
Type 9.2: Large highland rivers

Distribution in river landscapes and regions according to Briem (2003):

Large floodplains (over 300 m wide)

Picture:



Ruhr (North Rhine-Westphalia). Photograph: U. Koenzen

Short description of morphology:

Depending on slope and bedload transport, the rivers can flow in sinuate to meandering single channels, or develop numerous side channels and form braided reaches. While in narrow valley sections, the floodplain is small or absent, but can be very expansive and up to several hundred metres wide in open valleys. Habitat diversity is high. Channel substrates are dominated by boulder, cobbles and gravel. Deposits of finer sediments like sand and loam can be expansive in areas with reduced current. Large unvegetated gravel and cobble bars are characteristic for streams of this type. The channel profile is shallow; riffle and rapid sections alternate regularly with pools. Streams of this type are very dynamic and subject to expansive lateral channel movements.

Abiotic profile:

Size class: 1.000 - 10.000 km² catchment area
Slope of the valley floor: ~ 3 ‰
Flow category: predominantly fast flowing current, interrupted by slower sections
Channel substrates: boulders and cobbles dominate, some expansive fine substrate deposits of sand and mud

Physico-chemical water conditions:

generally calcareous
Conductivity [µS/cm]: 300 - 600
pH-value: 7,0 - 8,5
Alkalinity [°dH]: 4 -10
Total hardness [°dH]: 5 –13

Flow regime & hydrology:

High fluctuations in discharge over the year, with very pronounced extreme discharge events.

Type 9.2: Large highland rivers

Characterisation of the macroinvertebrate community:

Functional groups: As a result of habitat diversity, the coenosis is species rich, with many potamal species and rhithral species, which are flushed in from tributaries. Eurythermic species occur.

Selection of type-specific species: These include the snails *Theodoxus fluviatilis* and *Bithynia tentaculata*, the mayflies *Baetis vardarensis*, *Oligoneuriella rhenana* and *Potamanthus luteus*, the stoneflies *Brachyptera braueri* and *Perla burmeisteriana*, the dragonfly *Onychogomphus forcipatus*, the water bug *Aphelocheirus aestivalis*, the beetle *Stenelmis canaliculata* and the caddis fly *Hydropsyche bulgaromanorum*.

Characterisation of macrophyte and pyhtobenthos communities:

Especially frequent is the water crowfoot community with *Ranunculus fluitans*, *R. peltatus*, *R. penicillatus*, accompanied by large pondweeds. Other species include *Callitriche platycarpa* and *C. stagnalis* as well as the aquatic mosses *Scapania undulata*, *Fontinalis antipyretica*, *Chiloscyphus polyanthos*, *Hygroamblystegium fluviatile*, *Jungermannia exsertifolia*, *Racomitrium aciculare*, *Schistidium rivulare*, *Marsupella emarginata* and *Rhynchostegium riparioides*.

Characterisation of the fish fauna:

As a result of its high habitat diversity, the stream type supports a rich fauna, typical for the barbel region. Characteristic are gravel-spawning species like barbel and nase and other rheophilic river cyprinids, as well as some species, which are indifferent to current flow. The generally well-developed extensive floodplains support lenitic species. Migratory fish like salmon, sea lamprey, allis shad, and twaite shad spawn in this stream type or use it as a migratory route to reach spawning grounds in tributaries. In the large Danube tributaries, species endemic to the region like huchen and sandsmelt are also common.

Comments:

Examples of typical streams

Macroinvertebrates: Ruhr (North Rhine-Westphalia), Fulda (Hesse), Jagst (Baden-Württemberg)

Macrophytes and pyhtobenthos: Danube (Bavaria)

Comparative literature (selection):

LUA NRW (2001) „Schottergeprägter Fluss des Grundgebirges“