<u>Stream:</u> North Fork Tabeguache Creek

Executive Summary

Water Division: 4
Water District: 60
CDOW#: 43492
CWCB ID: 10/4/A-008

Segment: HEADWATERS TO THE CONFLUENCE WITH TABEGUACHE CREEK
Upper Terminus: HEADWATERS IN THE VICINTY OF
(Latitude 38° 27’ 14.47”N) (Longitude 108° 31’ 49.57”W)

Lower Terminus: CONFLUENCE WITH TABEGUACHE CREEK
(Latitude 38° 22’ 43.49”N) (Longitude 108° 27’ 43.97”W)

Watershed: San Miguel (HUC#: 14030003)
Counties: Montrose
Length: 9.67 miles
USGS Quad(s): Starvation Point, Windy Point
Flow Recommendation: 2.3 cfs (May 1 – June 30)
1.4 cfs (July 1 – August 14)
0.5 cfs (August 15 – March 31)
1.4 cfs (April 1 – April 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 ISF Rule 5i.

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 U.S. Forest Service (USFS) recommended this segment of North Fork (NF) Tabeguache Creek to the CWCB for inclusion into the Instream Flow Program. NF Tabeguache 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.

NF Tabeguache Creek originates midway along the Uncompahgre Plateau at an elevation of 9,340 feet and flows generally in a southeasterly direction through Uncompahgre National Forest for 9.67 miles as it drops to an elevation of 6,350 feet at its confluence with Tabeguache Creek. One hundred percent of the land on the 9.67 mile segment addressed by this report is publicly owned. NF Tabeguache is located within Montrose County and the total drainage area of the creek is approximately 18.2 square miles.

The subject of this report is a segment of NF Tabeguache Creek, beginning at headwaters and extending downstream to confluence with Tabeguache Creek. The proposed segment is located approximately 8.5 miles northwest of Nucla. Staff has received one recommendation for this segment, from the USFS. The recommendation for this segment is discussed below.

Instream Flow Recommendation

The USFS recommended 2.3 cfs (May 1 – June 30), 1.4 cfs (July 1 – August 14), 0.50 cfs (August 15 – March 31) and 1.4 cfs (April 1 – April 30). These recommendations were based on data collection efforts on October 6, 1993, June 21, 1994 and July 17, 2009, as well as USFS water availability analyses. The USFS also used CWCB staff water availability analyses and professional judgment for their final recommendation. CWCB staff subsequently reduced the USFS recommendation for the period of August 15 – March 31 to 0.5 cfs because its analysis indicated that water may not be available in the amounts recommended by the USFS.

Land Status Review

Upper Terminus	Lower Terminus	Total Length (miles)	Land Ownership	
			% Private	% Public
Headwaters	Confluence with Tabeguache Creek	9.67	0%	100%

100% of the public lands are owned by the USFS.

Biological Data

Fisheries surveys conducted on the NF Tabeguache in 2008 indicate that the stream environment supports self-sustaining populations of rainbow trout. Low flows are common in the late summer and fall, and may be a limiting factor for fish production and movement during this time. The stream channel provides good pool habitat during summer and winter low flows. Despite these natural flow limitations in the summer and winter seasons, the stream does support a fully functional riparian community, and suitable fish habitat to support the long-term persistence of cold water fish. The NF Tabeguache has been selected as a potential Colorado River cutthroat trout reclamation stream by both the Colorado Division of Wildlife and the U.S. Forest Service. The presence of several large natural barriers makes this stream an ideal location to isolate cutthroat from other salmonids that pose threats of competition or hybridization.

Field Survey Data

USFS 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 will result in the maintenance of aquatic habitat in pools and runs 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)
USFS & CDOW	10/6/1993	0.87	3.0 – 0.5	Out of Range	2.2
USFS	6/21/1994	1.2	2.2 – 0.3	Out of Range	1.65
USFS	7/17/2009	0.95	2.38 – 0.38	2.0	1.5
USFS	7/17/2009	0.96	2.4 – 0.38	2.6	1.3

CDOW= Colorado Division of Wildlife

The summer flow recommendation, which meets 3 of 3 criteria and is within the accuracy range of the R2CROSS model, is 2.3 cfs. The winter flow recommendation, which meets 2 of 3 criteria and is within the accuracy range of the R2CROSS model is 1.7 cfs. Due to water availability constraints the winter flow recommendation has been reduced to 0.5 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. 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 North Fork Tabeguache Creek, no such gage is available at the LT. In fact, there is no gage on North Fork Tabeguache Creek. It is thus necessary to describe the normal flow regime at North Fork Tabeguache Creek above the LT through a "representative" gage station. The gage station selected for this purpose was SAN MIGUEL RIVER @

NATURITA (USGS 09175500) (less San Miguel River nr Nucla USGS 09174000). The gage is at an elevation of 5,392.85 ft above mean sea level (amsl) and has a drainage area[1] of 420 mi^2. The hydrograph (plot of discharge over time) produced from this gage includes the effects of an upstream transbasin diversion and many within the basin. The transbasin diversion was 100% consumptive to the basin while the remaining diversions were only partially consumptive. To make the measured data from San Miguel @ Naturita Creek transferrable to North Fork Tabeguache Creek above the LT, the diversions were added back to the measured representative hydrograph. The resulting "adjusted" hydrograph could then be used on North Fork Tabeguache Creek above the LT by multiplying the "adjusted" hydrograph by an area ratio; specifically, the area of North Fork Tabeguache Creek above the LT (18.34 mi^2 above the LT) to San Miguel R @ Naturita (420 mi^2 above the gage). Next, the resulting proportioned "adjusted" hydrograph would itself be "adjusted" (decreased) to reflect the existing depletions on North Fork Tabeguache Creek above the LT resulting from upstream consumptive irrigation uses and transbasin diversions. The final hydrograph 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 North Fork Tabeguache Creek is to compute the Geometric Mean of the area-prorated "adjusted" data values from the San Miguel @ Naturita Creek hydrograph. This step is of value because of the inherent statistical limitations 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 limited, 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.

[1] Subtracting the area of San Miguel R nr Nucla from the area of San Miguel R @ Naturita

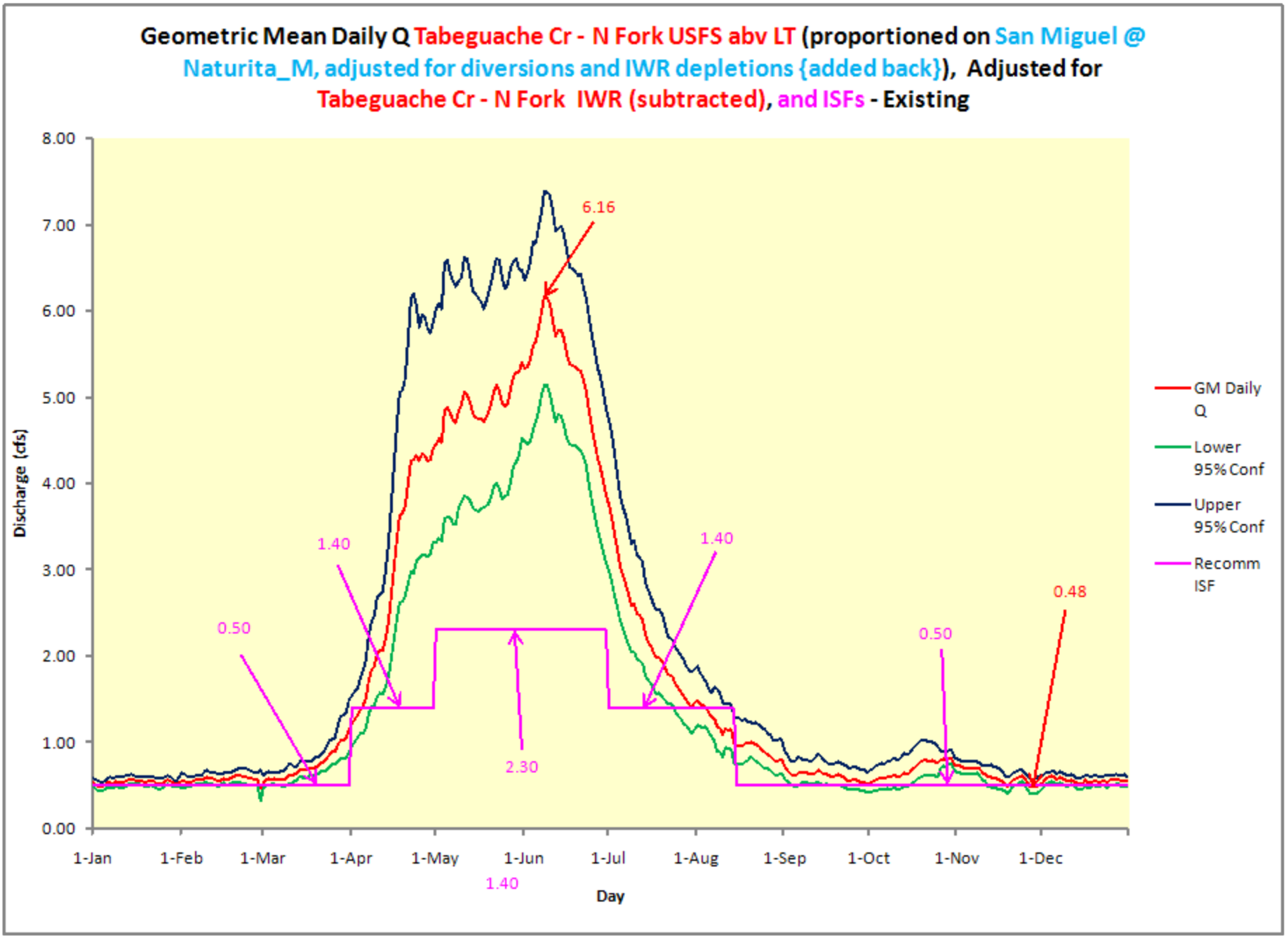

Geometric Mean Daily Q Tabeguache Cr - N Fork USFS abv LT (proportioned on San Miguel @ Naturita_M, adjusted for diversions and IWR depletions {added back}), Adjusted for Tabeguache Cr - N Fork IWR (subtracted), and ISFs - Existing
Discharge (cfs)
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
6.16
1.40
1.40
0.50
2.30
0.50
0.48
1.40
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
GM Daily Q
Lower 95% Conf
Upper 95% Conf
Recomm ISF

Table 2. Geometric Mean Existing Cond (with IWR subtracted) Tabeguache Cr N Fork USFS abv LT Prop on San Miguel R @ Naturita_M abv gage **Baseline Cond** (with San Mig IWR consumption added back)				
Date	**GM (abv LT) Prorated by 4.37%**	**Lower 95% Conf Prorated by 4.37%**	**Upper 95% Conf Prorated by 4.37%**	**Recommended ISF (cfs)**
1-Jan	0.53	0.48	0.59	0.50
2-Jan	0.50	0.45	0.56	0.50
3-Jan	0.49	0.43	0.55	0.50
4-Jan	0.48	0.44	0.54	0.50
5-Jan	0.50	0.45	0.55	0.50
6-Jan	0.52	0.48	0.58	0.50
7-Jan	0.53	0.47	0.59	0.50
8-Jan	0.52	0.46	0.58	0.50
9-Jan	0.55	0.50	0.60	0.50
10-Jan	0.53	0.47	0.59	0.50
11-Jan	0.52	0.46	0.60	0.50
12-Jan	0.54	0.48	0.61	0.50
13-Jan	0.56	0.51	0.62	0.50
14-Jan	0.57	0.52	0.62	0.50
15-Jan	0.56	0.51	0.61	0.50
16-Jan	0.56	0.51	0.60	0.50
17-Jan	0.55	0.51	0.60	0.50
18-Jan	0.55	0.51	0.60	0.50
19-Jan	0.54	0.49	0.60	0.50
20-Jan	0.54	0.49	0.60	0.50
21-Jan	0.55	0.50	0.60	0.50
22-Jan	0.54	0.49	0.60	0.50
23-Jan	0.52	0.47	0.58	0.50
24-Jan	0.51	0.45	0.57	0.50
25-Jan	0.52	0.47	0.58	0.50
26-Jan	0.55	0.50	0.59	0.50
27-Jan	0.56	0.52	0.61	0.50
28-Jan	0.55	0.51	0.59	0.50
29-Jan	0.52	0.48	0.57	0.50
30-Jan	0.51	0.48	0.55	0.50
31-Jan	0.54	0.48	0.59	0.50
1-Feb	0.55	0.47	0.64	0.50
2-Feb	0.54	0.47	0.63	0.50
3-Feb	0.53	0.48	0.60	0.50
4-Feb	0.53	0.48	0.59	0.50
5-Feb	0.55	0.50	0.60	0.50
6-Feb	0.57	0.52	0.61	0.50
7-Feb	0.56	0.52	0.62	0.50

8-Feb	0.56	0.51	0.61	0.50
9-Feb	0.59	0.53	0.66	0.50
10-Feb	0.60	0.53	0.68	0.50
11-Feb	0.58	0.52	0.65	0.50
12-Feb	0.58	0.51	0.65	0.50
13-Feb	0.57	0.51	0.64	0.50
14-Feb	0.55	0.49	0.62	0.50
15-Feb	0.57	0.51	0.63	0.50
16-Feb	0.58	0.53	0.64	0.50
17-Feb	0.57	0.50	0.64	0.50
18-Feb	0.58	0.51	0.65	0.50
19-Feb	0.59	0.53	0.67	0.50
20-Feb	0.61	0.54	0.68	0.50
21-Feb	0.61	0.54	0.69	0.50
22-Feb	0.61	0.53	0.69	0.50
23-Feb	0.60	0.52	0.70	0.50
24-Feb	0.59	0.51	0.69	0.50
25-Feb	0.58	0.51	0.67	0.50
26-Feb	0.58	0.51	0.66	0.50
27-Feb	0.57	0.50	0.65	0.50
28-Feb	0.56	0.49	0.64	0.50
1-Mar	0.47	0.33	0.68	0.50
2-Mar	0.54	0.47	0.61	0.50
3-Mar	0.57	0.50	0.64	0.50
4-Mar	0.57	0.50	0.66	0.50
5-Mar	0.57	0.51	0.64	0.50
6-Mar	0.57	0.51	0.64	0.50
7-Mar	0.57	0.50	0.65	0.50
8-Mar	0.57	0.49	0.66	0.50
9-Mar	0.56	0.48	0.67	0.50
10-Mar	0.59	0.50	0.69	0.50
11-Mar	0.62	0.52	0.74	0.50
12-Mar	0.62	0.52	0.74	0.50
13-Mar	0.63	0.55	0.71	0.50
14-Mar	0.64	0.57	0.73	0.50
15-Mar	0.69	0.61	0.78	0.50
16-Mar	0.67	0.58	0.77	0.50
17-Mar	0.67	0.59	0.78	0.50
18-Mar	0.69	0.61	0.78	0.50
19-Mar	0.69	0.61	0.78	0.50
20-Mar	0.71	0.62	0.82	0.50
21-Mar	0.72	0.63	0.83	0.50
22-Mar	0.75	0.66	0.86	0.50
23-Mar	0.77	0.67	0.88	0.50
24-Mar	0.81	0.67	0.96	0.50

25-Mar	0.85	0.70	1.03	0.50
26-Mar	0.88	0.75	1.04	0.50
27-Mar	0.89	0.75	1.06	0.50
28-Mar	0.97	0.78	1.20	0.50
29-Mar	1.02	0.80	1.29	0.50
30-Mar	1.03	0.80	1.31	0.50
31-Mar	1.06	0.83	1.35	0.50
1-Apr	1.15	0.89	1.48	0.50
2-Apr	1.21	0.96	1.54	1.40
3-Apr	1.27	1.01	1.59	1.40
4-Apr	1.31	1.05	1.63	1.40
5-Apr	1.38	1.09	1.74	1.40
6-Apr	1.42	1.11	1.83	1.40
7-Apr	1.51	1.17	1.96	1.40
8-Apr	1.73	1.33	2.24	1.40
9-Apr	1.84	1.41	2.41	1.40
10-Apr	1.88	1.43	2.48	1.40
11-Apr	2.02	1.53	2.67	1.40
12-Apr	2.06	1.57	2.71	1.40
13-Apr	2.07	1.56	2.75	1.40
14-Apr	2.21	1.64	2.99	1.40
15-Apr	2.39	1.74	3.28	1.40
16-Apr	2.70	1.96	3.73	1.40
17-Apr	3.03	2.19	4.21	1.40
18-Apr	3.35	2.42	4.65	1.40
19-Apr	3.63	2.61	5.06	1.40
20-Apr	3.65	2.63	5.07	1.40
21-Apr	3.75	2.70	5.22	1.40
22-Apr	4.00	2.85	5.65	1.40
23-Apr	4.27	2.98	6.13	1.40
24-Apr	4.27	2.96	6.19	1.40
25-Apr	4.33	3.11	6.06	1.40
26-Apr	4.26	3.14	5.80	1.40
27-Apr	4.34	3.17	5.96	1.40
28-Apr	4.32	3.17	5.92	1.40
29-Apr	4.26	3.15	5.78	1.40
30-Apr	4.27	3.19	5.74	1.40
1-May	4.40	3.32	5.87	1.40
2-May	4.46	3.31	6.02	2.30
3-May	4.52	3.36	6.09	2.30
4-May	4.47	3.33	6.01	2.30
5-May	4.85	3.59	6.56	2.30
6-May	4.87	3.61	6.59	2.30
7-May	4.81	3.61	6.42	2.30
8-May	4.73	3.53	6.35	2.30

9-May	4.70	3.52	6.28	2.30
10-May	4.85	3.72	6.34	2.30
11-May	4.91	3.79	6.37	2.30
12-May	5.05	3.86	6.62	2.30
13-May	5.03	3.85	6.60	2.30
14-May	4.94	3.80	6.44	2.30
15-May	4.81	3.72	6.23	2.30
16-May	4.77	3.68	6.20	2.30
17-May	4.75	3.68	6.15	2.30
18-May	4.75	3.71	6.10	2.30
19-May	4.72	3.72	6.02	2.30
20-May	4.82	3.76	6.18	2.30
21-May	4.91	3.83	6.31	2.30
22-May	5.06	3.96	6.47	2.30
23-May	5.13	4.00	6.61	2.30
24-May	5.08	3.93	6.58	2.30
25-May	4.93	3.82	6.37	2.30
26-May	4.89	3.85	6.24	2.30
27-May	4.93	3.87	6.31	2.30
28-May	5.10	4.02	6.49	2.30
29-May	5.25	4.19	6.58	2.30
30-May	5.29	4.25	6.60	2.30
31-May	5.29	4.32	6.48	2.30
1-Jun	5.41	4.52	6.47	2.30
2-Jun	5.33	4.49	6.35	2.30
3-Jun	5.35	4.46	6.44	2.30
4-Jun	5.43	4.49	6.57	2.30
5-Jun	5.60	4.62	6.80	2.30
6-Jun	5.65	4.71	6.79	2.30
7-Jun	5.81	4.84	6.98	2.30
8-Jun	5.98	5.02	7.14	2.30
9-Jun	6.16	5.14	7.39	2.30
10-Jun	6.15	5.14	7.38	2.30
11-Jun	6.08	5.05	7.34	2.30
12-Jun	5.89	4.86	7.16	2.30
13-Jun	5.71	4.72	6.93	2.30
14-Jun	5.77	4.80	6.95	2.30
15-Jun	5.77	4.78	6.97	2.30
16-Jun	5.68	4.69	6.89	2.30
17-Jun	5.50	4.52	6.70	2.30
18-Jun	5.38	4.46	6.50	2.30
19-Jun	5.37	4.45	6.49	2.30
20-Jun	5.35	4.44	6.47	2.30
21-Jun	5.31	4.41	6.40	2.30
22-Jun	5.30	4.38	6.43	2.30

23-Jun	5.19	4.31	6.26	2.30
24-Jun	5.07	4.19	6.14	2.30
25-Jun	4.83	3.97	5.90	2.30
26-Jun	4.64	3.79	5.71	2.30
27-Jun	4.48	3.63	5.54	2.30
28-Jun	4.29	3.47	5.33	2.30
29-Jun	4.18	3.34	5.24	2.30
30-Jun	4.02	3.21	5.06	2.30
1-Jul	3.85	3.06	4.87	2.30
2-Jul	3.75	2.99	4.73	1.40
3-Jul	3.60	2.86	4.57	1.40
4-Jul	3.41	2.69	4.35	1.40
5-Jul	3.23	2.57	4.10	1.40
6-Jul	3.04	2.40	3.86	1.40
7-Jul	2.93	2.32	3.73	1.40
8-Jul	2.83	2.22	3.63	1.40
9-Jul	2.71	2.12	3.47	1.40
10-Jul	2.58	2.04	3.30	1.40
11-Jul	2.61	2.05	3.34	1.40
12-Jul	2.49	1.97	3.17	1.40
13-Jul	2.46	1.95	3.13	1.40
14-Jul	2.42	1.92	3.08	1.40
15-Jul	2.24	1.78	2.85	1.40
16-Jul	2.17	1.71	2.76	1.40
17-Jul	2.12	1.68	2.69	1.40
18-Jul	2.02	1.60	2.58	1.40
19-Jul	1.97	1.55	2.53	1.40
20-Jul	1.99	1.57	2.54	1.40
21-Jul	1.94	1.53	2.48	1.40
22-Jul	1.86	1.49	2.35	1.40
23-Jul	1.79	1.45	2.22	1.40
24-Jul	1.77	1.44	2.19	1.40
25-Jul	1.68	1.36	2.11	1.40
26-Jul	1.63	1.31	2.07	1.40
27-Jul	1.59	1.28	2.01	1.40
28-Jul	1.54	1.22	1.97	1.40
29-Jul	1.49	1.19	1.89	1.40
30-Jul	1.44	1.15	1.83	1.40
31-Jul	1.41	1.11	1.82	1.40
1-Aug	1.46	1.16	1.86	1.40
2-Aug	1.50	1.20	1.88	1.40
3-Aug	1.45	1.18	1.80	1.40
4-Aug	1.42	1.17	1.76	1.40
5-Aug	1.41	1.18	1.71	1.40
6-Aug	1.34	1.12	1.62	1.40

7-Aug	1.29	1.07	1.58	1.40
8-Aug	1.28	1.02	1.63	1.40
9-Aug	1.19	0.89	1.62	1.40
10-Aug	1.17	0.90	1.57	1.40
11-Aug	1.08	0.83	1.46	1.40
12-Aug	1.16	0.95	1.45	1.40
13-Aug	1.14	0.92	1.44	1.40
14-Aug	1.15	0.93	1.44	1.40
15-Aug	0.98	0.75	1.32	1.40
16-Aug	0.96	0.74	1.28	0.50
17-Aug	0.95	0.74	1.28	0.50
18-Aug	0.95	0.74	1.25	0.50
19-Aug	0.98	0.77	1.28	0.50
20-Aug	0.98	0.79	1.24	0.50
21-Aug	1.01	0.83	1.23	0.50
22-Aug	0.98	0.81	1.22	0.50
23-Aug	0.97	0.77	1.24	0.50
24-Aug	0.95	0.77	1.19	0.50
25-Aug	0.91	0.73	1.16	0.50
26-Aug	0.89	0.70	1.16	0.50
27-Aug	0.86	0.69	1.11	0.50
28-Aug	0.84	0.67	1.08	0.50
29-Aug	0.80	0.65	1.02	0.50
30-Aug	0.78	0.62	1.02	0.50
31-Aug	0.80	0.63	1.04	0.50
1-Sep	0.81	0.65	1.03	0.50
2-Sep	0.72	0.58	0.91	0.50
3-Sep	0.68	0.55	0.86	0.50
4-Sep	0.64	0.52	0.80	0.50
5-Sep	0.62	0.50	0.77	0.50
6-Sep	0.61	0.49	0.79	0.50
7-Sep	0.64	0.51	0.83	0.50
8-Sep	0.65	0.53	0.81	0.50
9-Sep	0.64	0.53	0.80	0.50
10-Sep	0.65	0.53	0.81	0.50
11-Sep	0.62	0.51	0.78	0.50
12-Sep	0.64	0.52	0.79	0.50
13-Sep	0.65	0.53	0.82	0.50
14-Sep	0.67	0.53	0.88	0.50
15-Sep	0.66	0.52	0.85	0.50
16-Sep	0.63	0.50	0.79	0.50
17-Sep	0.64	0.53	0.78	0.50
18-Sep	0.61	0.51	0.74	0.50
19-Sep	0.60	0.50	0.74	0.50
20-Sep	0.61	0.50	0.76	0.50

21-Sep	0.62	0.51	0.78	0.50
22-Sep	0.61	0.50	0.76	0.50
23-Sep	0.59	0.48	0.75	0.50
24-Sep	0.57	0.46	0.72	0.50
25-Sep	0.55	0.45	0.70	0.50
26-Sep	0.56	0.45	0.72	0.50
27-Sep	0.56	0.45	0.71	0.50
28-Sep	0.55	0.44	0.70	0.50
29-Sep	0.53	0.43	0.68	0.50
30-Sep	0.54	0.44	0.68	0.50
1-Oct	0.51	0.41	0.65	0.50
2-Oct	0.53	0.42	0.68	0.50
3-Oct	0.54	0.43	0.70	0.50
4-Oct	0.56	0.44	0.72	0.50
5-Oct	0.58	0.45	0.75	0.50
6-Oct	0.58	0.46	0.75	0.50
7-Oct	0.58	0.45	0.75	0.50
8-Oct	0.59	0.46	0.78	0.50
9-Oct	0.59	0.46	0.78	0.50
10-Oct	0.61	0.47	0.81	0.50
11-Oct	0.61	0.47	0.81	0.50
12-Oct	0.60	0.46	0.79	0.50
13-Oct	0.62	0.47	0.82	0.50
14-Oct	0.65	0.49	0.87	0.50
15-Oct	0.63	0.48	0.86	0.50
16-Oct	0.65	0.49	0.87	0.50
17-Oct	0.70	0.53	0.93	0.50
18-Oct	0.72	0.54	0.95	0.50
19-Oct	0.75	0.58	0.98	0.50
20-Oct	0.78	0.60	1.02	0.50
21-Oct	0.79	0.61	1.02	0.50
22-Oct	0.79	0.62	1.02	0.50
23-Oct	0.78	0.61	1.00	0.50
24-Oct	0.79	0.62	1.01	0.50
25-Oct	0.77	0.61	0.99	0.50
26-Oct	0.75	0.60	0.96	0.50
27-Oct	0.80	0.70	0.91	0.50
28-Oct	0.81	0.73	0.90	0.50
29-Oct	0.80	0.72	0.88	0.50
30-Oct	0.82	0.74	0.90	0.50
31-Oct	0.81	0.74	0.90	0.50
1-Nov	0.74	0.67	0.83	0.50
2-Nov	0.73	0.65	0.81	0.50
3-Nov	0.72	0.65	0.80	0.50
4-Nov	0.70	0.64	0.78	0.50

5-Nov	0.70	0.63	0.78	0.50
6-Nov	0.70	0.63	0.78	0.50
7-Nov	0.70	0.63	0.78	0.50
8-Nov	0.70	0.63	0.77	0.50
9-Nov	0.70	0.64	0.77	0.50
10-Nov	0.69	0.62	0.76	0.50
11-Nov	0.65	0.57	0.73	0.50
12-Nov	0.62	0.54	0.72	0.50
13-Nov	0.60	0.49	0.73	0.50
14-Nov	0.60	0.48	0.74	0.50
15-Nov	0.58	0.47	0.71	0.50
16-Nov	0.57	0.47	0.71	0.50
17-Nov	0.56	0.45	0.69	0.50
18-Nov	0.54	0.45	0.66	0.50
19-Nov	0.52	0.43	0.62	0.50
20-Nov	0.49	0.41	0.59	0.50
21-Nov	0.53	0.45	0.62	0.50
22-Nov	0.57	0.49	0.65	0.50
23-Nov	0.58	0.51	0.66	0.50
24-Nov	0.60	0.54	0.67	0.50
25-Nov	0.61	0.55	0.67	0.50
26-Nov	0.57	0.51	0.64	0.50
27-Nov	0.53	0.46	0.61	0.50
28-Nov	0.48	0.40	0.58	0.50
29-Nov	0.48	0.41	0.57	0.50
30-Nov	0.49	0.41	0.58	0.50
1-Dec	0.52	0.44	0.61	0.50
2-Dec	0.54	0.47	0.62	0.50
3-Dec	0.58	0.52	0.64	0.50
4-Dec	0.59	0.54	0.65	0.50
5-Dec	0.61	0.55	0.66	0.50
6-Dec	0.59	0.54	0.65	0.50
7-Dec	0.57	0.52	0.63	0.50
8-Dec	0.59	0.53	0.67	0.50
9-Dec	0.58	0.52	0.65	0.50
10-Dec	0.56	0.50	0.63	0.50
11-Dec	0.54	0.48	0.61	0.50
12-Dec	0.56	0.51	0.62	0.50
13-Dec	0.55	0.50	0.61	0.50
14-Dec	0.53	0.47	0.59	0.50
15-Dec	0.51	0.44	0.58	0.50
16-Dec	0.52	0.46	0.59	0.50
17-Dec	0.56	0.50	0.62	0.50
18-Dec	0.54	0.47	0.61	0.50
19-Dec	0.53	0.47	0.60	0.50

20-Dec	0.55	0.50	0.61	0.50
21-Dec	0.54	0.49	0.61	0.50
22-Dec	0.54	0.49	0.59	0.50
23-Dec	0.55	0.49	0.60	0.50
24-Dec	0.55	0.49	0.62	0.50
25-Dec	0.54	0.47	0.62	0.50
26-Dec	0.56	0.50	0.62	0.50
27-Dec	0.56	0.51	0.62	0.50
28-Dec	0.57	0.51	0.63	0.50
29-Dec	0.56	0.51	0.62	0.50
30-Dec	0.55	0.49	0.62	0.50
31-Dec	0.55	0.49	0.63	0.50

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 appropriation on NF Tabeguache Creek, between the headwaters and the confluence with Tabeguache 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:

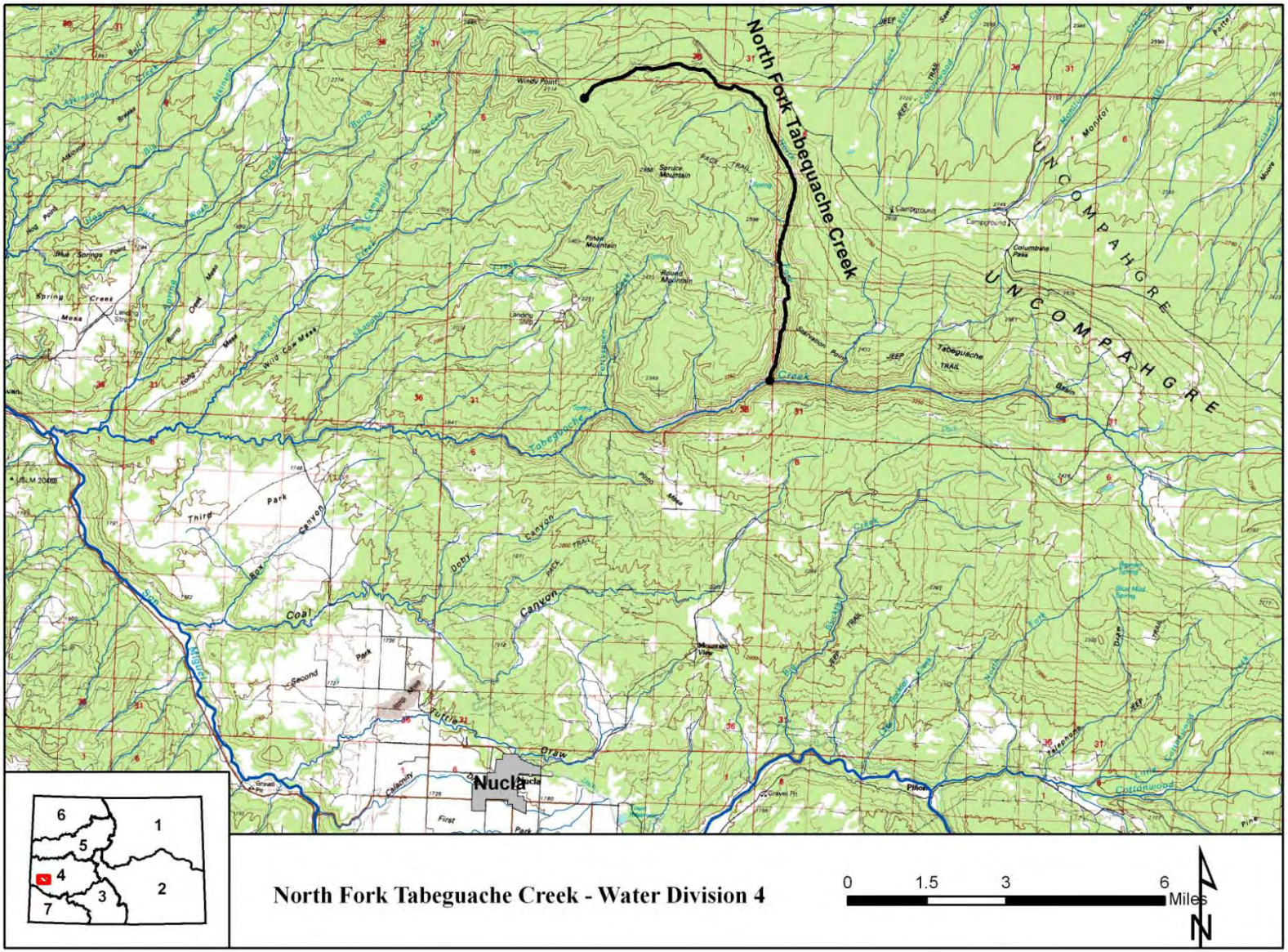
Segment: HEADWATERS TO THE CONFLUENCE WITH TABEGUACHE CREEK
Upper Terminus: HEADWATERS IN THE VICINTY OF
(Latitude 38° 27' 14.47"N) (Longitude 108° 31' 49.57"W)
UTM North: 4262098.53 UTM East: 191913.33
NE NW S4 T48N R15W NMPM
1710' East of the West Section Line; 1901' South of the North Section Line

Lower Terminus: CONFLUENCE WITH TABEGUACHE CREEK
(Latitude 38° 22' 43.49"N) (Longitude 108° 27' 43.97"W)
UTM North: 4253516.36 UTM East: 197554.38
SE SE S25 T48N R15W NMPM
190' West of the East Section Line; 19' North of the South Section Line

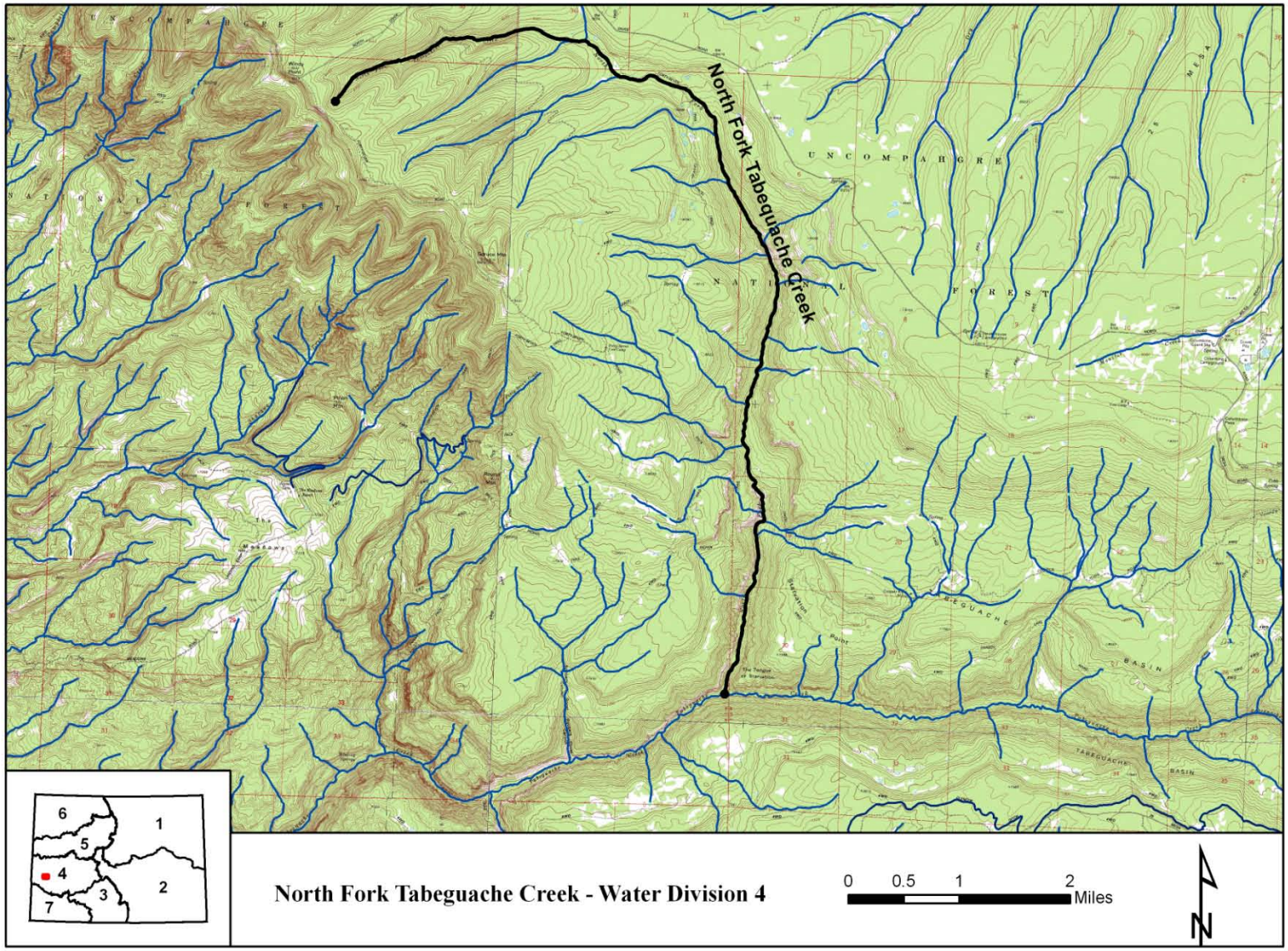
Watershed: San Miguel (HUC#: 14030003)
Counties: Montrose
Length: 9.67 miles
USGS Quad(s): Starvation Point, Windy Point
Flow Recommendation: 2.3 cfs (May 1 – June 30)

1.4 cfs (July 1 – August 14)
0.50 cfs (August 15 – March 31)
1.4 cfs (April 1 – April 30)

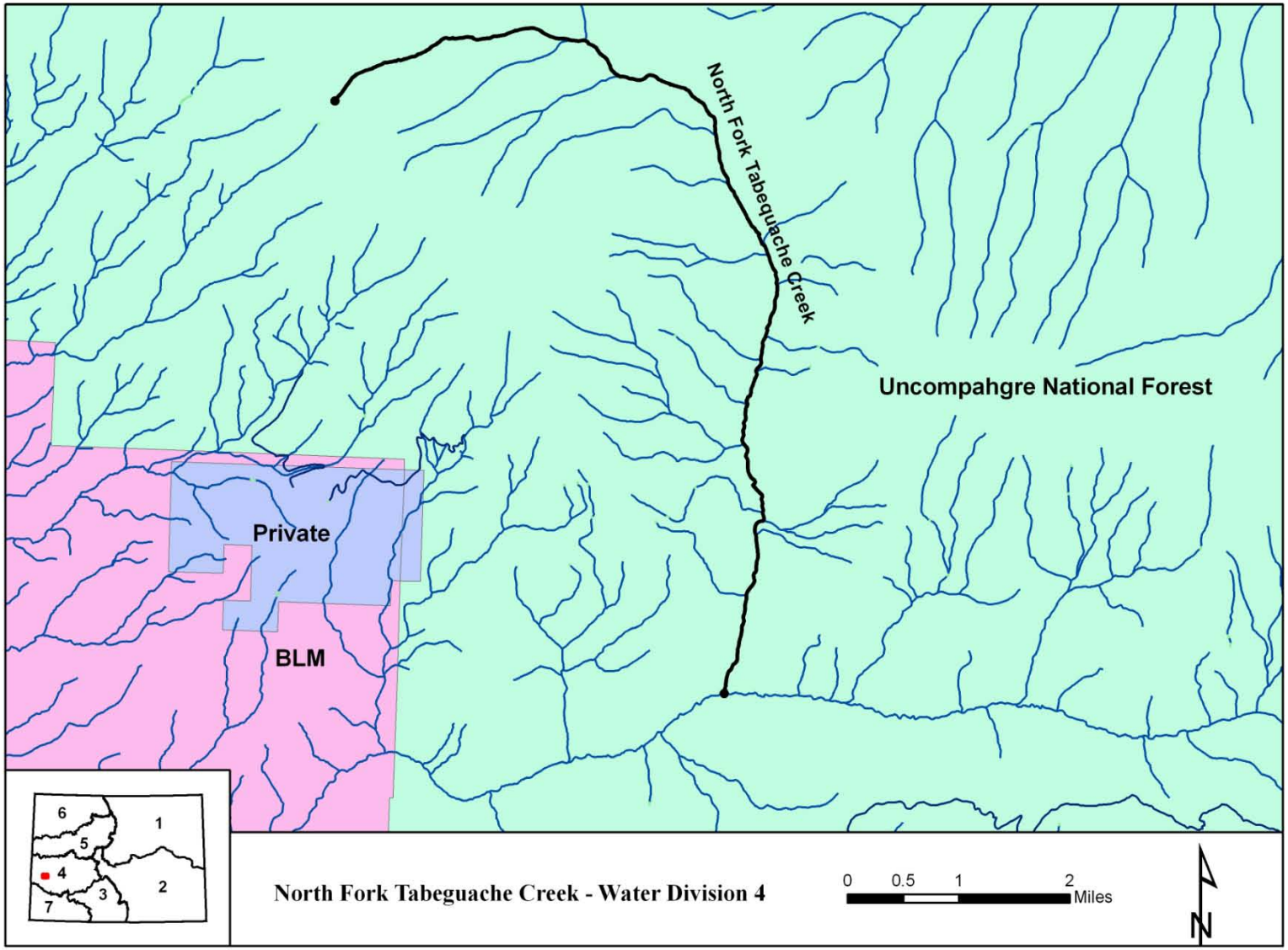
Vicinity Map



Water Rights Map



Land Use Map


North Fork Tabequache Creek
Uncompahgre National Forest
Private
BLM
6
1
5
4
3
2
7
North Fork Tabeguache Creek - Water Division 4
0
0.5
1
2
Miles
N