

## **Stream: Wallace Creek**

### **Executive Summary**

Water Division: 5

Water District: 45

CDOW#: 22614

CWCB ID: 08/5/A-002

**Segment:** Headwaters to the Confluence with North Fork Wallace Creek

**Upper Terminus:** HEADWATERS IN THE VICINITY OF  
(Latitude 39° 19' 7.7"N) (Longitude 107° 57' 47.2"W)

**Lower Terminus:** CONFLUENCE WITH NORTH FORK WALLACE CREEK  
(Latitude 39° 21' 9.38"N) (Longitude 108° 1' 43.19"W)

**Watershed:** Colorado headwaters-Plateau (HUC #:14010005)

**Counties:** Mesa

**Length:** 4.78 miles

**USGS Quad(s):** Hawxhurst Creek, Housetop Mountain

**Flow Recommendation:** 1.5 cfs (April 1 - October 31)  
0.6 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 Wallace Creek to the CWCB for inclusion into the Instream Flow Program. Wallace 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.

Wallace Creek is approximately 10 miles long. It begins on the west flank of Battlement Mesa within the Grand Mesa National Forest at an elevation of approximately 8600 feet and terminates at the confluence with the Colorado River at an elevation of approximately 5000 feet. Approximately 95% of the land on the 4.78 mile segment addressed by this report is publicly owned. Wallace Creek is located within Mesa County. The total drainage area of the creek is approximately 10.95 square miles. Wallace Creek generally flows in a northwesterly direction.

The subject of this report is a segment of Wallace Creek beginning at the headwaters and extending downstream to the confluence with North Fork Wallace Creek. The proposed segment is located approximately 6 miles northwest of Debeque. 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 1.5 cfs, summer, and 0.6 cfs, winter, based on its data collection efforts. The modeling results from this survey effort are within the confidence interval produced by the R2Cross model.

### **Land Status Review**

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Headwaters	Confluence with North Fork Wallace Creek	4.78	5%	95%

The U.S. Forest Service owns 69% of the public lands and BLM owns 31% of the public lands.

## 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 “Wallace Creek is a high gradient stream, with moderate substrate size. The creek is often confined by a narrow canyon, and it has cut down to bedrock in numerous locations. The riparian community is very vigorous in these confined locations and provides substantial shading and nutrient supply for the creek. The creek provides good pool habitat, riffles for spawning.

## 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: Wallace Creek R2Cross Summary**

Party	Date	Q (cfs)	Confidence Intervals	Recommended Flows (cfs)	
			250%-40%	Summer (3/3)	Winter (2/3)
BLM	06/09/2006	2.65	6.6 – 1.1	(1)	0.57
BLM	09/05/2003	0.41	1.0 – 0.2	1.49	(1)

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 1.5 cfs. The winter flow recommendation, which meets 2 of 3 criteria and is within the accuracy range of the R2Cross model is 0.6 cfs. 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 **Wallace Creek** no such gage is available at the LT. In fact, there is no gage on Wallace Creek. It is thus necessary to describe the normal flow regime at the Wallace Creek LT through a "representative" gage station. The gage station selected for this was BATTLEMENT CREEK NEAR PARACHUTE, CO (USGS 09092600), a gage with a 9 year period of record (POR) collected between 1956 and 1965. The gage is at an elevation of 6,630 ft above mean sea level (amsl) and has a drainage area of 10.5 mi<sup>2</sup>. The hydrograph (plot of discharge over time) produced by this gage includes virtually no upstream consumption through diversions. While this lack of significant upstream diversion and use make this gage attractive for our purposes, the gage does have one drawback; namely, it has a short POR.

To keep the positive values of the Battlement Creek gage while reducing the limitation of its short POR, a statistical procedure called linear regression was employed. The procedure gives us the means to relate characteristics of a limited (short) data set to those of a larger (longer) data set and, if the two data sets are similar enough, to predict the data values "missing" from the short data set. The outcome is a "predicted" (called "Y – Hat" or  $\hat{Y}$ ) set of data that augments

the short data set; creating, in effect, a longer POR that is reflective of climate variation (i.e., it includes more wet-dry cycles.) The gage that was selected to provide the longer POR was WEST DIVIDE CREEK NEAR RAVEN, CO (USGS 09089500), a gage with a 50 year POR collected between 1955 and 2005. The West Divide Creek gage is at an elevation of 7050 ft amsl and has a drainage area of 64.6 mi<sup>2</sup>.

Before performing the linear regression described above, the measured hydrographs of both gages must be adjusted to remove the effects of water consumption by upstream irrigation diversion. As mentioned above, the hydrograph of the Battlement Creek gage includes virtually no upstream consumption through diversions. West Divide Creek, however, does have a small number of upstream diversions as well as a trans-basin source of increased discharge. Thus, before performing the linear regression, the West Divide data record must be increased by the amount of consumptive loss due to upstream diversions; it must also be decreased by the amount of trans-basin additions. When the data sets are adjusted in the manner described, then the two gages can be regressed one against the other to produce a “predicted” hydrograph for Battlement Creek that displays the important attributes of a gage that is located nearby, is un-impacted (by irrigation consumption or “foreign water”), and exhibits a long-term POR.

With a satisfactory hydrograph for the “representative” gage station created, the next step is to use that hydrograph on Wallace Creek by multiplying the adjusted Battlement Creek discharge values (hydrograph) by the ratio of Wallace Creek basin area (10.95 mi<sup>2</sup> above the LT) to Battlement Creek basin area (10.5 mi<sup>2</sup>). With no significant upstream consumption or addition of “foreign water” in Wallace Cr., the resulting proportioned hydrograph thus represents a distribution of flow over time reflective of existing conditions.

The following hydrograph depicts the mean monthly discharge of Wallace Creek (proportioned off Battlement Creek near Parachute). Included in the hydrograph are the recommended ISF values. The data used in the creation of this hydrograph are displayed in Table #2.

Fig 1 - Wallace Cr Discharge (proportioned off Battlement Cr.) and Recommended ISFs

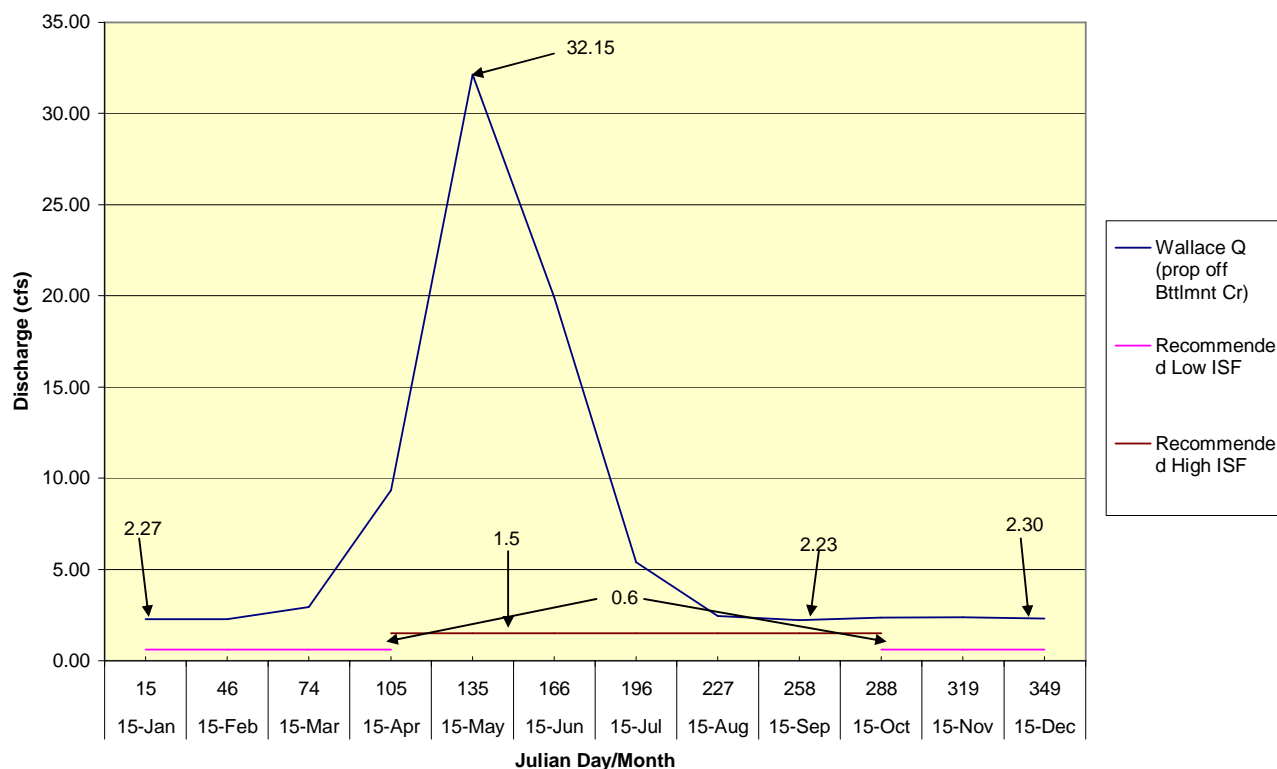


Table2 – Mean Monthly Discharge and Recommended Instream Flows – Wallace Cr.

	Julian Day	Wallace Cr (cfs)	Recommended ISF (cfs)
15-Jan	15	2.27	0.6
15-Feb	46	2.27	0.6
15-Mar	74	2.93	0.6
31-Mar	90	2.93	0.6
1-Apr	91	9.33	1.5
15-Apr	105	9.33	1.5
15-May	135	32.15	1.5
15-Jun	166	19.94	1.5
15-Jul	196	5.38	1.5
15-Aug	227	2.46	1.5
15-Sep	258	2.23	1.5
15-Oct	288	2.36	1.5
31-Oct	304	2.36	1.5
1-Nov	305	2.39	0.6
15-Nov	319	2.39	0.6
15-Dec	349	2.30	0.6

## Existing Water Right Information

Staff has analyzed the water rights tabulation to identify any potential water availability problems. There are two small water rights located within this stream reach. The Britt-Burns Lodge Augmentation plan is decreed for 3.8 acre feet. In addition, the Burns Reservoir is decreed for 5.0 acre feet, conditional. An augmentation plan is necessary for the lodge because there are numerous senior water rights located downstream from the proposed reach. One example is the Tenderfoot Ditch, which is decreed for 5.7 cfs with an 1884 priority. Based on this analysis staff has determined that water is available for appropriation on Wallace Creek, from the headwaters to the confluence with North Fork Wallace 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 North Fork Wallace Creek

#### **Upper Terminus:** HEADWATERS IN THE VICINITY OF

(Latitude 39° 19' 7.7"N)      (Longitude 107° 57' 47.2"W)

UTM = 4529343.0 N      UTM = 291756.7 E

NE SW S35 T8S R95W 6PM

2330' East of the West Section Line; 2150' North of the South Section Line

#### **Lower Terminus:** CONFLUENCE WITH NORTH FORK WALLACE CREEK

(Latitude 39° 21' 9.38"N)      (Longitude 108° 1' 43.19"W)

UTM = 4532468.0 N      UTM = 287635.4 E

SW SW S8 T11N R90W 6PM

390' West of the East Section Line; 1290' South of the North Section Line

**Watershed:** Colorado headwaters-Plateau (HUC #:14010005)

**Counties:** Mesa

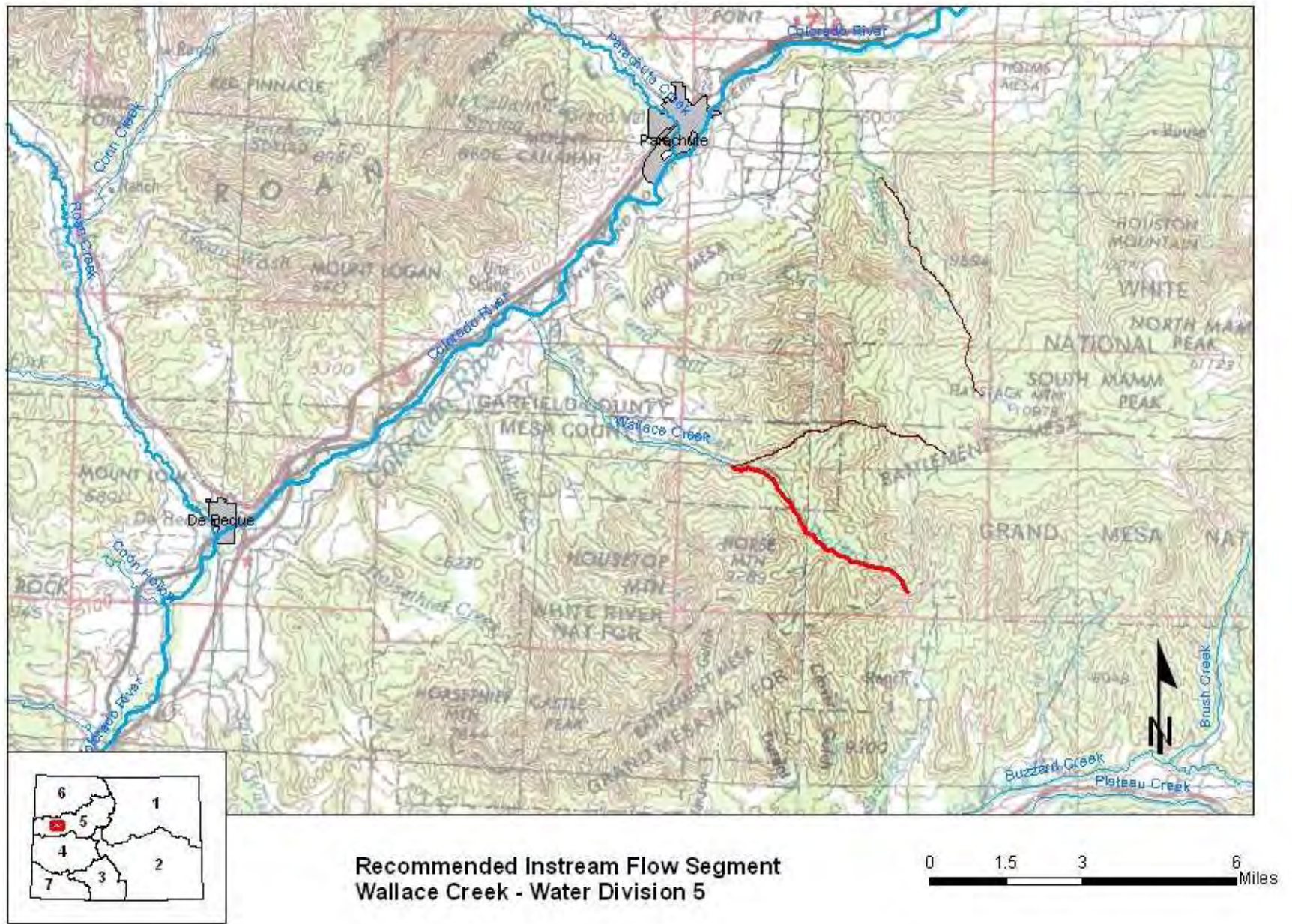
**Length:** 4.78 miles

**USGS Quad(s):** Hawxhurst Creek, Housetop Mountain

**Flow Recommendation:**      1.5 cfs (April 1 - October 31)  
   0.6 cfs (November 1 - March 31)

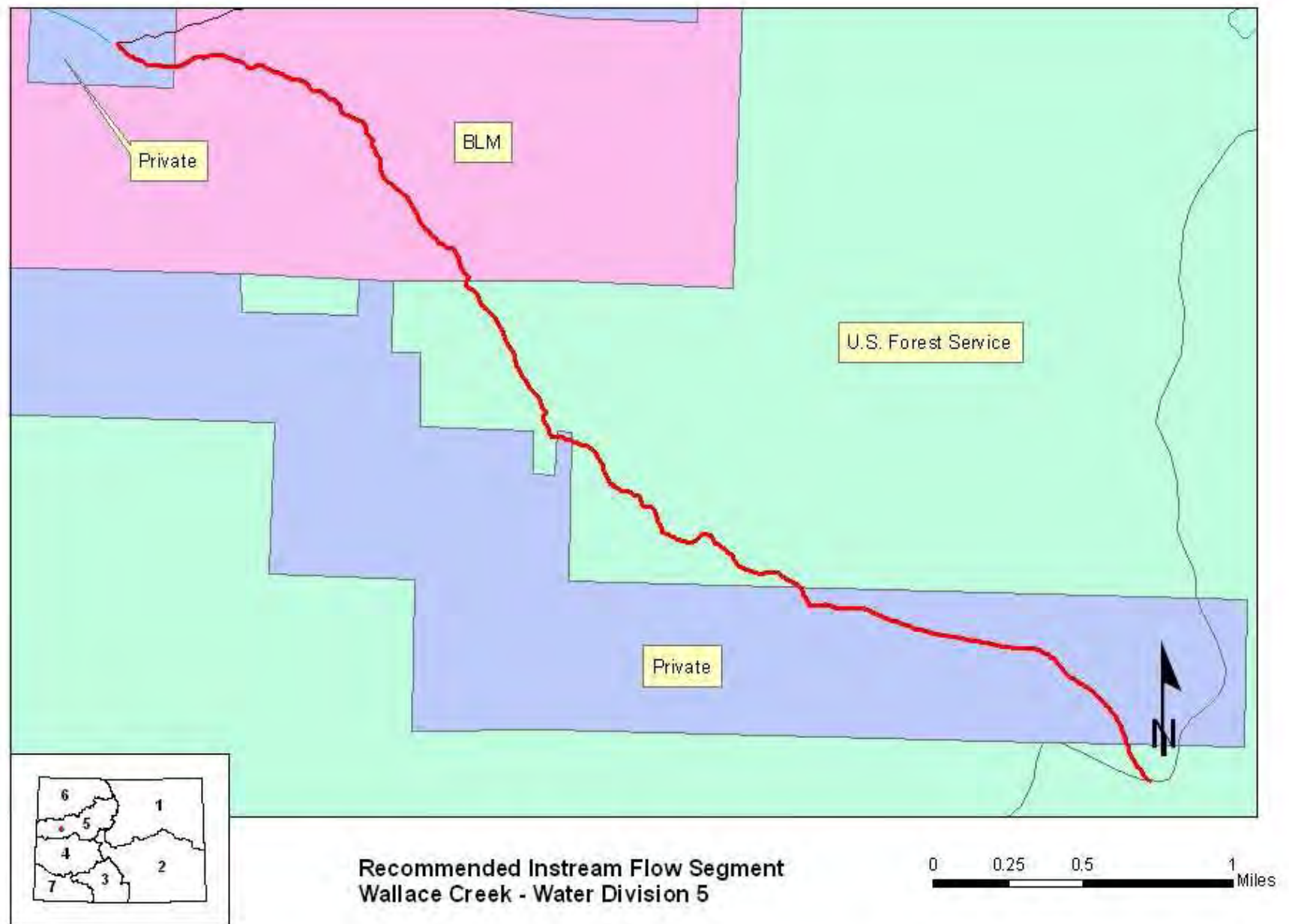


# Vicinity Map



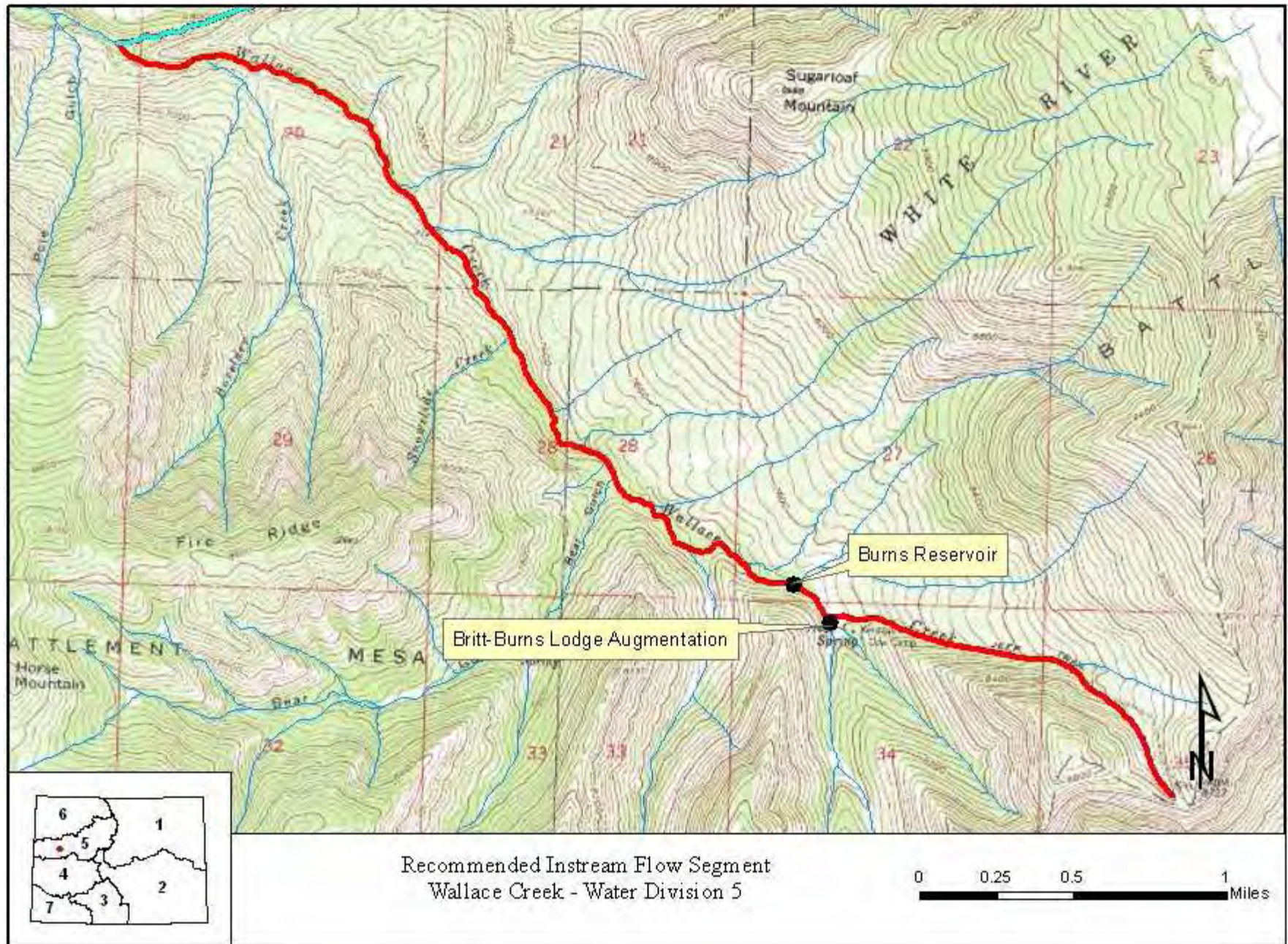


# Land Use Map





# Topographic & Water Rights Map



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

In Reply Refer To:  
7250 (CO-932)

DEC 26 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 Wallace Creek, located in Water Division 5.

**Location and Land Status.** Wallace Creek is tributary to the Colorado River approximately six miles northeast of Debeque, Colorado. The creek is located within the lower Colorado River watershed. This recommendation covers the stream reach beginning at the headwaters and extends downstream to the confluence with North Fork Wallace Creek. Approximately 95 percent of the 3.5-mile reach is located on federal lands, while the remaining 5 percent is located on private lands. U.S. Forest Service lands and private lands are located in the higher elevations of the reach, while BLM lands are located in the lower part of the reach.

**Biological Summary.** Wallace Creek is a high gradient stream, with moderate substrate size. The creek is often confined by a narrow canyon, and it has cut down to bedrock in numerous locations. The riparian community is very vigorous in these confined locations and provides substantial shading and nutrient supply for the creek. The creek provides good pool habitat, but riffles for spawning are a limiting factor for the fish population. Fishery surveys indicate a self-sustaining population of Colorado River Cutthroat Trout and brook trout. BLM may take actions in the future to reduce the brook trout population, because brook trout are known to outcompete Colorado River Cutthroat Trout. The Colorado River Cutthroat Trout may be of high genetic quality. This location is good for managing for Colorado River Cutthroat Trout because the stream reach is isolated, physical barriers are present downstream that prevent the migration of other fish into the reach, and the creek has reliable base flows.

**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:

- 1.5 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 plunge pools, it is very important to maintain adequate velocity in the limited riffle habitat.
- 0.6 cubic feet second is recommended for the base flow period from November 1 through March 31. This recommendation is driven by the average depth criteria. This base flow rate provides good habitat in pools and provides sufficient water for passage between pools. This base flow rate should also maintain sufficient water exchange in pools to prevent complete icing during the winter, because Wallace Creek has a northwest aspect and is susceptible to icing.

**Water Availability.** There are two small water rights located within this stream reach. The Britt-Burns Lodge Augmentation Plan is decreed for 3.8 acre feet. In addition, the Burns Reservoir is decreed for 5.0 acre feet, conditional. An augmentation plan is necessary for the lodge because there are numerous senior water rights located downstream from the proposed reach. For example, the Tenderfoot Ditch is decreed for 5.7 cubic feet per second, and it holds an 1884 priority. Examination of the diversion records for the downstream senior water rights should provide further information about water availability.

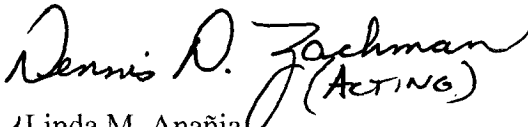

BLM is not aware of any historical gage information for this stream reach, but there are other gages in the vicinity. BLM recommends using the Battlement Creek gage (U.S. Geological Survey (USGS) 09092600) located approximately 10 miles to the east. Battlement Creek has a similar watershed size, aspect, and snowmelt runoff pattern to North Fork Wallace Creek.

**Relationship to Management Plans.** BLM's management of this stream reach may change in the future. BLM believes that the Colorado River Cutthroat Trout in this reach may be of high genetic quality. The Colorado Division of Wildlife has sent genetic samples to laboratories for analysis, but BLM has not yet received results of the analysis. If the trout are of high genetic quality, BLM will move this creek from a monitoring and maintenance category to an active management category. Possible actions BLM could take under active management may be to eliminate the brook trout portion of the fish population, and to identify downstream barriers that could be enhanced to maintain separation between fish communities. BLM's efforts to maintain riparian and fisheries health will be supplemented by an instream flow appropriation.

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 section were forwarded with BLM's draft recommendation in February 2007.

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,

  
(ACTING)  
 Linda M. Anañia  
Deputy State Director  
Resources and Fire

cc: Jamie Connell, Grand Junction FO  
Tom Fresques, Glenwood Springs FO



## Appendix - B

### Field Data



COLORADO WATER  
CONSERVATION BOARD

# FIELD DATA FOR INSTREAM FLOW DETERMINATIONS



## LOCATION INFORMATION

STREAM NAME: <u>Wallace Creek</u>		CROSS-SECTION NO.: <u>1</u>
CROSS-SECTION LOCATION: <u>100 yds. downstream from confluence w/ Boxelder Creek</u>		
DATE: <u>6-9-06</u>	OBSERVERS: <u>R. Smith, T. Fresques</u>	
LEGAL DESCRIPTION:	1/4 SECTION: <u>NW</u>	SECTION: <u>20</u>
	TOWNSHIP: <u>8 N(S)</u>	RANGE: <u>9 SE(W)</u> PM: <u>6:01</u>
COUNTY: <u>Mesa</u>	WATERSHED: <u>Colorado</u>	WATER DIVISION: <u>S</u>
		DOW WATER CODE: <u>22614</u>
MAP(S):	USGS: <u>Housdop Mtn. 7.5'</u>	<u>12 S 0756394</u>
	USFS: <u>436 0041</u>	

## SUPPLEMENTAL DATA

SAG TAPE SECTION SAME AS DISCHARGE SECTION: <input checked="" type="radio"/> YES <input type="radio"/> NO	METER TYPE: <u>Marsh-McBirney</u>
METER NUMBER:	DATE RATED:
CALIB/SPIN: _____ sec	TAPE WEIGHT: _____ lbs/foot
TAPE TENSION: _____ lbs	
CHANNEL BED MATERIAL SIZE RANGE: <u>gravel to 8" cobbles</u>	PHOTOGRAPHS TAKEN: <input checked="" type="radio"/> YES <input type="radio"/> NO
	NUMBER OF PHOTOGRAPHS: <u>3</u>

## CHANNEL PROFILE DATA

STATION	DISTANCE FROM TAPE (ft)	ROD READING (ft)
<input checked="" type="radio"/> Tape @ Stake LB	0.0	<u>surveyed</u>
<input checked="" type="radio"/> Tape @ Stake RB	0.0	<u>surveyed</u>
<input type="radio"/> WS @ Tape LB/RB	0.0	<u>5.96/5.96</u>
<input type="radio"/> WS Upstream	<u>16.0'</u>	<u>5.75</u>
<input type="radio"/> WS Downstream	<u>20.5'</u>	<u>7.86</u>
SLOPE	<u>2.11 / 36.5' = 0.058</u>	

SKETCH

## AQUATIC SAMPLING SUMMARY

STREAM ELECTROFISHED: YES <input checked="" type="radio"/> NO <input type="radio"/>	DISTANCE ELECTROFISHED: _____ ft	FISH CAUGHT: YES/NO	WATER CHEMISTRY SAMPLED: YES <input checked="" type="radio"/> NO <input type="radio"/>														
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
AQUATIC INSECTS IN STREAM SECTION BY COMMON OR SCIENTIFIC ORDER NAME:																	
<u>stonefly, caddisfly, mayfly</u>																	

## COMMENTS

<u>7.9 = Ph</u>
<u>400 = TDS</u>
<u>12°C = Temp</u>

## DISCHARGE/CROSS SECTION NOTES

STREAM NAME:						CROSS-SECTION NO.	DATE	SHEET ____ OF ____					
BEGINNING OF MEASUREMENT	EDGE OF WATER LOOKING DOWNSTREAM: (0.0 AT STAKE)							LEFT / RIGHT	Gage Reading:	TIME:			
Features	Stake Grassline (S) Waterline (W) Rock (R)	(S)  (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)		Area (ft²)	Discharge (cfs)
										At Point	Mean in Vertical		
S	O.O		4.50										
G	O.S		5.21										
	I.O		5.6Z										
W	I.B		5.9b										
	Z.Z		6.25	0.30						0.00			
	Z.S		6.28	0.35						0.00			
	Z.8		6.37	0.40						0.10			
	3.I		6.27	0.30						0.36			
	3.4		6.15	0.20						0.42			
	3.7		6.37	0.40						0.89			
	4.O		6.66	0.60						1.67			
	4.3		6.67	0.60						1.71			
	4.6		6.67	0.60						2.08			
	4.9		6.45	0.50						2.46			
	5.2		6.44	0.50						2.14			
	5.5		6.39	0.40						2.01			
	5.8		6.32	0.35						1.49			
	6.I		6.26	0.30						0.18			
	6.4		6.24	0.30						0.05			
	6.7		6.19	0.25						0.72			
	7.O		6.14	0.20						1.95			
	7.3		6.23	0.25						1.75			
	7.6		6.17	0.20						1.32			
	7.9		6.16	0.20						0.09			
	8.2		6.11	0.15						0.00			
	8.7		6.00	0.05						0.00			
W	9.6		5.9b										
G	12.o		5.26										
S	13.O		5.Ob										
TOTALS:													
End of Measurement	Time: 12.35	Gage Reading: .4 ft	CALCULATIONS PERFORMED BY:							CALCULATIONS CHECKED BY:			



### DISCHARGE/CROSS SECTION NOTES

[illegible]



# CUTTHROAT TROUT - CRN

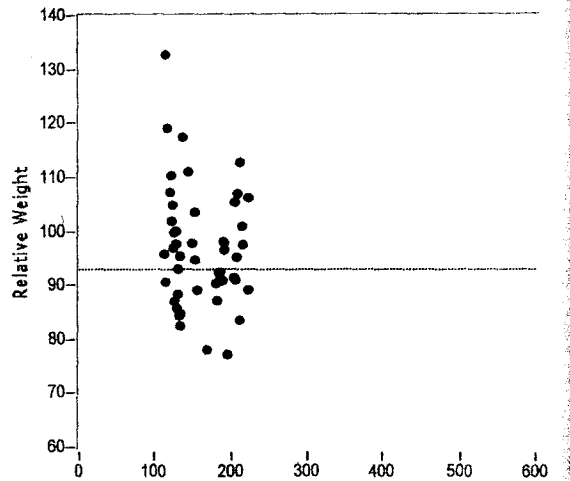
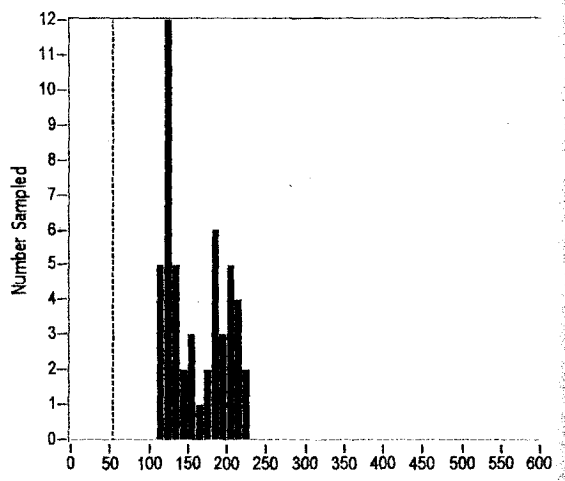
Water	Wallace Creek	Date	8/10/2005
Location	Below confluence with North Fork	Water Code	22614
Drainage	Colorado River	UTM Zone	12N
Crew	Elmblad, Talley, McKenna, Rice	UTM X	755898
Notes	Purpose of the sample was to look for cutthroat trout and the composition of the fish community. Took tissue samples for genetics analysis. Water temp. was 57degrees F. It rained hard that day and rained all night the night before. Stream was very murky and fish were hard to see. The start was just below the confluence with the north fork. We used 2 shocking crews 15 yards apart for each pass. Up near the Forest Seervice boundary the stream channel was completely covered by overhanging bank vegetation and unfishable.		
		UTM Y	4360143
		Station Length (ft)	292
		Station Width (ft)	7.5

Metric

	Estimate	95% CI (+/-)	1st PASS
NUMBER/HA	2605	303	40
kg/HA	118	14	10
NUMBER/km	595	89	0.76
kg/km	27	3	53.00
			95% CI (+/-)
			6.16

English

	Estimate	95% CI (+/-)	1st PASS
NUMBER/Acre	1054	123	40
Lbs/Acre	105	12	10
NUMBER/Mile	958	111	0.76
Lbs/Mile	96	11	53.00
			95% CI (+/-)
			6.16



MIN CUT 55

MAX CUT -1

After

Length (mm)

# BROOK TROUT

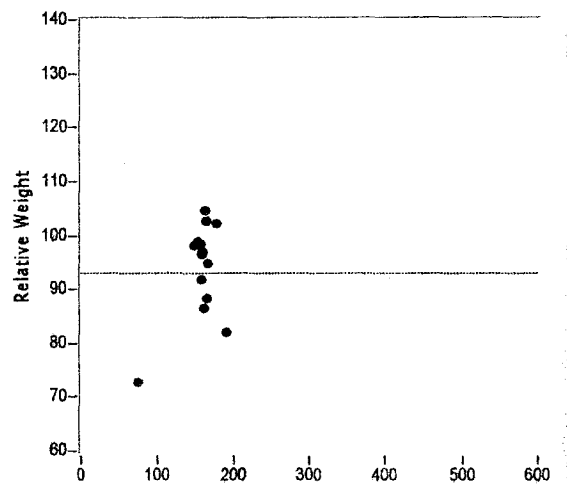
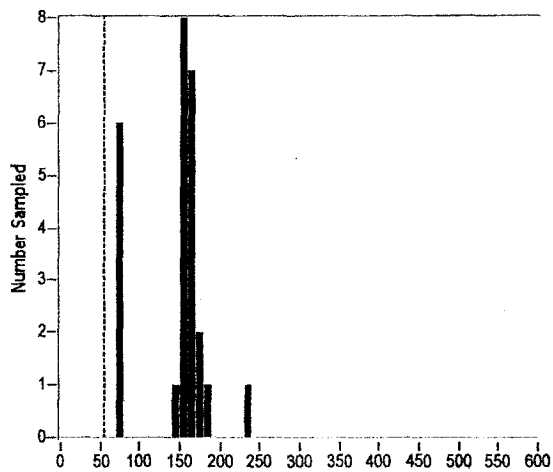
Water	Wallace Creek	Date	8/10/2005
Location	Below confluence with North Fork	Water Code	22614
Drainage	Colorado River	UTM Zone	12N
Crew	Elmblad, Talley, McKenna, Rice	UTM X	755898
Notes	<p>Purpose of the sample was to look for cutthroat trout and the composition of the fish community. Took tissue samples for genetics analysis. Water temp. was 57degrees F. It rained hard that day and rained all night the night before. Stream was very murky and fish were hard to see. The start was just below the confluence with the north fork. We used 2 shocking crews 15 yards apart for each pass. Up near the Forest Seervice boundary the stream channel was completely covered by overhanging bank vegetation and unfishable.</p>		
		UTM Y	4360143
		Station Length (ft)	292
		Station Width (ft)	7.5

Metric

	Estimate	95% CI (+/-)	1st PASS
NUMBER/HA	1339	201	21
kg/HA	34	5	5
NUMBER/km	306	46	0.77
kg/km	8	1	27.25
			95% CI (+/-) 4.10

English

	Estimate	95% CI (+/-)	1st PASS
NUMBER/Acre	542	82	21
Lbs/Acre	30	5	5
NUMBER/Mile	493	74	0.77
Lbs/Mile	27	4	27.25
			95% CI (+/-) 4.10



MIN CUT 55

MAX CUT -1

After

Length (mm)

Date  
8/10/2005

**LEVEL 2 - STREAM SURVEY (2 PASS REMOVAL)**

Water Code  
22614

UTM Zone 12N

UTM X 755898

UTM Y 4360143

Station Length (ft)

292

Station Width (ft)

7.5

[illegible][illegible]

























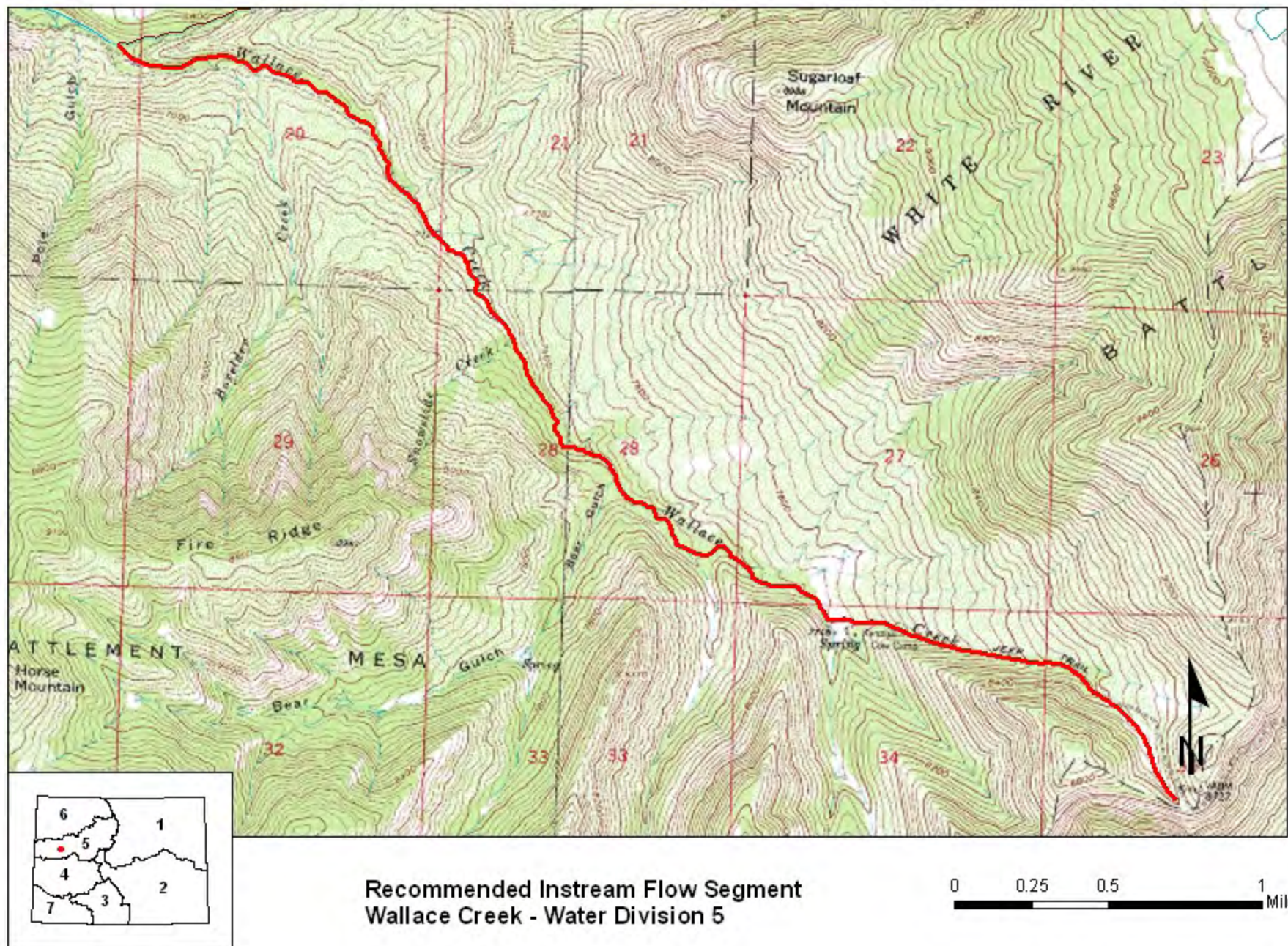




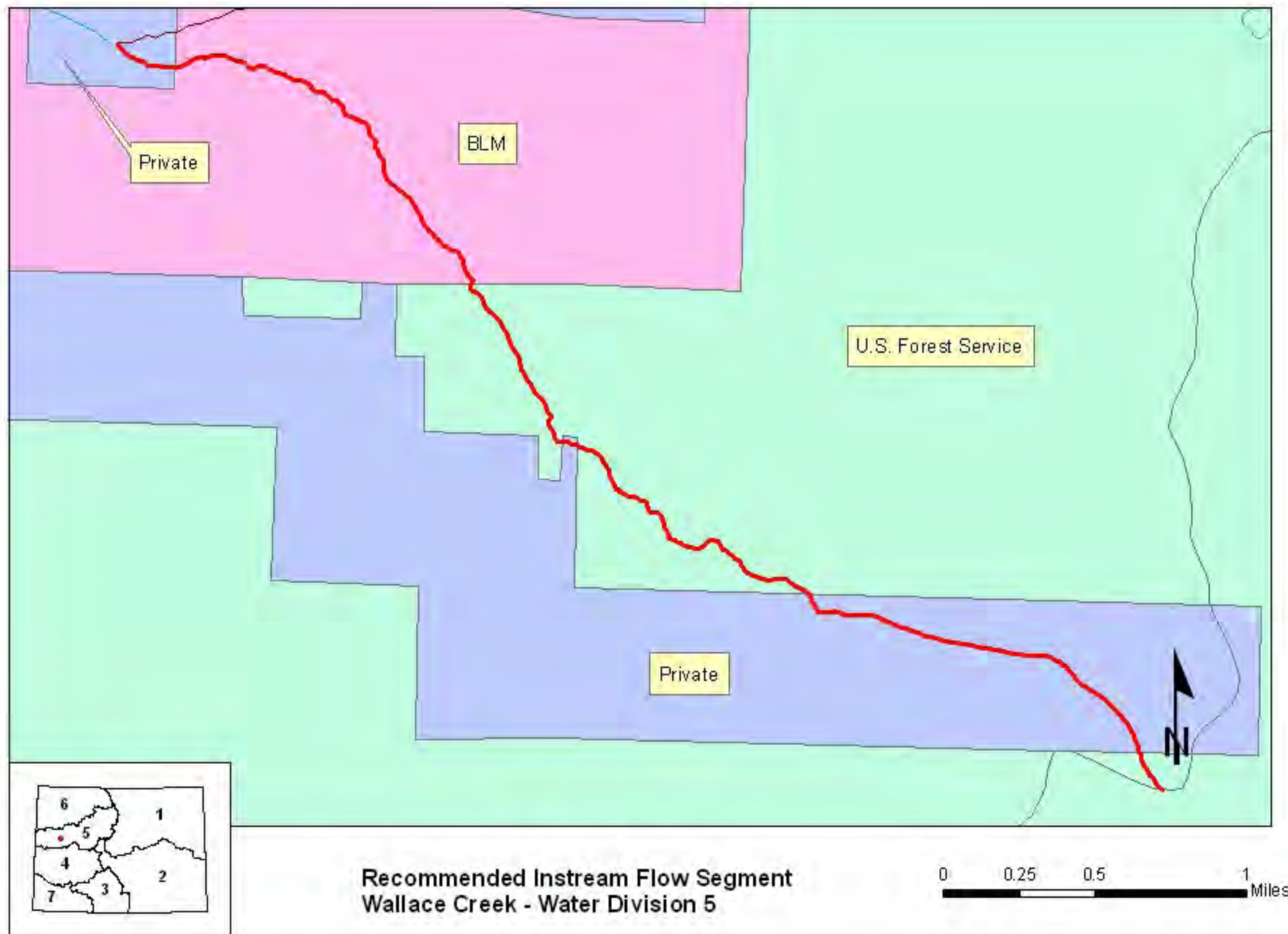


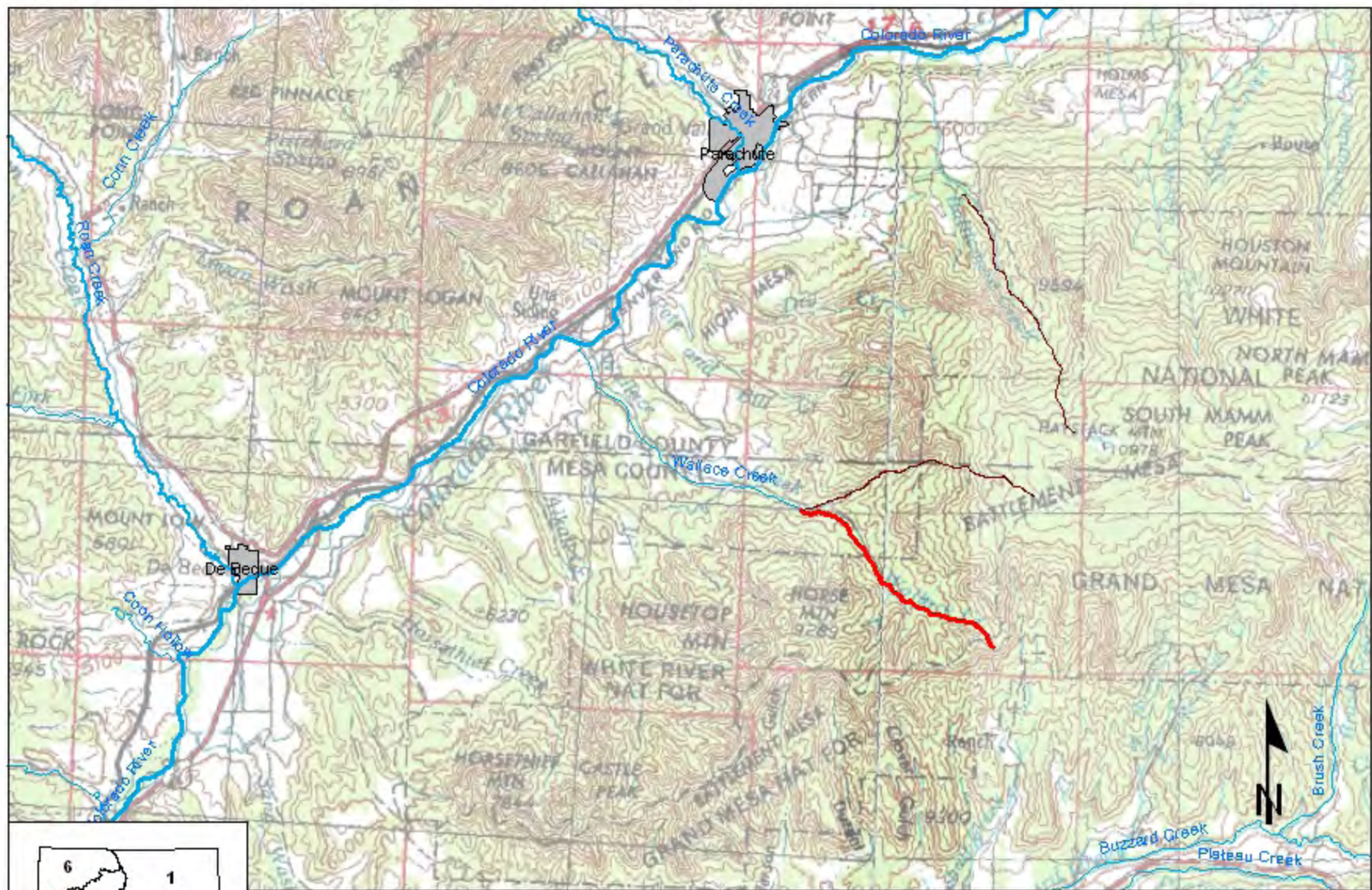
## Appendix - E

### Maps









**Recommended Instream Flow Segment  
Wallace Creek - Water Division 5**

0 1.5 3 6 Miles