Project Summary
Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Restore an Abandoned Wastewater Treatment Pond to Wetland Habitat in Morefield Canyon, Mesa Verde 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: 6/7/2017 – 9/30/2019
Funding Amount: $62,280

Investigators and Agency Representative:
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Project Abstract: In 1964, the NPS constructed a series of wastewater treatment ponds in Morefield Canyon, Mesa Verde National Park. The ponds treat wastewater generated by the Morefield Village area, which includes employee residences, various visitor services and the Morefield Campground. The facility consisted of three sequential ponds (cells) built on the canyon floor, portions of which had previously been palustrine wetlands. Problems with a seasonally high water table in the uppermost pond (cell 1) became evident at some time after construction. In 1984, an attempt was made to improve the function of the ponds by placing liners in cells 1 and 2 and by excavating a ditch to intercept and divert groundwater around cell 1. In 1999, the NPS deepened the ditch to its present level. By 2008, the problem of high groundwater levels in the upper portion of the site had not been resolved. Cell 1 was abandoned the next year in favor of using only cells 2 and 3 for wastewater treatment.

In 2011, MEVE staff asked NPS-Water Resources Division (WRD) staff to evaluate site conditions in hopes of restoring the abandoned pond to wetland habitat. The liner has been removed, but 6-12″ of bentonite remains on top of the native soil (sandy clay). WRD and park staff installed 10 wells in the abandoned pond in late summer 2011 for purposes of investigating site hydrology and developing and evaluating feasibility of restoration design concepts. The goal of the project is to establish an approximately 1.6 acre wetland system at the abandoned wastewater treatment pond. Objectives include:

- Establish self-sustaining open water, marsh, wet meadow, and willow habitats.
- The vegetated zones should have a dominant cover of native wetland and riparian plant species with minimal non-native plant cover.
- The site should provide habitat for migratory waterfowl, northern leopard frogs, tiger salamanders and other wildlife species.

Colorado State University (CSU) has worked closely with WRD and MEVE staff to complete near-final (90%) design plans and specifications for grading (earthmoving), erosion control, plant propagation, seeding, planting and post-restoration monitoring. MEVE has already secured a $14,000 grant from Colorado Parks and Wildlife for this restoration work. This Task Agreement provides the balance of funds needed to complete the final design, implement the restoration and conduct post-restoration monitoring and assessment.

The restoration work would be performed by removing the bentonite fill and reshaping the site according to the grading plan to create the targeted wetland habitat types. Earthwork would occur in the fall when water levels are typically low. The site would be planted the following spring and early summer with native wetland and riparian species according to the hydrologic conditions of each elevation zone. Once these project phases have been implemented, the cooperators would also work with the NPS to establish monitoring wells and vegetation plots or transects to evaluate project success.

Keywords: wetland restoration, Morefield Canyon, Mesa Verde National Park, Colorado State University