

Type 19:

Small streams in riverine floodplains

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

Ecoregion independent stream type. Large floodplains (over 300 m wide), Lower river terraces

Picture:



Hellbach (Schleswig-Holstein). Photograph: J. Stuhr

Short description of morphology:

Streams with very low slope, running in winding to meandering, in parts multiple channels, through floodplains of main stem rivers, which hydrologically influences these tributaries.

A valley form is not discernible. The very shallow, hardly cut-in channels have stable banks. Channel substrates vary from organic material to fine or coarse mineral fractions depending on the original fluvial deposits (often sand and loam, less common are gravel or loess). The water is often turbid as a result of high loads of suspended material, and streams rich in organics are often coloured brown by humic substances. Characteristic is an alternation of running water sections with standing water pools, as well as shaded and well-lighted reaches where macrophytes and reeds are abundant. At high discharges, the entire floodplain is inundated, often for longer periods of time. Water flow in river terrace tributaries is backed up, when the main stem river is experiencing high discharges.

In young moraines, reaches above lakes can be categorised into this stream type.

Abiotic profile:

Size class: 10 - 300 km² catchment area

Slope of the valley floor: < 2 ‰

Flow category: alternation of stretches with barely evident current and clearly flowing stretches; rarely turbulent.

Channel substrates: besides organic substrates (macrophytes, woody debris, peat), deposits of the river terrace or the further extending catchment make up the channel substrates

Physico-chemical water conditions:

No generally parameter ranges can be given, because they are dependent on the geological-pedological conditions in the river terraces or the further extending catchment.

Flow regime & hydrology:

Low to high discharge fluctuations over the year, depending on the hydrology of the main stem river.

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Characterisation of the macroinvertebrate community:

Functional groups: The characteristic combination of slowly flowing reaches and lenitic stretches leads to a high amount of both species common to slow flowing reaches and standing water taxa. Hyporhithral and epipotamal species dominate, supplemented by numerous litoral species. Abundant macrophyte growth promotes high shares of plant colonisers. Other taxa include inhabitants of fine and hard substrates (under near-natural conditions mainly coarse woody debris). The fine, partially organic sediments, support sediment and detritus feeders, which make up the most abundant functional feeding group. Mainly euryoecious and eurythermic species.

Selection of type-specific species: Potentially high diversity due to occurrence of both lenitic and lotic species. Among them are *Gammarus roeseli*, *Caenis* spec., *Calopteryx splendens*, *Tinodes waeneri*, *Neureclipsis bimaculata*, *Agrypnia* spp., *Phryganea* spec., *Oecetis* spec., *Ceraclea* spec., *Mystacides* spec., *Molanna angustata*, *Simulium angustipes*, *Simulium erythrocephalum*. Accompanying species include species from the family of Dytiscidae, *Limnephilus* spec., *Halesus radiatus*, *Goera pilosa* and numerous molluscs.

Characterisation of macrophyte and pyhtobenthos communities:

The stream type is characterised by a rich macrophyte community, which can cover the vast expanses of the channel bed, due to favourable insolation conditions. The occurring species are often not running water specialists, but rather species, which also occur in standing water bodies. They include *Potamogeton natans*, *Myriophyllum spicatum* or *Nuphar lutea*.

Characterisation of the fish fauna:

The high current and substrate diversity support a very species rich and abundant fish fauna. Species common in running and standing waters, as well as those indifferent to current flow occur. So do species, which prefer mineral spawning substrates, or spawn among macrophytes. Besides fish species, which prefer small streams, species of larger water bodies also occur. The gravel-dominated sections of this stream type are colonised by trout and bullhead, while Crucian carp, roach and pike inhabit slow flowing reaches with high shares of organic matter or long and extensively inundated floodplains. Generally, species composition is influenced by the fish fauna of the main stem river.

Comments:

In contrast to other lowland stream types, Type 19 is not defined by the dominant channel substrates! Characteristic for this stream type is the plain floodplain setting, with no discernible valley shape, and the hydrologic influence by the main stem river, into which type 19 streams flow. Lacking shade and extensive reed stands are not artefacts, but are characteristic for this stream type. When bogs or valley peat occur in the catchment, humic substances often colour the water brown. Near natural streams of this stream type are hard to find, as a result of intensive landuse. Most streams of this type have been straightened, channelised and impounded.

Possible confusion with other stream types: Compared with stream types 11 and 12 (small and mid-sized to large organic rivers), streams of this type do not have a discernible valley form and have much lower stream slope. It is not a hydrologically independent stream type, but is much rather controlled by the discharge behaviour of the main stem river, into which or through the floodplain of which it flows (back flow). Biocoentically, the stream type supports high numbers of standing water body species, while type 11 and 12 are characterised by running water and floodplain species. The stream type only comprises small rivers up to 300m² catchment area. Periodically or permanently connected backwaters and old channels of the large rivers do not belong to stream type 19, but are rather categorised as stream type 15 or 20.

Notice: The description of this stream type may be supplemented with results from currently running research projects.

Examples of typical streams

Macroinvertebrates: Hellbach (Schleswig-Holstein), Seege (Lower-Saxony)

Comparative literature (selection):

LUA NRW (2001) „Fließgewässer der Niederungen“, RASPER (2001) „Fließgewässer der großen Feinmaterialauen in Sandgebieten“, LANU (2001) „Teilmineralisch geprägte Fließgewässer der Niederungen und Moorgebiete“