



**Alpine Watershed Group**  
 Stream Bioassessment Summary  
 March 2018

**Background**

Macroinvertebrates, also known as small bugs like caddisflies and damselflies, rest at the bottom of rivers and creeks under rocks and within sediment. The number and types of macroinvertebrates indicate watershed health as expressed by the California Stream Condition Index (CSCI) score. This score measures the health and resilience of the watershed. AWG’s volunteer watershed monitors conduct a “bioassessment” by collecting and analyzing macroinvertebrates along with conducting a visual habitat assessment. Since 2005, AWG’s amazing volunteer monitors have worked together to conduct bioassessments at four consistent locations along Markleeville Creek between Pleasant Valley Road and the Forest Service (FS) Campground below the town of Markleeville in Alpine County, California. The data summarized in this report indicates that the health of Markleeville Creek is slightly impaired or altered, especially at locations nearest to the town of Markleeville.

**Understanding CSCI Scores**

A CSCI score of 1 represents an average healthy ecosystem. Scores that approach 0 indicate an unhealthy aquatic habitat. Scores that are greater than 1 represent a healthier site.

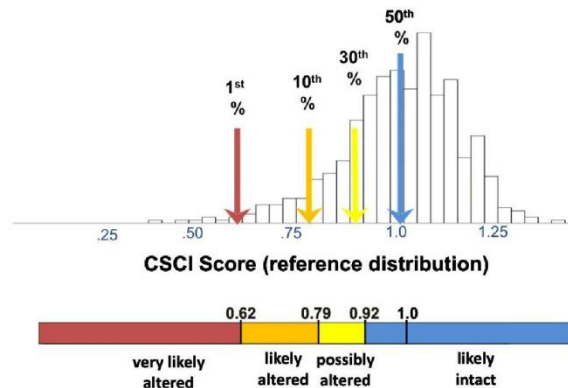
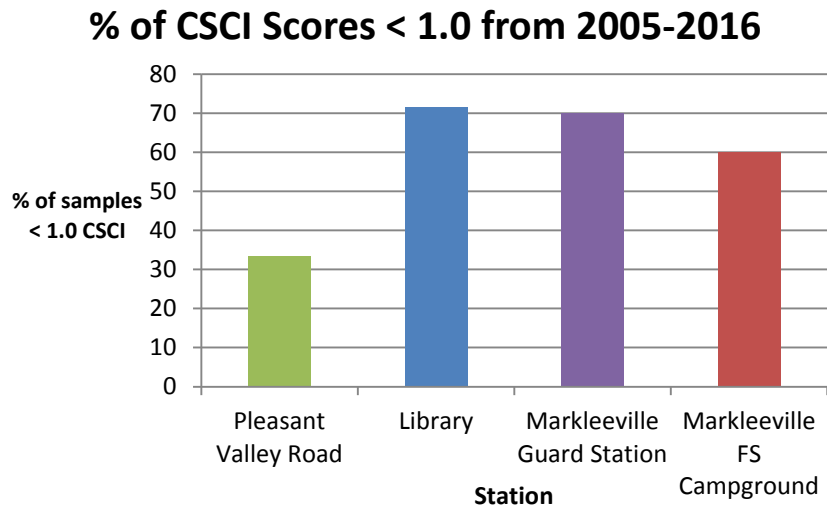


Figure 1:

The numerical scores are described qualitatively in a range of ‘very likely altered’, ‘likely altered’ to ‘possibly altered.’

Figure 2:



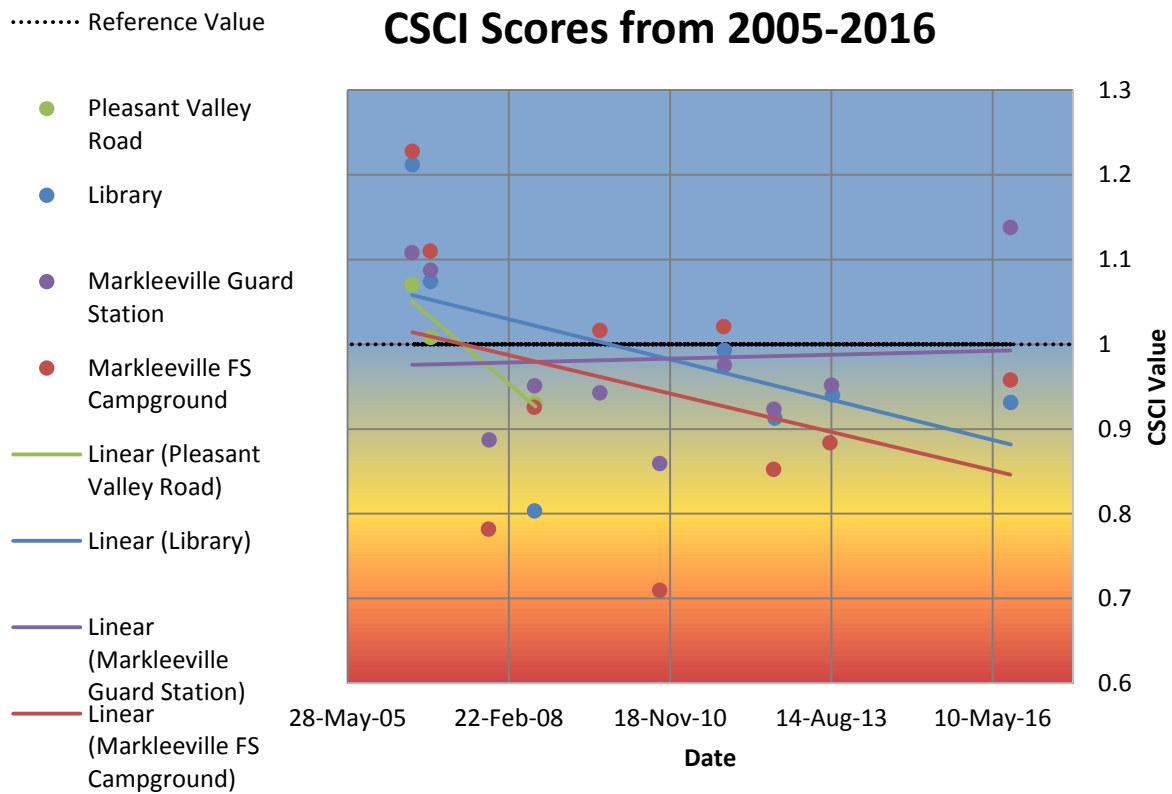
### Our Data Analysis

Alpine Watershed Group has conducted periodic bioassessments at four sites on Markleeville Creek and its tributaries in Alpine County. Markleeville Creek is a tributary to the East Fork Carson River. The data collected from 2004 – 2017 shows that the lowest CSCI score was 0.71 at the Library site and the highest score was 1.23 at the Markleeville Forest Service Campground. The other sites that were regularly assessed on Markleeville Creek are at the old Markleeville Guard Station and the Pleasant Valley Road crossing. Below in Figure 2, the bar graph identifies the percentage of CSCI scores that were less than 1.0 for each of the four sites. The sites are in order from upstream to downstream: Pleasant Valley Road, Library, Guard Station, and Campground as seen in Map 1 (below). This bar graph indicates that each of these sites are “possibly altered” to “likely altered”, meaning degraded from an average healthy ecosystem. The two sites at the Library and at Markleeville Guard Station have the greatest percentage of samples that are below 1.0 CSCI.

Below, Figure 3 records the CSCI scores over time from May 2005 to our most recent bioassessment in May 2016. The color gradient in the grid reflects the colors of Figure 1 of the score distribution with red “very likely altered”, orange “likely altered”, yellow “likely altered”, and blue “likely intact”. In general, the trends of the library and the Markleeville FS Campground decline in CSCI score over time.<sup>1</sup> The Pleasant Valley Road station lacks enough samples to come to any specific conclusion on trend. The Markleeville Guard Station indicates a linear positive trend over time; however, the trend remains below the 1.0 CSCI score.

<sup>1</sup> Note: The R<sup>2</sup> values related to each trend line do not represent statistically significant relationships.

Figure 3:



### Next Steps

Thanks to years of volunteer monitors conducting bioassessments, we are just starting to be able to identify potential trends in aquatic habitat health along Markleeville Creek near the town of Markleeville. The diversity of macroinvertebrates in our streams does not change drastically within a year, but over the course of many years. As we continue to conduct bioassessments every 2-3 years, we will begin to accumulate enough data to confidently determine trends over time. There is a map that displays the monitoring sites within this Sierra Nevada region that have CSCI scores calculated. To view this map interactively, check out this [link](#). It shows that our bioassessment sites are comparable to the rest of the region. The Lahontan Regional Water Quality Control Board is also conducting more bioassessments throughout the Carson Watershed in Alpine County in 2017-2019, but not on Markleeville Creek. If you are interested in the raw bioassessment data, many of them from various sites around the state are available on [CEDEN](#). If you would like to learn more about CSCI scores and how they are developed, check out the [link](#). If you are interested in getting involved in our bioassessments or other volunteer watershed monitoring and restoration projects, see our [website](#) to learn more, sign up for our [newsletter](#), follow us on [Facebook](#), or [contact us](#) at the office.

Map 1:

