

I. Project Title:

Evaluation of entrainment of Colorado pikeminnow into Yampa River canals.

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III. Project Summary: The purpose of this work is to determine if Colorado pikeminnow (*Ptychocheilus lucius*) or other native fish are entrained in the Maybell Ditch. This study is recommended in the Yampa Management Plan (Roehm 2004) and Yampa Programmatic Biological Opinion (USFWS 2005). The Maybell Ditch, with a head gate located near river mile 90 in Juniper Canyon is the larger of two gravity-fed diversion canals within critical habitat for federally endangered Colorado pikeminnow. The other, smaller ditch is the Five-Fifty-Five Ditch near Duffy Mountain at river mile 108.5. The Maybell Ditch is unscreened, extracts more water, and has the greater potential to entrain fish. According to local ditch riders and ranchers, small numbers of fish have been stranded in both canals, but the species and number of fish entrained each year are unknown.

Because most of the Maybell Ditch is located on private property, in FY 2006 we proposed to meet with ditch association officers and to ask for permission from ditch association members to access the ditch for fish sampling and to identify whether there are pools deep enough to hold fish in the fall. If granted permission, we planned to sample the Maybell Ditch at the end of irrigation season in FY 2007 to determine whether fish are stranded in holding pools and if so, to identify the species and number stranded. Any native fish found in the ditch during sampling would be transported and released in the Yampa River.

IV. Study Schedule: *Initial year-2006; Final year-undetermined*

V. 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.

VI. Accomplishment of FY 2006 Tasks and Deliverables, Discussion of Initial Findings and shortcomings:

Task 1 (FY 06) Apr- Sep 2006

Contact and discuss options with Maybell Ditch association officers; contact private landowners and obtain permission for reconnaissance of ditch and later access for fish sampling.

Task 2 (FY 07) Oct-Nov 2006

Sample ditch. Capture and translocate native fish to the Yampa River.

Task 3 (FY 07) Dec 2006

Equipment maintenance. Data entry and analysis. Prepare Recovery Program annual progress report.

Task 1: Task 1 was completed in 2006 (Federal FY 2006). We scouted the head gate and surrounding area of the Maybell Ditch intake which is located on BLM lands and also scouted the ditch via state highway. We met with the Maybell Ditch Association President and a couple of ditch association members and discussed how we would approach sampling and address landowner concerns. We followed those discussions by email and phone. We were unable to obtain permission to access or sample fish in the ditch via private property. In speaking with ditch association members, their reluctance to allow access was primarily related to concerns that discovery of endangered fishes in the ditch would negatively affect ditch operations. In addition, our request for access coincided with a request by the State Engineer's Office that the ditch association install a metering flume at the ditch head gate to monitor intake to assure that conservation pool water released from Elkhead Reservoir for endangered fishes would flow freely downstream. We spoke with Patty Schrader-Gelatt of Ecological Services, U.S. Fish and Wildlife Service in Grand Junction, and at our recommendation the Association President also spoke with her to discuss the Yampa PBO and understand if there would be implications to ditch operations if Colorado pikeminnow were found entrained by the ditch.

Tasks 2 & 3: Planned for October or November 2006 (Federal FY 2007) so results will be reported in the 2007 Annual Report. However, no landowners volunteered to allow sampling on their property, so no Federal FY-2007 sampling occurred in 2006.

VII. Recommendations:

Although we can continue to seek landowners that might be willing to allow access for us to sample the ditch, we suggest a different approach for two reasons, 1) it is unlikely that we will obtain permission for access to the entire ditch, and 2) sampling late in the season at base flow when ditch flows are curtailed may not accurately detect Colorado pikeminnow because it is more likely that pikeminnow would be entrained during their migration to downstream spawning areas in late June or early July. Any fish entrained in July during runoff would likely be dead and decomposed by fall during baseflow. We recommend that the ditch be actively monitored for entrained Colorado pikeminnow with a passive, stationary PIT tag recorder. A passive tag monitoring station should have no detrimental effect on ditch operations and should be easier to obtain access permission because the head gate and the upper part of the ditch are located on BLM land. The other alternative is to build and maintain a temporary weir or net to capture entrained fish but this method will require intensive manpower and will only sample intermittently during periods when it is manned.

As of the end of 2006, we estimate that approximately 15% of the pikeminnow upstream of the Maybell Ditch are tagged with PIT tags (Biomark 134.2 kHz super tag) that could be read and monitored by a stationary recorder. More pikeminnow will be tagged in 2007 and future years. To add to the number of fish that could be monitored we could also PIT tag surrogate fish such as roundtail chub, bluehead sucker and flannelmouth sucker in Juniper Canyon immediately upstream of the Maybell Ditch head gate and monitor whether they are entrained. Although there is a high up-front cost, the monitoring equipment and knowledge developed in this study could be transferred to answer similar questions about movement or entrainment of Colorado pikeminnow or other species at other locations in the basin. This multiple use of equipment could provide a cost savings to future projects.

Estimated costs to install a monitoring station at this remote location using components from Biomark are about \$50,000. About \$40,000 of the cost is for hardware that includes an FS1001M transceiver, two antennas, cables, a vandal-resistant enclosure box with power and conditioning electronics, and a propane-powered thermo-electric generator. Site visits and setup costs would be about \$10,000 for Biomark personnel. Although the initial costs appear somewhat high, most of the equipment would be useable at other locations to answer similar entrainment or passage questions. To use this system at another location would require replacement of the antennas, which in this application cost about \$4,000 each. Other costs would include additional personnel for setup, installation, site maintenance and monitoring, and downloading and analyzing data.

Another alternative to sampling or monitoring the Maybell Ditch would be to temporarily shift attention to the Five-Fifty-Five Ditch at Duffy Mountain. This ditch forms a backwater that connects to the river between the head gate and the tunnel during spring runoff. The ditch could be sampled inexpensively to determine if Colorado pikeminnow use the backwater. However, this would not answer the question of whether fish are entrained into the tunnel and stranded in the ditch.

VIII. Project Status: The project is "On Track and On Going", but the scope of work and budget will need to be adjusted if alternative sampling techniques are requested. Predicted future funding needs will depend upon the preferred work plan

IX. FY 2006 Budget Status

A. Funds Provided: \$5,955

B. Funds Expended: \$5,955

C. Difference: 0

D. Percent of the FY 2006 work completed, and projected costs to complete: 100%.

E. Recovery Program funds spent for publication charges: None

X. Status of Data Submission (Where applicable): No fish data collected in 2006.

XI. Signed: John Hawkins 11/21/06
Principal Investigator Date