

**COLORADO RIVER RECOVERY PROGRAM
FY 2010-2011 PROPOSED SCOPE OF WORK for:
(Habitat evaluation surveys)**

Project No.: C6 HYD

Lead Agency: U.S. Fish and Wildlife Service
Submitted by: Tom Chart (Lead)
Address: U.S. Fish and Wildlife Service
P.O. Box 25486, DFC
Denver, CO 80225
Phone: 303-969-7322 Ext 226
FAX: 303-969-7327
E-Mail: Tom_Chart@fws.gov

Submitted by: Terry Stroh
Address: U.S. Bureau of Reclamation,
2764 Compass Drive,
Suite 106,
Grand Junction, CO 81504,
E-Mail: tstroh@usbr.gov,
Phone: (970)-248-0608,
FAX: (970) 248-0601

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Category:

- Ongoing project
- Ongoing-revised project
- Requested new project
- Unsolicited proposal

Expected Funding Source:

- Annual funds
- Capital funds
- Other

I. Title of Proposal:

Physical evaluation of floodplain habitats restored/enhanced to benefit endangered fishes of the upper Colorado River basin.

II. Relationship to RIPRAP:

COLORADO RIVER ACTION PLAN: MAINSTEM
ACTIVITY II. RESTORE HABITAT

II.A. Restore and manage flooded bottomland habitat.

II.A.6. Develop and implement Colorado River Sub-basin Floodplain Management Plan.

COLORADO RIVER ACTION PLAN: GUNNISON RIVER
ACTIVITY II. RESTORE HABITAT

II.A. Restore and manage flooded bottomland habitat.

II.A.3. Develop and implement Colorado River Sub-basin Floodplain Management Plan.

III. Study Background/Rationale:

The Habitat Restoration element of the Upper Colorado River Endangered Fish Recovery Program seeks to enhance floodability of riparian habitats to assist in recovery of the razorback sucker. Razorback sucker spawn on the ascending limb of the hydrograph during spring runoff. After several days the eggs hatch, and larvae emerge from the spawning substrate and begin drifting down river. Studies have suggested that larvae will not survive unless they are able to drift into suitable floodplain nursery habitats. As a result of water development and flow management, spring flows rarely get high enough for larvae to gain access to suitable floodplain habitats, so levees have been breached at several floodplain wetland depressions along the Colorado and Gunnison rivers in Colorado to allow access by drifting razorback sucker larvae. For most of the floodplain sites, levees were breached so that the sites would connect to the river nearly every year. Levee-breach configurations may be affected by factors such as erosion, sediment deposition, vegetation encroachment and, as a result, the ability of the breaches to entrain drifting razorback sucker larvae. A need exists to determine the existing quality of levee-breach configurations in terms of ability to entrain larvae, and to recommend corrective actions and improvements as necessary. Other considerations addressed by this work are to ensure that restored habitats will not adversely affect adjacent landowners, and that any need for long-term O&M will be minimal.

Update: July 2009

This project was originally funded in 2006, however it was not until 2008 that flows were high enough to connect all four floodplains. Reclamation carried the 2006 funds and were able to characterize connection flows at all four sites and survey the conditions (erosions / deposition) at Unaweep and Audubon during and subsequent to peak flows in 2008. Those data will be synthesized and reported by the end of FY09. In that report, Reclamation will include a recommendation for future surveys. At their July 2009 meeting, the Biology Committee indicated they would likely consider the result of the ongoing Floodplain Synthesis (Project FR-FP Synth) to determine the need for future surveys of floodplain connection sites.

Based on field observations in 2008, Reclamation believes that excavation of deposited sediments at the Audubon site and perhaps placement of more riprap at Unaweep site will be required. This SOW therefore covers the costs of actual remediation work in 2010 at those two floodplain sites and covers costs of follow-up survey work in 2011.

IV. Study Goals, Objectives, End Product:

Goal:

To restore floodplain nursery habitats to assist in recovery of the endangered fishes, and to ensure that the habitats function as designed and constructed, and to take remedial measures as necessary.

Objectives:

1. To determine, as a function of main-stem flows, how well selected floodplain nursery habitats connect with the river and are likely to entrain drifting larvae (Audubon, Unaweep, Walter Walker);
2. To characterize post-runoff habitat and levee-breach morphology at selected sites (Audubon, Unaweep, Walter Walker) and compare to as-built morphology (Audubon, Unaweep);
3. To identify potential problems and make recommendations (Audubon, Unaweep, Walter Walker);
4. To estimate when the downstream levee will breach at GJ Pipe.

End Product:

An interim report will be submitted by October 1, 2009, which will include: 1) results of site surveys conducted during the spring and summer 2008 and, 2) recommendations for on site remediation as needed.

V. Study Sites

Property Acres River-RM Purpose Connection Flow

Audubon 10.40 Colo-168.0 Larvae 16.7kcfs (1.25-year)

Unaweep 55.00 Gunn-13.0 Larvae 4.2kcfs (1.11-year)

Walter Walker 450.00 Colo-164.5 Larvae 13.6kcfs (1.11-year)

GJ Pipe 13.70 Colo-165.5 Larvae 37.8kcfs (5-year)

VI. Study Methods/Approach

Objective 1.

To determine how well selected floodplain nursery habitats connect with the river as a function of mainstem flows, cross-sectional profiles will be surveyed within the levee breaches. Flow volumes entering the floodplain habitats will be measured for mainstem flows ranging from initial site connection flows to spring peak flows (at least three flow measurements per site), and an empirical relationship will be developed for targeted sites.

Objective 2.

To characterize post-runoff habitat and levee-breach morphology, surveying will be conducted to identify areas of erosion and sediment deposition. Results will be compared to as-built morphology (Audubon, Unaweep) and pre-runoff morphology. Modified topo maps will identify areas of erosion and deposition (Audubon, Unaweep).

Objective 3.

Estimate approximately when downstream levee at the GJ Pipe site will be breached by the river. Analyses of these data will yield modified as-built topographic maps (Audubon, Unaweep), levee-breach cross-sectional profiles (Audubon, Unaweep, Walter Walker), levee-breach stage discharge relationships (Audubon, Unaweep), and GJ Pipe levee dimensions.

VII. Task Description and Schedule

Task 1. Pre-runoff surveys

- All sites: Establish monuments
- Audubon and UnawEEP: Survey cross sections through both the upstream and downstream levee breaches
- Walter Walker: Survey the lowered levee
- GJ Pipe: Measure dimensions (especially widths) of the downstream levees

Field work completed in 2008; data will be synthesized by October 1, 2009.

Task 2. Runoff surveys

- All sites: Note any potential problems or risks to adjacent landowners during runoff.
- Audubon and UnawEEP: Determine flows at which sites connect with the main channel of the river. Measure flows through the upstream levee breaches on the ascending, peak, and descending limbs of the hydrograph. Develop a flow rating curve for the breaches, and determine the relationship between main channel flows and inflows through the levee breaches.
- Walter Walker: Determine flows at which site connects with the main channel of the river. Measure water surface elevations to determine depths of flow over the lowered levee, and relate to main channel flows.
- GJ Pipe: Visit site and note any scour that may be occurring on the downstream levee.

Field work completed in 2008; data will be synthesized by October 1, 2009.

Task 3. Post-runoff surveys

- All sites: Perform visual observation of the sites with regard to aggradation and degradation, and survey shots to locate areas where notable scour or deposition has occurred. Note any potential problems.
- Audubon and UnawEEP: Survey cross sections through both the upstream and downstream levee breaches. Compare survey information to as-built data, modify as-built topo maps.
- Walter Walker: Survey the lowered levee. Compare to pre-runoff survey.
- GJ Pipe: Measure dimensions (especially width) of the downstream levee. Compare to prerunoff survey.

Field work completed in 2008; data will be synthesized by October 1, 2009.

Task 4. Analyze results and write summary report with conclusions and recommendations. Note: Reclamation believes remediation work will be needed

at the Audubon and Unawep, based on field observations and preliminary assessment of data collected in 2008.

Task 5. Remediate floodplain connections as called for in Task 4.

VIII. FY 2010 Work – Task 5.

-Deliverables: annual report due November 2010

-Budget

Hydro-Tech (GS-9 @ 35.00/hour x 16 hours) 560
Biologist (GS-11 @ 42.50/hour x 8 hours) 340
Engineer GS-12 @ 62.50/hour x 16 hours) 1,000
Surveyor (GS-11 @ 48.50/hour x 12 hours) 600
Heavy Equipment Operation @ 300/hour x 30 hours) 9,000
RipRap and associated materials 3,000
Misc. Supplies 1500
Subtotal 16,000
Contingency 4,000
Total 20,000

FY 2011 Work – Task 1- 4 (contingent on Biology Committee assessment of need)

-Deliverables: annual report due November 2011; final report with recommendations for site maintenance.

-Budget

Surveyor (GS-11 @ 48.50/hour x 80 hours) 3,880
Hydro-Tech (GS-9 @ 35.00/hour x 80 hours) 2,800
Biologist (GS-11 @ 42.50/hour x 160 hours) 6,800
Engineer GS-12 @ 62.50/hour x 40 hours) 2,500
Misc. Supplies 720
Subtotal 16,700
Contingency 3,300
Total 20,000

IX. Budget Summary

FY 2010: \$20,000

FY 2011: \$20,000

X. References