COLORADO RIVER RECOVERY PROGRAM Project No.:146
FY-2006-2007 PROPOSED SCOPE OF WORK
Yampa diversion entrainment

Lead Agency: Colorado State University

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Category:
__ Ongoing project
X Ongoing-revised project
__ Requested new project
__ Unsolicited proposal

Expected Funding Source:
X Annual funds
__ Capital funds
__ Other (explain)

I. Title of Proposal:

Evaluation of entrainment of Colorado pikeminnow into Yampa River canals.

II. Relationship to RIPRAP (March 28, 2004 version @ http://www.r6.fws.gov/crrip/rip.htm)

Green River Action Plan: Yampa and Little Snake rivers

II.	Restore habitat
II.A.2.	Reduce /eliminate entrainment of Colorado pikeminnow at diversion structures.
II.A.2.a.	Identify and evaluate existing structures for entrainment of Colorado pikeminnow.
II.A.2.b.	Develop and implement remedial measures, as necessary, to reduce or eliminate entrainment.

III. Study Background/Rationale and Hypotheses

[1] See last page for changes and dates of each revision.

The Yampa River has two gravity-fed diversion canals within critical habitat for federally endangered Colorado pikeminnow (*Ptychocheilus lucius*). These include Duffy Mountain (or Duffy Tunnel) diversion canal at river mile 108.6 and Maybell Canal diversion at river mile 90.3. Both structures are in Lower Yampa River Division 6, District 44 (CDSS 2006). The Maybell Canal diverts water from the Yampa River within Juniper Canyon and carries irrigation water through Maybell, Colorado. The Duffy Diversion routes water through Duffy Tunnel under the saddle between Duffy Mountain and Signal Butte. The Duffy Diversion is screened for debris with steel bars but the bars are spaced about 6 inches apart and are spaced wide enough for fish to pass into the canal. The Maybell Canal diversion is unscreened; therefore, both canals have the potential to entrain fish including resident or migrating Colorado pikeminnow. Head gates for both diversions are located on Bureau of Land Management (BLM) lands. Local ditch riders and ranchers have observed small numbers of fish stranded in the canals at the end of irrigation season. The actual species and number of fish entrained each year are unknown.

Colorado pikeminnow adults are resident in the vicinity of both head gate inlets and are known to migrate from other locations downstream past these inlets during migrations to spawning areas in Dinosaur National Monument. After spawning, pikeminnow return upstream past these head gates during their return migration to overwinter sites. Colorado pikeminnow that occupy these reaches are typically adults over 450 mm (18 inches) long. Other native endangered fish including razorback sucker (*Xyrauchen texanus*), humpback chub (*Gila cypha*), and bonytail (*Gila elegans*) apparently do not presently occur in these reaches and none of these species have been collected near either diversion.

This research will focus on the Maybell Canal which is the larger of the two diversions. We plan to sample the canal after irrigation flows are reduced in late summer or fall to determine if native fish are entrained and stranded in the canal. Because most of the Maybell Canal is located on private property, fish sampling in 2007 will occur only within the first 1 1/2 miles from the head gate on BLM land. Access to the remote sampling site is limited and may be problematic because there is not a continuous access road along the canal. Representatives of the Recovery Program will meet with the District to coordinate all sampling activities. While sampling we will identify whether there are pools deep enough to hold fish. We will also document whether fish are occupying flowing waters or are retained in holding pools and if so, identify the species and sizes captured. If native fish are found stranded in the canal during sampling, they will be transported and released in the Yampa River.

Rationale/Problem Statement:

Identification of existing Yampa River diversion structures which may entrain Colorado pikeminnow into canals is recommended in the Yampa Management Plan (Roehm 2004) and Yampa PBO (USFWS 2005). The Maybell Canal is currently the largest diversion on the Yampa River in Critical Habitat with a water right of 129 cfs. The purpose of this proposal is to determine if Colorado pikeminnow or other native fish are entrained in the Maybell Canal and if so to capture and return these fish back to the river.

IV. Study Goals, Objectives, End Product:

The goal is to document if the Maybell Canal entrains Colorado pikeminnow or other native fishes and if so to return them to the river.

Objectives:

1. Coordinate with Maybell Irrigation District (District) officers to determine the best method for access to the Maybell Canal within BLM land.
2. Site survey of the Maybell Canal on BLM land to determine whether there are pools that could retain fish.
3. Sample pools or flowing water on 1-2 days in the Maybell Canal on BLM land after the canal flows are normally reduced in late summer to determine if fish are present.

End Product: Annual report that identifies fishes collected in the Maybell Canal.

V. Study area:

The study area is the Maybell Canal including the entire canal and its inlet at river mile 90.3 on the Yampa River, in Moffat County, Colorado. In late summer or autumn 2007, we will examine and collect fish only the 1 1/2 miles of canal on BLM land in Juniper Canyon.

Sampling Dates

Sampling will occur between August and November primarily after canal flow is reduced or shut off during normal operations. Sampling will occur on 1-2 days.

VI. Study Methods/Approach

Most of the Maybell Canal is located on private property, so contact and cooperation from the District and private landowners is critical. Recovery Program representatives signed a Memorandum of Understanding (MOU) with the District that describes the background, responsibilities, benefits, actions, and products of sampling the ditch for fish. All sampling activities will be conducted in accordance to the procedures described in that MOU. In 2007, the fish survey will occur only on the portion of the canal on BLM lands between the head gate and approximately 1 1/2 mile downstream in Juniper Canyon. Sampling will occur after irrigation diversions are reduced or terminated per normal operations. Sampling will occur on 1 or 2 days as needed to cover the section of ditch within BLM land. The 2-days of sampling will occur within a 5-day period to allow for possible delays due to inclement weather such as rain that would make travel over the BLM access road difficult for the fish-hauling truck. Sampling gear may include seines, stationary nets, dipnets, electrofishing barge, electric seine, or bank electrofisher. All fish will be enumerated and native fish will be relocated to the Yampa River

and released alive. Northern pike will be transported to Loudy Simpson pond and smallmouth bass ≥ 250 mm (≥10 inches) will be transported to Elkhead Reservoir. Other nonnative fishes will be returned alive into the ditch. We will provide an annual report on the species, numbers, and locations of all fish captured in the canal.

VII. Task Description and Schedule

FY 2006		
Task 1	April-Sep	Contact and discuss options with Maybell Irrigation District officers; contact private landowners and obtain permission for reconnaissance of ditch and later access for fish sampling.
FY 2007		
Task 2	Aug	Site visit with Irrigation District officers to identify access points and logistical considerations, learn about canal operations, and identify areas that could hold fish after the irrigation season. Provide a written description of fish sampling methods and schedule to District officers.
Task 3	Aug-Nov	Sample canal within BLM lands on one occasion for 1-2 days as necessary. Capture and translocate native fish to the Yampa River.
Task 4	Dec	Equipment maintenance. Data entry and analysis. Prepare Recovery Program annual progress report.

VIII. FY-2006–2007 Work

Deliverables/Due Dates:

Recovery Program Annual Report: Dec 2006
Dec 2007

FY-2006 Budget by Task

Task 1:	Researcher IV (1111/week-3 wks)	3333
	Truck lease ($677/month x 1 months)	677
	Travel-Lodging ($65/night x 3 nights/trip x 2 trips)	390
	Travel-Per diem ($25/day x 4 days/trip x 2 trips)	200
	Truck mileage ($0.39/mile x 600 miles/trip x 2 trips)	468
	Total Task 1	5068

CSU Overhead rate to BOR (17.5%)	887
TOTAL	5955

FY-2007 Budget by Task

Task 2:	Researcher IV (1111/week-1 wks)	1111
	Field Technician (650/week x 1 person x 1 week)	650
	Travel-Lodging ($80/night x 2 nights/trip x 2 people x 1 trip)	320
	Travel-Per diem ($39/day x 3 days/trip x 2 people x 1 trip)	234
	Truck mileage ($0.69/mile x 700 miles/trip x 1 trip)	483
	Total Task 2	2798
Task 3:	Researcher IV (1111/week- 1 wks)	1111
	Technicians 3 (650/week-includes OT x people x 1 week	1950
	Travel-Lodging ($80/night x 4 nights x 4 people)	1280
	Travel-Per diem ($39/day x 5 days x 4 people)	780
	Truck mileage ($0.69/mile x 700 miles/trip)	483
	Field supplies (Generator gas, nets)	500
	Services (long distance, cell phone, and outside labor costs such as equipment maintenance and repair)	150
	Total Task 3	6254
Task 4	Researcher IV (1111/week-2 wks)	2222
	Research Scientist (900/-1/2 wk)	900
	Total Task 4	3122
	Sub-total	12174
	CSU Overhead rate to BOR (15%)	1826
TOTAL		14,000

IX. Budget Summary

FY-2006	$ 5,955
FY-2007	$ 14,000
Total	$ 19,955

X. Reviewers

XI. References

CDSS 2006 (Colorado Decision Support System website http://cdss.state.co.us

Hydrosphere (Hydrosphere Resource Consultants). 1995. Reconnaissance evaluation of Yampa River diversion structures. Final report to Colorado River Water Conservation District, Colorado Water Conservation Board, and Bureau of Reclamation.

Roehm, G.W. 2004. Management plan for endangered fishes in the Yampa River Basin and environmental assessment. U.S. Fish and Wildlife Service, Mountain-Prairie Region (6). Denver.

USFWS. (U.S. Fish and Wildlife Service) 2005. Final programmatic biological opinion on the

Management Plan for Endangered Fishes in the Yampa River Basin dated January 10, 2005. Mountain-Prairie Region (6). Denver.

Revision dates:
02/20/06: Initial 2006 SOW in response to RFP (JAH); 7/23/07 JH revised for 2007 sampling based on MOU with Maybell Irrigation District. 08/02/07 JH revised in response to P. Nelson request to closer match details in the MOU.

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