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March 16, 2009

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North Coast Regional Water Quality Control Board
5500 Skylane Blvd, Suite A
Santa Rosa, CA 95403-1072

Subject: Comments for the 2008 303 (d) List of Water Quality Limited Segments

Dear North Coast Water Quality Control Board,

Thank you for this opportunity to provide comments and feedback on the 2008 North Coast Polluted Waters List. The Quart Valley Indian Reservation is located in the Scott River Watershed, specifically on Shackleford Creek. Tribal members are of Shasta and Karuk Indian decent and tribal lands are currently located in both the Scott and Shasta watersheds. Protection and enhancement of the cultural resources of the Klamath River Basin, and specifically these tributaries, are of utmost importance to the Tribe for the sustainability of the tribal way of life. Polluted rivers in the basin threatened that mission and ultimately tribal people and their resources. It is for these reasons and more that we are providing this feedback.

Current Listings

Decision ID 13974: List Mainstem Klamath River from Iron Gate to Scott River for cyanobacteria hepatotoxic microcystins AND Decision ID 13971: List Mainstem Klamath River from Scott River to Trinity River for cyanobacteria hepatotoxic microcystins

The QVIC **supports** the decision to list the mainstem Klamath River for microcystins. The mainstem Klamath River can be polluted by the toxigenic hepatotoxin microcystin during the hot summer months, particularly in August and September. Being in the water during these months is not an option for people. Critical ceremonies for QVIR members of Karuk decent occur during this time period that require bathing in the Klamath River water. Traditionally, medicine men drank the River water. Since they still practice the traditional style of dipnet fishing, it requires them to spend long hours in backwaters and eddies, where the blooms are likely to be the most toxic. Mussels in the River were shown to be toxic and unfit for human consumption as cited in your fact sheets LOE ID 25846 and 25847. Mussels are an important subsistence food for the tribal people. It is

imperative that microcystin is eliminated from the Klamath River for the protection of beneficial uses.

To be protective of beneficial uses, the Klamath River should be listed for not only microcystin but also the toxigenic cyanobacteria *Microcystis aeruginosa* that produces microcystin.

Decision ID 9638: List Lake Shastina for Mercury

The QVIC **supports** the recommendation to list Lake Shastina for Mercury. Mercury contamination is a very important public health issue. Lake Shastina is used as a drinking water supply, a source of water contact recreation, and a recreational fishery. All of these beneficial uses are severely impacted by the presence of mercury in the system.

Decision ID 9540 Salmon River – Delist Wooley Creek for Temperture

The QVIC **does not support** the de-listing of Wooley Creek. The North Fork of Wooley Creek is located on the opposite side of the mountain from the Shackleford Headwaters, Quartz Valley. This area historically was used regularly as a migration and trade route between tribal people and neighboring settlers. This is an important drainage to the QVIC, Karuk and Shasta members both have memories of traveling this route.

A de-listing would indicate suitable temperatures exist for the beneficial uses established. The cold-water fishery is an important beneficial use to the Tribe and it is for this reason that we have analyzed temperature data from lower Wooley Creek.

Temperature data was requested and received from Six Rivers National Forest for lower Wooley Creek. The data set was from 7/6/2006-10/9/2007. A 7-day average of daily maximums (7DADM) was calculated for this data set. The EPA criteria listed in the Wooley Creek Fact Sheet for LOE ID 26643 was a 16 C 7DADM. The 16 degrees C MWMT criterion is recommended by US EPA Region 10 to (1) safely protect juvenile salmon and trout from lethal temperatures; (2) provide upper optimal conditions for juvenile growth under limited food during the period of summer maximum temperatures and optimal temperatures for other times of the growth season; (3) avoid temperatures where juvenile salmon and trout are at a competitive disadvantage with other fish; (4) protect against temperature induced elevated disease rates; and (5) provide temperatures that studies show juvenile salmon and trout prefer and are found in high densities. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. U.S. Environmental Protection Agency Region 10 Office of Water, Seattle, WA.

Of the 445 calculations, 157 exceeded the EPA criteria. This occurred between July and September for both 2006 and 2007 (Figure 1). Therefore, temperatures in Wooley Creek are not protective of juvenile salmonids during the hot summer months.

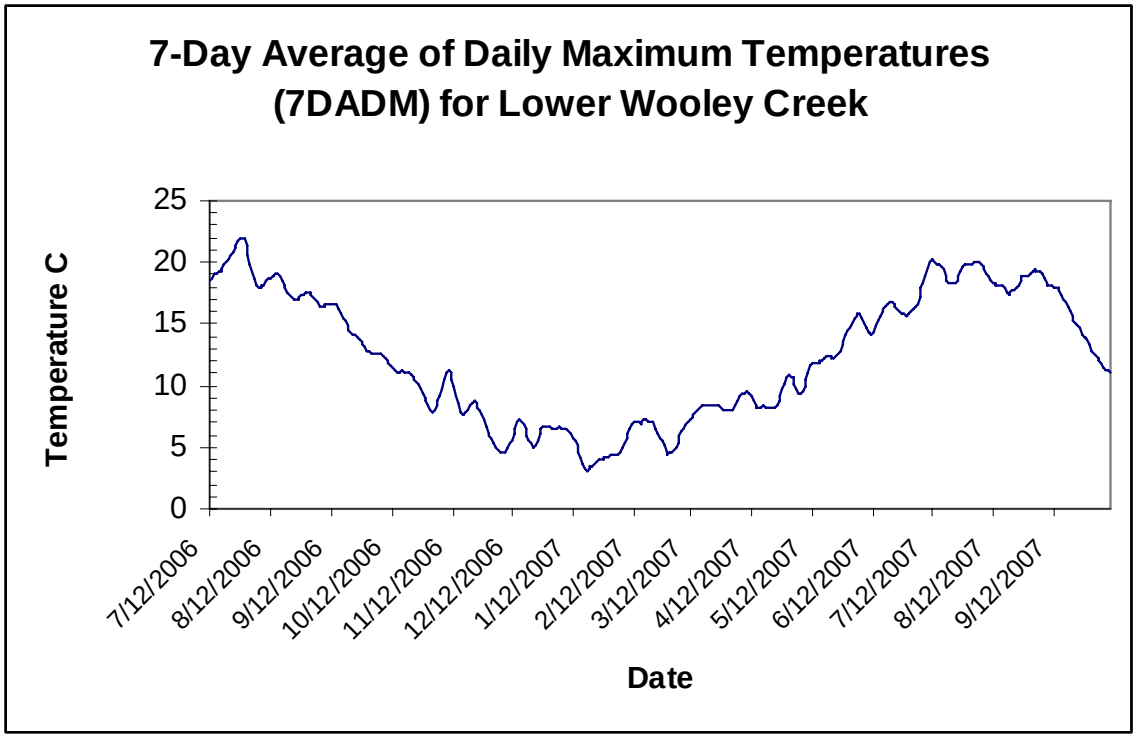

Figure 1. 7-day average of daily maximum temperature for lower Wooley Creek. Calculations were done by Karuk Tribe Water Quality. Data was provided by Six Rivers National Forest.

Even though a large portion of the Wooley Creek watershed is designated as a wilderness area now, it is and has been impacted and disturbed by human activity. There is active management occurring in over 15% of the watershed. Fire (suppression) management by the National Forests has resulted in large-scale fires in recent years in the Wooley drainage. These un-naturally large fires, due to suppression, have the ability to effect stream temps through loss of canopy and increases in sediment yield to the stream. The Wooley Creek wilderness also has 2 grazing permits, one managed by the Six-Rivers NF and the other by the Klamath NF. Grazing has the potential to negatively effect this watershed. Although specific data for the Wooley Creek grazing allotment does not exist, data does exist for the Shackleford and Kidder grazing allotments and it is important to see what types of impacts have been documented which respect to grazing on another KNF managed allotment, which is geographically very close in proximity to Wooley.

The information provided in the *Shackleford and Kidder Creek Allotments Draft EA* and in KNF BMP water quality reports (1999-2006) grazing sections show a pattern of failure to meet effectiveness criteria for bank stability and disturbance of lentic habitat. Kidder Creek and Shackleford Allotments both had 20-30% bank erosion in meadow reaches and nearly 10% of the stream bottom had been physically trampled by cows. The latter information also indicates that cattle defecate in streams, adding nutrients and, potentially, pathogens. Pathogens, nutrient and flow data were collected in 2007 by the QVIR EPD. High loads of both nitrogen and *E.coli* were detected in the Shackleford headwaters in 2007 (QVIR Monitoring and Assessment Report). The pattern of bank

failure along 20-30% of stream banks within all Scott River grazing allotments, and those in other Ranger Districts, indicates a KNF-wide problem with grazing management (KNF, 1999-2006).

Table 1 shows the frequency of failure to meet effectiveness (FE) standards or the 4 inch stubble height criteria, signaling over-grazing (OG), in the Kidder Creek and Shackleford Allotments. BMP effectiveness criteria are not being met in the Kidder Creek or Shackleford Allotments, nor are they met in most other Scott River Ranger District allotments.

Allotment	1998	2001	2002	2003	2004	2005	2006
Kidder Creek	OG	OG	OG		OG	OG	OG
Shackleford		OG		OG	OG	FE	

Table 1. Summary of Kidder Creek and Shackleford Allotments failure to meet effectiveness monitoring standards (FE) or over-grazing (OG) (stubble height less than 4").

In conclusion, Wooley Creek is not meeting the temperature criteria for the protection of the cold-water fishery. These temperatures have been altered by decades of fuel and grazing management and therefore does not warrant a de-listing.

Suggestions for Future Listing

Scott River
Data collected by the QVIR Environmental Program in 2007 and 2008 indicates additional impairments beyond temperature and sediment (current listing) of the Scott River and tributaries. Water quality parameters, sampled locations and the years sampled that do not meeting the NC Basin water quality objectives are:

1. *E.coli* (2007, 2008)– Shackleford Creek, Sniktaw Creek and Scott River mainstem
2. dissolved oxygen and pH (2007, 2008) – Scott River mainstem
3. specific conductivity (2008) – Scott River mainstem

Nutrient data (TN, TP) collected in 2007 and 2008 from the Scott mainstem and Shackleford Creek also exceeds the Nutrient Numeric Endpoints (NNE) developed for the USEPA by Tetratech (2006). In addition, water samples collected in 2007 from the Marble Mountain wilderness lakes of the Shackleford drainage indicate nutrient and bacteria loading (TN, TP and *E.coli*) is occurring during the summer sampling season in exceedances of NNE targets.

Immediate Listing Recommendation – Scott River *E.coli*
E.coli poses a serious threat to human health. Tribal members fully submerge themselves during sweats and the public enjoys recreation (swimming, boating, kayaking,

snorkeling) in the Scott mainstem, tributaries and head-water wilderness lakes. Data indicates the highest concentrations of *E.coli* are occurring during the summer season when these activities are most likely to occur, see Figure's 2-7. Due to the human health impacts, it is timely to list the Scott now, not wait until another 2+ years for the Final 2010 303 (d) Listing Report. We recommend this parameter for immediate listing and hope that we can coordinate something with your staff to explore the most appropriate options for 2009.

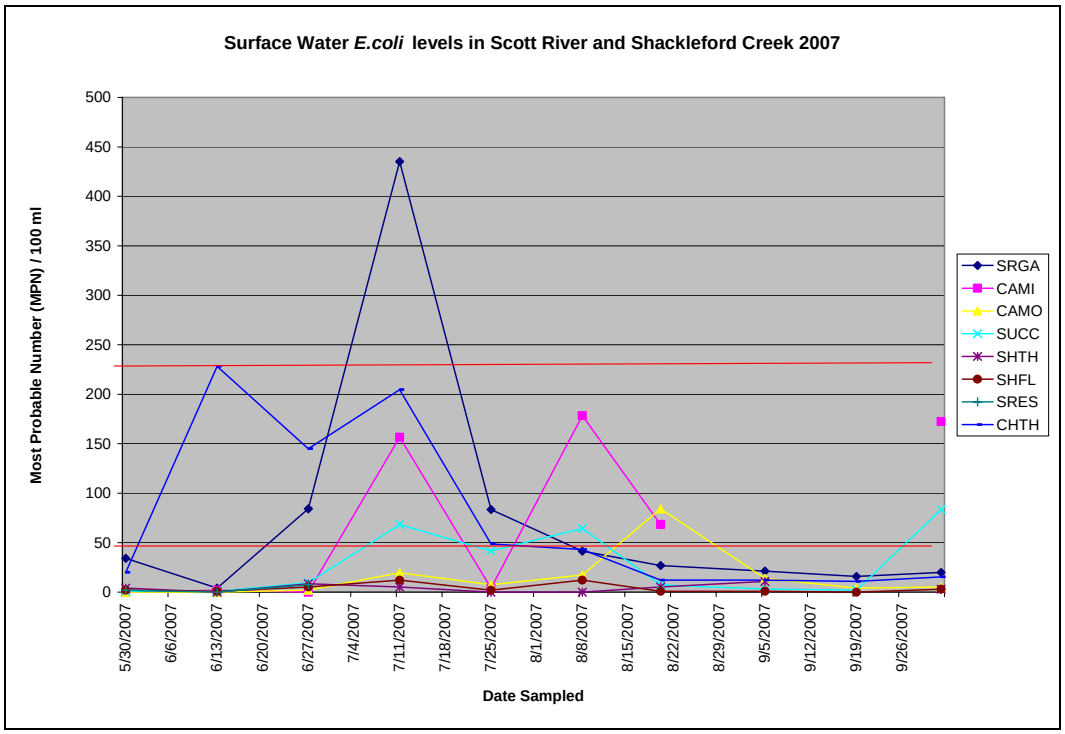

Figure 2 *E.coli* results for Shackleford Creek (CAMI, CAMO, SUCC, SHTH, SHFL, SRES and CHTH) and the Scott River (SRGA) in 2007. The top red line is the federal (U.S. EPA 1986) single exceedance value, 235 MPN. The bottom red line is the NCRWQCB (2007) *Basin Plan* objective of a median value of 50 MPN with at least 5 equally spaced sampling events within 30 days.

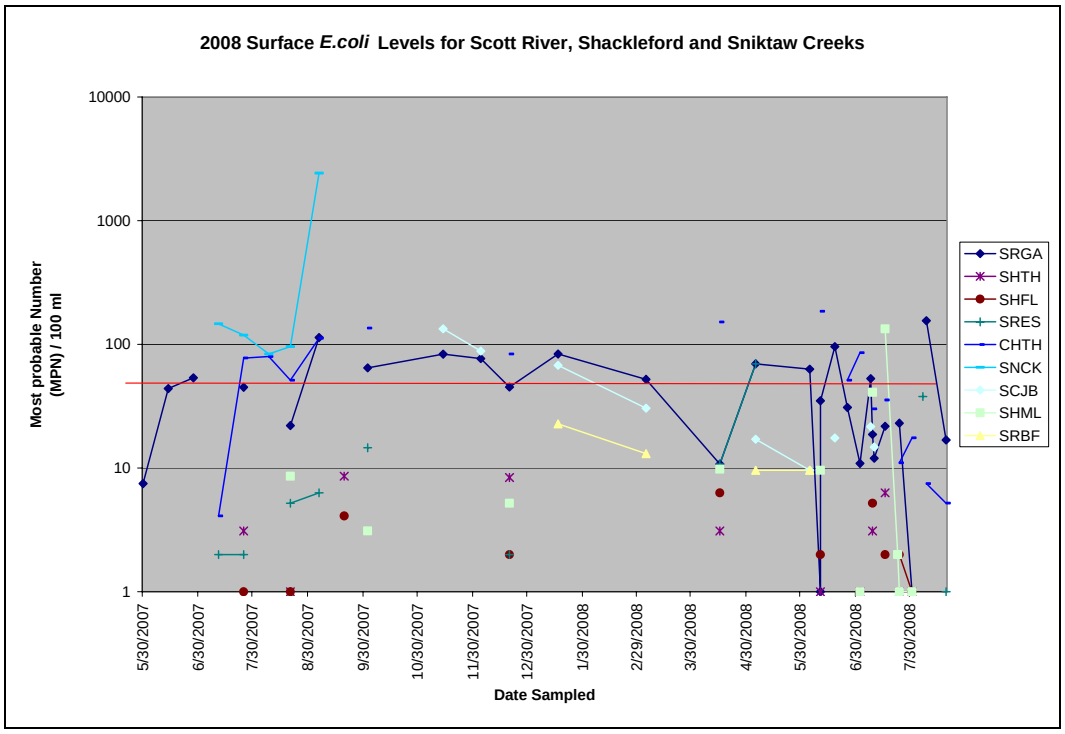

Figure 3 *E.coli* results for all sites sampled on Scott River (SRGA, SRJB, SRBF), Shackleford (SHTH, SHFL, SRES, CHTH), Mill (SHML) and Sniktaw Creeks (SNCK) in 2008. The red line is the NCRWQCB (2007) *Basin Plan* objective of a median value of 50 MPN with at least 5 equally spaced sampling events within 30 days.
*note this graph is a logarithmic scale

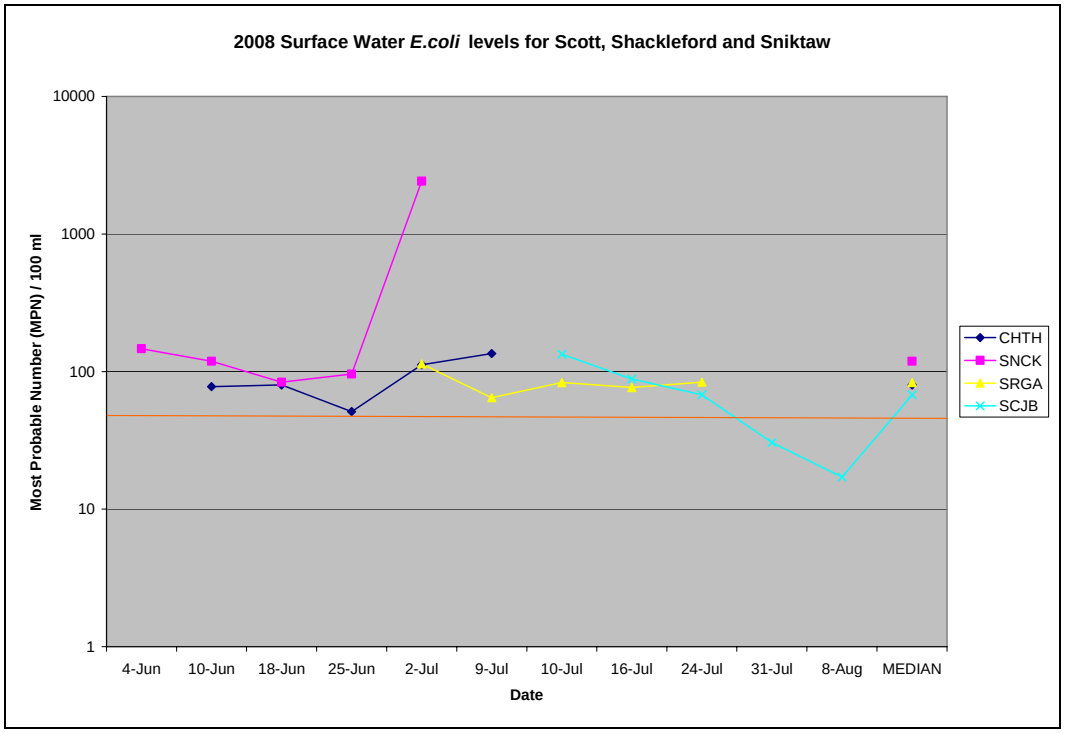

Figure 4 *E.coli* results targeted for comparison to state objective. Selected sites included Scott River (SRGA, SRJB), Shackleford (CHTH) and Sniktaw Creeks (SNCK) in 2008. The red line is

the NCRWQCB (2007) *Basin Plan* objective of a median value of 50 MPN with at least 5 equally spaced sampling events within 30 days.
*note - graph is a logarithmic scale
*note - calculated median values per site are graphed on the far right (see x-axis)

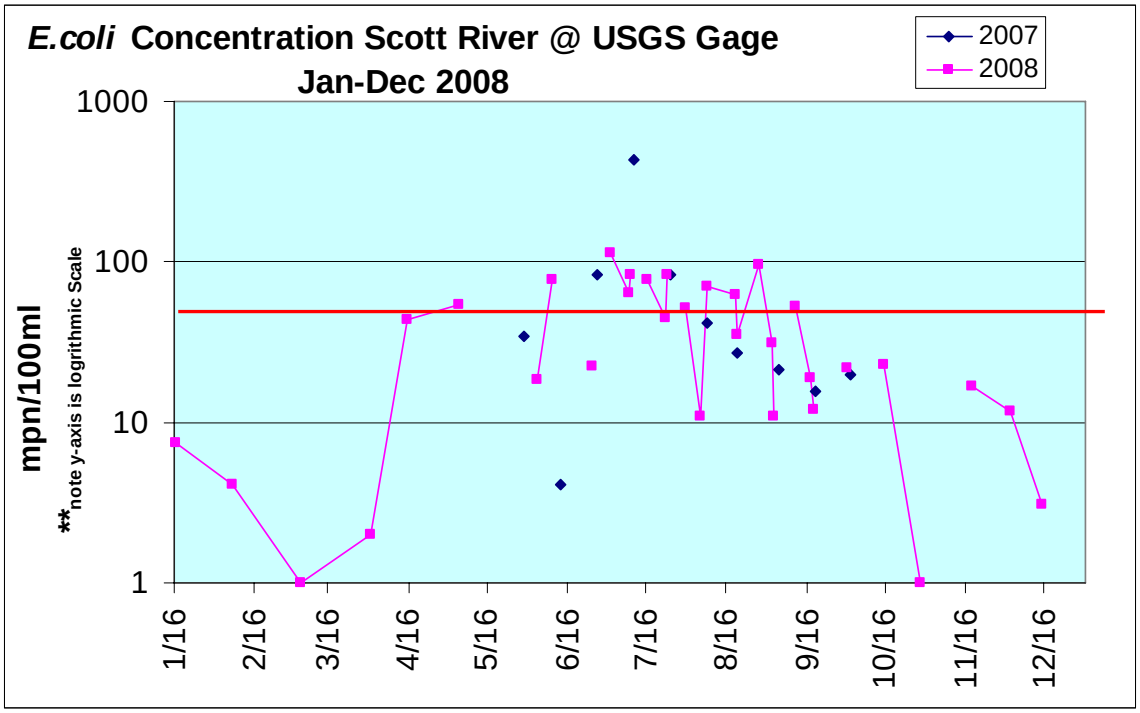

Figure 5 Annual Comparisons of E.coli concentration @ Scott River Gaging Station
*note logarithmic scale on y-axis

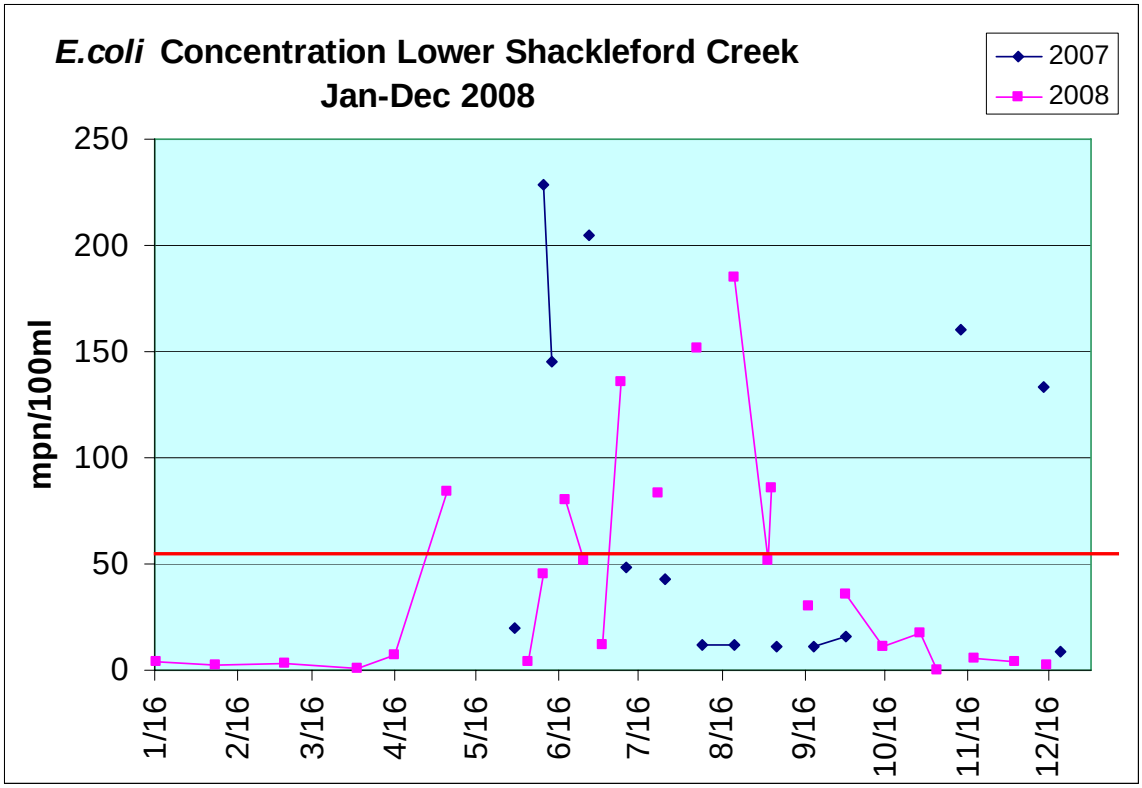

Figure 6 Annual comparison of *E.coli* concentration on Lower Shackleford Creek.

Figure 7 Photo taken at lower Shackleford Creek sampling station (see *E.coli* results in Figure 6), river location of high cultural use to the QVIC.

Data and analysis can be found in the 2007 Quartz Valley Tribal Water Quality and Assessment Report. Staff will submit the 2008 report to the NCRWQCB this spring when complete.

Shasta River

We would like to request that Dwinnell Reservoir (aka Lake Shastina) in the Shasta River Valley be considered for addition to the 303(d) Impaired Waterbodies List for nutrients, dissolved oxygen and pH.

We did not contribute new data for your consideration regarding Dwinnell Reservoirs listing, but we believe that sufficient data to support this action can be found in the North Coast Regional Water Quality Control Board funded *Lake Shastina Limnology* (Vignola and Deas 2005) study. Data therein and narrative clearly indicate that the water body is not meeting Basin Plan standards and is; therefore, subject to listing as impaired for nutrients, dissolved oxygen and toxic algae.

Your Regional Board has designated beneficial uses for Dwinnell Reservoir, the Shasta River and the Klamath River that include Native American cultural use, water contact recreation, non-contact water recreation, commercial and sportfishing, subsistence fishing, cold freshwater habitat and habitat for rare, threatened, or endangered species.

An objective analysis of existing evidence strongly supports the conclusion that Dwinnell Reservoir is an impediment to achievement of most of these objectives. Action on Dwinnell Reservoir is needed to prevent loss of Pacific salmon species, such as coho salmon, given the now recognized effects of global warming and predicted patterns of climate and ocean productivity (see Cumulative Effects to the Klamath River).

Pacific Salmon populations in the Shasta River have been dramatically reduced by the construction of Dwinnell Reservoir (Figure 8) and problems are compounded by illegal groundwater withdrawal (see Cumulative Effects to the Klamath River). Dwinnell Dam has blocked Shasta River fish passage 40 miles upstream of the Klamath River since 1928 blocking dozens of miles of salmon and steelhead prime spawning and rearing habitat (Figure 9). Fall Chinook salmon run trends show more than 80,000 fish in the 1930's, reflecting the carrying capacity of the river before Dwinnell Dams construction.

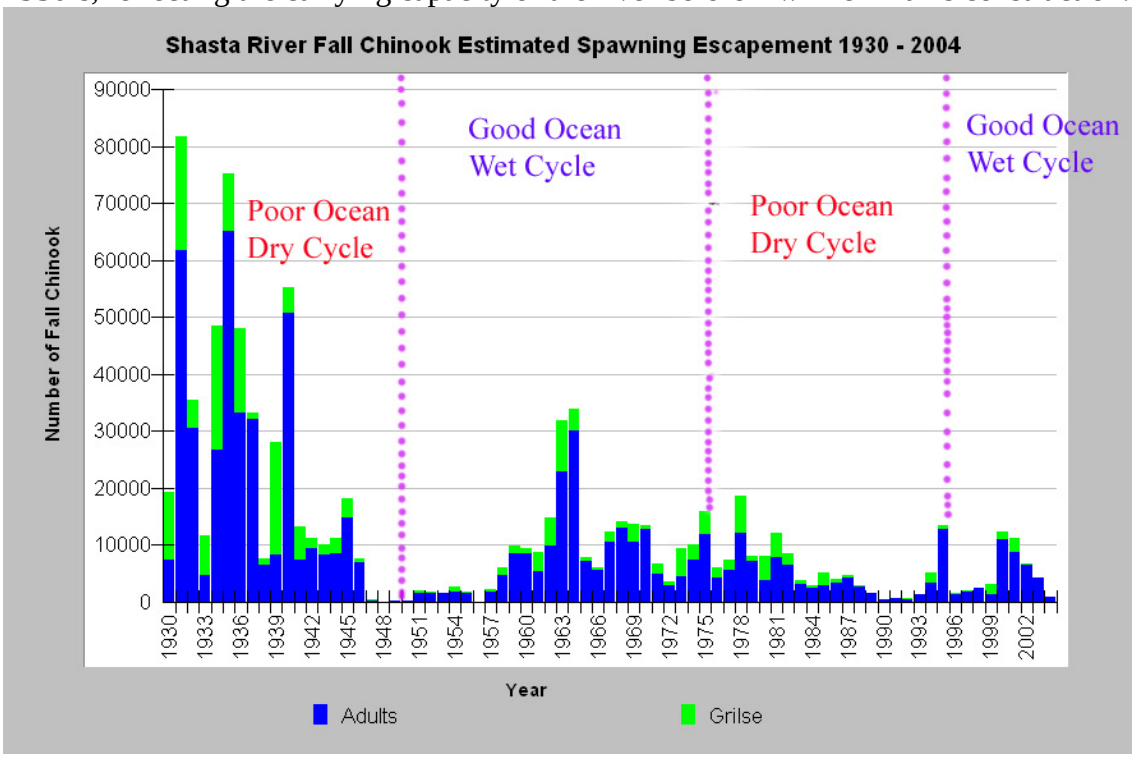

Figure 8. Shasta River fall Chinook salmon runs continue to dwindle, despite effects of ocean and climatic conditions (Hare et al. 1999) as a result of diminishing habitat quality and access. Data from CDFG and cycle periods based on Collison et al. (2003).

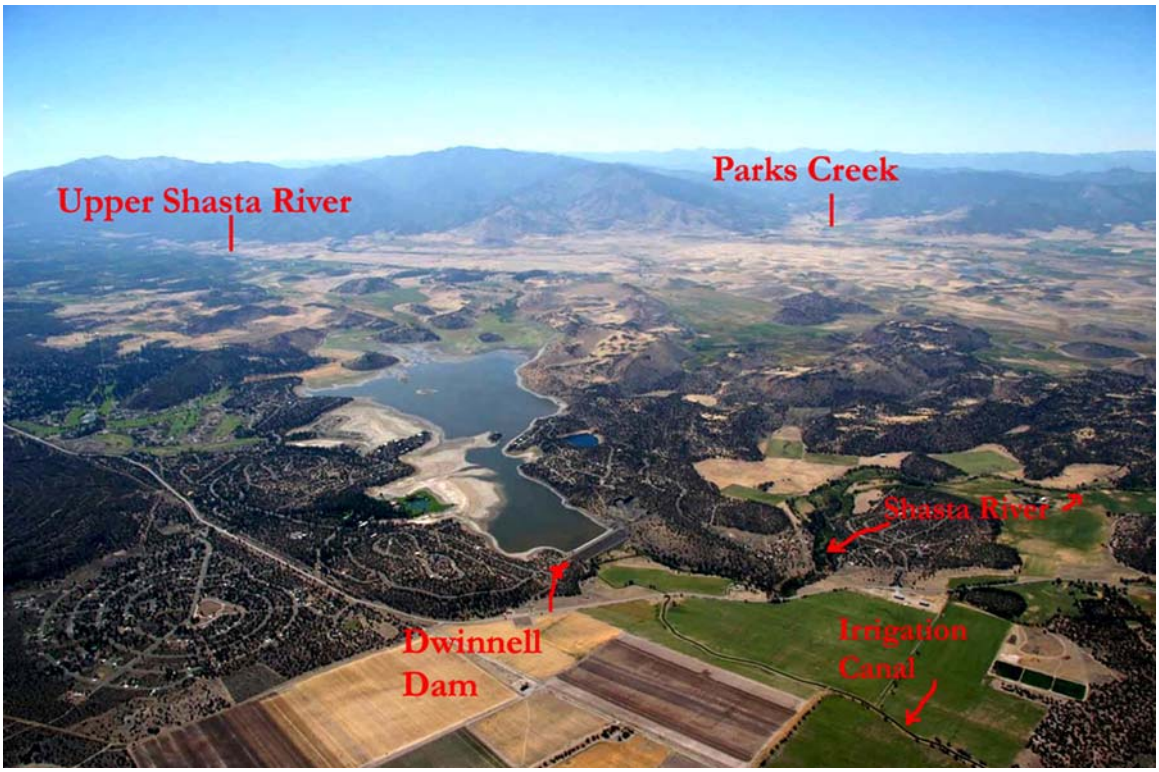

Figure 9. Dwinnell Reservoir is at the center of this photograph with formerly productive salmon and steelhead blocked upper Shasta River and Parks Creek areas labeled. The reservoir has no tail water release, which means it leaves a large segment of the Shasta River below it unsuitable for salmonids. This is clearly an impediment to attaining beneficial uses and results in violation of CDFG Code #5937. To provide more background information, we are attaching QVIR (2008) comments on the proposed CDFG *Shasta River Watershed-wide Incidental Take Permit for Coho Salmon.*

Current and historic practices related to the operation of Dwinnell Reservoir also include diverting all flow of lower Parks Creek, a major tributary of the Shasta River below the dam. This also impedes fish passage in and out of Parks Creek, which has substantial impacts on cold water fish related beneficial uses and adds cumulatively to the water quality problems of the mainstem Shasta River downstream of Dwinnell Reservoir.

Available Water Quality Data Showing Dwinnell Impairment

Temperature: Vignola and Deas (2005) show surface waters temperatures reaching 25^{o} C (77 ^{o} F) (Figure 10), which is lethal to Pacific salmon (Sullivan et al. 2000). The Basin Plan states that "At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature." The Shasta River before dam construction in the reach submerged was optimal salmon habitat and water temperatures would have been below 20^{o} C (68^{o} F). This is a clear violation of *Basin Plan* standards and, since the reservoir has a large surface area and summer air temperatures in summer exceed 100 ^{o} F, this cannot be mitigated. These warm waters would contribute to downstream existing thermal pollution in the Shasta River except that

the waters of Dwinnell Reservoir are so foul that none can be released downstream without high risk of adverse effects on fish.

Nutrient Pollution: There are several lines of evidence provided by Vinola and Deas (2005) that show nutrient pollution in Dwinnell Reservoir. Dissolved oxygen data indicate clear violation of the *Basin Plan* standards (7.0 mg/l) from June (Figure 11) to September (Figure 12). Anoxia persists at depth into October (Vignola and Deas 2005), when fall Chinook salmon are spawning downstream.

Vignola and Deas (2005) identify problems with limnological nuisance algae that thrive in the warm stagnant waters of the Dwinnell Reservoir, including blue-green algae species that fix nitrogen and toxigenic *Anabaena flos-aquae.* Since these algae create their own nitrogen source from the atmosphere, and phosphorous in Dwinnell Reservoir is not limited because of volcanic formations upstream on the slopes of Mount Shasta, there is no way to prevent this nutrient pollution cycle.

The pH in Dwinnell Reservoir exceeds 9.0, which is over the Basin Plan standard: "The pH shall not be depressed below 6.5 nor raised above 8.5." Vignola and Deas (2005) point out that conversion of ammonium ions to dissolved ammonia rises exponentially over 8.5. Dissolved or unionized ammonia is toxic to Pacific salmon at very low levels and Vignola and Deas (2005) indicate that reservoir conditions likely create conditions lethal to all fish.

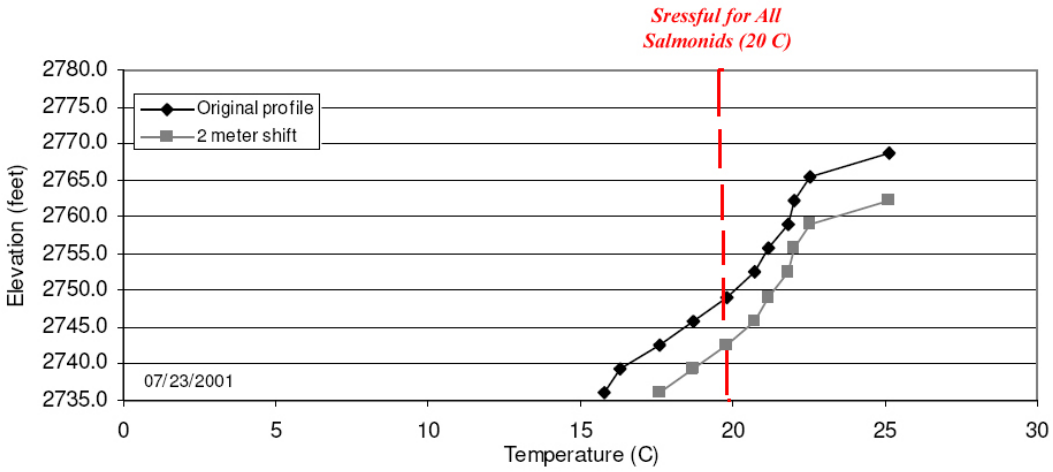

Figure 10. Dwinnell Reservoir surface water temperature (original profile) exceeds 25 C (77 F), which is in violation of Basin Plan standards. Adapted from Vignola and Deas (2005).

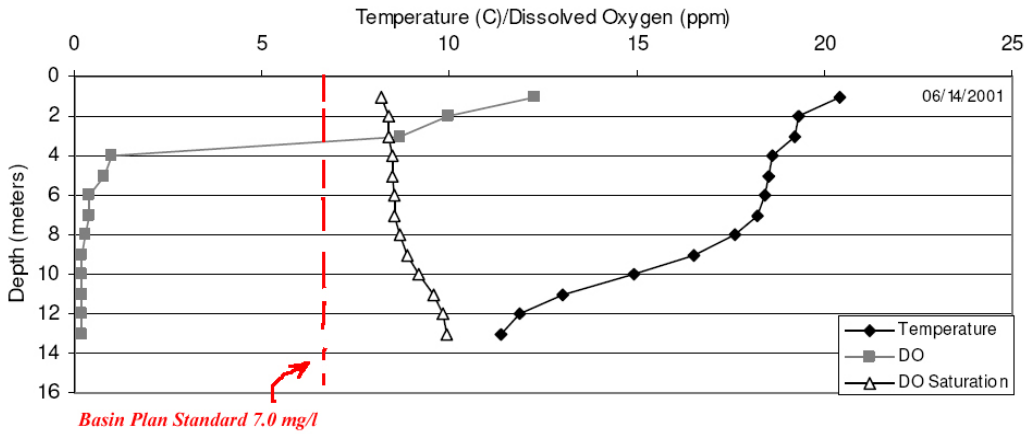

Figure 11. Dissolved oxygen and temperature profiles from Dwinnell Reservoir indicate anoxic conditions developing below 10 feet in violation of Basin Plan standards as early as June in 2001. This figure and Figure 5 are adapted from Vignola and Deas (2005).

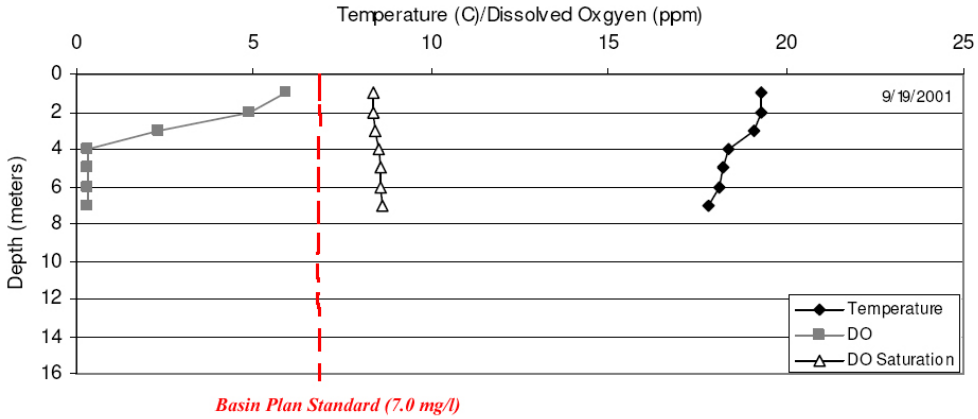

Figure 12. Dissolved oxygen and temperature profiles from Dwinnell Reservoir indicate anoxic conditions occurring nearer the surface in September 2001.

Cumulative Effects to the Klamath River

As the North Coast Board is aware, the Klamath River has shown severe signs of ecological distress bordering on collapse as indicated by the large adult fish kill of September 2002 (CDFG 2003, Guillien et al. 2003a, 2003b). Your staff is working on a water pollution abatement report and implementation plan under the TMDL process, but the health of the Klamath River cannot be restored without also getting water back in the Shasta River and remediating its water quality problems. The Shasta River is suffering from acute nutrient pollution and temperature problems and the contributions to the Klamath River constitute nothing more than an agricultural tailwater (Figure 13). This fuels nutrient pollution in the Klamath River and only increased flows can remediate the problems.

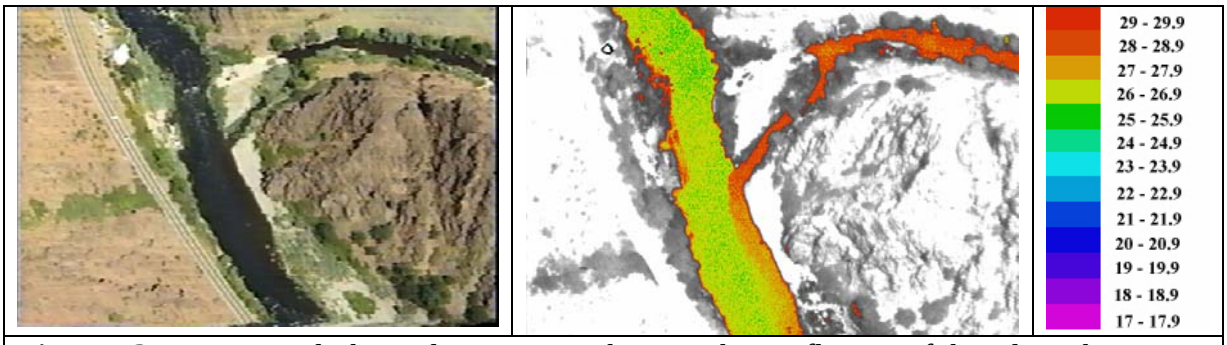

Figure 13. Day TV and Thermal Image Pair showing the confluence of the Klamath River (at left and the Shasta River (flowing right to left in the image). The Shasta River is approximately 29 degrees C and a warm water plume is observed into the Klamath River. (McIntosh an Li 1998)

Klamath River coho salmon are on the verge of extinction and all year classes in the Shasta River are weak (see QVIR 2008). The adult fall Chinook salmon kill indicate that quick and decisive action is needed, particularly in light of global warming, to prevent the collapse of the Klamath River. The National Academy of Sciences (2003) report on endangered Klamath Basin fishes suggests that only Mt. Shasta will have more snow as global warming advances and that removal of Dwinnell Reservoir needs to be considered.

Scientists have also discovered that salmon of the Klamath River and the region shrink and swell with positive and negative ocean productivity and climate cycles (Hare 1998). The North Coast Regional Board funded another study that has bearing in the Independent Science Review Panel report (Collison et. Al. 2003) that noted that regional chances for salmon recovery need to be expeditiously pursued because the Pacific Decadal Oscillation Cycle is likely to swing from its current favorable condition to adverse sometime between 2015 to 2025. This suggests that if Dwinnell Reservoir is still in place, causing disconnection of Pacific salmon habitat and acute water pollution, that some salmon species will be wiped out. My people have witnessed a severe decline in populations of coho, Chinook, steelhead, and lamprey in the Klamath Watershed. To us, water is life. We are concerned about the future of our lives and we call upon the North Coast and State Water Boards to protect and heal the Shasta River Watershed.

Attached, you will find our comments and recommendations to CDFG on their EIR for the Shasta River coho ITP, which supplies more information that confirm our request for listing Dwinnell Reservoir as impaired. Please contact myself at 530-468-5907 for further information or clarification on the issues discussed.

Thank you,

Crystal Bowman
Environmental Director

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