Stream: Rabbit Ears Creek

Executive Summary

Water Division: 5
Water District: 50
CDOW#: 26903
CWCB ID: 08/5/A-008

Segment: Headwaters to the Confluence with Troublesome Creek

Upper Terminus: HEADWATERS IN THE VICINITY OF
(Latitude 40° 21’ 13.94”N) (Longitude 106° 21’ 36.13”W)

Lower Terminus: CONFLUENCE WITH TROUBLESOME CREEK
(Latitude 40° 15’ 46.03”N) (Longitude 106° 19’ 6.85”W)

Watershed: Colorado headwaters (HUC#: 14010001)
Counties: Grand
Length: 9 miles
USGS Quad(s): Hyannis Peak
Flow Recommendation: 5.0 cfs (April 1 - October 31)
2.2 cfs (November 1 - March 31)

Staff Analysis and Recommendation

Summary

The information contained in this report and the associated instream flow appendices (see CD entitled 2008 Instream Flow Recommendations) forms the basis for staff's instream flow recommendation to be considered by the Board. It is staff's opinion that the information contained in this report is sufficient to support the findings required in Rule 5.40.

Colorado's Instream Flow Program was created in 1973 when the Colorado State Legislature recognized "the need to correlate the activities of mankind with some reasonable preservation of the natural environment" (see 37-92-102 (3) C.R.S.). The statute vests the CWCB with the exclusive authority to appropriate and acquire instream flow and natural lake level water rights. In order to encourage other entities to participate in Colorado's Instream Flow Program, the statute directs the CWCB to request instream flow recommendations from other state and federal agencies. The Bureau of Land Management (BLM) recommended this segment of Rabbit Ears Creek to the CWCB for inclusion into the Instream Flow Program. Rabbit Ears Creek is being considered for inclusion into the Instream Flow Program because it has a natural environment that can be preserved to a reasonable degree with an instream flow water right.

Rabbit Ears Creek is approximately 9 miles long. It begins on the south flank of Rabbit Ears Range within the Arapaho National Forest at an elevation of approximately 10000 feet and terminates at the confluence with Troublesome Creek at an elevation of approximately 8500 feet. Approximately 99% of the land on the 9 mile segment addressed by this report is publicly owned. Rabbit Ears Creek is located within Grand County. The total drainage area of the creek is approximately 16.9 square miles. Rabbit Ears Creek generally flows in a southeasterly direction.

The subject of this report is a segment of Rabbit Ears Creek beginning at the headwaters and extending downstream to the confluence with Troublesome Creek. The proposed segment is located approximately 13 miles northeast of Kremmling. The staff has received only one recommendation for this segment, from the BLM. The recommendation for this segment is discussed below.

Instream Flow Recommendation(s)

BLM recommended 5.0 cfs, summer, and 2.2 cfs, winter, based on its October 13, 2006 data collection efforts. Two cross sections were surveyed and the modeling results were valid for use in quantifying the flow required to preserve the natural environment to a reasonable degree.

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Headwaters in the Vicinity of	Confluence with Troublesome Creek	9	1%	99%

50% of the public lands are managed by the U.S. Forest Service & the other 50% are managed by the BLM.

Biological Data

The BLM has conducted field surveys of the fishery resources on this stream and have found a natural environment that can be preserved. As reported in the letter from BLM to the CWCB "Rabbit Ears Creek is a moderate gradient stream with large substrate size. Much of the creek is confined by narrow canyons. The lower part of the reach is punctuated with numerous beaver ponds among dense willows, separated by short reaches of riffle habitat. Frequently, the beaver activity forces the creek into multiple channels. The willow riparian community provides substantial shading and nutrient supply for the creek, and it provides numerous pools and bank overhangs for the fish population. Fish surveys indicate that the creek supports a self-sustaining population of brown trout with a wide variety of age classes. The creek also supports small numbers of brook trout and molted sculpin".

Field Survey Data & Biological Flow Quantification

BLM staff used the R2Cross methodology to quantify the amount of water required to preserve the natural environment to a reasonable degree. The R2Cross method requires that stream discharge and channel profile data be collected in a riffle stream habitat type. Riffles are most easily visualized, as the stream habitat types that would dry up first should streamflow cease. This type of hydraulic data collection consists of setting up a transect, surveying the stream channel geometry, and measuring the stream discharge.

The CWCB staff relied upon the biological expertise of the cooperating agencies to interpret output from the R2Cross data collected to develop the initial, biologic instream flow recommendation. This initial recommendation is designed to address the unique biologic requirements of each stream without regard to water availability. Three instream flow hydraulic parameters, average depth, percent wetted perimeter, and average velocity are used to develop biologic instream flow recommendations. The CDOW has determined that maintaining these three hydraulic parameters at adequate levels across riffle habitat types, aquatic habitat in pools and runs will also be maintained for most life stages of fish and aquatic invertebrates (Nehring 1979; Espegren 1996).

For this segment of stream, two data sets were collected with the results shown in Table 1 below. Table 1 shows who collected the data (Party), the date the data was collected (Date), the measured discharge at the time of the survey (Q), the accuracy range of the predicted flows based on Manning's Equation (240% and 40% of Q), the summer flow recommendation based on meeting 3 of 3 hydraulic criteria and the winter flow recommendation based upon 2 of 3 hydraulic criteria.

Table 1: Rabbit Ears Creek R2Cross Summary

			Confidence Intervals	Recommended Flows (cfs)	
Party	**Date**	**Q (cfs)**	**250%-40%**	**Summer (3/3)**	**Winter (2/3)**
BLM	10/13/2006	5.51	13.8 – 2.2	4.90	(1)
BLM	10/13/2006	4.97	12.4 – 2.0	6.13	2.21

BLM = Bureau of Land Management
(1) Predicted flow outside of the accuracy range of Manning's Equation.

The summer flow recommendation, which meets 3 of 3 criteria and is within the accuracy range of the R2CROSS model is 5.0 cfs. The winter flow recommendation, which meets 2 of 3 criteria and is within the accuracy range of the R2Cross model is 2.2 cfs. These recommendations were derived by averaging the results of the two data sets. It is our belief that recommendations that fall outside of the accuracy range of the model, over 250% of the measured discharge or under 40% of the measured discharge may not give an accurate estimate of the necessary instream flow required.

Hydrologic Data and Analysis

After receiving the cooperating agency's biologic recommendation, the CWCB staff conducted an evaluation of the stream hydrology to determine if water was physically available for an instream flow appropriation. This evaluation was done through a computation that is, in essence, a "water balance". In concept a "water balance" computation can be viewed as an accounting exercise. When done in its most rigorous form, the water balance parses precipitation into all the avenues water pursues after it is deposited as rain, snow, or ice. In other words, given a specified amount of water deposition (input), the balance tries to account for all water depletions (losses) until a selected end point is reached. Water losses include depletions due to evaporation and transpiration, deliveries into ground water storage, temporary surface storage, incorporations into plant and animal tissue and so forth. These losses are individually or collectively subtracted from the input to reveal the net amount of stream runoff as represented by the discharge measured by stream gages. Of course, the measured stream flow need not be the end point of interest; indeed, when looking at issues of water use to extinction stream flow measurements may only describe intermediate steps in the complex accounting process that is a water balance carried out to a net value of zero.

In its analysis, CWCB staff has attempted to use this idea of balancing inputs and losses to determine if water is available for the recommended Instream Flow Appropriation. Of course, this analysis must be a practical exercise rather than a lengthy, and costly, scientific investigation. As a result, staff has simplified the process by lumping some variables and employing certain rational and scientifically supportable assumptions. The process may be described through the following description of the steps used to complete the evaluation for this particular stream.

The first step required in determining water availability is a determination of the hydrologic regime at the Lower Terminus (LT) of the recommended ISF reach. In the best case this means looking at the data from a gage at the LT. Further, this data, in the best case, has been collected for a long period of time (the longer the better) including wet and dry periods. In the case of **Rabbit Ears Creek** no such gage is available at the LT. In fact, there is no gage on Rabbit Ears Creek. It is thus necessary to describe the normal flow regime at the Rabbit Ears Creek LT through a "representative" gage station. The gage station selected for this was TROUBLESOME CREEK NEAR PEARMONT, CO (USGS 09039000), a gage with a 40 year period of record (POR) collected between 1953 and 1993. The gage is at an elevation of 8049 ft above mean sea level (amsl) and has a drainage area of 44.6 mi^2. The hydrograph (plot of discharge over time) produced by this gage includes the consumptive uses of two upstream diversions. To make the measured data transferable to Rabbit Ears Creek the consumptive portions of these upstream diversions were added back to the measured hydrograph. The resulting adjusted hydrograph was then used on Rabbit Ears Creek by multiplying the adjusted Troublesome Creek discharge values

(hydrograph) by the ratio of Rabbit Ears Creek basin area (16.9 mi^2 above the LT) to Troublesome Creek near Pearmont, CO basin area (44.6 mi^2). Because there are no irrigation diversions in the Rabbit Ears Creek Basin above the LT, it was not necessary to further adjust the proportioned hydrograph to account for consumptive depletions in Rabbit Ears Creek.

The following hydrograph depicts the mean monthly discharge of Rabbit Ears Creek (proportioned off Troublesome Creek near Pearmont, CO). Included in the hydrograph are the recommended ISF values. The data used in the creation of this hydrograph are displayed in Table #2.

Figure 1 - Rabbit Ears Creek @ LT (proportioned off Troublesome Cr. nr Pearmont) & ISFs

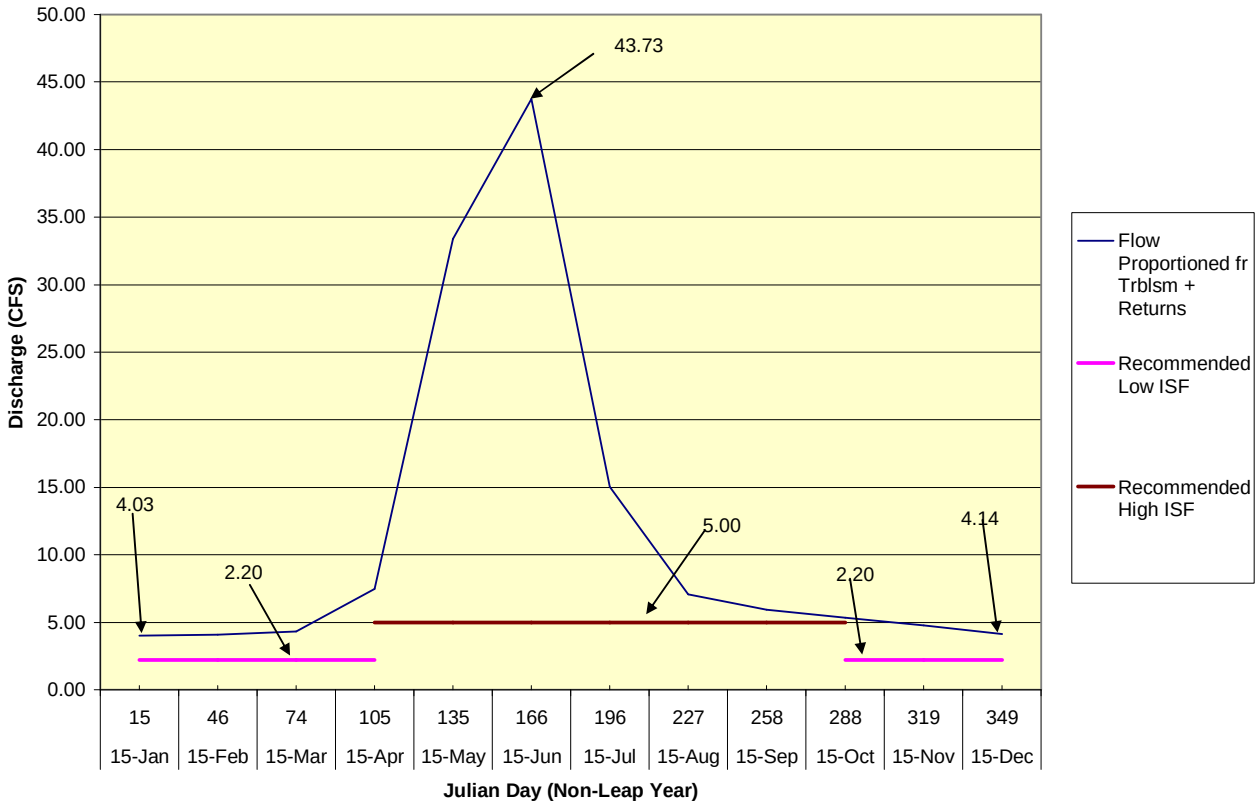

Table 2 – Mean Monthly Discharge and Recommended Instream Flows – Rabbit Ears Cr

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Month	Julian Day	Rabbit Ears Cr (cfs)	Recommended ISF (cfs)
15-Jan	15	4.03	2.20
15-Feb	46	4.08	2.20
15-Mar	74	4.34	2.20
31-Mar	90	4.34	2.20
1-Apr	91	7.47	5.00
15-Apr	105	7.47	5.00
15-May	135	33.37	5.00
15-Jun	166	43.73	5.00
15-Jul	196	15.04	5.00
15-Aug	227	7.07	5.00
15-Sep	258	5.91	5.00
15-Oct	288	5.32	5.00
31-Oct	304	5.32	5.00
1-Nov	305	4.77	2.20
15-Nov	319	4.77	2.20
15-Dec	349	4.14	2.20

Existing Water Right Information

Staff has analyzed the water rights tabulation to identify any potential water availability problems. There are no decreed water rights along this stream reach. Based on this analysis staff has determined that water is available for appropriation on Rabbit Ears Creek, from the headwaters to the confluence with Troublesome Creek, to preserve the natural environment to a reasonable degree without limiting or foreclosing the exercise of valid existing water rights.

CWCB Staff's Instream Flow Recommendation
Staff recommends the Board form its intent to appropriate on the following stream reach:

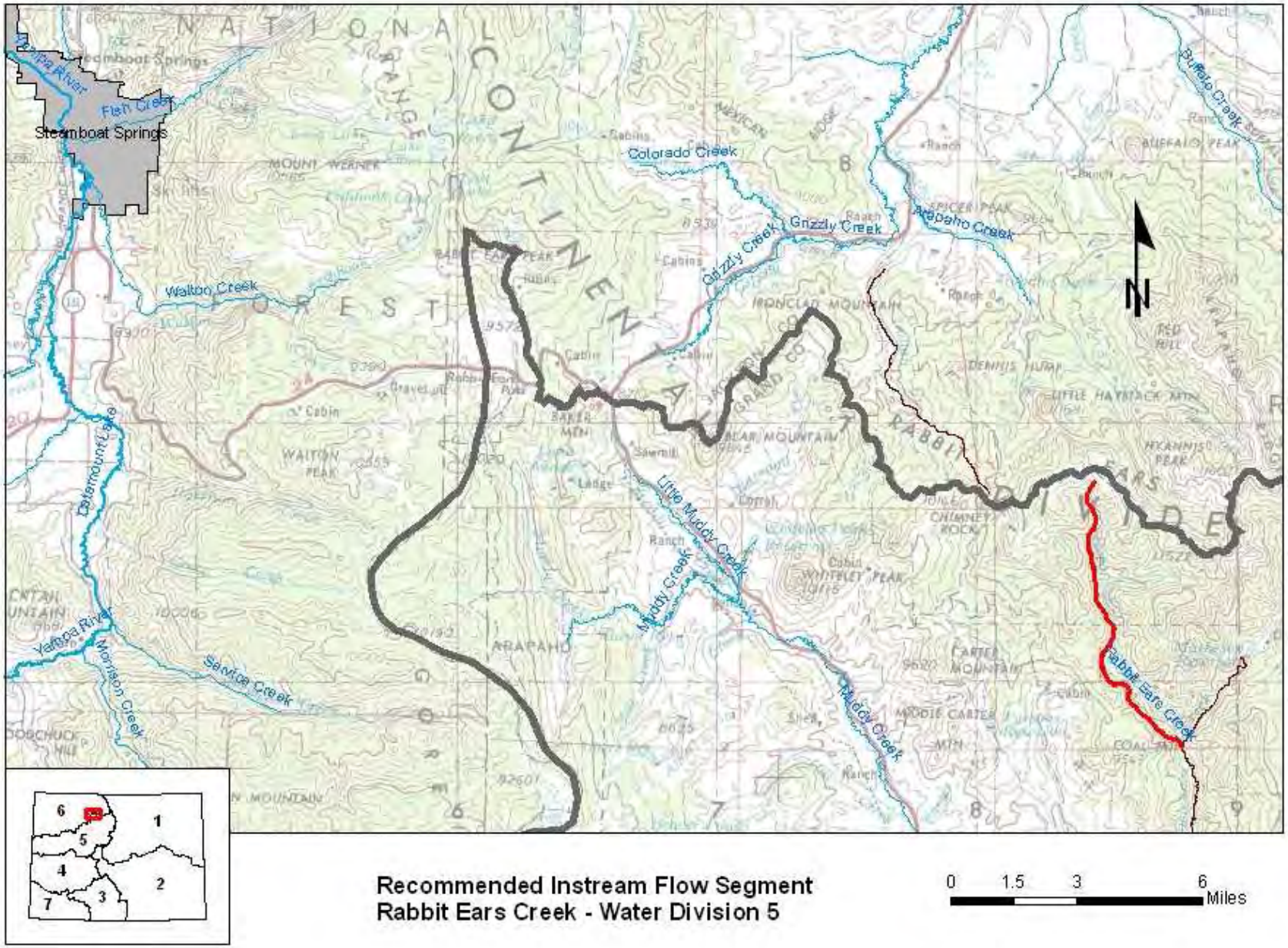
Segment: Headwaters to the Confluence with Troublesome Creek

Upper Terminus: HEADWATERS IN THE VICINITY OF
(Latitude 40° 21' 13.94"N) (Longitude 106° 21' 36.13"W)
UTM = 4467922.6 N UTM = 384507.5 E
NW SW S35 T5N R78W 6PM
755' East of the West Section Line; 1780' North of South Section Line

Lower Terminus: CONFLUENCE WITH TROUBLESOME CREEK
(Latitude 40° 15' 46.03"N) (Longitude 106° 19' 6.85"W)
UTM = 4457758.6 N UTM = 387878.3 E
SW SE S35 T4N R80W 6PM
1150' West of the East Section Line; 710' North of the South Section Line

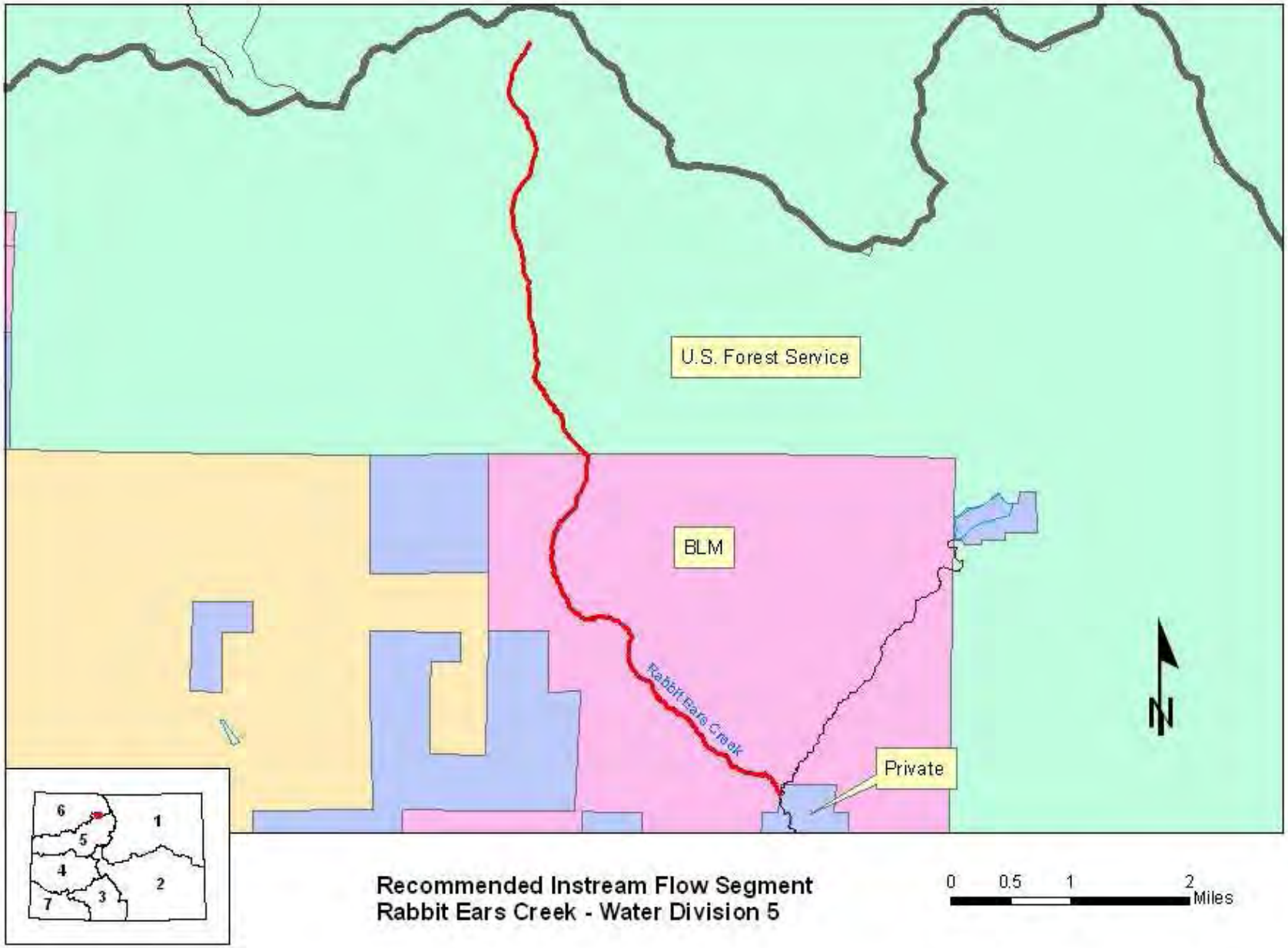
Watershed: Colorado headwaters (HUC#: 14010001)
Counties: Grand
Length: 9 miles
USGS Quad(s): Hyannis Peak
Flow Recommendation: 5.0 cfs (April 1 - October 31)
2.2 cfs (November 1- March 31)

Vicinity Map

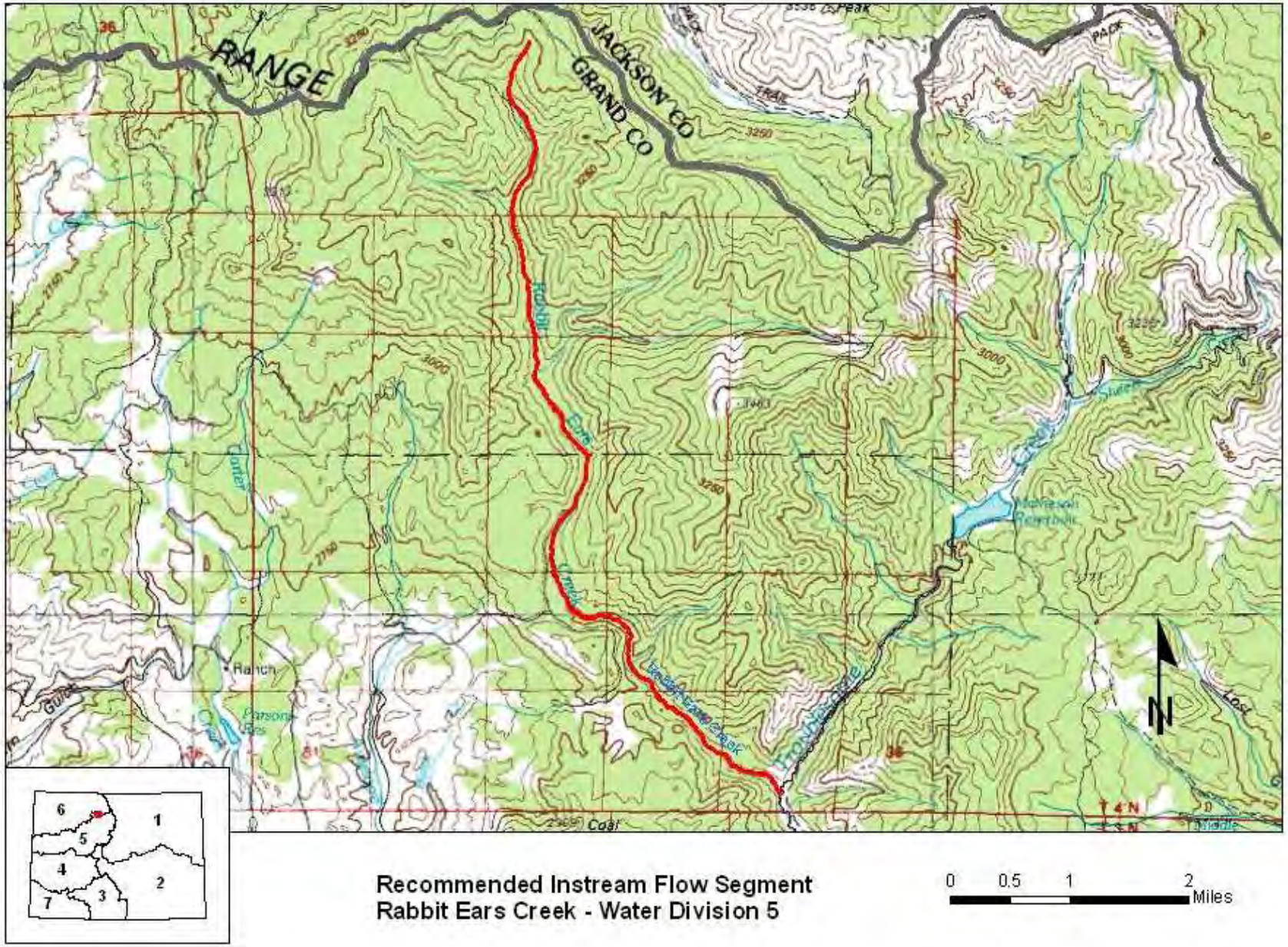


Recommended Instream Flow Segment
Rabbit Ears Creek - Water Division 5

Land Use Map


U.S. Forest Service
BLM
Private
Rabbit Ears Creek
N
6
1
5
4
2
7
3
Recommended Instream Flow Segment
Rabbit Ears Creek - Water Division 5
0
0.5
1
2
Miles

Topographic & Water Rights Map



Recommended Instream Flow Segment
Rabbit Ears Creek - Water Division 5

0 0.5 1 2 Miles

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
COLORADO STATE OFFICE
2850 YOUNGIFELD STREET
LAKEWOOD, COLORADO 80215-7093

In Reply Refer To:
7250 (CO-932)

DEC 2 6 2007

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

Dear Ms. Bassi:

The Bureau of Land Management (BLM) is writing this letter to formally communicate its instream flow recommendation for Rabbit Ears Creek, located in Water Division 5.

Location and Land Status. Rabbit Ears Creek is tributary to Troublesome Creek approximately thirteen miles northeast of Kremmling, Colorado. The creek is located within the upper Colorado River watershed in Grand County. This recommendation covers the stream reach beginning at the headwaters and extending downstream to the confluence with Troublesome Creek. All of the land along the creek is federally owned and managed, with the exception of the last 200 feet before the confluence with Troublesome Creek, which is privately owned. The U.S. Forest Service manages the upper half of the 9.0 mile reach, while BLM manages the lower half of the reach.

Biological Summary. Rabbit Ears Creek is a moderate gradient stream with large substrate size. Much of the creek is confined by narrow canyons. The lower part of the reach is punctuated with numerous beaver ponds among dense willows, separated by short reaches of riffle habitat. Frequently, the beaver activity forces the creek into multiple channels. The willow riparian community provides substantial shading and nutrient supply for the creek, and it provides numerous pools and bank overhangs for the fish population. Fishery surveys indicate that the creek supports a self-sustaining population of brown trout with a wide variety of age classes. The creek also supports small numbers of brook trout and mottled sculpin.

R2Cross Analysis. BLM's data analysis, coordinated with the Division of Wildlife, indicates that the following flows are needed to protect the fishery and natural environment to a reasonable degree:

- 5.0 cubic feet per second is recommended during the high temperature period from April 1 through October 31. This recommendation is driven by the average velocity criteria. Because the creek is characterized by short riffles between numerous beaver ponds and plunge pools, it is very important to maintain adequate velocity in the limited riffle habitat, especially during the brown trout spawning season in October.

- 2.2 cubic feet per second is recommended for the cold temperature period from November 1 through March 31. This recommendation is driven by the depth criteria. This flow should allow passage between and pools and beaver ponds during the winter, and it should prevent complete icing of the water column at this high elevation location.

Water Availability. There are no decreed water rights along this stream reach. For calculating water availability, BLM recommends using U.S. Geological Survey (USGS) Gage 09039000, Troublesome Creek near Pearmont, Colorado. Rabbit Ears Creek drains directly into Troublesome Creek, so a simple basin apportionment calculation can be performed. This gage is located upstream from the numerous senior ditch diversion located in the lower Troublesome Creek watershed, so it is a good indication of raw water availability. In addition, this gage has a 40-year period of record.

Relationship to Management Plans. Rabbit Ears Creek forms the southwestern boundary of BLM's Troublesome Wilderness Study Area. Accordingly, BLM manages this area to maintain and enhance riparian and aquatic conditions that are only slightly altered from pre-settlement conditions. Appropriation of an instream flow water right will assist BLM in meeting these management objectives.

The BLM requests that the Board recognize that this recommendation is based only upon the minimum flows necessary to support cold-water and cool-water fishery values. BLM 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 BLM resource management plans. Data sheets, R2Cross output, fishery survey information, and photographs of the cross sections were included with our February 2007 draft recommendation.

We thank both the 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 Roy Smith, Water Rights Specialist, at 303-239-3940.

Sincerely,

Dennis D. Zachman (ACTING)

for Linda M. Anama
Deputy State Director
Resources and Fire

cc: Dave Stout, Kremmling FO
Paula Belcher, Kremmling FO
Tom Freques, Glenwood Springs FO

Appendix - B

Field Data

COLORADO WATER CONSERVATION BOARD

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME:					CROSS-SECTION NO.: 1	
CROSS-SECTION LOCATION:						
DATE:	OBSERVERS:					
LEGAL DESCRIPTION	¼ SECTION: SW	SECTION: 35	TOWNSHIP: 4 (N)/S	RANGE: 80 E/(W)	PM: 6th	
COUNTY:	WATERSHED:	WATER DIVISION:	DOW WATER CODE: 26903			
MAP(S): USGS: Hyannis Peak 7.5'						
USFS:						

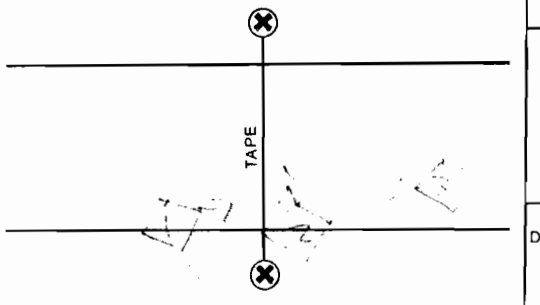
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: Marsh-McBirney			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ____ sec	TAPE WEIGHT: ____ lbs/foot	TAPE TENSION: ____ lbs
CHANNEL BED MATERIAL SIZE RANGE: 2 to 8 cobbles	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS:		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	
⊗ Tape @ Stake RB	0.0	
① WS @ Tape LB/RB	0.0	
② WS Upstream	19.0	
③ WS Downstream	32.0	
SLOPE	0.31 / 51.0 = .00606	

SKETCH



LEGEND:
- Stake ⊗
- Station ①
- Photo ①→
- Direction of Flow ←→

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES/NO	DISTANCE ELECTROFISHED: ____ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL
see attached survey																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

COMMENTS

Comp: 39°

FORM #ISF FD 1-85

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: [illegible] Creek	CROSS-SECTION NO.:	DATE: [illegible]	SHEET ___ OF ___

BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: [illegible] ft	TIME: [illegible]

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft²)	Discharge (cfs)
[illegible]	0.0		[illegible]								
G	1.0		[illegible]								
W	[illegible]		[illegible]	Ø				Ø			
	[illegible]		7.75	[illegible]				[illegible]			
	[illegible]		7.79	0.50				0.84			
	[illegible]		7.72	[illegible]				[illegible]			
	[illegible]		7.71	[illegible]				[illegible]			
	[illegible]		7.78	[illegible]				1.02			
	[illegible]		7.84	[illegible]				1.04			
	[illegible]		7.91	[illegible]				[illegible]			
	[illegible]		7.98	[illegible]				[illegible]			
	[illegible]		8.03	[illegible]				1.31			
	[illegible]		8.06	[illegible]				[illegible]			
	[illegible]		8.02	[illegible]				[illegible]			
	[illegible]		8.17	[illegible]				[illegible]			
	[illegible]		7.90	[illegible]				[illegible]			
	[illegible]		7.80	[illegible]				[illegible]			
	8.5		7.71	[illegible]				[illegible]			
	[illegible]		7.81	[illegible]				[illegible]			
	[illegible]		7.93	[illegible]				[illegible]			
	[illegible]		8.01	0.70				[illegible]			
	[illegible]		7.96	[illegible]				[illegible]			
W	[illegible]		[illegible]	Ø				Ø			
LS+G	[illegible]		[illegible]								
TOTALS:											

End of Measurement	Time: [illegible]	Gage Reading: [illegible] ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

FIELD DATA FOR INSTREAM FLOW DETERMINATIONS

COLORADO WATER CONSERVATION BOARD

COLORADO DIVISION OF WILDLIFE

LOCATION INFORMATION

STREAM NAME: Rabbit [illegible] Fork						CROSS-SECTION NO.: 2	
CROSS-SECTION LOCATION: [illegible] ft. [illegible] confluence w/ [illegible] Creek							
DATE: [illegible]	OBSERVERS: [illegible]						
LEGAL DESCRIPTION	¼ SECTION: SW	SECTION: 35	TOWNSHIP: 4 (N)/S	RANGE: 80 E/(W)	PM: 6th		
COUNTY: Grand	WATERSHED: Colorado	WATER DIVISION: 5	DOW WATER CODE: 26903				
MAP(S):	USGS: Hyannis Peak 7.5'						
	USFS:						

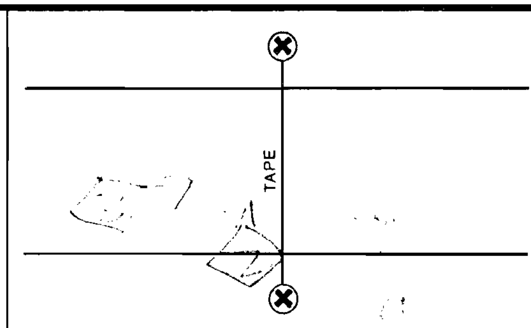
SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: YES / NO	METER TYPE: [illegible]			
METER NUMBER:	DATE RATED:	CALIB/SPIN: ______ sec	TAPE WEIGHT: ______ lbs/foot	TAPE TENSION: ______ lbs
CHANNEL BED MATERIAL SIZE RANGE: [illegible] to [illegible]" [illegible]	PHOTOGRAPHS TAKEN: YES/NO	NUMBER OF PHOTOGRAPHS: [illegible]		

CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
⊗ Tape @ Stake LB	0.0	surveyed
⊗ Tape @ Stake RB	0.0	surveyed
① WS @ Tape LB/RB	0.0	7.22
② WS Upstream	30.0	7.02
③ WS Downstream	21.0	7.36
SLOPE	0.34/51.0 = 0.00666	

SKETCH



LEGEND:

Stake ⊗

Station ①

Photo ◇→

Direction of Flow

AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: (YES)/NO	DISTANCE ELECTROFISHED: ______ ft	FISH CAUGHT: (YES)/NO	WATER CHEMISTRY SAMPLED: (YES)/NO

LENGTH - FREQUENCY DISTRIBUTION BY ONE-INCH SIZE GROUPS (1.0-1.9, 2.0-2.9, ETC.)

SPECIES (FILL IN)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	>15	TOTAL
see attached																	

AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:

[illegible] mayfly, [illegible], stonefly

COMMENTS

[illegible]

[illegible]

[illegible]

DISCHARGE/CROSS SECTION NOTES

STREAM NAME: Rabbit [illegible] Creek	CROSS-SECTION NO.: 2	DATE: [illegible]	SHEET 1 OF 1
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE) LEFT / RIGHT	Gage Reading: [illegible] ft	TIME: 12:10

Features: Stake (S) Grassline (G) Waterline (W) Rock (R)	Distance From Initial Point (ft)	Width (ft)	Total Vertical Depth From Tape/Inst (ft)	Water Depth (ft)	Depth of Observation (ft)	Revolutions	Time (sec)	Velocity (ft/sec) At Point	Velocity (ft/sec) Mean in Vertical	Area (ft^2)	Discharge (cfs)
LEW	2.0		5.74								
G	5.7		6.72								
W	8.7		7.22	0				0			
	9.0		7.28	0.05				0			
	9.5		7.32	0.10				0.55			
	[illegible]		7.36	0.15				0.31			
	[illegible]		7.53	0.30				0.61			
	[illegible]		7.41	0.20				0.91			
	[illegible]		7.51	0.30				1.2			
	[illegible]		7.37	0.16				0.32			
	[illegible]		7.42	0.30				[illegible]			
	14.0		7.56	0.34				0.76			
	13.5		7.50	0.30				[illegible]			
	[illegible]		7.42	[illegible]				0.28			
	[illegible]		7.27	0 [illegible]				0			
	[illegible]		7.36	[illegible]				[illegible]			
	15.5		7.54	0.30				[illegible]			
	[illegible]		7.35	[illegible]				[illegible]			
	[illegible]		7.33	[illegible]				[illegible]			
	[illegible]		7.46	[illegible]				[illegible]			
	[illegible]		7.62	[illegible]				[illegible]			
	18.5		7.61	[illegible]				[illegible]			
	[illegible]		7.75	[illegible]				[illegible]			
	[illegible]		7.75	[illegible]				[illegible]			
	[illegible]		7.84	0.69				[illegible]			
	[illegible]		7.83	[illegible]				[illegible]			
	[illegible]		7.76	[illegible]				[illegible]			
	[illegible]		7.86	[illegible]				[illegible]			
	[illegible]		7.71	[illegible]				[illegible]			
	[illegible]		7.70	[illegible]				[illegible]			
	[illegible]		7.86	[illegible]				[illegible]			
	[illegible]		7.68	[illegible]				[illegible]			
	23.5		7.77	[illegible]				[illegible]			
	[illegible]		7.55	[illegible]				1.32			
	[illegible]		7.51	[illegible]				[illegible]			
	25.0		7.57	[illegible]				[illegible]			
	[illegible]		7.46	[illegible]				[illegible]			
	[illegible]		[illegible]	0				0			
	27.[illegible]		6.64	[illegible]				[illegible]			
S	32.7		5.69	[illegible]				[illegible]			
TOTALS:											

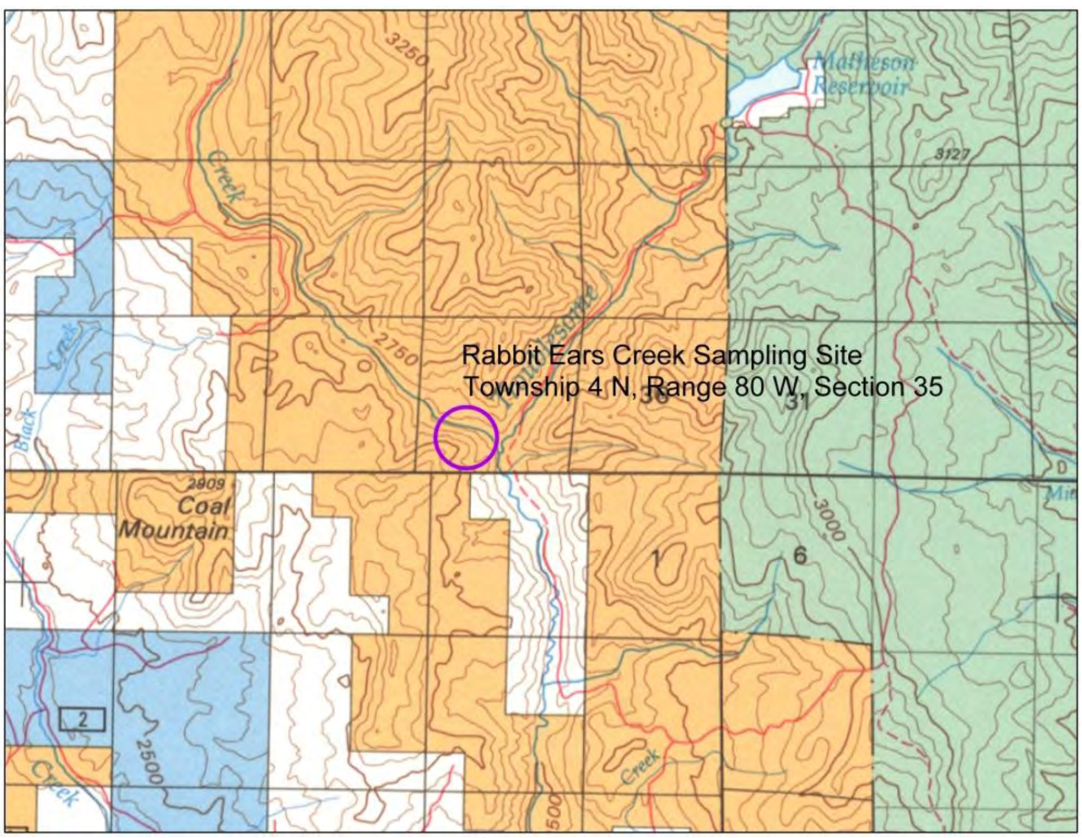
End of Measurement	Time: [illegible]	Gage Reading: [illegible] ft	CALCULATIONS PERFORMED BY:	CALCULATIONS CHECKED BY:

Kremmling Field Office Stream Surveys
October 2006

Rabbit Ears Creek - Water Code #26903

Rabbit Ears Creek, located north of Kremmling, CO and located on BLM lands managed by the Kremmling Field Office was sampled on October 13, 2006. Rabbit Ears Creek is tributary to Troublesome Creek which then enters the Colorado River. Presence/absence sampling was done in support of the Colorado BLM in-stream flow program. Sampling was conducted via backpack electro-shocker and approximately 200 feet of stream was sampled. Personnel present were Paula Belcher, KRFO, Hydrologist, Roy Smith, CSO Water Rights Program Lead, Paul Wirthrich a private land owner along Troublesome Creek, Tom Fresques, BLM West Slope Fisheries Biologist, and Malia Boyum, Biological Technician, GSFO.

A total of 20 fish were collected including 14 brown trout, 3 brook trout, and 3 sculpin. See the data sheet below for size class distributions.


Rabbit Ears Creek Sampling Site
Township 4 N, Range 80 W, Section 35
Matheson Reservoir
Coal Mountain
3250
2750
3127
3000
2909
2500
Creek
Black
6
1
31
2

FISH SAMPLING FORM

WATER Rabbit Ears Creek CODE 26903 DATE 10-13-06

GEAR backpack shocker EFFORT 200 ft STATION #___ PASS #__

(mm)

species	length	weight	mark		species	length	weight	mark
BRN	304							
BRN	302							
BRN	241							
BRN	235							
BRN	380							
BRN	243							
BRN	309							
BRN	78							
BRN	76							
BRN	70							
BRK	215							
BRK	165							
BRN	211	← 2ND bucket picture						
BRN	146							
BRN	215							
BRN	77							
MOSC	90							
MOSC	77							
MOSC	70							
BRK	64							

GPS Location:

Notes (water temp, etc.):

20 total fish: 14 brown trout (*Salmo trutta* morpha *fario*); 3 brook trout (*Salvelinus fontinalis*); 3 mottled sculpin (*Cottus bairdi*)