

SERDP PROJECT OF THE YEAR SUSTAINABLE INFRASTRUCTURE

RIPARIAN ECOSYSTEM MANAGEMENT: IMPACTS, RESTORATION AND ENHANCEMENT STRATEGIES

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On many military ranges, training involves operating large mechanized vehicles such as tanks and strykers on terrain near riparian ecosystems. Such training, over time, often results in vegetation loss and severe erosion from upland areas, which can affect water quality downstream and negatively impact the structure and function of associated riparian and stream ecosystems.

To ameliorate these impacts, Dr. Patrick Mulholland and his team from Oak Ridge National Laboratory, Auburn University, and Fort Benning evaluated the effects of low-cost restoration strategies involving physical stabilization and revegetation of eroded ephemeral drainages and the addition of coarse woody debris to perennial headwater streams. Ephemeral drainage restoration decreased sediment accumulation by about 80% on disturbed riparian plots located downstream from restoration sites. However, there were no clear indications that indices of nutrient cycling responded to these restoration efforts. In-stream restorations increased the hydraulic complexity and rate of nutrient uptake relative to control streams; however, there is no evidence yet of increases in gross primary production. Positive responses of stream biota and habitat variables to wood additions were observed in some restored streams.

Through an improved understanding of the impacts of upland and riparian disturbances to riparian ecosystem function, land managers can make informed decisions about training intensity and the use of prescribed fire as well as leverage these practical, cost-saving methods that control sedimentation and improve the overall health of streams.

For more specific information about this project, stop by Poster #101.