Project Title: Maximizing the hydrogeomorphic effectiveness of riparian vegetation management on the Rio Grande, Big Bend National Park

Task Agreement: P18AC01207   **Mods:**
Discipline: Natural
Type of Project: Technical Assistance
Funding Agency: National Park Service
Other Partners/Cooperators: Colorado State University
Student Participation:
Effective Dates: October 1, 2018 – December 31, 2019
Funding Amount: $19,999

Investigators and Agency Representative:
NPS Contact: Jeff Bennett, Physical Scientist, Big Bend National Park, 432.837.9964, Jeffery_bennett@nps.gov

Investigator: Derek Schook, Department of Forest and Rangeland Stewardship, Colorado State University, 1472 Campus Delivery, Fort Collins, CO 80523-1476; derek.schook@colostate.edu

Project Abstract: The Rio Grande in Big Bend National Park is a modified river that is of local, regional, and international importance. The river's modern processes are affected by complex interactions among water, sediment, and riparian vegetation. The physical landscape in the river corridor is driven by movement of water and sediment, but these processes are affected by surrounding riparian vegetation that stabilizes banks and reduces transport capacity. Over the past decade the National Park Service and partners have developed a diverse and well-planned sediment monitoring program to evaluate interactions between river flow and sediment transport, deposition, and budgets. To manage the river and its riparian ecosystem more effectively, however, Big Bend National Park staff want to use data analyses to inform their management actions.

Beginning in 2008, Big Bend National Park began an intensive vegetation management program along the Rio Grande. The initial goal was to eradicate that non-native salt cedar, which was largely accomplished by 2014. However, in some areas the plants replacing salt cedar also are thought to have adverse effects on the riparian corridor. *Arundo donax* (giant reed) is a Eurasian grass that has aggressively colonized open floodplain surfaces. The plant forms dense stands of homogenous vegetation that results in low physical and biological diversity. *Arundo* also reduces flow velocity and captures sediment, which reduces conveyance and diversity within the riparian zone. *Arundo* control so far has included burning, herbiciding, and release of a wasp for biological control. Other plant species inhabit the riparian zone, and each likely has a different influence on hydrogeomorphic processes. Vegetation management for hydrologic and sediment goals will be enhanced with an improved understanding of the influence of various riparian plant species.