<u>Stream</u>: Big Beaver Creek

Executive Summary

Water Division: 6
Water District: 43
CDOW#: 24935
CWCB ID: 10/6/A-002

<u>Segment</u>: Confluence with Allen Creek to Confluence with East Beaver Creek

Upper Terminus: CONFLUNCE WITH ALLEN CREEK
(Latitude 40° 04’ 37.59”N) (Longitude 107° 36’ 32.86”W)

Lower Terminus: CONFLUENCE WITH EAST BEAVER CREEK
(Latitude 40° 02’ 5.77”N) (Longitude 107° 38’ 40.56”W)

Watershed: Upper White (HUC#: 14050005)
Counties: Rio Blanco
Length: 3.94 miles
USGS Quad(s): Sawmill Mountain, Fawn Creek
Existing ISF: 5-03CW276, 2.9 cfs (April 1 – July 14), 1.0 cfs (July 15 – March 31)
Flow Recommendation (increase): 2.1 cfs (April 1 – June 30)

Staff Analysis and Recommendation

Summary

The information contained in this report and the associated instream flow file folder 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 Big Beaver Creek to the CWCB for an increased water right under the Instream Flow Program. Big Beaver Creek is being considered for an increase because it has a natural environment that can be preserved to a reasonable degree with an increased instream flow water right.

Big Beaver Creek is approximately 12 miles long. It begins in the White River National Forest at an elevation of 9,680 feet and terminates at the confluence with the White River at an elevation of 6,985 feet. Approximately 85% of the land on the 3.94 mile segment addressed by this report is publicly owned. The total drainage area of the creek is approximately 19.8 square miles. Big Beaver Creek is located within Rio Blanco County and generally flows in a southwesterly direction.

The subject of this report is a segment of Big Beaver Creek beginning at the confluence with the Allen Creek downstream to the confluence with East Beaver Creek. The proposed segment is located approximately 16 miles southeast of Meeker. Staff has received only one recommendation for this segment, from the BLM. The recommendation for this segment is discussed below.

Justification for Instream Flow Increase

This segment contains a population of native Colorado River Cutthroat Trout. BLM believes that all streams providing habitat for Colorado River Cutthroat Trout merit full protection under the CWCB instream flow program. From the BLM perspective, full protection means protecting flow rates that meet all three instream flow criteria whenever sufficient water is available in the stream system. The BLM is investigating whether the Big Beaver Creek population should be identified as a core conservation population. BLM and CDOW also have plans to investigate barriers along the creek, and if necessary, construct barriers to prevent non-native fish passage from Lake Avery up into this stream reach. BLM believes that all feasible opportunities to manage viable Colorado River Cutthroat Trout populations should be supported by instream flow water rights, because such actions help make formal listing of the species under the Endangered Species Act unnecessary.

Instream Flow Recommendation

The BLM recommended an increase of 2.1 cfs (April 1 to June 30), 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
Confluence. w/ Allen Creek	Confluence w/ East Beaver Creek	3.94	15%	85%

67% of the public lands are managed by the BLM and the remaining 18% are managed by the U.S. Forest Service.

Biological Data

Big Beaver Creek is a high gradient stream with moderate to large substrate size, with boulders commonly found in the stream channel. Most of the creek is confined by a narrow valley. The riparian community is diverse, vigorous, and provides substantial shading for the creek. Riparian species include cottonwood, alder, birch, willow, and spruce.

The creek provides a good mixture of runs, riffles, and pools for fish habitat. Aquatic insects are diverse and abundant, and include mayfly, caddisfly, and stonefly species. Fishery surveys confirmed that the population of Colorado River Cutthroat Trout and mottled sculpin survived the drought year of 2002-2003 and continue to thrive. BLM is in the process of testing the fish population for genetic purity

Field Survey Data

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.

Biological Flow Recommendation

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. It is believed 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.

Table 1: Data

Party	Date	Q	250%-40%	Summer (3/3)	Winter (2/3)
BLM	7/14/2008	5.27	13.2 – 2.1	5.83	2.92
BLM	7/14/2008	5.06	12.6 – 2.0	4.44	2.64

The summer flow, which meets 3 of 3 criteria and is within the accuracy range of the R2CROSS model is 5.0 cfs. This recommendation was derived by averaging the results of the two data sets. The recommended flow of 2.1 cfs, when added to the existing flow of 2.9 cfs is equal to 5.0 cfs.

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 together 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 **Big Beaver Creek** no such gage is available at the LT. In fact, there is no gage on Big Beaver Creek. It is thus necessary to describe the normal flow regime at Big Beaver Creek above the LT through a "representative" gage station. The gage station selected for this purpose was LOST CREEK NEAR BUFORD, CO. (USGS 09302450), a gage with a 25 year period of record (POR) collected between 1964 and 1989. The gage is at an elevation of 7,560 ft above mean sea level (amsl) and has a drainage area of 21.5 mi^2. In this instance, due to the absence of existing significant upstream consumptive irrigation uses or transbasin diversions, the hydrograph (plot of discharge over time) produced from this gage was not "adjusted". To make the measured data from Lost Creek transferrable to Big Beaver Creek above the LT, all that was required was multiplication of the measured hydrograph by an area ratio; specifically, the area of Big Beaver Creek above the LT (19.8 mi^2 above the LT) to Lost Creek near Buford, CO (21.5 mi^2 above the gage). Unlike the situation in Lost Creek, there were several diversions in the watershed above Big Beaver Creek above the LT. Consequently, the resulting proportioned hydrograph had to be "adjusted" (decreased) to reflect existing consumptive irrigation depletions on Big Beaver Creek. The final hydrograph thus represents a distribution of flow over time that has been reduced to reflect existing human uses.

{The Following discussion is based upon the US Geological Survey's *Techniques of Water-Resources Investigations* Series, *Book 4: Hydrologic Analysis and Interpretation, Chapter A3: Statistical Methods in Water Resources* (Chapter 3: Describing Uncertainty) by D.R. Helsel and R. M. Hirsch. This technical reference provides the scientific background and guidance important to the systematic interpretation of hydrologic data. The document is available online and is a valuable aid to understanding and interpreting the analyses described here.}

The next step in producing a representation of the discharge at Big Beaver Creek above the LT was to compute the Geometric Mean of the area-prorated data values from the Lost Creek near Buford, CO Hydrograph. This step is of value because of the inherent statistical weaknesses found in any collection of data intended to measure natural stream discharge. Without getting into the details of statistical theory, it is worth noting that a set of discharge measurements is inherently inaccurate, no matter how well collected, due to the difficulties attendant to data collection, especially hydrologic data. To give deference to this fact and to increase the value of the hydrograph product of this analysis, the Geometric Means of the data were computed and plotted along with the 95% Confidence Intervals about the data. The resultant hydrograph, including recommended Instream Flow values, is displayed in Figure 1 with the data displayed in Table 2.

Figure 1

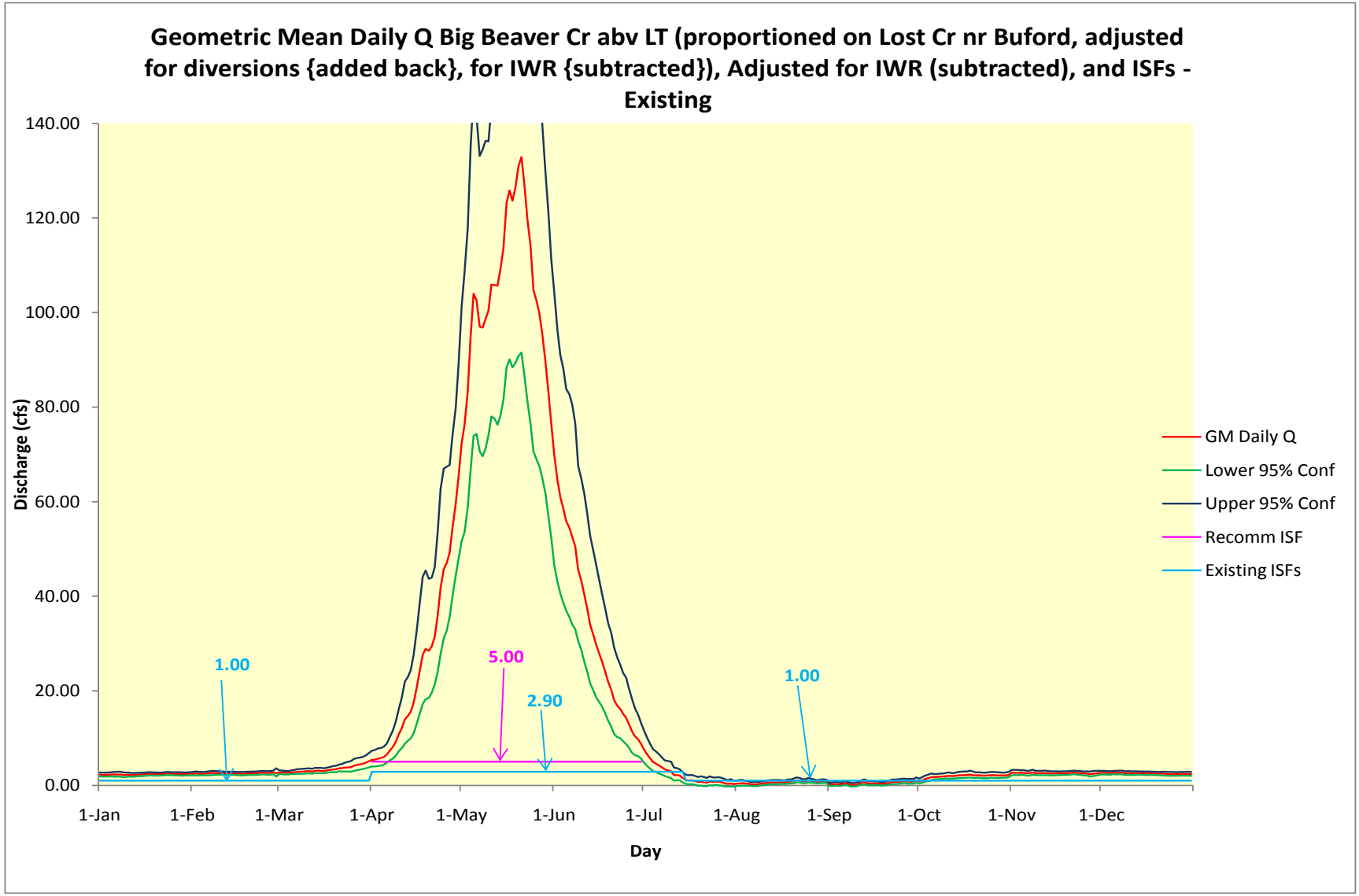

Geometric Mean Daily Q Big Beaver Cr abv LT (proportioned on Lost Cr nr Buford, adjusted for diversions {added back}, for IWR {subtracted}), Adjusted for IWR (subtracted), and ISFs - Existing
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
Discharge (cfs)
1-Jan
1-Feb
1-Mar
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
Day
1.00
5.00
2.90
1.00
GM Daily Q
Lower 95% Conf
Upper 95% Conf
Recomm ISF
Existing ISFs

Table 2. Geometric Mean Discharge and Recommended Instream Flows			
Date	Existing ISF	Recommended ISF	Proportioned Adjusted GM (abv gage) Adj (-) for Irr & OoB in Big Beaver Cr abv LT
1-Jan	1		2.30
2-Jan	1		2.23
3-Jan	1		2.24
4-Jan	1		2.27
5-Jan	1		2.31
6-Jan	1		2.28
7-Jan	1		2.32
8-Jan	1		2.30
9-Jan	1		2.19
10-Jan	1		2.22
11-Jan	1		2.25
12-Jan	1		2.18
13-Jan	1		2.21
14-Jan	1		2.28
15-Jan	1		2.31
16-Jan	1		2.34
17-Jan	1		2.42
18-Jan	1		2.43
19-Jan	1		2.37
20-Jan	1		2.39
21-Jan	1		2.37
22-Jan	1		2.41
23-Jan	1		2.47
24-Jan	1		2.46
25-Jan	1		2.45
26-Jan	1		2.41
27-Jan	1		2.42
28-Jan	1		2.40
29-Jan	1		2.39
30-Jan	1		2.40
31-Jan	1		2.43
1-Feb	1		2.45
2-Feb	1		2.49
3-Feb	1		2.47
4-Feb	1		2.46
5-Feb	1		2.47
6-Feb	1		2.48
7-Feb	1		2.57
8-Feb	1		2.62
9-Feb	1		2.62
10-Feb	1		2.58
11-Feb	1		2.57
12-Feb	1		2.55
13-Feb	1		2.52

14-Feb	1		2.53
15-Feb	1		2.51
16-Feb	1		2.48
17-Feb	1		2.46
18-Feb	1		2.46
19-Feb	1		2.51
20-Feb	1		2.52
21-Feb	1		2.56
22-Feb	1		2.56
23-Feb	1		2.57
24-Feb	1		2.63
25-Feb	1		2.64
26-Feb	1		2.62
27-Feb	1		2.62
28-Feb	1		2.73
29-Feb	1		2.61
1-Mar	1		2.76
2-Mar	1		2.72
3-Mar	1		2.67
4-Mar	1		2.64
5-Mar	1		2.74
6-Mar	1		2.79
7-Mar	1		2.89
8-Mar	1		2.91
9-Mar	1		2.94
10-Mar	1		2.98
11-Mar	1		3.03
12-Mar	1		2.96
13-Mar	1		3.09
14-Mar	1		3.11
15-Mar	1		3.08
16-Mar	1		3.04
17-Mar	1		3.18
18-Mar	1		3.29
19-Mar	1		3.38
20-Mar	1		3.40
21-Mar	1		3.63
22-Mar	1		3.65
23-Mar	1		3.78
24-Mar	1		3.82
25-Mar	1		3.85
26-Mar	1		4.16
27-Mar	1		4.32
28-Mar	1		4.43
29-Mar	1		4.58
30-Mar	1		4.80
31-Mar	1		5.10
1-Apr	2.9	5.00	5.41
2-Apr	2.9	5.00	5.46

3-Apr	2.9	5.00	5.66
4-Apr	2.9	5.00	5.77
5-Apr	2.9	5.00	6.00
6-Apr	2.9	5.00	6.52
7-Apr	2.9	5.00	7.34
8-Apr	2.9	5.00	8.15
9-Apr	2.9	5.00	9.24
10-Apr	2.9	5.00	10.82
11-Apr	2.9	5.00	12.09
12-Apr	2.9	5.00	13.98
13-Apr	2.9	5.00	14.70
14-Apr	2.9	5.00	15.58
15-Apr	2.9	5.00	17.53
16-Apr	2.9	5.00	20.87
17-Apr	2.9	5.00	24.32
18-Apr	2.9	5.00	27.63
19-Apr	2.9	5.00	28.86
20-Apr	2.9	5.00	28.46
21-Apr	2.9	5.00	29.41
22-Apr	2.9	5.00	31.45
23-Apr	2.9	5.00	35.84
24-Apr	2.9	5.00	41.75
25-Apr	2.9	5.00	45.70
26-Apr	2.9	5.00	47.01
27-Apr	2.9	5.00	49.18
28-Apr	2.9	5.00	54.55
29-Apr	2.9	5.00	59.62
30-Apr	2.9	5.00	65.56
1-May	2.9	5.00	72.27
2-May	2.9	5.00	76.28
3-May	2.9	5.00	83.18
4-May	2.9	5.00	95.04
5-May	2.9	5.00	103.98
6-May	2.9	5.00	102.60
7-May	2.9	5.00	97.00
8-May	2.9	5.00	96.79
9-May	2.9	5.00	98.61
10-May	2.9	5.00	100.47
11-May	2.9	5.00	105.91
12-May	2.9	5.00	105.80
13-May	2.9	5.00	105.67
14-May	2.9	5.00	109.26
15-May	2.9	5.00	113.54
16-May	2.9	5.00	123.21
17-May	2.9	5.00	125.82
18-May	2.9	5.00	123.65
19-May	2.9	5.00	126.35
20-May	2.9	5.00	131.03
21-May	2.9	5.00	132.88

22-May	2.9	5.00	127.01
23-May	2.9	5.00	119.81
24-May	2.9	5.00	114.15
25-May	2.9	5.00	104.70
26-May	2.9	5.00	102.61
27-May	2.9	5.00	99.87
28-May	2.9	5.00	95.53
29-May	2.9	5.00	89.63
30-May	2.9	5.00	83.27
31-May	2.9	5.00	76.42
1-Jun	2.9	5.00	69.93
2-Jun	2.9	5.00	64.64
3-Jun	2.9	5.00	60.95
4-Jun	2.9	5.00	58.58
5-Jun	2.9	5.00	55.88
6-Jun	2.9	5.00	54.48
7-Jun	2.9	5.00	52.47
8-Jun	2.9	5.00	50.49
9-Jun	2.9	5.00	45.56
10-Jun	2.9	5.00	43.24
11-Jun	2.9	5.00	40.36
12-Jun	2.9	5.00	37.42
13-Jun	2.9	5.00	33.98
14-Jun	2.9	5.00	31.98
15-Jun	2.9	5.00	29.65
16-Jun	2.9	5.00	27.88
17-Jun	2.9	5.00	26.16
18-Jun	2.9	5.00	24.17
19-Jun	2.9	5.00	21.84
20-Jun	2.9	5.00	20.24
21-Jun	2.9	5.00	18.07
22-Jun	2.9	5.00	16.92
23-Jun	2.9	5.00	16.19
24-Jun	2.9	5.00	15.10
25-Jun	2.9	5.00	14.32
26-Jun	2.9	5.00	12.93
27-Jun	2.9	5.00	11.45
28-Jun	2.9	5.00	10.33
29-Jun	2.9	5.00	9.74
30-Jun	2.9	5.00	8.80
1-Jul	2.9		7.61
2-Jul	2.9		6.57
3-Jul	2.9		5.73
4-Jul	2.9		4.97
5-Jul	2.9		4.65
6-Jul	2.9		4.20
7-Jul	2.9		3.78
8-Jul	2.9		3.36
9-Jul	2.9		3.19

10-Jul	2.9	2.97
11-Jul	2.9	2.16
12-Jul	2.9	2.18
13-Jul	2.9	2.05
14-Jul	2.9	1.54
15-Jul	1	1.15
16-Jul	1	1.05
17-Jul	1	1.09
18-Jul	1	0.94
19-Jul	1	0.72
20-Jul	1	0.76
21-Jul	1	0.66
22-Jul	1	0.59
23-Jul	1	0.85
24-Jul	1	0.73
25-Jul	1	0.79
26-Jul	1	0.75
27-Jul	1	0.65
28-Jul	1	0.44
29-Jul	1	0.33
30-Jul	1	0.40
31-Jul	1	0.25
1-Aug	1	0.38
2-Aug	1	0.44
3-Aug	1	0.47
4-Aug	1	0.42
5-Aug	1	0.32
6-Aug	1	0.22
7-Aug	1	0.25
8-Aug	1	0.22
9-Aug	1	0.36
10-Aug	1	0.40
11-Aug	1	0.51
12-Aug	1	0.63
13-Aug	1	0.66
14-Aug	1	0.63
15-Aug	1	0.66
16-Aug	1	0.66
17-Aug	1	0.63
18-Aug	1	0.76
19-Aug	1	0.78
20-Aug	1	0.87
21-Aug	1	1.07
22-Aug	1	1.03
23-Aug	1	0.84
24-Aug	1	0.84
25-Aug	1	1.03
26-Aug	1	0.94
27-Aug	1	0.86

28-Aug	1	0.75
29-Aug	1	0.83
30-Aug	1	0.86
31-Aug	1	0.82
1-Sep	1	0.20
2-Sep	1	0.25
3-Sep	1	0.28
4-Sep	1	0.23
5-Sep	1	0.23
6-Sep	1	0.45
7-Sep	1	0.36
8-Sep	1	0.11
9-Sep	1	0.09
10-Sep	1	0.14
11-Sep	1	0.36
12-Sep	1	0.64
13-Sep	1	0.68
14-Sep	1	0.38
15-Sep	1	0.42
16-Sep	1	0.37
17-Sep	1	0.43
18-Sep	1	0.32
19-Sep	1	0.35
20-Sep	1	0.39
21-Sep	1	0.57
22-Sep	1	0.71
23-Sep	1	0.70
24-Sep	1	0.76
25-Sep	1	0.83
26-Sep	1	0.92
27-Sep	1	0.79
28-Sep	1	0.81
29-Sep	1	0.80
30-Sep	1	1.05
1-Oct	1	0.82
2-Oct	1	1.07
3-Oct	1	1.33
4-Oct	1	1.51
5-Oct	1	1.73
6-Oct	1	1.78
7-Oct	1	1.79
8-Oct	1	1.89
9-Oct	1	1.89
10-Oct	1	1.99
11-Oct	1	2.01
12-Oct	1	1.94
13-Oct	1	2.00
14-Oct	1	2.12
15-Oct	1	2.14

16-Oct	1	2.18
17-Oct	1	2.21
18-Oct	1	2.32
19-Oct	1	2.16
20-Oct	1	2.10
21-Oct	1	2.15
22-Oct	1	2.06
23-Oct	1	2.05
24-Oct	1	2.09
25-Oct	1	2.16
26-Oct	1	2.15
27-Oct	1	2.10
28-Oct	1	2.10
29-Oct	1	2.09
30-Oct	1	2.13
31-Oct	1	2.22
1-Nov	1	2.67
2-Nov	1	2.66
3-Nov	1	2.65
4-Nov	1	2.65
5-Nov	1	2.66
6-Nov	1	2.52
7-Nov	1	2.58
8-Nov	1	2.73
9-Nov	1	2.58
10-Nov	1	2.56
11-Nov	1	2.59
12-Nov	1	2.59
13-Nov	1	2.58
14-Nov	1	2.52
15-Nov	1	2.51
16-Nov	1	2.56
17-Nov	1	2.53
18-Nov	1	2.57
19-Nov	1	2.57
20-Nov	1	2.59
21-Nov	1	2.66
22-Nov	1	2.72
23-Nov	1	2.61
24-Nov	1	2.58
25-Nov	1	2.50
26-Nov	1	2.50
27-Nov	1	2.33
28-Nov	1	2.44
29-Nov	1	2.52
30-Nov	1	2.60
1-Dec	1	2.66
2-Dec	1	2.66
3-Dec	1	2.63

4-Dec	1	2.60
5-Dec	1	2.69
6-Dec	1	2.65
7-Dec	1	2.70
8-Dec	1	2.68
9-Dec	1	2.57
10-Dec	1	2.58
11-Dec	1	2.58
12-Dec	1	2.57
13-Dec	1	2.58
14-Dec	1	2.57
15-Dec	1	2.54
16-Dec	1	2.51
17-Dec	1	2.53
18-Dec	1	2.51
19-Dec	1	2.49
20-Dec	1	2.46
21-Dec	1	2.48
22-Dec	1	2.44
23-Dec	1	2.41
24-Dec	1	2.38
25-Dec	1	2.40
26-Dec	1	2.38
27-Dec	1	2.41
28-Dec	1	2.43
29-Dec	1	2.41
30-Dec	1	2.42
31-Dec	1	2.39

Existing Water Right Information

Staff has analyzed the water rights tabulation and contacted the Division Engineer Office (DEO) to identify any potential water availability problems. There are no decreed surface diversions within this reach of stream. Staff has determined that water is available for an increase appropriation on Big Beaver Creek, between the confluence with the Allen Creek to the confluence with East Beaver 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:

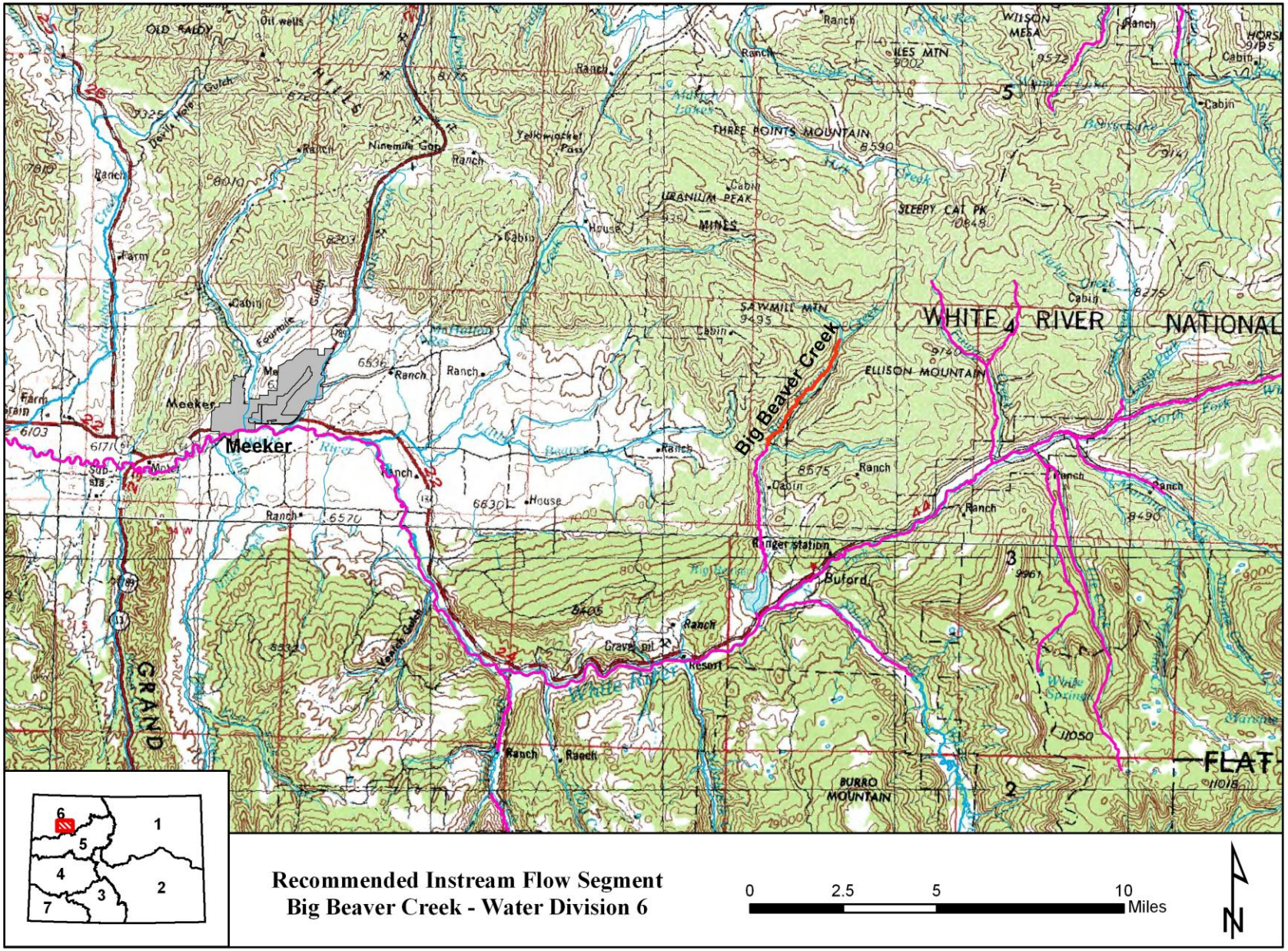
Segment: Confluence with Allen Creek to Confluence with East Beaver Creek

Upper Terminus: CONFLUNCE WITH ALLEN CREEK
(Latitude 40° 04' 37.59"N) (Longitude 107° 36' 32.86"W)
UTM North: 4439578.05 UTM East: 277522.96
SE SW S4 T1N R91W 6th PM
1500' East of the West Section Line; 73' North of the South Section Line

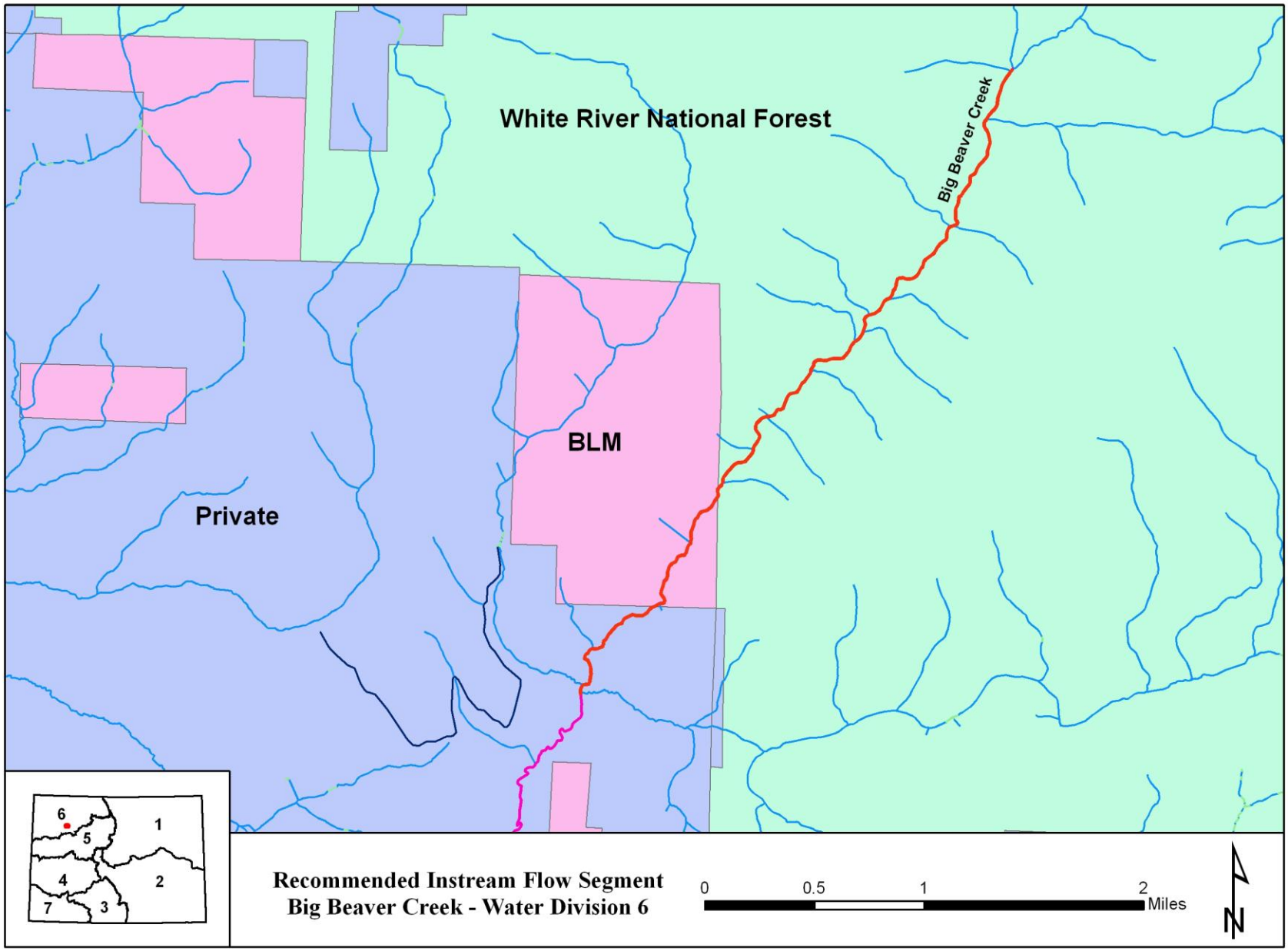
Lower Terminus: CONFLUENCE WITH EAST BEAVER CREEK
(Latitude 40° 02' 5.77"N) (Longitude 107° 38' 40.56"W)
UTM North: 4434985.96 UTM East: 274358.94
SE SW S19 T1N R91W 6th PM
1760' East of the West Section Line; 570' North of the South Section Line

Watershed: Upper White (HUC#: 14050005)
Counties: Rio Blanco
Length: 3.94 miles
USGS Quad(s): Sawmill Mountain, Fawn Creek
Existing ISF: 5-03CW276, 2.9 cfs (April 1 – July 14), 1.0 cfs (July 15 – March 31)
Flow Recommendation (increase): 2.1 cfs (April 1 – June 30)

Vicinity Map



Land Use Map


White River National Forest
Big Beaver Creek
BLM
Private
6
1
5
4
2
7
3
Recommended Instream Flow Segment
Big Beaver Creek - Water Division 6
0
0.5
1
2
Miles
N

Topographic & Water Rights Map