organised at Palupõhja; the camps were very popular.
Public interest in the project was very high. Project activities were repeatedly featured in media and publications. Particular attention was paid to the formal Laeva River re-opening event. Public interest and support for the project was very high. This is also illustrated by the socio-economic impact study that was carried out. People believe that the restoration of the river is very valuable – 22 million euros in monetary terms.

The implementation of the project contributed to the objectives of the Alam-Pedja protected area, it increases the integrity of the protected area and the size of the area with good ecological status and improves connections between them. The project was an important extension of the LIFE Happyfish project that strengthens and amplifies its results.
Migration routes were also opened outside of the protected area on the larger tributaries (Pedja, Põltsamaa, Laeva, Elva) of the Emajõgi River; this supports and enhances project results and the positive effects of the actions. Passages for fish have been created in recent years, for example, in small towns of Puurmani and Laeva.
Ecosystem services offered by natural waterbodies grew and became stronger.

PROPOSED MANAGEMENT ACTIONS

Project actions were planned and implemented in accordance with the Alam-Pedja Nature Reserve Protection Policy and the Management Plan. Therefore, the monitoring of the results of the project actions and their sustainability are ensured by the implementation of the Protection Policy and the Management Plan.

Table 2 of the action plan summarises an excerpt from the budget of the Alam-Pedja Natura 2000 Site Management Plan for the assessment of the status of watercourses (habitat type 3260) and for the implementation of actions necessary for the management and restoration of habitats. In the table, the activities have been divided into the following priority classes according to the

importance of the action: 1) first priority – an essential action without which it is impossible to meet the protection objectives within the planned time period, a measure aimed at preserving the values and eliminating an existing risk factor; action necessary for assessing management effectiveness; 2) second priority – a necessary action aimed at restoring and exhibiting values and on eliminating potential risk factors; 3) third priority – recommended action, that is, an action that indirectly contributes to the preservation and restoration of values and the elimination of risk factors.

Table 2. Budget of the Alam-Pedja Natura 2000 Site Management Plan for the Period 2016–2025 (excerpt from the management plan, costs in hundreds of euros)

	Name of action	Type of action	Organiser	Priority	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	Total
Inventories, monitoring, studies															
4.1.1	National monitoring	National monitoring	KAUR	I	x	x	x	x	x	x	x	x	x	x	
4.1.5	Monitoring the state of oxbow lakes, including the status of aquatic biota	Monitoring	KeA	II	10					10					20
Management, restoration, control															
4.2.3	Removal of beaver dams (as needed)	Control of problematic species	KeA, RMK, interested parties	II	8	8	8	8	8	8	8	8	8	8	80
4.2.4	Mowing of semi-natural communities	Community management	KeA, RMK, interested parties	I	1088	1156	1224	1292	1360	1428	1496	1564	1632	1700	13940
4.2.8	Managing the mouths of oxbow lakes, as needed	Community management	KeA	II	15	15	15	15	15	15	15	15	15	15	150
4.2.9	Restoration of the lower reaches of the Laeva River	Community restoration	RMK	III	110	500	1480	10	10						2110
Infrastructure, equipment, animals															
4.3.1	Establishing access roads to alluvial meadows	Establishment of other infrastructure	RMK	I	x	x	x	x	x						

Organisers: KAUR – Estonian Environment Agency, KeA – Environmental Board, RMK – State Forest Management Centre

After the end of the project, Wildlife Estonia will continue to actively participate in the implementation of management activities in the protected area. Wildlife Estonia will request to participate in national and project-based monitoring of the Emajõgi River and waterbodies of the Emajõgi system using a variety of traditional and most up-to-date monitoring methods. The tools and knowledge for this are available. Monitoring of the status of asp will be continued and actions necessary for improving its status will be carried out in accordance with the adopted national action plan for the protection of asp. During the project, knowledge has been gained about the behavioural patterns and habitat preferences of asp. Skills of how to artificially breed and stock asp into waterbodies if it becomes necessary have also been acquired. Experience is transferable to other Estonian water bodies. Wildlife Estonia will also plan and take part in both planned and project-based actions associated with the waterbodies of the Emajõgi system, including keeping oxbow lakes open. In the course of the projects, a lot of experience has been acquired for carrying out this activity and the equipment needed for various activities has been purchased.

Wildlife Estonia will also continue to participate in the work of the Alam-Pedja Partnership. We believe that it is very important to introduce the values and actions of the protected area and to inform the public. We will continue to inform all parties and the general public by organising events, by participating in events, and by using the media.

REFERENCES:

The Management Plan of the Alam-Pedja Natura 2000 Site for the Period 2016–2025, approved by Decree No. 1-4.2/15/2015 of August 11, 2015 of the Director General of the Environmental Board.