COLORADO RIVER RECOVERY PROGRAM Project No.: **CAP-6-HYD**
FY-2001 PROPOSED SCOPE OF WORK

Lead Agency: U.S. Fish and Wildlife Service
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Category:
_ Ongoing project
X Ongoing-revised project
_ Requested new project
_ Unsolicited proposal

Expected Funding Source:
_ Annual funds
X Capital funds
_ Other

I. Title of Proposal:

Site surveys, floodability assessments, design and engineering for floodplain habitat restoration.

II. Relationship to RIPRAP:

-GREEN RIVER ACTION PLAN: MAINSTEM
ACTIVITY II. RESTORE HABITAT
II.A. Restore and manage flooded bottomland habitat.
-COLORADO RIVER ACTION PLAN: MAINSTEM
ACTIVITY II. RESTORE HABITAT
II.A. Restore and manage flooded bottomland habitat.
-COLORADO RIVER ACTION PLAN: GUNNISON RIVER
ACTIVITY II. RESTORE HABITAT
II.A. Restore and manage flooded bottomland habitat.
-GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN
ACTIVITY II. RESTORE HABITAT
II.A. Conduct inventory of flooded bottomland habitat for potential restoration.
II.B. Support actions to reduce or eliminate contaminant impacts.

III. Study Background/Rationale:

The Floodplain Habitat Restoration Program seeks to restore and/or enhance the floodability of riparian habitats to benefit endangered fishes and assist in recovery. The more practical, cost-effective nonflow alternatives for enhancing floodability include breaching levees and/or lowering floodplain elevations. To increase likelihood of success and minimize potential adverse impacts, pre-construction surveys and design planning are recommended.

To date, floodability assessments and site design/engineering have been done for the U.S. Fish and Wildlife Service's Ouray National Wildlife Refuge (Johnson Bottom, Leota Bottom, Wyasket Lake, Sheppard Bottom, and Old Charley Wash); the National Park Service's Canyonlands National Park (Millard Canyon, Queen Anne Bottom, Anderson Bottom, Bonita Bend, Unknown Bottom, and Valentine Bottom)(FLO Engineering 1996); BLM wetlands (Bonanza Bridge, Horseshoe Bend, The Stirrup, Baeser Bend, and Above Brennan)(FLO Engineering 1997); 17 private properties along the Green River, 8 along the Colorado River, and 4 (and Escalante State Wildlife Area) along the Gunnison River.

Data collected on the Ouray Refuge indicated that 22,800 cfs (Jensen) would be needed to inundate 5,000 acres of floodplain habitat. If levees were breached, however, the same amount of habitat could be inundated at 12,000 cfs. In Canyonlands, data suggested that flows in excess of 39,000 cfs (Green River, Utah) would be necessary for the river to leave its banks and flood adjacent terraces.

Where private landowners are interested in selling fee or easements, floodability assessments are prudent for determining the amount of floodable habitat the Program would be buying for acquisition dollars. On both private and public lands where it is determined that levee removal or excavation could enhance floodability, and where landowners and managers are willing to cooperate, floodability assessments are prudent for determining the amount of floodable area the Program will be getting for construction dollars.

Other considerations being addressed by this work help ensure that acquired and restored habitats will:

1. enhance survival, growth and recruitment of young razorback suckers;
2. maximize inundation, to make the best use of existing (and anticipated future) flow regimes;
3. avoid or minimize long-term O&M;
4. avoid or minimize adverse effects on adjacent landowners;
5. avoid or minimize adverse effects on the geomorphology of the main river channel.

IV. Study Goals, Objectives, End Product:

Goal:

To restore floodplain habitats in a manner that will benefit endangered fishes, minimize potential adverse effects, and be cost-effective.

Objectives:

1. To determine bankful flood flows, with and without excavation;
2. To determine area of inundation as a function of flow, with and without excavation;
3. To compare historical versus existing frequency, duration, and timing of flood flows, with and without excavation;
4. To characterize pre-restoration baseline channel and site morphology, and post-restoration morphology;
5. To develop design options for enhancing floodability.

End Products:

Reports of results of each year's surveying, site design and engineering activities, including stage-discharge relationships; pre- and post-restoration surface area of inundation as a function of flow; cross-sectional profiles; and topo maps with design enhancements.

V. Study Area

Sites and segments will be located on the Green, Colorado, and Gunnison rivers.

VI. Study Methods/Approach

To determine area of inundation versus flow relationships, surveys are conducted on candidate sites, the river channel, and water surface elevations. Analyses of these data yield topo maps, cross-sectional profiles, stage-discharge relationships, and bankful flood flow estimates (pre- and post-restoration). USGS data are analyzed to determine flow magnitude, frequency, duration, and timing of flooding both pre- and post-restoration. Baseline topo maps and channel profiles also serve as a basis for post-restoration comparison.

VII. Task Description and Schedule

Task 1. Reconnaissance surveys (Oct 2000-Mar 2001)

Establish permanent monuments for main channel cross-sectional profiles, hydraulic controls, water surface elevations, site topography, bankful and levee elevations.

Task 2. Data collection (Oct 2000-Jul 2001)

Conduct channel cross-sectional profile surveys and topographic surveys; collect stage-discharge data.

Task 3. Analyses (Oct 2000-Aug 2001)

Plot cross-sectional profiles and topo maps; develop stage-discharge relationships. Conduct HEC-2 analyses; develop area-of-inundation versus flow relationships; conduct hydrologic analyses.

Task 4. Configuration design (Oct 2000-Aug 2001)

Identify design options; advantages/disadvantages of each.

Task 5. Monitoring/evaluation (May 2001-Jul 2001)

Evaluate site floodability/drainability; monitor post-construction topography and channel morphology.

Candidate Sites for FY 00-01 Acquisition and/or Restoration

Candidate sites identified by the Land Acquisition Coordinator that appear to have potential value as endangered fish habitat will require pre-acquisition and/or pre-restoration surveys. As private lands and partnership lands along the Green, Colorado, and Gunnison rivers continue to become available, they will need to undergo floodability assessments as part of the pre-acquisition and pre-restoration processes.

VIII. FY 01 Work

-Description of Work
See study methods/approach and task descriptions, above.
-Deliverables
FY 01 Report - July 2002
-Budget
$100K (carried over; not FY 01 funds)

IX. Budget Summary

FY 2001 $0K (no FY 01 funds)

X. References

FLO Engineering. 1996. Green River flooded bottomlands investigation - Ouray Wildlife Refuge and Canyonlands National Park. FLO Engineering, Breckenridge, CO. 105 pp. + app.

FLO Engineering. 1997. Green River floodplain habitat restoration investigation - Bureau of Land Management sites and Ouray National Wildlife Refuge sites near Vernal, Utah - Final Report. FLO Engineering, Breckenridge, CO. 63 pp. + app.

FLO Engineering. 1999. Floodability assessments of private land sites along the Green River, Gunnison River and Colorado River. Final 1998 floodplain habitat restoration status report, Volume IA. FLO Engineering, Breckenridge, CO. Six sections + app.

FLO Engineering. 1999. Post-restoration sedimentation and erosion monitoring/evaluation for Green River floodplain habitat restoration sites, near Vernal, Utah. Final 1998 floodplain habitat restoration status report, Volume IIA. FLO Engineering, Breckenridge, CO. Five sections + app.