



Springs – a special habitat

Water is an indispensable good not only for humans, yet also for numerous of beings that are dependent on water.

The low and constant temperatures of the spring water and shallow spring areas pose extreme conditions for many species. Only selected, highly specialised animals and plants settle these habitats.

Besides the **curled hook moss**, a multiplicity of plant species is characteristic of spring areas and the attached upper reaches: **large bitter-cress** and **golden saxifrage** can form dense “carpets” in and next to the waters.

Microbes primarily dominate the fauna. **Planarians**, **freshwater snails**, common **freshwater amphipods** and **stonefly larvae** need very clean water.

The **sombre goldenring**, a dragonfly species of the low mountain range, and the **fire salamander** are dependent on these waters. They set off their larvae in the shallow areas with little current in order that the larvae can slowly develop into adults.

Being an actually fixed component of our biodiversity, the protection of the fire salamander is constantly becoming more relevant, yet the species is threatened by the „bsal“, an introduced cutaneous fungus that is deadly for salamanders and newts. Studies will indicate if the fungus appears in the counties of Paderborn and Höxter, too, as it has already be found in the western part of North Rhine-Westphalia.



Fire salamander larva

Sombre goldenring larva
(blickwinkel, H. Bellmann, F. Hecker)

Pan-European Nature Conservation



Natura 2000

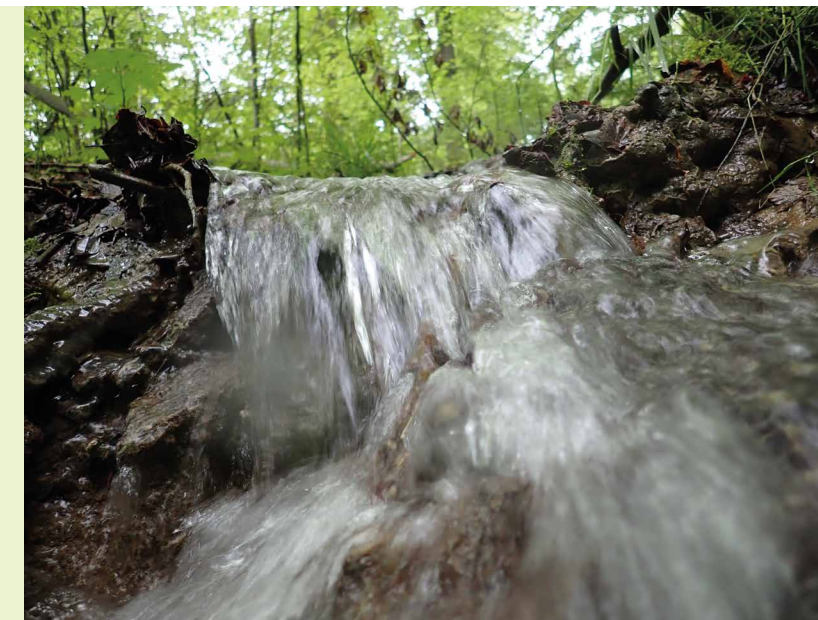
The forest areas, selected for the project, rank among the European Natural Heritage and are therefore subject to a special protection status.

The system for nature protection areas, Natura 2000, is the result of a transnational network dedicated to a common standard in nature and species conservation in Europe. This system is based on the Wild Birds Directive (1979) and the Fauna-Flora-Habitat Directive (FFH-Directive, 1992), both passed by the EU. They do not only protect rare and feral plants and animals, but also their living environments.

LIFE

By introducing LIFE in the year 1992, the European Union initialized a fitting support programme for climate, nature and environment. The subject area „nature and biodiversity“ supports projects for the preservation and the recreation of threatened habitats and animal and plant species endangered by their rarity in the areas of Natura 2000.

Since the year 1992 when LIFE was introduced, almost 4000 projects have been promoted in the EU. “Tuff-LIFE” is one of so far 33 LIFE projects in North Rhine-Westphalia.



About

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Tuff-LIFE

A habitat of water and lime

Spring areas moulded by moss.

Rushing streams.

In the midst of our forests.



www.tuff-life.nrw.de



Pan-European Natural Heritage

A very special type of spring is in the focus of the nature conservation project „Tuff-LIFE“: the petrifying springs with tufa formation rank among the European natural heritage by means of their rarity and their unique composition of species.

The focal point of their dispersion is located in Germany. In the state of North Rhine-Westphalia, the region Hochstift (the counties of Paderborn and Höxter) is home to 80 % of the statewide legally protected springs. They are primarily found in the wooded areas of the counties Paderborn and Höxter.

Alder-, ash tree- and alluvial softwood forests often accompany the streams. Slope- and hillside mixed forests are characterised by ash trees as well. Besides the focus on the waters, these forests are taken into account in the project, too. Those forests have been severely impaired by ash dieback, a disease of the characteristic tree species Common Ash, for several years by now.

Calcareous tufa – a porous stone

Petrifying springs with tufa formation often appear on small areas and occur merely in areas in which the soil contains calcareous stones. When subterranean water enriched by lime reaches the ground surface, the lime precipitates.

Algae and moss, such as the curled hookmoss (*Palustriella commutata*), have a significant impact on the tufa formation due to their photosynthetic activity. The precipitated lime deposits on moss, stones and branches in the further course of the spring. Characteristic terraces of limestone and calcareous tufa arise due to alternate deposition of lime and regeneration of the moss.



Caddisfly larvae on stone



Terraces of limestone and calcareous

Renaturation as a long-term conservation strategy

Endangering

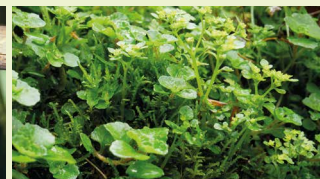
Being sensitive habitats, springs rapidly react to external influence. Humans have always been using springs and forests in various manners, yet not always in favour of the springs' natural dispersion. Nowadays many springs undergo severe impairments, for which the causes are variable:

- old spring enclosures
- erosions
- forestations with spruces
- foot traffic caused by animals
- narrow pipings in forest tracks.

Typical plants and animals can no longer take up residence, nor can they spread in the spring areas. The tufa formation suffers from this as well.



Sombre goldenring (blickwinkel, F. Hecker)



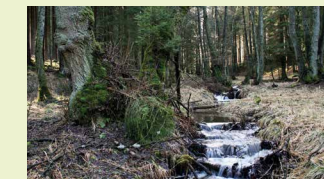
Curled hook moss and golden saxifrage

Measures

The springs are going to be recultivated over the course of the next years by the use of systematic measures. Forestal and landscape management measures are planned to protect the springs in the long run:

- removal of obstructions
- construction of fords or strong passages
- establishment of buffering areas
- creation of lacking habitats for amphibians
- forest conversion towards more habitat-oriented tree species
- adaption of the forests moulded by ash trees.

Detailed studies at selected springs at the beginning and at the ending of the project will show whether the measures have had a positive impact on the composition of species in the habitats.



Streams are often surrounded by floodplain forests



Calcareous tufa with curled hook moss