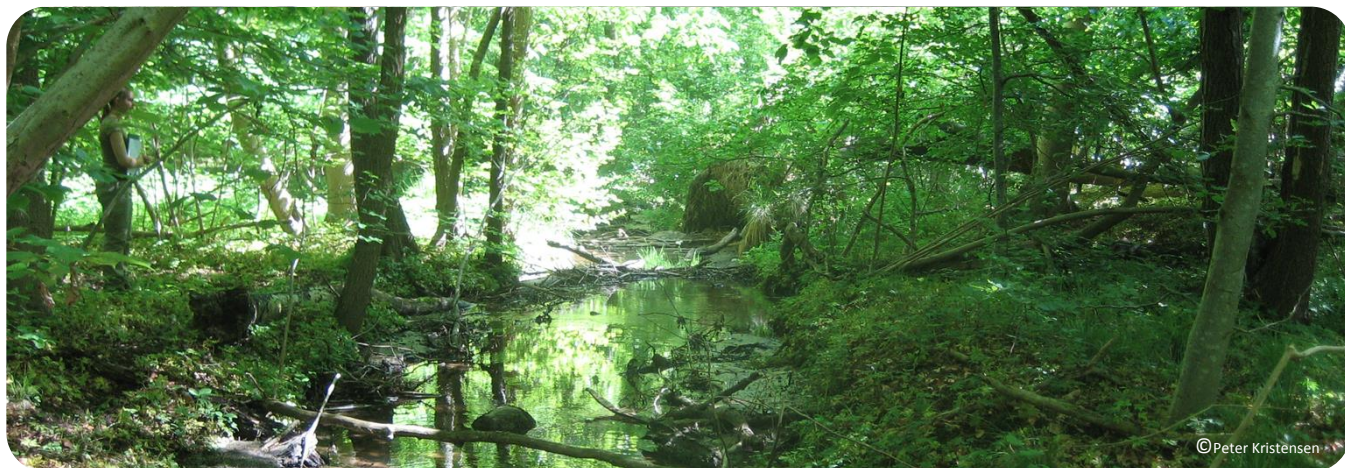


Riparian areas to sustain freshwater life



Key words

Riparian habitats, restoration, ecological status, ecosystem services, biodiversity, land use

Contribution to policy

- Water Framework Directive - EC 2000/60/EC
- Water Blueprint - COM (2012) 673 final
- Green Infrastructure - COM(2013) 249 final

Summary

- ✓ More than a half of European surface water bodies are far from good **ecological status**, not meeting the objectives of the **Water Framework Directive (WFD)**. This is mainly due to **nutrient enrichment** and **hydromorphological alterations**, whose negative effects on freshwater ecosystems will be exacerbated under **climate change** conditions.
- ✓ The **Water Lives Symposium** highlighted that **intensive land use** along rivers (i.e. increased conversion of riparian areas to agricultural land) is the most important stressor **limiting the achievement of good ecological status**. In well-developed **riparian areas**, **biodiversity and ecological status increase**. Under climate change, even relatively short stretches of riparian forest have a **high potential to mitigate the negative effects of increased water temperature**.
- ✓ **Riparian restoration** needs to be promoted within **River Basin Management Plans**. This represents a **win-win solution** by enhancing **ecological quality, biodiversity and ecosystem services**, but also encourages **synergies** with other sectorial policies such as the **greening of the Common Agricultural Policy (CAP)**.



Multiple stressors in freshwater ecosystems

While **freshwaters** are essential for livelihoods due to the **functions and services** they provide, no other ecosystem has experienced such rapid and **massive biodiversity declines** due to the impact of **multiple stressors**. In Europe, freshwater biodiversity is severely threatened and many freshwater habitats remain in “bad” or “inadequate” condition. Further, more than half of surface water bodies are in less than good ecological status and will need restoration measures to meet the **Water Framework Directive (WFD)** objectives. Among the main stressors affecting surface water bodies in EU are pollution from diffuse sources causing nutrient enrichment (**eutrophication**) and hydromorphological alterations causing **habitat degradation**, which are related to **catchment land use**. The effect of some **stressors** could be **exacerbated** (e.g. warming and eutrophication acting along similar pathways) under **climate change** conditions. **Riparian areas** and associated ecosystems can be fundamental for **reducing** the **adverse effects** of multiple stressors in freshwaters.

The restoration of degraded riparian habitats will significantly contribute to halting freshwater biodiversity loss, to the delivery of good ecological status of water bodies, the provision of ecosystem services and to climate change mitigation.

Multiple benefits of riparian areas

Riparian areas are created by transitional habitats between the terrestrial and aquatic systems providing a wide range of **ecosystem functions and services**. Some examples are enhanced **habitat connectivity** and heterogeneity; **water purification** by retention of nutrients and other pollutants; sediment retention and bank stabilization offering a higher capacity for **protection of extreme flood events**; and **cooling of water temperature** by shading. However, the increased conversion of riparian areas to agricultural land has negative effects on the freshwater environment. Research results shown at the Water Lives Symposium demonstrated how **intensive land use** along rivers is the most important stressor **limiting the achievement of good ecological status** and **diminishing biodiversity** in most freshwater ecosystems. Biodiversity and ecological status of streams and rivers increase when well-developed riparian areas are present.

Furthermore, when considering **climate change**, results indicated that relatively short stretches of **riparian forest** alongside streams can **combat the negative effects of increased temperature** on stream water. The EU has recognized the benefits of riparian areas, e.g. in the recently published **Blueprint to safeguard Europe’s water resources** it is stated that ‘*pressure from agriculture and flood protection can be mitigated or prevented by developing buffer strips and using green infrastructure such as the restoration of riparian areas, wetlands and floodplains*’. Additionally, they are an important component of the **Green Infrastructure (GI)**, playing direct or indirect roles across different policy areas, such as biodiversity and nature (e.g. **Biodiversity Strategy 2020**), agriculture (i.e. **CAP**), and climate change (e.g. **EU Strategy on Adaptation**).



Action is needed: advocating for riparian restoration

Successful restoration measures need to integrate conservation and management programmes at the **catchment scale**. One key message from the symposium was the need to further **reduce nutrient loading** in the future considering expected **climate change**, with clear implications for the **catchment land use**. Given the evidence of the **multiple benefits provided by riparian areas**, their restoration should be promoted within the **River Basin Management Plans**. This would offer **win-win solutions** by enhancing **ecological quality** and **ecosystem services** (e.g. natural water retention measures for climate change adaptation), but also would encourage **synergies** with other **sectorial policies** such as greening of the CAP (e.g. the identification of ecological focus areas). Considering that time lags of 10-20 years are expected to observe a recovery of freshwaters from the impact of multiple stressors, **riparian restoration is urgently needed** and should be a **priority in management actions**.

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Additional information

WaterLives Symposium video streaming

www.ufz.de/waterlives/index.php?en=32365

WaterLives Symposium presentations

www.ufz.de/export/data/437/56373_01_Hering_MultipleStressors.pdf

www.ufz.de/export/data/437/56490_04_Verdonschot_ImpactsofClimate%20and%20land%20use.pdf

www.ufz.de/export/data/437/56383_05_noges_guiding%20principles%20for%20management%20of%20freshwaters%20%28recommendations%20%5Bcompatibilit%C3%A4tsmodus%5D.pdf



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www.waterlives.eu

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www.freshwaterbiodiversity.eu
www.refresh.ucl.ac.uk