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*Ecological Effects of Sediment
Erosion and Transport
Associated With Dam Removal*

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Ecological Effects of Sediment Erosion and Transport Associated With Dam Removal¹

Research Need

A relatively large inventory of aging dams exists on rivers and streams throughout the United States; increasing numbers of these structures are slated for removal due to safety concerns and associated environmental issues. Environmental benefits derived from dam removal include improved environmental connectivity and restored sediment transport within the natural stream system. However, there is also potential for adverse environmental impacts associated with release of sediments accumulated behind these dams. Guidance is needed to inform planning efforts, including pre-demolition characterization of behind-dam sediments and assessment of anticipated impacts due to contaminant release and re-deposition of sediments downstream.

Project Objectives & Plan

The purpose of this effort is to develop a framework for screening potential sediment-related issues associated with dam removal, and to tailor SMART Planning compatible modeling tools for assessing anticipated downstream sediment impacts and benefits. The primary deliverables will include publications and webinars outlining the steps involved in assessing sediment issues associated with dam decommissioning. A state of the science review and a decision matrix/flowchart for screening and assessing risks and impacts associated with sediment transport are planned. Additional deliverables will include numerical models development enabling rapid screening of potential dam removal sites for sediment issues and assessing geomorphic response, sediment fate and ecological consequences of dam removal at a single site.

Payoff

The products of this effort will provide a more complete understanding of effects associated with dam removal and support prediction and management of adverse impacts. A streamlined assessment framework and guidance for quantifying and modeling sediment transport and impacts – including burial and contaminant release – will enable USACE

planners to appropriately assess dam removal alternatives and manage anticipated impacts. These products will enable planners to undertake feasibility-level analyses within the time constraints imposed by SMART Planning while also informing preliminary engineering and design.

Products

Technical Reports (TRs)

Echevarria-Doyle, W., McKay, S.K., and Bailey, S.E. (2023). Sensitivity of sediment transport analyses in dam removal applications (ERDC TR-23-15), Technical Report. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Technical Notes (TNs)

(). A research roadmap for the impacts of sedimentation associated with dam removal, Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

(). Application of case studies and lessons learned at dam #1, Technical Note. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Conference Presentations/Webinars/Workshops

(2017) Impacts of sedimentation associated with dam removal – a multi-agency workshop to assess the state of the science with respect to multiple aspects of dam removal and technical guidance development, Workshop. New York, New York.

McKay, S.K., Lackey, T., Bailey, S., Echevarria-Doyle, W. and Hayter, E. (2019). Tools for evaluating sediment impacts from dam removal—qualitative guidance, Conference Paper. SEDHYD 2019 Conference, Reno, Nevada.

McKay, S.K., and Bailey, S. (2018). Sediment impacts associated with dam removal: State of the science, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

McKay, S.K., and Bailey, S. (2020). Dam removal short course – Part 1A: An overview, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

Duda, J. and Bountry, J. (2020). Dam removal short course – Part 1B: Synthesis of the science and case studies, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi.

McKay, S.K. (2020). Dam removal short course – Part 2A: Sediment management, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

Bailey, S. (2020). Dam removal short course – Part 2B: Sediment management, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

Lackey, T. (2020). Dam removal short course – Part 3A: Assessment methods, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

McKay, S.K. (2020). Dam removal short course – Part 3B: Assessment methods, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

Echevarria-Doyle, W. (2020). Dam removal short course – Part 4A: Modeling Techniques – 1-dimensional numerical model applications: Simkins Dam case study, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

Hayter, E. (2020). Dam removal short course – Part 4B: Modeling Techniques – Milltown Dam case study, Webinar. U.S. Army Engineer Research and Development Center, Vicksburg, Mississippi

¹**Project Alias – Work Unit Documentation Title:** *Ecological effects of sediment erosion and transport associated with dam removal*