

I. **Project Title:** Floodability Assessments and Post-Restoration Sedimentation and Erosion Monitoring/Evaluation for the Floodplain Habitat Restoration Program; Green River, UT - Colorado River, CO - Gunnison River, CO

II. **Principal Investigator:**
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III. **Project Summary:** The objectives of this work are 1) to conduct pre-acquisition and pre-restoration floodability surveys to determine what the Recovery Program is getting for its acquisition and construction dollars; 2) to develop habitat restoration design options and to assist with construction oversight; and 3) to conduct post-restoration surveys to refine site designs that will not adversely affect channel morphology or adjacent landowners and that will require minimal long-term O&M.

Pre-acquisition floodability assessments were conducted for nine Green River properties, one Gunnison River property, and four Colorado River properties. The results of these floodability assessments have been given to the USBR in Grand Junction who have added property lines to the mapping. The finalized maps will be used to negotiate easements and/or purchase appropriate properties.

In addition, construction inspection and stake out surveys were provided for the Leota Bottom and Johnson Bottom fish kettle structures. Post-restoration erosion and sedimentation monitoring was performed at all eight sites along the Green River. A summary of the 1999 monitoring data has not been completed. It will be completed in February 2000. However, a status report that summarized data collected during 1997 and 1998 was completed, submitted for peer and biology committee review, revised and finalized.

IV. **Study Schedule:**
Initial Year - FY 95
Final Year - Unknown

V. **Relationship to RIPRAP:**
General Recovery Program Support
II. Restore habitat

- II.A Restore flooded bottomland habitats
 - II.A.2 Screen high-priority sites for potential restoration/acquisition
- Green River Action Plan: Mainstem
- II. Restore habitat
 - II.A Restore and manage flooded bottomland habitat
 - II.A.3 Implement levee removal strategy
 - II.A.3.c. Evaluation

VI. Accomplishment of FY 99 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: (FLO Project #10600.21 Tasks)

Task 1 – Reconnaissance surveys were successfully completed for all 14 sites studied in 1999. With the addition of GPS RTK survey equipment to the data collection capabilities and improved communication with the USBR–Grand Junction surveyors, the reconnaissance surveys of the properties of interest have been greatly expedited. A site that typically took seven days of data collection to complete in the previous study years, now takes five days or less. This saves the program money and allows information to be collected at multiple sites during one field visit.

Task 2 – Data Collection – The majority of data collection in 1999 revolved around the floodability analyses for new bottomland sites. Fourteen sites were surveyed in 1999. The data included topographic surveys of the properties of interest, including boundaries; river cross section surveys to develop a hydraulic model; and stage discharge data to calibrate the flood prediction models. Due to a less than average snow year in the Colorado and Gunnison basins, the 1999 runoff season did not provide good opportunities to collect stage measurements at higher flows of interest to improve flooding predictions. This should be considered the most significant shortcoming of the 1999 data. The models developed on the Gunnison and Colorado rivers have only a limited accuracy due to a lack of high flow data. Particularly the modeling of Escalante site along the Gunnison River and Hot Spot Pond along the Colorado River should be suspect due the lack of data and complex river channel at those sites. Further stage discharge data should be collected during the 2000 runoff season or during the next significant high flow year. Especially if modification of the sites studied in 1999 is being considered. The data collected for the Green River sites, however, has been much more thorough and can be considered more reliable.

Task 3 – Analyses – The floodability analyses were completed at 12 of the 14 sites studied in 1999 at the time this report was written. The analyses at the Clifton Slough and Hot Spot Pond on the Colorado River have not yet been completed. The Hot Spot Pond analysis has been 95% completed and will be submitted by the end of 1999. The Clifton Slough analysis has been considered a lower priority. Therefore, results from that site will not be submitted until February or March 2000. For the remainder of the 1999 sites, the analyses have been completed and lot

lines have been added by the USBR. A comprehensive report summarizing the 1999 sites is being completed and will be available by February 2000. Some additional hydrologic analyses still need to be completed for Colorado river reaches downstream of the Gunnison River.

Task 4 – Configuration Design – A preliminary floodplain restoration design was submitted for review for the Escalante State Wildlife Area on the Gunnison River near Delta, CO in 1999. In addition, restoration designs for the Bonanza Bridge and Above Brennan site were completed to reconfigure these sites as flow through sites versus backwater bottomland sites. Some quantities and design assistance was also provided to the Ouray National Wildlife Refuge (ONWR) for the Sheppard Bottom site. The ONWR is proposing to remove one of the downstream most river levees along Sheppard and rebuilding one of their inner dikes.

Task 5 – Monitoring/evaluation – The ongoing erosion and sedimentation monitoring tasks were completed for all eight restored bottomlands sites along the Green river. However, monitoring of the actual bottomland cross sections and adjacent river cross sections was not performed. The results of the 1997 and 1998 bottomland cross sections (across the bottomland itself, not the inlet or outlet locations) indicated little or no change. Therefore, it was decided not to perform those cross sections in 1999 and to use that part of the budget to perform additional floodability surveys instead. The river cross sections too, were not surveyed and that money was also used to collect data at other new sites. Surveying of the river cross sections does provide valuable channel morphology data and should be considered for the 2000 runoff season. The results of the 1999 erosion and sedimentation monitoring data have not yet been analyzed. These results will be submitted with the comprehensive report to be completed by February 2000.

VII. Recommendations:

The monitoring of erosion and sedimentation at the bottomland and river cross sections should continue in 2000 and beyond. The reaction of the river and bottomland to various opening configurations will provide valuable data that can be referenced in making decisions on future levee removal activities.

VIII. Project Status:

The project should be considered on-track and ongoing. Funding needs may be greatly increased if the number of new sites continues to increase at a rapid pace.

IX. FY 99 Budget:

- A. Funds Provided: \$ 150K
- B. Funds Expended: \$ 150K

- C. Difference: \$ 0
- D. Percent of FY99 work completed, and projected costs to complete: 85% - \$22,500
- E. Recovery Program funds spent for publication charges: \$0

X. **Status of Data Submission:** Not applicable

XI. **Signed:** Gus R. Steppen, P.E. 12-14-99
Principal Investigator Date

Appendix: For more detailed information on the 1997 and 1998 data, please refer to: FLO Engineering, Inc., (August, 1999). "1998 Floodplain Habitat Restoration Investigation Status Report".