

Type 17:

Mid-sized and large gravel-dominated lowland rivers

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

Large floodplains (over 300 m wide); old river terraces; old moraines; terminal moraines of younger moraine landscapes

Picture:



Ilmenau (Lower-Saxony). Photograph: L. Meyer

Short description of morphology:

Sinuate to strongly meandering, dynamic mid-sized to large streams in wide shallow u-shaped valleys. Beside the usually well-rounded gravel fraction, cobbles and sand occur. Fraction sorting is common: gravel bars occur in stronger current regions, sand bars in calm sections. Beside side bars, mid-channel gravel bars and development of scour pools along eroding meander banks are common. The channel profile is shallow, but eroding bank cliffs can form. In the floodplain, old meanders are transformed into numerous backwaters and abandoned side channels, with varying degrees of silting up. In respect to substrate and current conditions, streams passing terminal moraine gorges of the young moraine landscapes belong to this stream type.

Abiotic profile:

Size class:	100 - 10.000 km ² catchment area
Slope of the valley floor:	0,5 - 1,5 ‰
Flow category:	fast to turbulent current, slow flowing stretches
Channel substrates:	well-rounded gravel fractions of varying grain size dominate, sand accounts for comparable portions of channel substrates, cobbles are subordinate

Physico-chemical water conditions:

The stream type occur as a siliceous and a calcareous variant

	siliceous	calcareous
Conductivity [µS/cm]:	~ 450	500 - 800
pH-value:	~ 7,5	7,5 - 8,5
Alkalinity [°dH]:	~ 6	8 - 10
Total hardness [°dH]:	~ 8	12 - 18

Flow regime & hydrology:

Medium to high discharge fluctuations over the year.

Type 17:

Mid-sized and large gravel-dominated lowland rivers

Characterisation of the macroinvertebrate community:

Functional groups: Species rich invertebrate community with rheophile hard substrate dwellers inhabiting stable gravel reaches; also sand-dwelling species in stable, detritus-rich sandy deposits. Species typical for the metarhithral to epipotamal region dominate. In transition zones from the highlands to lowlands, numerous highland river species occur.

Selection of type-specific species: Characteristic species for gravel bars with fast current are the water bug *Aphelocheirus aestivalis*, and the caddis flies *Rhyacophila* spec., *Hydropsyche* spec. and *Cheumatopsyche lepida* (terminal moraine gorges). In slower, calmer currents, finer substrates are inhabited by the mussel *Unio pictorum* or the dragonfly *Gomphus vulgatissimus*. Accompanying species include *Ancylus fluviatilis* and *Theodoxus fluviatilis*, *Serratella ignita*, *Elmis aenea* and species of the genus *Potamophylax* spec.. Typical river species like the mussel *Unio crassus*, and the beetles *Haliphus fluviatilis* and *Brychius elevatus* occur.

Characterisation of macrophyte and pyhtobenthos communities:

Beside large pondweeds like *Potamogeton lucens*, *P. perfoliatus*, *P. alpinus* and *P. gramineus*, the bur reed (*Sparganium emersum*) community with numerous growth forms occurs. *Sagittaria sagittifolia* and *Nuphar lutea* are typical.

Young moraines: macrophyte colonisation varies. Eroding zones are usually not colonised, otherwise there are marginal to wide spread stands of different macrophyte communities dominated by typical stream species and stream reeds; subordinate are elements of pondweed and floating plant communities. Hard substrates are often colonised by moss (e.g. *Fontinalis*) or freshwater algae (e.g. *Hildenbrandia rivularis*); amphibious zones are poorly vegetated or support insular or marginal reeds and sedge communities.

Characterisation of the fish fauna:

The fish fauna is diverse and dominated by gravel-spawning species. Due to the varied currents and depth variance species of calm stretches occur beside the rheophile species of the main channel. Calm stretches are found in back waters or disconnected side channels. Most species spawn in the gravel substrates, but species, which spawn on sand or between macrophytes can occur.

Comments:

This stream type incorporates very dynamic streams passing terminal moraine gorges. These are short river stretches limited to young moraine landscapes near former glacier margins. They flow through shallow troughs or u-shaped valley. In terminal moraine gorges, the stream channel is straight to sinuate, the current velocities and hydraulic forces are generally high, dominant substrates are gravel, cobbles and boulders. Coarse woody debris, cobble bars and island formation are common.

In terminal moraine gorges, the macroinvertebrate community can include many potamal species, if lakes are passed in the course of the river (see Type 21).

Examples of typical streams

Macroinvertebrates: Rur (Netherlands), Terminal moraine gorges of Nebel and Warnow (Mecklenburg-West Pomerania), Trave (Schleswig-Holstein), Ilmenau, Meiße, Seeve (Lower Saxony)

Macrophytes and phytobenthos: Warnow (Mecklenburg-West Pomerania)

Comparative literature (selection):

LUA NRW (2001) „Kiesgeprägter Fluss des Tieflandes“