



April 2, 2009

Ms. Pamela Creedon, Executive Officer  
Central Valley Regional Water Quality Control Board  
11020 Sun Center Drive, #200  
Rancho Cordova, CA 95670-6114

Re: Central Valley Regional Water Quality Control Board's Cleanup and Abatement Order issued to the El Dorado County Department of Transportation.

Dear Ms. Creedon,

The Off-Highway Motor Vehicle Recreation (OHMVR) Division of California State Parks appreciates the opportunity to comment on the Draft Cleanup and Abatement Order (DCAO) for the El Dorado County portion of the Rubicon Trail, issued by the Central Valley Regional Water Quality Control Board (CVRWQCB) on January 23, 2009.

The primary mission of the OHMVR Division is to provide and promote responsible, legal, and sustainable off-highway vehicle (OHV) recreation, and to protect and where necessary restore natural resources, to ensure quality recreational opportunities remain available for future generations of Californians. The program provides financial and technical assistance to federal, state, and local agencies that manage the varied legal OHV facilities in California. The Rubicon Trail is one such facility. In fact, over the years, the OHMVR Division has invested close to two million dollars of OHMVR Trust Funds for trail maintenance, restoration, law enforcement, resource conservation, and other projects for the improvement of the Rubicon Trail. This significant investment of public funds was made with the full expectation of long-term opportunity for OHV recreation on this scenic and world-renowned trail.

The OHMVR Division is committed to, and recognizes the need for stronger management of the Rubicon Trail and has worked with El Dorado County Department of Transportation (EDCDOT) to that end. Included in the investments indicated above, the OHMVR Division has provided close to \$200,000 in grant funding for the planning of two bridges along the trail at Gerle Creek and Ellis Creek crossings which are scheduled to be constructed in the summer of 2010. In addition, through a cooperative agreement with the OHMVR Division, the California Geological Survey (CGS) is conducting an assessment of the El Dorado County portion of the trail. The CGS assessment is very detailed and, at its core, consists of an updateable geographic information system (GIS)

database which details features and trail segments in need of maintenance and/or redesign. The CGS assessment is to be used as a trail management tool by the EDCDOT. While presentations of the CGS draft assessment were given to various parties, including CVRWQCB staff, the CGS assessment is not yet final. It is anticipated a final report will be delivered to EDCDOT in late April 2009.

Rubicon Trail stakeholders, including the United States Forest Service (USFS) representatives, OHV community representatives, members of the public who are passionate about the area but are not OHV enthusiasts, and OHMVR Division representatives meet monthly with Tom Celio, the Deputy Director of the EDCDOT and other County officials. The group functions ad hoc as the Rubicon Oversight Committee (ROC). Issues regarding the trail and surroundings, trail needs, and efforts conducted or to be conducted on the trail by EDCDOT and/or volunteer groups are presented and discussed at the ROC meetings. Over the years, the ROC has proven to be a constructive and well-established forum for addressing the challenges faced on the Rubicon Trail.

As stated, the OHMVR Division recognizes the need for stronger management of the Rubicon Trail, and to that end, we appreciate the focus the DCAO has provided El Dorado County. This investigation process by the CVRWQCB has shown that many of the elements required by the DCAO are elements that were already planned, implemented, or in the process of being implemented prior to the issuance of the DCAO. This includes the CGS Rubicon Trail assessment and the bridges at Ellis Creek and Gerle Creek.

While the OHMVR Division recognizes and supports a partnership for change in management approaches to the Rubicon Trail, we are concerned by some of the statements and examples used by CVRWQCB. At this time, it is unclear on what factual evidence the CVRWQCB decided to issue the DCAO. The DCAO references a "short-term sediment study" conducted by CVRWQCB staff, and a CVRWQCB report of the study, entitled "Assessment of Sediment Delivery from the Rubicon Jeep Trail," dated January 20, 2009, is attached to the DCAO. However, based on a review by CGS (please see the attached document), the CVRWQCB report appears to have a number of significant technical shortcomings which call into question the report's conclusions. In fact, it would seem the Assessment raises more questions than it answers.

The OHMVR Division encourages management decisions based on factual information and transparent testing mechanisms. Water quality testing for sediment discharge, human sanitation and petroleum-based fluids should be based on sound scientific data and be transparent to the public. The Division suggests and would support further consideration by the CVRWQCB in identifying all of the various sediment discharge

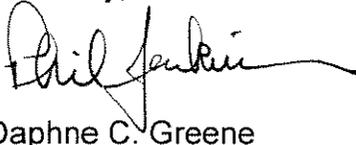
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issues and to also consider the implementation of solutions. In addition, we feel the issues addressed in the DCAO could be effectively addressed through collaboration and a cooperative relationship with interested stakeholders, state and local governments, and agency partners. This partnership must be an essential part of a proactive management strategy to effectively reduce the problems listed in the DCAO.

Any final decisions made by CVRWQCB with regard to the Rubicon Trail should be based on factual information, sound science, and the best available data. The OHMVR Division is prepared to work closely with CVRWQCB in developing this information which will lead to sound management of the Rubicon Trail.

Once again, thank you for the opportunity to comment on the DCAO. I look forward to a positive outcome.

Sincerely,

  
for

Daphne C. Greene  
Deputy Director  
Off-Highway Motor Vehicle Recreation Division

cc: Wendy Wyels, CVRWQCB  
Tom Celio, EDCDOT  
Phil Jenkins, CSP OHMVR Division

Attachment: CGS Comments on the CVRWQCB report, "Assessment of Sediment Delivery from the Rubicon Jeep Trail."



# DEPARTMENT OF CONSERVATION

## CALIFORNIA GEOLOGICAL SURVEY

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To: Daphne Greene  
Deputy Director  
California State Parks  
Off-Highway Motor Vehicle Recreation Division  
1725 23rd Street, Suite 200  
Sacramento, CA 95816

From: Will J. Harris  
California Geological Survey  
801 K Street, Suite 1324  
Sacramento, CA 95814

Date: March 26, 2009

Subject: Comments on the Central Valley Regional Water Quality Control Board (CVRWQCB) report, "Assessment of Sediment Delivery from the Rubicon Jeep Trail," dated January 20, 2009, and attached to CVRWQCB Draft Cleanup and Abatement Order issued to the El Dorado County Department of Transportation on January 23, 2009.

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Below are general and specific comments based on the California Geological Survey's (CGS) review of the Central Valley Regional Water Quality Control Board (CVRWQCB) report, "Assessment of Sediment Delivery from the Rubicon Jeep Trail" (Assessment Report). The Assessment Report is dated January 20, 2009 and was prepared by Drew Coe and Marty Hartzell of the CVRWQCB. It was prepared for and attached to the CVRWQCB's Draft Cleanup and Abatement Order issued to the El Dorado County Department of Transportation on January 23, 2009.

At its conclusion, the Assessment Report states that mitigation measures such as well-placed water control features can reduce sediment generation along the Rubicon Trail.

It is clear mitigation measures will reduce the potential for future sediment generation from the trail. However, the data and specific conclusions in the Assessment Report are not fully documented and in some cases appear to be worst case assumptions which render it difficult to judge the overall significance of the measured values presented. Our comments below focus on the technical aspects of the data in the Assessment Report.

The Assessment Report was issued without page numbers, so for purposes of reference, it will be assumed that page number one of the report begins with the first full page of text.

## General Comments

1. The Assessment Report states that seven segments of the Rubicon Trail were measured to calculate sediment production. There is no map in the Assessment Report to indicate where those segments are located.
2. The Assessment Report provides no mention of geology, geomorphology, soil types, climate, hydrology, or vegetative cover along the Rubicon Trail.

The region is predominantly underlain by granitic rock of varying composition. Exposed granitic rock is regionally jointed which effects overland water flow, vegetation growth patterns, and soil distribution. The region has been subjected to past episodes of glaciation which left behind much coarse and fine-grained glacial till. Glaciation has roughly planed off much of the granite surface, creating steep canyon walls and more muted, undulated topography with shallow depressions along canyon drainages. Much of the Rubicon Trail is along the topographic transition between steep canyon wall and canyon bottom, and tributary drainages, such as Ellis Creek, cross this transition, causing their gradients to lessen, stream flow velocities to slow, and natural sediment loads to be dropped.

3. The Assessment Report does not discuss hydrologic effects from existing and previous land practices on areas adjacent to the Rubicon Trail. There are various forest road networks located upslope from the Rubicon Trail, in particular in the vicinity of the Ellis Creek. In this area, both El Dorado National Forest lands and privately held timberlands have been logged. Overland waterflow (runoff) and small tributary drainages are diverted by the forest roads, skid trails and landings used for logging operations. The hydrologic influence of these features and their potential for sediment delivery should have been considered.
4. The central assumption of the Assessment Report is that predicted sediment delivery using "dust layer measurements" is nearly equal to actual sediment delivery (see Figure 2 on page 4 of the Assessment Report). The assumption is based on a study conducted in Northern Thailand. As presented in the Assessment Report, the cited study shows a one-to-one relationship between predicted and observed sediment delivery from "six road plots subjected to simulated rainfall in Northern Thailand."

For obvious geographic, geologic and climatic reasons, the use of a predictive model based on simulated rainfall in Northern Thailand as a central assumption for an analysis of sediment delivery on the western slope of the Sierra Nevada is questionable without an explanation of applicability.

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## Specific Comments

1. Section 1.1 "Background," pages 1 and 2. Section 1.1 cites literature sources to broadly describe hydrologic impacts of off-highway vehicle (OHV) trails and unpaved roads. There is no specific reference to the Rubicon Trail, and references that demonstrate proper road and trail design (such as "Handbook for Forest and Ranch Roads" by W. Weaver and D. Hagans, Mendocino County Resource Conservation District, 1994; and Part X of the California Salmonid Habitat Restoration Manual, entitled "Upslope Erosion Inventory and Sediment Control Guidance," California Department of Fish and Game, 2006) are not provided or discussed.

Section 1.1 also presents Equation 1, which is  $E_t = E_b + E_s$ , and states that it is used for determining the erosion rate on an OHV trail segment that has been determined to be hydrologically connected to a water body.

The authors of the Assessment Report explain that " $E_t$ " in Equation 1 is the total erosion of the trail segment and that it is equal to the baseline erosion rate of the trail segment (" $E_b$ ") plus the amount of surface material generated by OHV traffic (" $E_s$ "). According to the Assessment Report authors, " $E_s$ " "can be approximated by gravimetric or volumetric estimates of the loose sediment on the surface" of the trail segment using the "dust layer" method. The Assessment Report authors later assume " $E_b$ " to be zero (page 3, paragraph 2), so that " $E_t$ " becomes equal to " $E_s$ ."

Stated plainly, the Assessment Report assumes that whatever loose sediment is on a measured trail segment, 100% of it is due to OHV traffic and that 100% is delivered to a water body. Given this broad simplification, the literature references and the cited Equation 1 in Section 1.1 are unnecessary and not relevant to the presented data.

2. Section 2.0 "Methods," page 2. This section lists five specific observations to determine if a trail segment is hydrologically connected to a water body. It is not clear if one or all of these observations were used to identify hydrologically connected trail segments on the Rubicon Trail. And, as stated in General Comment No. 1, above, there is no map with the Assessment Report, so it is not known where these observations were made.
3. Section 2.0 "Methods," page 3, last paragraph, page 4, first paragraph. The authors measured the width of a trail segment, on average, every 10 feet. For every trail width measurement, only one measurement of "dust depth" was taken. The widths were averaged and the dust depths were averaged, and those two averaged numbers were multiplied by the trail segment length to determine what the authors considered to be the available volume of loose sediment that is delivered to a water body.

The trail tread profile of any segment of the Rubicon Trail is variable, both along its length and along any point where the trail width is measured. Many tread sections contain outcrops of granite adjacent to loose material. Given the topographic and compositional variability of the trail tread, the authors' practice of taking one "dust depth" measurement for every ten linear feet of trail segment is not representative of the amount of loose material available at any one cross-section of a trail segment, and the calculated volumes based on the average dust depth measurements are not representative of actual volumes along trail segments.

4. Section 2.0 "Methods," page 4, second paragraph, and Section 3.3, pages 5 and 6. The last sentence in the second paragraph on page 4 states that "annual sediment delivery is assumed to be less than 100% for trail segments connected to the channel network via sediment plumes." This assumption is later contradicted in Section 3.3. Here, the authors identify two trail segments that are indeed "connected to the channel network via sediment plumes," but then assume that annual sediment delivery for those two segments is 100% of the calculated available sediment. This overestimates the calculated amount of sediment delivery based on the authors' own assumptions. This overestimated quantity is 25 cubic yards per year, which is 25% of the total estimated annual delivery of sediment from the measured trail segments.
5. Section 3.2 "Trail Sediment Production," pages 4 and 5, and Section 3.4 "Beneficial Use Impairment," pages 8 and 9. In Section 3.2, the authors present the range of dust depth measurements and explain that the averaged or "median" value of dust depth (0.03 feet) is more statistically valid than the determined "mean" dust depth of 0.04 feet. Consequently, the authors state that the median value of 0.3 feet was used to determine estimated "sediment production and delivery." On page 8, the authors again explain their rationale for using the median value and not the mean value. Despite this, on page 9, the authors proceed to use the calculated mean "dust depth" volume to compare calculated "sediment production rates" from the Rubicon Trail segments to "gravimetric sediment production rates" calculated from a previous study on forest roads in the watersheds of the South Fork of the American River and the Consumnes River. The comparison shows a "50-fold difference in mean erosion rates," with the Rubicon Trail having the higher rate.

There are several concerns here. First, if the authors claim that the median value is more valid than the mean value, there is no point in using the mean value in any calculation. Second, the Assessment Report regards potential sediment delivery calculated by volume. The cited forest roads report calculated sediment production by weight using "gravimetric sediment production rates." To make this comparison, the authors must convert the calculated volume determined from mean dust depth to units of weight by assuming a uniform density (or unit weight) for all of the calculated available sediment along the Rubicon Trail segments. This conversion and the assumption of uniform density serves to

compound the stated statistical inaccuracy of the mean dust depth, making a direct comparison with any other study suspect. Third, there is no discussion of geology or soils in the Assessment Report, no geological or soils data presented from the cited forest roads study, and no description of the design and proposed use of the forest roads in the cited study, so it is unclear how the tread of forest roads in other watersheds is comparable to the Rubicon Trail.

6. Section 3.4, "Beneficial Use Impairment," page 6, Figure 4, page 8, and Section 5.0, "Conclusions," page 10. The Assessment Report states that "pebble counts above and below the Ellis Creek crossing" were made and that analysis of the data showed that stream bed sediment below the crossing was too fine for several trout species to spawn but adequate for spawning upstream from the crossing. It is later stated in the "Conclusions" section of the report that this is due to "settleable solids from the trail surface" (page 10). Two pebble counts were taken for the Assessment Report, one upstream from the Rubicon Trail/Ellis Creek crossing and one downstream. Figure 4 in the report shows the plotted grain size data from the two pebble counts. Other than "upstream" and "downstream," there is no indication in the Assessment Report as to where along Ellis Creek the two pebble counts were taken relative to the Ellis Creek crossing.

Grain size distribution in a stream bed can vary greatly based on many factors that control water flow velocity in a stream, such as, the characteristics of the stream bed (for example, a step-pool reach versus a cascade reach or a pool-riffle reach); the variation of stream width which causes water flow to slow or accelerate; a change in stream gradient based on regional geomorphic features (as noted in General Comment No. 2, above); sediment sources, and seasonal variation of available water. These fluvial controls on a stream should be examined to determine why stream bedload may fine or coarsen along a particular reach. Pebble counts can assist in quantifying bedload changes, but should not be coupled with only one landscape feature—in the case of the Assessment Report, the location of the Rubicon Trail—to provide rationale for bedload changes. Additionally, the difference displayed between just two pebble counts is statistically insufficient to make the two very broad conclusions that the bedload downstream of the Ellis Creek crossing is too fine to allow for spawning of trout and that the fining is due to "settleable solids from the trail surface." It should also be noted that the authors fail to state that Ellis Creek flows into the dammed water reservoir Loon Lake, which is artificially stocked with trout by the California Department of Fish and Game (<http://www.dfg.ca.gov/news/stocking/>) and is managed by the Sacramento Municipal Utility District for hydroelectric power generation.

7. Section 5.0, "Conclusions," page 10. In the third sentence of the "Conclusions" paragraph, the Assessment Report authors state that their estimated sediment production rates from the Rubicon Trail segments are "50 times greater than sediment production rates reported from native surface logging roads on adjacent forest lands."

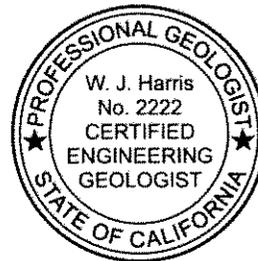
A comparison using the numeric multiplier of 50 is not accurate or applicable because it is based on a sediment delivery rate calculated from a value that the authors state is not statistically valid (the mean "dust depth," see Specific Comment No. 5, above). The "50 times" comparison also does not apply to the rate of "approximately 100 [cubic yards] of sediment annually," mentioned in the preceding sentence in the "Conclusions" paragraph. That value is based on the median "dust depth," according to the Assessment Report authors. Finally, the comparison is to a forest road study conducted in two separate watersheds which are tens of miles to the south of the Rubicon Trail. It is not accurate to refer to the forest road study as one conducted on "adjacent forest lands."

Should you have any questions regarding our comments, please feel free to call.

Respectfully submitted,

*Original signed by:*

Will J. Harris, PG 5679, CEG 2222, CHg 750  
Senior Engineering Geologist  
California Geological Survey



Concur:

*Original signed by:*

William R. Short, PG 4576, CEG 1429, CHg 61  
Supervising Engineering Geologist  
California Geological Survey



cc: Phil Jenkins, CSP OHMVR Division