

Type 2: Streams in the alpine foothills

(Sub types 2.1 and 2.2)

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

Tertiary hills, old moraines (ground and terminal moraines) and river terraces, lower river terraces, occasionally in loess regions

Picture:



Kleine Laber (Bavaria). Photograph: Bavarian Water Management Agency (LFW)

Short description of morphology:

Stream type 2 „Streams in the alpine foothills“ comprises both small rivers (sub type 2.1) and mid-sized rivers (sub type 2.2). Characteristic for these stream types is the winding and meandering channel form. Dominant substrates are cobble and depending on catchment geology gravel with varying shares of sand and loam. Cobble and gravel bars with some argyllal and valley peat intrusions are common. Slowly flowing pool sections are disrupted by fast flowing riffles.

Abiotic profile:

Size class: 10 - 1.000 km² catchment area
(Sub type 2.1 small rivers: 10 - 100 km² catchment area)
(Sub type 2.2 mid-sized rivers: 100 - 1.000 km² catchment area)

Slope of the valley floor: > 0,5 ‰

Flow category: slow flowing with fast flowing riffles sections

Channel substrates: cobble, gravel, sand, clay, silt

Physico-chemical water conditions:

(slightly) calcareous or siliceous

Conductivity [μS/cm]: 300 - 400

pH-value: 7,9 - 8,4

Alkalinity [°dH]:

Total hardness [°dH]:

Flow regime & hydrology:

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

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Characterisation of the macroinvertebrate community:

Functional Groups: The macroinvertebrate community is dominated by rheophilic stone-dwellers. Besides these, species inhabiting the small gravel and sand patches also occur. With respect to abiotic parameters (current velocity, oxygen supply and water temperature) demanding species are prevalent. In sub type 2.1 species of the epirhithral are abundant.

Selection of type-specific species in small rivers (sub type 2.1):

Ephemeroptera: *Baetis muticus*, *B. niger*, *Electrogena ujhelyii*, *Habrophlebia lauta*, *Rhithrogena semicolorata*. Odonata: *Calopteryx virgo*. Plecoptera: *Siphonoperla torrentium*, *Brachyptera risi*, *Nemoura cambrica*, *Leuctra albi-da*, *Leuctra hippopus*. Heteroptera: *Sigara fossarum*, *S. hellensii*, *Velia caprai*. Neuroptera: *Osmylus fulvicephalus*. Coleoptera: *Brychius elevatus*, *Halplus lineatocollis*, *Deronectes latus*, *Platambus maculatus*, *Hydraena belgica*, *H. gracilis*, *Elmis aenea*, *E. maugetii*, *Limnius volckmari*. Trichoptera: *Rhyacophila fasciata*, *Philopotamus montanus*, *Tinodes rostocki*, *Hydropsyche instabilis*, *H. saxonica*, *Silo nigricornis*, *S. pallipes*, *Potamophylax cingulatus*, *Odontocerum albicorne*.

Selection of type-specific species in mid-sized rivers (sub type 2.2):

Ephemeroptera: *Baetis lutheri*, *Ecdyonurus insignis*, *Heptagenia flava*, *H. sulphurea*, *Potamanthus luteus*, *Caenis macrura*. Odonata: *Calopteryx splendens*, *C. virgo*, *Gomphus vulgatissimus*. Plecoptera: *Perlodes dispar*, *Perla burmeisteriana*, *Taeniopteryx nebulosa*, *Leuctra fusca*, *L. geniculata*. Heteroptera: *Micronecta griseola*, *M. minutissima*, *Aphelocheirus aestivalis*. Megaloptera: *Sialis nigripes*. Coleoptera: *Oreochilus villosus*, *Bidessus delicatulus*, *Ochthebius bicolon*, *O. colveranus*, *Hydraena pulchella*, *Elmis maugetii*, *E. obscura*, *Oulimnius tuberculatus*, *Limnius volckmari*, *Macronychus quadrituberculatus*, *Heterocerus marginatus*. Trichoptera: *Rhyacophila dorsalis*, *Agapetus laniger*, *Cheumatopsyche lepida*, *Hydropsyche bulbifera*, *Hydropsyche exocellata*, *Brachycentrus subnubilus*, *Goera pilosa*, *Potamophylax rotundipennis*, *Athripsodes bilineatus*, *Ceraclea annulicornis*.

Characterisation of macrophyte and pyhtobenthos communities:

Selection of type-specific macrophyte species: *Callitriche obtusangula*, *Hygroamblystegium fluviatile*, *Brachythecium rivulare*, *Bryum argenteum*, *Cratoneuron filicinum*, *Callitriche hamulata*.

Selection of type-specific diatom species: *Achnanthes biasolettiana*, *Achnanthes minutissima*, *Cymbella microcephala*.

Characterisation of the fish fauna:

Small rivers offer suitable habitat for brook trout, bullhead, minnow and stone loach. Mid-sized rivers generally represent the grayling and barbel regions. In this stream type, gravel-spawning species like grayling, nase, barbel and indifferent species like chub and roach are common. Typical small fish species are schneider and gudgeon. Often the grayling region fauna is not developed. In temporary small rivers of this stream type, the fish fauna can be reduced or absent depending on the extent and length of dry periods.

Comments:

Stream type 2 „Streams in the alpine foothills“ comprises two longitudinal sub types: small rivers (sub type 2.1) and mid-sized rivers (sub type 2.2). Longitudinal, biotic differentiation and local particularities should be considered in stream assessment.

Examples of typical streams

Macrophytes and pyhtobenthos: Baierzer Rot (Baden-Württemberg), Schrannenbach (Bavaria)

Comparative literature (selection):