



December 24, 2015

Cal Fire - Forest Practice Program Manager
135 Ridgeway Ave,
Santa Rosa, California 95401
santarosapubliccomments@calfire.ca.gov

Subject: THP 1-15-042 SON (Gualala Redwoods Inc. "Dogwood" THP)

Dear CAL FIRE:

I am a hydrologist with over twenty five years of technical and consulting experience in the fields of geology, hydrology, and hydrogeology. I have been providing professional hydrology services in California since 1991 and routinely manage projects in the areas of surface- and groundwater hydrology, water supply, water quality assessments, water resources management, and geomorphology. Most of my work is located in the Coast Range watersheds of California, including the Central and Northern California Counties. My areas of expertise include: characterizing and modeling watershed-scale hydrologic and geomorphic processes; evaluating surface- and ground-water resources/quality and their interaction; assessing hydrologic, geomorphic, and water quality responses to land-use changes in watersheds and causes of stream channel instability; and designing and implementing field investigations characterizing surface and subsurface hydrologic and water quality conditions. I co-own and operate the hydrology and engineering consulting firm Kamman Hydrology & Engineering, Inc. in San Rafael, California (established in 1997). I earned a Master of Science in Geology, specializing in Sedimentology and Hydrogeology as well as an A.B. in Geology from Miami University, Oxford, Ohio. I am a state Certified Hydrogeologist (CHg) and a state registered Professional Geologist (PG).

I am very familiar with hydrologic and geomorphic conditions within the Gualala River watershed as I have completed numerous technical studies within the watershed since 2002. A list of documents that I've authored as part of this work are provided in Attachment A.

I have reviewed the recently resubmitted Dogwood THP, prepared by Gulalala Redwoods, Inc. Based on my review, I believe the THP does not sufficiently analyze potential adverse impacts on water quality conditions of the Gualala River. Specifically, it is my professional opinion that the THP has not demonstrated that removing trees from the river floodplain would lead to increases in both sediment loads and water temperature in the Gualala River. The following statement on page 27 of the THP concerns me in particular; *"Experience in these zones that affect hydraulic roughness have shown that generally hydraulic roughness is increased by operation. No large woody debris in the flood prone area will be harvested but some may be taken from the flats and used to*

enhance LWD in the channels with agency agreement.” Based on my experience and expertise in hydrology and geomorphology, I believe that removing a significant proportion of standing trees and understory vegetation (to access the trees) will reduce both hydraulic roughness and sediment trapping ability. These actions also have the potential to alter riparian microclimate conditions that lead to increases in air temperature and, in turn, potential adverse impacts on riparian/aquatic vegetation and wildlife.

The importance of the Gualala River floodplain in trapping sediment before it reaches the mainstem channel is espoused in the following statement found at the top of page 150. *“Along the Gualala River there are extensive alluvial terrace deposits that are covered with second growth redwood forest. These alluvial flats act as a buffer between the steeper upslope areas, from which sediment is migrating, and the major watercourses. Sediment that is carried from transport reaches in steep class I, II and III watercourses at the headwaters of the watershed units drop out of suspension as they cross the lower gradient storage reaches that occur adjacent to the river. Also, class III watercourses that feed directly into the alluvial flats disappear into the sandy soil without contributing their sediment load directly to higher order watercourses.”* The existing floodplain plays an important role in reducing sediment loads to a sediment impaired river. An important contributor to the sediment trapping characteristics of this floodplain is the hydraulic roughness generated by, *“Moderately to densely spaced 2nd growth redwoods in the 12 to 36 inch dbh size classes.”* In their 2005 guidance document for timber operations in flood prone areas¹, the California Department of Forestry and Fire Protection’s Riparian Protection Committee (RPC) states (page 13), *“The function of vegetative roughness will need to be identified and protected in the planning of timber harvesting operations on flood prone areas.”* The RPC goes on to outline a standard USGS field method for determining floodplain hydraulic roughness by quantifying tree stand density and how the associated hydraulic roughness changes in response to timber operations². Given the current elevated sediment loads contributing to the degraded ecological condition of the Gualala River and the stated importance of the floodplain in reducing sediment loads to the river, it would seem prudent to better evaluate how the Dogwood THP will alter floodplain roughness. The THP does not provide any analysis on the effects of timber operations on floodplain roughness and associated sediment trapping processes. In my opinion, I would expect the hydraulic roughness of the floodplain to decrease in response to tree removal. Reducing the hydraulic roughness of the floodplain will reduce the sediment trapping efficiency and allow higher and unmitigated sediment loads to reach the mainstem.

The THP also does not present any technical analyses on how timber operations may impact air and water temperatures within and adjacent to the river. The THP presents an assumption that the 30-foot buffer adjacent to the river will maintain existing levels of shade and there will be no impact to water temperatures. However, the RPC’s 2005

¹ California Department of Forestry and Fire Protection, 2005, Flood Prone Area Considerations in the Coast Redwood Zone. Report prepared by the Riparian Protection Committee, November, 67p.

² The 2005 RCP recommendations also include the need and methods for identifying the frequency overbank inundation to determine the floodplain sensitivity to timber operations. No such analysis or determination is presented in the Dogwood THP.

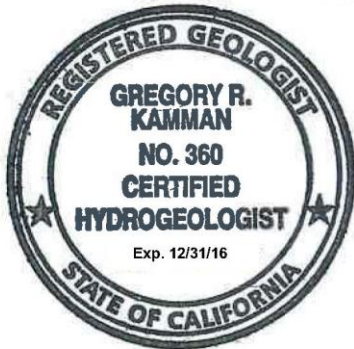
guidance document states that, “*Past research has shown that streamside vegetation can have a significant influence on local microclimate parameters near a stream channel.*” An important function of floodplain vegetation is to moderate riparian microclimate conditions (air temperature, relative humidity, soil temperature, soil moisture, etc.). The 2005 RCP document presents data and case studies that show how adverse effects on microclimates due to timber harvest along streams can propagate well over 30-feet. Yet, even with the RCP recommendations developed to help guide THP preparation, the Dogwood THP does not present any analysis of potential impacts to riparian microclimates associated with proposed timber operations. Therefore this potential adverse impact remains unresolved.

Given the Gualala River is a sediment and temperature impaired waterway, it is my opinion that State resources agencies should not approve the Dogwood THP until it can demonstrate that proposed timber harvest actions will not lead to increases in sediment loads, degraded riparian microclimates, and the associated impacts to the Gualala River ecosystem. Please feel free to contact me by phone (415-491-9600) or email (greg@khe-inc.com) if you have any questions or would like to discuss this letter further.

Sincerely,



Greg Kamman
Principal Hydrologist



ATTACHMENT A
List of Kamman's Gualala River Study Reports, Declarations and Presentations

- Bowen, M., Kamman, G.R., Kaye, R. and Keegan, T., 2007, Gualala River Estuary assessment and enhancement plan. Estuarine Research Federation, California Estuarine Research Society 2007 Annual Meeting, 18-20 March, Bodega Marine Lab (UC Davis), Bodega Bay, CA
- Ecorp Consulting, Inc and Kamman Hydrology & Engineering, Inc., 2004, Draft Gualala Estuary and Lower River Enhancement Plan: Results of 2002 and 2003 Physical and Biological Surveys. Prepared for: Sotoyome Resource Conservation District and California Coastal Conservancy, June 10.
- Kamman, G.R., 2015, THP 1-15-042 SON (Gualala Redwoods Inc. "Dogwood" THP) and THP 1-15-033 SON (Gualala Redwoods Inc. "Apple" THP). Letter to Cal Fire – Forest Practice Program Manager, August 6, 8p.
- Kamman, G.R., 2012, Adequacy of Applicant Responses to Comments on FEIR, Fairfax Conversion Project (SCH# 2004082094). Memorandum prepared for Friends of the Friends of the Gualala River, May 31, 3p.
- Kamman, G.R., 2012, Review of Mitigated Negative Declaration, Ratna Ling Buddhist Retreat Master Plan, File No.: PLP08-0021. Professional declaration prepared for Friends of the Gualala River, April 4, 5p.
- Kamman, G.R., 2009, Fairfax Conversion Project Environmental Impact Report (SCH# 2004082094). Professional declaration prepared for Friends of the Gualala River, July 27, 15p.
- Kamman, G.R., 2007, Negative Declaration for File No. UPE04-0040, Gualala Instream. Professional declaration prepared for Friends of the Gualala River, October 21, 2p.
- Kamman, G.R., 2004, Evaluation of potential impacts on hydrology and water supply, THP No. 1-04-055 SON and Proposed Mitigated Negative Declaration TCP No. 04-533, Roessler/Zapar Inc. THP/Conversion, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, August 13, 11p.
- Kamman, G.R., 2004, Evaluation of potential hydrologic effects, THP No. 1-04-059 SON and Proposed Mitigated Negative Declaration TCP No. 04-531, Sleepy Hollow (Martin) THP/Conversion, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, July 17, 9p.
- Kamman, G.R., 2003, Evaluation of potential hydrologic effects, Negative Declaration for THP/Vineyard Conversion, No. 1-01-171 SON, Artesa Vineyards, Annapolis, CA. Professional declaration prepared for Friends of the Gualala River, May 19, 9p.
- Kamman, G.R., 2002, Flow Monitoring and Analysis of Baseflows on the North Fork Gualala River. Study completed on behalf of the California Coastal Conservancy.