Ms. Linda Bassi
Colorado Water Conservation Board
1313 Sherman Street, Room 721
Denver, Colorado 80203

Dear Ms. Bassi:

The USDA Forest Service (FS) is writing this letter to formally communicate its instream flow recommendation for Red Canyon Creek, located in Water Division 4.

Location and Land Status. The FS is recommending stream flow protection under the CWCB Stream and Lake Protection program for 6.75 miles of Red Canyon Creek starting at the headwaters and terminating at the confluence of Red Canyon Creek and Horsefly Creek. Red Canyon is tributary to Horsefly Creek which flows into the San Miguel River approximately 13 miles east of Naturita. The stream reach covered by the surveys conducted on FS lands start at the confluence with Horsefly Creek and comprises the entire Red Canyon watershed. The proposed reach is entirely located on NFS lands. Two small 40-80 acre parcels of private land do exist in the watershed.

Biological Summary. Fisheries surveys in the watershed indicate that the stream environment supports self-sustaining populations of native Colorado River cutthroat trout and mottled sculpin. A small rainbow trout population is also located near the mouth of the creek. Colorado River cutthroat trout are of limited distribution across the state of Colorado, particularly in the San Miguel River sub-basin, where Red Canyon Creek is one of only three populations that currently exist. Distribution of these genetically pure CRCT populations is limited to approximately 5-7% of their native distribution on the Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUG NF) (James and Speas 2005). Electofishing surveys completed in 2005 indicate that there are approximately 40 adult fish per mile in Red Canyon Creek (USFS unpublished).

Low flows are common in the late summer and fall, and may be a limiting factor for fish production and movement during this time. The stream channel provides good pool habitat during summer and winter low flows. However, depth appears to limit movement and distribution of CRCT during this time. Low flows also limit aquatic insect production during this low period as well. Despite these natural flow limitations in the summer and winter seasons, the stream does support a full-functional riparian community, and suitable fish habitat to support the long-term persistence of native CRCT.

R2Cross Analysis. Three cross sections were collected on Red Canyon Creek on June 27, 2008, and used to quantify instream flow protection using R2Cross procedures outlined by the Colorado Water Conservation Board (CWCB 1996). FS data analysis indicates that the following flows are needed to preserve the fishery and natural environment to a reasonable degree.

> A minimum flow of 3.8 cubic feet per second is recommended from January 1st to December 30th. If natural stream flows fall below 3.8 cubic feet per second, then all remaining water should be protected in order to "preserve the native fishery and natural environment to a reasonable degree." Based on the FS observations of this stream the

protection of flows below 3.8 cubic feet per second is needed to protect existing fish habitat, fish migration, and spawning and incubation periods for Colorado River cutthroat trout. Water use and development during low flow periods would have severe detrimental effects incubation success, summer and fall distribution and migration patterns, and aquatic food abundance in a stream system where these fisheries habitat and food requirements are already strained by naturally occurring low flows.

Water Availability

In the absence of gage data from Red Canyon Creek, a hydrograph was constructed using a natural flow estimation model developed by Kircher et al (1985). The southwest regional equation was used to model streams on the Uncomaphgre Plateau. A review of five Uncompahgre Plateau streams by the BLM was used to validate the use of southwest regional equations (Appendix B). Intermittent USGS gages from Spring Creek near Beaver Hill (1978 - 1980), Potter Creek near Olathe: (1980), and Hay Press Creek above Fruita Reservoir #3 (1984 – 1987) were used to develop monthly streamflow characteristics for Red Canyon Creek. Monthly water yield estimates were eventually converted to mean monthly discharge numbers to construct an annual hydrograph (Table 1). Annual yield was estimated at 5,963 acre-feet, with 95% of the annual yield occurring in April-June.

Table 1. Mean monthly hydrograph for Red Canyon Creek developed using southwest regional equations developed by Kircher et al (1985) and Bureau of Land Management (D. Murphy pers. communications) for streams on the Uncompahgre Plateau.

Water Yield Estimates – Kircher 1985 (southwest regional equation)

Watershed:	**Red Canyon Creek**
Location:	FS lands

Drainage Area (square miles):	12.90661
Mean Basin Elevation (ft):	8480.971
Mean Basin Elev. -5000 ft/1000 ft:	3.480971
Mean Annual Flow (cfs):	8.236
Mean Annual Yield (AF):	5963

	Percent of annual flow	AF/Month	AF/Day	Mean Monthly flow (cfs)
January	0.0032	19.085	0.616	0.311
February	0.0065	38.766	1.337	0.675
March	0.0100	59.640	1.924	0.972
April	0.1470	876.713	29.224	14.759
May	0.5541	3304.076	106.583	53.830
June	0.2461	1467.153	48.905	24.700
July	0.0130	77.532	2.501	1.263
August	0.0050	29.820	0.962	0.486
September	0.0040	23.856	0.795	0.402
October	0.0039	23.260	0.750	0.379
November	0.0037	22.067	0.736	0.371
December	0.0035	20.874	0.673	0.340

Relationship to Management Plans. The Grand Mesa, Uncompahgre, and Gunnison National Forests (GMUG NF) Land and Resource Management Plan provide land management direction for FS lands located in the Red Canyon watershed. Forest Plan direction for Fisheries, Threatened, Endangered, and Sensitive species suggest that land managers should among other things, maintain viable populations of native fish species, improve fish habitat conditions, and cooperate with state agencies to meet minimum flow needs to support fish populations. Additionally, agencies of the Colorado Division of Natural Resources and the Forest Service have signed agreements to assist in the conservation and protection of Colorado River cutthroat trout (CRCT River Cutthroat Trout Task Force 2006), and to work together to solve water issues in Colorado (Colorado DNR/USDA Forest Service MOU on water, 2004).

The Red Canyon stream segment is important to the FS because it is one of only three CRCT populations that currently exist in the San Miguel River. Red Canyon provides important spawning and rearing habitat for a self-sustaining Colorado River cutthroat trout fishery. Additionally, Red Canyon Creek is one of only a few perennial streams in the semi-arid landscape of the Uncompahgre Plateau. The stream is an important source of water for the lower reaches of Horselfly Creek, since headwater diversions currently divert a significant source of the summer flows for irrigation and small domestic use. Access into Red Canyon is very limited, so fishing pressure, and other land management uses are is minimal, so stream level protection would be an important tool in maintaining aquatic values in this area of the Uncompahgre Plateau.

The FS requests that the Board recognize that this recommendation is based only upon the minimum flows necessary to support the cold-water fishery values. FS may wish to work with the Board and/or through the Colorado water rights system to appropriate flows to optimally protect fish values and to protect other water-dependent values specified in FS resource management plans.

Data sheets, R2Cross output, fishery survey information, hydrology and water yield techniques, and photographs of the cross section are enclosed to support this recommendation. We thank both the Colorado Division of Wildlife and the Water Conservation Board for their cooperation in this effort.

If you have any questions regarding our instream flow recommendation, please contact Christopher James, Fisheries Biologist, at (970) 240-5421 or John Almy, Forest Hydrologist, at (970) 874-6656.

4 Enclosures

cc: Pauline Adams, GMUG NF, Water Rights Coordinator
Polly Hayes, Regional Office, Water Program Manager
Scott Ludwig, Regional Office, Water Rights Coordinator

Literature Cited

Colorado River Cutthroat Trout Task Force 2006. Conservation Agreement and Strategy for Colorado River cutthroat trout in the states of Colorado Wyoming, and Utah. April 2001, updated June 2006.

Colorado Water Conservation Board 1996. Development of instream flow recommendations in Colorado using R2Cross. By Greg Espegren, Senior Water Resource Specialist. January 1996.

James, C. and C. Speas. 2005. Colorado River cutthroat trout Species and Conservation Assessment. Prepared for the GMUG NF, November 2005.

Kircher, J.E., A.F. Choquette, and B.D. Richter, 1985. Estimation of Natural Streamflow Characteristics in Western Colorado. Water Resources Investigations Report 85-4086, 1985. U.S. Geological Survey, Prepared in Coordination with the Bureua of Land Management.