<u>Stream</u>: Cucharas Creek

Executive Summary

Water Division: 2
Water District: 16
CDOW#: 29606
CWCB ID: 08/2/A-003

<u>Segment</u>: Headwater to the State Highway 12

Upper Terminus: HEADWATERS IN THE VICINITY OF
(Latitude 37° 17’ 46.95”N) (Longitude 105° 9’ 27.75”W)

Lower Terminus: STATE HIGHWAY 12
(Latitude 37° 19’ 54.1”N) (Longitude 105° 5’ 47.58”W)

Watershed: Alamosa-Trinchera (HUC#: 13010002)
Counties: Huerfano
Length: 4.7
USGS Quad(s): Trinchera Peak, Cucharas Pass
Flow Recommendation: 4.9 cfs (May 15 to June 30)
1.6 cfs (July 1 to September 15)
1.2 cfs (September 16 to March 31)
1.6 cfs (April 1 to May 14)

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 Cucharas Creek to the CWCB for inclusion into the Instream Flow Program. Cucharas 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.

Cucharas Creek is approximately 8.5 miles long. It begins on the northeast side of Trinchera Peak at an elevation of approximately 11600 feet and joins the Cucharas River at an elevation of 9080 feet. Of the 4.7 mile segment addressed by this report, 100% of the segment, is located on public lands. Cucharas Creek is located within Huerfano County and generally flows in a northeasterly direction.

The subject of this report is a segment of Cucharas Creek beginning at its headwaters and extending downstream to State Highway 12. The proposed segment is located southwest of the Town of Cuchara. The recommendation for this segment is discussed below.

Instream Flow Recommendation(s)

The CDOW is recommending 4.9 cfs (May 15 to June 30), 1.6 cfs (July 1 to September 15), 1.2 cfs (September 16 to March 31), 1.6 cfs (April 1 to May 14), 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
Headwaters	State Highway 12	4.7	0%	100%

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

Biological Data

Cucharas Creek is classified as a small stream (between 10 to 19 feet wide) and fishery surveys indicate the stream environment of the Cucharas Creek supports rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*) and brook trout (*Salvelinus fontinalis*)

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 Board staff relies 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, three 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, 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)
DOW	4/23/1997	3.5	8.8 – 1.4	4.9	2.0
DOW	5/10/2006	2.2	5.5 – 0.9	7.9(or)	1.3
DOW	7/19/2006	2.7	6.8 – 1.1	7.8(or)	1.4

DOW = Division of Wildlife OR = Outside of R2X Accuracy Range

The summer flow recommendation, which met 3 of 3 criteria and is within the accuracy range of the R2CROSS model, is 4.9 cfs. The winter flow recommendations, which met 2 of 3 criteria and were within the accuracy range of the R2CROSS model, ranged from 2.0 cfs to 1.3 cfs. Averaging the values within this range, would result in a 1.6 cfs winter recommendation. As a result of water availability limitations, 1.6 cfs was used for the time periods from July 1 to September 15, and from April 1 to May 14. The winter flow recommendation of 1.2 cfs from September 16 to March 31, was further reduced from 1.6 cfs due to water availability limitations. Based on the foregoing, staff is recommending that the Board appropriate the flow amounts set forth in this paragraph.

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 **Cucharas Creek** there is a USGS gage record of discharge on the stream. However, the gage station is downstream from the LT. The USGS gage is CUCHARAS RIVER AT BOYD RANCH, NEAR LA VETA, CO. (USGS 07114000); it has a period of record (POR) of 47 years collected between 1934 and 1981. The gage is at an elevation of 7,781 ft above mean sea level (amsl) and has a drainage area of 56.0 mi^2. The hydrograph (plot of discharge over time) produced from this gage includes the consumptive uses of several diversions. However, the existence of these diversions is not a major limitation upon the use of the data from the gage. To make the measured data transferable to Cucharas Creek above the LT, the consumptive portions of these diversions were added back to the measured hydrograph. The resulting "adjusted" hydrograph could then be used on Cucharas Creek above the LT by multiplying the "adjusted" gage discharge values by an area ratio; specifically, the area of Cucharas Creek above the LT (9.48 mi^2) to Cucharas River at Boyd Ranch, near La Veta, CO (56.0 mi^2). In this instance, due to the absence of existing significant upstream consumptive irrigation uses or transbasin diversions on Cucharas Creek above the LT, the resulting proportioned "adjusted" hydrograph was not further "adjusted" (decreased). Nevertheless, the final hydrograph represents the existing distribution of flow over time.

{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 Cucharas Creek is to compute the Geometric Mean of the area-prorated "adjusted" data values from the Cucharas River at Boyd Ranch, near La Veta, 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 an enlargement displayed in figure 2. The data displayed by this hydrograph follow in Table 1.

Fig. 1. Geometric Mean Q Cucharas Cr abv LT (prop on Cucharas R at Boyd Ranch near La Veta, adjusted for irr) & ISFs

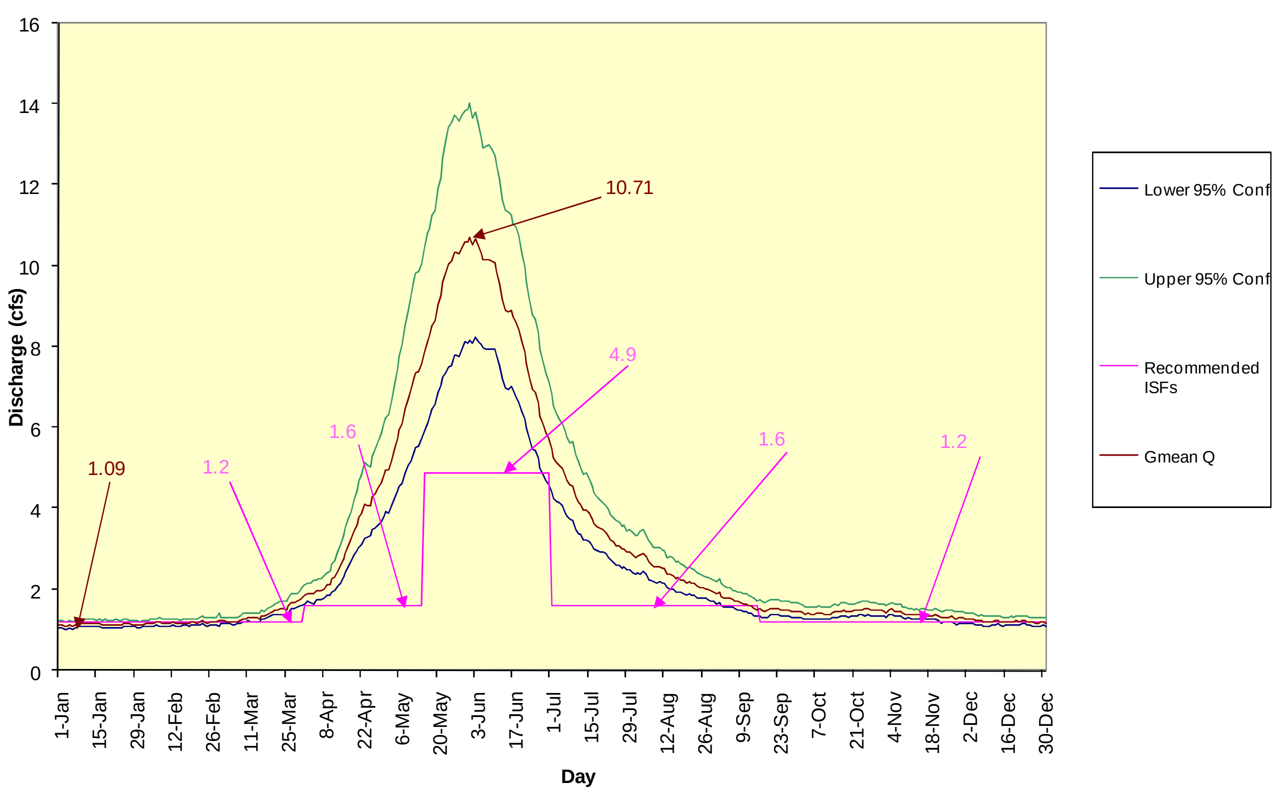


Fig. 2. Geometric Mean Q Cucharas Cr abv LT (prop on Cucharas R at Boyd Ranch near La Veta, adjusted for irr) & ISFs

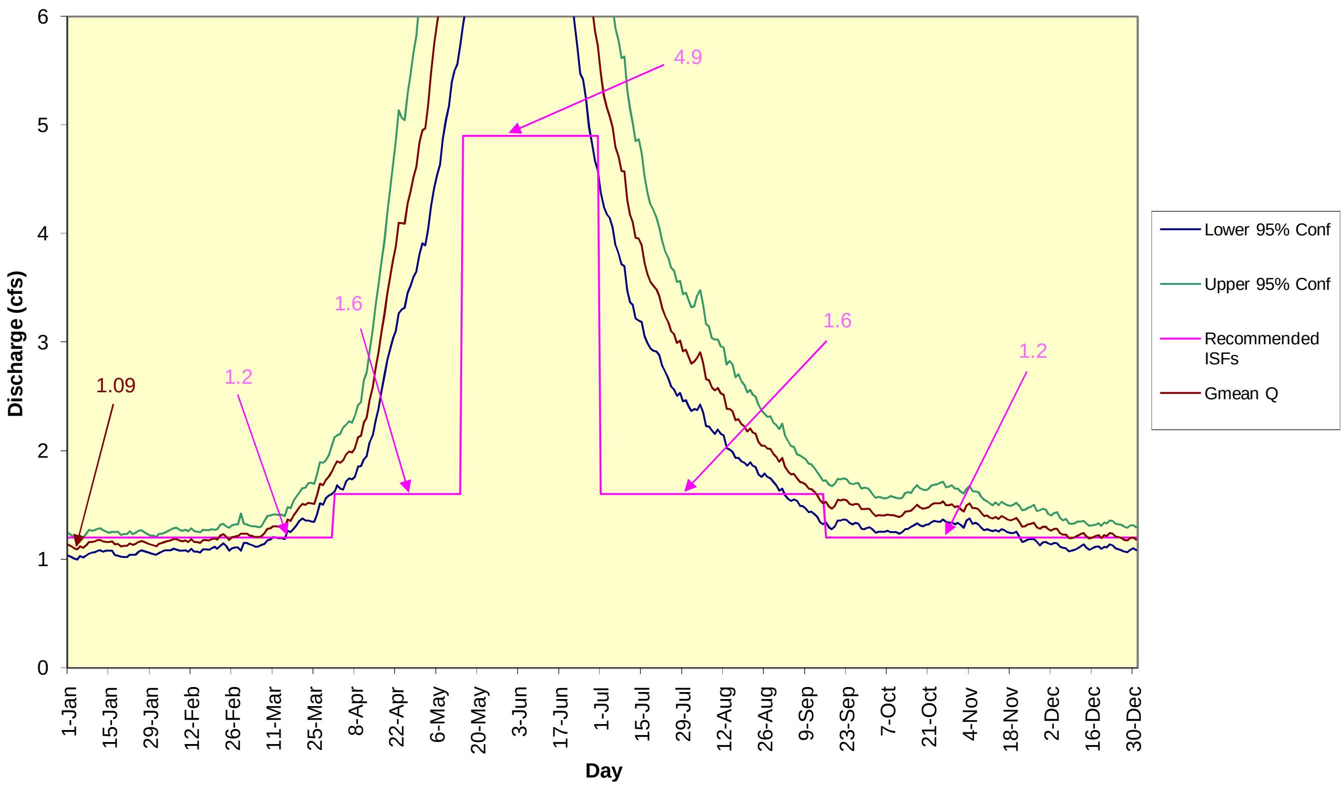


Table 1. Geometric Mean Discharge and Recommended Instream Flows		
Date	Recommended ISF	Proportioned Adjusted GM (abv gage) Adj (-) for Irr & OoB in Cucharas Cr abv LT
1-Jan	1.20	1.130798133
2-Jan	1.20	1.11701651
3-Jan	1.20	1.099077494
4-Jan	1.20	1.091695436
5-Jan	1.20	1.117697214
6-Jan	1.20	1.104125636
7-Jan	1.20	1.128260148
8-Jan	1.20	1.157919962
9-Jan	1.20	1.157028195
10-Jan	1.20	1.162614728
11-Jan	1.20	1.175460756
12-Jan	1.20	1.179288165
13-Jan	1.2	1.161960784
14-Jan	1.2	1.161053694
15-Jan	1.2	1.160070355
16-Jan	1.2	1.164004715

17-Jan	1.2	1.13875404
18-Jan	1.2	1.139780959
19-Jan	1.2	1.118086964
20-Jan	1.2	1.120997593
21-Jan	1.2	1.121703087
22-Jan	1.2	1.145091175
23-Jan	1.2	1.131899976
24-Jan	1.2	1.139083422
25-Jan	1.2	1.160904099
26-Jan	1.2	1.169536484
27-Jan	1.2	1.157511908
28-Jan	1.2	1.145219138
29-Jan	1.2	1.135068603
30-Jan	1.2	1.128392275
31-Jan	1.2	1.119915594
1-Feb	1.2	1.141469965
2-Feb	1.2	1.150714909
3-Feb	1.2	1.160954322
4-Feb	1.2	1.167926064
5-Feb	1.2	1.173949196
6-Feb	1.2	1.185157864
7-Feb	1.2	1.184646428
8-Feb	1.2	1.17219374
9-Feb	1.2	1.165663733
10-Feb	1.2	1.174238046
11-Feb	1.2	1.158658456
12-Feb	1.2	1.187031846
13-Feb	1.2	1.159213353
14-Feb	1.2	1.15824708
15-Feb	1.2	1.150925399
16-Feb	1.2	1.17817561
17-Feb	1.2	1.176969429
18-Feb	1.2	1.174064743
19-Feb	1.2	1.185168267
20-Feb	1.2	1.190601304
21-Feb	1.2	1.182578979
22-Feb	1.2	1.217001654
23-Feb	1.2	1.232115956
24-Feb	1.2	1.210443493
25-Feb	1.2	1.177620408
26-Feb	1.2	1.202636222
27-Feb	1.2	1.209376991
28-Feb	1.2	1.211197887
29-Feb	1.2	1.237270108
1-Mar	1.2	1.234073326
2-Mar	1.2	1.233622486
3-Mar	1.2	1.219765371
4-Mar	1.2	1.21368061
5-Mar	1.2	1.205472902

6-Mar	1.2	1.203230068
7-Mar	1.2	1.215521925
8-Mar	1.2	1.242201363
9-Mar	1.2	1.282577905
10-Mar	1.2	1.285931173
11-Mar	1.2	1.303249063
12-Mar	1.2	1.30128904
13-Mar	1.2	1.297292667
14-Mar	1.2	1.297860751
15-Mar	1.2	1.289671177
16-Mar	1.2	1.366768123
17-Mar	1.2	1.354112455
18-Mar	1.2	1.403570545
19-Mar	1.2	1.439340811
20-Mar	1.2	1.478124597
21-Mar	1.2	1.51033661
22-Mar	1.2	1.499844655
23-Mar	1.2	1.518606299
24-Mar	1.2	1.517349552
25-Mar	1.2	1.510872936
26-Mar	1.2	1.590779177
27-Mar	1.2	1.695597421
28-Mar	1.2	1.682994179
29-Mar	1.2	1.730187768
30-Mar	1.2	1.764910211
31-Mar	1.2	1.809914252
1-Apr	1.6	1.864545825
2-Apr	1.6	1.901603981
3-Apr	1.6	1.889047179
4-Apr	1.6	1.909633181
5-Apr	1.6	1.965474267
6-Apr	1.6	1.993924018
7-Apr	1.6	1.98195646
8-Apr	1.6	2.023805085
9-Apr	1.6	2.122141682
10-Apr	1.6	2.13565543
11-Apr	1.6	2.258751884
12-Apr	1.6	2.307555343
13-Apr	1.6	2.463932466
14-Apr	1.6	2.587785298
15-Apr	1.6	2.762383084
16-Apr	1.6	2.907903466
17-Apr	1.6	3.091470091
18-Apr	1.6	3.258629105
19-Apr	1.6	3.462159572
20-Apr	1.6	3.613225595
21-Apr	1.6	3.768788046
22-Apr	1.6	3.886486028
23-Apr	1.6	4.101281784

24-Apr	1.6	4.096212611
25-Apr	1.6	4.09389728
26-Apr	1.6	4.28182951
27-Apr	1.6	4.390729411
28-Apr	1.6	4.519371812
29-Apr	1.6	4.615219288
30-Apr	1.6	4.843803398
1-May	1.6	4.952391247
2-May	1.6	4.968885194
3-May	1.6	5.192761302
4-May	1.6	5.485680304
5-May	1.6	5.753974383
6-May	1.6	5.945136272
7-May	1.6	6.114410323
8-May	1.6	6.463216753
9-May	1.6	6.700766638
10-May	1.6	6.937116809
11-May	1.6	7.241090682
12-May	1.6	7.35029997
13-May	1.6	7.405614173
14-May	1.6	7.592527387
15-May	4.9	7.877379084
16-May	4.9	8.120771135
17-May	4.9	8.246581487
18-May	4.9	8.533616094
19-May	4.9	8.657459137
20-May	4.9	9.046594972
21-May	4.9	9.282339726
22-May	4.9	9.593602972
23-May	4.9	9.812108744
24-May	4.9	10.04746826
25-May	4.9	10.12162279
26-May	4.9	10.34483651
27-May	4.9	10.34784709
28-May	4.9	10.29524418
29-May	4.9	10.44206917
30-May	4.9	10.61805111
31-May	4.9	10.60246489
1-Jun	4.9	10.71440614
2-Jun	4.9	10.52069541
3-Jun	4.9	10.67633362
4-Jun	4.9	10.48740997
5-Jun	4.9	10.29735928
6-Jun	4.9	10.16376632
7-Jun	4.9	10.16166762
8-Jun	4.9	10.1731872
9-Jun	4.9	10.13208497
10-Jun	4.9	10.07567738
11-Jun	4.9	9.877608961

12-Jun	4.9	9.570719686
13-Jun	4.9	9.155819806
14-Jun	4.9	8.922247084
15-Jun	4.9	8.88152317
16-Jun	4.9	8.904284698
17-Jun	4.9	8.755253439
18-Jun	4.9	8.625146443
19-Jun	4.9	8.438851956
20-Jun	4.9	8.135253627
21-Jun	4.9	7.861301629
22-Jun	4.9	7.576776887
23-Jun	4.9	7.240972079
24-Jun	4.9	6.947123457
25-Jun	4.9	6.86610093
26-Jun	4.9	6.632272413
27-Jun	4.9	6.29454647
28-Jun	4.9	6.094031672
29-Jun	4.9	5.871195981
30-Jun	4.9	5.730830746
1-Jul	1.6	5.482733352
2-Jul	1.6	5.275299145
3-Jul	1.6	5.164322161
4-Jul	1.6	5.085105045
5-Jul	1.6	4.984683235
6-Jul	1.6	4.797886904
7-Jul	1.6	4.707405244
8-Jul	1.6	4.579724261
9-Jul	1.6	4.573724664
10-Jul	1.6	4.308676825
11-Jul	1.6	4.168568437
12-Jul	1.6	4.107408916
13-Jul	1.6	3.961182631
14-Jul	1.6	3.957886918
15-Jul	1.6	3.895804389
16-Jul	1.6	3.730515133
17-Jul	1.6	3.627677831
18-Jul	1.6	3.554189077
19-Jul	1.6	3.519043049
20-Jul	1.6	3.48903733
21-Jul	1.6	3.426451741
22-Jul	1.6	3.317950353
23-Jul	1.6	3.2428108
24-Jul	1.6	3.185064645
25-Jul	1.6	3.100481035
26-Jul	1.6	3.072822096
27-Jul	1.6	2.994509372
28-Jul	1.6	3.015351624
29-Jul	1.6	2.917525342
30-Jul	1.6	2.930110063

31-Jul	1.6	2.863087708
1-Aug	1.6	2.805467236
2-Aug	1.6	2.820504162
3-Aug	1.6	2.855424232
4-Aug	1.6	2.907586721
5-Aug	1.6	2.808178368
6-Aug	1.6	2.659048648
7-Aug	1.6	2.649176247
8-Aug	1.6	2.582126031
9-Aug	1.6	2.557000298
10-Aug	1.6	2.580316759
11-Aug	1.6	2.528851297
12-Aug	1.6	2.516655188
13-Aug	1.6	2.383319163
14-Aug	1.6	2.386750411
15-Aug	1.6	2.361784105
16-Aug	1.6	2.279486191
17-Aug	1.6	2.290582292
18-Aug	1.6	2.24418391
19-Aug	1.6	2.222031769
20-Aug	1.6	2.175375966
21-Aug	1.6	2.206111574
22-Aug	1.6	2.167613915
23-Aug	1.6	2.152658083
24-Aug	1.6	2.080527518
25-Aug	1.6	2.046996742
26-Aug	1.6	2.048122175
27-Aug	1.6	2.018697621
28-Aug	1.6	2.013885118
29-Aug	1.6	1.970355098
30-Aug	1.6	1.942214023
31-Aug	1.6	1.89770098
1-Sep	1.6	1.93210605
2-Sep	1.6	1.847256492
3-Sep	1.6	1.808981315
4-Sep	1.6	1.779001024
5-Sep	1.6	1.783461923
6-Sep	1.6	1.744677424
7-Sep	1.6	1.715278347
8-Sep	1.6	1.704888916
9-Sep	1.6	1.684394517
10-Sep	1.6	1.648877912
11-Sep	1.6	1.647320874
12-Sep	1.6	1.621502321
13-Sep	1.6	1.589834552
14-Sep	1.6	1.54435049
15-Sep	1.6	1.513743943
16-Sep	1.2	1.526920867
17-Sep	1.2	1.48359459

18-Sep	1.2	1.467125544
19-Sep	1.2	1.492940355
20-Sep	1.2	1.54468049
21-Sep	1.2	1.540836484
22-Sep	1.2	1.549671907
23-Sep	1.2	1.543008929
24-Sep	1.2	1.512169456
25-Sep	1.2	1.500494252
26-Sep	1.2	1.512785967
27-Sep	1.2	1.506690943
28-Sep	1.2	1.460083341
29-Sep	1.2	1.461533659
30-Sep	1.2	1.466549854
1-Oct	1.2	1.458891519
2-Oct	1.2	1.427087231
3-Oct	1.2	1.399088861
4-Oct	1.2	1.408423536
5-Oct	1.2	1.40431391
6-Oct	1.2	1.402086752
7-Oct	1.2	1.411193902
8-Oct	1.2	1.408836537
9-Oct	1.2	1.405563811
10-Oct	1.2	1.400082073
11-Oct	1.2	1.391025484
12-Oct	1.2	1.400663913
13-Oct	1.2	1.436915013
14-Oct	1.2	1.444976413
15-Oct	1.2	1.448865509
16-Oct	1.2	1.47673061
17-Oct	1.2	1.500100734
18-Oct	1.2	1.477250267
19-Oct	1.2	1.465724282
20-Oct	1.2	1.47069747
21-Oct	1.2	1.479964574
22-Oct	1.2	1.502357639
23-Oct	1.2	1.51369083
24-Oct	1.2	1.513619349
25-Oct	1.2	1.51676269
26-Oct	1.2	1.535049057
27-Oct	1.2	1.497935617
28-Oct	1.2	1.495068739
29-Oct	1.2	1.504310368
30-Oct	1.2	1.480197801
31-Oct	1.2	1.486252304
1-Nov	1.2	1.45996731
2-Nov	1.2	1.438601857
3-Nov	1.2	1.496935464
4-Nov	1.2	1.517010315
5-Nov	1.2	1.469006707

6-Nov	1.2	1.471910918
7-Nov	1.2	1.462958488
8-Nov	1.2	1.423558715
9-Nov	1.2	1.400265192
10-Nov	1.2	1.400419186
11-Nov	1.2	1.384748258
12-Nov	1.2	1.373724739
13-Nov	1.2	1.390434853
14-Nov	1.2	1.369090735
15-Nov	1.2	1.396884296
16-Nov	1.2	1.385029597
17-Nov	1.2	1.365557648
18-Nov	1.2	1.359181084
19-Nov	1.2	1.365045374
20-Nov	1.2	1.381259009
21-Nov	1.2	1.342289173
22-Nov	1.2	1.298334889
23-Nov	1.2	1.304145404
24-Nov	1.2	1.319371462
25-Nov	1.2	1.326900885
26-Nov	1.2	1.335392017
27-Nov	1.2	1.292642426
28-Nov	1.2	1.278951915
29-Nov	1.2	1.300575584
30-Nov	1.2	1.299598455
1-Dec	1.2	1.275829449
2-Dec	1.2	1.26360906
3-Dec	1.2	1.279474941
4-Dec	1.2	1.281451252
5-Dec	1.2	1.240809339
6-Dec	1.2	1.225290059
7-Dec	1.2	1.228717906
8-Dec	1.2	1.193428885
9-Dec	1.2	1.197537694
10-Dec	1.2	1.204587942
11-Dec	1.2	1.220033121
12-Dec	1.2	1.229690173
13-Dec	1.2	1.239843834
14-Dec	1.2	1.210740325
15-Dec	1.2	1.192676215
16-Dec	1.2	1.201693249
17-Dec	1.2	1.211967534
18-Dec	1.2	1.220692754
19-Dec	1.2	1.197556993
20-Dec	1.2	1.221717993
21-Dec	1.2	1.215419599
22-Dec	1.2	1.240947171
23-Dec	1.2	1.233915507
24-Dec	1.2	1.207108303

25-Dec	1.2	1.20269387
26-Dec	1.2	1.193500375
27-Dec	1.2	1.177816614
28-Dec	1.2	1.173772466
29-Dec	1.2	1.19435501
30-Dec	1.2	1.20196586
31-Dec	1.2	1.183720338

Existing Water Right Information

CDOW staff has analyzed the water rights tabulation and contacted the Division Engineer's Office (DEO) to identify any potential water availability problems due to existing diversions. Records indicate that there are two surface water diversions that are located within this reach of Cucharas Creek, CS&WD Cuchara Intake AP and Briton #5 Ditch. Staff has determined that water is available for appropriation on Cucharas Creek, from the headwaters to State Highway 12, 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:

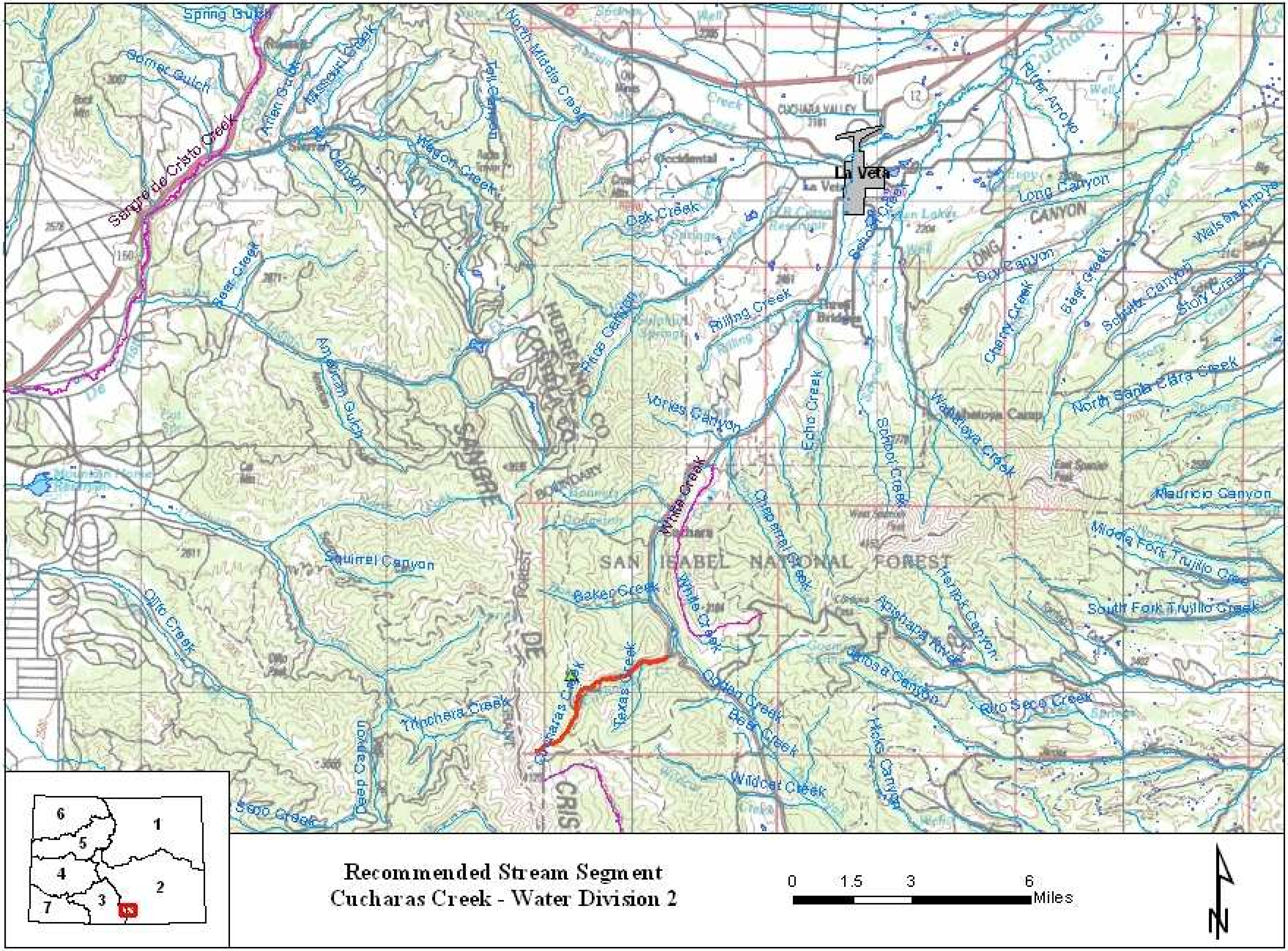
Segment: Headwater to the Confluence with State Highway 12

Upper Terminus: HEADWATERS IN THE VICINITY OF
(Latitude 37° 17' 46.95"N) (Longitude 105° 9' 27.75"W)
UTM North: 4127762.6 UTM East: 486022.5

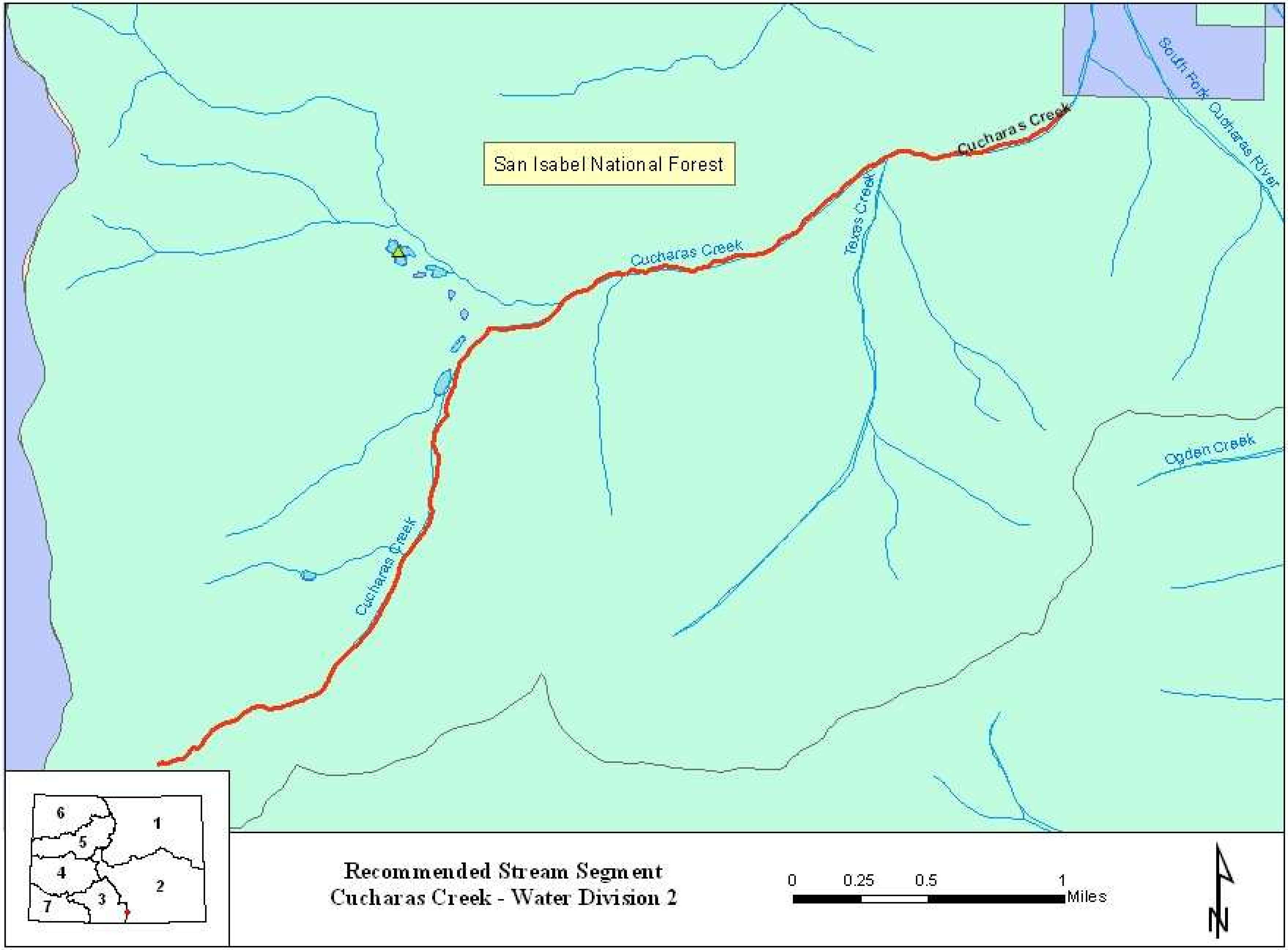
Lower Terminus: STATE HIGHWAY 12
(Latitude 37° 19' 54.1"N) (Longitude 105° 5' 47.58"W)
UTM North: 4131674.4 UTM East: 491446.9
NE SW S22 T31S R69W 6th PM
1350' East of West the Section Line; 2460' North of the South Section Line

Watershed: Alamosa-Trinchera (HUC#: 13010002)
Counties: Huerfano
Length: 4.7
USGS Quad(s): Trinchera Peak, Cucharas Pass
Flow Recommendation: 4.9 cfs (May 15 to June 30)
1.6 cfs (July 1 to September 15)
1.2 cfs (September 16 to March 31)
1.6 cfs (April 1 to May 14)

Vicinity Map



Land Use Map


San Isabel National Forest
Cucharas Creek
Cucharas Creek
Cucharas Creek
Texas Creek
South Fork Cucharas River
Ogden Creek
6
5
1
4
2
3
7
Recommended Stream Segment
Cucharas Creek - Water Division 2
0
0.25
0.5
1
Miles
N

Topographic & Water Rights Map