



River Renaturalization in the Tisza Basin after Forest Cutting Activities and public participation in it

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Destruction of riverbeds due to forest activities



the Skorodniy stream, tributary of Tisza in the Carpathians

Situation before the restoration

Excessive amounts of timber



replacement of lithorheophilic fauna, typical for mountaineer rivers, by xylophyte and perophilic ones.

After wide development of xylophyte chippers – *Amphipoda*, eurybiontic predators – *Hirudinea* – appear, then gatherers – larvae of *Chironomidae* etc.

In conditions when the whole riverbed or its large areas are polluted, such situation is not normal. Such “defective” communities can exist for years.

4 stages of river renaturalization

1. Collection of wooden residues in the riverbed



4 stages of river denaturalization

2. Restoration of morphological and biotopical structure



8 dams, 7 half-dams and 5 artificial rapids were made of local stones, the riverbed tortuosity was restored, while drops of depths and zones with different stream speeds and turbulization were created

4 stages of river denaturalization

3. Selection of reference (donor) river

(similar to the river in question by its size and geological structure of the riverbed, and situated at the same height above the sea level)



4 stages of river denaturalization

4. Re-introduction of typical for mountain rivers invertebrates and fish

(5,000 of specimen of Ephemeroptera naides, 9 stream trouts *Salmo trutta morpha fario*, 5 gobies *Cotlus poecilopus* and 4 minnows *Phoxinus phoxinus*)

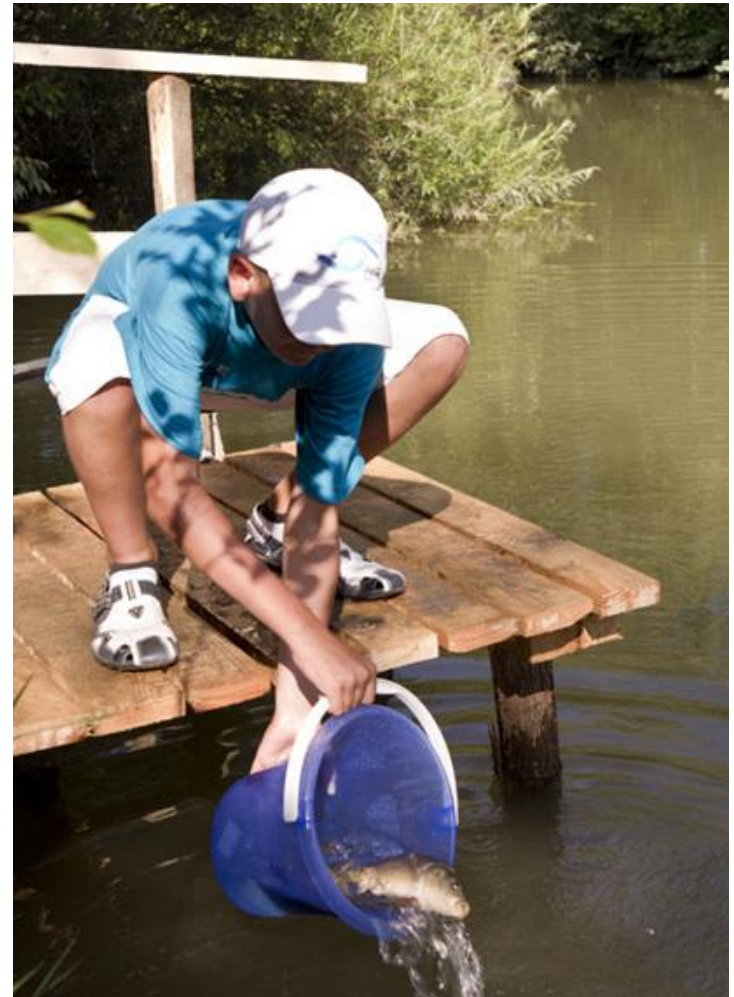


Results (after 4 years)

- Structure of the community of bottom invertebrates in the river Skorodniy in August 2012 looked as fully completed by quantity parameters— 1356 ind.m⁻² and 14 g.m⁻², as well as by taxonomic abundance – 67 species of macroinvertebrates from 10 taxonomic groups.
- The most widely present groups include: Ephemeroptera – 20, Trichoptera – 15 species, Plecoptera – 9 species. Juvenile larva of Chironomidae and green drake *Baetis sp.* dominates by number, Plecoptera – *P. burmeisteriana* and Ephemeroptera – *E. assimilis*, *Baetis sp* by biomass. There were rarely met *G. Balcanicus*, and Herpobdellidae – several items.
- Similarity of the specie composition with the reference river was quite high and was **IS = 0,58**.
- Besides, there is a local population of trout, as well as other fish, typical for this region, in the river.
- **Restoration of ecological state of the river Skorodniy was successful.**

Public participation in river restoration

- 1. Children involvement in the release of the fish



Public participation in river restoration

- 2. Introduction of separate collection of domestic waste



Public participation in river restoration

- 3. Restoration of the sources of the rivers



Public participation in river restoration

- 4. Field lessons on bioindication



Thank you for attention!

