Cucharas River Watershed Small Watershed Targeting

Small-scale Watershed Protection Priorities

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This report was prepared by:

JW Associates Inc.

PO Box 3759

Breckenridge, Colorado 80424

For more information contact:

Brad Piehl

970.406.0085 or

bpiehl@jw-associates.org

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Additional information on the Cucharas River Watershed is available at:

http://www.jw-associates.org/cucharas.html

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INTRODUCTION

Water providers in the Cucharas River Watershed are concerned about the potential impacts of wildfires and subsequent flooding, increased sediment yield and debris flows on their ability to provide high quality water to several municipalities as well as many irrigators in the basin. A group of concerned municipalities, water providers, agencies, irrigators and concerned citizens have completed the Cucharas River Wildfire/Watershed Assessment (JW Associates 2014). That assessment identified and prioritized sixth-level watersheds based upon their hazards of generating flooding, debris flows and increased sediment yields following wildfires that could have impacts on water supplies. It followed a procedure prescribed by the Front Range Watershed Protection Data Refinement Work Group (2009). The results of that assessment (Figure 1) clearly show that the hazards to water supplies and the Zones of Concern above critical water supply infrastructure overlap in the upper portions of the watershed.

The Cucharas River Wildfire/Watershed Assessments recommended that one of the pre-fire actions should be -

1. *Complete small-scale analysis and planning within each ZoC to identify specific hazard areas that will be the priority for vegetation or other treatments before fire, or targeted mitigation efforts after fire. Planning should also include setting long-term watershed/forest management goals such as increasing forest diversity to minimize impacts from wildfires, as well as future insect and disease outbreaks. This planning can also be used to provide valuable site-specific information to cooperating agencies on forest management projects or fire management plans in those areas. Small-scale targeting of high hazard areas also allows water supply agencies to justify investments in hazard reduction or watershed protection projects.*

This report presents a small watershed targeting that is part of the small-scale analysis and planning in the above recommendation. The small watersheds were delineated with the goal of identifying hazards in specific small-scale watersheds that would be targets of pre-fire or post-fire actions. This analysis focuses on the upper watershed area where the Cucharas River Wildfire/Watershed Assessment (JW Associates 2014), showed that the hazards to water supplies and the Zones of Concern above critical water supply infrastructure overlap (Figure 1).

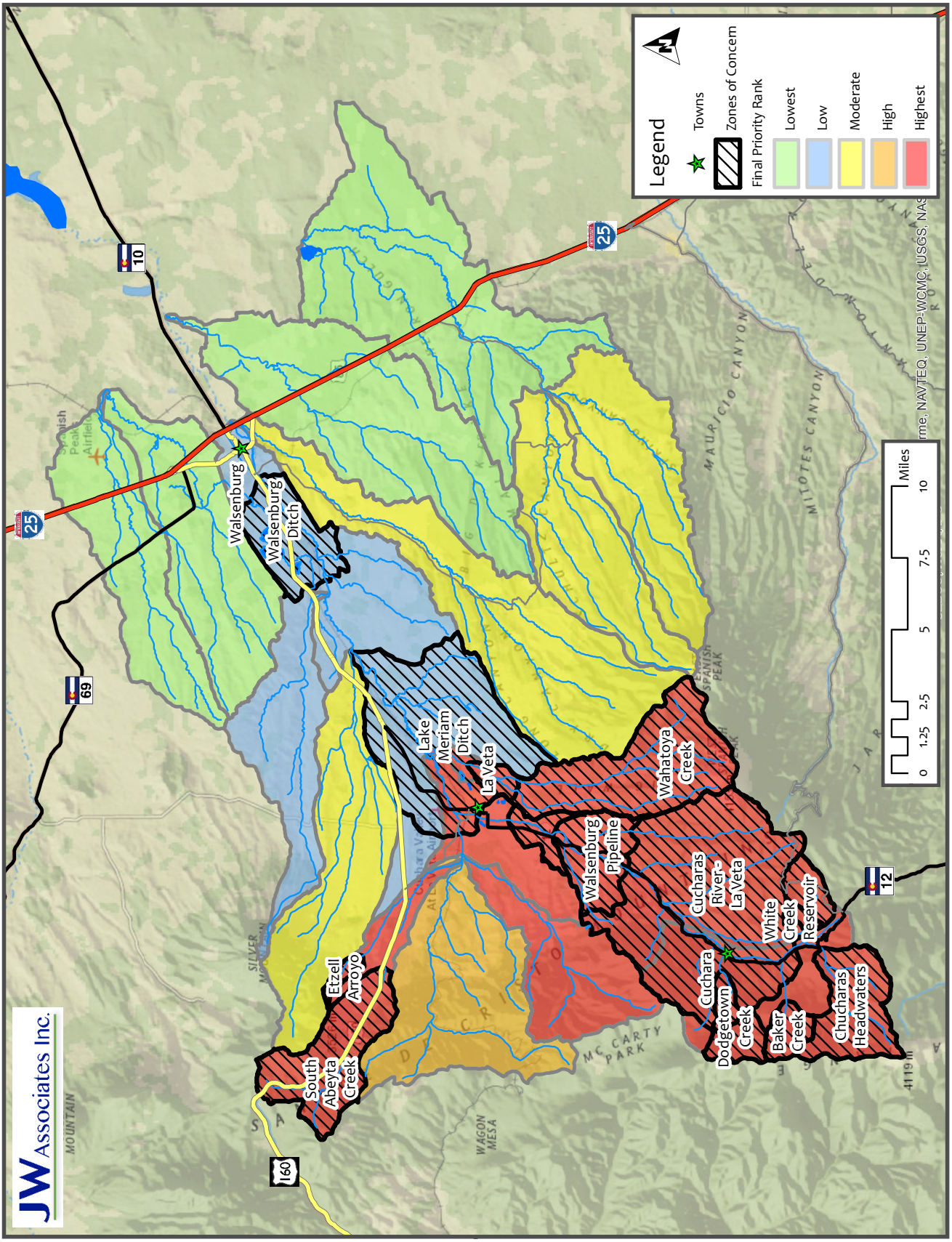

Figure 1. Cucharas River Watershed Zones of Concern and Final Priorities

SMALL WATERSHED HAZARD ASSESSMENT

A total of 79 small watersheds covering 143,122 acres were delineated within the Upper Cucharas River watershed (Figure 2 and Appendix A). These watersheds were ranked based upon some of the same hazard components used in the Cucharas River Wildfire/Watershed Assessment. The hazard ranking components used in this analysis include;

1. Wildfire Hazard
2. Flooding/Debris Flow Hazard
3. Soil Erodibility
4. Composite Hazard

The results for each component are categorized into five categories that are used in the analysis. The categorization is prescribed by the Colorado Watershed Protection Data Refinement Work Group (2009).

The calculation of ranking for each small watershed was completed as follows:

1. Use the hazard based on the percentage of each small watershed (or other metrics).
2. Scale the results so that they fall within five categories with a reasonable distribution.
3. Round the scaled result to the nearest whole number (retain the number for Composite Hazard Ranking).
4. Create a map of the results using the following scheme:

    Category 1 – Lowest
    Category 2
    Category 3
    Category 4
    Category 5 – Highest

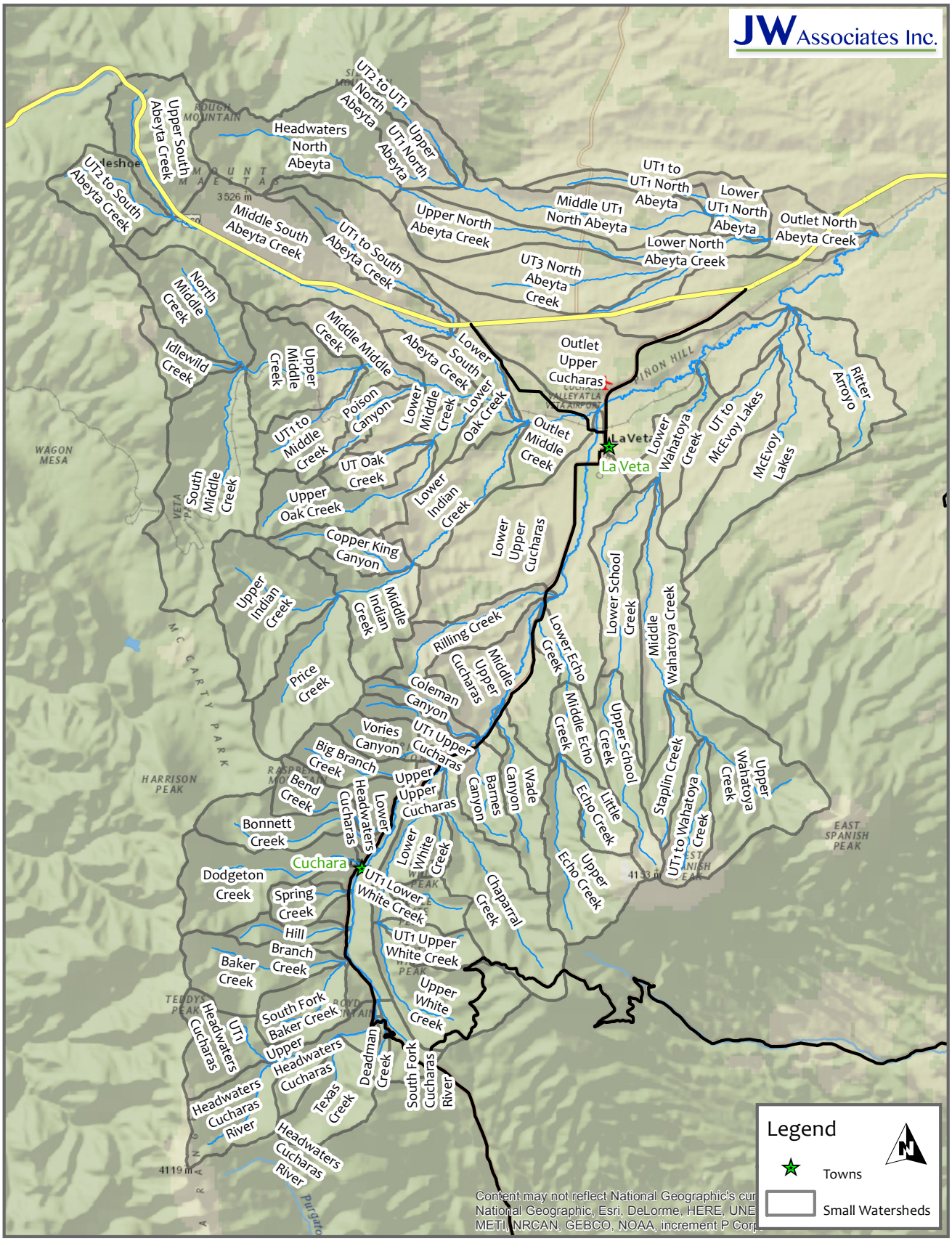

Figure 2. Cucharas River Small Watersheds

Component 1 - Wildfire Hazard

Forest conditions that have high wildfire hazards are the highest concern. The Colorado Wildfire Risk Assessment Report (CO-WRAP) system was used to generate a variety of wildfire hazard and risk analyses for the Cucharas River Watershed (Colorado State Forest Service 2014). The various elements of the CO-WRAP analysis were evaluated for appropriateness to this project. That evaluation and review by the Cucharas River watershed group determined that Flame Length and Fire Intensity were the two elements that would be used in this assessment. The wildfire risk elements in CO-WRAP were determined to not accurately represent the relative risks in the watershed and therefore, the CO-WRAP elements that were risk-based were not used in this assessment. The Flame Length analysis is similar to the wildfire hazard analysis that has been used in the previous wildfire/watershed assessments in Colorado.

Figure 3 shows the CO-WRAP Flame Length results in six categories ranging from lowest (Category 0) to highest (Category 5). The flame length categories are;

Flame Length Category 0 - Very Low (0-1 feet)

Flame Length Category 1 - Low (1-4 feet)

Flame Length Category 2 - Moderate (4-8 feet)

Flame Length Category 3 - High (8-12 feet)

Flame Length Category 4 - Very High (12-25 feet)

Flame Length Category 5 - Extreme (25+ feet)

Figure 4 shows the CO-WRAP Fire Intensity results. The Fire Intensity results were provided in five categories ranging from lowest (Category 1) to highest (Category 5). The results for both the Flame Length and Fire Intensity were categorized by small watershed into five categories that are used throughout the analysis (see Table B-1 in Appendix B) using the following formula.

Ranking = (% in Category 3 + 2 * % in Category 4 + 3 * % in Category 5) / Watershed Area

The combined wildfire hazard (flame length combined with fire intensity) by small watershed was mapped (Figure 5). The map shows that the highest hazards (Category 5) are found in nine small watersheds: Deadman Creek, Texas Creek, Chaparral Creek, Price Creek, South Fork Cucharas River, Wade Canyon, Upper Indian Creek, Cottonwood Canyon, and Hill Branch Creek (see also Table A-2 in Appendix A).

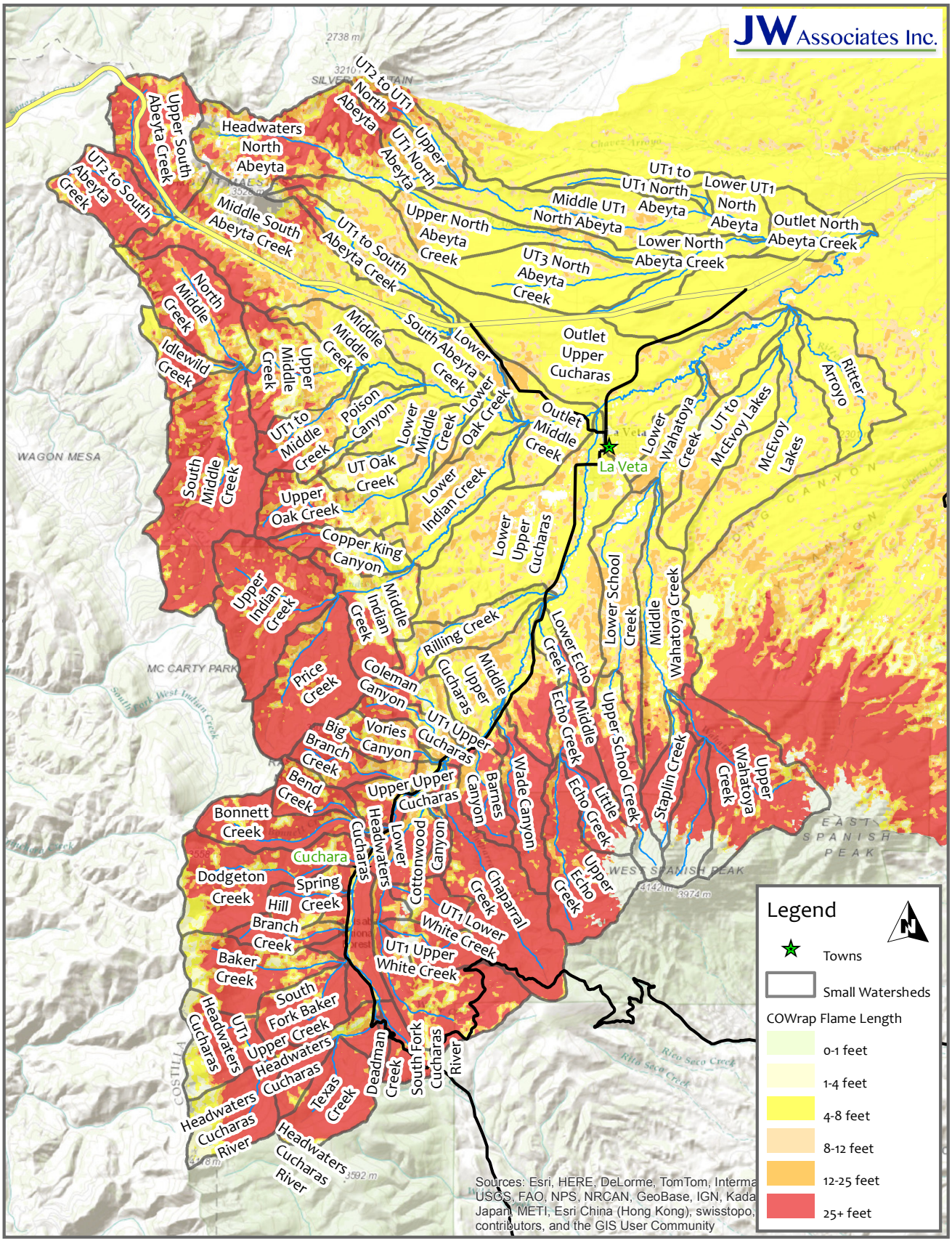

Figure 3. Cucharas River Small Watershed CO-WRAP Flame Length Results

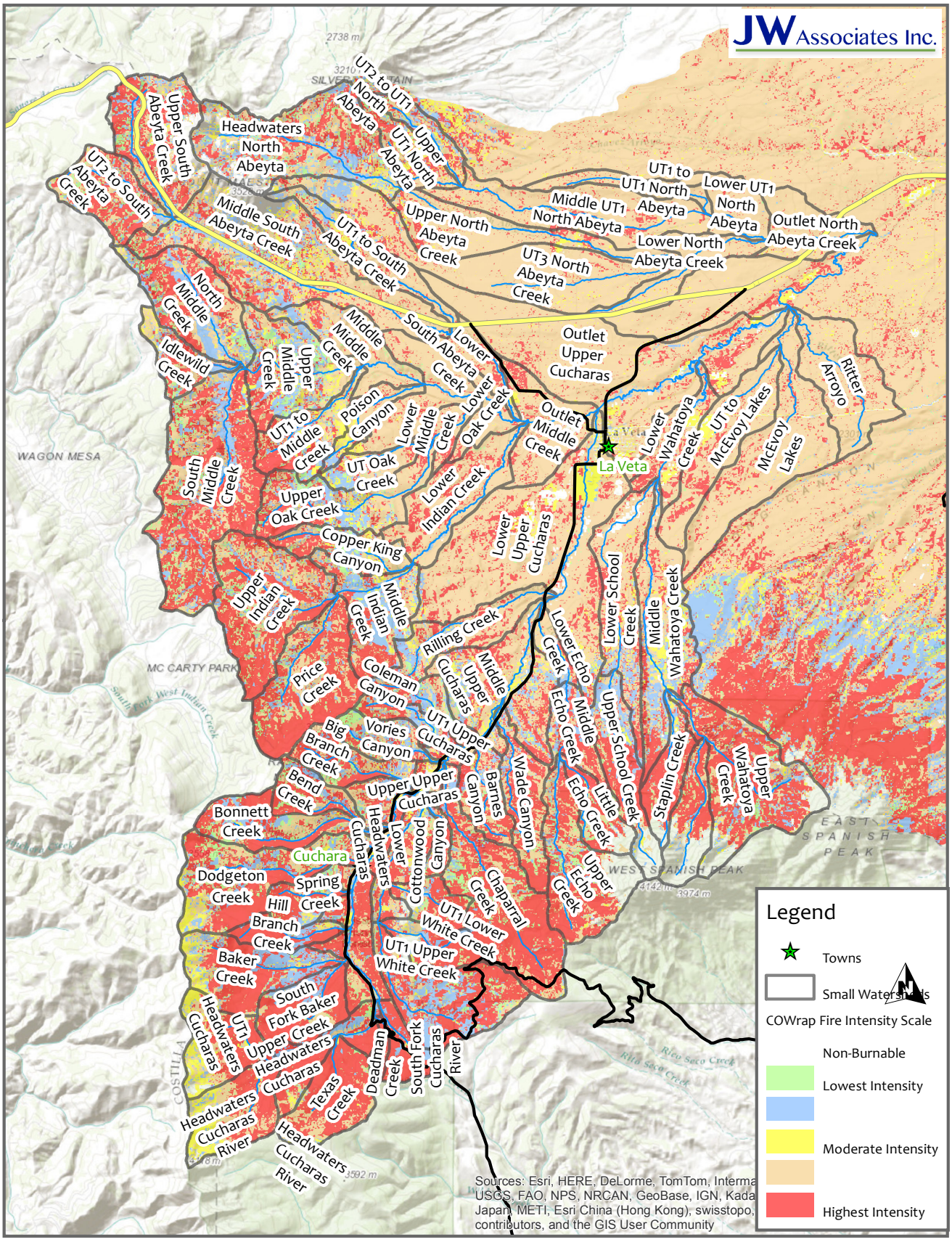

Figure 4. Cucharas River Small Watershed CO-WRAP Fire Intensity Results

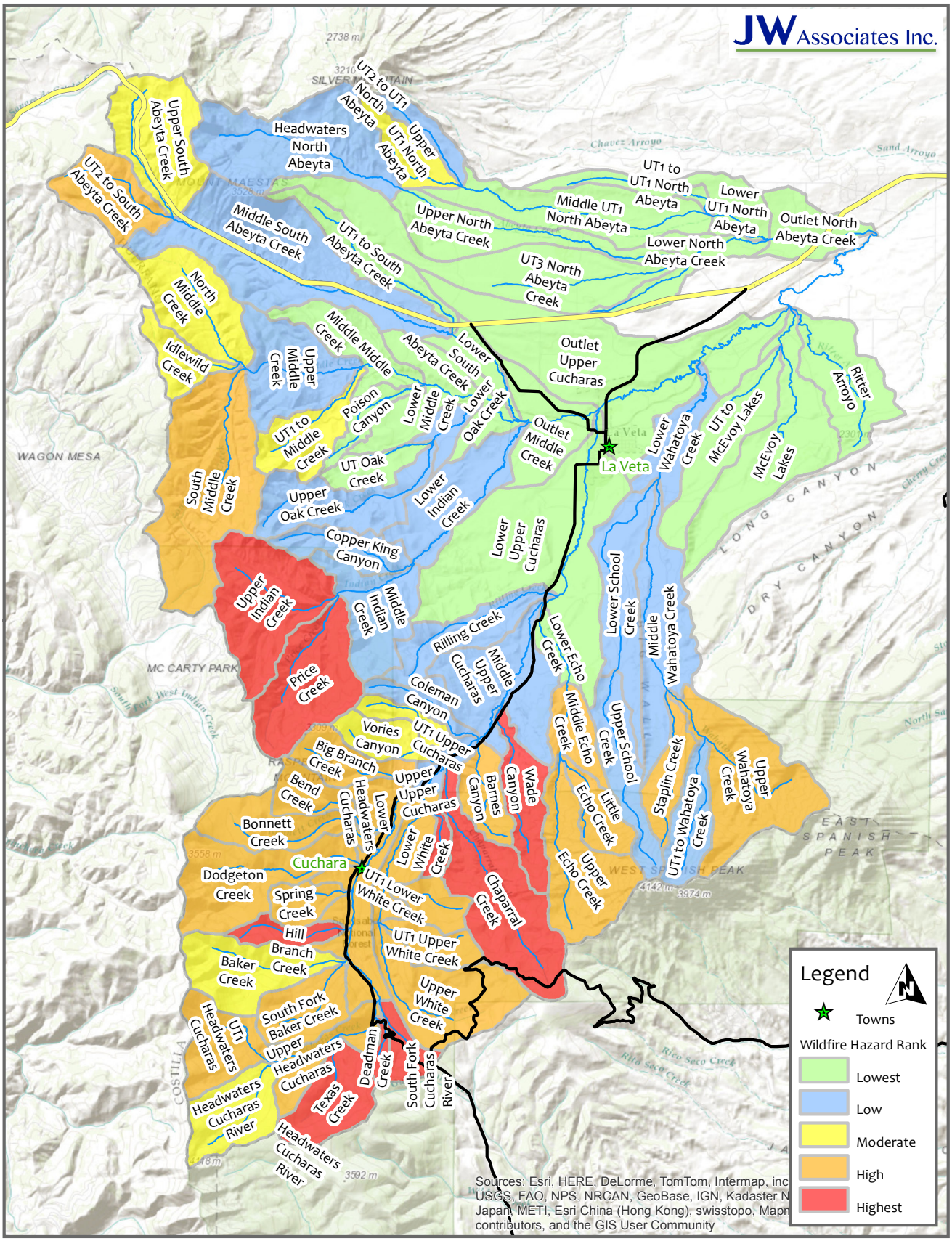

Figure 5. Wildfire Hazard Ranking for Cucharas River Small Watersheds

Component 2 - Flooding or Debris Flow Hazard

A combination of ruggedness and road density (miles of road per square mile of watershed area) was used to assess the flooding or debris flow hazard portion of the analysis. The two components, ruggedness and road density, are described below.

Ruggedness

Watershed steepness or ruggedness is an indicator of the relative sensitivity to debris flows following wildfires (Cannon and Reneau 2000). The more rugged the watershed, the higher its sensitivity to generating debris flows following wildfire (Melton 1957). The Melton ruggedness factor is basically a slope index.

Melton (1957) defines ruggedness, R, as;

$$R = H_b A_b^{-0.5}$$

Where A_b is basin area and H_b is basin height measured from the point of highest elevation along the watershed divide to the outlet.

The ruggedness result in some watersheds was adjusted because they do not accurately reflect the slope in those watersheds. Those situations are most common in composite watersheds because they are disconnected from their headwaters. These watersheds can have a high hazard for debris flows because they contain a main stem of a creek or river with several steep first order streams as tributaries. In those situations, the ruggedness calculation were adjusted up by reducing the watershed area.

The categorized ruggedness by small watershed is shown in Figure 6 and the results are displayed on Table A-3 in Appendix A. The highest ranked ruggedness hazards are in the following small watersheds: Deadman Creek, Staplin Creek, UT1 to Wahatoya Creek, Upper School Creek, Upper Headwaters Cucharas, and Little Echo Creek.

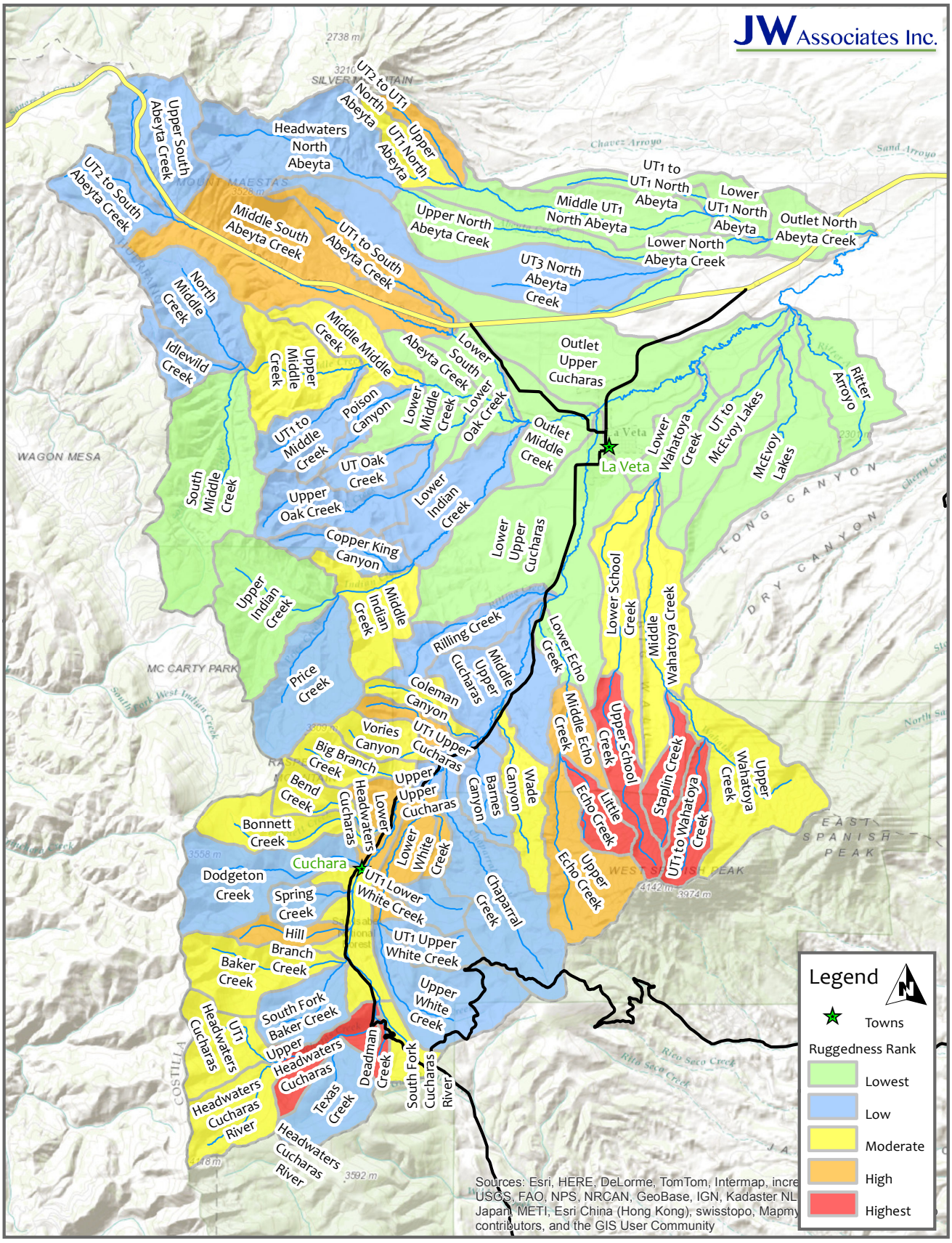

Figure 6. Ruggedness Ranking for Cucharas River Small Watersheds

Road Density

Roads can convert subsurface runoff to surface runoff and then route the surface runoff to stream channels, increasing peak flows (Megan and Kidd 1972, Ice 1985, and Swanson et al. 1987). Therefore, watersheds with higher road densities have a higher sensitivity to increases in peak flows following wildfires. Road density in miles of road per square mile of watershed area was used as an indicator of flooding hazard. The U.S. Forest Service roads data was used on National Forest System (NFS) lands because it is the most accurate roads data for those roads in the forest. On all other lands the U.S. Census Bureau's Tiger database was used because it is a consistent roads data layer.

The roads that are of interest in this analysis are those roads that would increase the risk of flooding or debris flows following wildfires in forested areas. Therefore, road densities were adjusted when some of the roads within the watershed are located within towns, developed areas, or outside the forested areas of the watershed. The watersheds were all examined by looking at the roads data overlain on digital images and vegetation mapping. If it was found that there were significant lengths of road outside forested areas, the road density in those watersheds was adjusted down based on ocular estimates. The adjustments are shown on Table A-4 in Appendix A.

Figure 7 displays the categorized road density for the Cucharas River Watershed and tabular results are presented in Appendix A. The highest road density rankings (Category 5) are in the Lower Headwaters Cucharas, Middle Headwaters Cucharas, South Fork Cucharas River, Rilling Creek, Upper Upper Cucharas, Upper White Creek, and Deadman Creek watersheds.

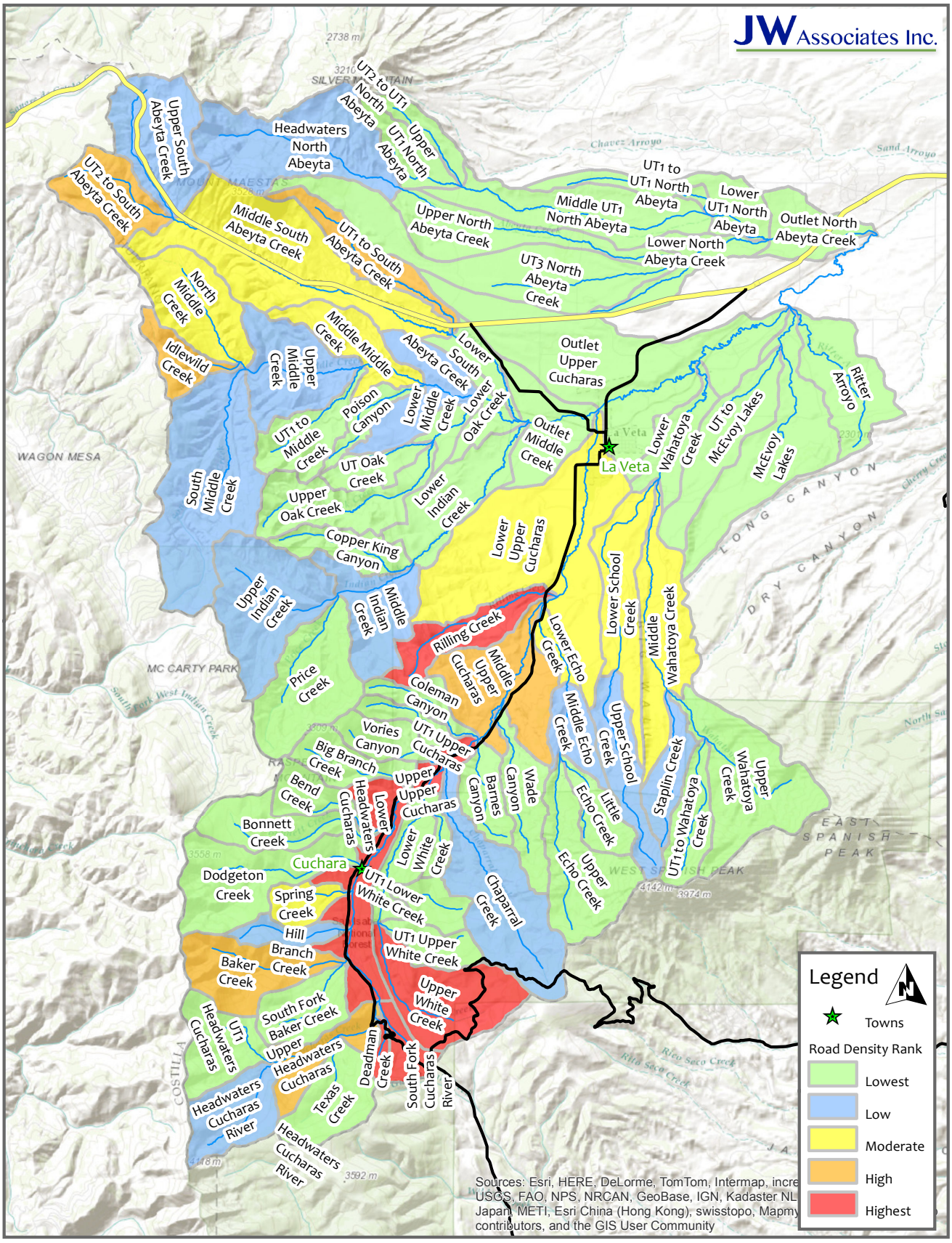

Figure 7. Road Density Ranking for Cucharas River Small Watersheds

Flooding or Debris Flow Hazard Ranking

The Flooding or Debris Flow Hazard is the combination of ruggedness and road density. The procedure from the Colorado Watershed Work Group (2009) assigned ruggedness a higher value than road density in this ranking. While ruggedness is the most important factor, an increase in road density will magnify the effects of ruggedness on the flooding/debris flow hazard. Accordingly, the analysis for flooding or debris flow hazard used the following formula. The results of this calculation were then re-categorized into five hazard rankings.

Flooding or Debris Flow Hazard Ranking = (Road Density Ranking + Ruggedness Ranking ***** 2)

The categorized flooding/debris flow hazard by small watershed are displayed on Figure 8 and on Table A-5 in Appendix A. The highest ranked flooding/debris flow hazards are in the following small watersheds: Deadman Creek, Upper Headwaters Cucharas, and Lower Headwaters Cucharas.

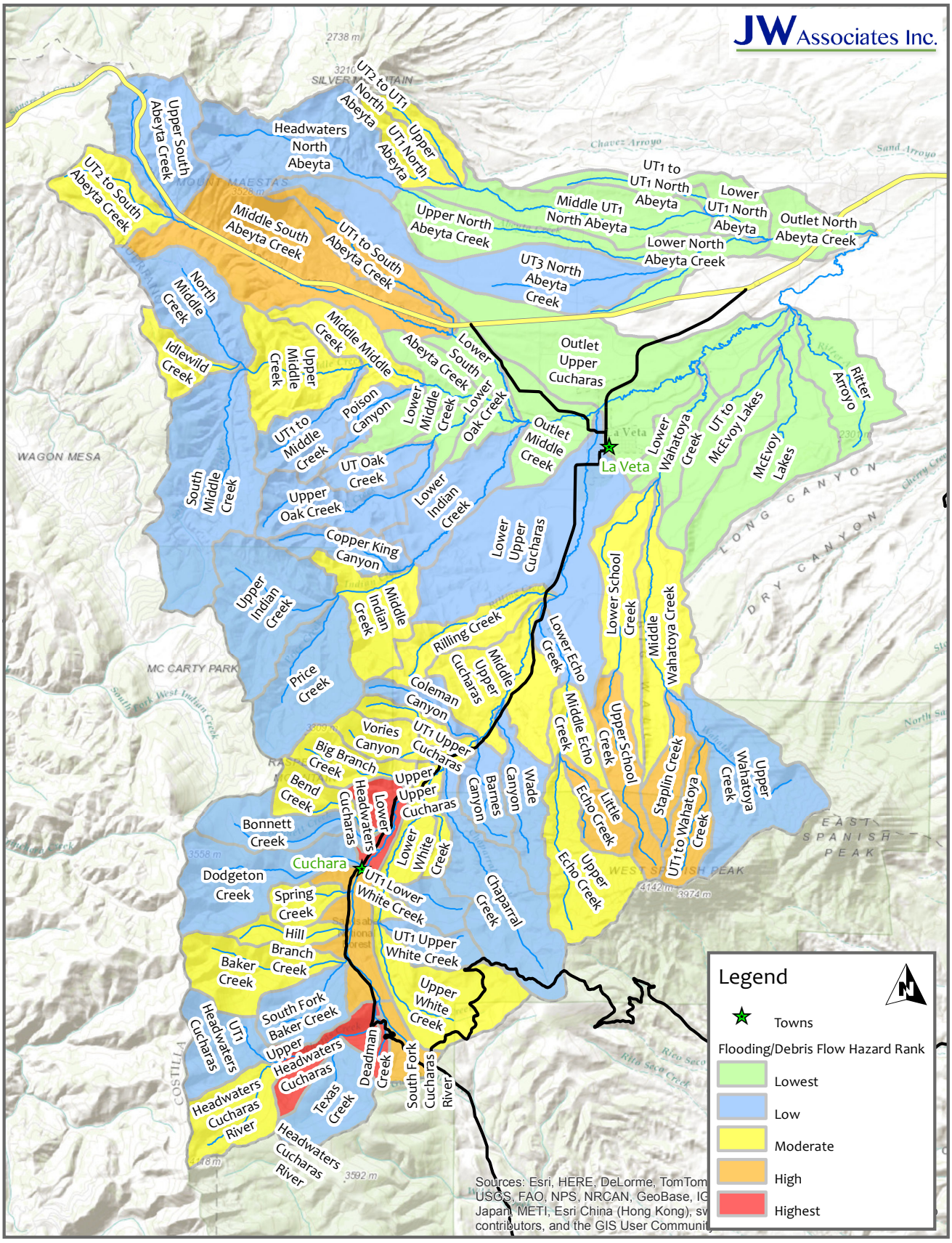

Figure 8. Flooding/Debris Flow Hazard Ranking for Cucharas River Small Watersheds

Component 3 - Soil Erodibility

High-severity fires can dramatically change runoff and erosion processes in watersheds. Water and sediment yields may increase as more of the forest floor is consumed (Wells et al. 1979, Robichaud and Waldrop 1994, Soto et al. 1994, Neary et al. 2005, and Moody et al. 2008) and soil properties are altered by soil heating (Hungerford et al. 1991).

The U.S.D.A. - Natural Resources Conservation Service (NRCS) SSURGO soils data were used in the soil erodibility analysis. SSURGO data is available at an appropriate scale (generally ranges from 1:12,000 to 1:63,360) for this analysis.

The soil erodibility analysis used a combination of two standard erodibility indicators: the inherent susceptibility of soil to erosion (K factor) and land slope derived from Unites States Geological Survey (USGS) 30-meter digital elevation models. The K factor data from the SSURGO spatial database was combined with a slope grid using NRCS (USDA NRCS 1997) slope-soil relationships (Table 1) to create a classification grid divided into slight, moderate, severe and very severe erosion hazard ratings.

Table 1. NRCS Criteria for Determining Potential Soil Erodibility

Percent Slope	K Factor <0.1	K Factor 0.1 to 0.19	K Factor 0.2 to 0.32	K Factor >0.32
0-14	Slight	Slight	Slight	Moderate
15-34	Slight	Slight	Moderate	Severe
35-50	Slight	Moderate	Severe	Very Severe
>50	Moderate	Severe	Very Severe	Very Severe

The potential soil erodibility analysis from the SSURGO data and the criteria in Table 1 is displayed on Figure 9. The categorized potential soil erodibility hazard rankings are shown on Figure 10 and the tabular results are presented in Appendix B. The highest ranked (Category 5) small watersheds are Cottonwood Canyon, Idlewald Creek, and Big Branch Creek.

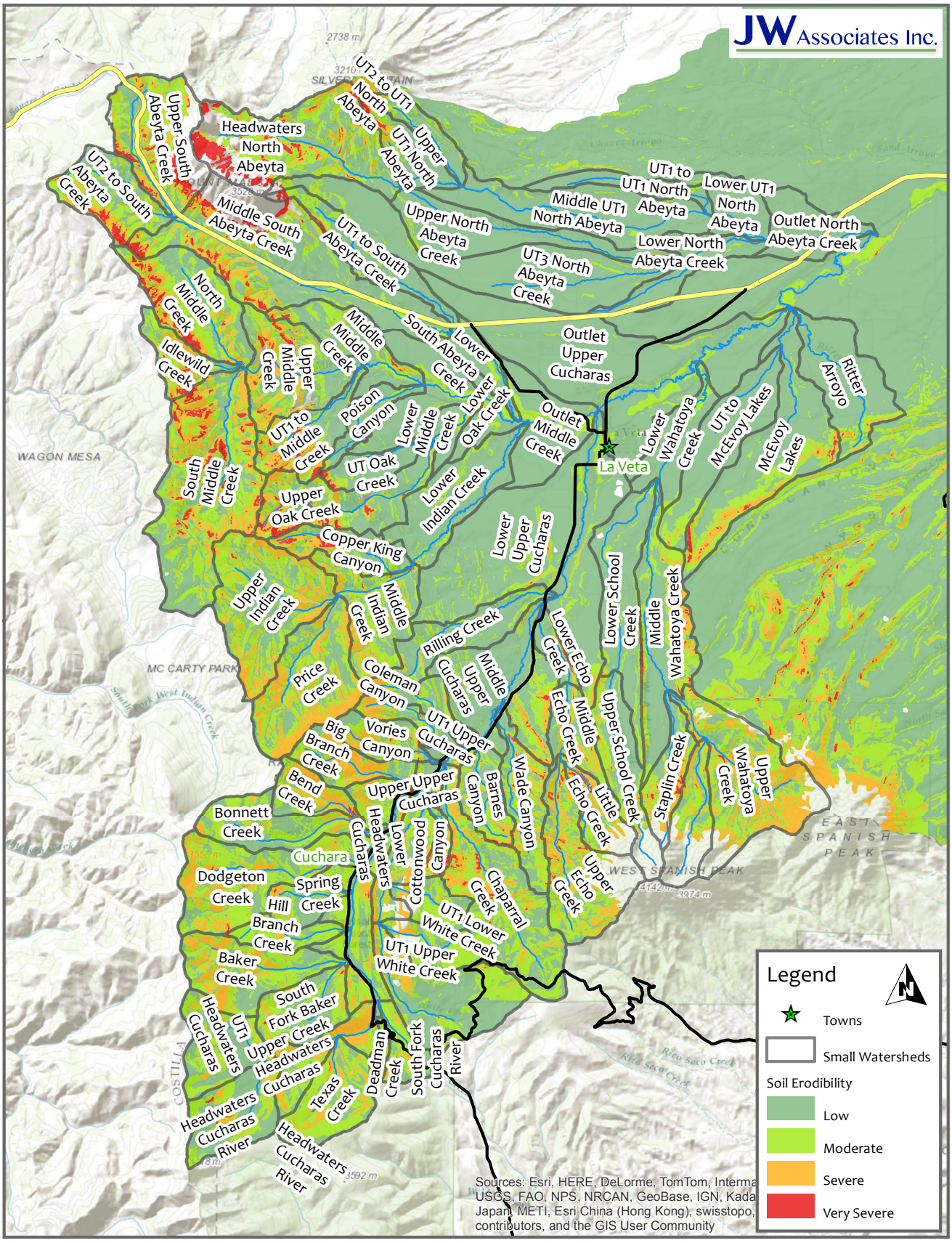

Figure 9. Soil Erodibility Analysis Results for Cucharas River Small Watersheds

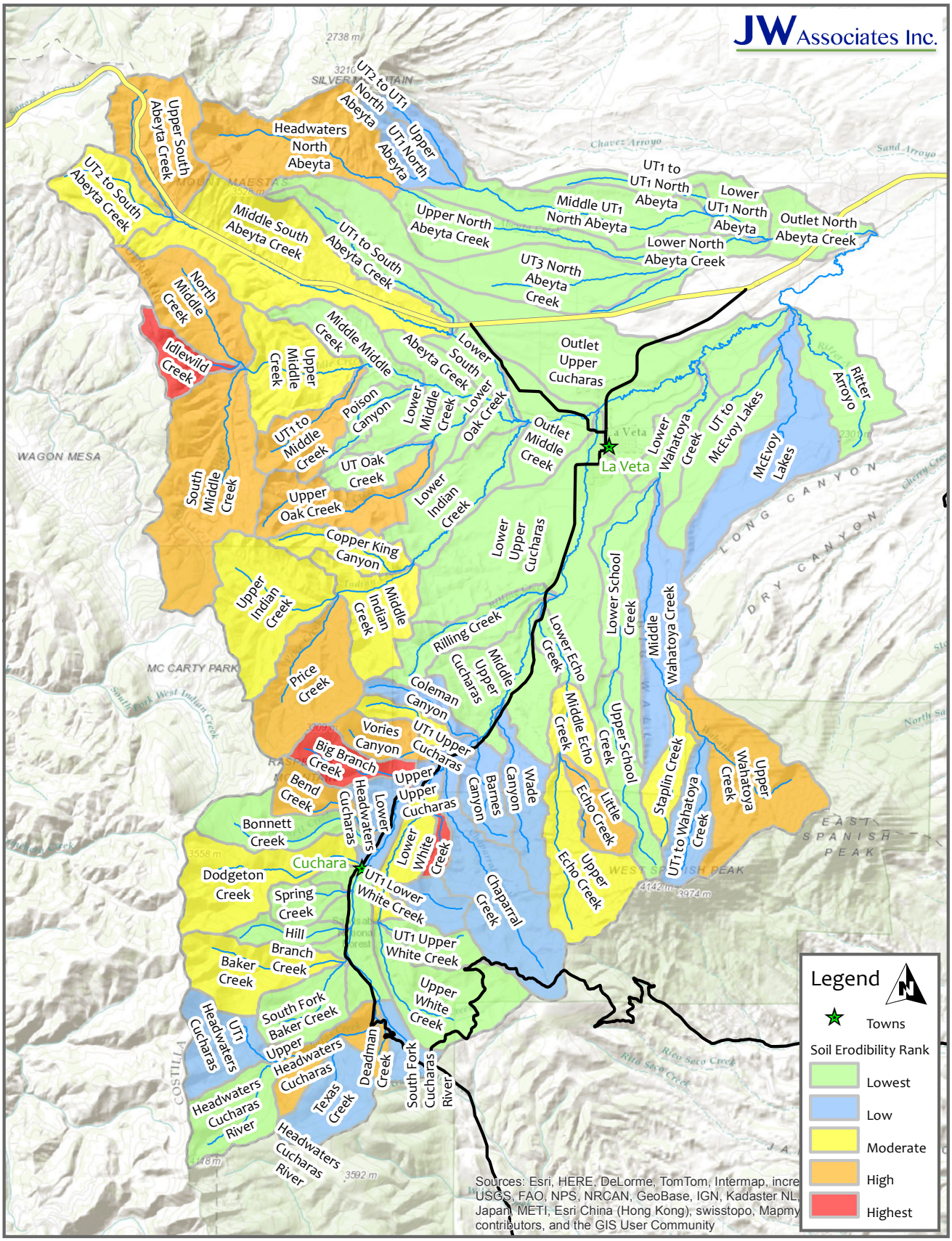

Figure 10. Soil Erodibility Ranking for Cucharas River Small Watersheds

Composite Hazard Ranking

The Composite Hazard Ranking is created by combining the rankings for Wildfire Hazard, Flooding/Debris Flow Hazard and Soil Erodibility for each small watershed. The watersheds are then re-categorized based on the sum of these factors. The Composite Hazard Ranking map is useful in comparing relative watershed hazards based solely on environmental factors. Figure 11 shows the Composite Hazard Ranking for the Cucharas River Watershed. The tabular results that display the individual rankings for Wildfire Hazard, Flooding/Debris Flow Hazard and Soil Erodibility, as well as the composite rankings, are presented in Table A-7 in Appendix A. The highest ranked (Category 5) small watersheds are Deadman Creek, Cottonwood Canyon, Upper Headwaters Cucharas, Staplin Creek, and Idlewald Creek.

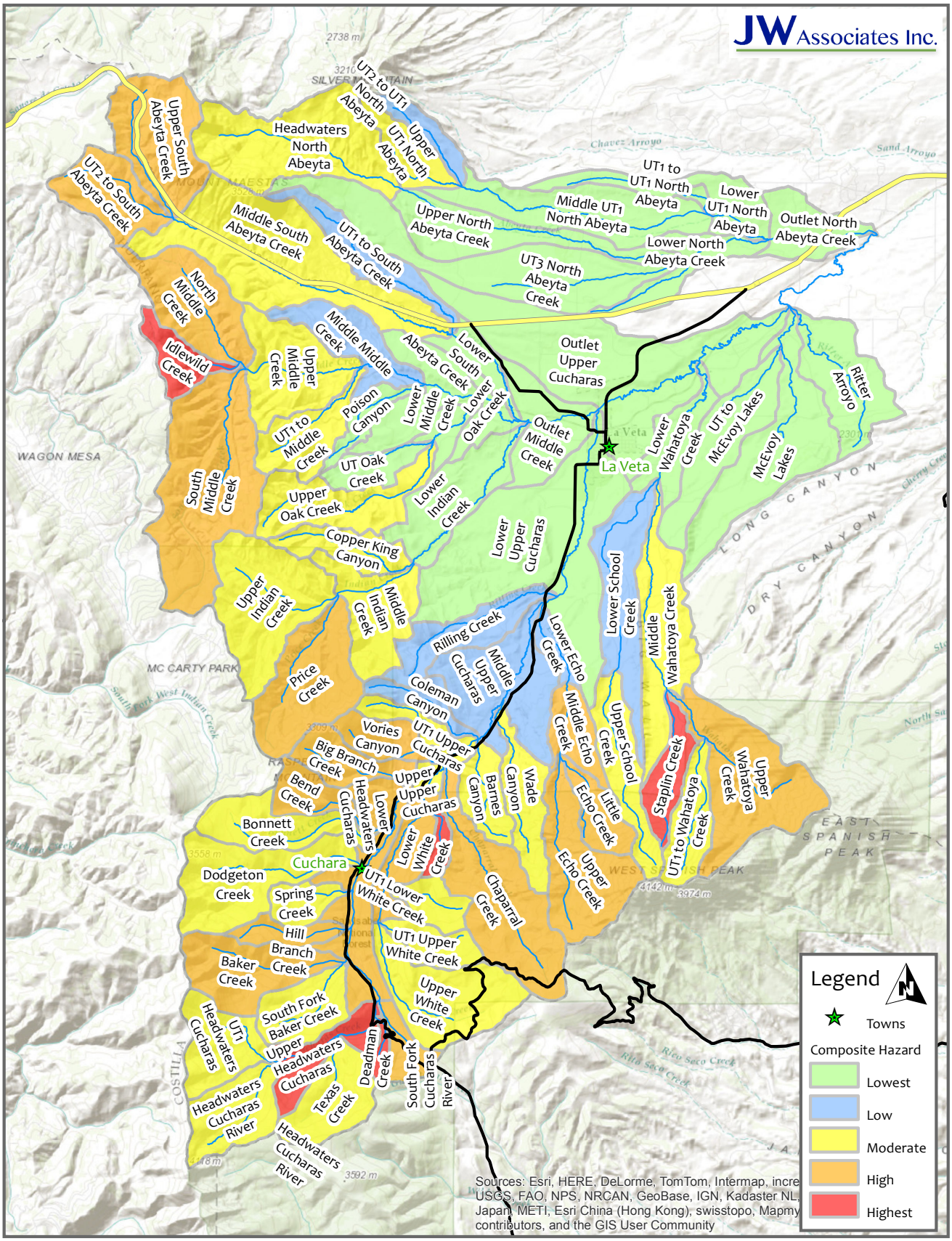

Figure 11. Composite Hazard Ranking for Cucharas River Small Watersheds

SEDIMENT TRANSPORT AND DEPOSITION

Understanding sediment generation and movement in watersheds and stream systems can provide valuable information on the hazards that wildfires might present to downstream water supply infrastructure and water quality. Sediment transport and deposition is a complicated process in natural stream systems. A simplified analysis was used in order to characterize sediment transport and deposition across many watersheds and provide a tool for use in targeting pre- and post-fire watershed protection activities.

This analysis used geomorphic indicators to evaluate where, and to what extent, instream sedimentation would occur after a high-intensity wildfire. These indicators were used to rank the sensitivity of stream junctions to accumulating large deposits of sediment and debris, as well as channel changes in response to increased loads of sediment.

Rosgen Stream Types

The streams of the assessment area were classified according to the Level 1 Rosgen classification method (Rosgen 1994). A Level 1 assessment characterizes streams based upon morphological characteristics. This characterization integrates the landform and fluvial features of the valley morphology with channel relief, pattern, shape and dimension. The longitudinal profiles inferred from topographical map layers and aerial imagery serves as the basis for breaking the stream reaches into slope categories that reflect profile morphology (Rosgen 1994). The characteristics of seven channel types are displayed in Table 2. The gradients and sinuosity measurements for each stream reach were determined using GIS. The sinuosity estimates using the existing stream line layers were determined to be relatively imprecise for stream classifications. Therefore, channel slope and inferred valley confinement were used as the main factors in classifying streams.

In general, stream channel positions in the drainage network and sediment transport characteristics of stream reach-level morphologies define source, transport, and response reaches (Montgomery and Buffington 1993). In steep areas, source reaches are transport limited and sediment storage sites are subject to intermittent debris flow scour (colluvial). Transport reaches are morphologically resilient, high-gradient, supply limited channels (bedrock, cascade, and step-pool) that rapidly convey increased sediment inputs. Response reaches are low-gradient, transport limited channels (plane-bed, pool-riffle, braided) in which significant morphologic adjustment occurs in response to increased sediment supply (Montgomery and Buffington 1993).

Source reaches are generally located in steeper areas where there is a supply of sediment available for movement downstream (sediment source areas). Although these reaches are high gradient and fast moving, the amount of sediment available for transport usually exceeds the ability of the stream to move the sediments. These reaches are generally smaller tributaries or headwater areas where the streamflow is limited. Sediments are moved intermittently from the source reaches during peakflow or following a disturbance event such as a high-severity wildfire followed by a storm. Because of high gradients and velocities in these streams, peak flows can move large amounts of sediment.

Table 2. Summary of Rosgen Criteria for Broad-level Characterization[1]

Stream Type	General Description	Entrench-ment Ratio	Width/ Depth Ratio	Sinuosity	Slope	Landform/ soils/features
Aa+	Very steep, deeply entrenched, debris transport streams	< 1.4	< 12	1.0 to 1.1	> 0.10	Very high relief. Erosional, bedrock or depositional features; debris flow potential. Deeply entrenched streams. Vertical steps with/ deep scour pools; waterfalls
A	Steep, entrenched, cascading, step/pool streams. High energy/debris transport associated with depositional soils. Very stable if bedrock or boulder dominated channel	< 1.4	< 12	1.0 to 1.2	0.04 to 0.10	High relief. Erosional or depositional and bedrock forms. Entrenched and confined streams with cascading reaches. Frequently spaced, deep pools in associated step-pool bed morphology
B	Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks	1.4 to 2.2	> 12	> 1.2	0.02 to 0.039	Moderate relief, colluvial deposition and/or residual soils. Moderate entrenchment and W/D ratio. Narrow, gently sloping valleys. Rapids predominate with occasional pools
C	Low gradient, meandering, point bar, riffle/pool, alluvial channels with broad, well defined floodplains	> 2.2	> 12	> 1.4	< 0.02	Broad valleys with terraces, in association with floodplains, alluvial soils. Slightly entrenched with well-defined meandering channel. Riffle-pool bed morphology.
D	Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.	n/a	> 40	n/a	< 0.04	Broad valleys with alluvial and colluvial fans, Glacial debris and depositional features. Active lateral adjustment, with abundance of sediment supply.
DA	multiple channels, narrow and deep with expansive well vegetated floodplain and associated wetlands. Very gentle relief with highly variable sinuoisties. Stable streambanks.	> 4.0	< 40	variable	< 0.005	Broad low gradient valleys with fine alluvium and/or lacustrine soils. Anastomosed (multiple channel) geologic control creating fine deposition with well vegetated bars that are laterally stable with broad wetland floodplains.
E	Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.	> 2.2	< 12	> 1.5	< 0.02	Broad valley/meadows. Alluvial materials with floodplain. Highly sinuous with stable, well vegetated banks. Riffle-pool morphology with very low width/depth ratio.
F	Entrenched meandering riffle/pool channel on low gradients with high width/ depth ratio	< 1.4	> 12	> 1.4	< 0.02	Entrenched in highly weathered material. Gentle gradients, with a high W/D ratio. Meandering, laterally unstable with high bank erosion rates. Riffle-pool morphology
G	Entrenched "gully" step/ pool and low width/depth ratio on moderate gradients	< 1.4	< 12	> 1.2	0.02 to 0.039	Gully, step-pool morphology with moderate slopes and low W/D ratio. Narrow valleys, or deeply incised in alluvial or colluvial materials; i.e., fans or deltas. Unstable, with grade control problems and high bank erosion rates

[1] Rosgen 1994

Some reaches may have a greater capacity to transport sediments than the surrounding watershed and upper reaches can supply. These reaches are considered "supply limited" and have higher streamflows than source reaches and higher velocities than response reaches. Most sediment that is delivered to the reach is transported downstream. These stream reaches are called transport reaches, a reflection of their ability to move sediment downstream.

Lower gradient stream reaches are generally not able to transport all the sediment that is delivered to them from upper stream reaches, tributaries or the surrounding watershed. These reaches are "transport limited" because their ability to transport sediment is exceeded by the amount of sediment supplied to them. Increased sediment delivery to these reaches is deposited in the reach rather than transported further downstream. Therefore, these stream reaches are called response reaches. Response reaches are typically pool-riffles or braided channels and although they tend to have the highest streamflow in the system because of the higher water volume lower in the watershed, they are the slowest moving. Transport of sediments deposited in response reaches usually occurs during peak flows events (snowmelt runoff or summer rainstorms).

The relationship of the different reaches determines where in the watershed potential problems with sediment deposition would occur. The most sensitive junctions in the watershed tend to be at the junction of other reaches with response reaches, where the velocity of the water is typically slow. When a transport reach encounters a response reach, there is a high potential for sediment deposition because the sediment transport capacity (in comparison to supply) of the upper transport reach is so much greater than the ability of the response reach to move sediment. Another sensitive stream junction is at the point where a source reach enters a response reach. Source reaches can deliver sediment at higher flows, and in some cases debris flows, directly to response reaches, overwhelming the ability of the much slower water in the response reach to move the sediment and debris.

Sediment deposition in response reaches is a natural process. The sediment will form bars or be stored in banks, floodplains, etc. and the reach will retain its function. However when sediment yield is increased or a catastrophic event occurs higher in the watershed, the amount of sediment delivered by a transport or source reach can overwhelm the response reach with sediment deposition and debris. The reach may move outside of dynamic equilibrium and not function properly until peak flow events possibly restore the channel to a functioning condition (dynamic equilibrium) by transporting the excess sediment downstream.

Stream segments were systematically identified as either "source," "transport," or "response" based on their Rosgen channel type (Table 3). The spatial distribution of source, transport, and response reaches governs the distribution of potential impacts and recovery times for the system.

Table 3. Relationship Between Sediment Transport Characteristics[2] and Rosgen Channel Type

Sediment Transport Characteristics	Rosgen Channel Type	Gradient
Source	Aa+	> 0.10
Transport	A	0.04 to 0.10
	B	0.03 to 0.039
	G	0.03 to 0.039
Response	B	0.02 to 0.03
	G	0.02 to 0.03
	C	< 0.02
	E	< 0.02

Once the streams were characterized by sediment transport characteristics, the junctions of the different channel types were evaluated. Table 4 presents the guidelines used to classify junctions. Green tagged junctions are areas where problematic deposition is unlikely to occur because sediment transport capacity does not change dramatically. Some of the green junctions are unlikely to occur in the watershed, such as transport to source junctions. Yellow tagged junctions may experience impacts from increased sediment supply that are pronounced and persistent. The transport to response junctions are discussed above and are areas of concern for increased sediment deposition. The source to transport junctions are also areas of concern, even though sediment transport capacity increases, because source reaches can generate debris flows following wildfires. Red tagged junctions are source to response junctions. These junctions were tagged red because source reaches can deliver debris flows in addition to increased sediment. The tagging of stream junctions allows a graphical presentation of sediment deposition in the watersheds and allows a simplified interpretation of potential problem areas.

[2] Montgomery and Buffington 1993

Table 4. Stream Junction Sediment Transport Tagging Guidelines

Upstream Stream Reach	Downstream Stream Reach	Junction Tag
Source	Source	Green
Transport	Source	Green
Source	Transport	Yellow
Transport	Transport	Green
Response	Transport	Green
Source	Response	Red
Transport	Response	Yellow
Response	Response	Green

This analysis was not added to the small watershed prioritization because it is difficult to interpret as a single number to insert into the categorization approach. The sediment transport analysis is presented within the context of the Zones of Concern in the next section of this document. It is suggested that this analysis should be used as additional information when evaluating hazards to water supply infrastructure and water quality. The red and yellow tags can be viewed as sediment stops in the system, or areas of concern, and the green tags as places where sediment continues to move downstream. However, sediment deposition at red and yellow tags is available to be transported downstream under floods or other high streamflows. A map of the stream segment classification and junction tags are present below on Figures 12, 13 and 14.

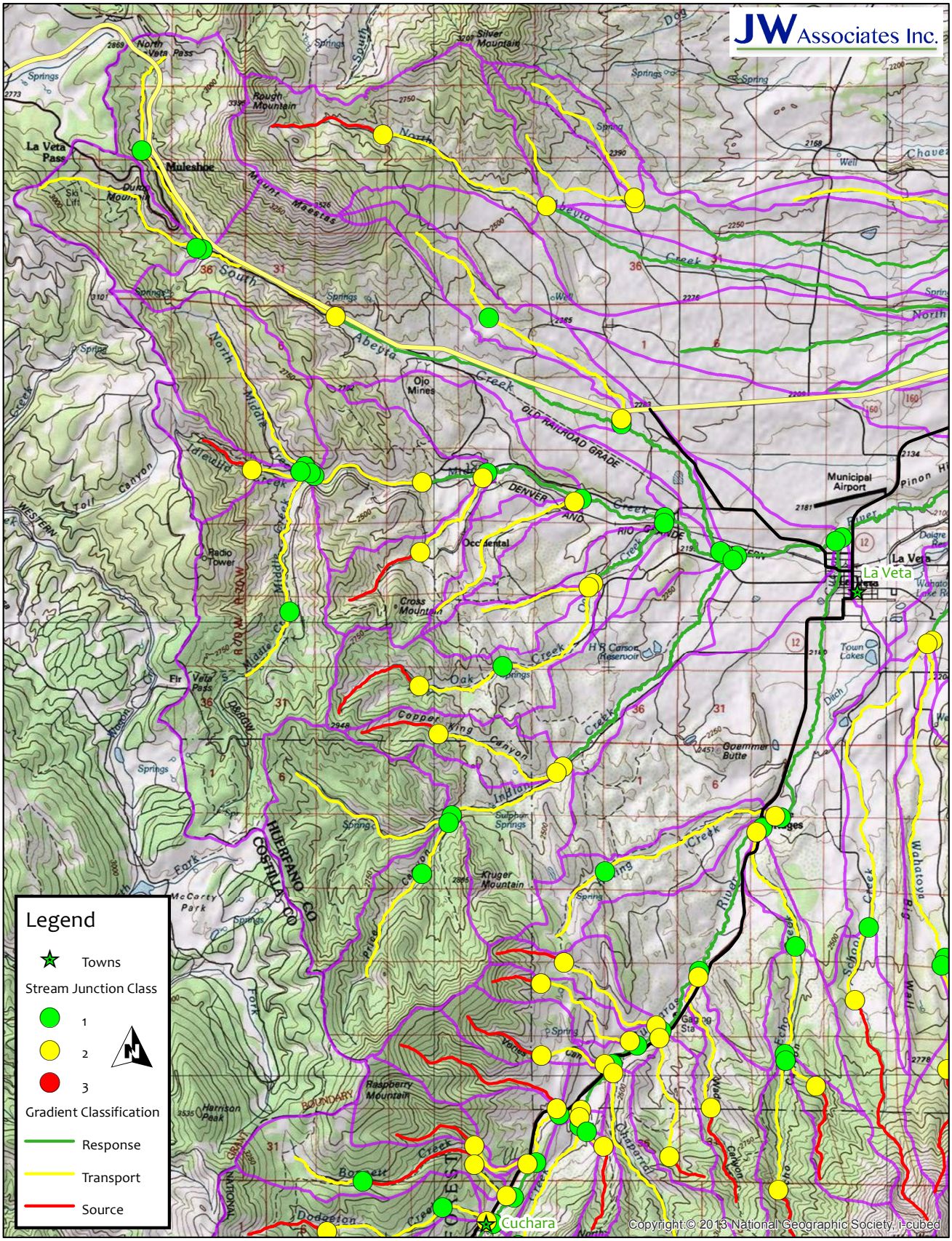

Figure 12. Upper Cucharas River Sediment Transport Northern Area

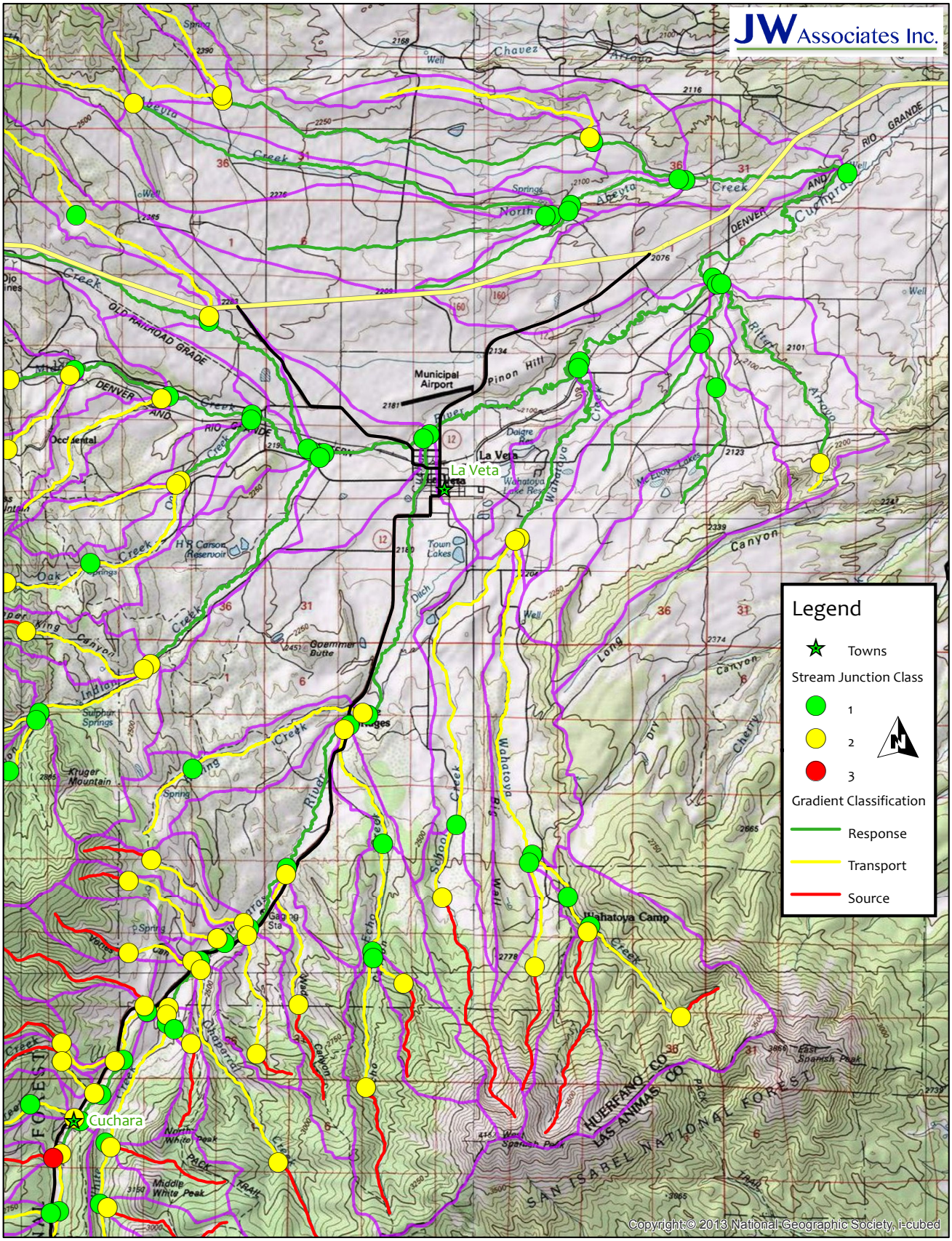

Figure 13. Upper Cucharas River Sediment Transport Eastern Area

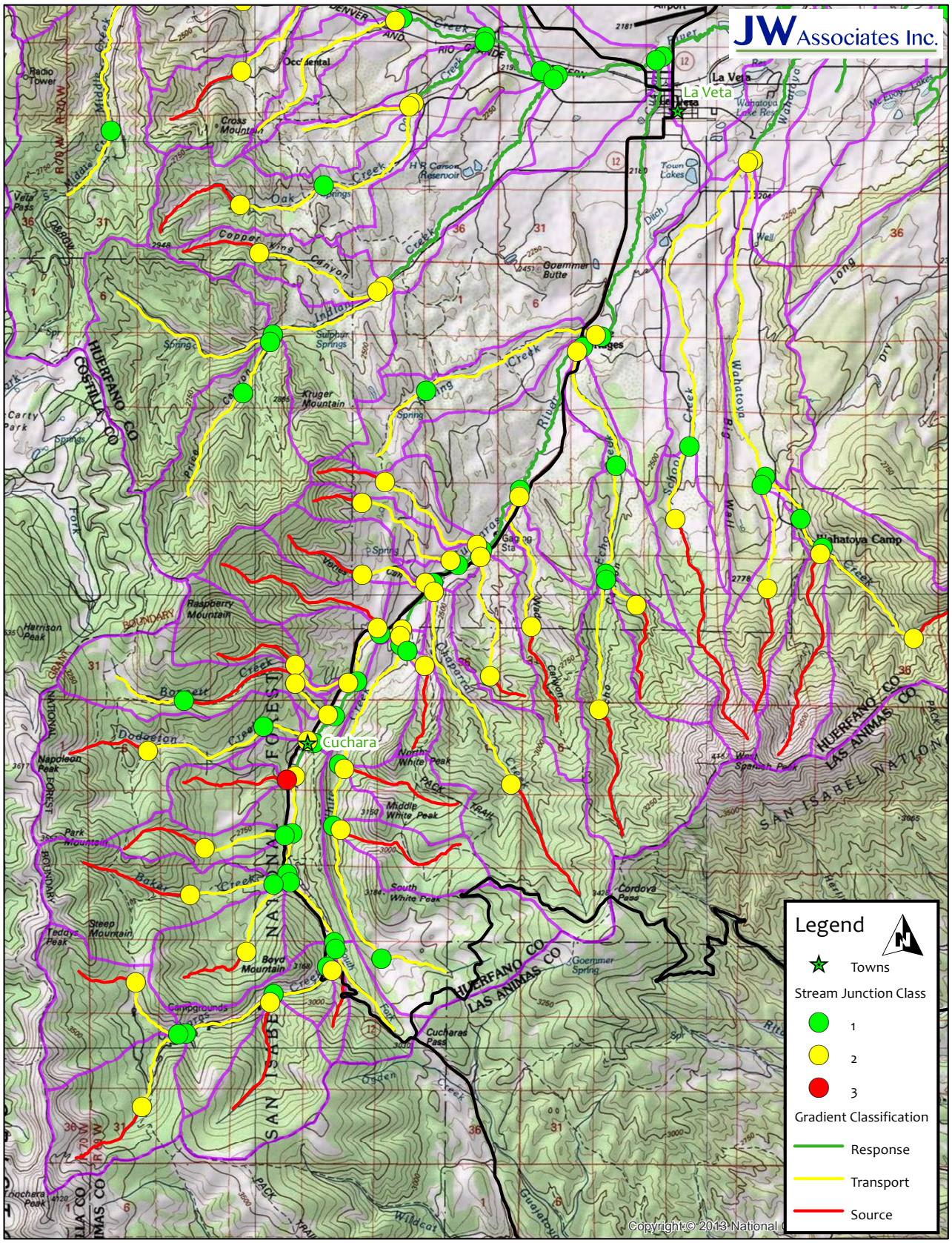

Figure 14. Upper Cucharas River Sediment Transport Southern Area

ZONES OF CONCERN

Zones of Concern were created for each water supply system in the Cucharas River Wildfire/Watershed Assessment (JW Associates 2014). These Zones of Concern are areas that should be the focus of watershed protection measures designed to protect water supplies. Figure 15 shows the Zones of Concern and the Composite Hazard Ranking on the same map.

The combination of the small watershed hazard identification and the sediment transport analysis within the Zones of Concern provides more appropriate small-scale targeting for watershed protection projects than the larger scale Cucharas River Wildfire/Watershed Assessment (JW Associates 2014). Maps displaying the Small Watershed Composite Hazard Ranking, Sediment Transport Analysis and the Zones of Concern are presented below as Figures 16, 17, 18, 19 and 20. These maps should be used in combination with the Opportunities and Constraints analysis presented in the Cucharas River Wildfire/Watershed Assessment (JW Associates 2014) to identify specific watershed protection measures within each Zone of Concern.

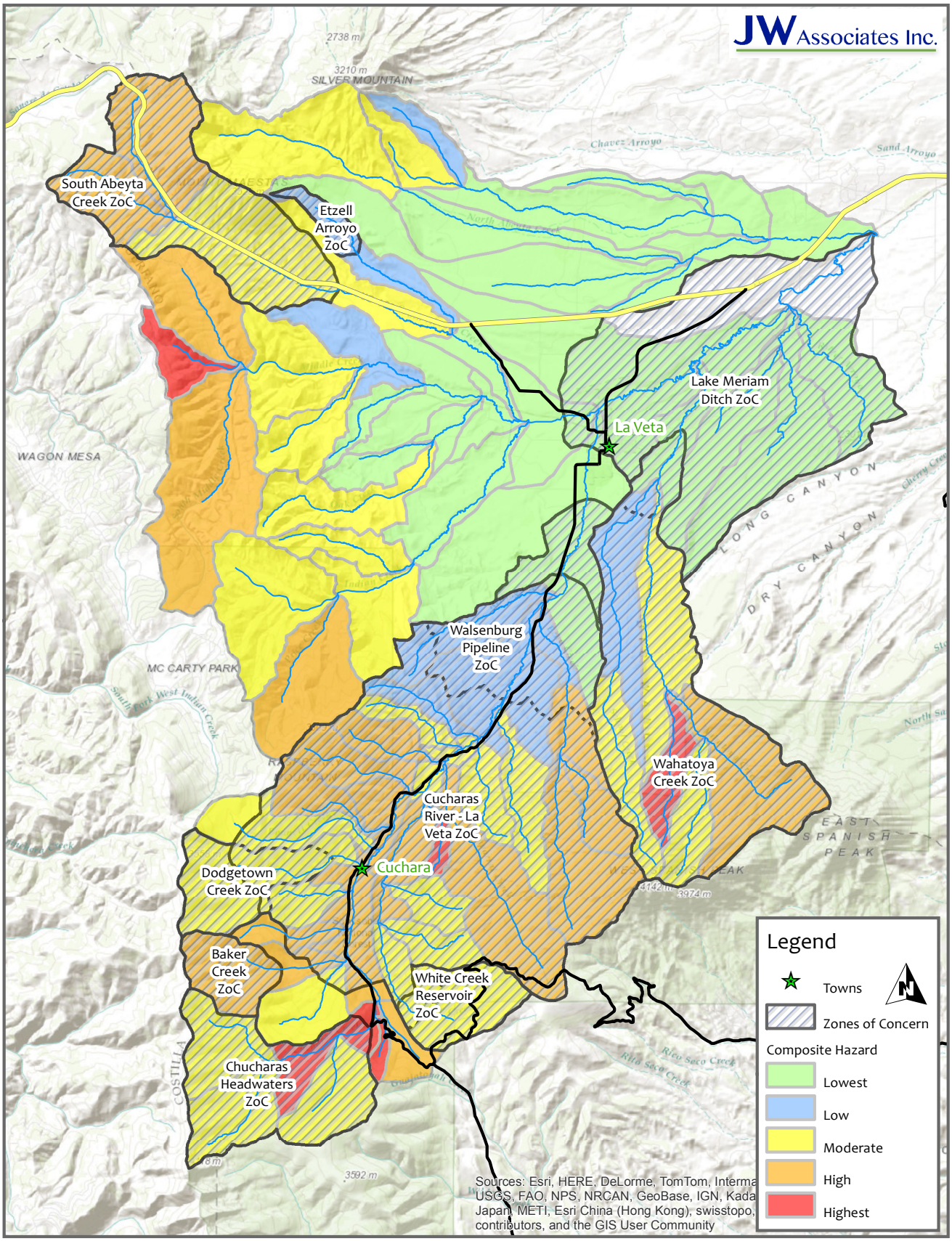

Figure 15. Zones of Concern and Composite Hazard Ranking for Cucharas River Small Watersheds

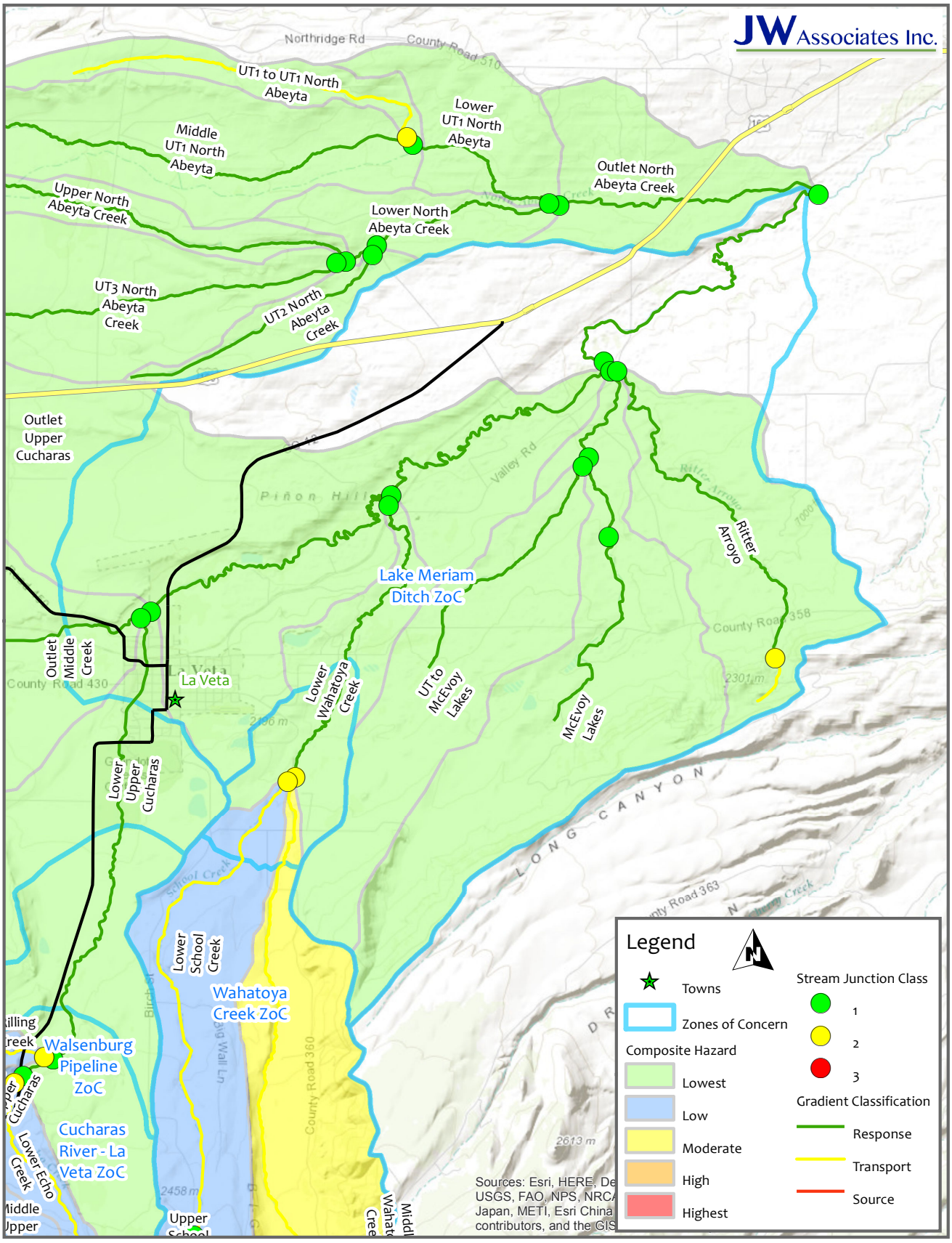

Figure 16. Composite Hazard Ranking and Sediment Transport for Lake Meriam Ditch Zone of Concern

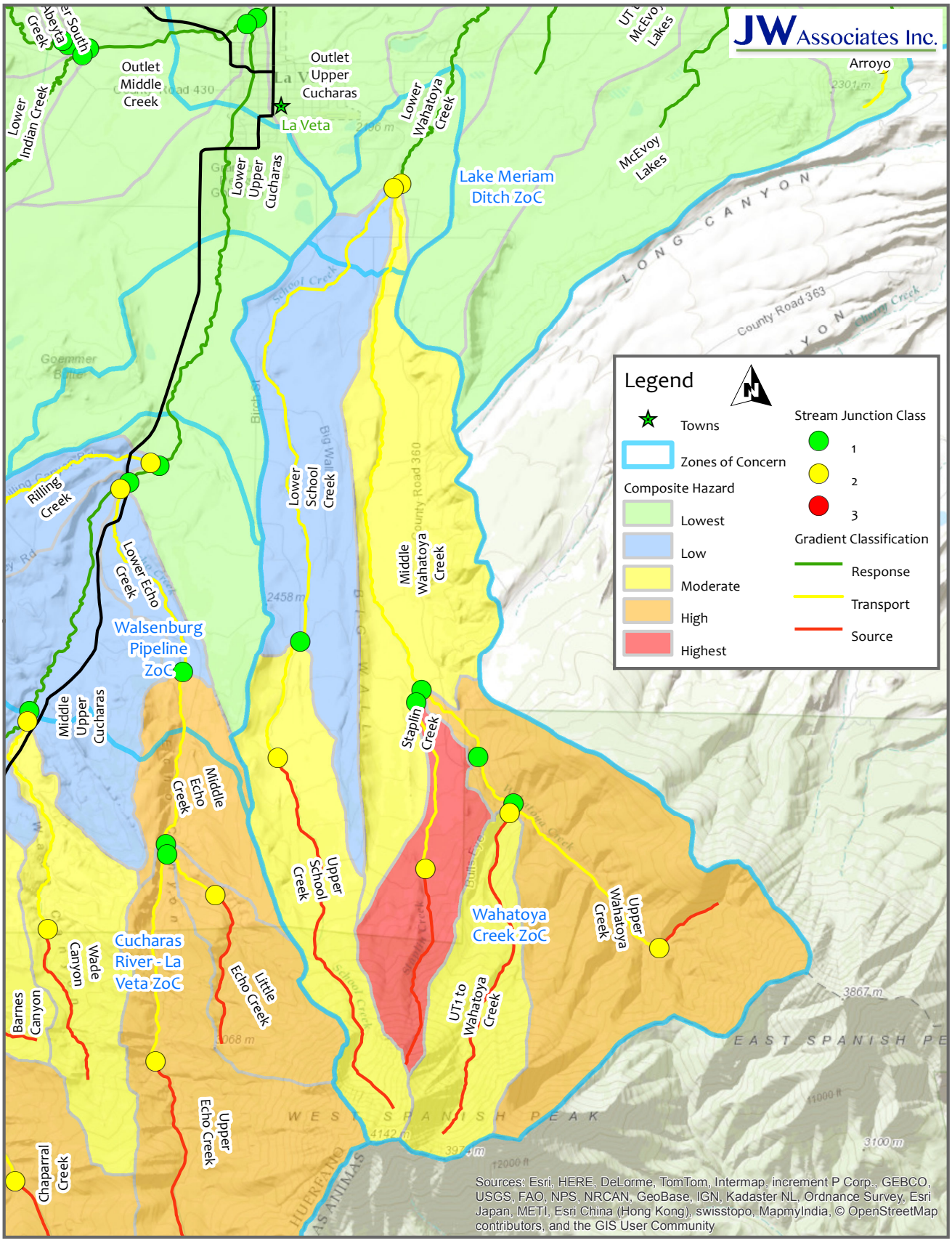

Figure 17. Composite Hazard Ranking and Sediment Transport for Wahatoya Creek Zone of Concern

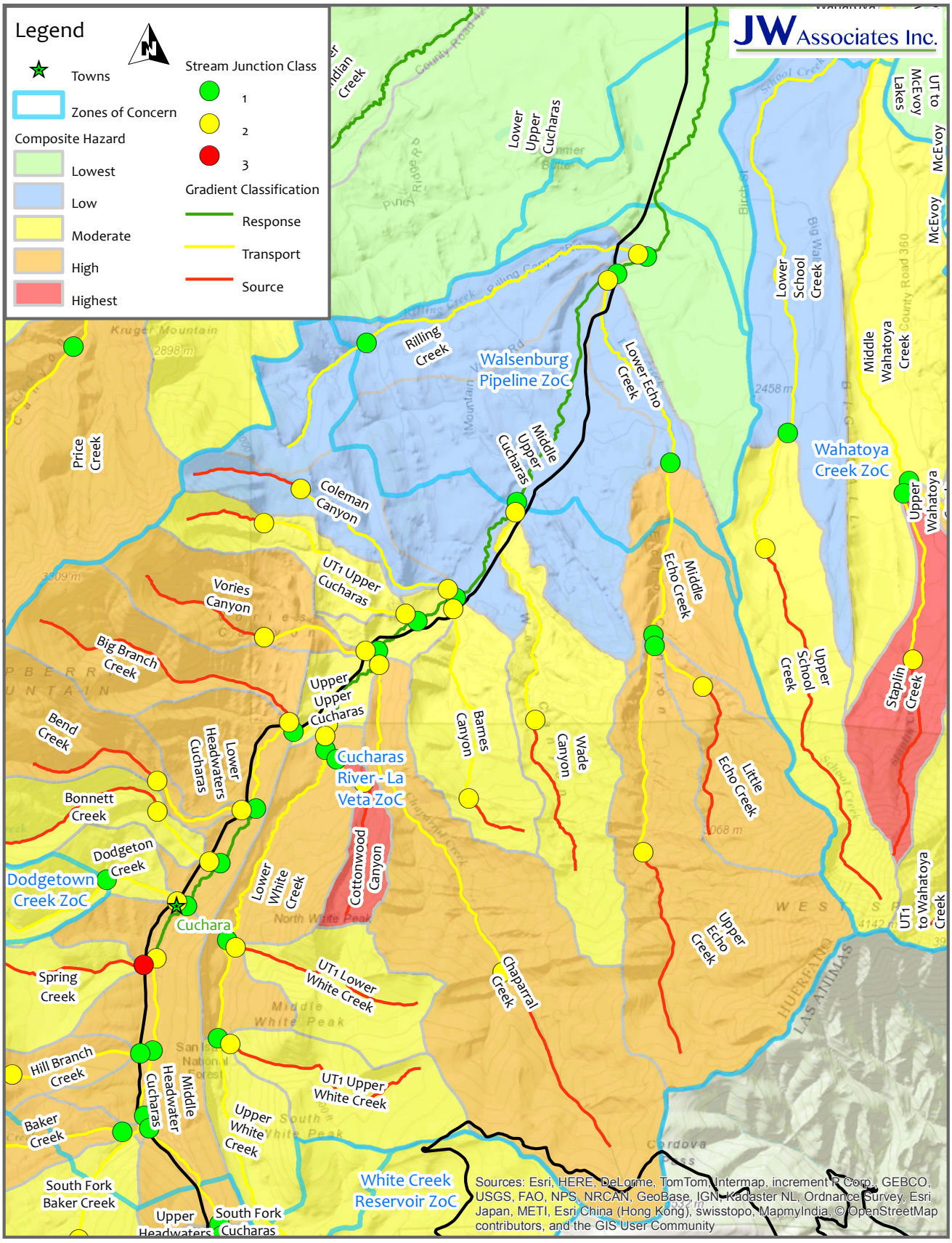

Figure 18. Composite Hazard Ranking and Sediment Transport for Lower Cucharas River Zones of Concern

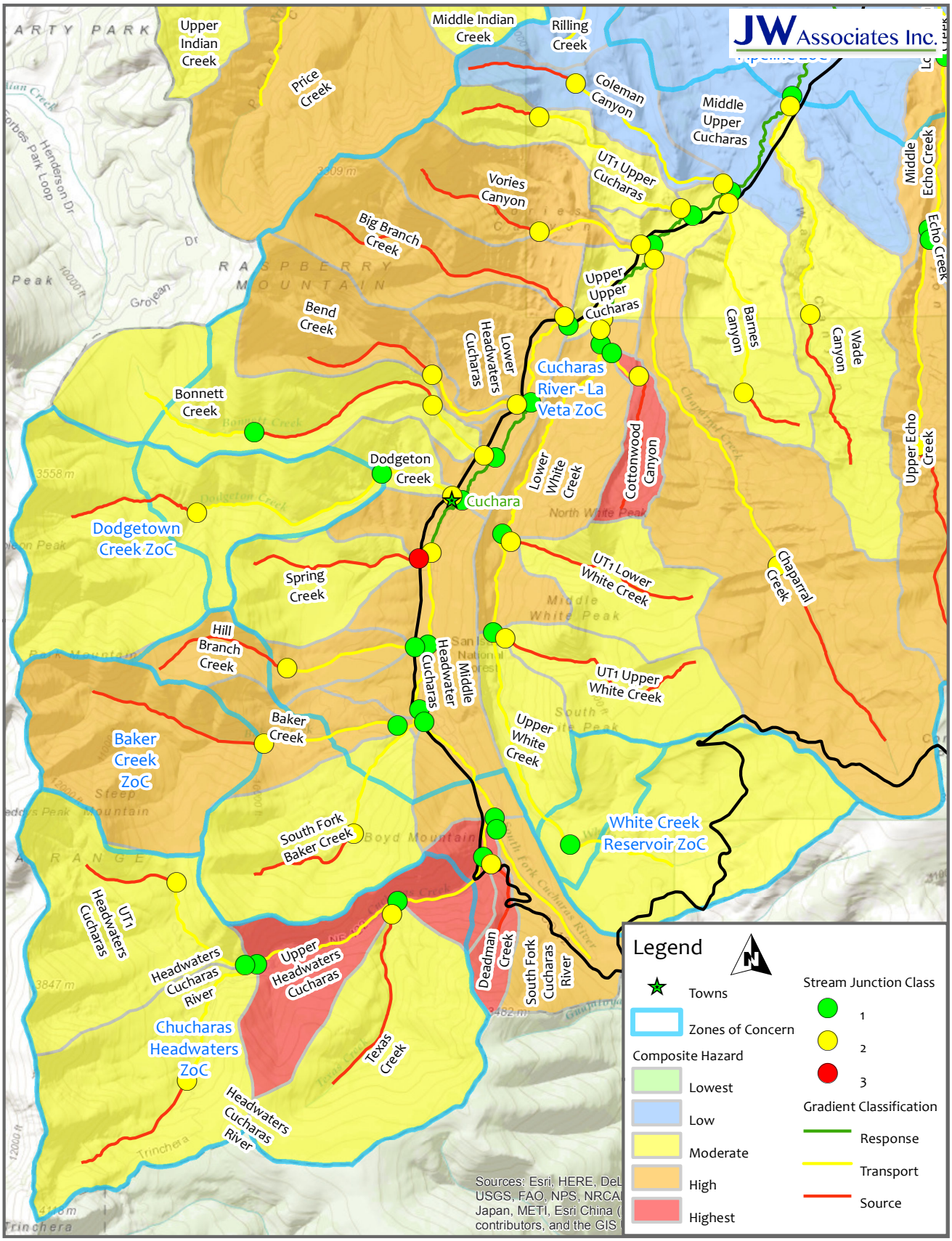

Figure 19. Composite Hazard Ranking and Sediment Transport for Upper Cucharas River Zones of Concern

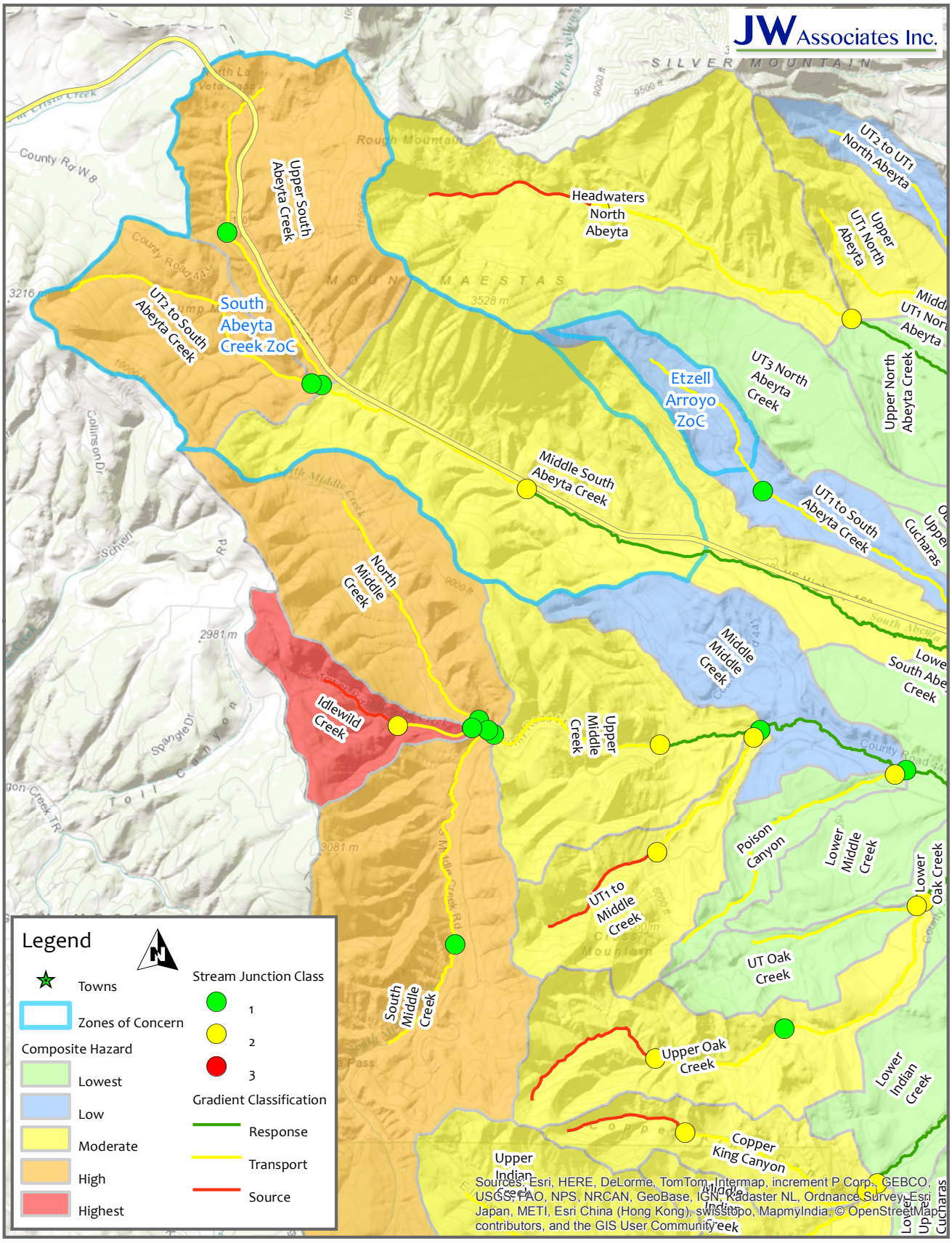

Figure 20. Composite Hazard Ranking and Sediment Transport for Abeyta Creek Zones of Concern

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Appendix A
Small Watershed Data

Table A-1. Cucharas River Small Watersheds

14 code HUC	Small Watershed Name	Area (acres)	12 code HUC	Sixth-level Watershed Name
11020006040101	Lower Headwaters Cucharas	907	110200060401	Headwaters Cucharas River
11020006040102	Big Branch Creek	1,114	110200060401	Headwaters Cucharas River
11020006040103	Bend Creek	922	110200060401	Headwaters Cucharas River
11020006040104	Bonnett Creek	1,666	110200060401	Headwaters Cucharas River
11020006040105	Dodgeton Creek	2,794	110200060401	Headwaters Cucharas River
11020006040106	Middle Headwater Cucharas	1,545	110200060401	Headwaters Cucharas River
11020006040107	Spring Creek	709	110200060401	Headwaters Cucharas River
11020006040108	Hill Branch Creek	631	110200060401	Headwaters Cucharas River
11020006040109	South Fork Baker Creek	1,392	110200060401	Headwaters Cucharas River
11020006040110	Baker Creek	2,099	110200060401	Headwaters Cucharas River
11020006040111	South Fork Cucharas River	695	110200060401	Headwaters Cucharas River
11020006040112	Upper Headwaters Cucharas	1,190	110200060401	Headwaters Cucharas River
11020006040113	Deadman Creek	208	110200060401	Headwaters Cucharas River
11020006040114	Texas Creek	1,678	110200060401	Headwaters Cucharas River
11020006040115	UT1 Headwaters Cucharas	1,610	110200060401	Headwaters Cucharas River
11020006040116	Headwaters Cucharas River	1,690	110200060401	Headwaters Cucharas River
11020006040201	Lower South Abeyta Creek	706	110200060402	South Abeyta Creek
11020006040202	UT1 to South Abeyta Creek	1,314	110200060402	South Abeyta Creek
11020006040203	Middle South Abeyta Creek	5,376	110200060402	South Abeyta Creek
11020006040204	UT2 to South Abeyta Creek	1,691	110200060402	South Abeyta Creek
11020006040205	Upper South Abeyta Creek	2,640	110200060402	South Abeyta Creek
11020006040301	Lower Indian Creek	2,113	110200060403	Indian Creek
11020006040302	Price Creek	2,753	110200060403	Indian Creek
11020006040303	Middle Indian Creek	1,960	110200060403	Indian Creek
11020006040304	Upper Indian Creek	3,268	110200060403	Indian Creek
11020006040305	Copper King Canyon	1,104	110200060403	Indian Creek
11020006040401	Outlet Middle Creek	2,387	110200060404	Middle Creek
11020006040402	Lower Middle Creek	1,747	110200060404	Middle Creek
11020006040403	Poison Canyon	666	110200060404	Middle Creek
11020006040404	Middle Middle Creek	1,502	110200060404	Middle Creek
11020006040405	UT1 to Middle Creek	1,416	110200060404	Middle Creek
11020006040406	Upper Middle Creek	2,341	110200060404	Middle Creek

Table A-1. Cucharas River Small Watersheds

14 code HUC	Small Watershed Name	Area (acres)	12 code HUC	Sixth-level Watershed Name
11020006040407	South Middle Creek	4,958	110200060404	Middle Creek
11020006040408	North Middle Creek	2,334	110200060404	Middle Creek
11020006040409	Idlewild Creek	893	110200060404	Middle Creek
11020006040410	Lower Oak Creek	528	110200060404	Middle Creek
11020006040411	UT Oak Creek	761	110200060404	Middle Creek
11020006040412	Upper Oak Creek	2,191	110200060404	Middle Creek
11020006040501	Lower Wahatoya Creek	1,194	110200060405	Wahatoya Creek
11020006040502	Middle Wahatoya Creek	2,646	110200060405	Wahatoya Creek
11020006040503	Staplin Creek	1,032	110200060405	Wahatoya Creek
11020006040504	Upper Wahatoya Creek	3,444	110200060405	Wahatoya Creek
11020006040505	UT1 to Wahatoya Creek	1,242	110200060405	Wahatoya Creek
11020006040506	Lower School Creek	2,316	110200060405	Wahatoya Creek
11020006040507	Upper School Creek	1,680	110200060405	Wahatoya Creek
11020006040601	Outlet Upper Cucharas	6,660	110200060406	Upper Cucharas River
11020006040602	Lower Upper Cucharas	6,731	110200060406	Upper Cucharas River
11020006040603	Rilling Creek	1,523	110200060406	Upper Cucharas River
11020006040604	Middle Upper Cucharas	2,936	110200060406	Upper Cucharas River
11020006040605	Wade Canyon	1,444	110200060406	Upper Cucharas River
11020006040606	Coleman Canyon	684	110200060406	Upper Cucharas River
11020006040607	Barnes Canyon	1,014	110200060406	Upper Cucharas River
11020006040608	Upper Upper Cucharas	502	110200060406	Upper Cucharas River
11020006040609	UT1 Upper Cucharas	582	110200060406	Upper Cucharas River
11020006040610	Vories Canyon	885	110200060406	Upper Cucharas River
11020006040611	Chaparrel Creek	3,543	110200060406	Upper Cucharas River
11020006040612	Lower White Creek	1,165	110200060406	Upper Cucharas River
11020006040613	Cottonwood Canyon	329	110200060406	Upper Cucharas River
11020006040614	UT1 Lower White Creek	781	110200060406	Upper Cucharas River
11020006040615	UT1 Upper White Creek	849	110200060406	Upper Cucharas River
11020006040616	Upper White Creek	2,658	110200060406	Upper Cucharas River
11020006040617	Lower Echo Creek	407	110200060406	Echo Creek
11020006040618	Middle Echo Creek	959	110200060406	Echo Creek
11020006040619	Little Echo Creek	931	110200060406	Echo Creek

Table A-1. Cucharas River Small Watersheds

14 code HUC	Small Watershed Name	Area (acres)	12 code HUC	Sixth-level Watershed Name
11020006040620	Upper Echo Creek	2,582	110200060406	Echo Creek
11020006040701	Outlet North Abeyta Creek	1,314	110200060407	North Abeyta Creek
11020006040702	Lower UT1 North Abeyta	963	110200060407	North Abeyta Creek
11020006040703	UT1 to UT1 North Abeyta	711	110200060407	North Abeyta Creek
11020006040704	Middle UT1 North Abeyta	2,880	110200060407	North Abeyta Creek
11020006040705	UT2 to UT1 North Abeyta	668	110200060407	North Abeyta Creek
11020006040706	Upper UT1 North Abeyta	1,004	110200060407	North Abeyta Creek
11020006040707	Lower North Abeyta Creek	659	110200060407	North Abeyta Creek
11020006040708	UT2 North Abeyta Creek	554	110200060407	North Abeyta Creek
11020006040709	UT3 North Abeyta Creek	4,216	110200060407	North Abeyta Creek
11020006040710	Upper North Abeyta Creek	2,192	110200060407	North Abeyta Creek
11020006040711	Headwaters North Abeyta	3,931	110200060407	North Abeyta Creek
11020006041001	Ritter Arroyo	2,204	110200060410	Upper Cucharas River
11020006041002	McEvoy Lakes	3,434	110200060410	Upper Cucharas River
11020006041003	UT to McEvoy Lakes	2,178	110200060410	Upper Cucharas River
	Totals	**143,122**		

Table A-2. Cucharas River Small Watershed Wildfire Hazard

Small Watershed Name	Flame Length Value	Fire Intensity Value	Wildfire Value	Watershed Area (acres)	Wildfire Hazard Rank
Deadman Creek	293.6%	260.4%	553.99%	208	*5.5*
Texas Creek	285.0%	263.0%	548.02%	1,678	*5.4*
Chaparrel Creek	284.5%	240.8%	525.30%	3,543	*5.1*
Price Creek	282.3%	239.1%	521.40%	2,753	*5.1*
South Fork Cucharas River	274.7%	235.6%	510.29%	695	*4.9*
Wade Canyon	278.9%	228.1%	507.04%	1,444	*4.9*
Upper Indian Creek	277.8%	220.1%	497.96%	3,268	*4.7*
Cottonwood Canyon	270.1%	220.4%	490.53%	329	*4.6*
Hill Branch Creek	260.0%	223.8%	483.89%	631	*4.6*
South Middle Creek	268.0%	211.1%	479.11%	4,958	*4.5*
Spring Creek	260.5%	217.6%	478.05%	709	*4.5*
Middle Headwater Cucharas	261.7%	214.2%	475.97%	1,545	*4.4*
Bonnett Creek	269.0%	206.8%	475.80%	1,666	*4.4*
South Fork Baker Creek	255.2%	220.0%	475.26%	1,392	*4.4*
Barnes Canyon	259.4%	214.8%	474.17%	1,014	*4.4*
UT2 to South Abeyta Creek	265.7%	206.9%	472.66%	1,691	*4.4*
UT1 Lower White Creek	253.0%	210.3%	463.29%	781	*4.3*
Upper Headwaters Cucharas	246.2%	216.4%	462.57%	1,190	*4.3*
Bend Creek	265.9%	194.3%	460.26%	922	*4.2*
Staplin Creek	241.9%	217.6%	459.50%	1,032	*4.2*
Middle Echo Creek	249.2%	204.1%	453.33%	959	*4.1*
UT1 Upper White Creek	246.7%	205.0%	451.70%	849	*4.1*
Big Branch Creek	247.7%	199.0%	446.65%	1,114	*4.0*
Upper Wahatoya Creek	243.8%	199.5%	443.36%	3,444	*4.0*
Dodgeton Creek	242.8%	200.1%	442.96%	2,794	*4.0*
Little Echo Creek	247.2%	192.6%	439.77%	931	*4.0*
Upper Echo Creek	238.3%	191.5%	429.71%	2,582	*3.8*
Upper White Creek	241.1%	185.3%	426.38%	2,658	*3.8*
Lower Headwaters Cucharas	234.9%	191.1%	426.02%	907	*3.8*
Lower White Creek	229.5%	194.5%	424.00%	1,165	*3.7*
UT1 Headwaters Cucharas	204.5%	203.2%	407.68%	1,610	*3.5*

Table A-2. Cucharas River Small Watershed Wildfire Hazard

Small Watershed Name	Flame Length Value	Fire Intensity Value	Wildfire Value	Watershed Area (acres)	Wildfire Hazard Rank
North Middle Creek	219.9%	176.4%	396.27%	2,334	*3.4*
Baker Creek	206.1%	189.9%	396.03%	2,099	*3.4*
Headwaters Cucharas River	193.4%	200.5%	393.95%	1,690	*3.3*
Idlewild Creek	207.4%	185.0%	392.39%	893	*3.3*
Upper South Abeyta Creek	216.9%	175.0%	391.98%	2,640	*3.3*
UT1 Upper Cucharas	181.4%	176.3%	357.70%	582	*2.8*
UT1 to Middle Creek	173.5%	180.8%	354.30%	1,416	*2.8*
Vories Canyon	193.3%	151.8%	345.08%	885	*2.7*
Upper UT1 North Abeyta	146.0%	191.4%	337.38%	1,004	*2.6*
Headwaters North Abeyta	179.1%	147.7%	326.81%	3,931	*2.4*
Upper School Creek	169.2%	156.0%	325.21%	1,680	*2.4*
Upper Oak Creek	142.5%	174.2%	316.68%	2,191	*2.3*
Upper Upper Cucharas	137.3%	173.2%	310.53%	502	*2.2*
Middle Indian Creek	153.5%	151.5%	305.06%	1,960	*2.1*
UT1 to Wahatoya Creek	164.8%	138.5%	303.31%	1,242	*2.1*
UT2 to UT1 North Abeyta	135.7%	161.7%	297.41%	668	*2.0*
Middle Upper Cucharas	117.3%	179.2%	296.46%	2,936	*2.0*
Coleman Canyon	140.7%	154.3%	295.09%	684	*2.0*
Copper King Canyon	128.8%	164.5%	293.35%	1,104	*2.0*
Lower Indian Creek	72.9%	218.0%	290.86%	2,113	*1.9*
Lower School Creek	100.2%	189.1%	289.29%	2,316	*1.9*
Upper Middle Creek	145.8%	142.9%	288.69%	2,341	*1.9*
Lower Wahatoya Creek	79.8%	205.2%	285.04%	1,194	*1.9*
Lower Oak Creek	63.7%	221.4%	285.04%	528	*1.9*
Middle Wahatoya Creek	117.4%	162.3%	279.63%	2,646	*1.8*
Rilling Creek	87.9%	184.4%	272.32%	1,523	*1.7*
Middle South Abeyta Creek	113.8%	153.3%	267.10%	5,376	*1.6*
Lower South Abeyta Creek	48.7%	204.1%	252.84%	706	*1.4*
UT to McEvoy Lakes	43.5%	205.9%	249.38%	2,178	*1.4*
Outlet Middle Creek	41.0%	203.1%	244.09%	2,387	*1.3*
UT1 to South Abeyta Creek	68.5%	173.9%	242.37%	1,314	*1.3*

Table A-2. Cucharas River Small Watershed Wildfire Hazard

Small Watershed Name	Flame Length Value	Fire Intensity Value	Wildfire Value	Watershed Area (acres)	Wildfire Hazard Rank
Upper North Abeyta Creek	36.6%	205.3%	241.93%	2,192	*1.3*
Lower Upper Cucharas	51.7%	189.7%	241.43%	6,731	*1.3*
Middle UT1 North Abeyta	28.9%	209.9%	238.76%	2,880	*1.2*
McEvoy Lakes	31.5%	206.3%	237.77%	3,434	*1.2*
UT3 North Abeyta Creek	36.0%	194.1%	230.15%	4,216	*1.1*
Lower Middle Creek	23.9%	203.6%	227.44%	1,747	*1.1*
Lower Echo Creek	74.1%	152.0%	226.06%	407	*1.1*
Ritter Arroyo	20.8%	203.3%	224.06%	2,204	*1.0*
Middle Middle Creek	36.1%	186.3%	222.44%	1,502	*1.0*
Poison Canyon	38.3%	180.4%	218.63%	666	*1.0*
UT Oak Creek	50.6%	166.9%	217.58%	761	*0.9*
Lower UT1 North Abeyta	11.3%	204.3%	215.64%	963	*0.9*
UT1 to UT1 North Abeyta	10.5%	204.6%	215.14%	711	*0.9*
Outlet Upper Cucharas	22.7%	191.0%	213.76%	6,660	*0.9*
Outlet North Abeyta Creek	9.0%	196.4%	205.47%	1,314	*0.8*
Lower North Abeyta Creek	3.8%	201.6%	205.42%	659	*0.8*
UT2 North Abeyta Creek	0.7%	184.3%	185.02%	554	*0.5*

Table A-3. Cucharas River Small Watershed Ruggedness Ranking

Small Watershed Name	Watershed Area (sq. ft.)	Maximum Elevation	Minimum Elevation	Difference Elevation	Ruggedness	Ruggedness Rank
Deadman Creek	9,056,124	11,414	9,184	2,230	0.7410	*5.5*
Staplin Creek	44,949,564	12,662	8,003	4,659	0.6949	*5.2*
UT1 to Wahatoya Creek	54,118,944	13,420	8,430	4,990	0.6784	*5.0*
Upper School Creek	73,167,732	13,546	8,003	5,543	0.6480	*4.8*
Upper Headwaters Cucharas	34,543,080	11,585	9,086	2,499	0.6379	*4.8*
Little Echo Creek	40,558,716	12,333	8,364	3,969	0.6232	*4.6*
Lower White Creek	33,834,504	10,332	8,069	2,263	0.5836	*4.4*
UT1 Upper Cucharas	25,330,140	10,529	7,905	2,624	0.5214	*3.9*
Cottonwood Canyon	14,326,884	10,070	8,134	1,935	0.5113	*3.8*
Middle South Abeyta Creek	156,116,136	11,545	7,413	4,132	0.4961	*3.7*
Middle Echo Creek	27,860,976	9,643	7,905	1,738	0.4940	*3.7*
Lower Headwaters Cucharas	26,347,992	9,824	8,134	1,690	0.4937	*3.7*
Hill Branch Creek	27,482,004	11,260	8,692	2,568	0.4899	*3.7*
Upper Echo Creek	112,454,496	13,546	8,397	5,150	0.4856	*3.7*
UT1 to South Abeyta Creek	57,233,484	11,015	7,446	3,569	0.4718	*3.6*
UT2 to UT1 North Abeyta	29,080,656	10,135	7,610	2,526	0.4683	*3.5*
Bend Creek	40,140,540	11,250	8,331	2,919	0.4607	*3.5*
Middle Indian Creek	56,927,112	9,975	7,675	2,300	0.4572	*3.4*
Big Branch Creek	48,504,060	11,250	8,134	3,116	0.4474	*3.4*
Vories Canyon	38,563,668	10,660	7,970	2,690	0.4331	*3.3*
Coleman Canyon	29,812,464	10,201	7,839	2,362	0.4326	*3.3*
Upper UT1 North Abeyta	43,712,460	10,430	7,610	2,821	0.4266	*3.2*
Middle Headwater Cucharas	44,866,800	10,365	8,462	1,903	0.4261	*3.2*
South Fork Cucharas River	30,291,624	11,330	9,086	2,244	0.4078	*3.1*
Headwaters Cucharas River	73,629,468	13,481	10,070	3,411	0.3976	*3.0*
Upper Wahatoya Creek	150,029,352	12,800	8,003	4,797	0.3916	*3.0*
Middle Middle Creek	43,618,080	9,000	7,282	1,718	0.3903	*3.0*
Middle Wahatoya Creek	76,828,224	9,446	7,183	2,263	0.3872	*2.9*
Wade Canyon	62,913,708	10,726	7,708	3,018	0.3805	*2.9*
Baker Creek	91,441,152	12,295	8,790	3,505	0.3665	*2.8*
Lower School Creek	67,250,832	9,086	7,183	1,903	0.3480	*2.7*

Table A-3. Cucharas River Small Watershed Ruggedness Ranking

Small Watershed Name	Watershed Area (sq. ft.)	Maximum Elevation	Minimum Elevation	Difference Elevation	Ruggedness	Ruggedness Rank
Upper Middle Creek	67,979,736	9,350	7,446	1,904	0.3465	*2.6*
UT1 Headwaters Cucharas	70,114,176	12,920	10,070	2,850	0.3404	*2.6*
Bonnett Creek	72,579,672	11,250	8,397	2,853	0.3349	*2.6*
Dodgeton Creek	121,684,860	12,055	8,462	3,593	0.3257	*2.5*
UT1 Upper White Creek	36,969,372	10,791	8,823	1,968	0.3237	*2.5*
Idlewild Creek	38,916,504	9,980	8,003	1,977	0.3169	*2.4*
UT3 North Abeyta Creek	183,640,248	11,054	6,855	4,198	0.3098	*2.4*
Spring Creek	30,884,040	10,245	8,561	1,684	0.3031	*2.3*
Poison Canyon	29,028,384	8,890	7,282	1,608	0.2985	*2.3*
UT1 Lower White Creek	34,029,072	10,332	8,594	1,738	0.2980	*2.3*
South Fork Baker Creek	60,639,876	11,120	8,856	2,264	0.2907	*2.2*
Chaparrel Creek	154,333,080	11,578	7,970	3,608	0.2904	*2.2*
Price Creek	119,903,256	11,250	8,102	3,148	0.2875	*2.2*
Upper Upper Cucharas	14,586,792	8,561	7,839	722	0.2834	*2.2*
Barnes Canyon	44,148,060	9,709	7,839	1,870	0.2814	*2.2*
Upper South Abeyta Creek	115,007,112	11,450	8,462	2,988	0.2786	*2.2*
Headwaters North Abeyta	171,247,428	11,546	7,905	3,641	0.2782	*2.1*
Rilling Creek	66,337,524	9,665	7,413	2,252	0.2765	*2.1*
Copper King Canyon	48,090,240	9,580	7,675	1,905	0.2747	*2.1*
Texas Creek	73,093,680	11,742	9,446	2,296	0.2685	*2.1*
UT Oak Creek	33,144,804	8,890	7,380	1,510	0.2623	*2.0*
UT1 to Middle Creek	61,689,672	9,415	7,446	1,969	0.2507	*2.0*
Upper White Creek	115,765,056	11,447	8,823	2,624	0.2439	*1.9*
UT2 to South Abeyta Creek	73,651,248	10,465	8,462	2,003	0.2333	*1.8*
Lower Indian Creek	61,349,904	8,300	7,085	1,215	0.2327	*1.8*
Upper Oak Creek	95,422,536	9,650	7,380	2,270	0.2324	*1.8*
Middle Upper Cucharas	85,273,056	8,790	7,446	1,344	0.2184	*1.7*
North Middle Creek	101,669,040	10,165	7,970	2,195	0.2177	*1.7*
Upper Indian Creek	142,341,012	10,332	8,102	2,230	0.1869	*1.5*
Lower Upper Cucharas	195,474,048	8,692	6,986	1,706	0.1830	*1.5*
Lower Oak Creek	15,321,504	7,635	7,183	452	0.1731	*1.4*

Table A-3. Cucharas River Small Watershed Ruggedness Ranking

Small Watershed Name	Watershed Area (sq. ft.)	Maximum Elevation	Minimum Elevation	Difference Elevation	Ruggedness	Ruggedness Rank
Lower Echo Creek	17,711,496	8,134	7,446	689	0.1637	*1.3*
Lower Middle Creek	50,729,976	7,904	7,183	721	0.1518	*1.2*
South Middle Creek	215,974,836	10,105	7,970	2,135	0.1452	*1.2*
Upper North Abeyta Creek	95,496,588	8,233	6,888	1,345	0.1376	*1.1*
McEvoy Lakes	149,571,972	8,200	6,691	1,509	0.1234	*1.0*
UT1 to UT1 North Abeyta	30,949,380	7,511	6,855	656	0.1179	*1.0*
UT to McEvoy Lakes	94,873,680	7,938	6,790	1,148	0.1179	*1.0*
Ritter Arroyo	96,010,596	7,544	6,691	853	0.0870	*0.8*
Middle UT1 North Abeyta	125,444,088	7,806	6,855	951	0.0849	*0.8*
Lower South Abeyta Creek	30,749,004	7,560	7,118	442	0.0798	*0.7*
UT2 North Abeyta Creek	24,110,460	7,216	6,855	361	0.0735	*0.7*
Lower Wahatoya Creek	51,993,216	7,290	6,822	468	0.0648	*0.6*
Outlet Upper Cucharas	290,109,600	7,774	6,691	1,083	0.0636	*0.6*
Lower UT1 North Abeyta	41,956,992	7,118	6,724	394	0.0608	*0.6*
Outlet North Abeyta Creek	57,246,552	6,986	6,560	426	0.0564	*0.5*
Lower North Abeyta Creek	28,714,752	7,019	6,724	295	0.0551	*0.5*
Outlet Middle Creek	103,977,720	7,500	6,986	514	0.0504	*0.5*

Table A-4. Cucharas River Small Watershed Road Density Rank

Small Watershed Name	Roads (miles)	Roads Adjusted (miles)	Watershed Area (sq. mi.)	Road density (miles per sq. mi.)	Road Density Rank
Lower Headwaters Cucharas	6.8	4.6	1.42	3.00	*5.5*
Middle Headwater Cucharas	17.5	8.7	2.41	3.00	*5.5*
South Fork Cucharas River	3.6	3.3	1.09	3.00	*5.5*
Rilling Creek	7.5	7.5	2.38	3.00	*5.5*
Upper Upper Cucharas	3.3	3.3	0.78	3.00	*5.5*
Upper White Creek	11.7	11.7	4.15	2.83	*5.2*
Deadman Creek	0.8	0.8	0.32	2.56	*4.8*
Upper Headwaters Cucharas	4.2	4.2	1.86	2.28	*4.3*
UT2 to South Abeyta Creek	5.8	5.8	2.64	2.18	*4.1*
UT1 to South Abeyta Creek	4.7	4.2	2.05	2.07	*3.9*
Baker Creek	8.9	6.7	3.28	2.03	*3.9*
Middle Upper Cucharas	9.3	9.3	4.59	2.02	*3.9*
Idlewild Creek	2.6	2.6	1.40	1.88	*3.6*
Lower School Creek	8.6	6.5	3.62	1.78	*3.5*
North Middle Creek	6.4	6.4	3.65	1.75	*3.4*
Middle Wahatoya Creek	9.4	7.1	4.13	1.71	*3.3*
Middle Middle Creek	8.0	4.0	2.35	1.70	*3.3*
Middle South Abeyta Creek	28.0	14.0	8.40	1.66	*3.3*
Lower Upper Cucharas	32.8	16.4	10.52	1.56	*3.1*
Lower Echo Creek	1.9	1.0	0.64	1.52	*3.0*
Spring Creek	1.4	1.4	1.11	1.31	*2.7*
Middle Indian Creek	3.5	3.5	3.06	1.13	*2.4*
Upper South Abeyta Creek	8.7	4.4	4.13	1.06	*2.3*
Upper Middle Creek	4.9	3.7	3.66	1.00	*2.2*
South Middle Creek	7.6	7.6	7.75	0.99	*2.1*
Headwaters North Abeyta	6.1	6.1	6.14	0.99	*2.1*
Middle Echo Creek	1.5	1.5	1.50	0.98	*2.1*
Headwaters Cucharas River	2.5	2.5	2.64	0.96	*2.1*
Chaparrel Creek	4.9	4.9	5.54	0.89	*2.0*
Hill Branch Creek	0.8	0.8	0.99	0.85	*1.9*
Upper Indian Creek	3.8	3.8	5.11	0.74	*1.7*

Table A-4. Cucharas River Small Watershed Road Density Rank

Small Watershed Name	Roads (miles)	Roads Adjusted (miles)	Watershed Area (sq. mi.)	Road density (miles per sq. mi.)	Road Density Rank
Upper School Creek	1.7	1.7	2.62	0.65	*1.6*
Staplin Creek	1.0	1.0	1.61	0.63	*1.5*
Lower Middle Creek	3.3	1.7	2.73	0.61	*1.5*
UT3 North Abeyta Creek	6.6	3.3	6.59	0.50	*1.3*
Upper North Abeyta Creek	6.6	1.7	3.43	0.48	*1.3*
UT1 Headwaters Cucharas	1.2	1.2	2.52	0.47	*1.3*
Vories Canyon	0.7	0.7	1.38	0.47	*1.3*
UT1 Upper White Creek	0.6	0.6	1.33	0.45	*1.3*
Copper King Canyon	0.7	0.7	1.73	0.42	*1.2*
Upper Wahatoya Creek	2.1	2.1	5.38	0.40	*1.2*
Bonnett Creek	1.1	0.9	2.60	0.34	*1.1*
Bend Creek	0.5	0.5	1.44	0.33	*1.1*
Dodgeton Creek	1.7	1.4	4.36	0.32	*1.0*
Lower Indian Creek	4.1	1.0	3.30	0.31	*1.0*
Upper Oak Creek	1.0	1.0	3.42	0.30	*1.0*
South Fork Baker Creek	0.6	0.6	2.18	0.28	*1.0*
Lower South Abeyta Creek	2.8	0.3	1.10	0.26	*0.9*
Wade Canyon	0.6	0.6	2.26	0.26	*0.9*
Little Echo Creek	0.4	0.4	1.45	0.26	*0.9*
Upper UT1 North Abeyta	0.8	0.4	1.57	0.25	*0.9*
Big Branch Creek	0.4	0.4	1.74	0.24	*0.9*
UT Oak Creek	0.3	0.3	1.19	0.21	*0.9*
UT2 to UT1 North Abeyta	0.1	0.1	1.04	0.11	*0.7*
Barnes Canyon	0.2	0.2	1.58	0.09	*0.7*
Upper Echo Creek	0.3	0.3	4.03	0.06	*0.6*
UT1 to Middle Creek	0.3	0.1	2.21	0.06	*0.6*
Texas Creek	0.0	0.0	2.62	0.00	*0.5*
Price Creek	0.0	0.0	4.30	0.00	*0.5*
Outlet Middle Creek	10.9	0.0	3.73	0.00	*0.5*
Poison Canyon	0.0	0.0	1.04	0.00	*0.5*
Lower Oak Creek	1.7	0.0	0.82	0.00	*0.5*

Table A-4. Cucharas River Small Watershed Road Density Rank

Small Watershed Name	Roads (miles)	Roads Adjusted (miles)	Watershed Area (sq. mi.)	Road density (miles per sq. mi.)	Road Density Rank
Lower Wahatoya Creek	10.2	0.0	1.87	0.00	*0.5*
UT1 to Wahatoya Creek	0.0	0.0	1.94	0.00	*0.5*
Outlet Upper Cucharas	41.5	0.0	10.41	0.00	*0.5*
Coleman Canyon	0.0	0.0	1.07	0.00	*0.5*
UT1 Upper Cucharas	0.0	0.0	0.91	0.00	*0.5*
Lower White Creek	0.0	0.0	1.82	0.00	*0.5*
Cottonwood Canyon	0.0	0.0	0.51	0.00	*0.5*
UT1 Lower White Creek	0.0	0.0	1.22	0.00	*0.5*
Outlet North Abeyta Creek	6.6	0.0	2.05	0.00	*0.5*
Lower UT1 North Abeyta	5.1	0.0	1.51	0.00	*0.5*
UT1 to UT1 North Abeyta	2.0	0.0	1.11	0.00	*0.5*
Middle UT1 North Abeyta	6.9	0.0	4.50	0.00	*0.5*
Lower North Abeyta Creek	2.0	0.0	1.03	0.00	*0.5*
UT2 North Abeyta Creek	1.3	0.0	0.86	0.00	*0.5*
Ritter Arroyo	4.9	0.0	3.44	0.00	*0.5*
McEvoy Lakes	9.0	0.0	5.37	0.00	*0.5*
UT to McEvoy Lakes	6.4	0.0	3.40	0.00	*0.5*
Totals	**375.8**	**191.1**	**223.63**	**0.85**	

Table A-5. Cucharas River Flooding/Debris Flow Risk Ranking

Small Watershed Name	Watershed Area (acres)	Ruggedness	Ruggedness Rank	Road density (mi per sq. mi.)	Road Density Rank	Combined Numeric Rank	Composite Ranking
Deadman Creek	208	0.7410	5.5	2.56	4.8	15.76	5.5
Upper Headwaters Cucharas	1,190	0.6379	4.8	2.28	4.3	13.81	4.8
Lower Headwaters Cucharas	907	0.4937	3.7	3.00	5.5	12.92	4.5
Middle Headwater Cucharas	1,545	0.4261	3.2	3.00	5.5	11.94	4.2
Staplin Creek	1,032	0.6949	5.2	0.63	1.5	11.88	4.1
South Fork Cucharas River	695	0.4078	3.1	3.00	5.5	11.68	4.1
Upper School Creek	1,680	0.6480	4.8	0.65	1.6	11.23	3.9
UT1 to South Abeyta Creek	1,314	0.4718	3.6	2.07	3.9	11.05	3.8
Middle South Abeyta Creek	5,376	0.4961	3.7	1.66	3.3	10.73	3.7
UT1 to Wahatoya Creek	1,242	0.6784	5.0	0.00	0.5	10.59	3.7
Little Echo Creek	931	0.6232	4.6	0.26	0.9	10.22	3.6
Upper Upper Cucharas	502	0.2834	2.2	3.00	5.5	9.87	3.4
Rilling Creek	1,523	0.2765	2.1	3.00	5.5	9.77	3.4
Middle Echo Creek	959	0.4940	3.7	0.98	2.1	9.56	3.3
Baker Creek	2,099	0.3665	2.8	2.03	3.9	9.46	3.3
Hill Branch Creek	631	0.4899	3.7	0.85	1.9	9.29	3.2
Middle Indian Creek	1,960	0.4572	3.4	1.13	2.4	9.27	3.2
Middle Middle Creek	1,502	0.3903	3.0	1.70	3.3	9.26	3.2
Middle Wahatoya Creek	2,646	0.3872	2.9	1.71	3.3	9.22	3.2
Lower White Creek	1,165	0.5836	4.4	0.00	0.5	9.22	3.2
Upper White Creek	2,658	0.2439	1.9	2.83	5.2	9.01	3.1
Lower School Creek	2,316	0.3480	2.7	1.78	3.5	8.78	3.1
Idlewild Creek	893	0.3169	2.4	1.88	3.6	8.49	3.0
UT1 Upper Cucharas	582	0.5214	3.9	0.00	0.5	8.32	2.9
Cottonwood Canyon	329	0.5113	3.8	0.00	0.5	8.17	2.8
Headwaters Cucharas River	1,690	0.3976	3.0	0.96	2.1	8.13	2.8
Bend Creek	922	0.4607	3.5	0.33	1.1	7.99	2.8
Upper Echo Creek	2,582	0.4856	3.7	0.06	0.6	7.91	2.7
Vories Canyon	885	0.4331	3.3	0.47	1.3	7.83	2.7
UT2 to South Abeyta Creek	1,691	0.2333	1.8	2.18	4.1	7.79	2.7
UT2 to UT1 North Abeyta	668	0.4683	3.5	0.11	0.7	7.74	2.7

Table A-5. Cucharas River Flooding/Debris Flow Risk Ranking

Small Watershed Name	Watershed Area (acres)	Ruggedness	Ruggedness Rank	Road density (mi per sq. mi.)	Road Density Rank	Combined Numeric Rank	Composite Ranking
Big Branch Creek	1,114	0.4474	*3.4*	0.24	*0.9*	7.65	*2.7*
Upper Middle Creek	2,341	0.3465	*2.6*	1.00	*2.2*	7.45	*2.6*
Upper UT1 North Abeyta	1,004	0.4266	*3.2*	0.25	*0.9*	7.37	*2.6*
Spring Creek	709	0.3031	*2.3*	1.31	*2.7*	7.34	*2.5*
Middle Upper Cucharas	2,936	0.2184	*1.7*	2.02	*3.9*	7.31	*2.5*
Upper Wahatoya Creek	3,444	0.3916	*3.0*	0.40	*1.2*	7.10	*2.5*
Coleman Canyon	684	0.4326	*3.3*	0.00	*0.5*	7.03	*2.4*
North Middle Creek	2,334	0.2177	*1.7*	1.75	*3.4*	6.84	*2.4*
Wade Canyon	1,444	0.3805	*2.9*	0.26	*0.9*	6.71	*2.3*
Upper South Abeyta Creek	2,640	0.2786	*2.2*	1.06	*2.3*	6.57	*2.3*
UT1 Headwaters Cucharas	1,610	0.3404	*2.6*	0.47	*1.3*	6.49	*2.2*
Chaparrel Creek	3,543	0.2904	*2.2*	0.89	*2.0*	6.46	*2.2*
Headwaters North Abeyta	3,931	0.2782	*2.1*	0.99	*2.1*	6.44	*2.2*
UT1 Upper White Creek	849	0.3237	*2.5*	0.45	*1.3*	6.21	*2.2*
Bonnett Creek	1,666	0.3349	*2.6*	0.34	*1.1*	6.18	*2.1*
UT3 North Abeyta Creek	4,216	0.3098	*2.4*	0.50	*1.3*	6.09	*2.1*
Dodgeton Creek	2,794	0.3257	*2.5*	0.32	*1.0*	6.02	*2.1*
Lower Upper Cucharas	6,731	0.1830	*1.5*	1.56	*3.1*	6.02	*2.1*
Lower Echo Creek	407	0.1637	*1.3*	1.52	*3.0*	5.68	*2.0*
Copper King Canyon	1,104	0.2747	*2.1*	0.42	*1.2*	5.44	*1.9*
South Fork Baker Creek	1,392	0.2907	*2.2*	0.28	*1.0*	5.44	*1.9*
Poison Canyon	666	0.2985	*2.3*	0.00	*0.5*	5.09	*1.8*
UT1 Lower White Creek	781	0.2980	*2.3*	0.00	*0.5*	5.09	*1.8*
Barnes Canyon	1,014	0.2814	*2.2*	0.09	*0.7*	5.00	*1.7*
Price Creek	2,753	0.2875	*2.2*	0.00	*0.5*	4.93	*1.7*
UT Oak Creek	761	0.2623	*2.0*	0.21	*0.9*	4.92	*1.7*
Upper Indian Creek	3,268	0.1869	*1.5*	0.74	*1.7*	4.71	*1.6*
Texas Creek	1,678	0.2685	*2.1*	0.00	*0.5*	4.66	*1.6*
Lower Indian Creek	2,113	0.2327	*1.8*	0.31	*1.0*	4.66	*1.6*
Upper Oak Creek	2,191	0.2324	*1.8*	0.30	*1.0*	4.64	*1.6*
South Middle Creek	4,958	0.1452	*1.2*	0.99	*2.1*	4.52	*1.6*

Table A-5. Cucharas River Flooding/Debris Flow Risk Ranking

Small Watershed Name	Watershed Area (acres)	Ruggedness	Ruggedness Rank	Road density (mi per sq. mi.)	Road Density Rank	Combined Numeric Rank	Composite Ranking
UT1 to Middle Creek	1,416	0.2507	*2.0*	0.06	*0.6*	4.50	*1.6*
Lower Middle Creek	1,747	0.1518	*1.2*	0.61	*1.5*	3.98	*1.4*
Upper North Abeyta Creek	2,192	0.1376	*1.1*	0.48	*1.3*	3.57	*1.2*
Lower Oak Creek	528	0.1731	*1.4*	0.00	*0.5*	3.28	*1.1*
McEvoy Lakes	3,434	0.1234	*1.0*	0.00	*0.5*	2.56	*0.9*
UT1 to UT1 North Abeyta	711	0.1179	*1.0*	0.00	*0.5*	2.48	*0.8*
UT to McEvoy Lakes	2,178	0.1179	*1.0*	0.00	*0.5*	2.48	*0.8*
Lower South Abeyta Creek	706	0.0798	*0.7*	0.26	*0.9*	2.36	*0.8*
Ritter Arroyo	2,204	0.0870	*0.8*	0.00	*0.5*	2.03	*0.7*
Middle UT1 North Abeyta	2,880	0.0849	*0.8*	0.00	*0.5*	2.00	*0.7*
UT2 North Abeyta Creek	554	0.0735	*0.7*	0.00	*0.5*	1.83	*0.6*
Lower Wahatoya Creek	1,194	0.0648	*0.6*	0.00	*0.5*	1.71	*0.6*
Outlet Upper Cucharas	6,660	0.0636	*0.6*	0.00	*0.5*	1.69	*0.6*
Lower UT1 North Abeyta	963	0.0608	*0.6*	0.00	*0.5*	1.65	*0.6*
Outlet North Abeyta Creek	1,314	0.0564	*0.5*	0.00	*0.5*	1.59	*0.5*
Lower North Abeyta Creek	659	0.0551	*0.5*	0.00	*0.5*	1.57	*0.5*
Outlet Middle Creek	2,387	0.0504	*0.5*	0.00	*0.5*	1.50	*0.5*

Table A-6. Cucharas River Soil Erodibility Ranking

Sixth-level Watershed Name	Moderate (acres)	Moderate (%)	Severe (acres)	Severe (%)	Very Severe (acres)	Very Severe (%)	Soil Erodibility Value	Watershed Area	Soil Erodibility Rank
Cottonwood Canyon	136.3	41.4%	89.7	27.3%	45.6	13.9%	0.500	329	*5.5*
Idlewild Creek	342.4	38.3%	219.3	24.5%	107.2	12.0%	0.485	893	*5.4*
Big Branch Creek	338.6	30.4%	446.3	40.1%	2.6	0.2%	0.405	1,114	*4.6*
UT1 to Middle Creek	406.7	28.7%	351.3	24.8%	103.5	7.3%	0.394	1,416	*4.4*
Bend Creek	317.4	34.4%	336.8	36.5%	10.8	1.2%	0.389	922	*4.4*
Deadman Creek	94.6	45.5%	77.3	37.2%	0.3	0.1%	0.374	208	*4.2*
Headwaters North Abeyta	1,341.3	34.1%	524.0	13.3%	454.6	11.6%	0.365	3,931	*4.1*
North Middle Creek	956.1	41.0%	430.2	18.4%	191.3	8.2%	0.348	2,334	*4.0*
Little Echo Creek	271.9	29.2%	266.8	28.6%	27.9	3.0%	0.346	931	*4.0*
South Middle Creek	1,955.4	39.4%	1,040.9	21.0%	333.1	6.7%	0.344	4,958	*3.9*
Price Creek	957.4	34.8%	921.9	33.5%	2.0	0.1%	0.336	2,753	*3.9*
Upper Headwaters Cucharas	499.6	42.0%	393.0	33.0%	2.5	0.2%	0.335	1,190	*3.8*
Upper South Abeyta Creek	943.6	35.7%	402.3	15.2%	229.4	8.7%	0.326	2,640	*3.8*
Upper Oak Creek	591.0	27.0%	439.4	20.1%	136.6	6.2%	0.325	2,191	*3.8*
Upper Wahatoya Creek	1,166.6	33.9%	1,078.0	31.3%	13.4	0.4%	0.321	3,444	*3.7*
Vories Canyon	288.6	32.6%	269.5	30.4%	6.3	0.7%	0.319	885	*3.7*
Staplin Creek	286.6	27.8%	237.7	23.0%	35.2	3.4%	0.299	1,032	*3.5*
Upper Middle Creek	744.3	31.8%	486.9	20.8%	82.2	3.5%	0.278	2,341	*3.3*
UT2 to South Abeyta Creek	705.8	41.7%	250.7	14.8%	104.0	6.2%	0.271	1,691	*3.2*
Upper Echo Creek	916.7	35.5%	623.5	24.2%	35.9	1.4%	0.269	2,582	*3.2*
UT1 Upper Cucharas	161.2	27.7%	146.1	25.1%	4.9	0.9%	0.268	582	*3.2*
Baker Creek	922.0	43.9%	528.0	25.2%	0.0	0.0%	0.252	2,099	*3.0*
Middle Echo Creek	344.5	35.9%	167.8	17.5%	35.4	3.7%	0.249	959	*3.0*
Copper King Canyon	331.2	30.0%	179.9	16.3%	45.9	4.2%	0.246	1,104	*3.0*
Dodgeton Creek	1,471.2	52.7%	585.7	21.0%	21.3	0.8%	0.225	2,794	*2.7*
Lower White Creek	380.0	32.6%	247.1	21.2%	4.4	0.4%	0.220	1,165	*2.7*
Middle Indian Creek	819.6	41.8%	403.0	20.6%	8.8	0.5%	0.215	1,960	*2.6*
Middle South Abeyta Creek	1,189.0	22.1%	562.8	10.5%	283.3	5.3%	0.210	5,376	*2.6*
Upper Indian Creek	1,328.9	40.7%	644.8	19.7%	7.2	0.2%	0.202	3,268	*2.5*
Wade Canyon	573.4	39.7%	229.7	15.9%	23.3	1.6%	0.191	1,444	*2.4*
Lower Headwaters Cucharas	475.9	52.4%	148.1	16.3%	11.9	1.3%	0.190	907	*2.4*

Table A-6. Cucharas River Soil Erodibility Ranking

Sixth-level Watershed Name	Moderate (acres)	Moderate (%)	Severe (acres)	Severe (%)	Very Severe (acres)	Very Severe (%)	Soil Erodibility Value	Watershed Area	Soil Erodibility Rank
Chaparrel Creek	1,510.7	42.6%	570.0	16.1%	45.3	1.3%	0.186	3,543	*2.4*
Upper UT1 North Abeyta	149.7	14.9%	96.3	9.6%	35.8	3.6%	0.167	1,004	*2.2*
Middle Wahatoya Creek	752.7	28.5%	339.7	12.8%	48.8	1.8%	0.165	2,646	*2.2*
Coleman Canyon	222.9	32.6%	101.6	14.8%	4.8	0.7%	0.162	684	*2.1*
Texas Creek	971.4	57.9%	248.8	14.8%	1.6	0.1%	0.150	1,678	*2.0*
UT1 to Wahatoya Creek	303.7	24.4%	161.8	13.0%	3.7	0.3%	0.136	1,242	*1.9*
South Fork Cucharas River	394.6	56.7%	84.1	12.1%	0.3	0.0%	0.122	695	*1.7*
Barnes Canyon	387.5	38.2%	99.6	9.8%	11.1	1.1%	0.120	1,014	*1.7*
McEvoy Lakes	744.2	21.7%	292.0	8.5%	55.9	1.6%	0.118	3,434	*1.7*
UT1 Headwaters Cucharas	636.2	39.5%	180.6	11.2%	0.5	0.0%	0.113	1,610	*1.6*
UT1 Lower White Creek	319.0	40.8%	87.0	11.1%	0.0	0.0%	0.111	781	*1.6*
UT2 to UT1 North Abeyta	147.1	22.0%	42.9	6.4%	15.6	2.3%	0.111	668	*1.6*
Upper Upper Cucharas	85.4	17.0%	39.8	7.9%	5.5	1.1%	0.101	502	*1.5*
Lower Echo Creek	44.9	11.0%	25.5	6.3%	7.2	1.8%	0.098	407	*1.5*
Spring Creek	273.6	38.6%	62.0	8.7%	3.8	0.5%	0.098	709	*1.5*
Middle Headwater Cucharas	820.6	53.1%	146.3	9.5%	2.1	0.1%	0.097	1,545	*1.5*
UT Oak Creek	79.1	10.4%	28.9	3.8%	19.0	2.5%	0.088	761	*1.4*
Hill Branch Creek	401.4	63.6%	51.5	8.2%	1.8	0.3%	0.087	631	*1.4*
UT1 to South Abeyta Creek	282.5	21.5%	44.9	3.4%	33.5	2.5%	0.085	1,314	*1.4*
South Fork Baker Creek	593.5	42.6%	105.6	7.6%	4.3	0.3%	0.082	1,392	*1.3*
Bonnett Creek	726.9	43.6%	130.4	7.8%	3.1	0.2%	0.082	1,666	*1.3*
Upper White Creek	770.0	29.0%	209.9	7.9%	0.9	0.0%	0.080	2,658	*1.3*
Middle Upper Cucharas	610.7	20.8%	169.3	5.8%	22.9	0.8%	0.073	2,936	*1.2*
Headwaters Cucharas River	531.8	31.5%	101.1	6.0%	11.2	0.7%	0.073	1,690	*1.2*
UT1 Upper White Creek	456.7	53.8%	55.7	6.6%	0.0	0.0%	0.066	849	*1.2*
Middle Middle Creek	429.2	28.6%	48.9	3.3%	16.3	1.1%	0.054	1,502	*1.0*
Upper School Creek	400.5	23.8%	78.5	4.7%	2.3	0.1%	0.050	1,680	*1.0*
Rilling Creek	322.0	21.1%	44.0	2.9%	4.0	0.3%	0.034	1,523	*0.8*
Lower Oak Creek	106.8	20.2%	14.5	2.7%	0.0	0.0%	0.027	528	*0.8*
Ritter Arroyo	193.8	8.8%	49.5	2.2%	1.8	0.1%	0.024	2,204	*0.7*
Lower School Creek	287.9	12.4%	26.8	1.2%	12.0	0.5%	0.022	2,316	*0.7*

Table A-6. Cucharas River Soil Erodibility Ranking

Sixth-level Watershed Name	Moderate (acres)	Moderate (%)	Severe (acres)	Severe (%)	Very Severe (acres)	Very Severe (%)	Soil Erodibility Value	Watershed Area	Soil Erodibility Rank
Poison Canyon	63.3	9.5%	6.8	1.0%	3.3	0.5%	0.020	666	*0.7*
Lower Upper Cucharas	811.8	12.1%	96.1	1.4%	15.7	0.2%	0.019	6,731	*0.7*
Upper North Abeyta Creek	92.2	4.2%	22.4	1.0%	0.4	0.0%	0.011	2,192	*0.6*
UT to McEvoy Lakes	200.5	9.2%	17.9	0.8%	0.4	0.0%	0.009	2,178	*0.6*
UT1 to UT1 North Abeyta	79.6	11.2%	5.8	0.8%	0.0	0.0%	0.008	711	*0.6*
UT3 North Abeyta Creek	222.4	5.3%	9.1	0.2%	6.2	0.1%	0.005	4,216	*0.6*
Lower Middle Creek	205.3	11.7%	8.6	0.5%	0.0	0.0%	0.005	1,747	*0.5*
Lower Indian Creek	238.2	11.3%	5.1	0.2%	0.4	0.0%	0.003	2,113	*0.5*
Outlet Middle Creek	391.4	16.4%	6.5	0.3%	0.0	0.0%	0.003	2,387	*0.5*
Outlet Upper Cucharas	418.1	6.3%	10.3	0.2%		0.0%	0.002	6,660	*0.5*
Lower Wahatoya Creek	141.8	11.9%	1.0	0.1%	0.0	0.0%	0.001	1,194	*0.5*
Lower North Abeyta Creek	23.2	3.5%	0.2	0.0%	0.0	0.0%	0.000	659	*0.5*
Middle UT1 North Abeyta	81.5	2.8%	0.2	0.0%	0.0	0.0%	0.000	2,880	*0.5*
Lower South Abeyta Creek	153.0	21.7%	0.0	0.0%	0.0	0.0%	0.000	706	*0.5*
Outlet North Abeyta Creek	13.2	1.0%	0.0	0.0%	0.0	0.0%	0.000	1,314	*0.5*
Lower UT1 North Abeyta	22.9	2.4%	0.0	0.0%	0.0	0.0%	0.000	963	*0.5*
UT2 North Abeyta Creek	8.5	1.5%	0.0	0.0%	0.0	0.0%	0.000	554	*0.5*

Table A-7. Cucharas River Composite Hazard Ranking

Sixth-Level Watershed	Wildfire Hazard Rank	Flooding/ Debris Flow Rank	Soil Erodibility Rank	Composite Numeric Rank	Composite Hazard Rank
Deadman Creek	5.5	5.5	4.2	14.0	5.5
Cottonwood Canyon	4.6	2.8	5.5	13.0	5.1
Upper Headwaters Cucharas	4.3	4.8	3.8	12.9	5.1
Staplin Creek	4.2	4.1	3.5	11.8	4.6
Idlewild Creek	3.3	3.0	5.4	11.6	4.5
Little Echo Creek	4.0	3.6	4.0	11.5	4.5
Bend Creek	4.2	2.8	4.4	11.4	4.4
Big Branch Creek	4.0	2.7	4.6	11.3	4.4
South Fork Cucharas River	4.9	4.1	1.7	10.7	4.2
Lower Headwaters Cucharas	3.8	4.5	2.4	10.7	4.2
Price Creek	5.1	1.7	3.9	10.6	4.1
Middle Echo Creek	4.1	3.3	3.0	10.5	4.1
UT2 to South Abeyta Creek	4.4	2.7	3.2	10.3	4.0
Upper Wahatoya Creek	4.0	2.5	3.7	10.2	4.0
Middle Headwater Cucharas	4.4	4.2	1.5	10.1	3.9
South Middle Creek	4.5	1.6	3.9	10.0	3.9
Upper Echo Creek	3.8	2.7	3.2	9.8	3.8
North Middle Creek	3.4	2.4	4.0	9.7	3.8
Chaparrel Creek	5.1	2.2	2.4	9.7	3.8
Baker Creek	3.4	3.3	3.0	9.7	3.7
Lower White Creek	3.7	3.2	2.7	9.6	3.7
Wade Canyon	4.9	2.3	2.4	9.6	3.7
Upper South Abeyta Creek	3.3	2.3	3.8	9.3	3.6
Hill Branch Creek	4.6	3.2	1.4	9.2	3.5
Vories Canyon	2.7	2.7	3.7	9.1	3.5
Texas Creek	5.4	1.6	2.0	9.0	3.5
UT1 Upper Cucharas	2.8	2.9	3.2	8.9	3.4
Upper Indian Creek	4.7	1.6	2.5	8.9	3.4
Dodgeton Creek	4.0	2.1	2.7	8.8	3.4
Headwaters North Abeyta	2.4	2.2	4.1	8.8	3.4
UT1 to Middle Creek	2.8	1.6	4.4	8.8	3.4

Table A-7. Cucharas River Composite Hazard Ranking

Sixth-Level Watershed	Wildfire Hazard Rank	Flooding/ Debris Flow Rank	Soil Erodibility Rank	Composite Numeric Rank	Composite Hazard Rank
Spring Creek	4.5	2.5	1.5	8.5	3.3
Upper White Creek	3.8	3.1	1.3	8.2	3.2
Middle Indian Creek	2.1	3.2	2.6	8.0	3.1
Middle South Abeyta Creek	1.6	3.7	2.6	7.9	3.1
Bonnett Creek	4.4	2.1	1.3	7.9	3.0
Barnes Canyon	4.4	1.7	1.7	7.8	3.0
Upper Middle Creek	1.9	2.6	3.3	7.8	3.0
UT1 to Wahatoya Creek	2.1	3.7	1.9	7.7	2.9
UT1 Lower White Creek	4.3	1.8	1.6	7.6	2.9
Upper Oak Creek	2.3	1.6	3.8	7.6	2.9
South Fork Baker Creek	4.4	1.9	1.3	7.6	2.9
UT1 Upper White Creek	4.1	2.2	1.2	7.4	2.8
UT1 Headwaters Cucharas	3.5	2.2	1.6	7.4	2.8
Headwaters Cucharas River	3.3	2.8	1.2	7.4	2.8
Upper School Creek	2.4	3.9	1.0	7.3	2.8
Upper UT1 North Abeyta	2.6	2.6	2.2	7.3	2.8
Upper Upper Cucharas	2.2	3.4	1.5	7.1	2.7
Middle Wahatoya Creek	1.8	3.2	2.2	7.1	2.7
Copper King Canyon	2.0	1.9	3.0	6.8	2.6
Coleman Canyon	2.0	2.4	2.1	6.6	2.5
UT1 to South Abeyta Creek	1.3	3.8	1.4	6.5	2.5
UT2 to UT1 North Abeyta	2.0	2.7	1.6	6.3	2.4
Rilling Creek	1.7	3.4	0.8	5.9	2.2
Middle Upper Cucharas	2.0	2.5	1.2	5.8	2.2
Lower School Creek	1.9	3.1	0.7	5.7	2.1
Middle Middle Creek	1.0	3.2	1.0	5.3	2.0
Lower Echo Creek	1.1	2.0	1.5	4.5	1.7
Lower Indian Creek	1.9	1.6	0.5	4.1	1.5
Lower Upper Cucharas	1.3	2.1	0.7	4.0	1.5
UT Oak Creek	0.9	1.7	1.4	4.0	1.5
UT3 North Abeyta Creek	1.1	2.1	0.6	3.8	1.4

Table A-7. Cucharas River Composite Hazard Ranking

Sixth-Level Watershed	Wildfire Hazard Rank	Flooding/ Debris Flow Rank	Soil Erodibility Rank	Composite Numeric Rank	Composite Hazard Rank
McEvoy Lakes	*1.2*	*0.9*	*1.7*	3.8	*1.4*
Lower Oak Creek	*1.9*	*1.1*	*0.8*	3.8	*1.4*
Poison Canyon	*1.0*	*1.8*	*0.7*	3.4	*1.2*
Upper North Abeyta Creek	*1.3*	*1.2*	*0.6*	3.1	*1.1*
Lower Middle Creek	*1.1*	*1.4*	*0.5*	3.0	*1.1*
Lower Wahatoya Creek	*1.9*	*0.6*	*0.5*	2.9	*1.0*
UT to McEvoy Lakes	*1.4*	*0.8*	*0.6*	2.8	*1.0*
Lower South Abeyta Creek	*1.4*	*0.8*	*0.5*	2.7	*0.9*
Ritter Arroyo	*1.0*	*0.7*	*0.7*	2.5	*0.8*
Middle UT1 North Abeyta	*1.2*	*0.7*	*0.5*	2.4	*0.8*
UT1 to UT1 North Abeyta	*0.9*	*0.8*	*0.6*	2.3	*0.8*
Outlet Middle Creek	*1.3*	*0.5*	*0.5*	2.3	*0.8*
Outlet Upper Cucharas	*0.9*	*0.6*	*0.5*	2.0	*0.6*
Lower UT1 North Abeyta	*0.9*	*0.6*	*0.5*	2.0	*0.6*
Outlet North Abeyta Creek	*0.8*	*0.5*	*0.5*	1.8	*0.6*
Lower North Abeyta Creek	*0.8*	*0.5*	*0.5*	1.8	*0.6*
UT2 North Abeyta Creek	*0.5*	*0.6*	*0.5*	1.6	*0.5*