Stream: Morrison Creek (Upper Segment)

Executive Summary

Water Division: 6
Water District: 58
CDOW#: 21294
CWCB ID: 10/6/A-003

Segment: Confluence with Muddy Creek to Confluence with Silver Creek

Upper Terminus: CONFLUENCE WITH MUDDY CREEK
(Latitude 40° 10’ 54.50”N) (Longitude 106° 45’ 0.35”W)

Lower Terminus: CONFLUENCE WITH SILVER CREEK
(Latitude 40° 14’ 42.44”N) (Longitude 106° 47’ 10.75”W)

Watershed: Upper Yampa (HUC#: 14050001**)**
Counties: Routt
Length: 8.99 miles
USGS Quad: Green Ridge
Flow Recommendation: 3.1 cfs (April 1 – October 31)
1.4 cfs (November 1 – March 31)

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 Colorado Division of Wildlife (CDOW) recommended this segment of Morrison Creek to the CWCB for inclusion into the Instream Flow Program. Morrison 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.

Morrison Creek is approximately 21.0 miles long. It begins at an elevation of 8,400 feet and generally flows northwesterly until it terminates at the confluence with the Yampa River at an elevation of 7,200 feet. Of the 8.99 mile segment addressed by this report, approximately 23.0% of the segment is located on public lands. Morrison Creek is located within Routt County and has a total drainage area of approximately 76.52 square miles.

The subject of this report is a segment of the Morrison Creek beginning at the confluence with Sugar Creek and extending downstream to the confluence with Silver Creek. The proposed segment is located approximately 8.3 miles northeast of the town of Yampa. Staff has received only one recommendation for this segment, from the CDOW. The recommendation for this segment is discussed below.

Instream Flow Recommendation

The CDOW is recommending 3.1 cfs (April 1 – October 31) and 1.4 cfs (November 1 – March 31) based on their data collection efforts and staff's water availability analyses.

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Confluence w/ Muddy Creek	Confluence w/ Silver Creek	3.59	77%	23%

100% of the public lands are owned by the State Land Board.

Biological Data

The CDOW and Bureau of Land Management (BLM) have collected stream cross section information, natural environment data, and other data needed to quantify the instream flow needs for this reach of the Morrison Creek. Morrison Creek is classified as a medium stream (between 20 to 35 feet wide) and fishery surveys indicate the stream environment of Morrison Creek supports a naturally reproducing brook trout (*Salvelinus fontinalis*) population.

Field Survey Data

CDOW 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, four 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)
CDOW	10/17/1997	15.7	39.2 – 6.3	Out of range	Out of range
CDOW	7/25/2005	2.3	5.8 – 0.9	1.7	1.4
CDOW	6/29/2006	7.2	17.9 – 2.9	4.5	Out of range
CDOW	9/4/2007	1.1	2.7 – 0.4	Out of range	2.7

The summer flow recommendation, which met 3 of 3 criteria and is within the accuracy range of the R2CROSS model, is 3.1 cfs. The winter flow amount, which meets 2 of 3 criteria, is 2.0 cfs

but was lowered to 1.4 cfs due to water availability constraints. The winter and summer flow recommendations were derived by averaging the results of the data sets.

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 **Morrison Creek – Upper New** there was a Colorado DWR gage record of discharge on the stream. However, the gage station is upstream from the LT. The DWR gage is MORRISON CREEK ABOVE MILES RANCH, CO. (MORCRECO); it has a period of record (POR) of 1 year collected between 1990 and 1991. Because of the short POR, this gage was not useable for this analysis. It is thus necessary to describe the normal flow regime at Morrison Creek – Upper New above the LT through a "representative" gage station. The gage station selected for this purpose was SERVICE CREEK NEAR OAK CREEK, CO (USGS 09237800), a gage with an 8 year POR collected between 1965 and 1973. The gage is at an elevation of 7,000 ft above mean sea level (amsl) and has a drainage area of 38.26 mi^2. The hydrograph (plot of discharge over time) produced from this gage includes a diversion's consumptive use. However, the existence of this diversion does not preclude use of the data from the gage. To make the measured data transferable to Morrison Creek – Upper New above the LT, the consumptive portion of this diversion was added back to the measured hydrograph. The resulting "adjusted" hydrograph could then be used on Morrison Creek – Upper New above the LT by multiplying the "adjusted"

gage discharge values by an area ratio; specifically, the area of Morrison Creek – Upper New above the LT (47.25 mi^2) to Service Creek near Oak Creek, CO (38.26 mi^2). The resulting proportioned hydrograph was itself "adjusted" (decreased) to reflect the consumptive irrigation depletions of several diversions upstream of the LT. 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 Morrison Creek – Upper New is to compute the Geometric Mean of the area-prorated "adjusted" data values from the Service Creek near Oak Creek, 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

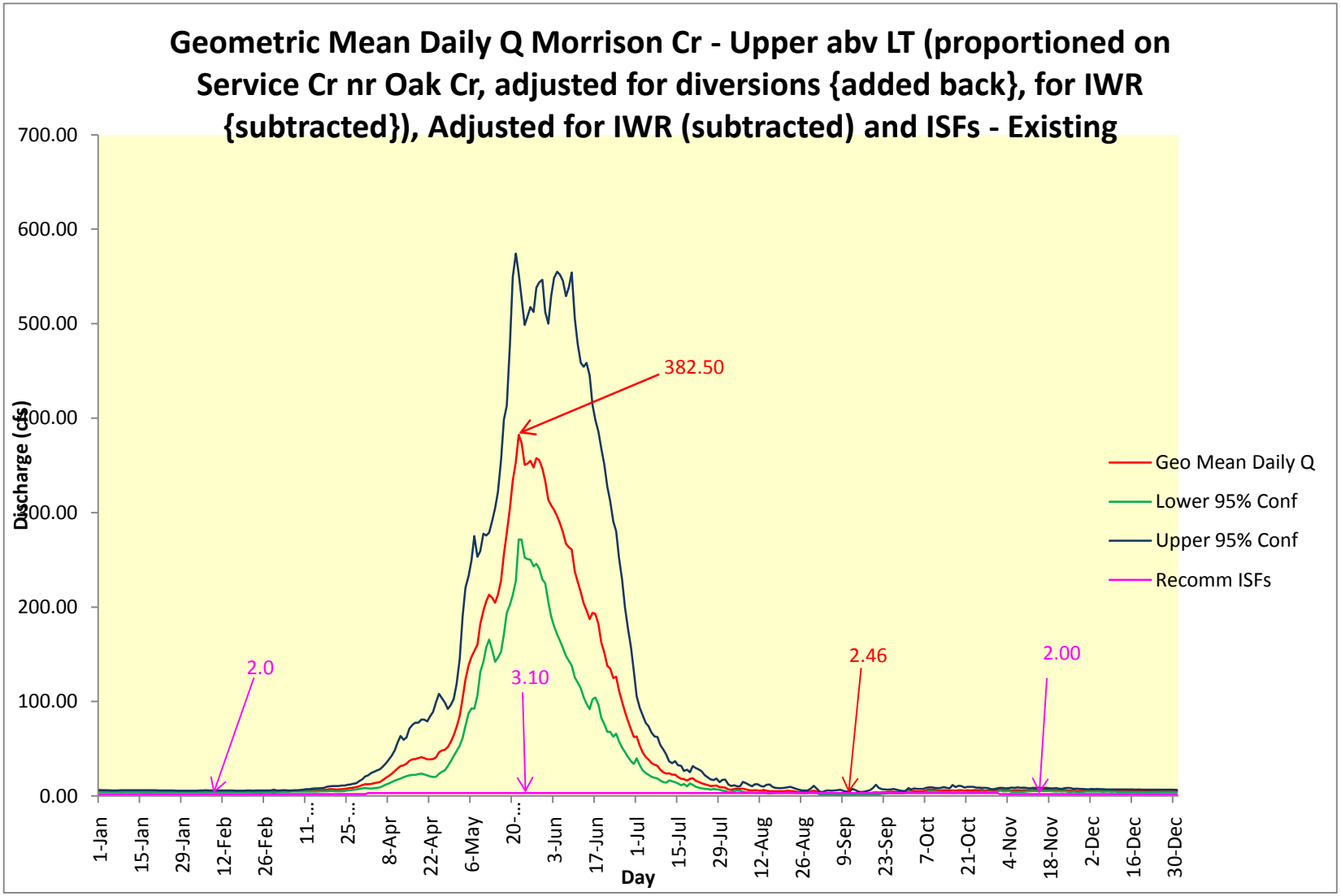

Geometric Mean Daily Q Morrison Cr - Upper abv LT (proportioned on Service Cr nr Oak Cr, adjusted for diversions {added back}, for IWR {subtracted}), Adjusted for IWR (subtracted) and ISFs - Existing
Discharge (cfs)
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
382.50
2.0
3.10
2.46
2.00
Geo Mean Daily Q
Lower 95% Conf
Upper 95% Conf
Recomm ISFs
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
11-...
25-...
8-Apr
22-Apr
6-May
20-...
3-Jun
17-Jun
1-Jul
15-Jul
29-Jul
12-Aug
26-Aug
9-Sep
23-Sep
7-Oct
21-Oct
4-Nov
18-Nov
2-Dec
16-Dec
30-Dec
Day

Table 2. Geometric Mean Discharge and Recommended Instream Flows			
Date	Existing	Recommended	Proportioned Adjusted GM (abv gage)
	ISF	ISF	Adj (-) for Irr & OoB in Morrison Cr – Upper New abv LT
1-Jan		1.4	5.15
2-Jan		1.4	5.09
3-Jan		1.4	5.05
4-Jan		1.4	5.06
5-Jan		1.4	5.03
6-Jan		1.4	4.95
7-Jan		1.4	4.93
8-Jan		1.4	4.98
9-Jan		1.4	4.92
10-Jan		1.4	5.06
11-Jan		1.4	5.18
12-Jan		1.4	5.10
13-Jan		1.4	5.13
14-Jan		1.4	5.03
15-Jan		1.4	4.85
16-Jan		1.4	4.75
17-Jan		1.4	4.70
18-Jan		1.4	4.71
19-Jan		1.4	4.88
20-Jan		1.4	4.87
21-Jan		1.4	4.90
22-Jan		1.4	4.92
23-Jan		1.4	4.90
24-Jan		1.4	4.90
25-Jan		1.4	4.90
26-Jan		1.4	4.89
27-Jan		1.4	4.89
28-Jan		1.4	4.78
29-Jan		1.4	4.80
30-Jan		1.4	4.75
31-Jan		1.4	4.77
1-Feb		1.4	4.82
2-Feb		1.4	4.85
3-Feb		1.4	4.84
4-Feb		1.4	4.86
5-Feb		1.4	4.91
6-Feb		1.4	4.97
7-Feb		1.4	4.94
8-Feb		1.4	4.89
9-Feb		1.4	4.88
10-Feb		1.4	4.80
11-Feb		1.4	4.73
12-Feb		1.4	4.79
13-Feb		1.4	4.79
14-Feb		1.4	4.81
15-Feb		1.4	4.80
16-Feb		1.4	4.73
17-Feb		1.4	4.73
18-Feb		1.4	4.75

19-Feb		1.4	4.65
20-Feb		1.4	4.71
21-Feb		1.4	4.83
22-Feb		1.4	4.64
23-Feb		1.4	4.70
24-Feb		1.4	4.69
25-Feb		1.4	4.75
26-Feb		1.4	4.88
27-Feb		1.4	4.89
28-Feb		1.4	4.89
29-Feb		1.4	4.69
1-Mar		1.4	4.97
2-Mar		1.4	4.96
3-Mar		1.4	5.09
4-Mar		1.4	5.24
5-Mar		1.4	5.05
6-Mar		1.4	5.17
7-Mar		1.4	5.25
8-Mar		1.4	5.30
9-Mar		1.4	5.40
10-Mar		1.4	5.50
11-Mar		1.4	5.67
12-Mar		1.4	5.79
13-Mar		1.4	5.99
14-Mar		1.4	6.01
15-Mar		1.4	6.10
16-Mar		1.4	6.27
17-Mar		1.4	6.43
18-Mar		1.4	6.71
19-Mar		1.4	7.06
20-Mar		1.4	7.23
21-Mar		1.4	6.96
22-Mar		1.4	6.92
23-Mar		1.4	7.17
24-Mar		1.4	7.35
25-Mar		1.4	8.01
26-Mar		1.4	8.29
27-Mar		1.4	8.87
28-Mar		1.4	9.35
29-Mar		1.4	10.30
30-Mar		1.4	11.49
31-Mar		1.4	12.48
1-Apr		3.1	12.44
2-Apr		3.1	12.76
3-Apr		3.1	13.53
4-Apr		3.1	14.07
5-Apr		3.1	14.98
6-Apr		3.1	16.78
7-Apr		3.1	19.24
8-Apr		3.1	21.19
9-Apr		3.1	23.51
10-Apr		3.1	26.36
11-Apr		3.1	29.04
12-Apr		3.1	31.59

13-Apr		3.1	32.36
14-Apr		3.1	34.04
15-Apr		3.1	37.16
16-Apr		3.1	38.68
17-Apr		3.1	39.16
18-Apr		3.1	40.04
19-Apr		3.1	41.04
20-Apr		3.1	40.29
21-Apr		3.1	38.73
22-Apr		3.1	38.72
23-Apr		3.1	39.08
24-Apr		3.1	41.03
25-Apr		3.1	46.26
26-Apr		3.1	48.07
27-Apr		3.1	49.00
28-Apr		3.1	51.74
29-Apr		3.1	57.56
30-Apr		3.1	64.23
1-May		3.1	73.02
2-May		3.1	85.02
3-May		3.1	103.46
4-May		3.1	123.07
5-May		3.1	138.18
6-May		3.1	147.21
7-May		3.1	153.46
8-May		3.1	160.13
9-May		3.1	181.97
10-May		3.1	195.92
11-May		3.1	206.29
12-May		3.1	213.17
13-May		3.1	209.75
14-May		3.1	204.47
15-May		3.1	213.14
16-May		3.1	228.09
17-May		3.1	255.85
18-May		3.1	278.39
19-May		3.1	304.59
20-May		3.1	333.63
21-May		3.1	353.74
22-May		3.1	382.50
23-May		3.1	373.84
24-May		3.1	350.38
25-May		3.1	352.02
26-May		3.1	354.78
27-May		3.1	347.69
28-May		3.1	357.67
29-May		3.1	355.40
30-May		3.1	346.80
31-May		3.1	333.34
1-Jun		3.1	313.32
2-Jun		3.1	307.62
3-Jun		3.1	303.01
4-Jun		3.1	296.05
5-Jun		3.1	288.46

6-Jun		3.1	279.42
7-Jun		3.1	266.83
8-Jun		3.1	263.30
9-Jun		3.1	261.02
10-Jun		3.1	237.53
11-Jun		3.1	226.73
12-Jun		3.1	215.47
13-Jun		3.1	204.06
14-Jun		3.1	196.55
15-Jun		3.1	187.26
16-Jun		3.1	193.71
17-Jun		3.1	192.70
18-Jun		3.1	181.80
19-Jun		3.1	162.29
20-Jun		3.1	152.26
21-Jun		3.1	137.80
22-Jun		3.1	134.95
23-Jun		3.1	124.77
24-Jun		3.1	126.23
25-Jun		3.1	111.70
26-Jun		3.1	99.65
27-Jun		3.1	89.12
28-Jun		3.1	79.66
29-Jun		3.1	70.58
30-Jun		3.1	62.47
1-Jul		3.1	63.08
2-Jul		3.1	53.15
3-Jul		3.1	46.12
4-Jul		3.1	41.19
5-Jul		3.1	38.45
6-Jul		3.1	35.03
7-Jul		3.1	33.00
8-Jul		3.1	31.92
9-Jul		3.1	27.87
10-Jul		3.1	25.01
11-Jul		3.1	23.56
12-Jul		3.1	23.98
13-Jul		3.1	22.57
14-Jul		3.1	22.52
15-Jul		3.1	20.01
16-Jul		3.1	18.14
17-Jul		3.1	18.02
18-Jul		3.1	16.33
19-Jul		3.1	18.05
20-Jul		3.1	18.81
21-Jul		3.1	16.01
22-Jul		3.1	14.95
23-Jul		3.1	13.56
24-Jul		3.1	12.28
25-Jul		3.1	11.65
26-Jul		3.1	10.34
27-Jul		3.1	10.84
28-Jul		3.1	11.01
29-Jul		3.1	9.42

30-Jul		3.1	9.21
31-Jul		3.1	8.94
1-Aug		3.1	6.82
2-Aug		3.1	6.66
3-Aug		3.1	7.50
4-Aug		3.1	7.73
5-Aug		3.1	7.46
6-Aug		3.1	7.82
7-Aug		3.1	6.95
8-Aug		3.1	6.03
9-Aug		3.1	5.67
10-Aug		3.1	5.97
11-Aug		3.1	5.80
12-Aug		3.1	5.56
13-Aug		3.1	6.21
14-Aug		3.1	5.57
15-Aug		3.1	5.08
16-Aug		3.1	5.09
17-Aug		3.1	4.90
18-Aug		3.1	4.88
19-Aug		3.1	4.98
20-Aug		3.1	4.93
21-Aug		3.1	5.39
22-Aug		3.1	5.34
23-Aug		3.1	4.88
24-Aug		3.1	4.43
25-Aug		3.1	4.24
26-Aug		3.1	4.05
27-Aug		3.1	3.83
28-Aug		3.1	3.99
29-Aug		3.1	4.94
30-Aug		3.1	5.41
31-Aug		3.1	4.73
1-Sep		3.1	2.56
2-Sep		3.1	2.70
3-Sep		3.1	3.06
4-Sep		3.1	3.15
5-Sep		3.1	2.89
6-Sep		3.1	2.74
7-Sep		3.1	2.54
8-Sep		3.1	2.58
9-Sep		3.1	2.63
10-Sep		3.1	2.57
11-Sep		3.1	2.46
12-Sep		3.1	3.10
13-Sep		3.1	3.04
14-Sep		3.1	2.68
15-Sep		3.1	2.56
16-Sep		3.1	2.75
17-Sep		3.1	3.06
18-Sep		3.1	3.18
19-Sep		3.1	3.52
20-Sep		3.1	4.00
21-Sep		3.1	3.52

22-Sep		3.1	3.88
23-Sep		3.1	3.88
24-Sep		3.1	4.13
25-Sep		3.1	4.55
26-Sep		3.1	4.55
27-Sep		3.1	4.20
28-Sep		3.1	3.93
29-Sep		3.1	3.83
30-Sep		3.1	4.00
1-Oct		3.1	6.56
2-Oct		3.1	4.96
3-Oct		3.1	5.17
4-Oct		3.1	4.83
5-Oct		3.1	4.76
6-Oct		3.1	5.06
7-Oct		3.1	5.77
8-Oct		3.1	6.81
9-Oct		3.1	6.68
10-Oct		3.1	6.35
11-Oct		3.1	6.02
12-Oct		3.1	5.73
13-Oct		3.1	6.00
14-Oct		3.1	5.84
15-Oct		3.1	5.45
16-Oct		3.1	5.82
17-Oct		3.1	5.43
18-Oct		3.1	6.20
19-Oct		3.1	5.99
20-Oct		3.1	5.42
21-Oct		3.1	6.10
22-Oct		3.1	5.88
23-Oct		3.1	6.02
24-Oct		3.1	6.00
25-Oct		3.1	5.96
26-Oct		3.1	6.22
27-Oct		3.1	5.41
28-Oct		3.1	6.19
29-Oct		3.1	5.67
30-Oct		3.1	5.43
31-Oct		3.1	5.96
1-Nov		1.4	6.94
2-Nov		1.4	6.39
3-Nov		1.4	6.16
4-Nov		1.4	6.47
5-Nov		1.4	5.91
6-Nov		1.4	6.02
7-Nov		1.4	6.02
8-Nov		1.4	5.88
9-Nov		1.4	5.96
10-Nov		1.4	6.19
11-Nov		1.4	6.11
12-Nov		1.4	6.44
13-Nov		1.4	6.61
14-Nov		1.4	6.43

15-Nov		1.4	6.53
16-Nov		1.4	6.66
17-Nov		1.4	6.64
18-Nov		1.4	6.42
19-Nov		1.4	6.20
20-Nov		1.4	6.04
21-Nov		1.4	6.08
22-Nov		1.4	5.85
23-Nov		1.4	6.29
24-Nov		1.4	5.79
25-Nov		1.4	5.52
26-Nov		1.4	5.75
27-Nov		1.4	5.32
28-Nov		1.4	5.32
29-Nov		1.4	5.42
30-Nov		1.4	5.65
1-Dec		1.4	5.67
2-Dec		1.4	5.70
3-Dec		1.4	5.73
4-Dec		1.4	5.75
5-Dec		1.4	5.63
6-Dec		1.4	5.57
7-Dec		1.4	5.60
8-Dec		1.4	5.57
9-Dec		1.4	5.50
10-Dec		1.4	5.54
11-Dec		1.4	5.20
12-Dec		1.4	5.14
13-Dec		1.4	5.33
14-Dec		1.4	5.25
15-Dec		1.4	5.20
16-Dec		1.4	5.23
17-Dec		1.4	5.14
18-Dec		1.4	5.03
19-Dec		1.4	5.10
20-Dec		1.4	5.15
21-Dec		1.4	5.05
22-Dec		1.4	5.08
23-Dec		1.4	5.14
24-Dec		1.4	5.18
25-Dec		1.4	5.22
26-Dec		1.4	5.28
27-Dec		1.4	5.28
28-Dec		1.4	5.29
29-Dec		1.4	5.25
30-Dec		1.4	5.14
31-Dec		1.4	5.05

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 four decreed surface diversion within this reach of stream: Balanced Rock Ditch (3.0 cfs, 1945 appropriation), Alamo Ditch No. 1 (1.25 cfs , 1907 appropriation), Silver View Ditch (1.65 cfs, 1939 appropriation) and Dequine Ditch (1.25 cfs, 1991 appropriation). Staff has determined that water is available for appropriation on Morrison Creek, between the confluence with Muddy Creek and the confluence with Silver 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:

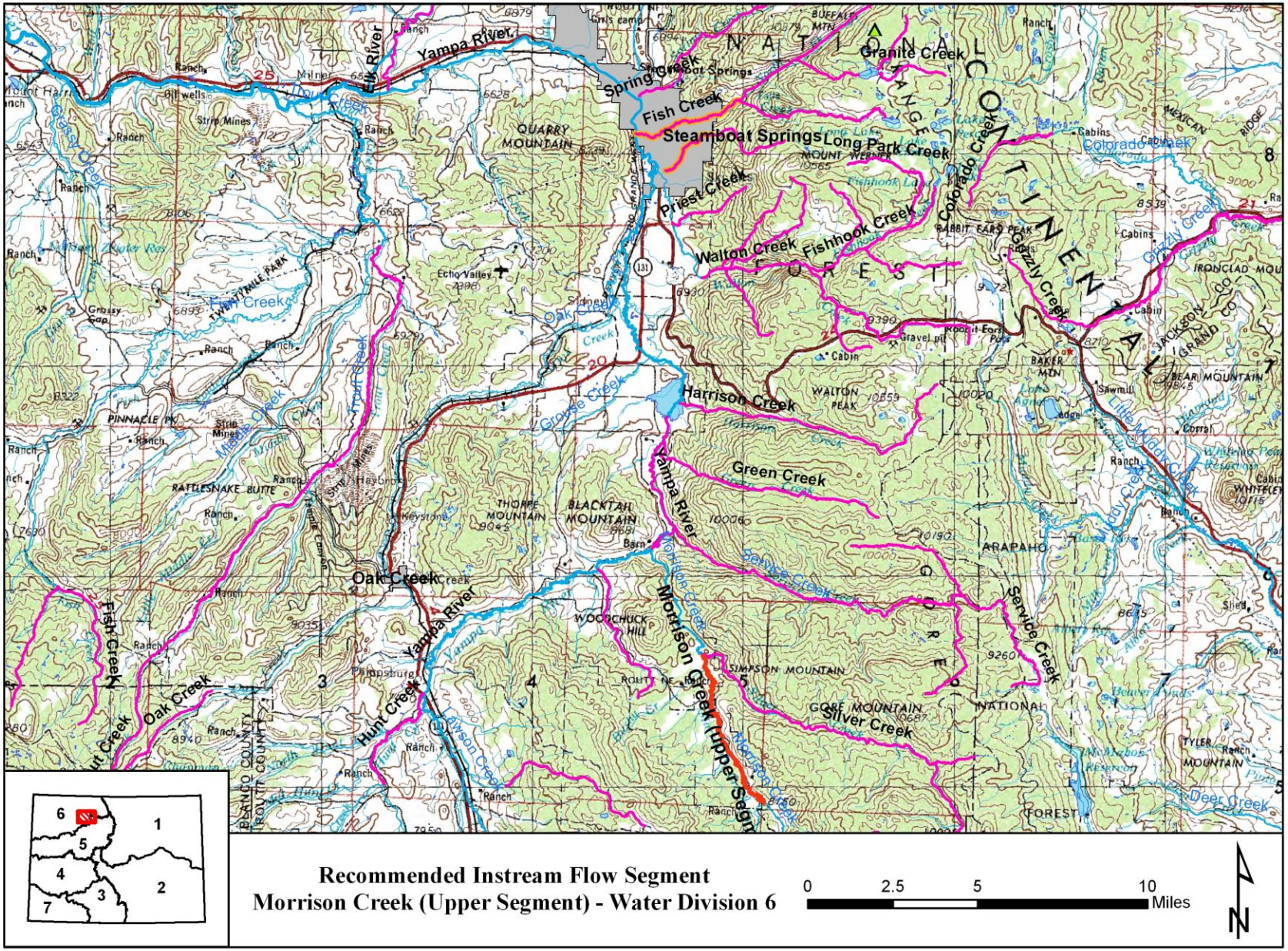
Segment: Confluence with Muddy Creek to Confluence with Silver Creek

Upper Terminus: CONFLUENCE WITH MUDDY CREEK
(Latitude 40° 10' 54.50"N) (Longitude 106° 45' 0.35"W)
UTM North: 4449404.70 UTM East: 351005.19
SE SE S36 T3N R84W 8th PM
70' West of the East Section Line; 740' North of the South Section Line

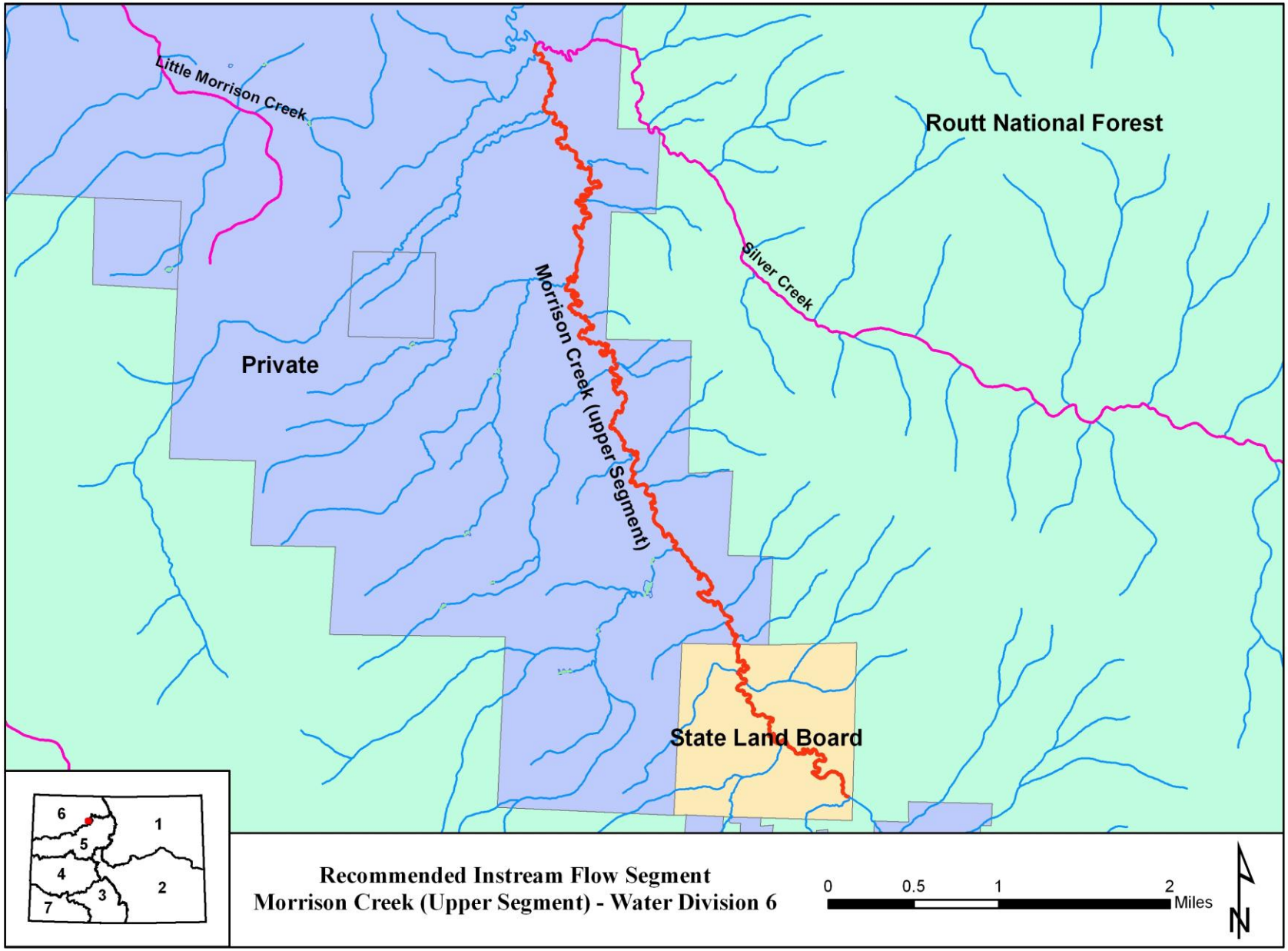
Lower Terminus: CONFLUENCE WITH SILVER CREEK
(Latitude 40° 14' 42.44"N) (Longitude 106° 47' 10.75"W)
UTM North: 4456494.46 UTM East: 348062.75
NW SW S11 T3N R84W 6th PM
15' East of the West Section Line; 2550' South of the North Section Line

Watershed: Upper Yampa (HUC#: 14050001**)**
Counties: Routt
Length: 8.99 miles
USGS Quad: Green Ridge
Flow Recommendation: 3.1 cfs (April 1 – October 31)
1.4 cfs (November 1 – March 31)

Vicinity Map



Land Use Map


Little Morrison Creek
Routt National Forest
Silver Creek
Morrison Creek (upper Segment)
Private
State Land Board
6
1
5
4
2
3
7
Recommended Instream Flow Segment
Morrison Creek (Upper Segment) - Water Division 6
0
0.5
1
2
Miles
N

Topographic and Water Rights Map