



Asp *Aspius aspius*

Asp is the biggest of Estonian native cyprinids and the only predator among these. It is highly abundant in Lake Peipus, Suur-Emajõgi River and Narva River. Asp is a thermophilic fish whose most active feeding occurs from May to October. It becomes sexually mature at the age of 5–7 years (females) and spawns in spring in rapid river sections on pebble or gravel bottom. It feeds on zooplankton in the first year and later on other fish, common bleak above all. In Estonia the lifetime of asp is up to 10 years. It grows up to 7–8 kg in weight, occasionally reaching 10 kg. Asp is an attractive species for hobby fishermen but its catch is prohibited in Estonia since 1992.

Main threats to asp include silting of spawning grounds, migration barriers, river deepening and cut-offs. Spawning ground preservation and open migration routes are the key conservation measures. In Alam-Pedja Nature Reserve the asp occurs in Emajõgi River, Laeva River, and Elva River, it is probably also spawning in the two former. It migrates to oxbow lakes for feeding. The current project aims to explain the migration pattern and spawning areas of asp.

Fish fauna of Emajõgi River and its oxbow lakes includes a number of **endangered European species** such as asp, European weatherfish, spined loach and European bullhead, but also various species of high fishing importance such as pike, pike-perch, perch, common bream and golden orfe.



European bullhead *Cottus gobio*

European bullhead is a freshwater fish with a club-shaped body and a wide flat head. Its naked skin without scales is covered with small spines. It mainly inhabits river sections with pebble and gravel in the bottom. It can be found also in Lake Peipus, Lake Võrtsjärv and in the coastal sea. European bullhead prefers cool oxygen-rich sites. In Estonia it becomes sexually mature at the age of two years. Spawning takes place in late April or in early May when the water temperature has raised to 5–9 °C. Bullhead is a benthic species hiding itself underneath a particular stone. It protects the area surrounding its shelter against other bullheads.

Main human threats to the European bullhead include deterioration of water quality due to pollution and eutrophication, as well as deepening, straightening and damming of rivers. In the Alam-Pedja reserve it is known to live in oxbow lakes of Ringkoolu and Lustivere.



European weatherfish *Misgurnus fossilis*

European weatherfish is an eel-like fish with small rounded fins. It has dark back and somewhat lighter sides with one wide and two narrow dark stripes, and five pairs of barbels around its mouth. Weatherfish is a secretive species and therefore difficult to capture. It favors shallow water bodies with muddy bottom and rich vegetation. Estonia is the northernmost natural distribution area for the European weatherfish. It burrows into mud and as a facultative air-breather is capable of tolerating oxygen deficiency. The spawning season lasts from late April to July. Owing to its barbels the nocturnal fish is able to feed on chironomids, larvae of other insects and zoobenthos even in the dark and in extremely muddy water.

European weatherfish is not currently threatened by human activities. Negative impacts can be mainly brought about by water level regulation and river-straightening. Water bodies of the catchment basin of Lake Peipus, oxbow lakes of Emajõgi river in the Alam-Pedja Nature Reserve and of Narva River in particular, as well as the shores of Lake Peipus provide suitable habitats for the European weatherfish and thus, are rich in this species. European weatherfish is found in all oxbow lakes of the Alam-Pedja reserve and here and there in the niches along the banks of Emajõgi River, Elva River and Pedja River.



Spined loach *Cobitis taenia*

Spined loach is a small benthic fish reaching a length of 11 cm. It has an elongate flat-sided body of pale yellowish color. Brown mottles on its sides form two parallel stripes. Its mouth is furnished with three pairs of small barbels. The spines below its eyes become erect for defence when there is a threat from the predator fish or bird. Spined loach lives both in rivers and lakes and favors clear water and sandy or clay bottom slightly covered with silt and detritus. Spined loach spawns in June and July in the depth of 0.3–0.8 m, depositing its eggs onto the leaves, roots and stems of plants both alive and dead. The fish is capable to change color along with the color of the bottom substrate. With poor swimming skills, the spined loach stays close to the bottom, hiding itself between the vegetation or burying in the bottom and leaving only the head exposed. It is highly resistant to living without food for up to five months. Similar to the European weatherfish, the spined loach possesses the ability of intestinal breathing. The oxbow lakes and waters near river banks in the Alam-Pedja reserve and at Palupõhja in Emajõgi River have high seasonal abundance of spined loach. To enhance its preservation, comprehensive research on the migration pattern of this fish is needed.

The spined loach is mainly threatened by water level regulations in lakes as well as in rivers where also deepening and straightening pose threat to the population.

Alam-Pedja area is an extensive wilderness area of vast mires and bogs, wet forests, floodplains and meandering rivers. The area under protection today covers 34,220 hectares. The nature reserve is located in the Lake Võrtsjärv depression bordered mainly by rivers – Pedja River, Põltsamaa River, Umbusi River, Pikknurme River, Laeva River and Suur Emajõgi River. The nature reserve consists of zones with different protection regime and has several nature trails and a nature centers.

Visitor's guidelines

- Some visiting restrictions are applied in the nature reserve. Please follow the tourist signs! Use only roads and parking lots for biking and driving motor-vehicles!
- Motorboats are allowed on Emajõgi River, Elva River and Ilmatsalu River. On Pedja River and Põltsamaa River motorboats are allowed with the written permission of the nature reserve governor only. Motorboats are prohibited all year round on the rest of the water bodies, including oxbow lakes of Emajõgi River.
- Other motorized watercraft is prohibited on the entire area of the nature reserve.
- Fishing in the nature reserve is prohibited on oxbow lakes of Emajõgi River between the mouth of Pedja River and Kärevere bridge on the Tallinn–Tartu highway from April 1 to June 30.
- When noticing any activities harmful to nature call the Environmental Inspection at 1313.

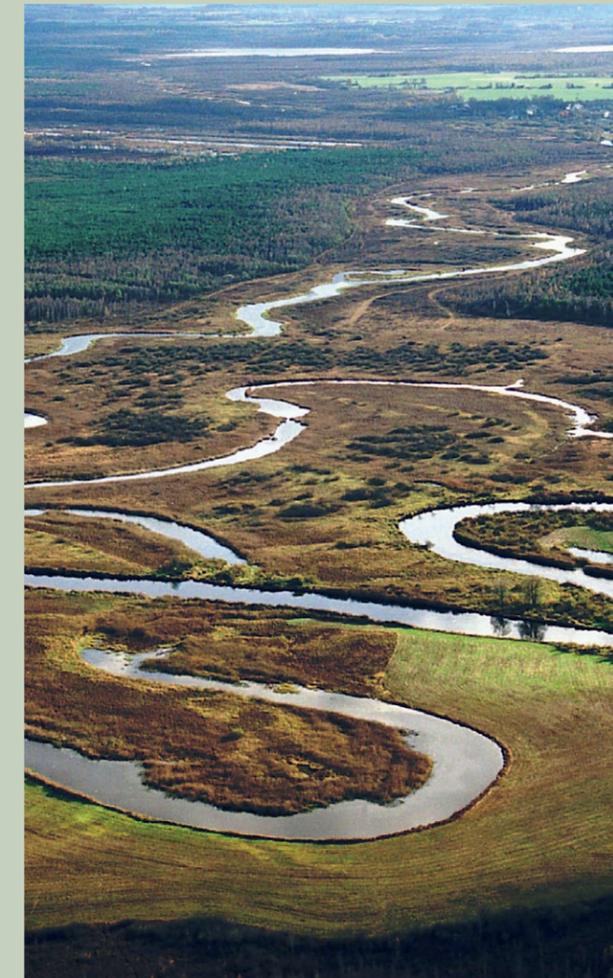
Alam-Pedja Nature Reserve is governed by the regional Jõgeva-Tartu department of the Environmental Board of Estonia (www.keskkonnaamet.ee). Visitor activities in the nature reserve are organized by nature conservation department of the State Forest Management Center (Tooma village, Jõgeva County; www.rmk.ee) and the Alam-Pedja Nature Center of the Environmental Board. Palupõhja nature school at Palupõhja (robert@kotkas.ee) has become one of the most visited and active centers of environmental education.

The project is financed by the EU LIFE+ Programme and the Estonian Environmental Investment Center and executed by Wildlife Estonia (Eesti Loodushoiu Keskus), Nature Conservation Society Kotkas and Environmental Information Center. For more information on the project HAPPYFISH please visit www.loodushoid.ee/happyfish



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Natura values of Alam-Pedja watershed





Emajõgi River with its numerous oxbow lakes and floodplain meadows form the most valuable areas of the Alam-Pedja Nature Reserve. The 100-km-long Emajõgi River connects Lake Peipus, the fourth largest lake in Europe, and Lake Võrtsjärv.

Over long period of natural formation of Emajõgi River, its streambed has undergone significant changes, resulting in distinctive water bodies cut off from the former riverbed. There are 55 oxbow lakes in the Alam-Pedja Nature Reserve. The total length and surface area of oxbow lakes on the territory of nature reserve is greater than that of the present riverbed.

Unique oxbow lake ecosystems have evolved over time. Oxbow lakes have rich fish fauna and provide ideal reproduction grounds for many fish species. Several studies have shown that many fish migrate to spawn here from Lake Peipus, Lake Võrtsjärv and other water bodies of the Emajõgi

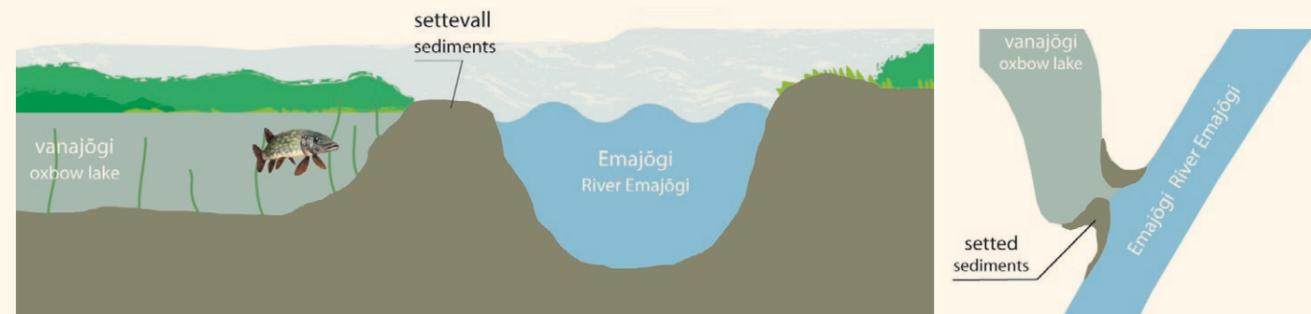
River system. The abundance of juvenile fish in oxbow lakes can reach as high as 1 million individuals per cubic meter.

Oxygen deficiency occurs in oxbow lakes in winter and sometimes also in summer. Unfortunately, it is not always possible for fish to escape from hypoxia to the oxygen-rich waters of Emajõgi River.

Low water levels in winter may disconnect oxbow lakes from the mainstream of Emajõgi River due to silting with sand and mud. Fish trapped in oxbow lakes without oxygen may die. To prevent this from happening sediment should be removed from the mouths of oxbow lakes.

To improve the living conditions for fish of the Emajõgi River system, the cleaning of spawning grounds on floodplain meadows, the protection of spawning grounds of asp that spawns on rapids and the artificial reproduction of asp for its reintroduction to rivers must be carried out.

A project called **HAPPYFISH** has been launched to conduct these works. For the restoration and enhancement of ecological potential of the Emajõgi River system the sediment removal is carried out at the mouths of oxbow lakes. The sites included in the project are Samblasaare, Kupu, Völlinge, Pudru, Kärkna and Rõhu oxbow lake, and I, II, III, and IV pit. In total, 50 hectares of spawning grounds will be restored and 50,000 fingerlings of asp introduced. Asp is a protected species and therefore has to be released after being caught. The ultimate aim of restoration would be achieving a wholly vigorous population and authorizing free fishing of this attractive species. In order to better examine the behavior and habitat needs of asp, we encourage fishermen to share information about the asp and other marked fish with Wildlife Estonia by telephone +372 517 6886.



Alam-Pedja Nature Reserve hosts the following species listed in the Annex II of the EU Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora: thick-shelled river mussel (*Unio crassus*), the beetles *Dytiscus latissimus* and *Graphoderus bilineatus*, yellow-spotted whiteface (*Leucorrhinia pectoralis*), large copper (*Lycaena dispar*), and probably also the dragonfly *Ophiogomphus cecilia*.

Thick-shelled river mussel lives in watercourses with cool and clean water and intermediate or high flow velocity. Preservation and revival of a stable population depends on host organisms, i.e. on other fish. The major threats to the species include habitat destruction caused by ditch drainage and damming, pollution with chemicals and silt, water level fluctuations in regulated rivers, and excessive rise of water temperature

The beetles *Dytiscus latissimus* and *Graphoderus bilineatus* found in the Alam-Pedja Nature Reserve prefer stagnant water bodies or low-flow water courses.



Yellow-spotted whiteface inhabits the stagnant water bodies, but is also found in oxbow lakes with no or minor (temporary) connection with the main river.

The dragonfly *Ophiogomphus cecilia* is believed to share the same habitats with the thick-shelled river mussel.

Of the dragonflies listed in the Annex IV of the EU habitat and species directive, the **dark whiteface** (*Leucorrhinia albifrons*), the **yellow-legged dragonfly** (*Gomphus flavipes*), the **green hawker** (*Aeshna viridis*), and the **Siberian winter damsel** (*Sympecma paedisca*) are found in the Alam-Pedja Nature Reserve.

Large copper mostly resides on floodplain meadows. Mire drainage is considered one of the principal threats to the species. Alam-Pedja Nature Reserve is the historic immigration area for the species in Estonia, currently hosting the most important and strongest Estonian population of large copper.

The watercourses of Alam-Pedja Nature Reserve play important role for the **scarce heath** (*Coenonympha hero*) and the



woodland brown (*Lopinga achine*), both listed among the butterflies in the Annex IV. Mowing of floodplain meadows in a way that the riparian deciduous forests and willow thickets are maintained is essential for the preservation of butterflies in the area.

The **European otter** (*Lutra lutra*) represents the mammals of the Annex II in the Alam-Pedja Nature Reserve. The rivers and oxbow lakes of the area provide highly important habitats for otter.

