Technical Training Workshop
The Stream Simulation Design Approach for Providing Aquatic Organism Passage at Road-Stream Crossings

Dates
4 - 8 March 2024, 4.5 days

Location
???, Virginia

Tuition
None, participants pay travel and per diem

Workshop Sponsors
USDA Forest Service: National Stream and Aquatic Ecology Center, R8-Southern Region, George Washington and Jefferson National Forests

Target Audience
Civil Engineers, Geotechnical Engineers, Hydrologists, Geomorphologists, Ecologists, Biologists, Geologists

Contact for a Pre-Registration Application and Additional Information About the Workshop
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Workshop Description
This 4.5-day workshop will present the USDA Forest Service's stream simulation method, an ecosystem-based approach for designing and constructing a channel through a road-stream crossing structure that reestablishes physical and ecological continuity along the stream corridor. The premise of stream simulation is that if the design channel simulates the dimensions and characteristics of the adjacent natural channel, fish and other aquatic organisms should experience no greater difficulty moving through the structure than if there were no crossing. Water depths, flow velocities, and flow paths in the channel through the structure are designed to be as complex and diverse as those encountered in the adjacent natural channel. Stream simulation integrates fluvial geomorphology with engineering principles to design a road-stream crossing that contains a natural and dynamic channel through the structure. This approach requires measurements of site-specific channel characteristics in the adjacent natural channel to ensure that an appropriate reference reach can be identified. Identifying a reference reach is a key concept and component of stream simulation as it provides the template for designing a channel through the crossing and determining the size and embedment depth of the replacement structure.

This is a technical design training, and the content of class is structured to advance and improve the technical skills of individuals who are or will be actively involved in 1) assessing, designing, and constructing road-stream crossings and/or 2) directing and reviewing road-stream crossing designs from third parties. This workshop will teach participants the necessary skills to design road-stream crossing structures that restore natural channel characteristics and fluvial processes through the structure, provide unimpeded fish and other aquatic organism passage through the structure, and maximize the long-term stability and flood resiliency of the structure using the stream simulation design method. Participants will systematically go through the stream simulation methodology of collecting and interpreting channel data at road-stream crossing sites, applying and integrating these data to develop engineering-based stream simulation design channels and road-stream crossing structures, and effectively constructing stream simulation designs by using numerous examples and class-based exercises. The stream simulation design method for designing road-stream crossings is an interdisciplinary effort involving hydrologists, engineers, and fish biologists. Participants work in interdisciplinary teams throughout the workshop to resolve road-stream crossing scenarios at different stages of the stream simulation site assessment, design, and construction process. An all-day field trip will occur mid-week. The field trip to multiple road-stream crossing sites will complement and reinforce concepts presented in the classroom as participants will identify, assess, and discuss various ecological, geomorphic/hydrologic, and engineering issues at those sites.