



Large Woody Debris

How does large woody debris enter a stream?

Large woody debris enter streams and rivers when trees are blown down by wind, toppled over by natural channel migration, or uprooted during flood events. The debris are then transported downstream.

What are the benefits of large woody debris in a stream or river?

Large woody debris is an essential component of aquatic ecosystems.

- It provides stability in a river system by capturing, retaining, and sorting sediment.
- It adds roughness to floodplains which slows down flood flows, captures fine sediment, and provides habitat for new growth of woody vegetation. Over time, debris degrades, providing organic material and nutrients, essential ingredients for the growth and propagation of riparian vegetation and aquatic organisms.
- It accumulates on gravel bars and streambanks, slowing stream flow and creating pools that help increase streambank stability. These pools provide shelter for fish, insects and other aquatic life.

Should you remove large woody debris from the river?

Before removing large woody debris from a stream or floodplain, you should carefully consider the impacts removal will have on the aquatic ecosystem and on local communities, including:

- Loss of riparian and instream habitat essential for the support of fish and wildlife populations and associated recreational opportunities.
- Increased erosion during seasonal high water and future flood events.
- Loss of a healthy, thriving aquatic ecosystem.
- Significant cost of removal and disposal.

Large woody debris should only be removed when:

- It poses a risk to human health and safety.
- It could be mobilized in future flood events and negatively affect downstream infrastructure and property.
- It has accumulated against bridges, structures, or streambanks, negatively altering the flow of water around and through important infrastructure.

Do you need a permit to remove woody debris?

Before working in and around Montana's streams and rivers, contact your local Conservation District for information. Please note, you may need more than one permit. Several resources are available to learn more, including the following:

- Montana Stream Permitting: A guide for Conservation District Supervisors and Others (Chapter 1)
https://dnrc.mt.gov/_docs/permits-services/StreamPermittingBinderBook2020.pdf
A Guide to Stream Permitting in Montana (flipbook)
- <https://dnrc.mt.gov/licenses-and-permits/stream-permitting/>