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An overview on the functions and importance of woody riparian buffers

Overview

Under natural conditions, most rivers in temperate regions would run through forests. The remaining near-natural river reaches with well-developed riparian forests are biodiversity hot-spots that offer multiple functions and ecosystem services.

To a certain degree, woody riparian buffer strips along rivers (referred to as woody buffers in the following) offer similar benefits (Fig. 1 left). Habitat and species diversity are usually high, as well as water quality due to the retention of nutrients, pesticides and fine sediment. Moreover, shading dampens water temperatures and mitigates the effect of climate change. The input of leaves and wood supports riverine food webs.

Besides these local effects in the buffered river reach, the beneficial effects of individual woody buffers potentially add up in downstream direction and they may provide migration corridors connecting near-natural sites in a green infrastructure network (Fig. 1 right).

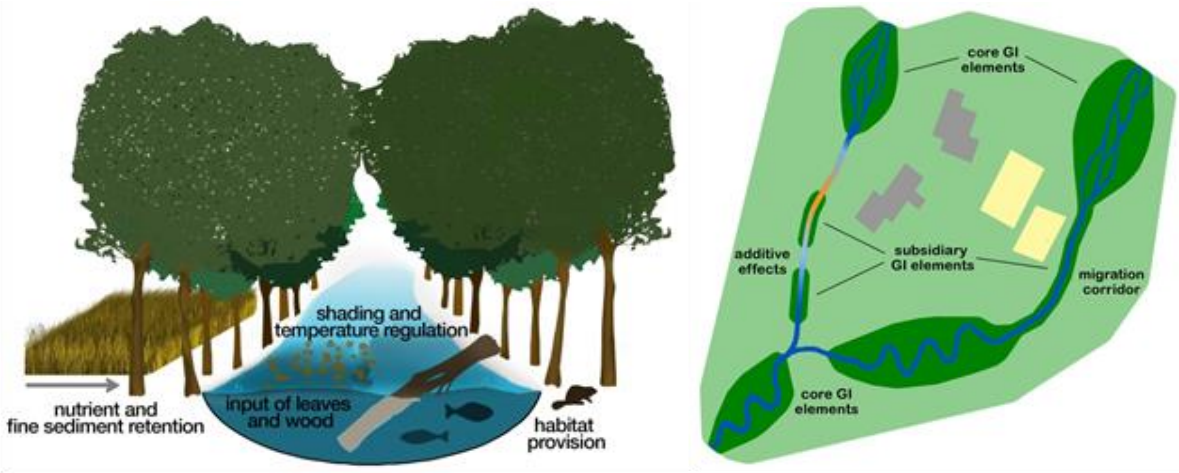

Fig. 1: Spatial scales and pressures influencing river biota at the reach scale (study reach).

Developing woody buffers is frequently rated as an effective restoration measure in cost-benefit perspective (Bernhardt et al. 2005; Stutter et al. 2012). Given limited financial resources, the establishment of woody buffers is often the most realistic option to reach ambitious environmental quality targets like those defined by the EU Water Framework Directive (WFD). However, woody buffers are competing for space with land uses like agriculture, which has recently been intensified by e.g biofuel production. Therefore, woody buffers are rarely established in practice, and even if they are being restored along a certain share of the river network, they remain fragmented.

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References

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