Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Assess Effects of Flow Diversion on Snake Creek Riparian Resources, Great Basin National Park

Discipline: Natural
Type of Project: Technical Assistance/Research
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Student Involvement: Yes, Graduate Research Assistant
Effective Dates: 4/19/2017 – 9/30/2019
Funding Amount: $109,898

Investigators and Agency Representative:
NPS Contact: Joel Wagner, National Park Service, NRSS-Water Resources Division; Phone: 303-969-2955; joel_wagner@nps.gov

Investigator: David Cooper, Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, CO 80523, Phone: 303-499-6441; dcooper@rm.incc.net

Project Abstract: The largest drainage basin in Great Basin National Park (GRBA) forms Snake Creek, a stream that supports an array of natural processes contributing to the Park's biodiversity, wildlife habitat, and hydro-geomorphic landscape. While flowing out of the mountains, the stream crosses porous karst-limestone where some surface water is lost to groundwater recharge. To prevent losses to groundwater in this stream segment and maintain surface flows for downstream irrigation use, a pipeline was built in the 1960's to transport water through the limestone reach. The diversion transports Snake Creek's water three miles downstream for re-delivery to the stream channel, leaving the dewatered reach dry through much of the year. The dewatered stream reach appears to be structurally and functionally impacted by the diversion, but there is a lack of quantitative data and a process-based understanding of the hydrologic, geomorphic, and ecological processes affected. The impacts likely affect riparian habitat and vegetation, hydrologic and geomorphic processes, fisheries, aquatic habitat, and ecological functioning. Analyses of stream and riparian conditions will be conducted to clarify the impacts on the stream corridor.

The primary objectives of the project are to: 1) document the eco-hydrological effects of the diversion on Snake Creek to its riparian ecosystem, and 2) understand the physical processes that occur in the Snake Creek riparian ecosystem under both modified and natural flow regimes, including how the processes drive ecosystem interactions throughout the river corridor. This requires an assessment of the fluvial system, including the riparian vegetation's composition and ecophysiology, the surface water flows, and groundwater-surface water interactions.

Keywords: evaluation, flow diversion, Snake Creek, Great Basin National Park, Colorado State University