

How Large Woody Debris in Streams and Rivers Can Help Habitats

Developing the priorities for Reclamation's research into habitat enhancement with large woody debris

Bottom Line

A facilitated technical workshop with experienced professionals in the field of large wood and river restoration identified priority gaps in tools that are needed to improve understanding of large wood roles and processes in riverine environments.

Better, Faster, Cheaper

Better tools for understanding the role of large woody debris in habitats will increase the effectiveness of Reclamation's habitat restoration and rehabilitation programs.

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Collaborators

- U.S. Army Corps of Engineers

Problem

Historically, many rivers had abundant riparian vegetation and large wood. Removing these natural features can disrupt river environments and contribute to species decline. Re-establishing large wood features is frequently recommended as a component in river restoration projects to reestablish flow patterns, enhance habitat, and help recover species. However, guidelines and processes for designing and analyzing the benefits and risks of large woody debris have not been fully established. Moreover, research into this effort needs to be prioritized to meet Reclamation's mission and specific project goals.

Solution

To determine research needs in this field, Reclamation and the U.S. Army Corps of Engineers held an interagency workshop in February 2012.

In the workshop, experts, who are currently designing and implementing large wood projects in river restoration, examined current tools and identified future large wood research needs and priorities.

Reclamation's

Science and Technology Program requested a tailored roadmap of large wood research concepts specific to Reclamation to help analyze future research proposals in this area of river restoration. The research roadmap was tailored to meet Reclamation's mission and project goals.



Development of the large woody debris research roadmap.

Top priority large wood research areas for Reclamation include:

- Develop technical guidelines on designing, implementing, analyzing scour, and monitoring.
- Communicate the value of large wood and risks.
- Design criteria to make safer structures.
- Develop more robust modeling techniques and interdisciplinary connections.

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- Develop tools to evaluate biological benefits, hydraulic effects, and potential consequences.
- Develop tools to evaluate interactions among multiple wood structures.

Application

The criteria in the table below was used to categorize research ideas into high, medium, and low priority groups based on technical merit, collaboration opportunities, and relevance to risk and safety.

Category	Technical Merit (Proposed research is a critical step commonly used in standard-of-practice design, analysis, or monitoring)	Collaboration Opportunity (Partnerships with academia, agencies, etc.)	Risk and Safety (Technical evaluation of liability associated with constructed features)
High Research Level	Poor surrogate tools are available and there is an immediate need to address a major data gap in the field of large wood design, analysis, or monitoring protocols.	Known opportunity exists to work with technical partners already working on identified data gap.	Research topic addresses safety and/or risk of constructed wood features, and would help inform whether to implement a large wood project.
Medium Research Level	Reasonable surrogate tools available for technical method, but lacking specific data for large wood.	Potential opportunity exists to work with technical partners, but have not started research.	Proposed research does not address safety or risk.
Low Research Level	Not a critical technique currently utilized, but may benefit design, analysis, or monitoring in the future.	Collaboration opportunities not yet identified; good candidate for scoping level proposal.	Proposed research does not address safety or risk.

“Using large wood as treatment to rehabilitate geomorphic processes and form for dependent species requires a thorough understanding of how to measure the associated risks and benefits. Research in this field will help us gain understanding for this evolving science and explore the most effective way to use large woody debris in our rehabilitation projects.”

Sean Kimbrel
Hydraulic Engineer, Reclamation’s
Technical Service Center

Future Plans

Future Reclamation plans are to continue collaboration with partners to generate large wood analysis and implementation guidelines, along with modeling tools that incorporate the more complex hydraulics associated with large wood features.

More Information

www.usbr.gov/research/projects/detail.cfm?id=3775



North Wind’s Weir site where King County, Washington, and U.S. Army Corps of Engineers have been placing earth-anchored log clusters in fine-grained soil to improve tidal backwater conditions at an urban site near Seattle that has local cultural significance. Photograph by Connie Svoboda, Reclamation’s Technical Service Center, February 2012.