

## **Assessing Channel Change and Bank Stability Downstream From Hog Park Reservoir, Medicine Bow National Forest, Wyoming.**

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**Abstract.** Transbasin diversions in the arid and semi-arid West play an important role in the complicated story of water provisions and channel adjustments due to changes in flow regime. Analysis of geomorphic form and function is necessary for water resource managers to effectively support their needs while minimizing resource impacts.

Hog Park Creek, in south central Wyoming, is a subalpine channel downstream from a dam used for storage and water transfers. Preliminary observations suggest that changes in the flow and sediment discharge regime have exacerbated bank erosion, since dam enlargement in 1984. We are testing the hypothesis that an increase in channel capacity can be related to specific alterations to the flow regime. Mechanistically, we hypothesize that increased shear stresses on compromised bank layers has caused widening and straightening of the channel.

In order to assess channel response to altered flow and sediment discharge, we used multiple analyses across a range of spatial and temporal scales: multi-decadal planform change as recorded in aerial photographs; analyses of ecologically-based hydrologic parameters prior to and following flow regulation; repeat surveys of channel cross sections and longitudinal profiles over multiple years; and detailed bank analysis and erosion modeling with BSTEM and HEC-RAS.

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