

Large Wood National Manual

Developing a National Manual for Planning, Designing, and Implementing Large Wood Projects

Bottom Line

Reclamation and the U.S. Army Corps of Engineers (USACE) are jointly developing a Large Wood National Manual to help establish more consistent methods to assess, design, and manage wood projects intended to restore streams and rivers throughout the United States.

Better, Faster, Cheaper

By more comprehensively understanding the detailed biology, geomorphology, hydraulics, and engineering aspects of a large wood design, practitioners will now be able to apply these guidelines on various river restoration projects across a range of geographic regions. This manual will also help provide a consistent process for project design and offer various techniques for applying wood as a restoration method.

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Problem

Wood is not just debris that rivers carry to the sea, but rather are important elements that alter channel shape and form (morphology), create habitat, store sediment and organic matter, and change landscapes. The role of wood in creating aquatic and riparian habitat has led many regulatory agencies and fisheries advocates to recommend the re-introduction of large wood structures in rivers and streams.

Various Federal and state agencies are increasingly advocating that more wood be used as a “softer,” more cost-effective, and ecologically beneficial engineering approach in restoration and mitigation projects to meet environmental mandates and endangered species requirements, while maintaining traditional agency missions. The term “softer” only implies that wood is a natural part of a river and, thus, better fits within the context of restoring natural conditions.

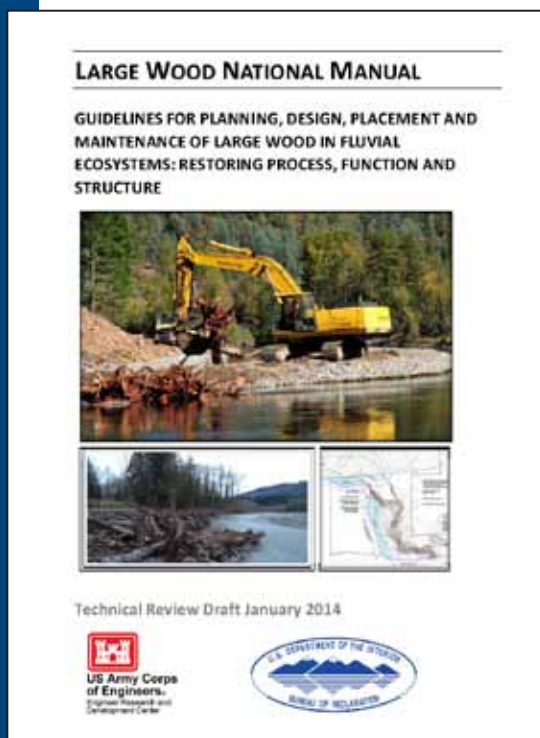
Yet there is nothing soft about the analysis and design of wood projects—they should be conducted with the same scientific and engineering rigor as any river project. Natural resource management professionals need practical information on how to use large wood in restoration practices and understand how to manage wood that naturally enters rivers and streams. This manual provides river and stream restoration professionals with comprehensive guidelines for the planning, design, placement, and maintenance of large wood in rivers and streams with an emphasis of restoring ecosystem process and function.

Solution

This Reclamation Science and Technology Program research project partners with the U.S. Army Corps of Engineers (USACE) and brings universities, private industries, and government entities together to develop a manual to:

- Serve as a practical resource for planners and help practitioners in the restoration industry to understand the roles of wood and how it should be re-introduced and managed in fluvial ecosystems using both active (placement) and passive (recruitment and transport) methods
- Develop comprehensive guidelines for the planning, design, placement, maintenance, and assessment of large wood in rivers and streams with an overarching emphasis of restoring ecosystem forms, processes, and functions, given the current states of science and practice

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- Provide guidance to states, territories, Native American Tribes, local governments, watershed organizations, and the general public regarding technical tools and sources of information for the planning, design, placement, and maintenance of large wood in rivers

The manual covers:

- The need and purpose of large wood in rivers
- Large wood planning processes
- Geomorphic and hydrologic considerations
- Ecological considerations
- Risks associated with wood placements
- Regulatory compliance, tradeoffs, and uncertainties
- Design and engineering considerations
- Fisheries considerations
- Flood events and related considerations
- Project implementation and construction



Large wood structure under construction at the Sawmill Rehabilitation Project (2009) on the Trinity River, near Lewiston, California.

In fields as fast-changing as restoration ecology and practice, this material will be improved with additional knowledge and experience. However, the basic elements of the manual will hold true long into the future—particularly the underlying premise that wood is a critical component of fluvial systems and will become more appreciated with additional research. Thus, Reclamation and USACE hope that this manual provides guidance and acts as a catalyst to drive further innovations and improved benefits for aquatic ecosystem restoration.

Future Plans

Four chapters are complete and have been peer reviewed by approximately 20 regional experts. The next four chapters will be out for both internal and external review in November 2014 with the final version slated for completion in May 2015, which will include two additional chapters bringing the total chapter count to 10. The *Large Wood National Manual* will be disseminated electronically and is designed to allow for future chapter developments and new scientific literature to be added annually.

Large Wood Conference, "Technical Workshop on Large Wood Applications and Research Needs in River Restoration," February 2012.



"This manual will provide the common set of guidelines for using wood in restoration efforts. This will serve as a foundation for future planning, design, implementation, and regulatory review to help restore ecosystem forms, processes, and functions."

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Collaborators

- Reclamation:
 - ◊ Research and Development Office's Science and Technology Program
 - ◊ Pacific Northwest Region's Columbia/Snake River Salmon Recovery Office
 - ◊ Mid-Pacific Region's Trinity River Restoration Program
- U.S. Army Corps of Engineers-Engineer Research and Development Center (USACE-ERDC)
- Utah State University
- ICF International
- Natural Systems Design
- Shields Engineering
- Fox Environmental

More Information

www.usbr.gov/research/projects/detail.cfm?id=2754