

I. Project Title: **Evaluation of entrainment of Colorado pikeminnow into Yampa River canals.**

II. Principal Investigators: John Hawkins and Kevin Bestgen

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III. Project Summary:

The purpose of this study was to determine if fish are entrained in the Maybell Canal, a gravity-fed diversion canal in the Yampa River within occupied habitat for adult Colorado pikeminnow (*Ptychocheilus lucius*), a federally listed endangered fish species. In 2008, we sampled the uppermost 1.4 miles (2.2 km) of the approximately 12 mile (19 km) long canal in October 2007 and in June and July 2008. We captured eleven species and a total of 704 fish or approximately 500 fish per mile, including adult roundtail chub (*Gila robusta*). Roundtail chub and Colorado pikeminnow are similar which suggests that the rarer Colorado pikeminnow could also be entrained in the ditch but not detected during our limited sampling. We suggest more thorough sampling using a temporary weir during the migration period for Colorado pikeminnow.

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 2008 Tasks and Deliverables, Discussion of Initial Findings and Shortcomings

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

Objectives:

- a. Coordinate with Maybell Ditch Association officers to determine the best method for access to the Maybell Ditch within BLM land for spring sampling.
- b. Sample the Maybell Ditch for fish during post runoff flows in early summer when Colorado pikeminnow typically migrate past the head-gate structure.

All objectives were accomplished in 2008.

We coordinated with the Maybell Ditch Association and sampled with hoop nets 1,341 hours from June 19 through July 11 during the migration period for Colorado pikeminnow. Unfortunately, the ditch was closed and drained for a brief period between July 4–7 to repair head gate damage and canal washout caused by high spring flows. This dried up the canal and pushed any entrained fish out of the study site. We captured two fish, both native roundtail chub. One was 19 in (482 mm) long with spawning coloration and tubercles and the other was 20 in (498 mm) long. Both were tagged with PIT tags and released in the river.

Because of their similarities with Colorado pikeminnow, the occurrence of large adult roundtail chub in the Maybell Ditch suggests that Colorado pikeminnow could also be entrained in the ditch. The lengths of the two roundtail chub captured in the ditch were similar to lengths of Colorado pikeminnow in the Yampa River. Both species are members of the minnow family (Cyprinidae) and they are morphologically and behaviorally similar. They share a streamlined, fusiform body shape, piscivorous behavior, occupy similar habitat, and likely have similar swimming performance.

No endangered fish were captured during sampling in 2008, but those results are not conclusive regarding entrainment into Maybell Ditch by endangered fishes because our ability to detect the presence of Colorado pikeminnow was low. Sampling was hindered because 1) sampling occurred only during a short portion of the migratory season, 2) the ditch was drained and refilled during sampling in 2008, and 3) the area sampled during spring migration provided little refuge for large fish such as Colorado pikeminnow suggesting that large-bodied fish entrained in the ditch would not remain for extended periods in the portion of the ditch that was sampled. To determine whether Colorado pikeminnow are entrained in the Maybell Ditch during their migration will require a more rigorous approach such as the use of a continuous weir.

VII. Recommendations

1. Install a temporary weir that would continuously sample incoming ditch flow for entrained large-bodied fish during the Colorado pikeminnow migration period.
2. If a weir is not feasible, continue with hoop net sampling with increased effort (more nets) and for a longer period of time during migration.

VIII. Project Status: The project objectives for 2008 were accomplished. Future funding needs will depend upon the preferred work plan determined by the Recovery Program.

IX. FY 2008 Budget Status

- A. Funds Provided: \$ 20,368
- B. Funds Expended: \$ 20,368
- C. Difference: 0
- D. Percent of the FY 2008 work completed, and projected costs to complete: 100%.
- E. Recovery Program funds spent for publication charges: None

X. Status of Data Submission: A final combined report for 2007 and 2008 results was submitted 11/11/08 to the Program Director's office for peer review.

XI. Signed: John Hawkins 02/02/09
Principal Investigator Date

Hawkins, J.A. 2008. An evaluation of fish entrainment into the Maybell Ditch on the Yampa River, Colorado, 2007 and 2008. Draft report of Project 146 to the Upper Colorado Endangered Fish Recovery Program, Lakewood, Colorado.