



# ROOT WAD

ADDRESSED  
HAZARDS

SWB14



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## ▼ Main components

- Attached tree trunks or bundles of tree roots are placed as barriers or reinforcements.
- Need anchorage with wooden piles or block stones, and are fixed with cables and tied to the piles.

As a benefit derived from this NbS it is important to highlight the formation of valuable habitats.

## ▼ Primary functions and key services

- **Ecological upgrade:** provide fish and small fauna habitats.
- **Streambank stabilisation:** provide long-term stabilisation due to anchoring function of trunk and roots.
- **Sediment management:** reduce sediment displacement.
- **Hydraulic resistance:** help deflect and dissipate flow.
- **Channel alignment:** support small scale meandering and natural water flow.

## Challenges this NbS addresses

- **Flooding and hydraulic instability**
- **Riverbed erosion**
- **Embankment toe failure**
- **Sediment loss or displacement**

## Ecosystem services

- ▶ **Riparian and wetland habitat restoration**
- ▶ **Biodiversity enhancement**
- ▶ **Floodplain and watershed management**
- ▶ **Recreation**
- ▶ **Carbon sequestration:** significantly increased carbon storage in above and below ground biomass of living plants

## References

Alaska Department of Fish and Game (S.a.): Streambank Revegetation and Protection: A Guide for Alaska Protection Techniques: Root Wads. Retrieved from: <https://www.adfg.alaska.gov/index.cfm?adfg=streambankprotection.rootwad> (accessed 25.01.2025).  
 Eubanks, C., Meadows, D., Technology & Development Program (U.S.). (2002). A soil bioengineering guide for streambank and lakeshore stabilisation. San Dimas, CA: U.S. Dept. of Agriculture Forest Service, Technology and Development Program (Eds.)  
 Zeh, H. (2007): Soil bioengineering Construction type manual. Eds. European Federation of Soil and Water Bioengineering, Verein für Ingenieurbioogie. Vdf Hochschulverlag AG: ETH Zürich.

## ▶▶ What is it?

### **Root wad**

*tree stump, (live/dead) root stock, trunk*

Root wads are typically single, or small or large clusters of trunks that are strategically placed in water courses and alongside river banks (Eubanks et al. 2002). This SWB technique has high ecological relevance and helps stabilising the bed and bank sediment and regulating the water flow. Root wads can be dead or alive, the latter forming new shoots.



**1. Root wad array, river Glatt (CH);**

Image Credit: [Rosemarie Stangl], [2023].  
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**2. Root stock single placement, river Glatt (CH);**

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## 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.