Comments on Draft Environmental Impact Report (DEIR) for the
Walt Ranch Erosion Control Plan
(Napa County Permit P11-00205-ECPA)

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& Livings Rivers Council

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Qualifications

I have been a consulting fisheries biologist with an office in Arcata, California for the last 25 years. I served as the lead author for the regional characterization of Pacific salmon stocks in northwestern California (Higgins et al. 1992) and also created fisheries elements for major watershed restoration plans in the region (Kier Assoc. 1992, MCRCD 1992, Pacific Watershed Assoc. 1994). From 1994 through 2003 I helped complete comprehensive fisheries, water quality, and watershed databases for 14 major northwestern California river sub-basins (www.krisweb.com). Clients included the U.S. Fish and Wildlife Service, U.S. Bureau of Reclamation, California Department of Forestry, and the Sonoma County Water Agency. From 2004 to 2010, I worked for the environmental departments of five federally recognized lower Klamath River Indian Tribes to help improve compliance with the Clean Water Act and promote expedient dam removal. I also assisted the National Marine Fisheries Service (NMFS) in development of coho recovery planning in southern Oregon and northern California from 2006 to 2010, including data assimilation and recovery plan development.

I have also studied the Napa River since 2006 for Thomas Lippe, Attorney at Law, and the Living Rivers Council (Higgins 2006a, 2006b, 2007, 2008a, 2008b, 2009, 2010); commenting on many proposals for timber harvests and vineyard developments, as well as on the *Napa River Total Maximum Daily Load* (Napalitano et al. 2009).

Key Literature Reviewed for Project

While all scientific documents that provide the foundation for these comments can be found in the References section below, several disserve particular mention because of their importance in terms of understanding the Walt Ranch development and its impacts. These are the:

- *Draft Environmental Impact Report for the Walt Ranch Erosion Control Plan* (Napa County Permit P11-00205-ECPA) including all Appendices (Analytical Environmental Services 2014);
- Comments of Gregory Kamman, Hydrologist (2014) on the *Walt Ranch DEIR*;
- U.S. Geologic Survey (USGS)(Farrar and Metzger 2003) ground-water study of the Lower Milliken-Sarco-Tulucay Creek area;
- The Napa County Resource Conservation District's (NCRCD)(Koehler and P. Blank 2010) *Milliken Creek Steelhead Habitat Modeling and Instream Flow Study*;
- Leidy et al. (2003) for historic records of salmon and steelhead presence and use of Milliken Creek; and
- Napa River and Milliken Creek fisheries and macroinvertebrate studies by Dr. Charles Dewberry (Dewberry 2003, Dewberry 2004).

As noted above, I have extensive previous Napa River watershed comments (Higgins 2006a, 2006b, 2007, 2008a, 2008b, 2009, 2010) and have excerpted from different previous works regarding various subject areas as they apply to the *Walt Ranch DEIR*.

Project Increases Erosion and Peak Flow and Decreases Base Flow

Comments of Greg Kamman (2014) regarding the *Walt Ranch DEIR* show that the project is likely to have very significant negative effects on Milliken Creek and potentially on the water supply for the City of Napa and the lower Lower Milliken-Sarco-Tulucay Creek groundwater basin (Farrar and Metzger 2003). Discussions below only cover the portion of the project falling within the Milliken Creek watershed (Figure 1).

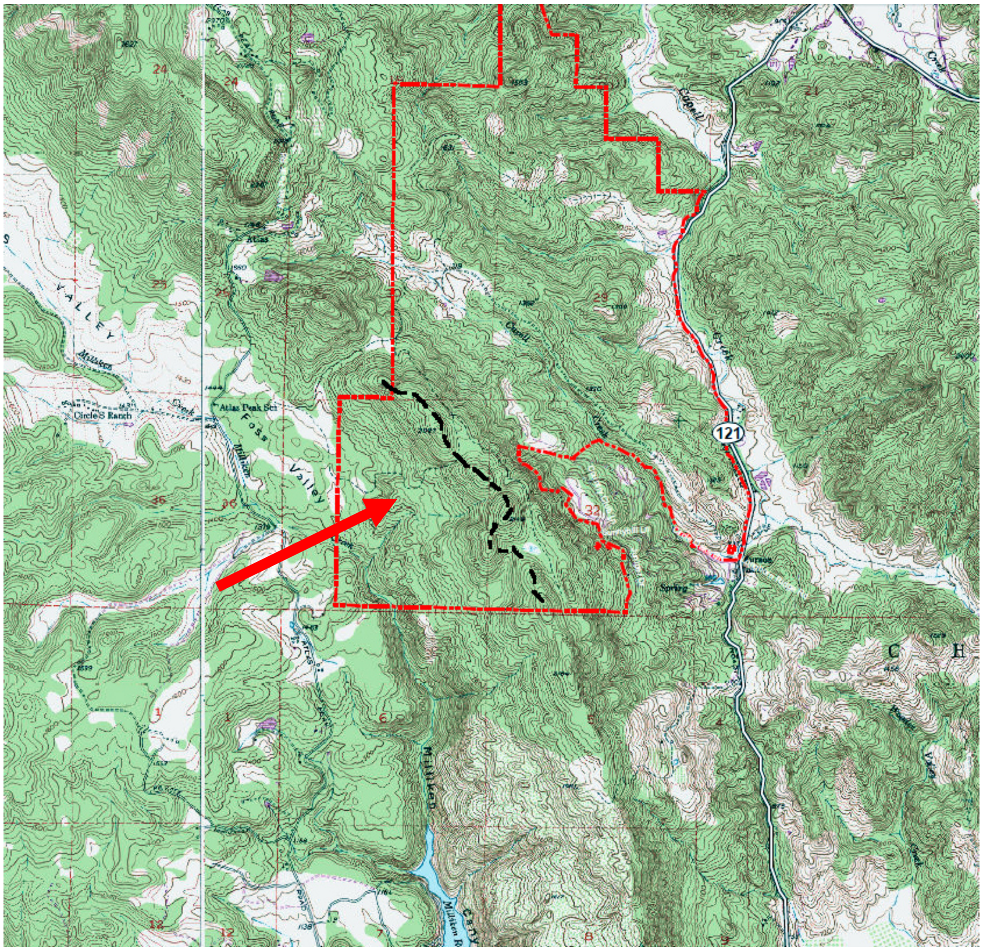

Figure 1. The Walt Ranch vineyard development includes both the upper Milliken Creek and Capell Creek watersheds, but these comments only examine impacts within the Milliken Creek and Napa River watersheds.

<u>Flow Alterations</u>: Development associated with the Walt Ranch vineyard includes 3 ponds and 7 wells (Figure 2) in the upper Milliken Creek watershed area. The project area is underlain by volcanic terrain, which is known to have complex hydrology that can result in delivery of water far downstream and off site (Farrar and Metzger 2003). Kamman (2014) points out that the site falls within the Lower Milliken-Sarco-Tulucay Creek groundwater basin (Farrar and Metzger 2003) and that increased water drawn from wells, storage in ponds, and reduced filtration due to development, will reduce flows not only to upper Milliken Creek, but also the lower reaches of the creek and the groundwater basin itself. Kamman (2014) notes that the *DEIR* should have used a water budget approach that contrasted current wildland hydrology versus with full project development. He points out that soil ripping in disturbed and compacted areas, proposed as a hydrologic mitigation for project development, will have only temporary benefit, and that long term effects would cause a significant decrease in infiltration. The extensive road network to be constructed also is likely to increase overland flow and peak flows downstream (Jones and Grant 1996). Jackson (2009) noted that reservoirs and ponds add to total impervious watershed area and contribute to peak flows.

The proposed Walt Ranch vineyard would use water from Milliken Creek to water grapes in the upper Capell Creek watershed, where local surface and groundwater are less available. Water used to irrigate grapes in upper Capell Creek will necessarily decrease water supply for the City of Napa from Milliken Reservoir and groundwater supply in the valley below (Kamman 2014). Such an inter-basin transfer of water requires an Appropriative Water Right from the State Water Resources Control Board Water Rights Division, which must find that there is surplus water to issue such a permit (CA Water Code § 1375).

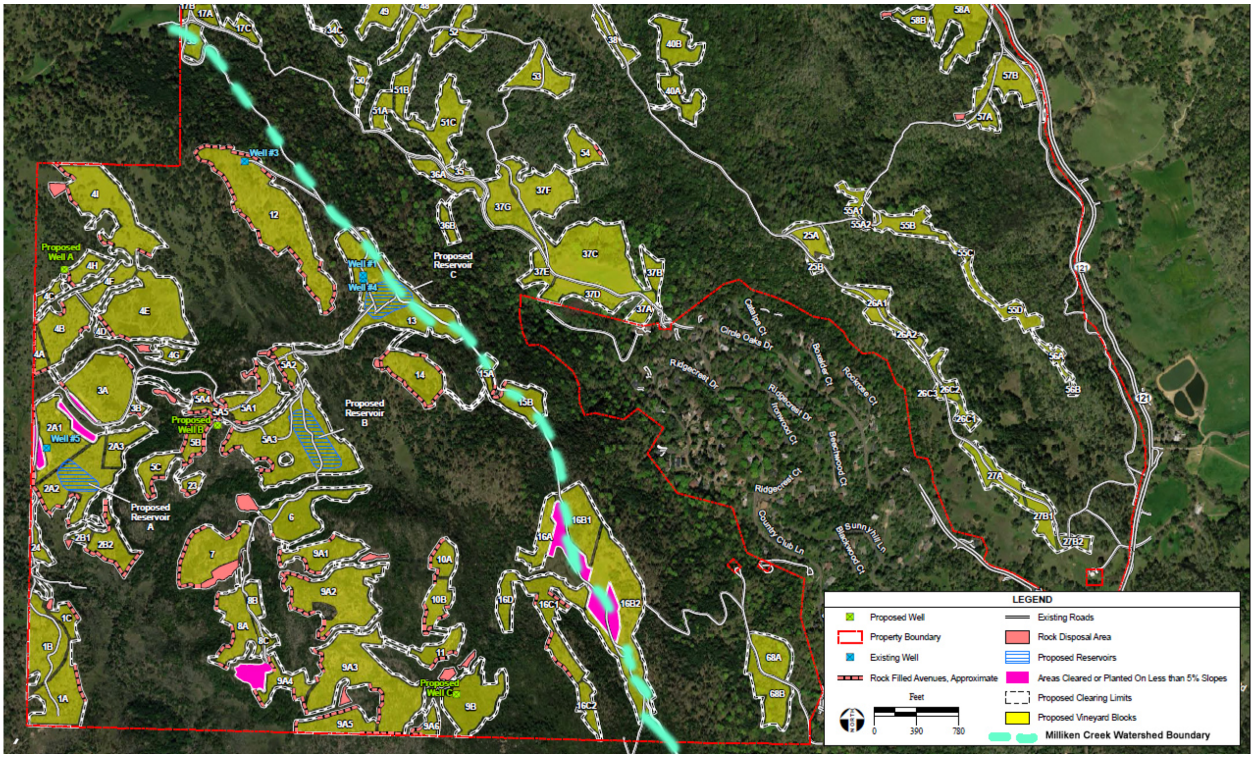

Figure 2. Map adapted from DEIR Figure 3.4 showing the proposed seven wells and three ponds associated with the Walt Ranch vineyard development. Teal colored line is the watershed boundary.

<u>Increased Sediment Delivery</u>: Volcanic terrain, such as that underlying the project site, is generally considered more resistant to erosion and mass wasting than other northern California geologic formations (i.e Coast Range, Central Belt Franciscan). However, rhyolite is a formation associated with volcanic activity, and present on the development site, which can be highly erodible (Armentrout et al. 1998). Studies of streams draining volcanic terrain near Mt Lassen in northeastern California have pertinence. The U.S. Forest Service (Napper 2001) noted that rhyolitic soils in the upper South Fork Battle Creek watershed "tend to have a moderate to high erosion hazard rating, which increases based on slope. As vegetation is disturbed, the erosion potential increases. Concentration of water on these slopes may result in deep gullies, and mass failures. Maintaining adequate effective ground cover is important to preventing accelerated erosion and to reducing displacement." Another USFS study (Armentrout et al. 1998) of the Mill, Deer and Antelope Creek watersheds, which are adjacent to Battle Creek, found that "roads on rhyolitic soils were responsible for delivered sediment estimates almost four times greater than the other parent materials." Consequently, the recurring assertions in the *DEIR* that soils within the project area are stable is not consistent with erosion potential associated with rhyolitic terrain.

Kamman (2014) noted that drop structures to catch sediment on slopes would likely fill up and then create scour and erosion below them without constant maintenance. Also, areas of concentrated flow coming off the project have the potential to reactivate dormant mass wasting features, according to Kamman (2014). Therefore, the sediment supply to Milliken Creek will increase causing impacts to the aquatic ecosystem.

<u>Roads Alter Hydrology and Sediment Delivery</u>: The Walt Ranch vineyard development entails construction of an extensive road network with 22 culverts disrupting headwater creek channels (Figure 3). Wemple et al. (1996) point out that roads actually function to extend stream networks, which is one of the mechanisms for peak flow increase and decreased groundwater infiltration (Figure 4). Roads often cause gully erosion, particularly on steep ground, and these gullies not only contribute erosion but may also serve as channel extensions as well (Wemple et al. 1996).

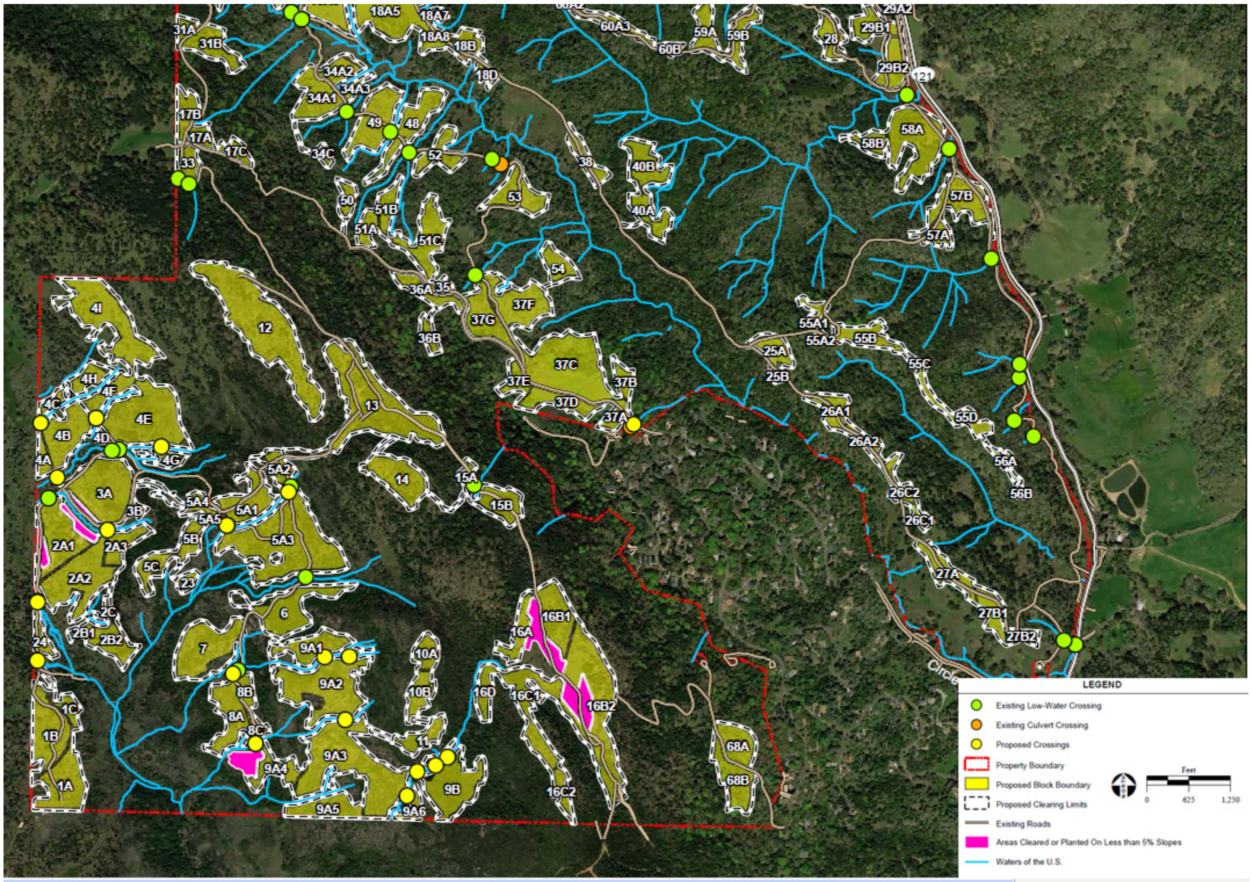

Figure 3. Road network and culverts associated with Walt Ranch vineyard development.

Klein (2003) found a linear relationship between turbidity and road density (Figure 5), which indicates that turbidity below the development is likely to increase to the detriment of biota downstream.

Status of Napa River Pacific Salmon Species Affected by Project

Napa River Pacific salmon species populations have been on a downward slide towards extinction as more and more of the watershed has been developed.

<u>Coho Salmon</u>: Napa River coho salmon (<u>Oncorhynchus kisutch</u>) were likely extirpated just prior to 1970 after dams were erected on east side tributaries of the Napa River watershed and development of west side watersheds intensified.

<u>Chinook Salmon</u>: The California Coastal Chinook salmon ESU, with which the Napa River population groups, was recognized as threatened in 1999 (NMFS 1999) and their status later confirmed by the National Marine Fisheries Service (NMFS 2006). Napa River Chinook salmon (<u>O. tshawytscha</u>) were thought to be extirpated or nearly so, but hundreds resumed spawning in mainstem reaches after 1999 (Stillwater & Dietrich 2002, Kohler 2005). Koehler and Blank (2010a) found juveniles Chinook rearing consistently in the Napa River from 2004-2010. The Napa River TMDL (SFRWQCB 2010) recommended that Chinook salmon be targeted for recovery as part of efforts to restore Napa River water quality. However, downstream migrant trapping records (Koehler and Blank 2010a) also indicate that there were virtually no Chinook juveniles produced in 2008-2009, a sign of high extinction risk (Riemers et al. 1993).

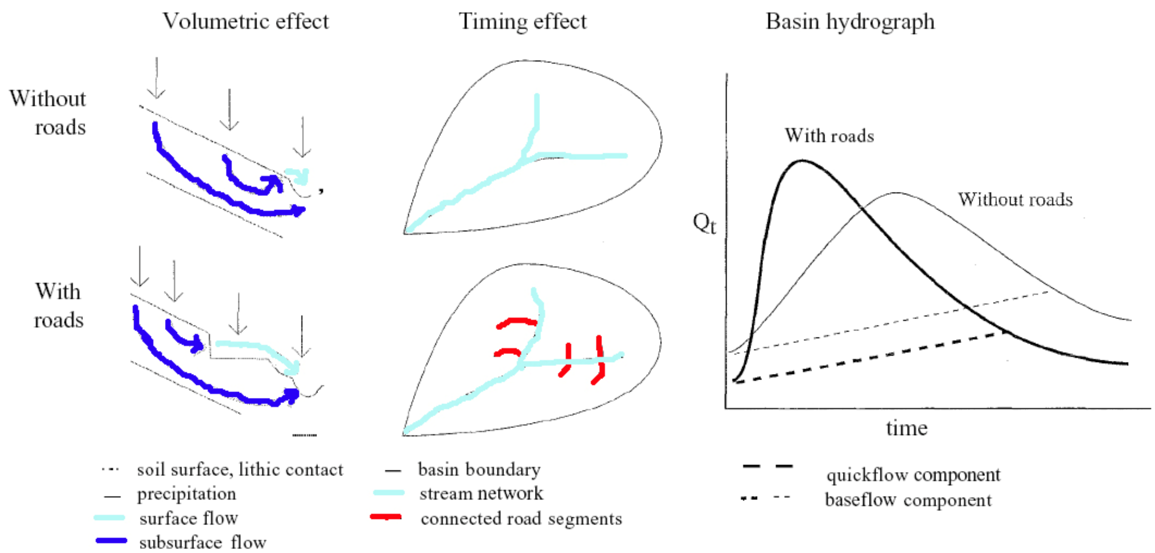

Figure 4. Illustration from Wemple et al. (1996) with color highlights added showing how groundwater storage can be decreased and the timing and magnitude of peak flow altered by road construction.

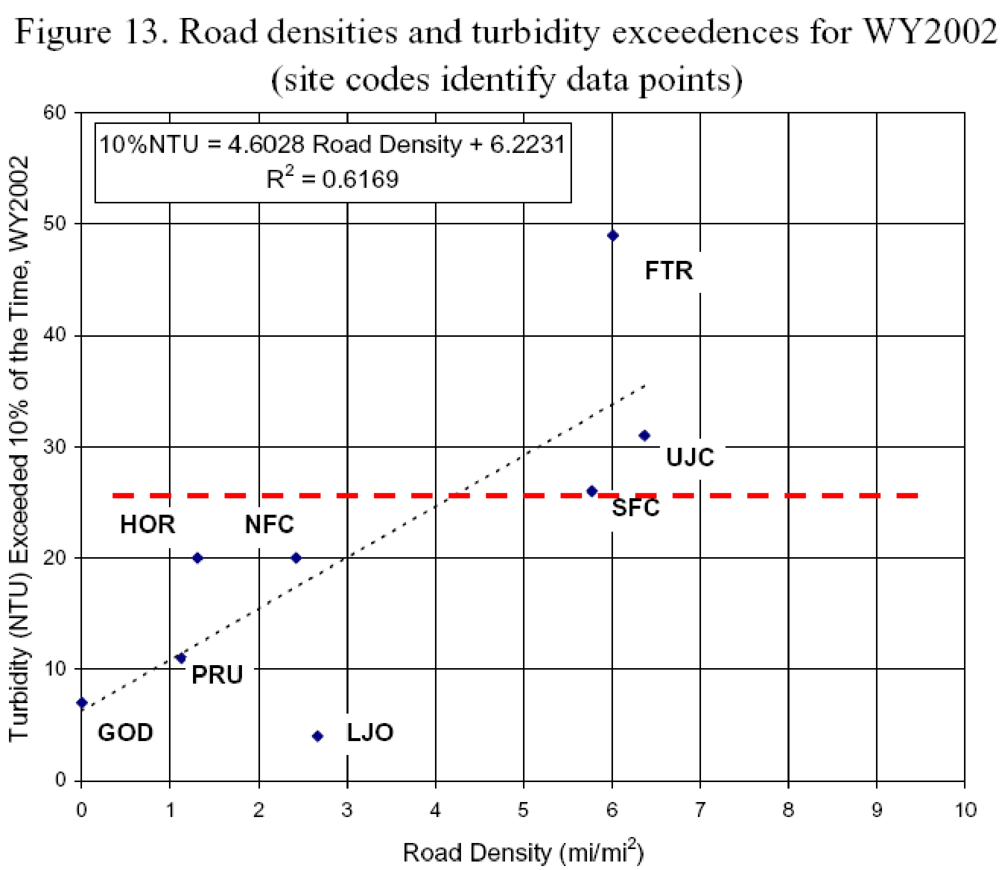

Figure 5. Relationship of road density to turbidity found by Klein (2003) in study of northwestern California watersheds. Threshold of 25 NTU is from Sigler et al. (1983) and denotes feeding impairment for steelhead. Adapted from Klein (2003) Figure 13.

.Historically lower Milliken Creek where it joins the Napa River, and in low gradient reaches extending several miles upstream, would have been ideal Chinook salmon spawning and rearing habitat. Fry and smolts would have been able to thrive in the interconnected wetlands and adjacent San Francisco Bay estuary and these habitats remain partially connected and functional today. The Walt Ranch vineyard project will have significant impacts on ESA-listed Chinook salmon using lower Milliken Creek, yet they are not considered in the DEIR.

> "Two federally listed critical habitats – critical habitat for Central Valley spring-run chinook and critical habitat for the Central Valley fall/late fall-run chinook – were also dismissed from the list, as they do not occur onsite."

<u>Steelhead Trout</u>: Napa River steelhead trout (<u>O. mykiss</u>) are part of the Central California Coast Steelhead Distinct Population Segment (DPS) that was listed as a threatened species (NMFS 1997) and has had its status subsequently reaffirmed (Good et al., 2005). Downstream migrant trapping indicates that production of smolt size steelhead that are known to have optimal chances for survival (Barnhart 1986) is highly variably and very low following drought years (Koehler and Blank 2010a).

Frey (1973) pointed out that the Napa River was a "gaining stream" circa 1972 and before because of groundwater influxes and tributary accretion in the lower river. This made for ideal older age steelhead habitat as they migrated out of small streams after a year or two in residence. Jackson (2009) demonstrated that the Napa River valley floor was being depleted by unsustainable levels of groundwater withdrawals resulting in habitat that favors warmwater species. The mainstem has become uninhabitable in summer, and numerous low gradient reaches are now dry or over optimal temperatures for steelhead rearing

Stillwater and Dietrich (2002) indicated that the run of adult steelhead was less than 200, which would put them potentially at risk because of lack of genetic diversity due to small population size (Gilpin and Soule 1991). Stillwater and Dietrich (2002) also measured flow of tributaries that formerly supported steelhead juveniles (Figure 6) and found levels over one cubic foot per second (cfs) that are mostly likely to provide suitable habitat for steelhead at only two locations in the entire Napa River watershed, upper Murphy Creek and lower Milliken Creek. Thus, flow depletion by the Walt Ranch vineyard development threatens one of the last potential strong holds or refugia for steelhead trout. Koehler and Bland (2010b) found optimal flows for steelhead in lower Milliken Creek were five cfs, yet flows already commonly drop below that level, indicating already advanced flow depletion. The DEIR states:

> "Drainages on the project site do not provide habitat for listed fish species such as steelhead and Chinook salmon, therefore focused surveys for fish were not conducted."

In fact, Leidy et al. (2003) documented reproducing populations of rainbow trout above Milliken Reservoir based on California Department of Fish and Game file memos (Shapavalov 1940a, Evans 1954, Fisher 1959). Dewberry (2003, FONR 2003) found young of the year steelhead in the reach above Milliken Reservoir more recently as well. Dewberry (2004) made the following observations:

> "Above the reservoir, rainbow trout were found in average to above average densities in Milliken Creek. About ½ of the survey reach had trout densities below 0.5 fish per meter squared and about ½ had densities greater than 0.5 fish per meter squared."

Landlocked rainbow trout upstream of anadromous populations have the same genetic make up and can become anadromous when washed downstream, similar to the findings of Titus (1994) regarding southern California steelhead. Consequently, direct impacts of the project are expected to ESA listed steelhead living upstream of Milliken Reservoir.

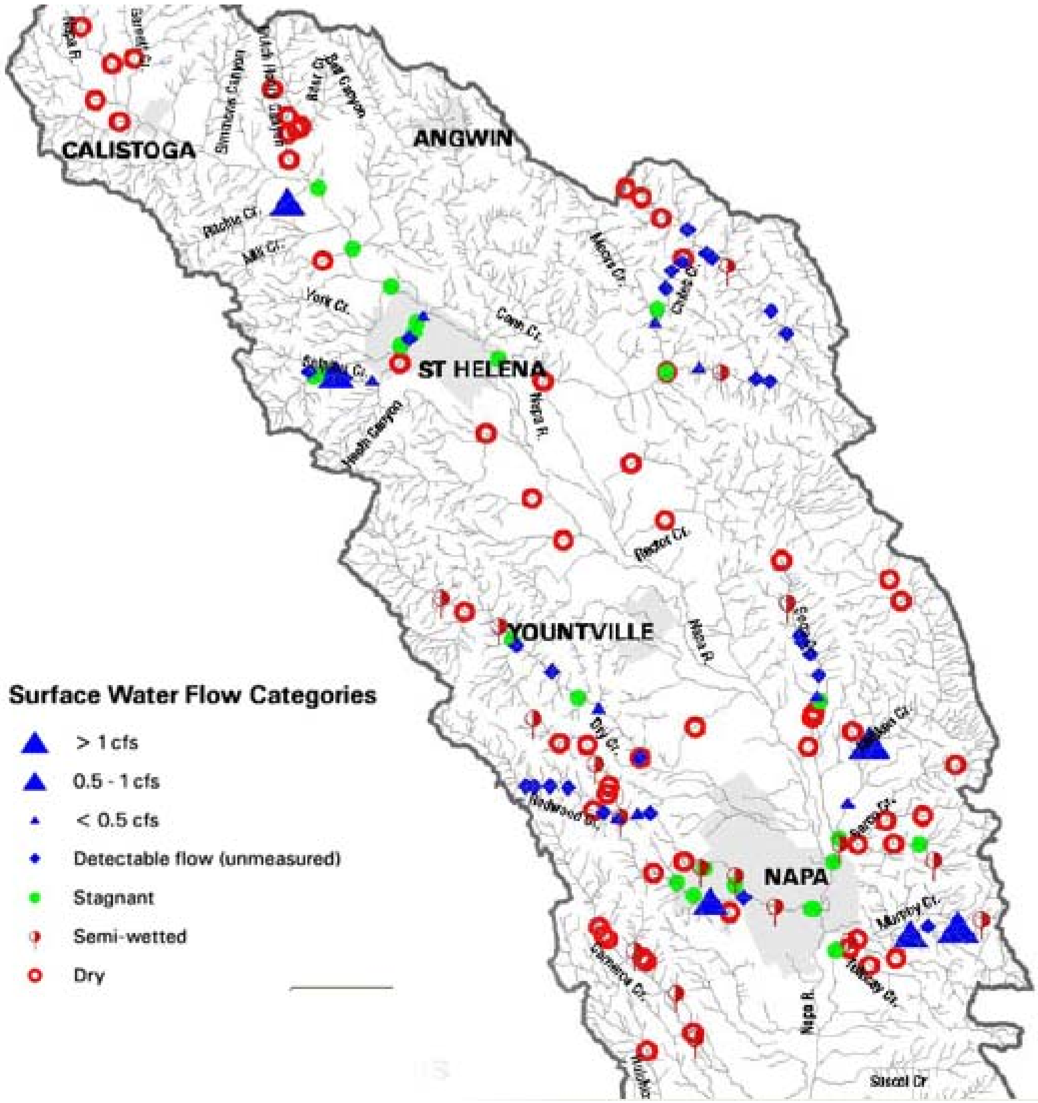

Figure 6. Lower Milliken Creek is one of the last streams in the Napa River basin with flows sufficient to support steelhead trout during low flow periods, especially in dry years. Figure adapted from Stillwater and Dietrich (2002) where it appears as Map 13.

Reduced flow and increased sediment from the Walt Ranch vineyard development will also cause impacts to lower Milliken Creek and steelhead that spawn and rear there. Dewberry (2004) found very high densities of steelhead juveniles below Milliken Canyon but not below the Silverado Country Club. Failure to discuss downstream and offsite impacts in the *DEIR* is not only a deficiency with regard to ESA, it also fails requirements of the California Environmental Quality Act (CEQA) to analyze cumulative effects (Dunne et al. 2001).

Altered Flow and Sediment Regimes and Harm to Pacific Salmon Habitat

As demonstrated above, the proposed land use associated with the Walt Ranch vineyard development will increase peak flows and decrease base flows in upper Milliken Creek, and has the potential to also decrease flows to downstream reaches and down hill wetlands because of the hydrology of the underlying volcanic terrain. Sediment yield from project development will also have impacts both above and below Milliken Reservoir. The DEIR fails to acknowledge the quality of habitat of upper (Figure 7) and lower Milliken Creek (Figure 8) and the significance of these habitats on a Napa River watershed scale to salmon and steelhead. A discussion of Walt Ranch vineyard development impacts on Pacific salmon habitat follows.

Figure 7. Upper Milliken Creek above Milliken Reservoir in the reach where Dewberry (2004) found resident rainbow trout with genes and behavioral capability similar to downstream anadromous steelhead. 11/16/14.

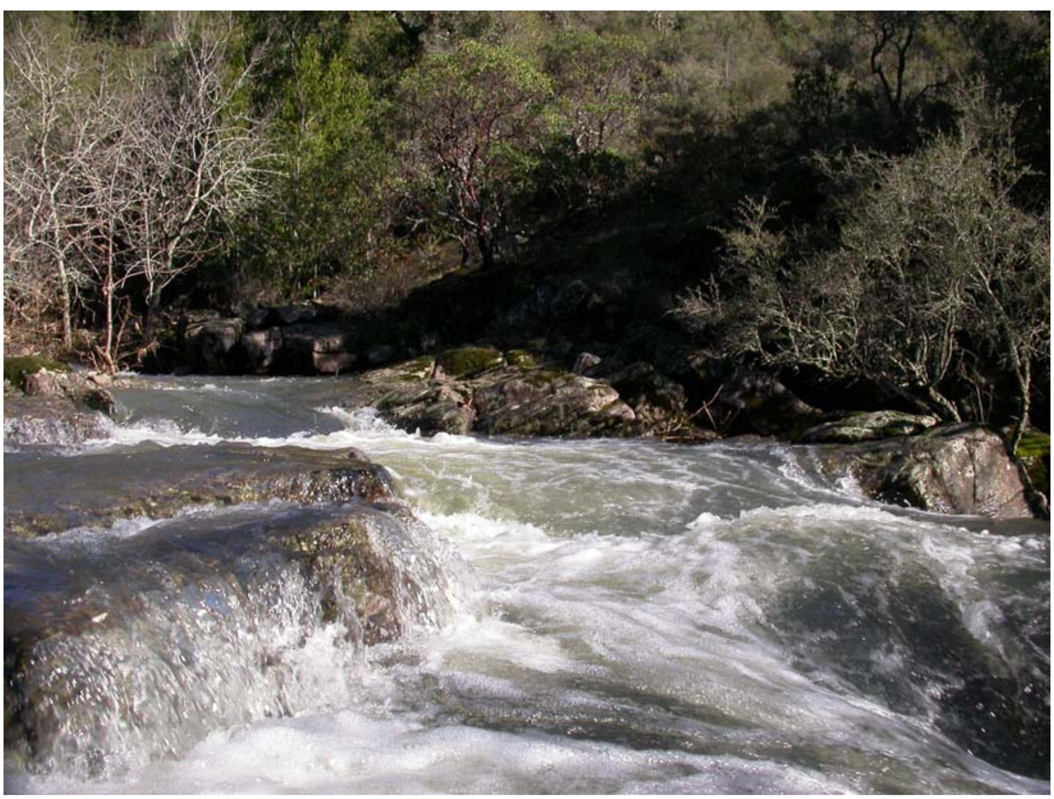

Figure 8 . Lower Milliken Creek. 11/16/14.

Lower Stream Flows: Decreased flows mean less volume of aquatic habitat and ultimately, stream desiccation and complete ecosystem alteration, if flow depletion is not limited. As noted above, Koehler and Bland (2010b) found that lower Milliken Creek already falls below optimum for carrying capacity in the recent years measured. Kamman (2014) demonstrated that the project has a likelihood of causing further depletion. It is highly likely that rainbow trout in upper Milliken Creek are persisting in the reservoir when stream flows are low and water temperatures elevated during droughts. If the project and other developments decrease the volume of the reservoir further, it may pass an ecological tipping point and no longer support rainbow trout. Kamman (2014) notes that wells and ponds developed in association with the project also pose a threat to other sensitive or rare species, such as the western pond turtle, because of disruption of delivery of cold groundwater at locations down slope. Band (2008) points out that the "cumulative impacts of water diversions from all areas of a drainage network require consideration of the network as an entity, and not just the sum of all individual reaches." For example, if the ponds on the Walt Ranch vineyard after completion were being filled at the same time as many others within the Milliken Creek sub-basin during rain event when fish were staging, flows needed for upstream Chinook salmon and steelhead migration to spawning areas at critical times might be cut off.

Increased Water Temperature: The volume and transit time of water are reflected in water temperature (Bartholow 1989); consequently, flow depletion leads to increased water temperatures. Flow depletion of Napa River tributaries has caused most of them to warm to the point where they are no longer optimal for or supportive of steelhead juveniles (Stillwater and Dietrich 2002). Consequently, reduced base flows as a result of the project have potential to substantially elevate the water temperature of upper Milliken Creek and also the creek's lower reaches. This may be especially true if Milliken Reservoir is drawn down and the volume of water there is substantially decreased, stratification breaks down, and warm top waters are delivered downstream.

Increased Peak Flow: Increased peak discharges are likely as a result of the project due to increased road density and concentration of over-land flow (Kamman 2014) and increases in total impervious areas, including ponds associated with vineyard development (Jackson 2009). Increases in peak discharge can overwhelm a salmonid juvenile's ability to maintain position during large storm events, resulting in fish being washed downstream before they had attained a size and age suitable for bay or ocean survival (Spence et al. 1996). Increased peak discharge can also increase bed shear stress, bed load mobility, and egg and alevin mortality of Chinook salmon and steelhead in lower Milliken Creek. Another well recognized problem in the Napa River basin is increased bed erosion and stream incision (Jackson 2009). The *Napa TMDL* (Napolitano et al. 2009) recognized that incision then leads to additional sediment pollution from bank erosion as resulting from down-cutting and over-steepening of banks.

Increased Turbidity: As noted above, road construction, vineyard development, and other vegetation removal will increase fine sediment runoff and; therefore, elevated turbidity in downstream reaches. Sigler et al. (1983) found that elevated turbidity inhibited steelhead juvenile steelhead feeding, growth, and survival. The rhyolitic terrain underlying the Walt Ranch vineyard development site make elevated turbidity likely in upper Milliken Creek immediately below the project, with substantial negative effects on resident trout there. Since the finer fraction of sediment remains in suspension for some time, there is also a likelihood that fines will be transported to lower Milliken Creek through the reservoir and; therefore, will negatively impact both steelhead and Chinook salmon spawning and rearing there.

Fine Sediment in Stream Gravels: The fine sediment coming off the Walt Ranch vineyard development would also cause problems as it infiltrates into the stream bed. Poole and Berman (2001) note that such sediment can decrease salmonid egg and alevin survival, reduce aquatic macroinvertebrate and salmonid food production, and can block hyporheic connections that can help keep surface waters cool. Such fine sediment impacts are likely in both upper and lower Milliken Creek if this project is implemented. Fines less than 1 mm in diameter that are most likely to be transported downstream are those known to most seriously effect egg and alevin survival (McNeil and Ahnell 1964, McHenry et al. 1994).

Aquatic Macroinvertebrate Data Indicative of Napa River and Milliken Creek Health

Dewberry (2004) collected macroinvertebrate data for the Friends of Napa River and EcoTrust from streams throughout the Napa River watershed in 2002 following standard protocols for data collection, and with analysis performed by certified specialists. Data and reports can be accessed at the Institute for Conservation Advocacy Research and Education (ICARE) website (www.icarenapa.org). While results cover many different metrics for analysis, the EPT index is used for comparison and discussion here. This index is the number of taxa there are in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (cadddisflies). Most of the species in these orders are intolerant of pollution and their diversity is a reflection of the level of water quality impairment.

Napa River basin-wide EPT data show a wide array of values with many very low scores indicating severe aquatic ecosystem impairment (Figure 9). Extremely impaired sites are those with fewer than 10 EPT taxa, which includes the following creeks: American Canyon, Blossom, Canon, Conn, Fagan, Huichica, and Salvadore. Most of these are lower elevation sites with substantial suburban or urban development, which is known to correlate with low biodiversity (May et al. 1996). Scores in the higher ranges include creeks, such as Mill, Moore, Nash, Rector and Richie, which are also streams where flows are most robust. Milliken Creek sites fall within the middle to lower spectrum when compared to basin-wide scores, although there is considerable diversity of EPT scores within the basin.

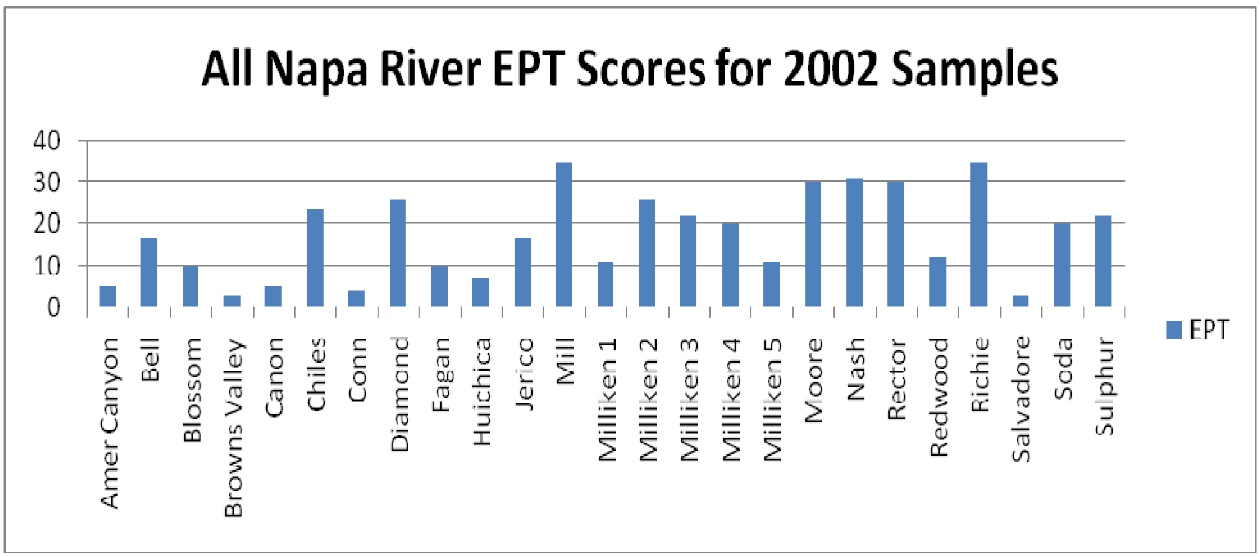

Figure 9. EPT scores from 2002 samples at 25 Napa River locations. Data from Dewberry (2004)

Within the Milliken Creek basin, the downstream and upstream locations had lower EPT scores (11), while those in the middle reaches had intermediate values (20-26)(Figure 10). Dewberrry (2004) notes that values in lower Milliken Creek likely reflect development upstream that includes suburban and urban development, vineyards, and a large golf course. The stations upstream of Milliken Reservoir had the benefit of perennial flow, while Dewberry (2004) thought that the upper-most sampling station at Atlas Peak Road had a very low score because of flow impairment.

EPT scores suggest that the middle reach of Milliken Creek above Milliken Reservoir and below the proposed Walt Ranch vineyard development has the most biodiversity in the basin. Flow depletion as a result of the project would likely seriously compromise stream health and cause a decline in macroinvertebrate abundance and diversity. Furthermore, upstream low scores indicate likely advanced cumulative effects from existing vineyard development in Foss Valley upstream of the proposed Walt Ranch project, not acknowledged in the *DEIR*. Similarly, the low scores below Silverado Avenue reflects cumulative effects there.

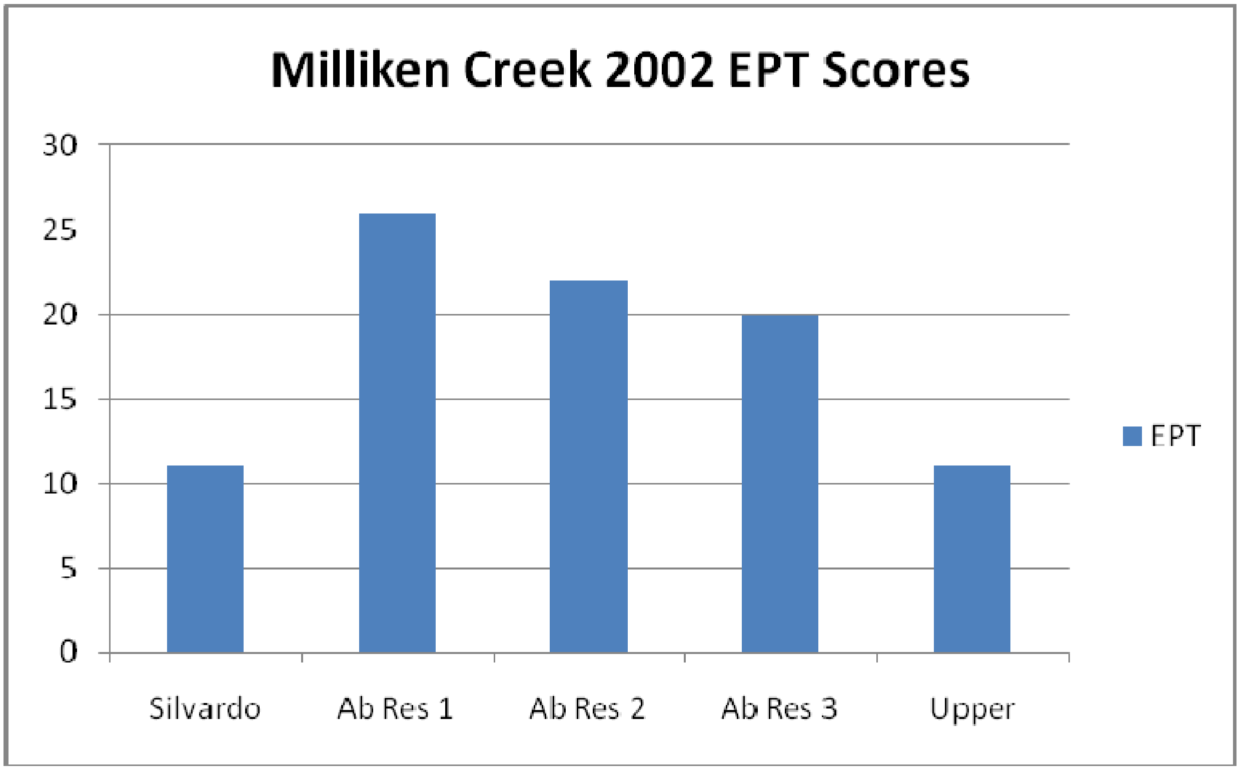

Figure 10. EPT scores within the Millien Creek watershed show most serious impairment in upper and lower reaches and highest diversity above Milliken Reservoir and below the proposed project. Data from Dewberry (2004).

Cumulative Watershed Effects Considerations

Existing cumulative effects in the Napa River watershed are widespread (Figure 11 & 12) and the Walt Ranch vineyard development will contribute to these effects in ways that cannot be mitigated. The *DEIR* does not address almost any of these effects as noted by Kamman (2014): "Runoff and erosion potential analyses were completed in a compartmentalized fashion, without regard to findings and potential impacts from their mutual effect and recommendations." The hydrologic and sediment impacts of this project will have irretrievable and irreversible effects on resident trout, anadromous steelhead trout, and Chinook salmon in Milliken Creek immediately downstream of the project all the way to where it converges with the Napa River. The *DEIR*'s failure to discuss cumulative watershed effect makes it deficient with regard to compliance with CEQA.

On site mitigations are not successful when the watershed as a whole is over its thresholds of disturbance (Collison et al. 2003). Dunne et al. (2001) point the problem that arises when projects are looked at individually and not in conjunction with all activities in a watershed. They warn that at-risk populations of aquatic and terrestrial species can be lost, if cumulative effects are ignored and anthropogenic stressors continued:

> "The concern about cumulative effects arises because it is increasingly acknowledged that, when reviewed on one parcel of terrain at a time, land use may appear to have little impact on plant and animal resources. But a multitude of independently reviewed land transformations may have a combined effect, which stresses and eventually destroys a biological population in the long run."

The reason that Milliken Creek has maintained flow, steelhead and resident trout is because the volcanic terrain in its upper watershed stores and releases cold groundwater throughout the year. These bounteous waters on which the stream relies are also those that would be extracted by the Walt Ranch vineyard development and even transported out of the basin to water grapes in the Capell Creek watershed.

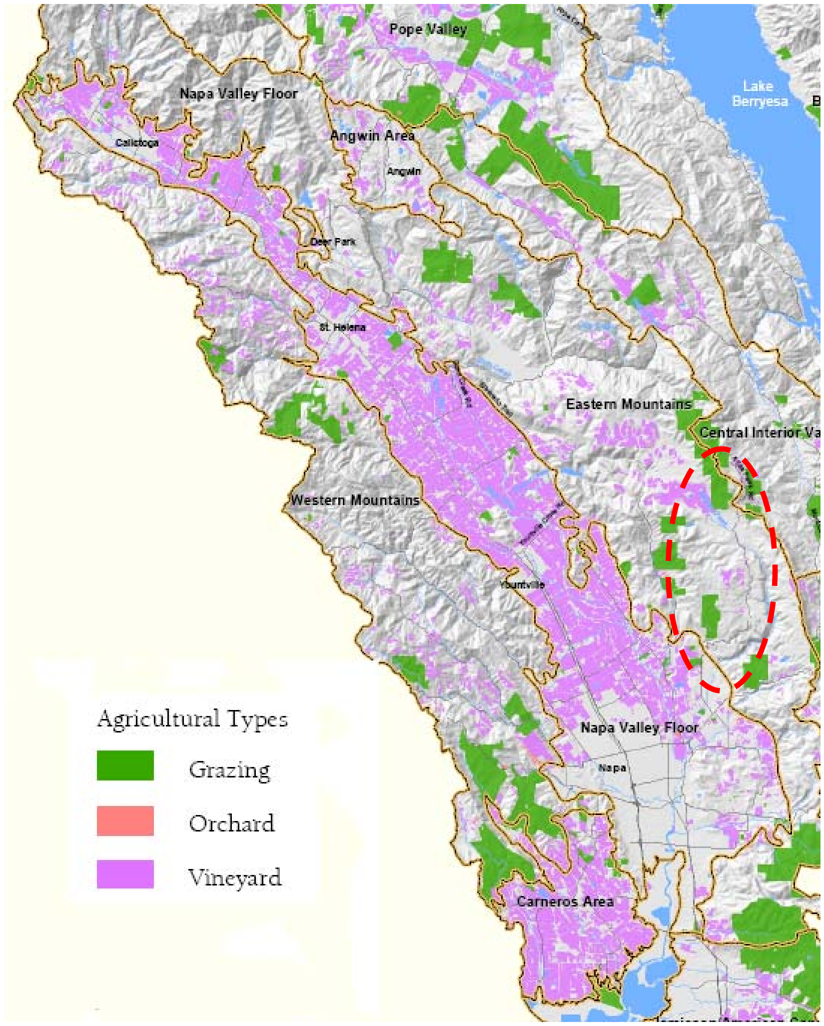

Figure 11. Land use map from Watershed Information Center and Conservancy (WICC 2014) shows that virtually the entire Napa Valley floor is in vineyards and the upper Milliken Creek watershed still retains a substantial wildland component.

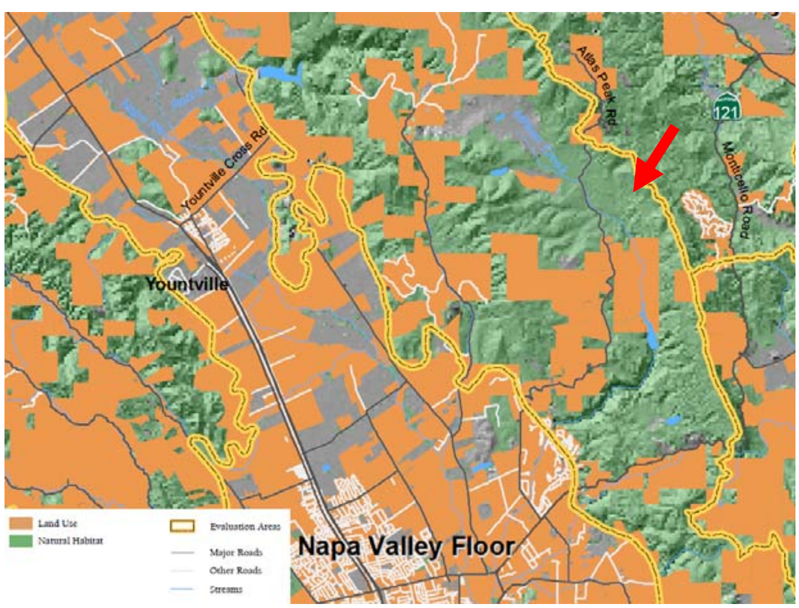

Figure 12. Land use map of the lower Napa River basin shows that upper Milliken Creek has low impacts. Red arrow is approximate location of Walt Ranch project in the middle of an intact watershed area.

Reeves et al. (1995) and Bisson et al. (2009) both found that, in order to restore conditions suitable for at-risk Pacific salmon species, watershed processes including flows need to mimic those with which they co-evolved. Bisson et al. (2009):

> “Management of the freshwater habitat of Pacific salmon should focus on natural processes and variability rather than attempt to maintain or engineer a desired set of conditions through time.”

The current pattern of land and water use in the Napa River watershed does not mimic the natural “patch” disturbance regime that would have prevailed before European colonization. Such widespread development and land use is termed by scientists as a “press disturbance” (Reeves et al. 1995) where the timing and amount of sediment, large wood and water contributed to the Napa River have no resemblance to historic norms with which Pacific salmon co-evolved and; therefore, Pacific salmon species are going extinct.

Milliken Creek represents some of the last, best habitat for salmonids and needs to be protected as a source of colonists, if steelhead in other Napa River sub-basins are to be restored. Upper Milliken Creek resident trout also represent important gene resources for basin-wide steelhead restoration. Bradbury et al. (1995), in reference to Pacific salmon restoration, point out that habitat “protection can be effective in the absence of restoration, but restoration cannot be effective without protection.”

Today many San Francisco Bay tributaries have very limited habitat and salmon and steelhead populations (Leidy et al. 2003). Therefore, there is no source of colonists to re-start the Napa River steelhead population in the event that the local population is lost, which makes protection of Milliken Creek’s lower and upper watershed steelhead populations even more important. Conversely, genes from native Napa River steelhead could be used to restore other San Francisco Bay tributaries, if they recover in the future.

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