

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 one Gunnison River property and four Colorado River properties. The results of three of these floodability assessments have been given to the USBR in Grand Junction who will add property lines to the mapping. The finalized maps will be used to negotiate easements and/or purchase appropriate properties. Assessments of the remaining two sites are ongoing, and final reports should be completed by mid-January 2001.

In addition, post-restoration erosion and sedimentation monitoring was performed at two sites along the Green River. Both sites were evaluated in a single report, which has been submitted to the USBR.

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 2000 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings: (FLO Project #10600.31 Tasks)

Task 1 – Reconnaissance surveys were successfully completed for 5 sites studied in 2000. Four of the sites were on the Colorado River, including the Audubon Site, the TF/RIGG Site, the Tipping Site and the Walter Walker Site. The fifth site, Escalante, is on the Gunnison River. A reconnaissance field trip was conducted in June of 2000 where Pat Nelson and Dave Soker (USFWS) met with Bill Fullerton and Peter Mestemaker (Tt/ISG) to discuss goals and concerns about four of the five sites. This reconnaissance trip was carried out after the completion of the TF/RIGG evaluation. The reconnaissance survey at TF/RIGG was conducted in conjunction with the data collection effort at that site.

Task 2 – Data Collection – Five sites were surveyed in 2000. The data included topographic surveys of the properties of interest, including; 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 2000 runoff season did not provide good opportunities to collect stage measurements at higher flows of interest to improve flooding predictions. Therefore, Tetra Tech had to rely on the hydraulic model, which was calibrated using low flows, to extrapolate for higher flows. This method is not optimal, however the analysis is sufficiently accurate for the purpose of determining the general floodability of a given parcel. Further stage discharge data should be collected during the 2001 runoff season or during the next significant high flow year. Tetra Tech will use this information to verify existing models, and to modify them if necessary.

Task 3 – Analyses – In 2000, the format of floodability assessments and post-restoration monitoring reports was modified. Prior to 2000, Tetra Tech submitted a single annual report, which presented the results of all studies conducted within the year. Beginning in 2000, Tetra Tech began submitting individual reports for each site. The improved format is more comprehensive and is intended to make the data more accessible and usable, while providing better documentation of the study effort and associated analysis.

At the time this report was written, floodability analyses were completed for 3 of the 5 sites studied in 2000. Analyses were completed for the Walter Walker Site and the TF/RIGG Site on the Colorado River, and the Escalante Site on the Gunnison River. Reports have been finalized for Escalante and TF/RIGG. A draft report was submitted for Walter Walker, and Tetra Tech is awaiting comments from USFWS

before finalizing the analysis at this site. Analyses are ongoing at the Audubon Site and the Tipping Site on the Colorado River. A draft report will be submitted for the Audubon Site in December 2000, and a draft report for the Tipping Site will be submitted in January 2001. The completed analyses have been submitted to the USFWS and lot lines may be added by the USBR.

Task 4 – Configuration Design – A final floodplain restoration design was submitted for the Escalante State Wildlife Area on the Gunnison River near Delta, CO in October 2000. In addition, a draft floodplain restoration design was submitted for review for the Walter Walker State Wildlife Area on the Colorado River near Grand Junction, CO in November 2000. The analysis at the TF/RIGG Site determined that very little modification would be required for that site to function as bottomland habitat. Therefore, a final report was submitted in July 2000, however no restoration design was included in that submittal. In April 2000, Tetra Tech assisted in the construction stake out for modifications at the Bonanza Bridge and Above Brennan sites. The designs for these sites were reconfigured to promote flow through conditions in the bottomland areas. Reclamation crews from Provo, Utah carried out construction activities.

Task 5 – Monitoring/evaluation – Post-restoration sedimentation and erosion monitoring was conducted at two sites along the Green River. The Bonanza Bridge Site and the Above Brennan Site were surveyed by Tetra Tech in May 2000. At each of the sites, endpoints were established at the newly constructed inlets, as well as two additional cross sections, which bisect the bottomland areas. This effort was carried out prior to the 2000 runoff season, and at the time of the survey, neither of the sites had been inundated. Therefore, these surveys reflect as-built conditions at the two sites and do not really address the issues of sedimentation and erosion. Further post-restoration activities were suspended due to the low flow conditions in 2000. It was anticipated that the below average runoff would limit sedimentation and erosion processes. The USFWS determined that monitoring efforts should be delayed until after higher flow conditions occur.

In lieu of ground based post-restoration monitoring, two aerial reconnaissance efforts were conducted to evaluate conditions at previously modified bottomland sites. Peter Mestemaker conducted one of these reconnaissance efforts in late-May to determine if the Above Brennan and Bonanza Bridge modifications were functioning as anticipated. Unfortunately, the survey was conducted a few days after the target flow levels had occurred, and flows had subsided by the time the flight took place. The inlet channels did appear to be wetted, however the bottomland habitat was not inundated. In August 2000, Bill Fullerton conducted the other aerial reconnaissance effort in August 2000, in which he flew over several of the bottomland sites along the Green River. The purpose of the flight was primarily to determine if sites, which had been inundated, were draining properly. Additionally, the extent of ponded water was documented on this flight, through the use of oblique color digital photography in five BLM sites.

VII. Recommendations:

The monitoring of erosion and sedimentation at the bottomland and river cross sections should continue in 2001 and beyond. The reaction of the river and bottomlands 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 increased if the number of new sites continues to increase at a rapid pace.

IX. FY 00 Budget:

- A. Funds Provided: \$ 149,986.50 (\$42,630 carryover from 1999 was used through February 2000)
- B. Funds Expended: \$ 125,292.46
- C. Difference: \$ 24,694.04
- D. Percent of FY00 work completed, and projected costs to complete: 84% - \$24,694.04
- E. Recovery Program funds spent for publication charges: \$0

X. Status of Data Submission: Not applicable

XI. Signed: William T. Fullerton, P.E. 12-08-00
Principal Investigator Date