COLORADO RIVER RECOVERY PROGRAM  
FY-2002-2003 PROPOSED SCOPE OF WORK

Lead Agency: U.S. Fish and Wildlife Service
Submitted by: Pat Nelson (Project Leader)
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: Pat_Nelson@FWS.GOV
Date: October 2, 2001

Category: Ongoing project  Expected Funding Source: Annual funds
_ Ongoing-revised project  X Capital funds
_ Requested new project  _ Other
_ Unsolicited proposal

I. Title of Proposal:

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

II. Relationship to RIPRAP:

-GENERAL RECOVERY PROGRAM SUPPORT ACTION PLAN
  ACTIVITY II. RESTORE HABITAT
    II.A.1. Conduct inventory of flooded bottomland habitat for potential restoration.
    II.A.2. Screen high-priority sites for potential restoration/acquisition.
    II.A.3. Conduct NEPA for floodplain restoration program.
  II.B. Support actions to reduce or eliminate contaminant impacts.

-GREEN RIVER ACTION PLAN: MAINSTEM
  ACTIVITY II. RESTORE HABITAT
    II.A. Restore and manage flooded bottomland habitat.
        II.A.1. Conduct site restoration.
        II.A.2. Acquire interest in high-priority flooded bottomland habitats.
            II.A.2.a. Identify and evaluate sites.
            II.A.2.c. Evaluation.
        II.A.3. Implement levee removal strategy at high-priority sites.
            II.A.3.a. Preconstruction (floodability assessments, design, and engineering).

-COLORADO RIVER ACTION PLAN: MAINSTEM
  ACTIVITY II. RESTORE HABITAT
II.A. Restore and manage flooded bottomland habitat.
II.A.4. Implement levee removal strategy at high-priority sites.
II.A.4.a. Preconstruction (floodability assessments, design, and engineering).
II.A.5. Acquire interest in high-priority flooded bottomland habitats.

-COLORADO RIVER ACTION PLAN: GUNNISON RIVER

ACTIVITY II. RESTORE HABITAT
II.A. Restore and manage flooded bottomland habitat.
II.A.2. Implement levee removal strategy at high-priority sites.
II.A.2.a. Preconstruction (floodability assessments, design, and engineering).
II.A.3. Acquire interest in high-priority flooded bottomland habitats.

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 Charlie 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;
6. To oversee construction activities;
7. To monitor results

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


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


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


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.


Identify design options; advantages/disadvantages of each.

Task 5. Oversee construction activities (Oct 2001-Sep 2003)


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

Candidate Sites for FY 02-03 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.
Sites targeted for construction during FY 02 include Unaweep Charolais Ranch on the Gunnison, Walter Walker and Grand Junction Pipe on the Colorado. Other candidate sites include the Audubon property and a CDOT property.

VIII. FY 02 Work

- Description of Work
  See study methods/approach and task descriptions, above.
- Deliverables
  FY 02 Report - July 1, 2003 to coordinator
- Budget
  $95.7K (see budget breakdown, attached)

FY 03 Work

- Description of Work
  See study methods/approach and task descriptions, above.
- Deliverables
  FY 03 Report - July 1, 2004 to coordinator
- Budget
  $99.3K (see budget breakdown, attached)

IX. Budget Summary

<table>
<thead>
<tr>
<th>Year</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2002</td>
<td>$95.7K</td>
</tr>
<tr>
<td>FY 2003</td>
<td>$99.3K</td>
</tr>
<tr>
<td>Total</td>
<td>$195K</td>
</tr>
</tbody>
</table>

X. References


