

**COLORADO RIVER RECOVERY PROGRAM  
FY 2008-2009 SCOPE OF WORK for:**

Project Number:   155  

I. Elkhead Creek Transit Loss Study downstream from Elkhead Reservoir

Lead agency: U.S. Geological Survey

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Category:

Ongoing project

Ongoing-revised project

Requested new project

Unsolicited proposal

Expected Funding Source:

Annual funds

Capital funds

Other *[explain]*

II. Title of Proposal: Elkhead Creek Transit Loss Study downstream from Elkhead Reservoir

III. Relationship to RIPRAP:

General Recovery Support Action Plan I.A1&3

Green River Action Plan: 1.A.1. Identify fish habitat and flow needs

IV. Study Background/Rationale and Hypotheses:

Through the enlargement of Elkhead Reservoir, the CWCB acquired 5,000 acre-feet of storage in Elkhead Reservoir to be use on behalf of the Upper Colorado Recovery Implementation Program (UCRIP) to support the maintenance of base flow through critical habitat reaches for endangered fish (93 cfs at the USGS streamflow-gaging station, Yampa R. near Maybell, CO - 09251000). To ensure that the reservoir releases are adequate to meet the downstream needs and are delivered at the proper time, water managers need to know the traveltime and transit loss for the reservoir releases. Results from releases made in August 2007 provided traveltime information along Elkhead Creek, however, transit losses were not determined. Qualitative interpretation of the streamflow data suggests that transit loss within Elkhead Creek may be higher than estimates for surrounding areas. Quantitative characterization of transit loss on Elkhead Creek, under conditions typical of those in place when supplemental streamflow requests occur during late summer and fall, would provide water and UCRIP managers with the information needed to properly manage reservoir releases made to improve critical habitat for endangered fish.

V. Study Goals, Objectives, End Product(s):

In 2008, the U.S. Geological Survey in cooperation with CRWCD will relocate the Elkhead Creek below Maynard Gulch streamflow-gaging station downstream near the mouth to Hwy 40 Bridge. Moving the gage to this location will greatly improve real-time transit-loss evaluations along Elkhead Creek during Elkhead Reservoir releases as well as provide water managers with better information with which to monitor diversions on Elkhead Creek during endangered-fish supplemental-water releases. Development of the stage-discharge rating will

begin with high flows during the snow-melt runoff peak in the spring in preparation of late summer and fall supplemental-flow releases.

In 2008-09, the U.S. Geological Survey and SEO Division 6 staff will measure streamflow to characterize the transit loss of releases from Elkhead Reservoir at strategic locations and relate these streamflow measurements to the relocated streamflow gage and reservoir-release records (to determine if there is a difference in losses between these locations and to quantify any differences). Streamflow measurements will be made using acoustic-Doppler equipment or constant-rate tracer injection techniques to provide the highest accuracy possible. These techniques were selected because the accuracy of other streamflow-measuring techniques may not properly quantify transit loss within Elkhead Creek due to the error associated with these measurement techniques (mechanical current-meter accuracy for a 'good' measurement is + or - 5 percent). These comparisons will provide detailed estimates of transit loss throughout the reach between the reservoir and the gage, and downstream of the Hwy 40 bridge to the mouth of Elkhead Creek.

In 2010, the U.S. Geological Survey will complete the data analysis and publish an interpretive report summarizing the transit-loss characteristics of Elkhead Creek for the study reach.

- VI. Study Area: Elkhead Creek downstream from Elkhead Reservoir to the Yampa River
- VII. Study Methods/Approach: See section V above.
- VIII. Task Description and Schedule: In 2008, re-locate the Elkhead Creek below Maynard Gulch streamflow-gaging station downstream near the mouth to Hwy 40 Bridge. In 2008-09, measure streamflow to characterize the transit loss of releases from Elkhead Reservoir at strategic locations and relate these streamflow measurements to the relocated streamflow gage and reservoir-release records (to determine if there is a difference in losses between these locations and to quantify any differences). In 2010, the U.S. Geological Survey will complete data analysis and publish an interpretive report summarizing the transit-loss characteristics of Elkhead Creek study reach.
- IX. Deliverables, Due Dates, and Budget by Fiscal Year:  
A U.S. Geological Survey Scientific Investigations Report (SIR) will be written, including a mass-balance analysis of selected streamflow data and statistical comparisons of discrete streamflow measurements. This report will be published in FY 2010 depending on whether the field data can be collected in FY 2008 or FY 2009.

X. Budget Summary: Partial funding for the project will come from UCRIP. Remaining funding required for the complete scope of work have been committed as outlined in the attached table.

	FY 2008		FY 2009
Participants	Streamflow-Gage Relocation and Supplemental Streamflow Measurements	Transit-Loss and Traveltime Study	Transit-Loss and Traveltime Study and Summary Report
<b>UCRIP</b>		<b>\$5,000</b>	<b>\$10,000</b>
CRWCD	\$16,900*		
CWCB			\$71,000
USGS COOP match			\$21,500
Colo. State Engineer Office, Div 6	16-24 hours of in-kind field support		80-120 hours of in-kind field support
TriState			pending
City of Craig			pending
<b>FY Totals</b>	<b>\$21,900</b>		<b>\$102,500</b>

\* Cost of gage relocation and supplemental operation will be distributed by CRWCD to those participants with holding pools in Elkhead Reservoir.