SOIL AND WATER BIOENGINEERING

ADDRESSED HAZARDS

WOODEN LOG FENCES

SWB20

NATURE-DEMO

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Main components

- **Installation:** rough planks or heavy posts (or piles) are driven into the ground in single or twin lines. Timber, logs, plans or thick stems are placed in front of or between the timber posts. Gaps can be filled with logging debris, smaller branches or rocks.
- **Securement:** timber is fastened to the posts with nails or screws, or placed between two large poles to reduce the introduction of non-biodegradable material (e.g. metal, plastic) into a site.
- **Material and Coverage:** generally dead bio-materials (wood) is used. At times, poles need additional shoring with timber to prevent bending, sliding or breaking. Life material (stakes, poles, root wads) can be integrated for additional vegetation establishment.

Primary functions and key services

- **Bank and riverbed stabilisation:** retaining of large quantities of sediment in the riverbed and increasing the elevation within the stream bed; thus, securing also river banks.
- **Sediment retention and management:** retaining large quantities of fine and rough sediments
- **Channel alignment:** enables natural meandering and the establishment of naturally braided-river systems.
- **Slope stabilisation & erosion control:** stops erosion from steep slopes and bank toes.
- **Rock fall protection:** for smaller rocks (depending on thickness and height of used planks or logs).

Ecosystem services

- **Restoration of damaged riverbeds and natural meandering river systems**
- **Riverbank erosion control**
- **Re-establishment of riparian buffers**
- **Habitat creation**
- **Biodiversity enhancement**
- **Carbon sequestration:** increased CO_2 storage and storage in above- and below-ground biomass of living plants.

What is it?

Wooden log fences

wooden timber wall, wooden plank, dead log weir, stem weir, engineered log check dam

Wooden log fences are transverse structures made of wooden piles driven into the ground with horizontally inserted trunks to fill the spaces between the logs. Hollow spaces between the trunk can be covered with logging debris and rocks to prevent erosion.
Live plant material (e.g. willows) can be introduced within riverbeds after an initial backfill with sediment to further improve stability and duration of the structures. (Hübl et al. 2024, Schiechtl 1980).

1. Log fence recently constructed at Demo-Site Brunntal.
Image Credit: [Johannes Hübl], [2024], Used with permission.
2. Consecutive wooden log fences in a river bed retaining and stabilising large quantities of sediment (Demo-Site Brunnsee)
Image Credit: [Johannes Hübl], [2024], Used with permission.

Challenges this NbS addresses

- **Debris mass stabilisation and retention**
- **Rockfall protection**
- **Erosion control**
- **Embankment and riverbed stabilisation**
- **Sediment retention**
- **Flood protection**

Environmental impacts (EU taxonomy)

- ☑ **Climate change mitigation**
- ☑ **Climate change adaptation**
- ☑ **Sustainable use and protection of water and marine resources**
- ☐ **Transition to a circular economy**
- ☑ **Pollution prevention and control**
- ☑ **Protection and restoration of biodiversity and ecosystems.**

References

Schiechtl H. M. (1980): Bioengineering for land reclamation and conservation. Univ. of Alberta Press, Edmonton/Alberta, Canada, 404 S.
Hübl, J; Kuschel E; Aigner P. (2024). Sediment Management in an Alpine Catchment with Wooden Log Fences. International Research Society INTERPRAEVENT, CONFERENCE PROCEEDINGS 930-934.