

**Rocky Mountains Cooperative Ecosystem Studies Unit
Project Summary**

Project Title: Final Restoration Design for Lulu City Wetland, Rocky Mountain National Park, Colorado

Discipline: Natural
Type of Project: Technical Assistance
Funding Agency: National Park Service
Cooperators: Colorado State University
Student Involvement: yes
Effective Dates: 6/15/2016 - 3/31/2017
Funding Amount: \$20,907

Investigators and Agency Representatives:

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Project Abstract: The Grand Ditch breach in 2003 sent tens of thousands of cubic yards of sediment into Lulu Creek and the Colorado River, and a portion of this sediment was deposited in the Lulu City wetland. Impacts from the breach and the need for restoration are documented in the Final EIS. To restore this wetland to its historic functioning and vegetation composition, river flow should be concentrated into a single channel, draining the permanently flooded wetland and replacing it with a floodplain that floods in the spring and dries out in late summer and fall. Confining water into a dominant channel will also have significant impacts on wetland areas that were inundated with debris. These areas will be drained, and will become prone to conifer invasion, as has occurred through the Colorado River valley between Lulu Creek and the Lulu City wetland. To prevent this invasion, a significant amount of material may need to be excavated to allow planted willows to access the ground water.

A key goal of the Lulu City wetland restoration is the return of the meandering Colorado River channel with a hydrologically connected riparian zone that will support a complex of tall willow communities. It was unclear to some members of the panel whether extensive sediment excavation was required at the head of the Lulu City wetland, and the approach developed to test the type of restoration needed was a temporary pilot channel to divert flow of the Colorado River into its historic channel in the wetland. The Phase I channel created in the summer of 2015 was designed to concentrate river flow from north to south in one channel, and to see if it would drain the adjacent floodplain to an extent conducive for a tall willow community, and where might require excavation to preclude conifer invasion. As long as the Phase I channel remains active following the high flows in the spring of 2016, the following scenarios outline the possible outcomes, and how each would inform the final design of Lulu City Wetland.

Scenario 1

Outcome: The constructed channel drains the adjacent floodplain and the debris zone and creates suitable conditions for tall willows.

Action: This outcome could suggest that simply connecting the zone 3 Colorado River with the historic channel in zone 4 is sufficient for tall willow restoration.

Scenario 2

Outcome: The constructed channel drains the adjacent floodplain and creates suitable conditions for conifer invasion onto the current Colorado River and wetland.

Action: Drying the central and western portion of the study area has the potential to allow conifers, particularly lodgepole pine, but also Engelmann spruce and subalpine fir to invade the area, similar to what has occurred in

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zone 3 along the Colorado River. This suggests excavation is required within the debris area.

Scenario 3

Outcome: The constructed channel does not drain the floodplain or the debris zone and the water table remains similar to what it was pre-pilot channel.

Action: This type of constructed channel in phase 1 was not sufficient to drain the wetland. This suggests that a more substantial restoration plan is needed for the Lulu City wetland.

To evaluate the impact of the Phase I channel and identify which of the above scenarios occurred, monitoring of the existing well network in Lulu City Wetland is required. This monitoring data, along with the monitoring from past years, will be used to create a final restoration design during the fall of 2016

Keywords: restoration, Grand Ditch, Lulu City Wetland, Rocky Mountain National Park, Colorado State University