

530.550.8760
P.O. Box 8568
Truckee, CA 96162
truckeeriverwc.org
#truckeeriverday



California Department
of Fish and Wildlife

California Department
of Parks and Recreation

California Department
of Water Resources

California Fly Fisher
Magazine

Glenshire Homeowners
Association

DMB/Highlands Group, LLC

East West Partners

Friends of Squaw Creek

KidZone Museum

Lahontan Regional
Water Quality
Control Board

Mountain Area
Preservation

Nevada County

North Lake Tahoe
Resort Association

Northstar California

Placer County

Placer County Water
Agency

Sagehen Creek Field
Station - UC Berkeley

Sierra Business Council

Sierra County

Sierra Watch

Sierra Watershed
Education Partnerships

Squaw Valley and
Alpine Meadows

Tahoe Truckee
Sanitation Agency

Town of Truckee

Trout Unlimited

Truckee Donner
Land Trust

Truckee Donner Public
Utility District

Truckee Meadows
Water Authority

U.S. Army Corps of
Engineers

USDA Forest Service

September 23, 2015

Richard Booth
Chief, TMDL/Basin Planning Unit
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Blvd.
South Lake Tahoe, CA 96150
Submitted via Richard.Booth@waterboards.ca.gov

Dear Richard,

Thank you for the opportunity to offer comments on the priority projects for the Triennial Review of the Lahontan Basin Plan.

The Truckee River Watershed Council respectfully requests the Lahontan Water Board add a priority project to the Triennial Review to consider adding a standard to the Truckee River TMDL for deposited/embedded sediment.

TRWC was founded to protect and restore the water quality and the biological resources of the Truckee River. We identify, coordinate, fund, and implement restoration and preservation projects related to the health, beauty, and economy of the watershed. As such, we reviewed the proposed priority list with interest and offer the following comments in support or an additional standard for the Middle Truckee River watershed.

We respectfully remind the Lahontan Water Board of our 2014 request for an additional TMDL standard for the Middle Truckee River Watershed. Please see the attached letter dated May 16, 2014 and presentation to the Board on June 19, 2014. The content of these materials is summarized below.

The current TMDL standard does not appear to be sufficient to detect actual impairment from excess sediment. An additional standard that directly assesses impacts to beneficial uses may be necessary.

Integrated Report calls for further investigation. The April 2014 Clean Water Act Sections 305(b) and 303(d) Integrated Report (Integrated Report) for the Lahontan Region states, "Though the total suspended sediment data shows the Truckee River meets the TMDL sediment target since 2004, consistent exceedances of the turbidity water quality objective for the past several years raises concern about effectiveness of the implemented actions and the other TMDL targets. Because total suspended sediment is closely related to turbidity, the fact that the total suspended sediment target is met while the turbidity objective is not met must be further investigated."

Data supports the need for further investigation. In 2010 and 2011 TRWC implemented a monitoring plan* in support of the Truckee River TMDL. The monitoring program consisted of (1) suspended sediment and turbidity monitoring, (2) bioassessment studies, and (3) sediment deposition surveys.

The data demonstrated inconsistencies between the current TMDL standard and support of beneficial uses:

- (1) **Suspended Sediment Concentration meets standard.** The suspended sediment (SSC) and turbidity monitoring focused on three crucial tributary streams: Cold Creek, Donner Creek, and Trout Creek. The SSC data* collected from these tributaries demonstrated that for the monitoring period the three tributary streams had suspended sediment concentrations below the TMDL standard (SSC concentration of 25 mg/L or less 90% of the time).
- (2) **However, bioassessment studies find Beneficial Uses are impaired.*** In contrast to the SSC and turbidity monitoring, the bioassessment data strongly supported that beneficial uses are impaired in the Truckee River:
 - **Compared to reference streams, the Truckee River consistently scored lower on the Eastern Sierra Index of Biological Integrity.** In 2010, Dr. David Herbst of U.C. Santa Barbara – Sierra Nevada Aquatic Research Laboratory, conducted a reference-test study comparing several sites along the Truckee River to similar eastern Sierra streams with less watershed disturbance (Carson, Walker, and Markleeville Creek). All sampling sites on the Truckee River scored below the “not supporting of beneficial uses” or “partially supporting” thresholds. Reference streams scored as “supporting” or “partially supporting”.
 - **There were significant differences in biological conditions starting with just 20% sediment coverage. At 80% or greater sediment coverage, there were very significant decreases in biological condition.*** Based upon this work, additional monitoring was conducted to more specifically examine the relationship between sediment and biological communities. A patch-scale study to examined the relationship between deposited sediment and biological condition of the benthic community, and found:
 - Decrease in the quantity and quality of food resources, meaning that both the number and size of benthic macroinvertebrates decreased with increasing sediment coverage;
 - The BMI community shifted away from organisms intolerant of pollution towards species that are more tolerant of poor water quality.
- (3) **Sediment Deposition is widespread.*** We completed surveys to assess the extent of sediment deposition near our bioassessment sampling sites*. In these surveys, at six of the ten sampling sites, 50% or more of the survey points

measured sediment coverage in the excessive category (80 – 100% coverage by fine sediment).

Current TMDL Standard does not reflect that Beneficial Uses Are Not Supported. Taken together, these studies indicate that Beneficial Uses including “Cold Freshwater Habitat” and “Spawning Reproduction and Development” are likely to not be fully supported in the Truckee River due to impacts on the base of the food web and excess deposited sediment. The current TMDL standard based on suspended sediment concentrations does not support beneficial uses.

We highlight our monitoring data to support the Lahontan Water Board staff conclusions that:

- **Beneficial uses are impacted in the Truckee River;**
- **The current TMDL numeric standard does not appear to be sufficient to detect actual impairment from excess sediment.**

There is precedent for standards based on deposited/embedded sediment. The following TMDLs partially address deposited/embedded sediment and the impact to Beneficial Uses. These could possibly be a starting point for development of an additional standard for the Truckee River TMDL:

SWRCB Region 6 – Lahontan Region, sediment TMDLs

- Blackwood Canyon
- Squaw Creek

SWRCB Region 1 – North Coast, sediment/siltation TMDLs

- Cape Mendocino – Mattole River
- Eel River
- Mad River

The Watershed Council’s goal is to complete 50 high priority projects in the next 10 years in order to improve the health and function of the Truckee River watershed. Identifying the appropriate standard for the Truckee River TMDL is fundamental to our ability to address the problems of our watershed. We strongly encourage the Lahontan Water Board to add a priority project to the Triennial Review to consider adding a standard to the Truckee River TMDL for deposited/embedded sediment.

Thank you for considering our comments.

Sincerely,



Lisa Wallace
Executive Director



Michele Prestowitz
Program Manager

CC: Beth Christman, Truckee River Watershed Council

Attachments:

1. TRWC letter of May 16, 2014: 305(b)/303(d) Integrated Report, April 2014
2. TRWC presentation to LRWOCB of June 19, 2016: Truckee River Sediment TMDL

*All data can be found in reports on our website at www.truckeeriverwc.org:

- [Bugs, Dirt, and Data – New Findings about Why the Truckee River Needs Our Help 1.27.15](#)
- [Middle Truckee River - Benthic Macroinvertebrate Responses to Sediment Deposition](#)
- [Middle Truckee River TMDL Bed Conditions Monitoring Report WY 2010-2011](#)
- [Middle Truckee River TMDL Bed Conditions Monitoring Report WY 2014](#)
- [Middle Truckee River TMDL Suspended Sediment Monitoring Report WY2011](#)
- [Middle Truckee River TMDL Suspended Sediment Monitoring Report WY2012](#)
- [Middle Truckee River TMDL Suspended Sediment Monitoring Report WY2013](#)
- [Middle Truckee River TMDL Suspended Sediment Monitoring Report WY 2014](#)
- [Middle Truckee River – Use of Benthic Invertebrate Indicators to Evaluate Excess Sediment Deposition](#)
- [Annual Monitoring Data Report 8.30.2008](#)
- [Annual Monitoring Data Report 2010](#)
- [Annual Monitoring Data Report 12.2011](#)
- [Annual Monitoring Data Report 12.2012](#)
- [Annual Monitoring Data Report 12.2013](#)
- [Annual Monitoring Data Report 2.10.2015](#)

530.550.8760
P.O. Box 8568
Truckee, CA 96162
truckeeriverwc.org



Truckee River Watershed Council

Collaborative solutions to protect, enhance and restore the Truckee River Watershed

California Department
of Fish and Wildlife

California Department
of Parks and Recreation

California Department
of Water Resources

California Fly Fisher
Magazine

Glenshire Homeowners
Association

DMB/Highlands Group, LLC

East West Partners

Friends of Squaw Creek

KidZone Museum

Lahontan Regional
Water Quality
Control Board

Mountain Area
Preservation

Nevada County

North Lake Tahoe
Resort Association

Northstar California

Placer County

Placer County Water
Agency

Sagehen Creek Field
Station - UC Berkeley

Sierra Business Council

Sierra County

Sierra Watch

Squaw Valley and
Alpine Meadows

Tahoe Truckee
Sanitation Agency

Town of Truckee

Trout Unlimited

Truckee Donner
Land Trust

Truckee Donner Public
Utility District

Truckee Meadows
Water Authority

U.S. Army Corps of
Engineers

USDA Forest Service
Tahoe National Forest

Carly Nilson

2501 Lake Tahoe Blvd.

South Lake Tahoe, CA 96150

May 16, 2014

RE: 305(b)/303(d) Integrated Report, April 2014

Thank you for the opportunity to offer comments on the recently released Clean Water Act Sections 305(b) and 303(d) Integrated Report (Integrated Report) for the Lahontan Region.

Support for Maintaining Listings

The Truckee River Watershed Council (TRWC) supports maintaining the listings for water bodies in the Truckee River watershed, including the Middle Truckee River, Donner Lake, and Squaw Creek. This comment letter will focus on data regarding the Middle Truckee River.

We agree with the conclusion presented in the Integrated Report Staff Report that the Truckee River is not ready for delisting. As stated on Page 10 of the Report, we agree that there needs to be further investigation of the current sediment target and turbidity water quality objectives.

Data in Support of the Listing

Impairment of Beneficial Uses. The Integrated Report is based on data collected through 2010. Data TRWC has collected since 2010 indicate that:

1. The current TMDL standard may not detect impairment of beneficial uses.
2. Beneficial uses are impacted in the Truckee River.

In 2010 and 2011 TRWC implemented a monitoring plan in support of the Truckee River TMDL. The monitoring program consisted of suspended sediment and turbidity monitoring as well as bioassessment studies.

Suspended Sediment Concentration. Our suspended sediment (SSC) and turbidity monitoring focused on three key tributary streams: Cold Creek, Donner Creek, and Trout Creek. The SSC data collected from these tributaries demonstrated that for the monitoring period the three tributary streams had suspended sediment concentrations below the TMDL standard, which is that the SSC concentration is 25 mg/L or less 90% of the time.

Bioassessment. In contrast, the bioassessment data strongly supported that beneficial uses are impaired in the Truckee River. We summarize below the key results from these studies.

We developed a monitoring program with Dr. David Herbst of U.C. Santa Barbara – Sierra Nevada Aquatic Research Laboratory. In 2010, we conducted a “reference-test” study comparing several sites along the Truckee River to similar eastern Sierra streams with less watershed disturbance (Carson, Walker, and Markleeville Creek). **Compared to similar reference streams, the Truckee River consistently scored lower on the Eastern Sierra Index of Biological Integrity.** All sampling sites on the Truckee River scored below the “not supporting of beneficial uses” or “partially supporting” thresholds. Reference streams scored as “supporting” or “partially supporting”.

Based upon this work, we completed additional monitoring in 2011 to more specifically examine the relationship between sediment and biological communities. We completed a “patch-scale” study to examine the relationship between deposited sediment and biological condition of the benthic community. **There were significant differences in biological conditions starting with sediment coverage of just 20%. At 80% or greater sediment coverage there were very significant decreases in biological condition.**

The differences in biological condition include:

- Decrease in the quantity and quality of food resources, meaning that both the number and size of benthic macroinvertebrates decreased with increasing sediment coverage;
- The BMI community shifted away from organisms intolerant of pollution towards species that are more tolerant of poor water quality.

Sediment Deposition. In addition to the bioassessment work, we completed surveys to assess the extent of sediment deposition near our bioassessment sampling sites. In these surveys, we found that:

- **Sediment deposition was fairly widespread;**
- At six of the ten sampling sites, 50% or more of the survey points measured sediment coverage in the excessive category (80 – 100% coverage by fine sediment).

Beneficial Uses Not Supported. Taken together, these studies indicate that beneficial uses including “Cold Freshwater Habitat” and “Spawning Reproduction and Development” are likely to not be fully supported in the Truckee River due to impacts on the base of the food web and excess deposited sediment.

De-listing is Pre-Mature

We recognize that data from our studies are not included in the current Integrated Report. We are highlighting our current data to support the Lahontan Water Board staff conclusions that:

- De-listing is premature;

- Beneficial uses are not being supported;
- The current TMDL numeric standard does not appear to be sufficient to detect actual impairment from excess sediment.

All data can be found in reports posted on our website: www.truckeeriverwc.org/about/documents.

Next Steps

We would like to formally request a time at a future Lahontan Water Board meeting to present the results of our TMDL monitoring program in greater depth.

Thank you for considering our comments.

Sincerely,



Beth Christman
Director of Restoration Programs



Lisa Wallace
Executive Director

Truckee River Watershed Council Truckee River Sediment TMDL

Lahontan Regional Water Quality Control Board
Beth Christman & Lisa Wallace
June 19, 2014

Presentation Outline

- ▶ Truckee River TMDL Background
- ▶ TRWC Monitoring Program
- ▶ Key Results
- ▶ Discussion of Findings

Middle Truckee River Sediment TMDL

- ▶ Truckee River listed for excess sediment
- ▶ Included on 303(d) list in 1991 based on biological impacts – best professional judgment
- ▶ TMDL adopted in 2008

TMDL Standards

- ▶ Watershed-wide TMDL
- ▶ Numeric target: 25 mg/L suspended sediment concentration (SSC)
- ▶ Implementation targets
 - Road sand tracking and recovery
 - Ski area BMPs
 - Dirt road maintenance/decommission
 - Legacy site restoration/BMP installation

Where are we now?

- ▶ TRWC began TMDL monitoring in 2010
 - Only TMDL-specific monitoring
- ▶ We now have data that shows biological impairment
- ▶ Current TMDL standard not suited to assess biological impact
- ▶ Preliminary meeting with LRWQCB staff

Why TRWC is Monitoring

- ▶ Lack of strong monitoring plan in the adopted TMDL
- ▶ Need for watershed-based vs. individual permittee reports
- ▶ Inconclusive biological studies - need for more data
- ▶ Establish “baseline” conditions to track progress

Monitoring Plan Elements

- ▶ **Macroinvertebrates**
 - Index of Biological Integrity study – reference test
 - Patch-scale sediment
 - Repeat LRWQCB 2004 sampling below tributaries
 - Studies completed 2011
- ▶ **Sediment and Turbidity**
 - Near continuous turbidity
 - Suspended sediment grab samples
 - Bed surveys
 - Funded through WY2014

Partners

- ▶ Town of Truckee
- ▶ Placer County

Technical Advisory Committee

- ▶ CA Department of Water Resources
- ▶ Lahontan Regional Water Quality Control Board
- ▶ Placer County
- ▶ Town of Truckee
- ▶ U.S. Geologic Survey

Elements Presented Today

- ▶ Macroinvertebrate – reference/test
- ▶ Macroinvertebrate – patch-scale
 - Studies by UCSB– SNARL, Dr. David Herbst
- ▶ Suspended sediment and turbidity summary
 - Studies by Balance Hydrologics

Key Points

1. Biological data shows impairment
2. Disconnect between current numeric standard and detecting impairment

Bioassessment

- ▶ Reference/Test Study (2010)
- ▶ Patch Scale Fine Sediment Study (2011)

Bioassessment 101

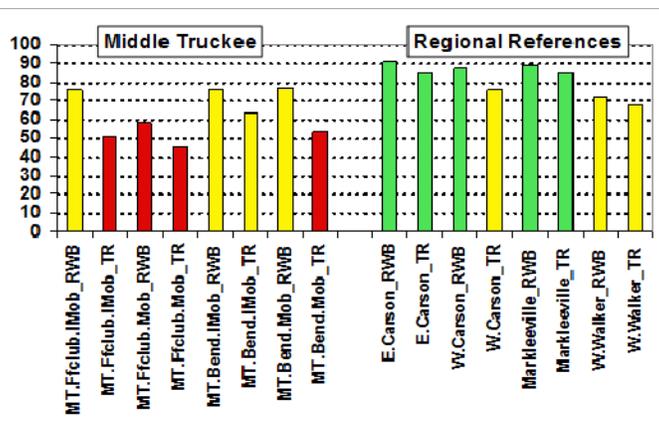
- ▶ Using biological organisms to assess water quality
- ▶ Direct indicator of stream environment
- ▶ Benthic macroinvertebrates most common
- ▶ Different types of insects tolerate poor water quality – assigned a “tolerance value”

Bioassessment “Jargon”

- ▶ Index of Biological Integrity (IBI) common analysis tool
 - Developed specific to a region
 - Allows to look at just one “score”
- ▶ EPT = Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies)
- ▶ Tolerance Value: 0–10 assigned to each species
- ▶ BMI = Benthic macroinvertebrate

Reference/Test Results – IBI Scores

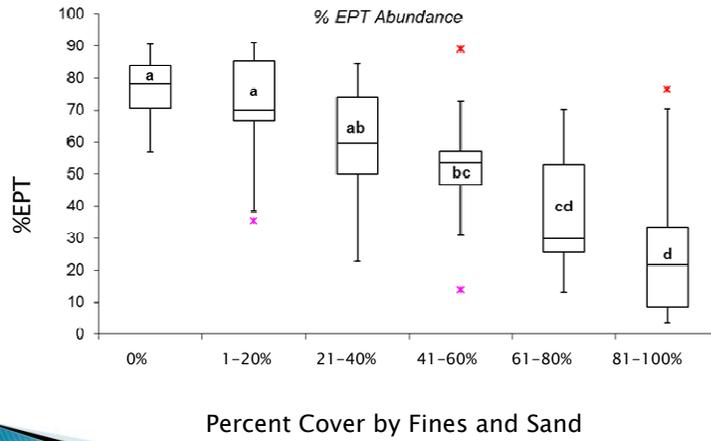
- Middle Truckee samples all scored as impaired (red) or partially supporting (yellow)
- Reference sites scored as partially supporting or supporting (green)



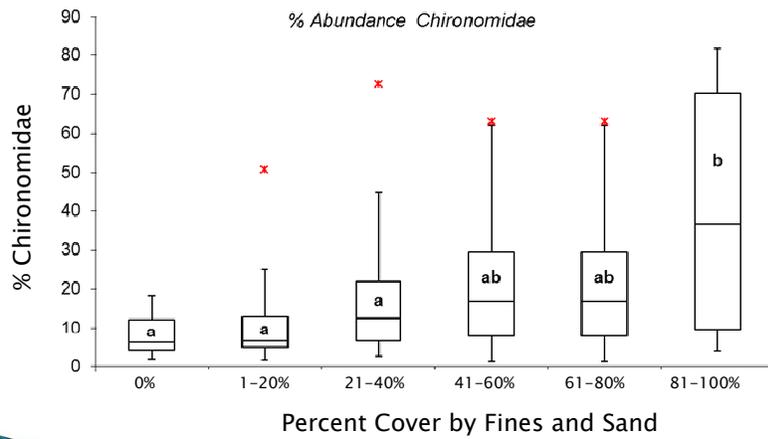
Patch Scale Analysis

- ▶ Tightens up relationship between sediment and biota
- ▶ Collect BMIs from small patches over a range of fine sediment cover (0–100%)
- ▶ Survey reaches of Middle Truckee to understand pattern of fine sediment deposition

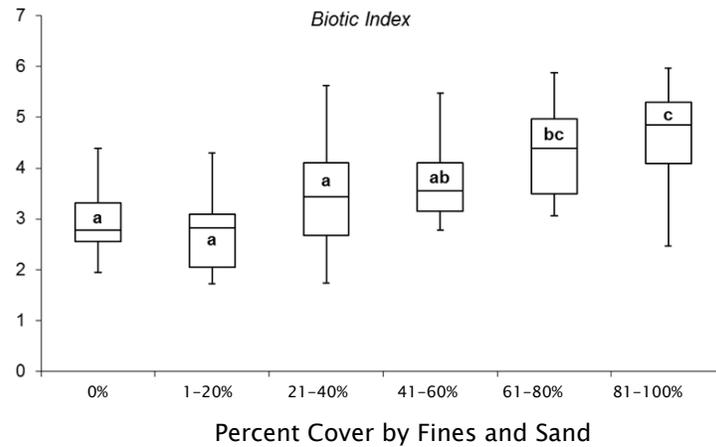
%EPT Decreases with Increased Fines



% Midges Increases with Increased Fines



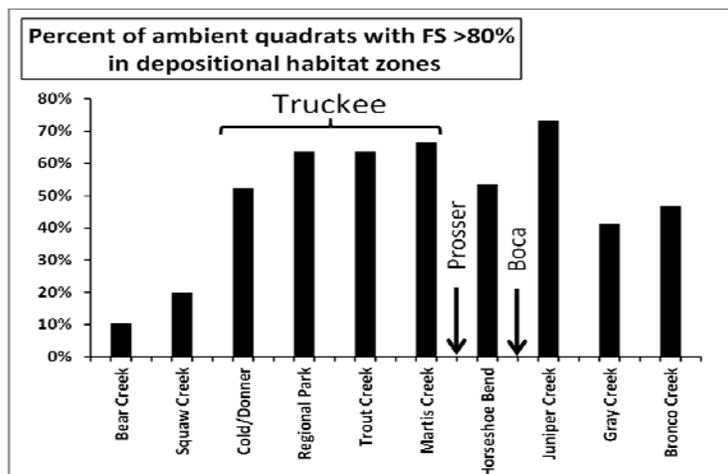
Fewer Intolerant, More Tolerant Species with Increased Fines



Summary of Biological Impacts

- ▶ Food quality and quantity decreases
 - Fewer insects
 - Smaller body size
- ▶ Sensitive taxa are lost from the community
- ▶ Sediment thresholds
 - Impacts appear >20% fine and sand cover
 - Impacts significant at 80%

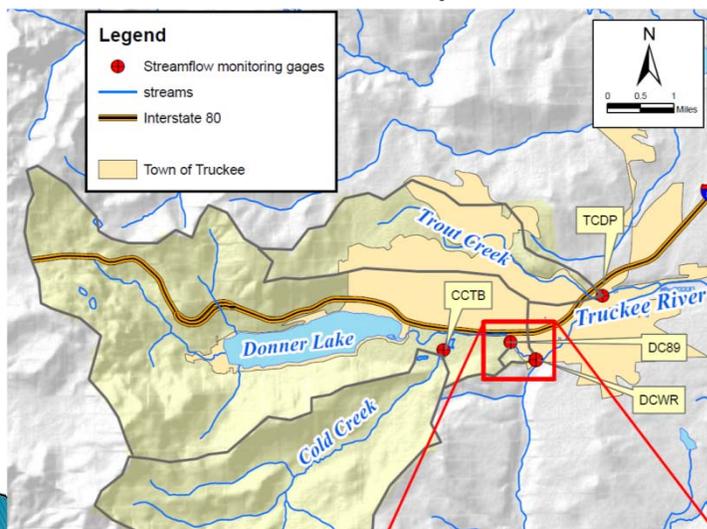
How Prevalent is Sediment Deposition?



Suspended Sediment Results

- ▶ Disconnect between bioassessment and sediment data

Sediment and Turbidity Monitoring Stations on 3 key tributaries



Suspended Sediment/Turbidity Results

- ▶ Data from WY 2010 – 2013
- ▶ Tributaries are meeting suspended sediment concentration standard of 25 mg/L 90% of the time

Beneficial Uses are Impaired

- ▶ Biological data show increased sediment = decreased condition
- ▶ Sediment deposition is fairly widespread in sampling reaches
- ▶ SSC data suggest current standard is largely met in 3 monitored tributaries

Next Steps

- ▶ Additional standard for Truckee River that directly assesses impacts to beneficial uses
 - Biological?
 - Deposited Sediment?
- ▶ Fund additional monitoring
 - Sediment distribution
 - Additional bioassessment sites
 - Depending on standard:
 - Annual cost \$30,000 – \$150,000+
 - Study period 3–5 years

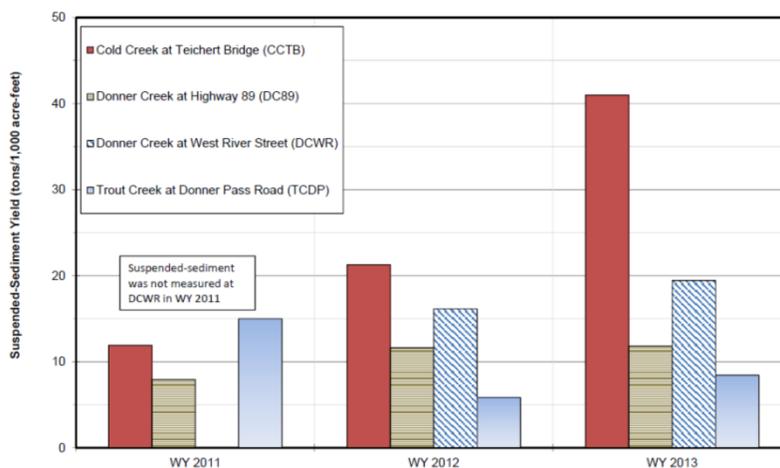
Questions?

- ▶ Reports available at: www.truckeerverwc.org

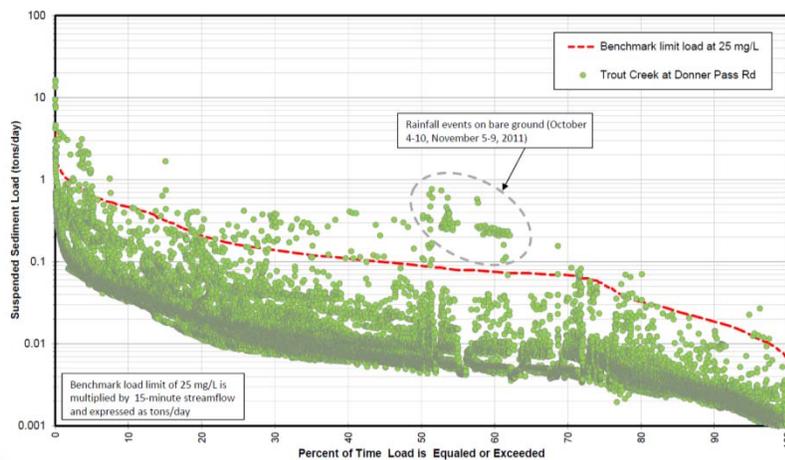
Beth Christman
(530) 550-8760
bchristman@truckeerverwc.org

Additional Information – Suspended Sediment

Total Loading from Tributaries

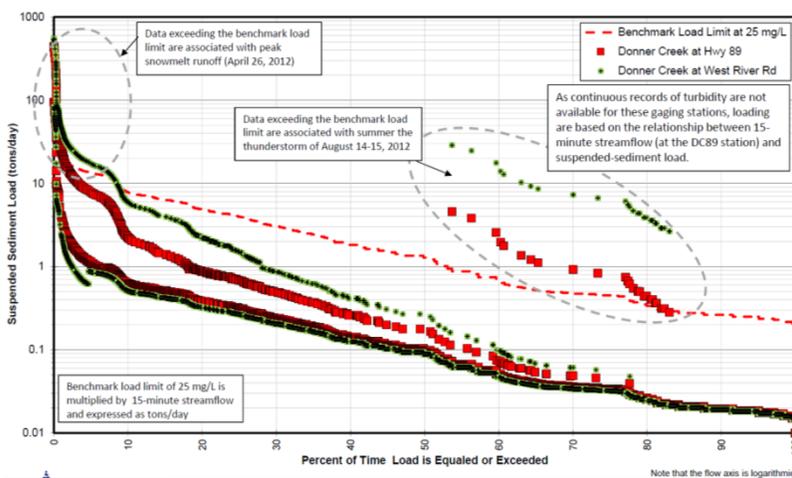


Relationship to TMDL SSC Standard?



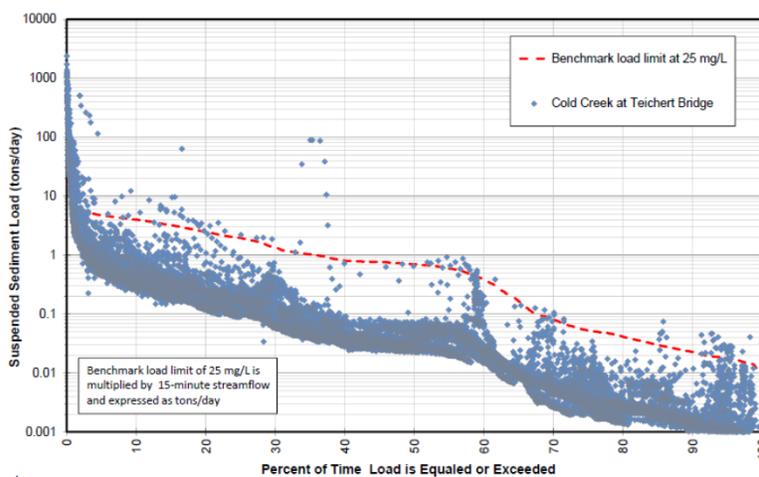
Water Year 2012 Data - Trout Creek

Relationship to TMDL SSC Standard?



Water Year 2012 Data - Donner Creek

Relationship to TMDL SSC Standard?



Water Year 2013 Data - Cold Creek

Key Sediment/Turbidity Conclusions

- ▶ Tributaries are meeting suspended sediment concentration standard of 25 mg/L 90% of the time
- ▶ Lower Donner watershed extremely high load contribution
- ▶ Early season rain storms result in significant loading

Farad Data

Table 3. Annual 90th percentile of suspended sediment as measured at the Farad monitoring station.

Water Year	90th Percentile SSC (mg/L)	Number of samples
2000-2001	7	12
2001-2002	56	25
2002-2003	51	36
2003-2004	7	12
2004-2005	6	12
2005-2006	7	12
2006-2007	4.52	12
2007-2008	6.37	12
2008-2009	13	11
2009-2010	5.03	12

Note: Data for Water Years 2001-2005 is from the Truckee River TMDL Staff Report pg. 4-7. Data for Water Years 2006-2008 is directly from the NDEP website. Data for Water Years 2008-2010 was received from NDEP upon request.

From LRWQCB, 2011. Truckee River Status Report