State of California Natural Resources Agency

Memorandum

To: Mr. Matthias St. John
Executive Officer
North Coast Regional Water Quality
Control Board

Attn: Mr. James Burke

Date: April 16, 2019

Telephone: (916) 653-7772

Website: www.fire.ca.gov

From: Thomas W. Porter
Director

California Department of Forestry and Fire Protection (CAL FIRE)

Subject: CAL FIRE Comment to NCRWQCB on Draft Order No. R1-2019-0021

Thank you for the opportunity to comment on draft Order No. R1-2019-0021, Waste Discharge Requirements for Nonpoint Source Discharges and Other Controllable Water Quality Factors Related to Timber Harvesting and Associated Activities Conducted by Humboldt Redwood Company, LLC, in the Upper Elk River Watershed, Humboldt County. CAL FIRE offers the following comments on three aspects included in the draft Order: (1) expanded riparian buffer strip requirements, (2) wet weather hauling restrictions, and (3) seasonal shut down dates.

As we stated in an earlier letter to you dated January 26, 2016, CAL FIRE Watershed staff were heavily involved in development of the Anadromous Salmonid Protection (ASP) Forest Practice Rule requirements, including those for adequate watercourse protection zones. This work included conducting a detailed review of the scientific literature available on this subject. CAL FIRE staff also participated in the PALCO HCP-SYP development in 1997-1998, including riparian protection zone measures. Current timber operations in HCP riparian management zones (RMZs) must comply with Elk River watershed analysis prescriptions. As stated in the existing Order, the prescriptions for RMZs include no harvest within 50 feet of Class I and 30 feet for Class II watercourses, and large tree and canopy retention requirements throughout the remainder of the RMZ (150 feet for Class I watercourses). Silvicultural treatments in RMZs must be used to develop late seral forest conditions, such as thinning from below or single tree selection. As stated in the HRC Report of Waste Discharge (ROWD), additional harvest restrictions can be applied up to 400 feet slope distance from the watercourse, dependent upon watercourse classification and slope condition.

The current draft Order states that RMZs are to extend up to 300 feet on either side of the channel for Class I and II watercourses, and 150 feet for Class III watercourses (i.e., TMDL RMZs). The draft Order includes "This Order incorporates HCP RMZ prescriptions for riparian protection as minimum protection standards but includes additional requirements within the TMDL RMZs that achieve the following objectives: extend protections upslope beyond the HCP RMZ widths, provide post-harvest tree retention standards, minimize ground disturbing activities, and eliminate activities near sensitive

areas. Table 2, Hillslope Water Quality Indicators and Numeric Targets, in the approved TMDL states that the expanded riparian zones are for "improvement in the quality/health of the riparian stand so as to promote (1) delivery of wood to channels, (2) slope stability, and (3) ground cover."

CAL FIRE finds, as stated in our January 26, 2016 letter, that since HRC is only using unevenaged management silvicultural systems upslope of the RMZs, it does not appear that this level of riparian protection is necessary for HRC Elk River plans. For example, many studies support the contention that riparian processes (e.g., shading, nutrient input, sediment filtration/buffer for ground disturbance) are generally subsumed within the streamside zone for large wood recruitment (e.g., Benda 2008), and that most large wood (90%) is recruited from within 30 m (~100 feet) of channel banks in managed coastal California forests (Benda and Bigelow 2014). Large wood recruitment source distances can be further where the dominant input mechanism is from landslide input (Naiman et al. 2000, Benda and Associates 2004, Benda and Bigelow 2014). The need for additional RMZ protection measures beyond the Forest Practice Rule and HCP standards, including expanded RMZ width in landslide prone terrain and areas with high windthrow potential, can be successfully determined by the RPF and interagency Review Team field participants on a project-by-project basis, as part of THP development and review, as has been occurring since the implementation of Order No. R1-2016-0004. Additionally, item 41 in the revised draft Order states that HRC's modeled harvest rates from Figure 4.3 of the ROWD will comply with hillslope numeric targets for peak flow. Therefore, it appears that additional post-harvest tree retention standards with wider RMZs to address changes in peak flows are not required, and are not a justification for increased RMZ width.

HRC monitoring results for the HCP standards, as well results from the Railroad Gulch BMP Evaluation Project (Stubblefield et al. 2017), should be used to modify the current FPR/HCP RMZ standards if they are found to be inappropriate. To date, the Railroad Gulch BMP Evaluation Project has not identified riparian buffer strip width as a contributing factor for management-related sediment generation (Stubblefield et al. 2019).

The draft Order TMDL RMZ width standards resemble the FEMAT standards (FEMAT 1993), which were intended to be interim standards which would apply only until detailed watershed analyses were completed. The FEMAT standards were deliberately made very conservative given the limited knowledge available at the time and the understanding that they would be reexamined on a watershed by watershed basis as the analyses were completed. The FEMAT standards were also deliberately made conservative to compensate for the more intensive use of private lands expected to result from the adoption of the stricter standards on federal land. As developed, the FEMAT standards were not intended to be applied to privately owned lands. With regard to the role of nonfederal lands in the implementation of the Aquatic Conservation Strategy, the FEMAT authors did not suggest the application of FEMAT standards. Rather they stated that "the provincial and watershed planning process is also intended to facilitate working with the states on Section 4(d) rules for improved clarity and certainty under the "take" provisions of the Endangered Species Act (FEMAT, V-60)" (FEMAT1993). Additionally, the peer review panel assembled for the adjacent Freshwater Creek watershed analysis did not find that riparian buffer width standards resembling those specified by FEMAT were necessary or appropriate (Pyles et al. 2002).

A notable omission from the draft Order and supporting documents is an evaluation of the proportion of HRC's Elk River holdings within the proposed riparian buffers. To address

this, CAL FIRE staff performed this analysis in ArcGIS Pro using THP-mapped watercourses and HRC property boundaries. When the proposed buffers are applied to the HRC's holdings within Elk River, we see that the majority of the watershed falls within riparian buffers (Attachment A). Further analysis shows that approximately 39 percent of HRC's holding fall within Class I and/or Class II riparian buffers, and approximately 22 percent fall within Class III riparian buffers (Attachment B). Altogether, approximately 61 percent of HRC's Elk River holdings fall within the draft Order's proposed riparian buffers. The accuracy of this estimate is dependent upon the quality of the THP-mapped watercourse data used in the analysis. It is also notable that expanded riparian buffers do not stop at the hydrologic divide (i.e., ridgetops).

Given the large proportion of HRC's Elk River ownership that falls within the draft Order's proposed buffers (i.e., approximately 61 percent), these expanded riparian buffers should have a clear process-based and evidence-supported linkage to water quality. Items 43 and 44 of the draft Order state multiple rationale for why increased riparian buffer expansion relate to hillslope water quality indicators and will achieve hillslope targets listed in TMDL Table 2. However, the effectiveness of the specific widths of the proposed riparian buffers in the draft Order are not supported by the published or gray literature, or evidence provided in the draft Order. Even if evidence supported the effectiveness of the increased buffers, the expanded riparian buffers generally apply to mitigating a relatively small proportion of the anthropogenic sediment load (i.e., primarily low order channel incision and lateral bank erosion) identified in the Tetra Tech Report (2015) and the "Peer Review Draft: Staff Report to Support the Technical Sediment Total Maximum Daily Load for the Upper Elk River" (NCRWQCB, 2013). These points have been raised in detail when expanded buffers were recommended for a 2016 HRC Elk River watershed THP (Coe, 2016; see Attachment C).

CAL FIRE does not contest the newly proposed wet weather hauling restrictions and seasonal shut down dates. Based on our Humboldt-Del Norte Foresters observations and our knowledge and experience, we believe that these changes are appropriate.

Thank you for the opportunity to comment on draft Order No. R1-2019-0021. If you have any questions or comments regarding this letter, please do not hesitate to contact Drew Coe (530-224-3274, drew.coe@fire.ca.gov) and Pete Cafferata (916-653-9455, pete.cafferata@fire.ca.gov) of my staff.

References

Benda, L. 2008. Riparian zones of influence and implications for riparian management in California. Unpublished report submitted to the California Department of Forestry and Fire Protection as part of Agreement No. 8CA07013/8CA00035. Sacramento, CA. 42 p.

Benda and Associates. 2004. Little North Fork Noyo River wood budget, Mendocino County, California. Unpubl. Final Report prepared for Campbell Timberland Management, Fort Bragg, CA. Lee Benda and Associates, Inc., Mt. Shasta, CA. 45 p.

Benda, L. and P. Bigelow. 2014. On the patterns and processes of wood in northern California streams. Geomorphology 209: 79-97.

Coe, D. 2016. Memorandum sent to Dr. Helge Eng, California Department of Forestry and Fire Protection, Sacramento, CA, dated September 19, 2016, titled Hydrologic Review of THP 1-16-056 HUM. California Department of Forestry and Fire Protection, Redding, CA. 22 p.

FEMAT (Forest Ecosystem Management Assessment Team). 1993. Forest ecosystem management: an ecological, economic, and social assessment. Portland, OR: U.S. Department of Agriculture; U.S. Department of the Interior.

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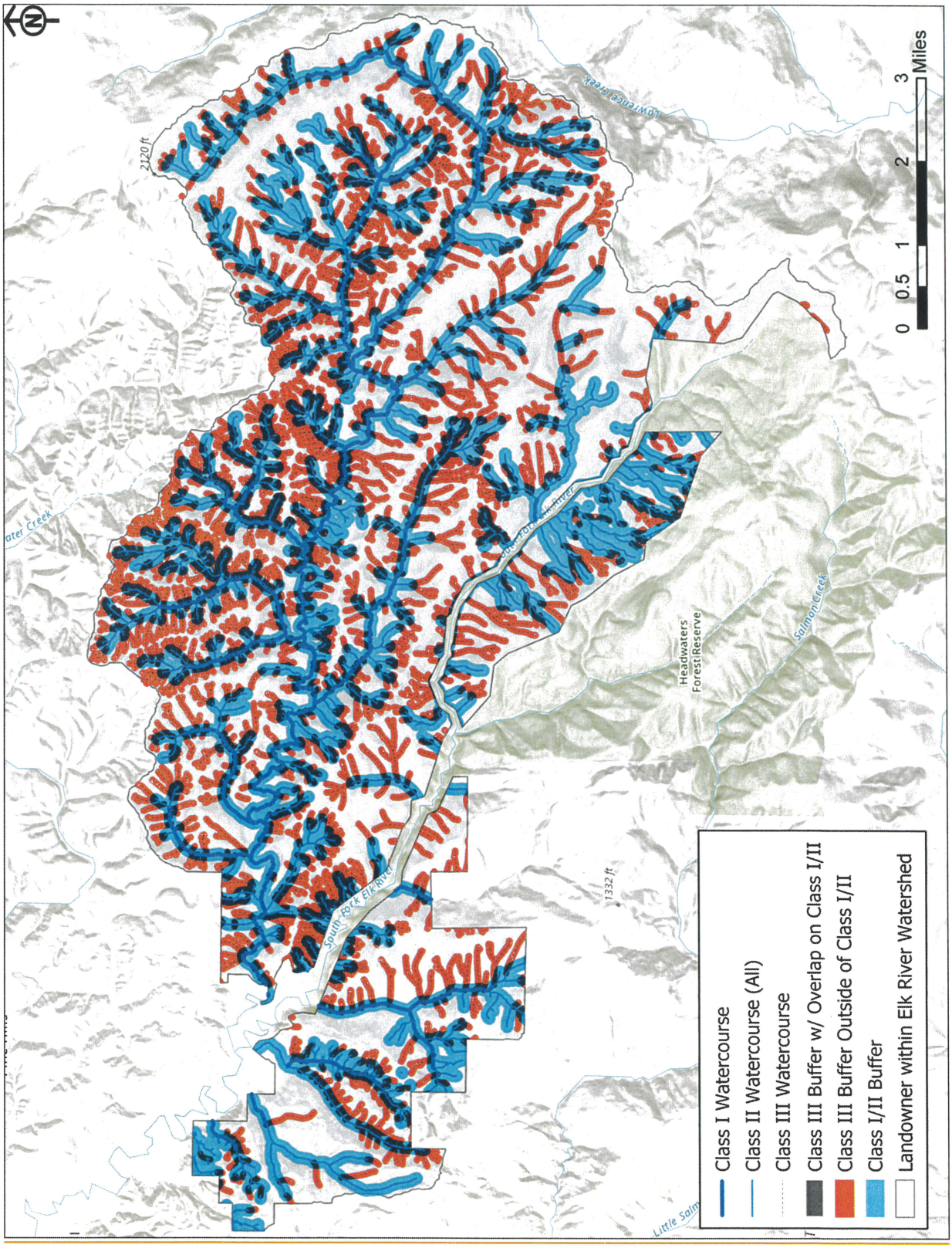
Pyles, M.R., R.A. Macedo, W.F. Megahan, and J. Tappeiner. 2002. Analysis and responses regarding prescriptions for the Freshwater Creek watershed. Watershed Analysis Peer Review Panel commissioned under The Pacific Lumber Company Habitat Conservation Plan. 43 p.

Tetra Tech, Inc., 2015. Upper Elk River: Technical Analysis for Sediment. Prepared for Environmental Protection Agency, Region 9 and North Coast Regional Water Quality Control Board. Fairfax, VA.

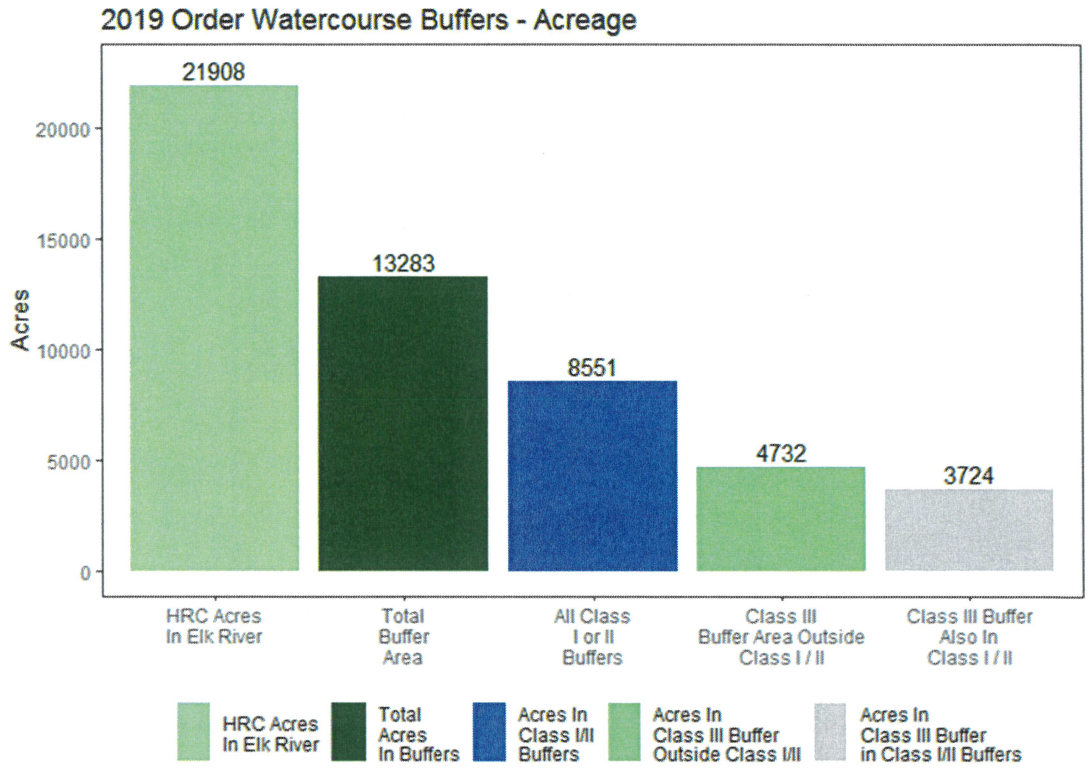
Stubblefield, A.P., S. Beach, N.M. Harrison, and M. Haskins. 2017. Watershed-scale evaluation of Humboldt Redwood Company's Habitat Conservation Plan Timber Harvest Best Management Practices, Railroad Gulch, Elk River, California. Pgs 105-115 in: R.B. Standiford, R. and Y. Valachovic (Technical Coordinators) Proceedings of the Coast Redwood Science Symposium – 2016: Past Successes and Future Directions. Gen. Tech. Rep. GTR-PSW-258. Albany, CA: U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station.
https://www.fs.fed.us/psw/publications/documents/psw_gtr258/psw_gtr258_105.pdf

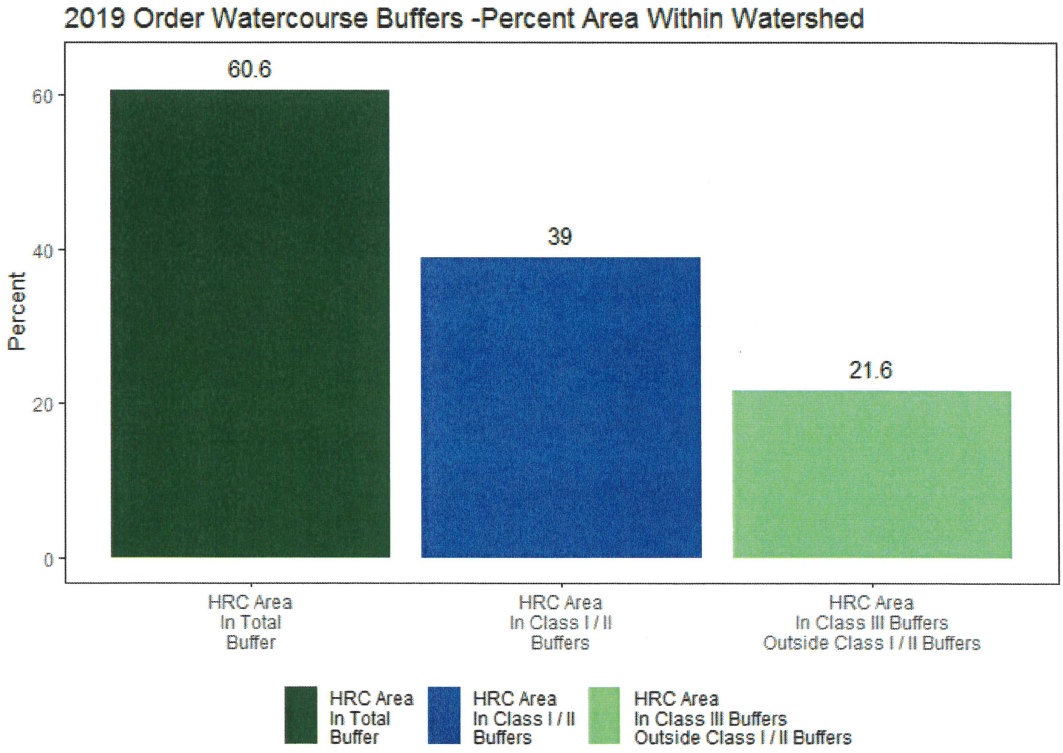
Stubblefield, A.P., M. Sparacino, S. Beach, N. Harrison, and C. Faubion. 2019. Railroad Gulch, Elk River Watershed Best Management Practices Evaluation Progress Report: Monitoring In-Stream Effectiveness and Timber Harvest Plan Implementation Water Year 2016 and 2017. Humboldt State University and Humboldt Redwood Company. Arcata, CA. 67 p. plus appendices.

Attachment A. A visual representation of the draft Order's proposed riparian buffers.



Attachment B. Acreage and areal proportion of HRC's Elk River holdings that fall within the draft Order's proposed riparian buffers.





Attachment C. Hydrologic Review of THP 1-16-056 (Coe 2016)

State of California — The Natural Resources Agency

Memorandum

To: Dr. Helge Eng, Deputy Director
California Department of Forestry and
Fire Protection, Sacramento Headquarters

Attention: Mr. Dominik Schwab, Forester III
Forest Practice Manager; North Coast Region

Date: September 19, 2016

Telephone: (530) 224-3274

Website: www.fire.ca.gov

From: Drew Coe, Forester II
Watershed Protection Program
RPF No. 2981
Department of Forestry and Fire Protection
Northern Region

Subject: Hydrologic Review of THP 1-16-056 HUM

This memorandum reports the results of a field and office review of the potential hydrologic impacts associated with the Bridge Too Far THP (1-16-56 HUM). I did not attend the initial Pre-Harvest Inspection (PHI), held on July 12, 2016. Field inspection participants for the Focused PHI held on August 17, 2016, when I participated, included the following individuals:

Jason Wells	HRC RPF
Mike Miles	HRC RPF
Thomas Schultz	HRC RPF
Shane Beach	HRC PG
Nicholas Simpson	CDFW Environmental Scientist
James Burke	NCRWQCB, Senior Engineering Geologist, PG
John Oswald	CGS Engineering Geologist CEG
Gerald Marshall	CGS Senior Engineering Geologist CEG
Chris Curtis	CAL FIRE Humboldt-Del Norte Forester I
Drew Coe	CAL FIRE Forest Practice Monitoring Program Coordinator

A Focused PHI was deemed necessary to address a disagreement between Humboldt Redwood Company (HRC) and the North Coast Regional Water Quality Control Board (NCRWQCB) over the NCRWQCB's PHI Report Recommendation 2. This recommendation was made by the NCRWQCB to mitigate against accelerated in-channel erosion in response to peak flow increases from upslope canopy removal, and decreased slope stability from increased shallow pore water pressure and loss of rooting strength. Recommendation 2 of the NCRWQCB's PHI Report recommends the implementation of the following riparian management zone (RMZ) protections:

bedrock of the Miocene-Pliocene age undifferentiated Wildcat Group, which is moderately to poorly indurated clayey siltstone, with lesser amounts of sandstone and conglomerate (see engineering geologic evaluation from Beach, 2016). Stands within the plan area predominantly contain coast redwood and Douglas-fir, and have a high growing site potential. Specified silviculture includes 225.1 acres of group selection, 21.6 acres of selection, 3 acres of road right-of-way, and 13.6 acres of no-harvest areas. Tractor yarding is proposed for 2 of the 5 units, with the remaining 3 units being cable yarded. Winter operations are being proposed for the THP area.

Section IV, Appendix B of the THP indicates that 15 THPs have been completed or approved within the past 10 years for the 9,039 acre Lower North Fork Elk River planning watershed. This accounts for approximately 32 percent of the planning watershed.

Protection of watercourses in this THP are proposed through the use of Riparian Management Zones (RMZs), as defined by the HRC Habitat Conservation Plan (HCP) and the prescriptions based on Watershed Analysis for Elk River and Salmon Creek, which provide increased protection over the standard California Forest Practice Rules. The previous landowner, PALCO, completed a Level II watershed analysis for the Elk River watershed in 2005, which provided site-specific prescriptions, as agreed to in the 1998 HCP. The Elk River/Salmon Creek watershed analysis was revisited in 2014 by HRC and the watershed analysis-generated specific recommendations for limiting sediment production are incorporated in this plan.

Office Review

A rapid review of the THP revealed that the Cumulative Impacts Assessment is generally sufficient for analysis related to sediment, peak flow, and hydrologic effects. In general, the assessment recognizes the relevant cause-and-effect relationships between timber harvest and hydrogeomorphic processes that drive hydrologic and sedimentary response. There are some instances of technically incorrect or unclear statements and several areas in the assessment that can be improved. For example:

- The Watershed Resources Assessment (Section IV, Item 6.1) incorrectly identifies the Upper North Elk River Planning Watershed as the planning watershed of interest, although this mistake is not carried throughout the rest of the analysis;

- There appears to be missing information at the bottom of page 154 (i.e., a list of future harvest areas);

- There is no mention that the Review Team agencies declared Elk River to have significant adverse cumulative impacts in 1997;

- There is no mention that the conclusions of the Cumulative Impacts Assessment is currently being tested with the Railroad Gulch BMP Evaluation study (THP 1-12-110 HUM, McCloud Shaw, Stubblefield et al. 2016);

1-16-056 HUM - Unit 2: Unit 2 is a large selection harvest unit which is proposed to be cable logged. The field PHI Team (Team) walked down to the channel head of the first order (Strahler, 1957) Class III watercourse shown in Figure 2 (see point A). The location of the channel head appeared to be properly identified as no channelized flow was observed above where the channel head was flagged. The area where the channel head was located can be characterized as hydraulically rough due to the prevalence of live vegetation, thick layers of duff, and a relative abundance of large woody debris (Figure 4). Below the channel head, the watercourse was discontinuous, relatively entrenched, with generally subvertical and well vegetated banks. The channel exhibited a relatively steep and stepped profile with generally subvertical discontinuities (i.e., headcuts) present. Channelization was discontinuous, with subsurface channelization/piping occurring in conjunction with large woody debris (Figure 5) and thicker accumulations of colluvium and/or anthropogenically-induced valley infilling from first cycle logging.

The Team continued down to the confluence of two Class III watercourses (Figure 2; Point B), where the watercourse became a second order channel. Below the confluence the watercourse displayed slightly more consistent signs of channelization. However, valley gradient, the condition of the banks, and the roughness of the channel did not change significantly. The second order Class III watercourse combined with another second order Class III watercourse to form a third order Class III watercourse (Figure 2; Point C). This larger third order Class III watercourse was characterized by a much gentler valley gradient, a broader valley bottom (Figure 6), but largely remained a discontinuous channel. Watercourse banks were well vegetated and did not show signs of active erosion, although there was evidence of subsurface flow and/or erosion voids along the axis of the channel, particularly in areas with larger accumulations of large woody debris (Figure 7).

The third order Class III watercourse transitioned into a Class II watercourse shortly above point D on Figure 2. This transition appeared to be accurately identified by the RPF. At point D, the Team walked up a first order Class III watercourse. This watercourse displayed similar characteristics and conditions to that of the first watercourse walked between points A and B (Figure 2). The Team continued to walk the watercourse until the channel head was reached (Point E, Figure 2). The channel head at point E was very similar to the one discussed for point A (Figure 2).

1-13-005 HUM: The Team walked down and along a Class III watercourse in a unit that was previously logged approximately two years ago as part of the Three Forks THP. The Bridge Too Far THP will be logged in a manner similar to the Three Forks THP, so observations of post-logging watercourses in the 1-13-005 HUM are expected to be representative of post-logging response for 1-16-056 HUM. Much of the Class III watercourse was not visible due to dense vegetation and accumulations of large woody debris (Figure 8), but channelization was generally discontinuous in nature. No signs of active erosion in the watercourse were observed. Figure 9 shows the level of canopy retention in the Unit, and this is expected to be representative of the level of canopy retention in the proposed THP.

but establish additional canopy retention out to 200 feet on Class II watercourses and 100 feet on Class III.

Additional protection measures considered as necessary to protect water quality include no harvest zones on Class III watercourses, avoidance of tractor crossings and retention of trees in unchanneled swales to the extent feasible, and implementation of highest feasible level of erosion control on all RMZ road segment, landings, and skid trails

*The TMDL Action Plan contains Hillslope Water Quality Indicators and Numeric Targets regarding riparian zone protection to promote improvement in the quality/health of the riparian stand so as to promote 1) delivery of wood to channels, 2) slope stability, and 3) ground cover within 300 feet of Class I and II watercourses and 150 feet of Class III watercourses. Requirements in the proposed WDR take into account hillslope and riparian zone protection provided by the selection Silviculture beyond the RMZ, which retain significant post-harvest canopy. Therefore, the following additional RMZ protections are supportable and necessary to implement water quality requirements, including the Elk River TMDL load allocation (**Recommendation 2**).*

Additionally, the primary supporting material for the increased riparian protections was sent in an email from Senior Engineering Geologist James Burke from the North Coast Regional Water Quality Control Board on 16 August, 2016. Rationale was based on the following documents: 1) the "Independent Scientific Review Panel" report (ISRP Report) (http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/report/Final-Phase-II-ISRP-Report.pdf); 2) the "Upper Elk River: Technical Analysis for Sediment" (Tetra Tech Report) (http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/151222/03_20151021_Upper_Elk_River_Tech_Analysis_for_Sediment.pdf); and 3) the "Action Plan for the Upper Elk River TMDL" (TMDL Action Plan).

Strength of Rationale

Regarding Recommendation 2, the ISRP Report states that, "large amounts of sediment enter the river system via small tributaries in steep headwaters areas and hollows, which are likely to be Class II or III waters and which make up a much greater length of the stream network than Class I waters" (pg 30; first paragraph) and that sediment is primarily generated through windthrown trees and through mass wasting exacerbated by harvest-induced increases in pore-water pressures. The ISRP Report further states:

The Panel finds that stream buffer designs that address all of the beneficial uses of water at the watershed scale could be improved by retaining the existing RMZs along with increasing the width of RMZs along Class II and Class III streams (see Figure 3 below). The upstream extension of robust RMZs would provide enhanced protection against accelerated sedimentation and fish habitat degradation in downstream waters of Class II and Class III streams, as well as better protection against elevated water temperatures in Class II streams. Furthermore, the Panel finds that risk of sedimentation could also be reduced if

channel erosion from lateral bank erosion and streamside landsliding are lumped together, despite being two distinct processes.

While the Tetra Tech Report does not partition lateral erosion and streamside landsliding into different sources, the "Peer Review Draft: Staff Report to Support the Technical Sediment Total Maximum Daily Load for the Upper Elk River" (NCRWQCB, 2013) (Peer Review Draft) does attempt to quantify these sources separately. The Peer Review Draft estimates that lateral bank erosion is approximately 16 percent of the combined in-channel sediment sources related to subcategory 2, with streamside landsliding comprising the remaining 84 percent of the in-channel sediment load. If we apply this same proportionality to the Tetra Tech Report, then lateral bank erosion is estimated to be approximately 26 $yd^3\ mi^{-1}\ yr^{-1}$, or approximately 8 percent of the total anthropogenic sediment load. As mentioned earlier, the engineering geologic evaluation from HRC and the PHI Reports from CGS and the NCRWQCB both suggest that streamside landslides are adequately mitigated in the proposed THP. This indicates that Recommendation 2 is primarily focused on mitigating against headward channel incision and low order channel bank erosion.

Field observations on the focused second PHI indicate a relative lack of recent in-channel erosion in the THP area. CGS's second PHI Report states that no active in-channel erosion was observed in Unit 2 of the proposed THP, or in the previously logged unit from THP 1-13-005 HUM. CGS's second PHI Report did note a small legacy fill failure from an old skid trail above a Class II watercourse in Unit 1. The NCRWQCB's second PHI Report states that no active in-channel erosion was observed in Units 1 or 2 of the proposed THP, or in the previously logged unit of THP 1-13-005 HUM. My observations confirm observations from both CGS and the NCRWQCB.

While we did not observe active in-channel erosion in THP 1-13-005 HUM, it is recognized that in-channel erosion is a threshold phenomenon, and that storms may not have been sufficiently large to initiate in-channel erosion in the logged unit. Regardless, the effectiveness of buffers for mitigating against headward channel extension and low order channel bank erosion has been questioned. For Caspar Creek, Reid and others (2010) stated that:

> *Robust buffer strips were incorporated into the logging plan, providing extensive filter strips below upland sediment sources and preventing direct disturbance to a significant portion of the stream network. Despite these measures, suspended sediment yields increased significantly after logging, and much of the increase appears to originate from gully-related processes that are not amenable to mitigation either through road improvements or buffer strips. If increased runoff after logging generates sediment from within downstream channels, control of excess sediment from this source would be possible only through management of the level of hydrologic change induced by logging, and this would require either management of the rate of logging within a watershed or modification of the silvicultural strategy used.*

Dr. Matthew Buffleben, formerly of the NCRWQCB, made similar recommendations to Reid et al. (2010) in a presentation to the California State Board of Forestry and Fire

Cologne Water Quality Control Act and the Federal Clean Water Act to be approved by the State Water Resources Control Board (SWRCB) and United States Environmental Protection Agency (USEPA). To date, the TMDL Action Plan has not been approved by the SWRCB or by the USEPA. Under California Water Code (CWC) Section 13245:

> *A water quality control plan, or a revision thereof adopted by a regional board, shall not become effective unless and until it is approved by the state board. The state board may approve such plan, or return it to the regional board for further consideration and resubmission to the state board. Upon resubmission the state board may either approve or, after a public hearing in the affected region, revise and approve such plan.*

CAL FIRE has made previous comments about the uncertainty of the proposed RMZ prescriptions (i.e., the same prescriptions used in Recommendation 2) in the Draft WDR for achieving desired water quality conditions (http://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/160223/160211_KenPimlott_CalFire_TMDL_comment.pdf). Since the unapproved TMDL Action Plan relies on the implementation of an unapproved Draft WDR to achieve water quality objectives, and CAL FIRE questions the efficacy of these prescriptions in achieving water quality objectives, the Department considers the TMDL Action Plan as insufficient evidence for supporting Recommendation 2. We recommend that the NCRWQCB wait until results from the Railroad Gulch BMP Effectiveness Monitoring Project (Stubblefield et al. 2016) are available before determining if significant revisions of RMZ prescriptions are necessary and appropriate.

Finally, it should also be noted that the load allocation in the proposed TMDL Action Plan for the Upper Elk River is established as zero. The proposed TMDL Action Plan states that the zero load allocation is not an effluent limitation or waste load allocation, and therefore shouldn't be interpreted as a requirement to discharge zero sediment. However, the threshold of concern for the TMDL Action Plan is not held to a conventional CEQA standard for significant adverse impacts. Rather, the proposed TMDL Action Plan gives the NCRWQCB the discretion to decide what constitutes a controllable discharge and craft requirements to reduce or eliminate these discharges to the maximum extent practicable. This indicates that if the TMDL Action Plan is approved by the SWRCB and USEPA, then any discharge, no matter how big or small, can be viewed as controllable by the NCRWQCB. Under an approved TMDL Action Plan and WDR, Recommendation 2 would theoretically reduce sediment discharge from the THP even though the reduction would likely be small and non-significant in magnitude.

Conclusions

Based on office and field review, as well as knowledge of the pertinent literature summarized above, water quality impacts associated with this plan are anticipated to be minor and not produce significant adverse impacts. The practices prescribed in this plan should not significantly degrade water quality in the Lower North Fork Elk River or Upper Elk River watersheds, given that the California Forest Practice Act and Rules are properly implemented by the Licensed Timber Operator. For completeness, the

NCRWQCB (North Coast Regional Water Quality Control Board). 2013. Peer review draft staff report to support the technical sediment Total Maximum Daily Load for the Upper Elk River. 4 March, 2013. Santa Rosa, CA. 229 p.

Reid, L.M., Dewey, N.J., Lisle, T.E. and Hilton, S., 2010. The incidence and role of gullies after logging in a coastal redwood forest. Geomorphology, *117*(1): 155-169.

Strahler, A.N., 1957. Quantitative analysis of watershed geomorphology. Eos, Transactions American Geophysical Union, 38(6): 913-920.

Stubblefield, A.P., S. Beach, N. Harrison, and M. Haskins. 2016. Railroad Gulch best management practices evaluation, Elk River watershed. Annual Report (WY 2014, 2015). Humboldt State University, Arcata, CA. 83 p.

Sullivan, K., D. Manthorne, R. Rossen, and A. Griffith. 2012. Trends in sediment-related water quality after a decade of forest management implementing an aquatic Habitat Conservation Plan. Technical Report. Humboldt Redwood Company. Scotia, CA. 187 p.

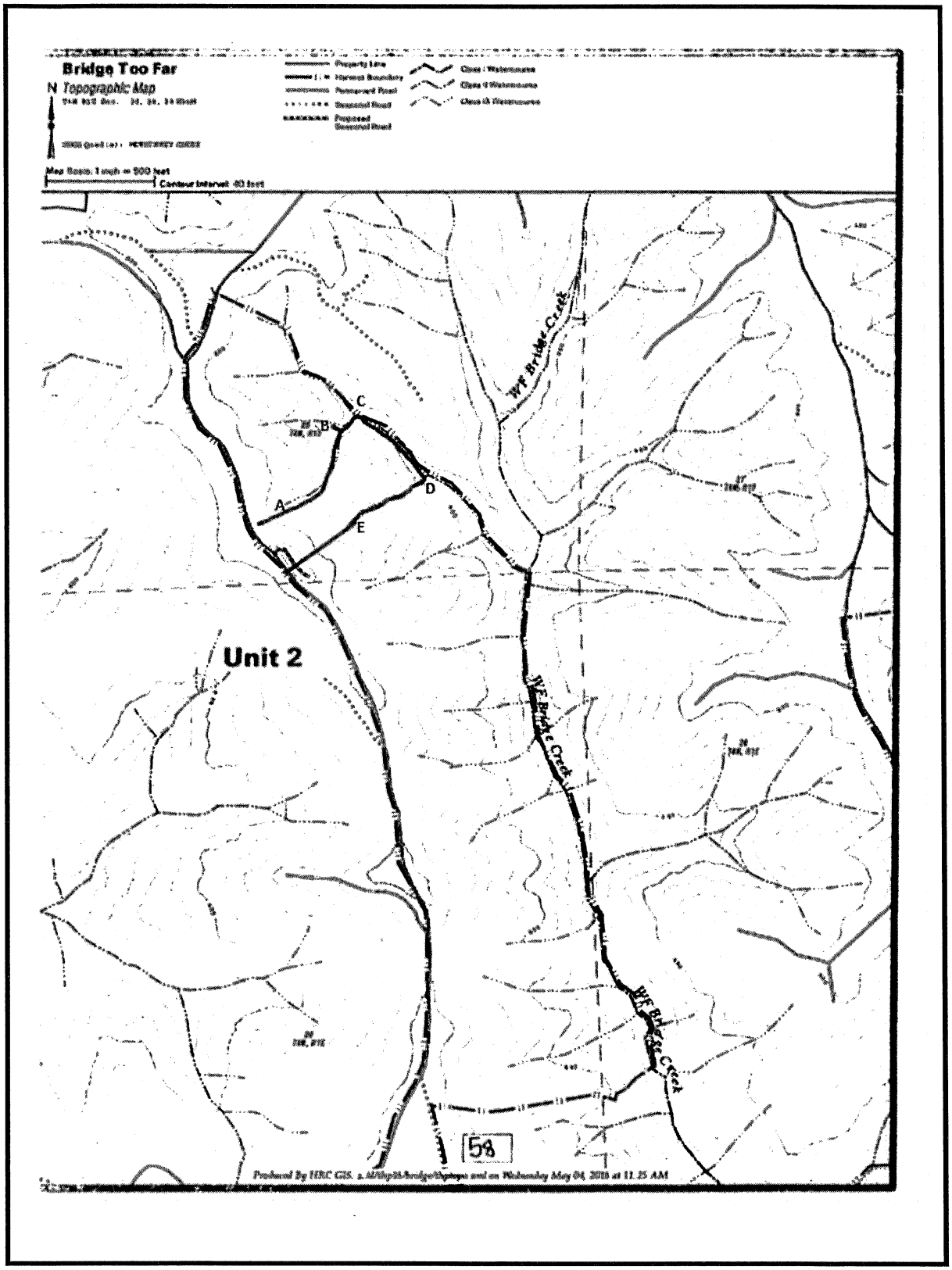


Figure 2. The route taken by the Review Team in Unit 2.

Figure 4. The channel head of the Class III watercourse. Note the dense vegetative cover and relative abundance of large woody debris.

Figure 6. The third order Class III watercourse. Note the lack of channelization and relatively unconfined valley bottom.

Figure 8. Looking up at the Class III watercourse in the Three Forks THP (1-13-005 HUM).