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December 29, 2008

Ms. Traci Tesconi
County of Sonoma
Permit and Resource Management Department
2550 Ventura Avenue
Santa Rosa, CA 95403

Re: Pelton House Winery Application #PLP05-0010 from Jess Jackson and Barbara Banke

Dear Ms. Tesconi,

I have reviewed Application # PLP05-0010 for a development of the Pelton House Winery for the Maacama Watershed Alliance and provide comments below on why the project proposes substantial risk to coho salmon (Oncorhynchus kisutch) and steelhead trout (Oncorhynchus mykiss). My conclusion is that there needs to be a full Environmental Impact Report (EIR) under the California Environmental Quality Act because of the need for study of cumulative effects of surface water and groundwater diversion on coho and steelhead in downstream areas. Existing cumulative effects in the Redwood Creek watershed are widespread and the project may contribute to these effects in ways that cannot be mitigated satisfactorily to meet CEQA requirements. Approval of a new discretionary use permit in a conservation area (Sonoma County 1979) where this project's specific land uses have previously been denied would also be a growth-inducing impact and potentially detrimental to critical habitat. Mitigation measures for the cumulative or growth-inducing impacts of this project have not been addressed in the Mitigated Negative Declaration.

In addition to the proposal itself, I have reviewed the Sonoma County (2008) proposed Mitigated Negative Declaration for the project and the November 10th, 2008 revised document, and I have also read or reviewed numerous other related documents, including those by Brelje and Race (2008), Siegal (2008), Richard Slade and Associates (2008), North Coast Regional Water Quality Control Board (NCRWQCB 2008, 2008 a), National Marine Fisheries Service (NMFS 2008), LSA Associates (2006), Curry and Jackson (2008) and Wiemeyer Ecological Services (2008). The project has two discrete sites and that are geographically separate and Figure 1 is adapted from Curry and Jackson (2008) to make the scale of impacts more clear.

My Qualifications

I have been a consulting fisheries biologist with an office in Arcata, California since 1989 and my specialty is salmon and steelhead restoration. I authored fisheries elements for several large northern California fisheries and watershed restoration plans (Kier Associates 1991, Pacific Watershed Associates 1994, Mendocino Resource Conservation District 1992) and co-authored the northwestern California status review of Pacific salmon species on behalf of the American Fisheries Society (Higgins et al. 1992).

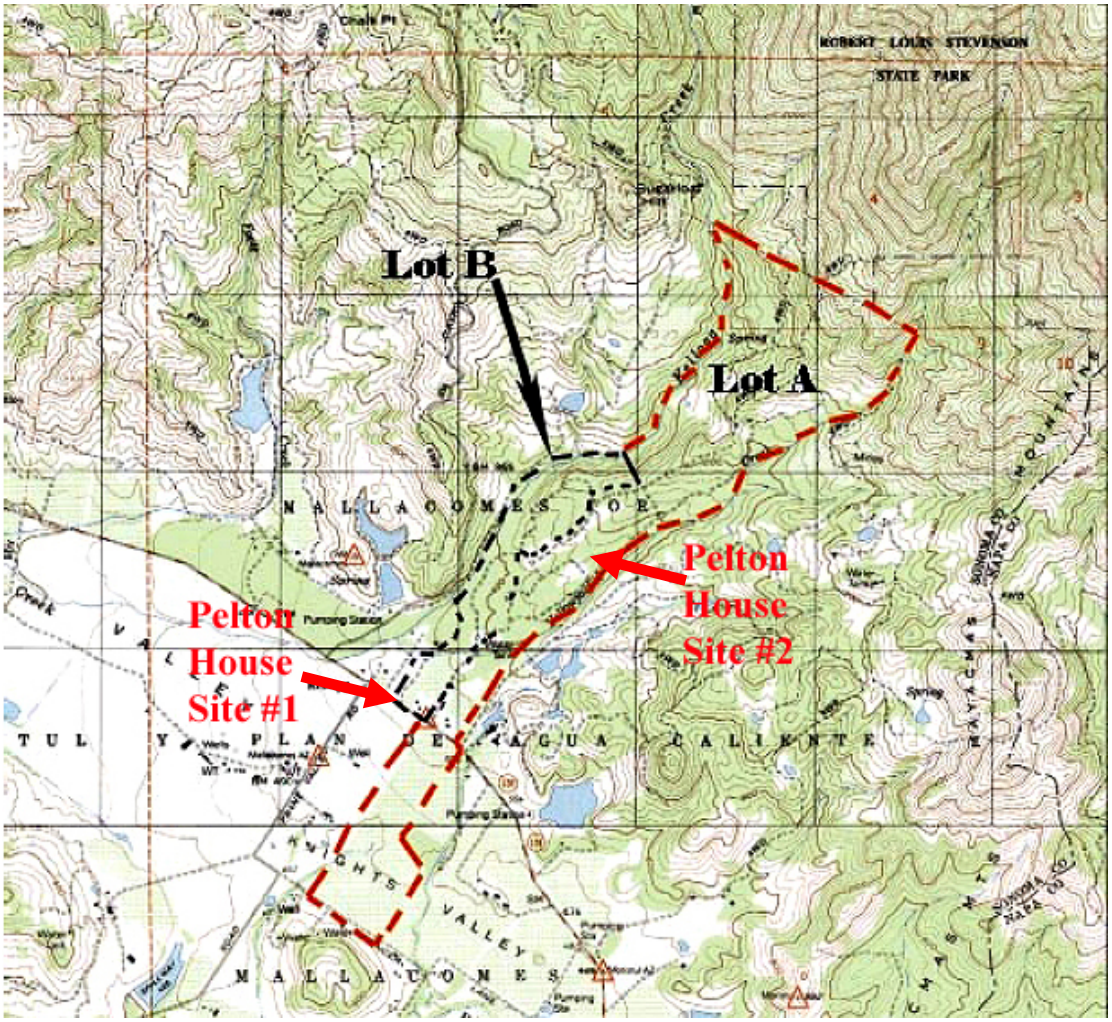

Figure 1. USGS topographic map showing the parcels involved in the Pelton House Winery project and the location of both sites slated for development (arrows).

Since 1994 I have been working on a regional fisheries, water quality and watershed information database system, known as the Klamath Resource Information System or KRIS (www.krisweb.com). This custom program was originally devised to track restoration success in the Klamath and Trinity River basins, but has been applied to another dozen watersheds in northwestern California. The California Department of Forestry (CDF) funded KRIS projects in six northern California watersheds as part of the North Coast Watershed Assessment Planning effort. The Sonoma County Water Agency (SCWA) also funded regional KRIS projects (IFR 2003), including one for the Russian River (KRIS Russian), in order to provide a seamless regional coverage for coho salmon recovery planning. The NCRWQCB served in an oversight capacity on the latter project for quality assurance and quality control. I draw extensively on information in KRIS Russian River and all data are available with metadata on-line at www.krisweb.com.

I have recently addressed the problems of illegal diversion of water in northwestern California, including Sonoma County, on behalf of the Redwood Chapter of the Sierra Club (Higgins 2008) in commenting on the California State Water Resources Control Board (SWRCB) Water Rights Division (WRD) *Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams* (SWRCB WRD 2008). I draw on those comments herein, but also am providing them in their original form as Appendix A.

My comments on Mendocino County's updated Draft General Plan (Higgins 2008a), also for the Redwood Chapter of the Sierra Club, are included as Appendix B and are not only relevant to the Pelton House Winery project but may also be useful in your own plan updating process.

Pelton House Proposal and Negative Declaration Regarding Mitigation of Impacts

Sonoma County's (2008) Draft Mitigated Negative Declaration (MND) for the Pelton House Winery has language regarding CEQA compliance that serves as the focus of these comments, because assumptions are not met and the deficiencies are sufficient to warrant a full EIR on the project.

Migration of Native Fish and Wildlife Species: The MND states that the project may not:

> "Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites."

The response is rhetorical and inadequate: "The project site and surrounding areas are partially developed with existing structures, vineyards, and fencing. The project development does not include any work within a creek or wildlife corridor." In fact further withdrawal of water from Yellowjacket, Kellogg, and Redwood Creeks, which is a likely side effect of this project, is a highly significant impact to migration of coho salmon and steelhead adults and juveniles. The underlying issue being ignored here is contributions of the Pelton House Winery to cumulative effects of surface water and groundwater withdrawal on aquatic resources.

Endangered Fish and Wildlife: The CEQA question captured in the MND regarding endangered species is as follows:

> "Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?"

Coho salmon in the Redwood Creek drainage and in the Russian River as whole are on the verge of extirpation (CDFG 2001, Good et al. 2005) and they are present in some years downstream of the project. Withdrawing water from the alluvial aquifer at the convergence of Kellogg and Yellowjacket Creeks will very likely affect flows downstream in Redwood Creek. The tactic in the Initial Study was nothing more than denial, claiming that mitigations will lessen impact to less than significant, but the project proponents actually fail to deal with the subject of endangered coho very near the project site (NMFS 2008, CDFG 2001). The project and MND should at least consider these impacts on the scale of the Maacama Creek watershed where both coho and steelhead face local extirpations due to extensive dry stream reaches and major problems with habitat quality (CDFG 2005). See discussion of Status of Pacific Salmon species.

Cumulative Effects: CEQA requires full recognition of interaction between land uses past, present and foreseeable:

> "Does the project have impacts that are individually limited, but cumulatively considerable ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?"

Once again, there is no analysis in the MND: “No cumulative or long-term impacts have been identified that were not fully mitigated.” Numerous other projects with substantially greater impact that are already permitted or built are acknowledged but with the false assumption that all their impacts have been fully mitigated as well. Figure 2 shows the location of the proposed project with annotations illustrating the existing high level of cumulative watershed effects, to which the project will add. As a discretionary project, this application is subject to a higher level of review, requiring full disclosure of potential impacts and mitigation.

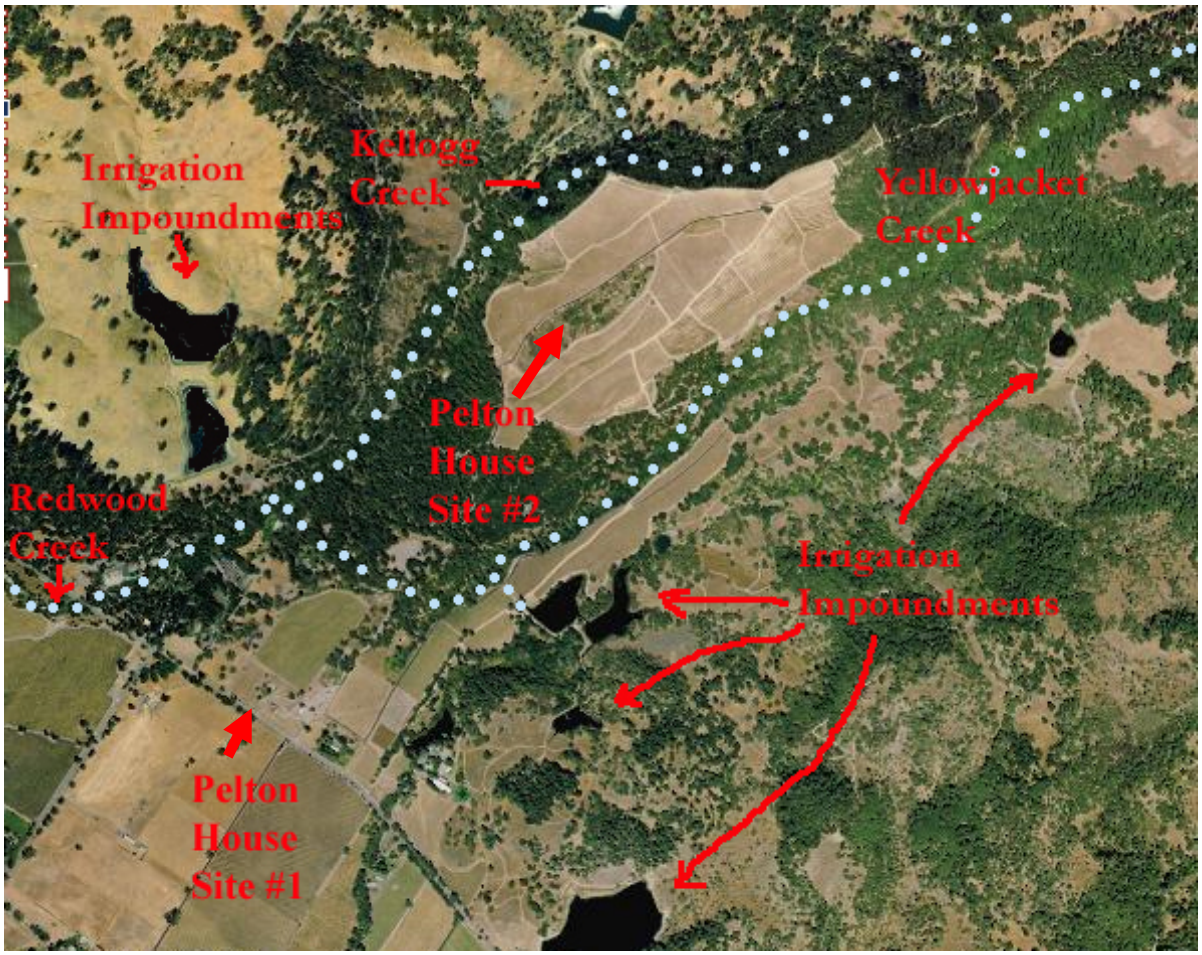

Figure 12. A number of impoundments adjacent to the proposed development sites are causing cumulative effects to downstream reaches of Redwood Creek (Band 2008), and water use associated with the Pelton House Winery will add to flow depletion endangering coho and steelhead. Blue dots approximate stream courses from USGS 1:24000 topographic maps.

Cumulative impacts from the project will be discussed at length below, but in summary they include groundwater withdrawal likely connected to surface water downstream and increased roads and total impervious caused by the project. The water use discussion also needs to acknowledge the extent of lawless use of water in the vicinity of the project (Stetson Engineers 2007, Ball 2005) and implications for cumulative watershed effects on coho salmon and steelhead.

Groundwater/Surface Water Connections in the Project Area and Downstream Flows

The project site is at the southern edge of the Kellogg Creek sub basin in the Maacama Creek watershed and Yellowjacket Creek is within the project site and Bidwell Creek is adjacent to the west. Waters on the project site (surface and subsurface) flow with the topography into Redwood Creek, thence Maacama Creek and the Russian River.

Curry and Jackson (2008) and Siegel (2008) point out that the aquifer under the proposed development site of the Pelton House Winery is in an alluvial valley likely connected upstream and downstream to surface water. Their criticism that pump tests were not conducted between July 15 and October 15, when other users would also be drawing on the aquifer, is valid and the response by Richard C. Slade & Associates (2008) is evasive. He claims a Sonoma County groundwater classification system as a basis for arguing that his client does not have to conduct the test during this period. In fact the MND is explicit that the applicant must show they do not "deplete groundwater supplies or interfere substantially with groundwater recharge," including prevention of decreasing supply for existing projects or users already permitted. This relationship cannot be discerned without data collection between July 15 and October 15. Sonoma County should require a full EIR for the Pelton House Winery project and make it consider the interaction of surface and groundwater interactions at least on the scale of the Kellogg Creek sub basin.

Sonoma County has direct evidence from neighbors (Ball 2005) that Yellowjacket Creek has been drying up as a result of illegal water extraction on or near the project site. Results of a recent consultants report (Stetson Engineers 2007) also show rampant illegal water diversion, including a number of unpermitted impoundments in the vicinity of the project. In fact there is an acute shortage of surface water supply in Yellowjacket Creek and in Redwood Creek downstream (see Habitat Condition). If surface and groundwater are connected, as hypothesized by Curry and Jackson (2008) and Siegel (2008), then additional water withdrawals at this time should not be allowed until such time as the SWRCB WRD can show there is a surplus of water as required by State Water Code.

Widespread Lawless Use of Water Needs Examination in Full EIS

The study by Stetson Engineers (2007), which was part of the SWRCB WRD (2007) *Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams*, determined that there were 1357 permitted impoundments in the Policy's area of interest and another 1771 unpermitted ones (Figure 3). Hundreds of illegal diversions are located in Sonoma County, but furthermore, many of these diversions are adjacent to the project site (Figure 4). The data for these legal and illegal diversions must be in the public domain and it is recommended that Sonoma County obtain a copy of electronic data for consideration of this MND and for other land use decisions reliant on additional water use. Figure 4 is derived from a map image in Adobe Acrobat Portable Document File (pdf) format provided by Stetson Engineers (2007) and Figure 5 is a zoom in closer to the project area of the same map. Although the stream resolution of the close up is poor, a major problem with illegal impoundments immediately adjacent to the proposed project is clearly established. A cluster of illegal diversions appears to be within the Redwood Creek watershed, although it is possible that some are in adjacent Maacama tributary watershed of Franz Creek. Figure 6 shows one such impoundment off Franz Valley Road near Highway 128 and not far from the proposed project location. The permit status of the impoundment shown is unknown, but Sonoma County has evidence that implicates the permit applicant as being one of the "unpermitted" operators who surreptitiously deepened irrigation ponds (Ball 2005). There are clearly existing flow related cumulative effects issues that are being ignored by Sonoma County that do not comport with the requirements of CEQA. Your negligence in this regard extends to CEQA's requirements that coho salmon be protected from harm by this project.

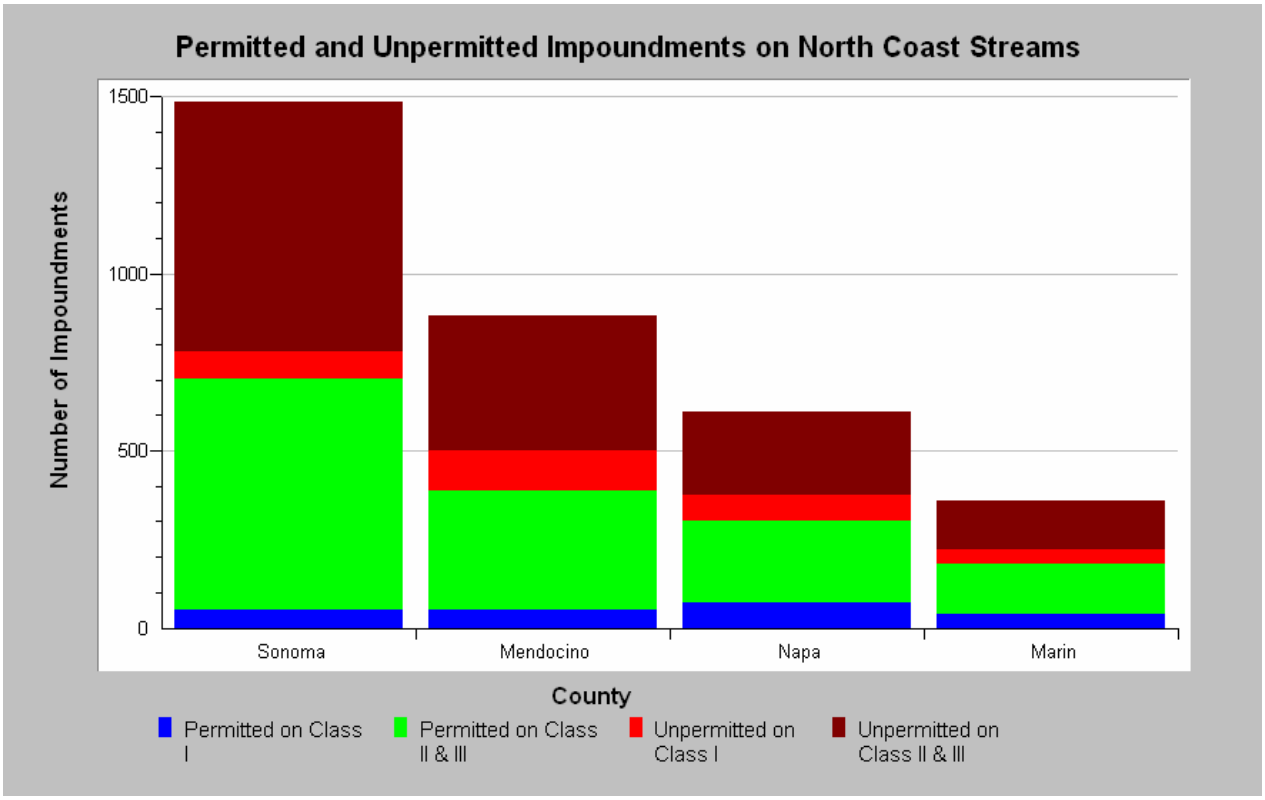

Figure 3. The number of permitted and unpermitted impoundments within the geographic area covered by the SWRCB WRD (2007) study is displayed above with illegal diversion impoundments outnumbering legal ones. Data from Stetson Engineers (2007a).

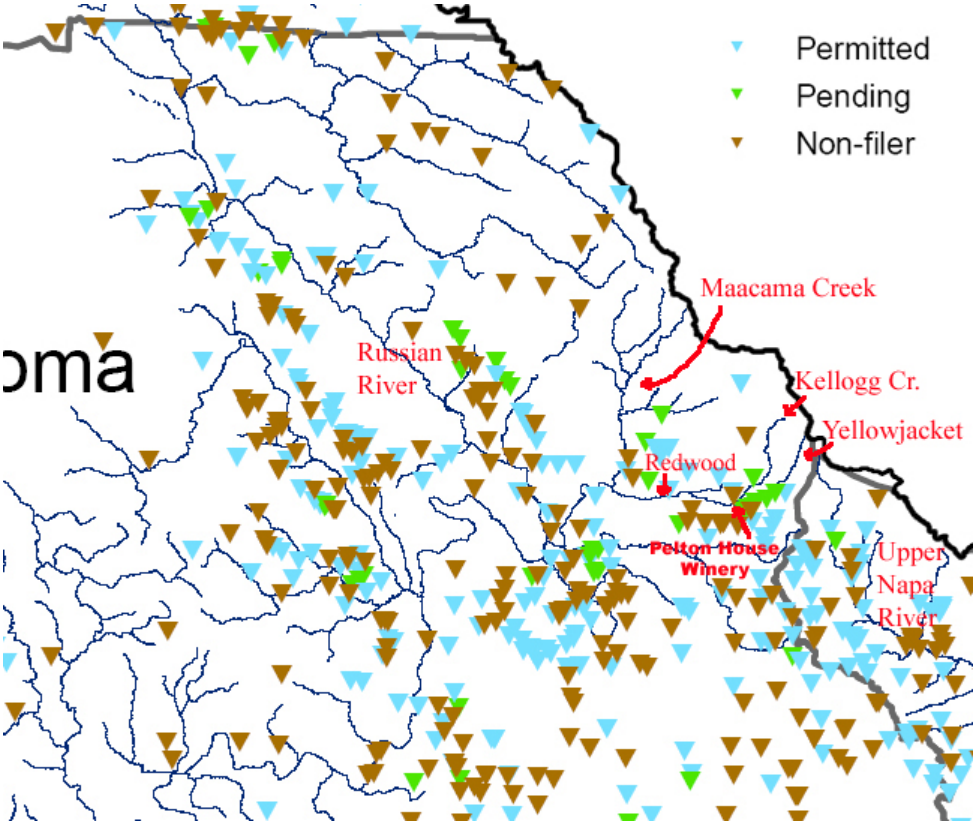

Figure 4. Map shows impoundments by categories of permitted, unpermitted and pending and is modified from Stetson Engineers (2007). Note the large number of unpermitted diversions near proposed site.

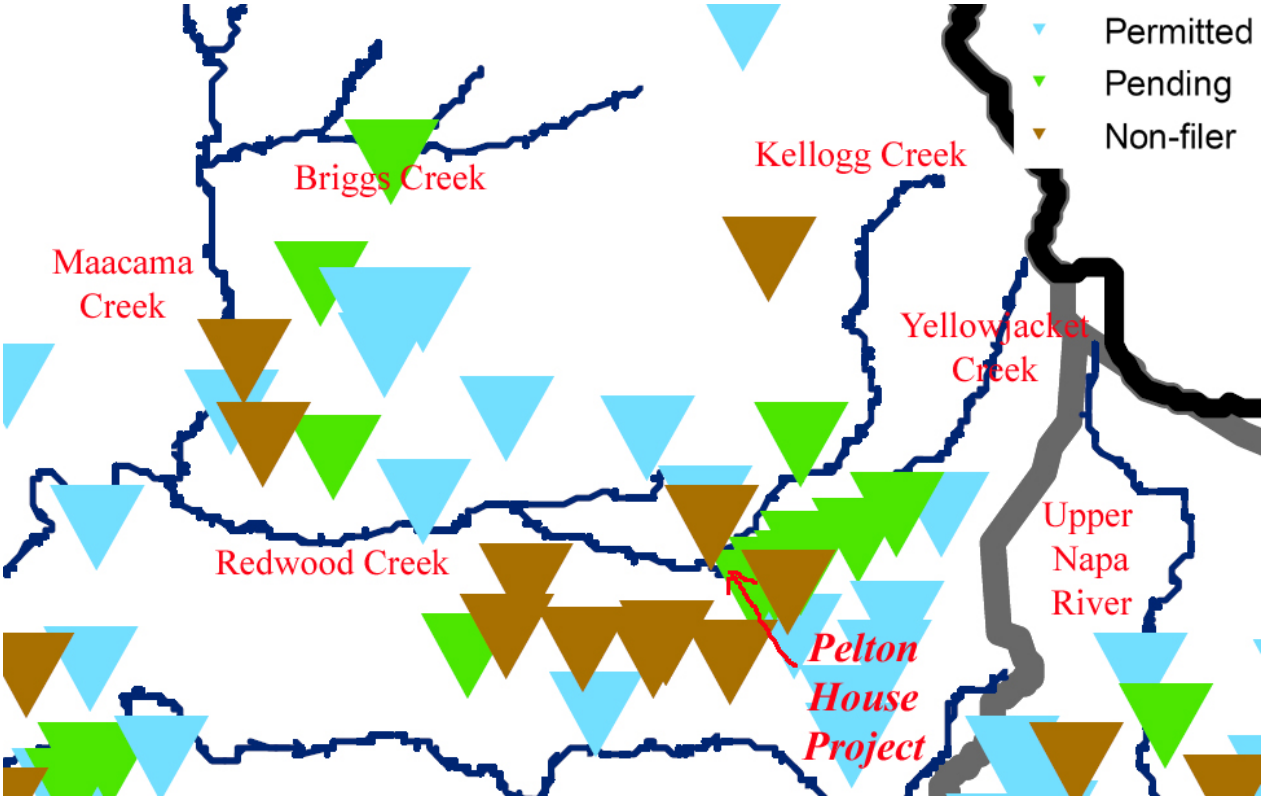

Figure 5. This close up map of legal and illegal impoundments shows clearly that there are a number of illegal ones on or near the project site, although the stream networks are not fully shown due to the scale of the original map by Stetson Engineers (2007).

Figure 6. Looking north off Franz Creek Road not far from Route 128. One of many permitted and unpermitted impoundments in the Redwood Creek drainage that affect stream flow and serve as sources of bull frogs and warmwater non-native fishes that can have undesirable effects on native species. Photo from KRIS Russian by Pat Higgins. 7/13/03.

As part of an EIR for this project's cumulative effects, impoundments and diversions in Redwood Creek and Maacama Creek below it need to be considered. When all reservoirs are filled simultaneously with the first rains of fall or winter, Chinook and coho salmon spawning migrations may be impeded (Band 2008). In a drought year, adult steelhead may be similarly stranded or unable to migrate to spawning grounds due to reservoir induced drops in flow. When reservoirs are filled in summer using stream flows or connected groundwater, nearby streams may dry up. Sonoma County has evidence that the permit applicant was apparently drying up Yellowjacket Creek in July 2005 (Ball 2005) in violation of CDFG Code 5937, and this incident is not likely isolated. Other impoundment related impacts that Sonoma County should be considering are effects of legal and illegal impoundments on water temperatures, the potential they have for introduction of bull frogs that decimate native frog populations, and their contribution to release of non-native warmwater fish that predate upon salmonids or displace them through competition (Higgins et al., 1992).

Status of Pacific Salmon Species in the Russian River and Potential Project Impacts

The MND has no in-depth discussion of the status of Pacific salmon species native to the Russian River and, particularly coho salmon and steelhead trout in the sub basins where impacts will occur. In fact, the Pelton House winery project will likely further deplete flows in reaches of Redwood Creek that have been known to recently support coho salmon and steelhead trout, which are both recognized as at risk of extinction in the Russian River basin. Flow depletion at the project site and in the Redwood Creek watershed also has ripple impacts on Chinook salmon that utilize Maacama Creek downstream.

Status of Russian River Pacific Salmon Populations: There are no baseline data for Russian River salmon and steelhead populations before the early 1960's when CDFG (Taylor, 1978) estimated that annual adult returns were 50,000 steelhead, 5,000 coho salmon and 500 Chinook salmon (Oncorhynchus tshawyscha). Pink salmon (Oncorhynchus gorbuscha) were also once native to the lower Russian River (Moyle et al. 1989), but no spawning has been documented since 1955 (Fry 1967). While pink salmon are not further discussed or likely restorable, they are worthy of note because they represent a species lost due to a much earlier wave of development and land use impacts. Substantial changes in land use will be necessary to prevent further extinctions, including enforcement of California Water Codes and CDFG Code 5937.

According to the National Marine Fisheries Service (1996, 1999, Good et al. 2005), Russian River coho salmon and steelhead fall into the Central Coast Evolutionarily Significant Unit (ESU), while Chinook salmon group with the California Coast ESU that extends south of the Klamath River. NMFS (1996) listed the Central California Coast coho salmon as threatened under the Endangered Species Act (ESA) and more recently upgraded their risk level to endangered (Good et al., 2005). Brown et al. (1994) noted that populations of coho salmon in California were at less than 5% of historic levels and that there were only seven streams with adult returns numbering in the hundreds.

CDFG (2002) acknowledge the need to list Central Coast ESU coho under the California ESA and surveys conducted annually from 2000-2002 indicated widespread regional extirpations (Figure 7). "Extant populations in this region appear to be small. Small population size along with large-scale fragmentation and collapse of range observed in data for this area indicate that metapopulation structure may be severely compromised and remaining populations may face greatly increased threats of extinction because of it."

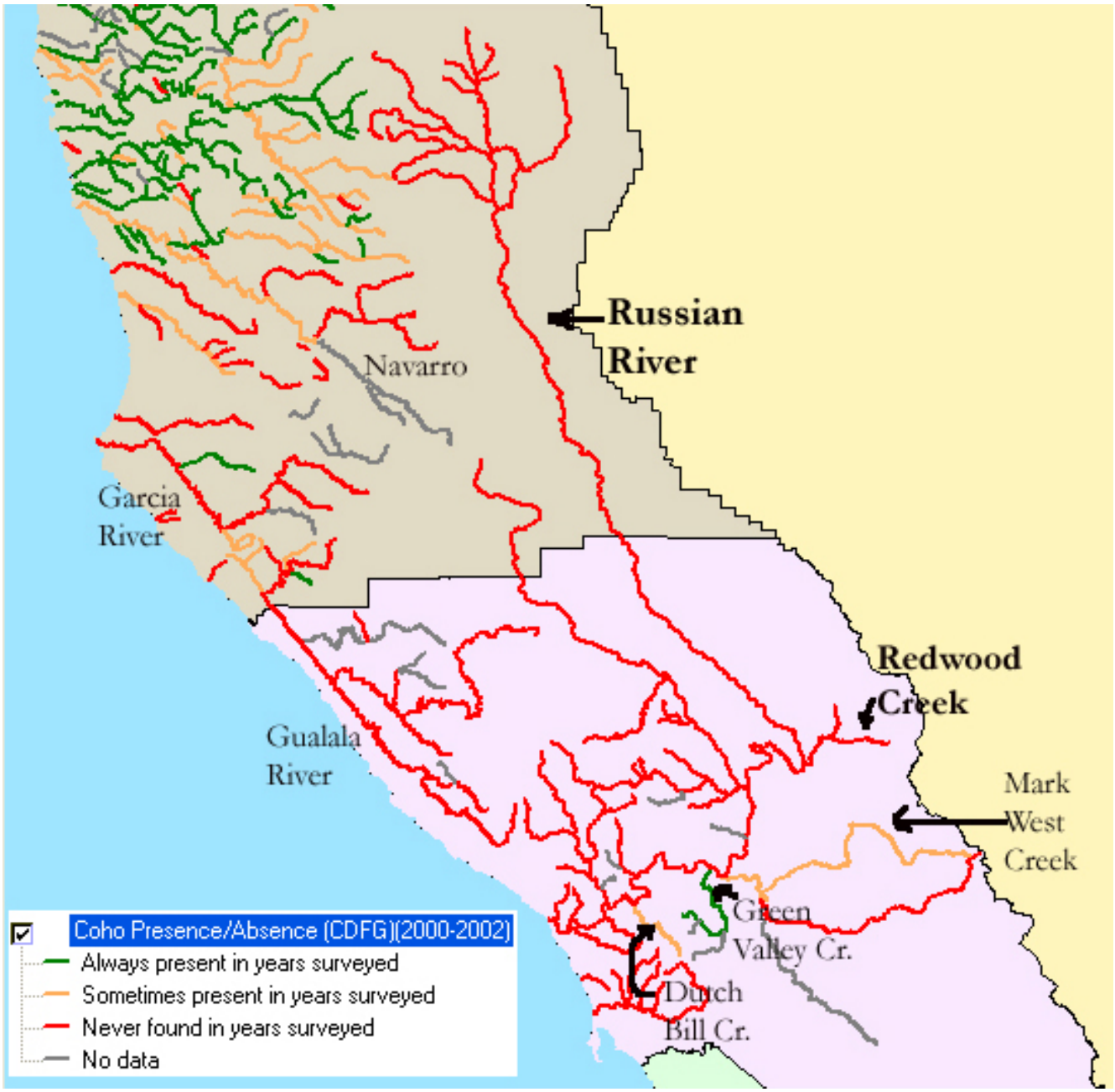

Figure 7. This map shows the CDFG coho salmon presence/absence survey results for the Russian River collected in years 2000-2002. Red = no coho found in all three years, orange = absent in at least one year and green = present all years. Only Green Valley Creek had coho all three years in the entire Russian River basin.

CDFG (2002) concluded that "coho salmon in the Central Coast Coho ESU are in serious danger of extinction throughout all or a significant portion of their range" and characterized the Russian River population as "extirpated or nearly so." Figure 8 is a summary chart of CDFG presence/absence coho salmon survey data from 2000-2002 showing a very high rate of coho extirpation in Sonoma County Coastal watersheds and the Russian River.

The recent NMFS (2008) Biological Opinion for large scale water users in the Russian River includes information on the viability of Russian River coho, including loss of genetic diversity that threatens their future existence:

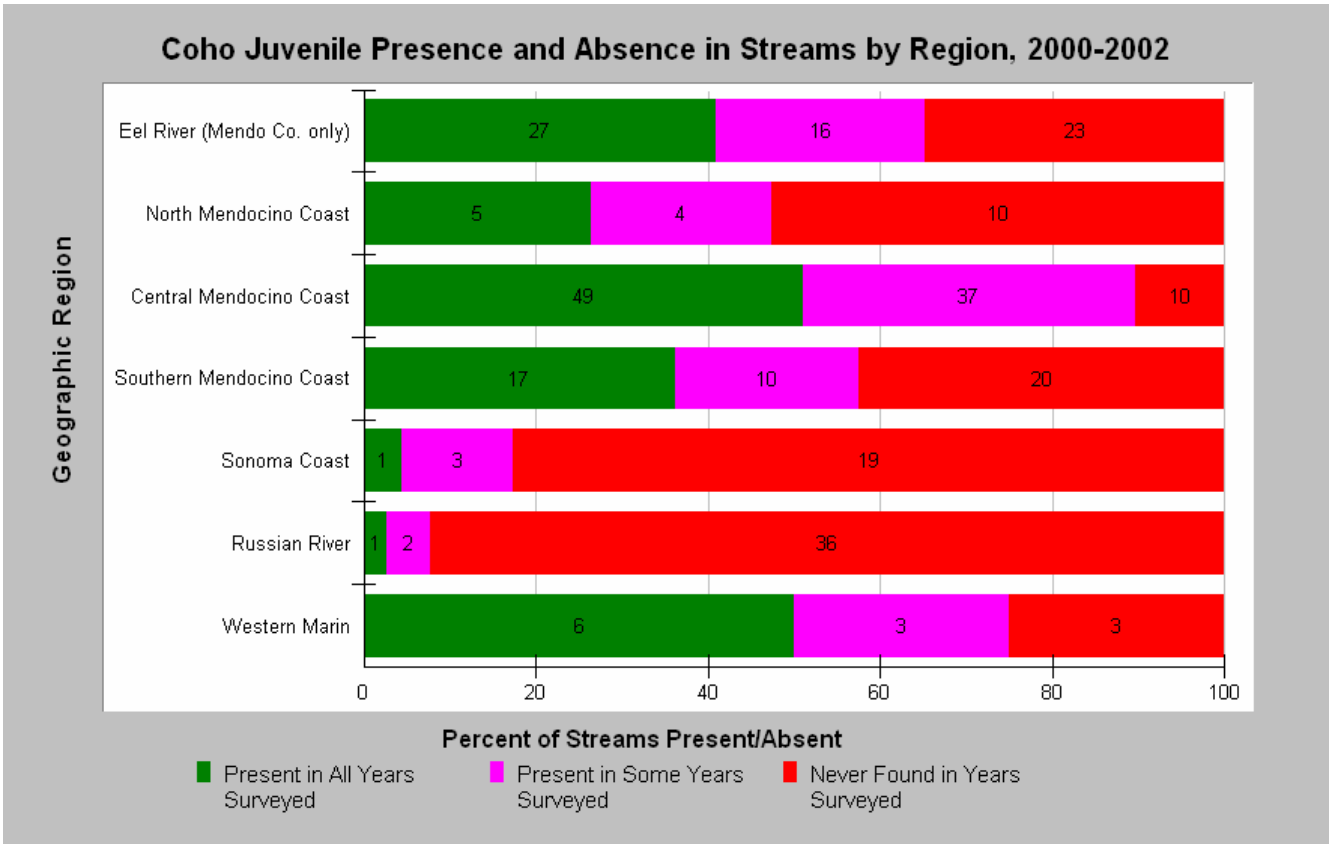

Figure 8. This chart shows a summary of the presence/absence of coho salmon juveniles in streams examined by CDFG in the years 2000-2002. The numbers shown on the chart bars indicate the number of streams in each region in which surveys always, never, or sometimes found coho. Note high absence rate for the Sonoma County Coast and Russian River basin.

> "Genetic analyses of coho salmon sampled from Russian River tributaries are consistent with what would be expected for a population with such extremely reduced abundance……This evidence suggests an acute loss of genetic diversity for the Russian River coho salmon population."
>
> "Based on its decline in abundance, restricted and fragmented distribution, and lack of genetic diversity, the Russian River population of coho salmon is likely in an *extinction vortex*, where the population has been reduced to a point where demographic instability and inbreeding lead to further declines in numbers, which in turn, feedback into further declines towards extinction."

Because of the scarcity of coho salmon in the Russian River basin, it would be highly undesirable to make Redwood Creek less able to support them at this critical juncture. See below for more discussion of salmonids in Maacama and Redwood Creeks based on KRIS Russian River data and other sources.

Steelhead in the Central California Coast ESU, including in the Russian River, were listed by NMFS (1997) as threatened and their status was reaffirmed in 2005 (Good et al., 2005). Similarly, the California Coastal Chinook salmon ESU were recognized as threatened in 1999 (NMFS, 1999) and their status confirmed in 2006 (NMFS, 2006).

<u>At Risk Salmonids Potentially Impacted by Pelton House Winery Project</u>: For the purpose of cumulative effects discussions related to Pacific salmon species, it is useful to focus on the scale of at least the Maacama Creek watershed, to which Redwood, Kellogg and Yellowjacket Creeks are tributary. Locally, coho would have utilized all habitats under 2% in gradient (Figure 9) and had easy access through gradients of at least 4%; therefore, coho were present historically in the project area.

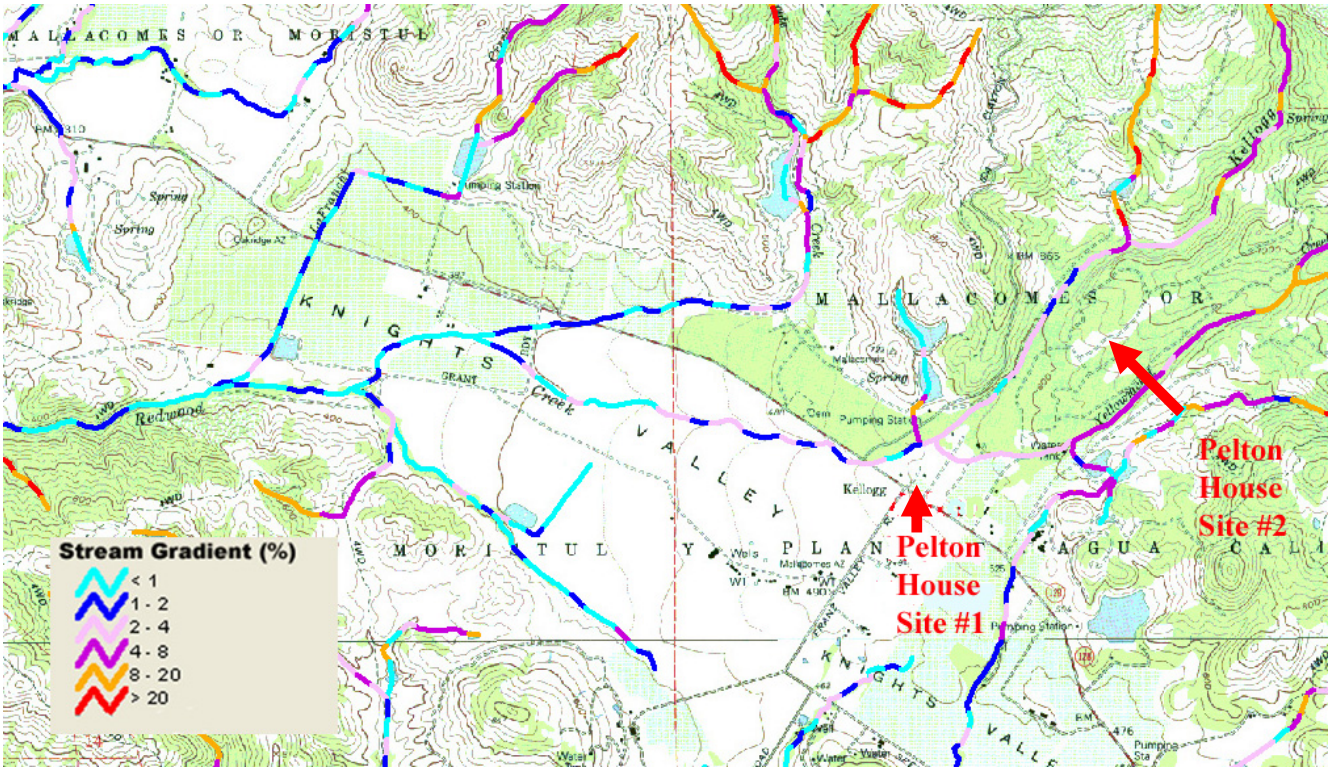

Figure 9. Stream gradient in Redwood Creek is 1-2% gradient, which would have made it ideal for coho salmon historically along with lower reaches of LaFranchi and Foote Creeks. Gradient constructed from 10 meter DEM. KRIS Russian River.

Headwaters of Kellogg and Yellowjacket Creeks rise too steeply for coho (4-20%), but they would have supplied spawning gravels, large wood and cold water that helped maintain coho in the mainstem of Redwood Creek just downstream. The alluvium that built up below Kellogg and Yellowjacket Creeks for millennia likely serves as a cold water storage bank that provided cold base flows during historic seasonal cycles. The Pelton House winery is tapping into this alluvial aquifer and diminishing whatever flow might remain to keep Redwood Creek functioning.

In Redwood Creek, CDFG (2001) collected biological data associated with a stream habitat inventory (CDFG 2004) and results of their electrofishing sample are displayed in Figure 10. While the sample collected reflects a diverse fish community, it is one dominated by warmwater adapted species such as the Sacramento sucker, stickleback and the California roach. A downstream migrant trap was operated in Redwood Creek and Maacama Creek in 1965 (CDFG 1965), likely to discern the effects of the 1964 Flood that devastated streams in the region. Although the trap on the mainstem of Maacama Creek and a tributary had large numbers of warmwater species, both native and introduced, the trap in Redwood Creek produced almost exclusively steelhead (146 of 148 fish captured). Thus, the ecological conditions in Redwood Creek have shifted away from favorable for cold water fish species due to changes in flow and channel conditions related to agricultural, particularly vineyard development (see Habitat Conditions). It should also be noted that coho salmon may have been absent from the 1965 Redwood Creek sample due to 1964 flood effects and the sample does not indicate that they were historically absent.

Maacama Creek is a substantially larger than Redwood Creek (4th & 5th Order) and its lower reaches would harbor native warm water adapted fish species from the adjacent mainstem Russian River during summer and early fall, such as Sacramento suckers, California roach and northern pikeminnow (then known as squawfish). In winter and spring Maacama Creek was dominated by salmonids as documented by CDFG memos (1954) that note spawning Chinook salmon in January of 1954, and the average angler catch on opening day of trout season in 1955 (three steelhead juveniles each) (CDFG

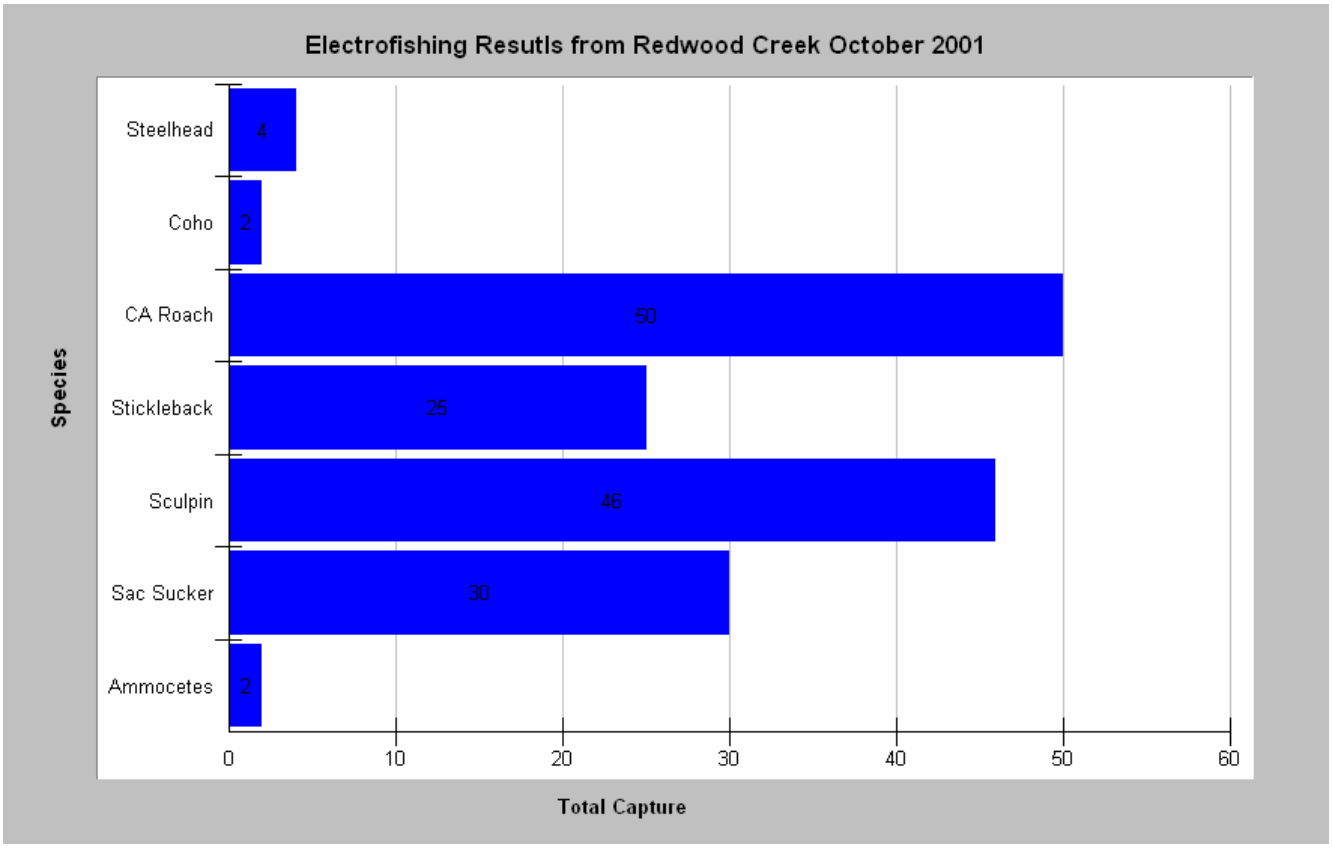

Figure 10. CDFG Redwood Creek electrofishing sample shows a fish community dominated by warmwater species but also containing two rare coho salmon juveniles and four steelhead trout juveniles.

1955). Angler catch was down from an average of nine “trout” each in 1953 (CDFG 1954) before the 1955 Flood. CDFG (1955) memos acknowledge “changing conditions” after the flood away from steelhead trout production, however, CDFG downstream migrant traps on Maacama Creek in 1965 caught four coho salmon along with hundreds of steelhead.

CDFG sampled an index site in Maacama Creek (IFR 2003) from 1993-2001 and data are useful in understanding standing crops of steelhead juveniles in summer and fall to determine survival during low flow periods (Figure 11). Maacama Creek summer carrying capacity for steelhead is much greater in wet years, such as 1995, 1996, 1998 and 1999, but survival is variable and appears to be declining. Standing crops of fall fish show a major reduction in many years, suggesting that low flow conditions are limiting, and these low flow conditions are likely linked to agricultural water use. Scientists (Hare et al. 1999, Collison et al. 2003) now recognize wet and dry climatic cycles that are linked to changes in ocean productivity and fish population dynamics and wet conditions in most years since 1995 are owing to a positive shift in the Pacific decadal oscillation cycle (PDO) (Hare et al. 1999).

Aquatic Habitat Conditions

Habitat data for Redwood and Maacama Creeks and other tributaries are available as a result of CDFG surveys conducted in accordance with their habitat typing protocols (CDFG 2004). Other lines of evidence presented below include remote sensing data and additional field reconnaissance photos. Pool frequency by length and average maximum depth are useful measures of stream health, particularly, since coho salmon juveniles prefer with a depth greater than three feet (Kier Associates and NMFS 2008). In an undisturbed Pacific Northwest streams, pool frequencies range from 37% to greater than 80% (Murphy et al. 1984 and Grette 1985) and CDFG (2004) rates frequencies greater than 40% as

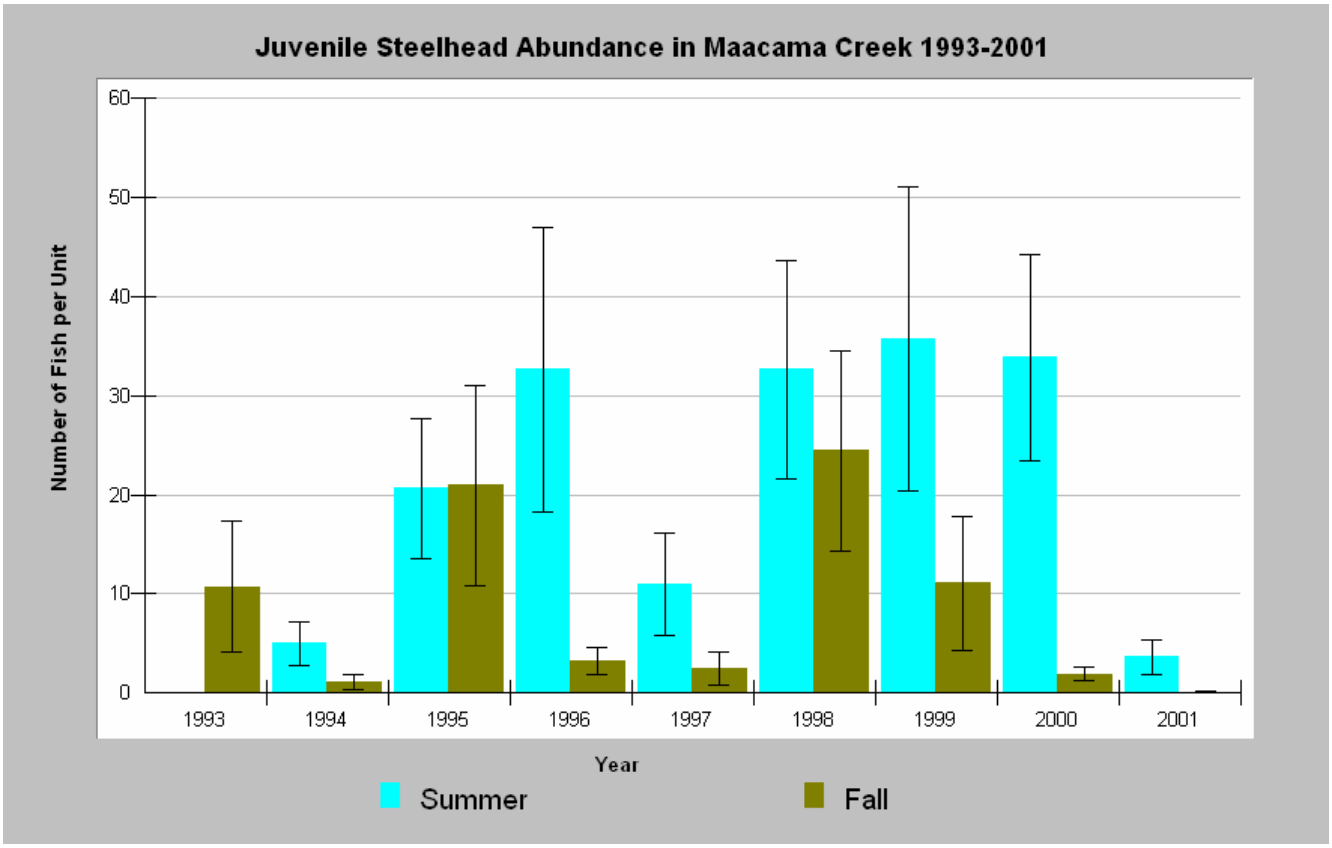

Figure 11. CDFG Maacama Creek electrofishing samples from 1993-2001 show summer and fall steelhead standing crops in a fish community dominated by warmwater species but also containing two rare coho salmon juveniles and four steelhead trout juveniles.

functioning for salmon and steelhead. Figure 12 shows that pool frequencies were under 10% on Redwood and Foote Creeks in some reaches and only about 25% of most Maacama Creek reaches. Pool depths are similarly compromised (Figure 13) with none over three feet deep in Foote Creek and the majority on Redwood Creek as well. Only Maacama Creek rates well on this scale and its pools should likely be 6-10 feet deep at least.

Habitat typing data also shed light on the problem of stream dewatering as indicated by almost 70% of habitats in Redwood Creek being dry (Figure 12) and all other streams showed signs of dewatering related to diversion of surface water and likely contributed to by over-use of groundwater. Riparian conditions on Maacama Creek and its tributaries (Figure 14). Upper reaches of some smaller Maacama Creek tributaries like upper McDonnel and Blue Gum have high conifer and shade components, but Redwood Creek has approximately 40% of its reaches exposed with no shade. Poor riparian conditions contributed to elevated water temperatures in Redwood and Maacama Creeks that will be discussed below. Coho salmon prefer pools formed by large wood (Reeves et al. 1988) and the high conifer components likely represent increased opportunity for large wood recruitment.

Landsat data provides another avenue for analysis of the riparian condition in and around the proposed Pelton House Winery project. The U.S. Forest Service Remote Sensing Lab and the California Department of Forestry analyzed 1999 Landsat images to formulate a California-wide electronic map layer of vegetation (Warbington et al., 1999). Figure 15 shows tree size classes in average diameter at breast height (dbh) for buffer strips that span 90 meters of each side of the stream center line. The alluvial valley reach of Redwood Creek and its tributaries provided 24 miles of habitat of low gradient, highly suitable habitat for coho salmon (CDFG 1954). The riparian zone before disturbance would have not only provided 100% shade, a gallery forest that extended back from the stream and a system

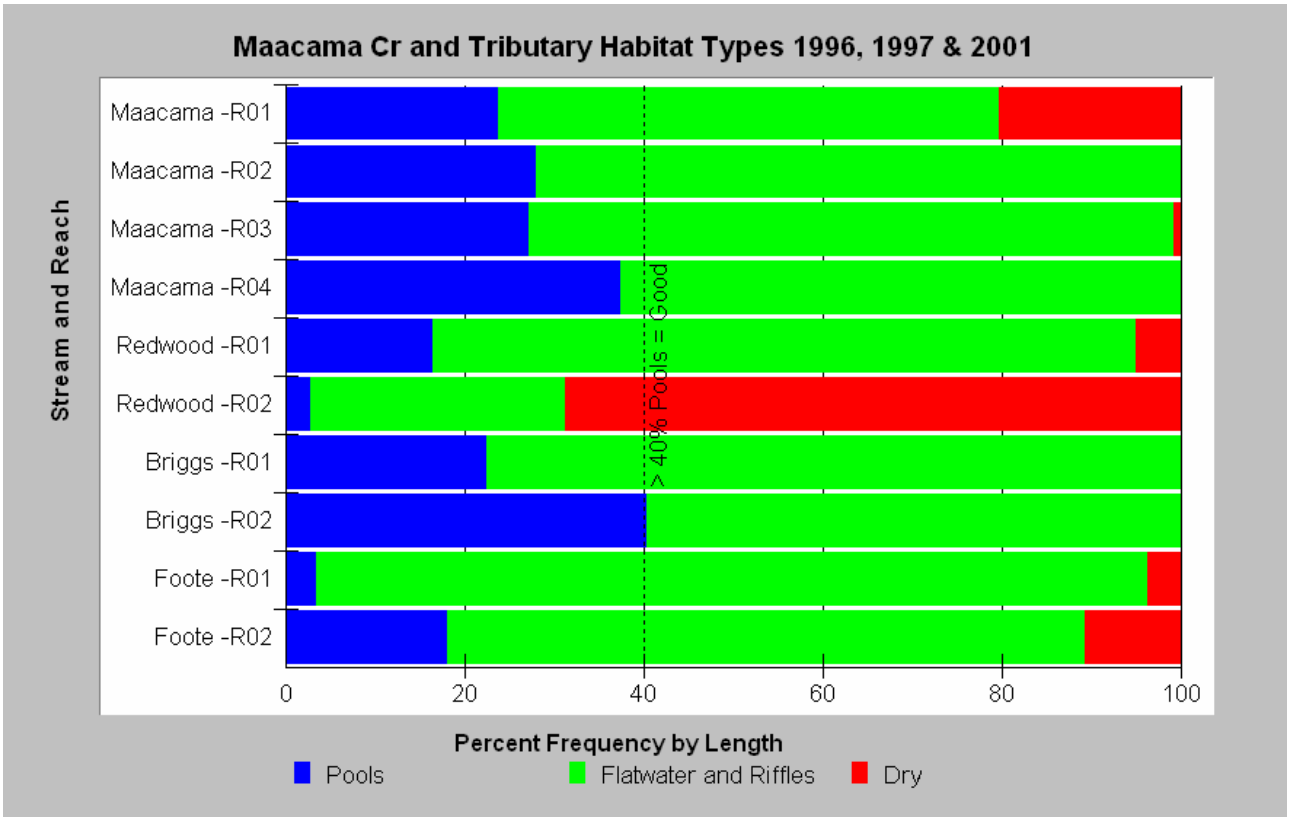

Figure 12. CDFG habitat typing data for Maacama Creek and its tributaries, including Redwood Creek, show low pool frequencies and a high percentage of dry habitats likely caused by stream diversions. Data from CDFG and chart from KRIS Russian River database.

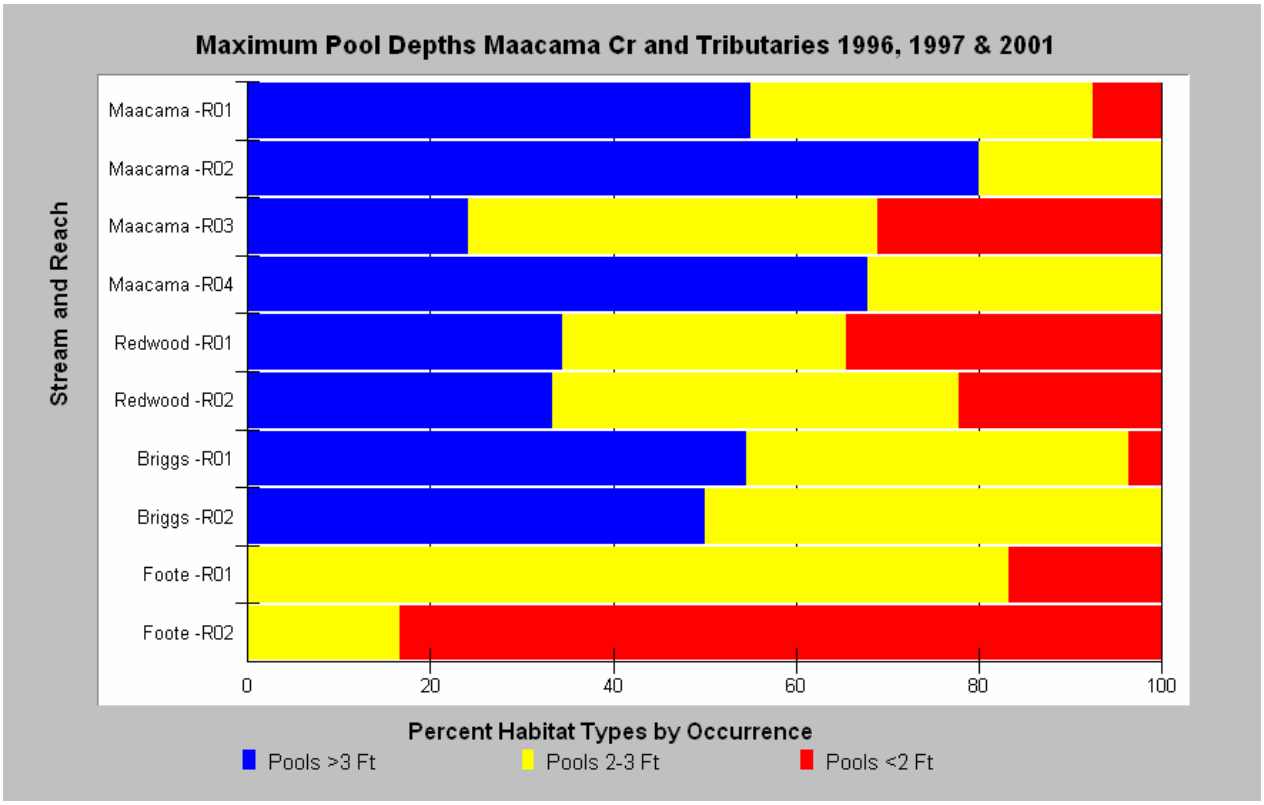

Figure 13. CDFG habitat typing data for Maacama Creek and its tributaries, including Redwood Creek, show pool depths are often restricted to less than two feet. Data from CDFG and chart from KRIS Russian River database.

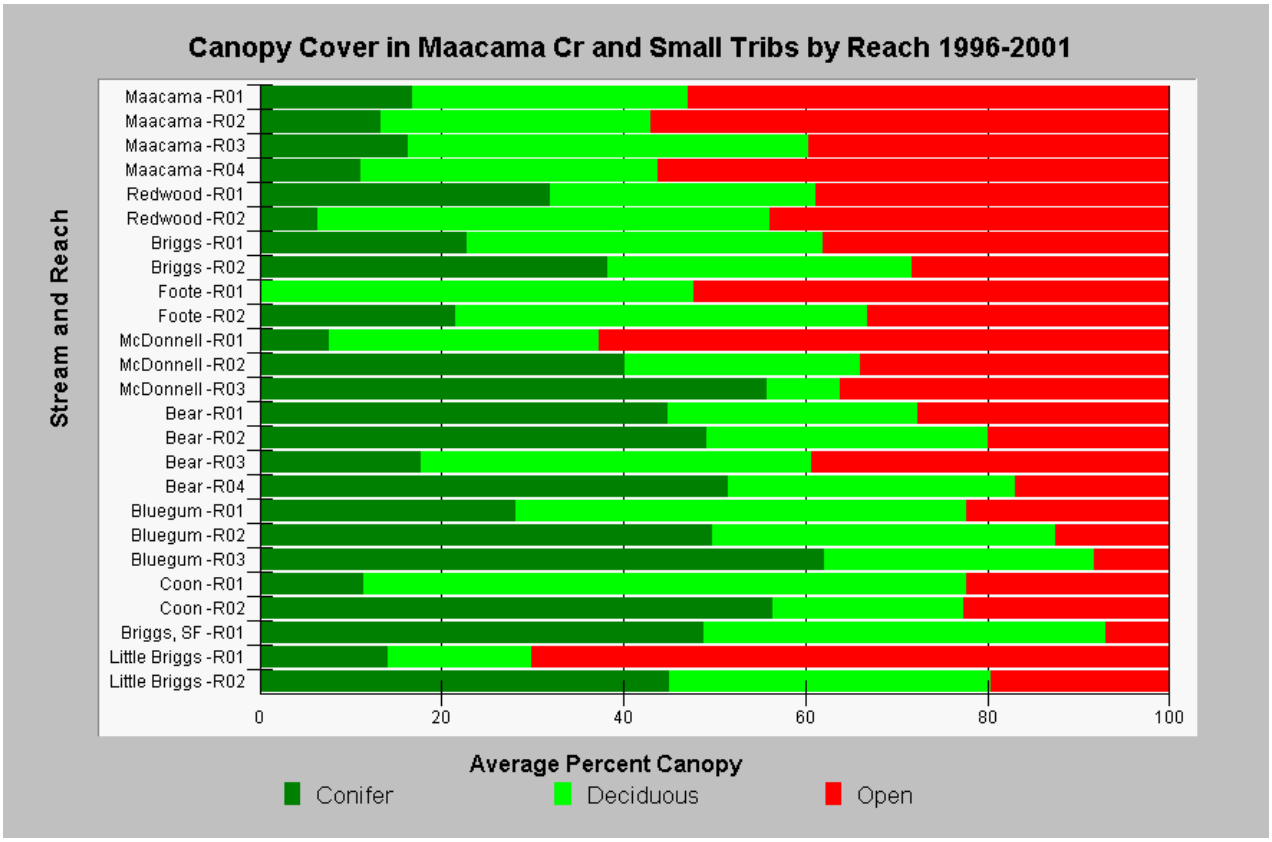

Figure 14. CDFG habitat typing survey data show shade canopy in Redwood Creek is deficient and that there are few large conifers adjacent to the stream. Data from CDFG and chart from KRIS Russian River database.

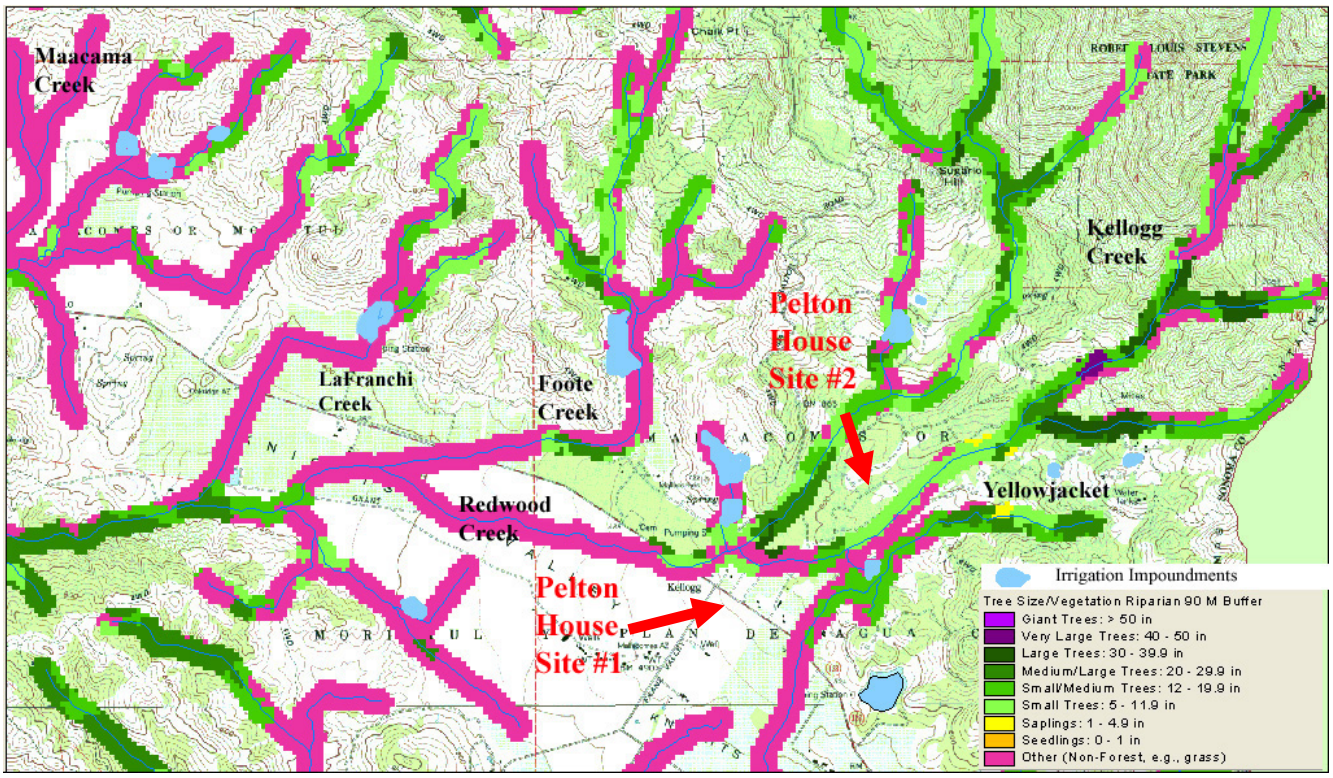

Figure 15. Classified Landsat imagery displays 90 meter (approx. 300') on each side of the stream channels of Redwood, Kellogg, Yellowjacket, Foote and LaFranchi Creeks and show that riparian zones are highly altered with spectral signature indicating grass or shrubs, not trees in most nearby stream side zones. Data from USFS (1999) and KRIS Russian River.

of inter-connected wetlands. Now they are reduced thin shade buffers or wholly lacking (Figures 16 and 17), which shows in Figure 15 as non-forest conditions indicative of riparian alteration by agriculture. Another major riparian disruption is construction of impoundments directly within the riparian zone and these are highlighted in Figure 15. Pool and Berman (2001) notes that surface water-groundwater connections in tributaries assist in maintaining cool water in streams during periods of low flow, and the capture of these cold water sources certainly has major consequences for both riparian function and carrying capacity of fish in downstream reaches.

Figure 16. LaFranchi Creek below Highway 128 shows a channelized stream bed and simplified riparian conditions indicative of fully non-functional salmonid habitat. Photo by Pat Higgins from KRIS Russian River. 7/14/03.

Figure 17. Foote Creek above Highway 128 is shown looking upstream with road adjacent, riprap confined bank, poor riparian conditions and vegetative cover on the stream bed indicative of chronic dewatering.

Original upland and riparian vegetation, at least on north facing slopes and areas of steep topography, would have included old growth redwoods and there are tiny patches of giant (>50" dbh) and very large trees (40-50" dbh) on upper Kellogg Creek. Medium-large (20-30" dbh) and large (30-40" dbh) mid-seral stands trees are also present in patches on Kellogg, Yellowjacket, Foote and LaFranchi Creeks, but most other riparian zones are predominantly small diameter conifers or hardwoods. However, some areas of sparse vegetation may be due to natural grasslands due to local geology.

When assessing impacts to Redwood Creek by the proposed Pelton House Winery project, one must also consider the health of proximate tributaries, such as LaFranchi and Foote Creek. Although historically likely productive because of their gradient, these streams are now severely disrupted by channelization by levees or dikes, which is evident both from the linear channels on the USGS stream maps (Figure 15) and in the ground reconnaissance photos (Figures 16-17). Disconnection from the floodplain and channel straightening causes loss of slow edge water habitats and side channels that would have been ideal coho salmon habitat, in part due to their connection with cold groundwater. Wetlands that have now been diked off or drained would have been inundated during flood flows and would have provided winter shelter for coho salmon that must spend at least one year in freshwater before going to the ocean. The disconnection of wetlands also diminishes their water storage and water filtration capacity. For example, both La Franchi and Foote Creeks have roads and field immediately adjacent with no buffer, which discharges of sediment and chemicals directly to these water courses and Redwood Creek just downstream.

Coho salmon prefer maximum floating weekly maximum water temperatures of no more than 18.4 C or 64 F (Welsh et al. 2001, McCullough 1999) and Redwood Creek is over this limit. According to data provided in the Russian River GIS (Circuit Rider Productions 2003) the maximum water temperature of Redwood Creek fluctuates from 65 F to 70 F , while Maacama, Briggs and lower Franz Creek are over 70 F (Figure 18).

Water temperature is a function in part of transit time and volume; therefore, any additional flow depletion should be prevented at this time to make sure that Redwood Creek doesn't depart further from coho requirements and into the acutely stressful range for steelhead.

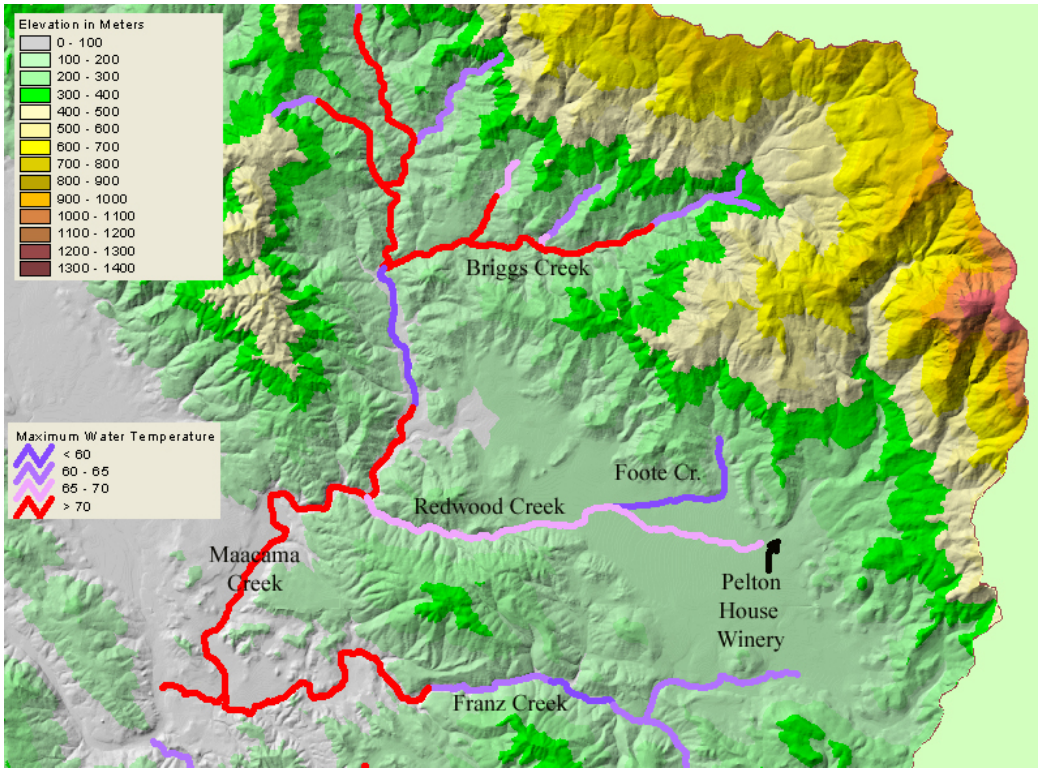

Figure 18. Elevation of surrounding terrain and maximum water temperature ranges for the Maacama Creek and its tributaries, including Redwood Creek. Data from Circuit Rider Productions and KRIS Russian River.

Cumulative Watershed Stress Due to Upland Disturbance

When considering the cumulative effects of the Pelton House Winery project, the full extent of development must be acknowledged as well as all other past, present and foreseeable off-site impacts. Sonoma County has information indicating non-discretionary land-uses and water diversions on the subject property have substantially impacted habitat and streams flows of Kellogg Creek and Yellowjacket Creek (Ball 2005), which flank the upper winery development site (#2). The project will take place in over ¾ in both the Kellogg and Yellow Jacket Creek riparian zones and the two sites must be linked with infrastructure that will cause further disruptions.

CDFG (1955) noted decreased suitability for salmonids in Maacama Creek, which was likely related to post WWII logging. Timber harvest for vineyard conversion continues on the slopes of Mt. St. Helena upstream from this project. Forest conversion for new vineyards in the upland areas of Knights Valley area is also projected to double as noted in the EIR for GP2020 (Sonoma County 2008a). These add to the already substantial impacts of road densities and road stream crossings left over from logging era or developed for on-going non-discretionary agricultural activities.

though timber harvest is no longer active in these watersheds, they have substantial road densities and road stream crossings left over from logging or developed for agricultural activities.

High road densities act to extend stream networks and intercept ground water flows (Jones and Grant, 1996), resulting in increased peak flows and decreased base flows (Montgomery and Buffington, 1993). U.S. Forest Service (1996) studies in the interior Columbia River basin found that bull trout were not found in basins with road densities greater than 1.7 mi/mi^2. They rank road-related cumulative effects risk as Extreme when road densities exceed 4.7 mi/mi^2 (Figure 19). National Marine Fisheries Service (1996) guidelines for salmon habitat characterize watersheds with road densities greater than 3 mi/mi^2 as "Not Properly Functioning" while "Properly Functioning Condition" is defined as less than or equal to 2 mi/mi^2 with no or few stream side roads.

Road densities were calculated as part of the KRIS Russian project on a large sub basin scale (Figure 20). Not surprisingly the urbanizing sub basins, such as Cloverdale Creek, have the highest densities (>5.0 mi/ mi^2). The Kellogg Creek Calwater Planning Watershed actually encompasses all of Yellowjacket Creek and Redwood Creek to its mouth and has 4.2 mi/ mi^2 and falls into the High risk (USFS, 1996) category (1.7-4.7 mi/mi^2).

Existing high road densities and stream-side roads are likely contributing substantially to channel damage in Redwood Creek and other Maacama Creek tributaries and reaches that are manifesting low pool frequency and depth. The Pelton House Winery proposal will increase total impervious area by constructing driveways and converting naturally vegetated areas into parking lots for both Site #1 and Site #2 and these aspects of development need to be considered in conjunction with high pre-existing impacts.

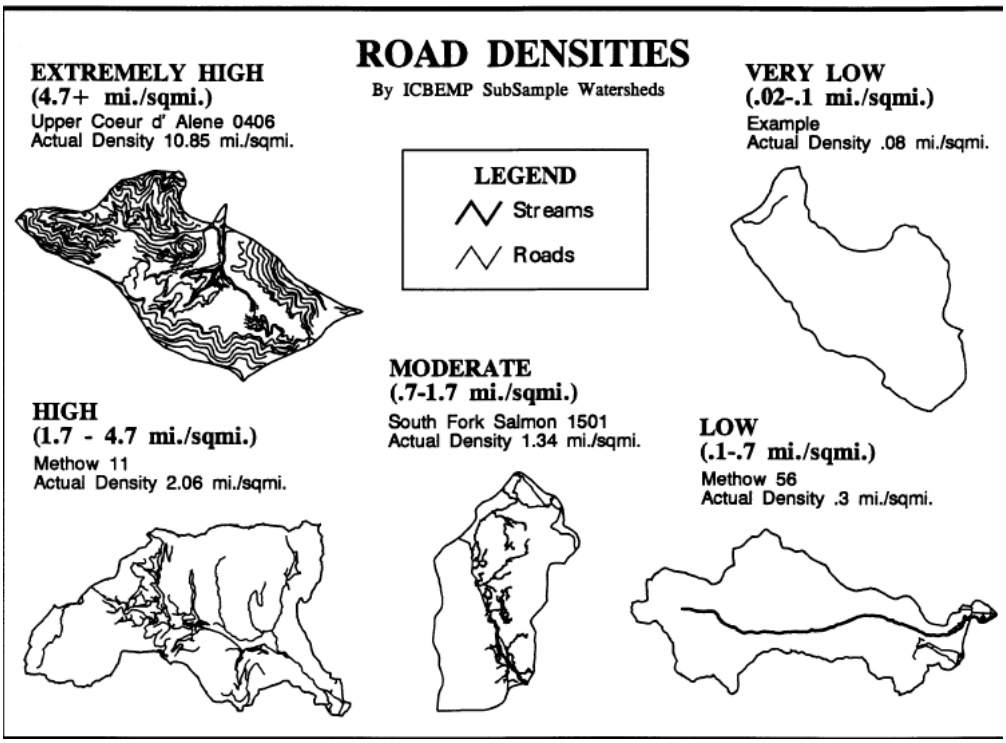

Figure 19 The USFS (1996) Interior Columbia River basin criterion for ecological and hydraulic risk from road densities is displayed here. The Bohemian Grove falls into the High (1.7-4.6 mi/mi^2) category.

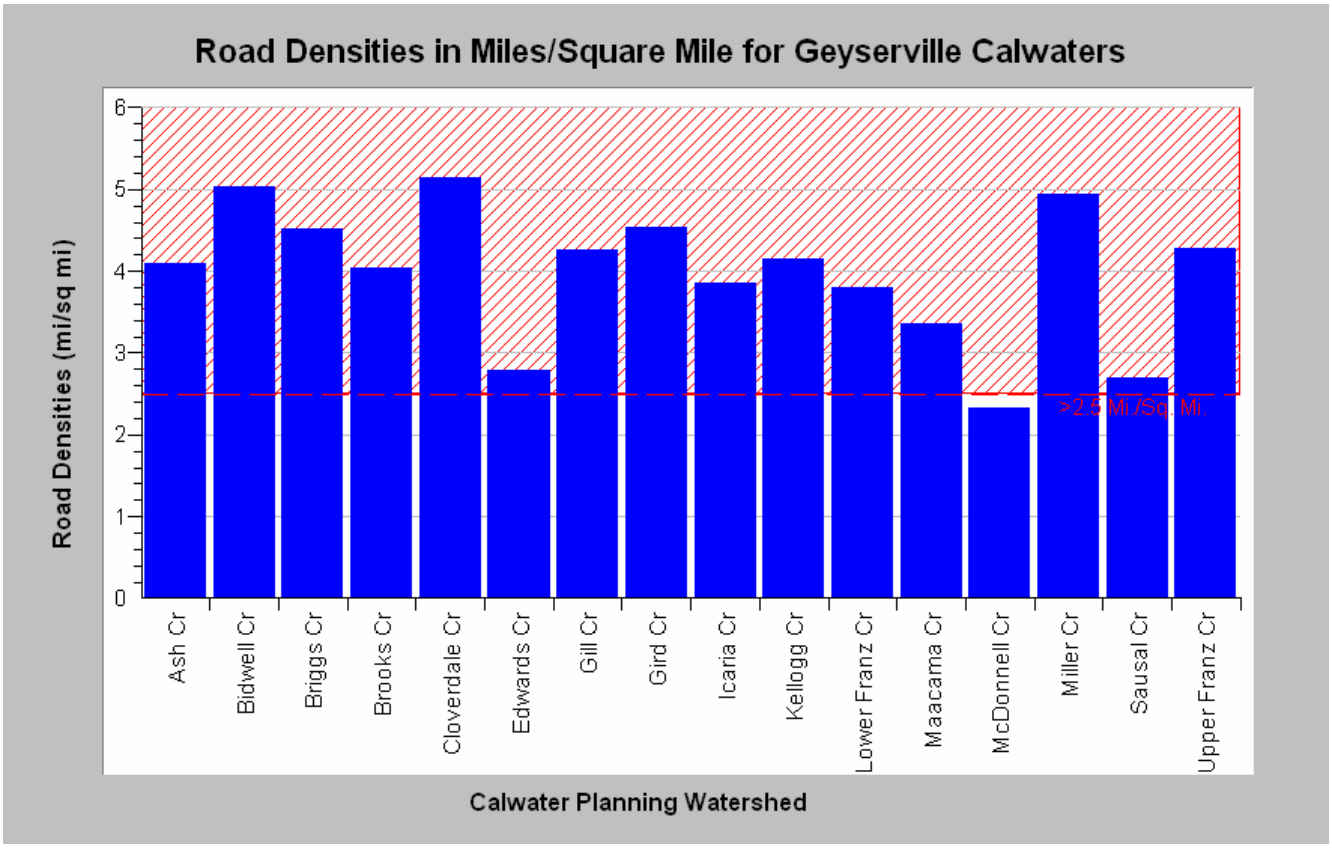

Figure 20. Road densities in various Calwater Planning watersheds are contrasted above based data from CDF. Kellogg Creek is over levels recommended for Properly Functioning watershed condition (2.5 mi/sq mi) for Pacific salmon (NMFS, 1996). KRIS Russian.

A further consideration under the topic of cumulative effects is that channel changes discussed above have likely diminished surface water availability. Highly aggraded stream channels may sometimes lose surface flow because of the depth of their bedload (Kier Associates 1991) and dry streambeds near the project area may be a reflection of both (Figures 21). Also compromised depth of pools may cause greater loss of fish habitat with the same amount of water withdrawn because of the changes in stream profile. Consequently, the SWRCB WRD needs to examine all pending and unpermitted use in light of this currently diminished surface water supply. If upland stresses are decreased through road decommissioning and allowing vegetation to approach its more normal range of variability, the channel will deepen and surface water availability could once again increase.

Thus, a combination of channel changes, adverse water quality and depleted flows are all acting synergistically to eliminate coho salmon. Redwood Creek (Figure 22) barely flows at present below the proposed project site and it is known to lose surface flow in more than half its length as it flows to Maacama Creek. All land use, including the proposed Pelton House Winery need to take these considerable impacts into consideration when considering the need for mitigation.

Conclusion

Coho salmon are at very high risk of extinction in the Russian River basin, yet NMFS (2008) considers their gene resources to be of extremely high importance for rebuilding of the entire CCC ESU. Expensive recovery efforts to restore Russian River coho salmon using captive broodstock from Green Valley Creek is failing to re-establish breeding populations in any Russian River tributary (NMFS2008). In fact, the problem is that there aren't any coho salmon refugia; perennial cold water streams with complex, deep pools. Problems are partially caused by development in uplands that exceed prudent risk thresholds, thereby increasing sediment yield and altering hydrology to the

Figure 21. Franz Creek running dry at its convergence with Maacama Creek, which may be caused by a combination of stream bed aggradation and upstream diversion. Photo by Pat Higgins from KRIS Russian River. 7/13/03.

Figure 22. Redwood Creek barely flowing upstream of Highway 128 just below the proposed project site. Photo by Pat Higgins from KRIS Russian River. 7/13/03.

the detriment of coho salmon. But the biggest problem is over-consumption of water to which the Pelton House Winery project will contribute

To meet CEQA requirements for use of best scientific information in analysis and for consideration of cumulative effects, the County of Sonoma needs to require development of a full EIR for the proposed Pelton House Winery project that covers topics above, including connections of groundwater to adjacent wells and connections to surface flow downstream in Redwood Creek in former and potential coho habitat. A full evaluation of fisheries resources and fish habitat within the project site should be provided with the EIR and survey results for sensitive amphibians, such as red-legged and yellow-legged frogs. Amphibians require moist riparian habitats for survival, and as shown above riparian habitat is profoundly altered and fragmented.

In light of existing road densities, the EIR needs to consider effects of increased impervious area, removal of naturally-vegetated areas, and the contribution of the event center's vehicular traffic and roadside parking areas to elevated sediment yield and altered hydrology that can both have negative impacts on downstream critical habitat. Finally, the EIR should address the projects growth-inducing stimulus for commercial destination development in a water-scarce area previously designated for resource conservation (Sonoma County 1979).

Sincerely,

Patrick Higgins

References

Ball, Gloria. 2005. Memo regarding flow depletion of Yellowjacket Creek to Lenny Stein. July 19, 2006. 1 p.

Bradbury, W., W. Nehlsen, T.E. Nickelson, K. Moore, R.M. Hughes, D. Heller, J. Nicholas, D. L. Bottom, W.E. Weaver and R. L. Beschta. 1995. Handbook for Prioritizing Watershed Protection and Restoration to Aid Recovery of Pacific Salmon. Published by Pacific Rivers Council, Eugene, OR. 56 p.

Brelje and Race. 2008. Memo to Karen Massey, Jackson Family Enterprises, re: response to comments on Pelton House Winery Application #PLP05-0010. By David Long and Thomas R. Jones. November 4, 1980. Brelje and Race Engineers. 4 p.

Brown, L.R., P.B. Moyle, and R.M. Yoshiyama. 1994. Historical Decline and Current Status of Coho Salmon in California. North American Journal of Fisheries Management. 14(2):237-261.

California Department of Fish and Game (CDFG). 1954. Maacama Creek (Russian River tributary) field notes from 1953 and 1954. Unpublished CDFG file memo compiled by W. Jones. Yountville, CA. 1 p.

California Department of Fish and Game (CDFG). 1955. Creel censuses on opening day of trout season, April 30, 1955 for four streams in Sonoma County. Unpublished CDFG memo by H.E. Pintler. Yountville, CA. 4 pp.

California Department of Fish and Game (CDFG). 1957. Russian River tributaries field notes, data tables and other sundry information, 1950's. Unpublished CDFG file memos. Yountville, CA. 14 pp.

California Department of Fish and Game (CDFG). 1965. Maacama Creek (Russian River tributary) trapping results. Unpublished CDFG file report. Yountville, CA. 6 pp.

California Department of Fish and Game (CDFG). 2002. Status Review of California Coho Salmon North of San Francisco . Report to the California Fish and Game Commission. California Department of Fish and Game, Sacramento , CA. 336pp.

California Department of Fish and Game (CDFG). 2004. California Salmonid Stream Habitat Restoration Manual. Fourth Edition. Inland Fisheries Division. California Department of Fish and Game. Sacramento, CA.

California Department of Fish and Game (CDFG). 2006. Redwood Creek Stream Inventory Report. CDFG, Yountville, CA. 16 p.

California State Water Resources Control Board, Water Rights Division. 2007. Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams. SWRCB WRD, Sacramento, CA.

Collison, A., W. Emmingham, F. Everest, W. Hanneberg, R. Martston, D. Tarboton, R. Twiss. 2003. Phase II Report: Independent Scientific Review Panel on Sediment Impairment and Effects on Beneficial Uses of the Elk River and Stitz, Bear, Jordan and Freshwater Creeks. Independent Science Review Panel performed analysis on retainer to the North Coast Regional water Quality Control Board, Santa Rosa, CA.

Curry, R. and D. Jackson. 2008. Draft Report on Pelton House Winery, PLP05-0010. October 5, 2008. Performed under contract to the Maacama Watershed Alliance by Watershed Systems, Soquel, CA. 27 p.

Dunne, T., J. Agee, S. Beissinger, W. Dietrich, D. Gray, M. Power, V. Resh, and K. Rodrigues. 2001. A scientific basis for the prediction of cumulative watershed effects. The University of California Committee on Cumulative Watershed Effects. University of California Wildland Resource Center Report No. 46. June 2001. 107 pp. http://www.krisweb.com/biblio/gen_ucb_dunneetal_2001_cwe.pdf

Good, T. P., R. S. Waples & P. B. Adams. 2005. Updated status of federally listed ESUs of West Coast salmon and steelhead. U.S. Department of Commerce, NOAA Technical Memorandum, NMFS-NWFSC-66. 598 pp.

Grette, G.B. 1985. The role of large organic debris in juvenile salmonid rearing habitat in small streams. Master's Thesis, University of Washington, Seattle, WA.

Higgins, P.T., S. Dobush, and D. Fuller. 1992. Factors in Northern California Threatening Stocks with Extinction. Humboldt Chapter of American Fisheries Society. Arcata, CA. 25pp.

Higgins, P.T. 2008. Comments on Draft Policy for Maintaining Instream Flows in Northern California Coastal Streams. April 2, 2008. Performed under contract to the Redwood Chapter Sierra Club. Patrick Higgins, Consulting Fisheries Biologist, Arcata, CA. 49 p.

Higgins, P.T. 2008a. Comments on Adequacy of Mendocino General Plan Update and Draft Environmental Impact Report (DEIR) with Regard to Pacific Salmon Recovery and Meeting CEQA Requirements. November 17, 2008. Performed under contract to the Redwood Chapter Sierra Club. Patrick Higgins, Consulting Fisheries Biologist, Arcata, CA. 22 p.

Institute for Fisheries Resources. 2003a. KRIS Russian, Navarro, East Marin-Sonoma Database and Map Projects. Funded by the Sonoma County Water Agency, Santa Rosa, CA. (www.krisweb.com).

Kauffman, J.B., R.L. Beschta, N. Otting, and D. Lytjen. 1997. An Ecological Perspective of Riparian and Stream Restoration in the Western United States. Fisheries 22(5):12-24.

Knopp, C. 1993. Testing Indices of Cold Water Fish Habitat. Final Report for Development of Techniques for Measuring Beneficial Use Protection and Inclusion into the North Coast Region's Basin Plan by Amendment. September 18, 1990. North Coast Regional Water Quality Control Board in cooperation with California Department of Forestry. 57 pp. http://www.krisweb.com/biblio/ncc_ncrwqcb_knopp_1993_sediment.pdf

Kier Associates. 1991. Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program. Klamath River Basin Fisheries Task Force. Yreka, CA.

LSA Associates, Inc. 2006. General Biotic Resources Assessment and Sensitive Resources Evaluation Pelton House Winery. Submitted to Jackson Enterprises, Santa Rosa, CA by LSA Associates, Inc., Pt Richmond, CA. 38 p.

Mendocino County Resource Conservation District (MCRCD). 1992. Garcia River watershed enhancement plan. Prepared for the California State Coastal Conservancy. Prepared by MCRCD, written by Jack Monschke and D. Caldon, Kier Associates. MCRCD, Ukiah, CA. 207 p.

Murphy, M.L., J.F. Thedinga, K.V. Koski and G.B. Grette. 1984. A stream ecosystem in an old growth forest in southeast Alaska: Part V. Seasonal changes in habitat utilization by juvenile salmonids. In Proceedings of Symposium on Fish and Wildlife in Relationships in Old Growth Forests. Eds. W.R.

Meehan, T.R. Merrill and T.A. Hanley. American Institute of Fishery Research Biologists, Asheville, North Carolina.

National Marine Fisheries Service. 2001. Status Review Update for Coho Salmon (Oncorhynchus kisutch) from the Central California Coast and the California portion of the Southern Oregon/Northern California Coasts Evolutionarily Significant Units. Southwest Fisheries Science Center, Santa Cruz, CA. 43 p.

National Marine Fisheries Service. 2005. Endangered and threatened species: final listing determinations for 16 ESUs of West Coast Salmon, and final 4(d) protective regulations for threatened salmonid ESUs. Federal Register, 70: 37160-37204.

National Marine Fisheries Service. 2008. Biological Opinion for ESA Section 7 Consultation on Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River watershed. NMFS, Santa Rosa, CA. 386 p.

National Marine Fisheries Service (NMFS). 2008b. Environmental Protection Agency Registration of Pesticides Containing Chlorpyrifos, Diazinon, and Malathion. National Marine Fisheries Service Endangered Species Act Section 7 Consultation Biological Opinion. NMFS, Silver Springs Md. 478 p.

Nehlsen, W., J.E. Williams, J.A.Lichatowich. 1991. Pacific Salmon at the Crossroads: Stocks at Risk from California, Oregon, Idaho, and Washington. Fisheries 16(2):4-21.

North Coast Regional Water Quality Control Board. 2008. Memo to Traci Tesconi, County of Sonoma, re: Pelton House Winery Application #PLP05-0010. From John Short, Senior Water Resources Engineer. October 14, 2008. NCRWQCB, Santa Rosa, CA. 6p.

North Coast Regional Water Quality Control Board. 2008a. Electronic Mail Memo to Traci Tesconi, County of Sonoma, re: Pelton House Winery Application #PLP05-0010. October 12, 2008. From Rhonda Raymond, NCRWQCB, Santa Rosa, CA. 6p.

Pacific Watershed Associates. 1994. Action plan for the restoration of the South Fork Trinity River watershed and its fisheries. Prepared for U.S. Bureau of Reclamation and the Trinity River Task Force, Contract No. 2-CS-20-01100. Arcata, CA.

Poole, G.C., and C.H. Berman. 2000. Pathways of Human Influence on Water Temperature Dynamics in Stream Channels. U.S. Environmental Protection Agency, Region 10. Seattle, WA. 20 p.

Richard C. Slade & Associates. 2008. Response to comments on Pelton House Winery Application #PLP05-0010. Correspondence to Jackson Family Enterprises. October 27, 2008. Richard C. Slade & Associates, Consulting Groundwater Geologist. 4 p.

Siegel, R. 2008. Memo re: Pelton House Winery Application# PLP05-0010 from Jess Jackson and Barbara Banke. Prepared for the Maacama Watershed Alliance. October 10, 2008. Randy Siegel, Registered Geologist/Hydrologist. 13 p.

Sonoma County. 1979. Franz Valley Area Plan. Sonoma County Planning Department, Santa Rosa, CA.

Sonoma County. 2008. Mitigated Negative Declaration Re-Circulated on Application# PLP05-0010 from Jess Jackson and Barbara Banke. Sonoma County Permit and Resource Management Department, Santa Rosa, CA. 90 p.

Sonoma County. 2008a. Mitigated Sonoma County General Plan 2020. Sonoma County Permit and Resource Management Department, Santa Rosa, CA.

Stetson Engineers Inc. 2007. Potential Indirect Environmental Impacts of Modification or Removal of Existing Unauthorized Dams. Appendix to Policy for Maintaining Instream Flows in Northern California Coastal Streams Performed under contract to SWRCB WRD, December 2007. 71 p.

U.S. Environmental Protection Agency. 2003. EPA Region 10 Guidance for Pacific Northwest State and Tribal Temperature Water Quality Standards. EPA 910-B-03-002. Region 10 Office of Water, Seattle, WA.

Wiemeyer Ecological Services. 2008. Comments on Pelton House Winery Application# PLP05-0010 from Jess Jackson and Barbara Banke. Prepared for the Maacama Watershed Alliance. October 10, 2008. Wiemeyer Ecological Services, Santa Rosa, CA. 95409. 6 p.