State of California
Department of Fish and Wildlife

M e m o r a n d u m

Date: November 7, 2019

To: Dominik Schwab, Forest Practice Program Manager
North Coast Region Office
California Department of Forestry and Fire Protection
135 Ridgway Avenue
Santa Rosa, CA 95401

From: Timberland Conservation Program Manager
Northern Region
California Department of Fish and Wildlife
601 Locust Street
Redding, CA 96001

Subject: **California Department of Fish and Wildlife (CDFW) Pre-Harvest Inspection (PHI) Report for Timber Harvesting Plan (THP) 1-19-00098 MEN, "Elk"**

Timberland Owner/ Plan Submitter	Gualala Redwood Timber, LLC (GRT)
CALWATER Planning Watershed (Version 2.2)	Robinson Creek (1113.810002) and Doty Creek (1113.810003)
7.5-Minute Quadrangles	McGuire Ridge and Gualala
Silviculture Treatments (acres)	Clearcutting (24), Selection (117), No Harvest Area (16)
Sensitive Species	• Anadromous salmonids • Northern Spotted Owl (*Strix occidentalis occidentalis*) • Marbled Murrelet (*Brachyramphus marmoratus*) • Osprey (*Pandion haliaetus*) • Bald Eagle (*Haliaeetus leucocephalus*) • Heron rookeries • Foothill yellow-legged frog (*Rana boylii*)
PHI Dates and Attendees	<u>September 13, 2019</u> • John Bennett, Registered Professional Forester (RPF) and Gabe Ghirann, Forestry Technician, GRT • Ken Margiott, Inspector, and Timothy Montgomery California Department of Forestry and Fire Protection (CAL FIRE) • Kevin Doherty, California Geological Survey

PHI Dates and Attendees (cont.)	• Jim Burke, North Coast Regional Water Quality Control Board (NCRWQCB) • Adam Hutchins, CDFW

INTRODUCTION

This report presents CDFW's evaluation of potential impacts from proposed operations on fish, plants, wildlife, and their habitat. CDFW's evaluation is based on review of the Timber Harvesting Plan (THP) and participation in the PHI. CDFW relied on the THP, field inspections, potentially-suitable habitat modeling, 2018 Light Detection and Ranging (LiDAR) data and derived products, historic aerial photography, and the California Natural Diversity Database (CNDDB, http://www.dfg.ca.gov/biogeodata/cnddb/) to identify and evaluate potential risks to biological resources resulting from timber operations (operations). CDFW uploaded PHI recommendations and supplemental information into CalTREES on September 26, 2019.

This report should be applied to the review of all other documents related to this project prepared and reviewed pursuant to the California Environmental Quality Act (CEQA).

THP DESCRIPTION AND SETTING

The proposed THP includes a total treatment area of 157 acres using ground-based tractor yarding. The proposed THP discloses "some" of the THP (CDFW estimated between 75 and 80 acres, or about half the THP) occur on the Flood Prone Area (FPA) of the North Fork Gualala River, located upstream and downstream of the confluence with the Little North Fork Gualala River. The THP proposes to harvest redwood (*Sequoia sempervirens*) on the FPA and mixed conifer on hill slopes.

Anadromous Salmonids

The North Fork Gualala River is known to support Steelhead Trout (*Oncorhynchus mykiss irideus*) and Coho Salmon (*Oncorhynchus kisutch*). The National Marine Fisheries Service lists Steelhead Trout as "threatened" and Coho as "endangered" pursuant to the Endangered Species Act. The California Fish and Game Commission lists Coho Salmon as "endangered" pursuant to the California Endangered Species Act (CESA)[1].

The CDFW Coastal Steelhead Project (in the mid-1970s), counted a minimum of 33 adult Coho Salmon in the Gualala River watershed between 1973 and 1976. This number represents a decline from the estimated 4,000 fish observed in 1963 (DFG, 2002). Between 1995 and 1997, a total of 45,000 juvenile Coho Salmon were released in the Little North Fork Gualala River to revive the Gualala River's Coho Salmon

[1] California lists Coho Salmon as "endangered" in watercourses tributary to the Pacific Ocean from Punta Gorda (Humboldt County) south throughout the remainder of the species range in California; and as "threatened" in watercourses tributary to the Pacific Ocean between Punta Gorda and the Oregon border.

population. Coho Salmon were last documented in the Little North Fork Gualala River in 2003 (Christy, 2016).

The floodplain surface of the North Fork Gualala River is critical habitat for anadromous salmonids. Floodplains provide habitat for juvenile salmonids in seasonal wetlands, temporary tributaries, off-channel ponds, sloughs, flood-channels, and seasonal estuarine drainages (Brown, 2002). When storm events exceed bankfull discharge and inundate floodplain surfaces, juvenile fish get access to invertebrate food sources in the soil which are not otherwise available in the comparatively nutrient-poor main channel. Bellmore et al. (2013) discusses how floodplain side channels are highly productive for feeding anadromous salmonids, and how an increased body mass is positively correlated to an increase in salmonid survival as salmonids migrate to sea.

The expression of perennial and seasonal wetlands on the floodplain surface is indicative of the close connection between the floodplain surface and groundwater, which is a key source of cool water in the summer and important in providing thermal refuge for salmonids (Levings et al., 1985). Riparian tree canopy reduces exposure of rearing fish to solar, ultra-violet radiation and maintains groundwater/hyporheic zone temperatures, providing essential riparian functions for juvenile salmonids (Brown, 2002). Juvenile Coho Salmon prefer stream temperatures between 12 and14 degrees Celsius, whereas the highest range of thermal tolerance is 23 to 25 degrees Celsius (Brett, 1952).

As the THP is located in a state-planning watershed with populations of anadromous salmonids, the THP is subject to the “Anadromous Salmonid Protection Rules” (ASP Rules), California Code of Regulations (Cal. Code Regs. tit. 14), section (§)916.9. Maps included in the proposed THP identify the Channel Zone, Core Area, Inner Zone A, Inner Zone B, and the Outer Zone, all Class I Watercourse Lake Protection Zones (WLPZ).

However, as we present below, significant hydrological and ecological portions of the FPA. described in the Cal. Code Regs. tit. 14 §916.9(f)(3), including Channel Migration Zones (CMZ), are not protected by the THP’s current buffers. For some relative background, the State of California Natural Resources Agency formed the Riparian Protection Committee (RPC) to address the potential impacts of timber harvesting in flood prone areas (including channel migration zones) in the coast redwood region (CAL FIRE, 2005). The RPC developed the *Flood Prone Area Considerations in the Coast Redwood Zone*, and identified examples of factors as well as consequences on salmonid habitat and survival potentially attributable to timber harvesting (CAL FIRE 2005, page 12 – Table 2, below).

Table 2. CAL FIRE, 2005 – Factors and Consequences of Timber Harvest on Salmonid Survival.

Potential Change in Physical Stream Environment	**Potential Change in Quality of Salmonid Habitat**	**Potential Consequences for Salmonid Growth and Survival**
Increased solar radiation	Increased stream temperature; higher light levels; increased autotrophic production	Reduced growth efficiency; increased susceptibility to disease; increased food production; changes in growth rate and age at smolting
Decreased supply of large wood	Reduced cover; loss of pool habitat; reduced protection from peak flows; reduced storage of gravel and organic matter; loss of hydraulic complexity	Increased vulnerability to predation; lower winter survival; reduced carrying capacity; less spawning gravel; reduced food production; loss of species diversity
Addition of logging slash (needles, bark, branches)	Short-term increase in dissolved oxygen demand; increased amount of fine particulate organic matter; increased cover	Reduced spawning success; short-term increase in food production; increased survival of juveniles
Erosion of streambanks	Loss of cover along edge of channel; increased stream width; reduced depth; increased fine sediment in spawning gravels and food production areas	Increased vulnerability to predation; increased carrying capacity for age-0 fish, but reduced carrying capacity for age-1 and older fish; reduced spawning success; reduced food supply

The RPC *Flood Prone Area Considerations in the Coast Redwood Zone* also identifies functions of the aquatic habitat important to fish, including floodplain channel features, as follows:

> *An important biological function of flood prone areas is providing secondary or overflow channel areas for anadromous fishes…These areas are habitat units located away from the main channel (Rasmussen 1999). Overflow channels and backwater, isolated, or alcove pools are important as refugia areas for juvenile coho salmon during strong winter storm events (Bell 2001, Ligon and others 1999, Welsh and others 2000, Bock and others 2004).* ***Streams with increased secondary channels, dammed/beaver pools, and backwater habitat (along with other***

> ***beneficial variables such as high amounts of gravel, wood) have been found to be more productive for juvenile salmonids. Therefore, it is important to recognize and protect secondary channels and other slow-water refugia areas found on flood prone surfaces.*** (CAL FIRE 2005, page 15 – bold emphasis added).

The RPC guidance for flood prone areas with an active channel migration zone includes the following:

> … *if a flood prone area has an active channel migration zone, commonly applied buffer widths beginning near the channel edge for long-term wood recruitment are likely to be inappropriate, since the active channel will move through the floodplain over time.* (CAL FIRE 2005, page 17)

The California Board of Forestry Forest Practice Rules (specifically, the ASP Rules) provide goals and objectives addressing the protection and restoration of the beneficial functions of riparian zones in watersheds with anadromous salmonids. The ASP Rules address tree and canopy retention objectives through the establishment of a Channel Zone, Channel Migration Zone, Core Zone, Inner Zone A, Inner Zone B, and an Outer Zone WLPZ for Flood Prone Areas. When accurately identifying the FPA, the ASP Rules can be applied appropriately, and the THP can address potentially significant impacts to anadromous salmonid habitat as follows:

- *Water temperature control* – Tree retention standards on the floodplain and CMZ (which can be the active channel in the future) minimize floodplain surface exposure to solar radiation that would otherwise increase soil temperatures and thereby potentially warming the hyporheic zone. The hyporheic zone consists of subsurface water in the floodplain that is connected to the main channel. When the subsurface water temperature increases, it may also increase free water temperatures in the main channel. Temperature increases in the main channel reduce dissolved oxygen, which may contribute to lethal conditions for fish.

- *Streambed and flow modification by large woody debris* – Harvesting dominant and pre-dominant trees on the floodplain may reduce natural recruitment of large woody debris needed for streambed development and habitat complexity. Decreasing the potential to supply large trees from the floodplain may result in the potential loss of complex habitat development, such as pool formation, protection from peak flow stream velocities, reduced storage of gravel and organic matter, and loss of hydraulic stream habitat complexity.

- *Filtration of organic and inorganic material* – Floodplain surfaces provide natural sediment filtration as upland erosion moves sediment downslope. Effective filtration depends on vegetation and organic litter, slope, soil type, and soil drainage structure. Activities that disturb or compact soils, destroy organic litter, remove large downed wood, or removes recruitment of future downed wood may reduce the effectiveness of sediment filtration on floodplain surfaces.

- *Bank and channel stabilization* – Vegetation on the floodplain provides roots that develop soil structure and stabilize stream banks by holding soils in place, thereby providing resistance to erosive water velocity. Root strength stabilizes stream banks, which should be considered in the main channel and the Channel Migration Zone.

- *Spawning, rearing, and refugia habitat for salmonids* – The ability for fish to have seasonal access to the floodplain—outside the active channel—is essential for gaining mass and increasing rates of survival prior to migrating to sea. Side channels and backwater channels provide quality foraging opportunities, winter refugia, and rearing habitat and have been found to increase the number of summer smolts (Solazzi, et al., 2000).

PHI OBSERVATIONS AND DISCUSSION

Floodplain Habitat

In 2004, CDFW Engineering Geologist/Geomorphologist Kris Vyverberg (since retired) concluded that conditions are present for avulsion in the North Fork Gualala River floodplain based on her field observations (CDFW PHI Report for THP 1-04-032 MEN, “Lily”). Ms. Vyverberg explained that active side channels on the floodplain are not unique channels, but rather segments of the total channel cross-section and are intermittently active and inseparable from the Class I watercourse designated as the active channel.

During First Review for THP 1-19-00098, CDFW inquired about GRT’s process for determining the extent of the Channel Migration Zone for the alluvial channels in the THP. Several locations identified by LiDAR, including one meter resolution digital elevation modeling, were referenced (see CalTREES attachment 20190603_1-19-00098MEN_1stReview-CMZ-Attachment-CDFW). The RPF indicated ground truthing was the primary method of assessment. The RPF explained that secondary channels, braiding/anabranching, large gravel bars, linear stands of red alder (*Alnus fubra*), eroding banks, high sinuosity, and wood jams are all present in and adjacent to the THP. However, the RPF indicated these features are only located in the Class I WLPZ Core Zone associated with the current active channel.

During the PHI, an assessment of the floodplain was focused on the left bank, between the current active channel and the toe of the valley slope. This area is located above the confluence of the North Fork Gualala River and the Little North Fork Gualala River. The meandering active channel of the North Fork Gualala River is comprised of alluvium material (gravel, sand, and silt with some cobble) wood jams, eroding banks, and large gravel bars. CDFW observed three areas that suggest lateral channel movement is occurring on the left bank of the floodplain, as well as a recent bank slide and associated wood jam in the active channel (see Figure 1).

The floodplain side channel identified during First Review, through LiDAR modeling and canopy height modeling, was subsequently viewed in aerial imagery from Pacific Air Industries (1953) and Cartwright Aerial Surveys (1965). This aerial imagery further suggests that a channel likely occurred in this area (see Figures 2 through 4).

During the PHI, CDFW observed the presence of a linear stand of red alder, the wetland obligate fringed corn-lily (*Veratrum fimbriatum*), bank and channel structure, and a potentially buried wood jam (see Figures 5 through 7). A backwater channel—identified as a Class III watercourse in the THP–extends below the buried wood jam to the current active channel and is in a “no harvest” area.

Desktop, CDFW estimated floodplain cross-sectional profiles 28 and 29 (see Figure 8) suggest a channel exists with a width similar to the current active channel. This channel is located along the landward side of the floodplain and below the bankfull elevation. For detailed information on the location of the cross-sectional profiles, see 20190926_1-19-00098 MEN PHI CDFW Recommendation 1 Supplemental Information.

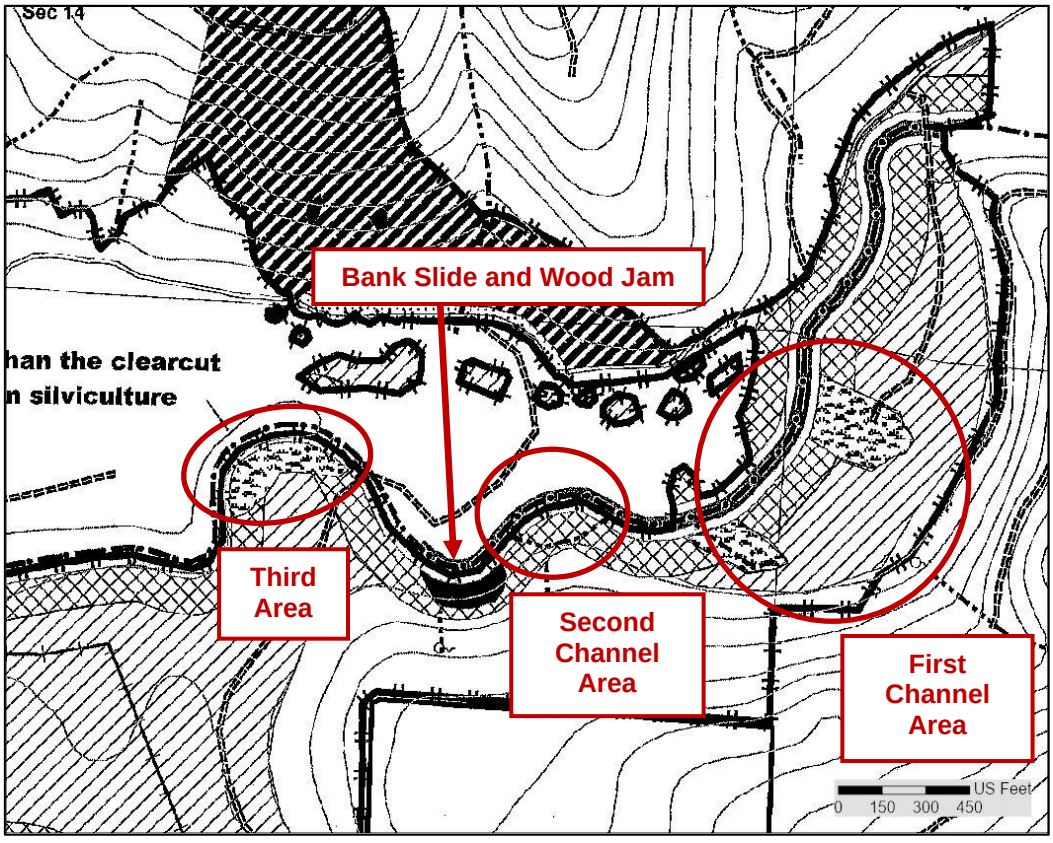

Figure 1. CDFW staff observed evidence of floodplain channels in three locations during the PHI. They are identified as the First Channel, Second Channel, and Third Channel Area. Bank slide and associated wood jam are also illustrated.

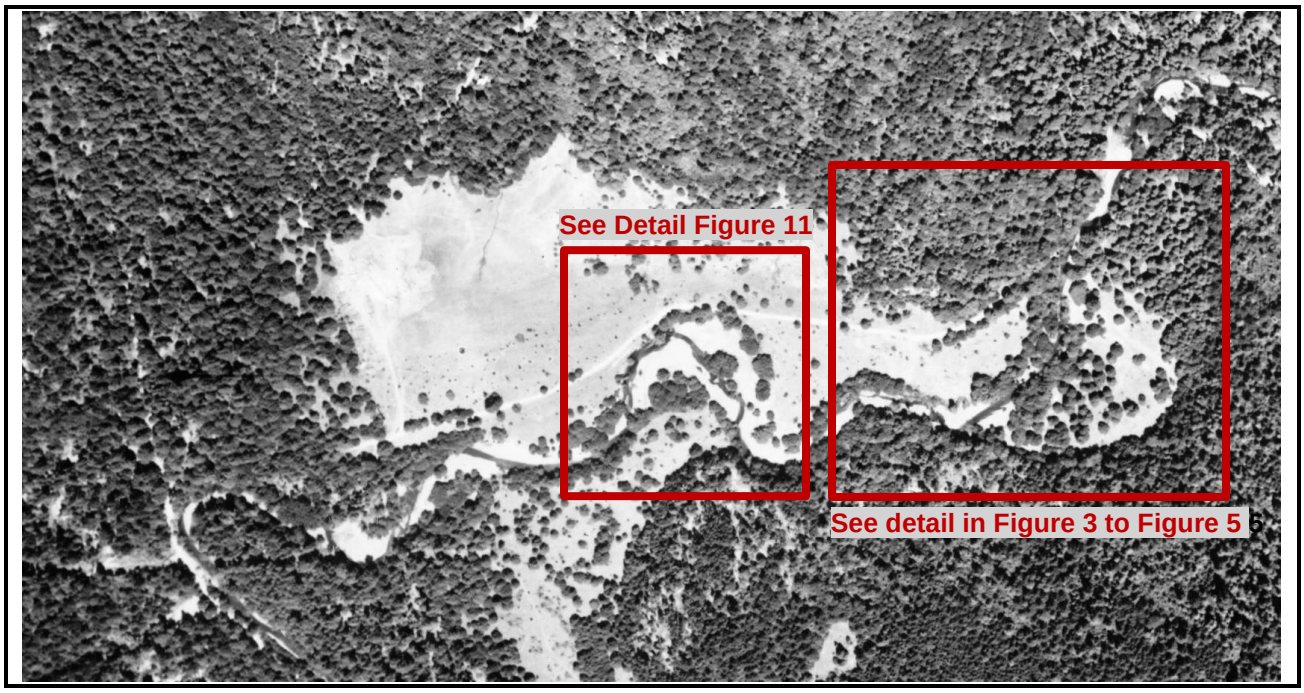

Figure 2. Aerial imagery of the North Fork Gualala River, 1953, suggesting large channel meanders in the Flood Prone Area in the THP (see Figures 3 and 4). A meander scroll indicates shifting of the channel across the floodplain (see Figure 11).

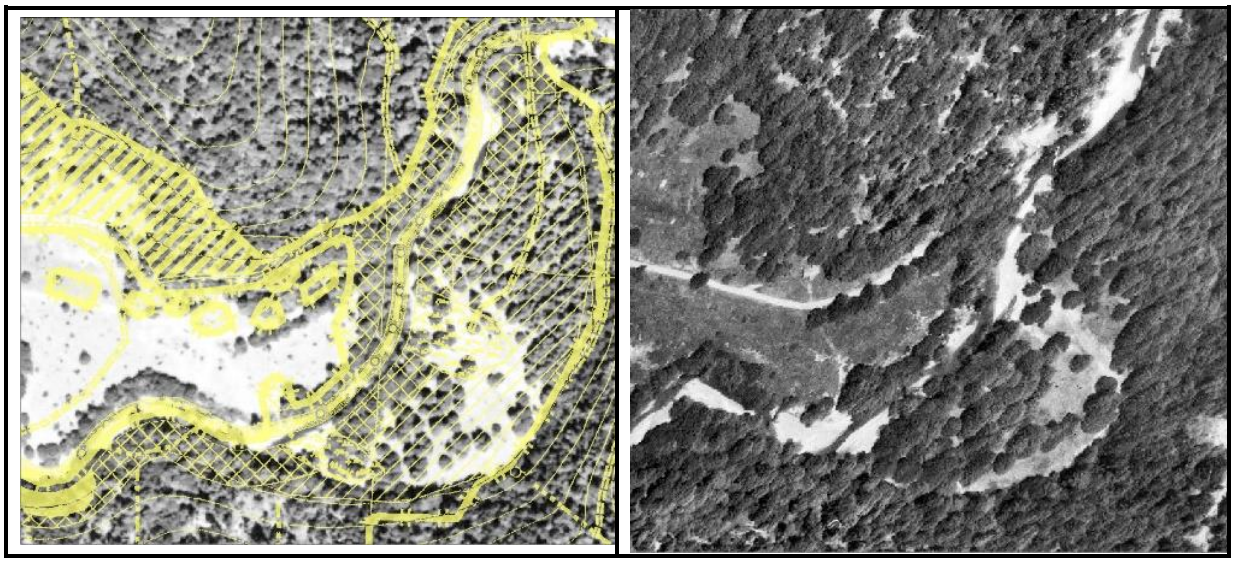

Figure 3. While the 1953 aerial imagery suggests a meander channel extends to the toe of the slope, THP WLPZ Inner A Zone and Inner B Zone buffers end (as opposed to begin) at the toe of the slope.

Figure 4. Detail of the same meander in the 1965 aerial photograph suggests the meander remains an intermittently active floodplain channel.

Figure 5. CDFW staff noted red alder and fringed corn-lily (foreground) and *Carex* species (background) within the banks of the floodplain channel.

Figure 6. Bankfull width of the historic floodplain channel is similar bankfull width of current active channel. Photo looking upstream, above the buried wood jam (Figure 7), the toe of the slope (upper right) and historic bank (upper left) define the linear stand of alders. Approximate location of Profile 29 (Figure 8).

Figure 7. The downstream extent of the floodplain channel appears to end around the buried wood jam.

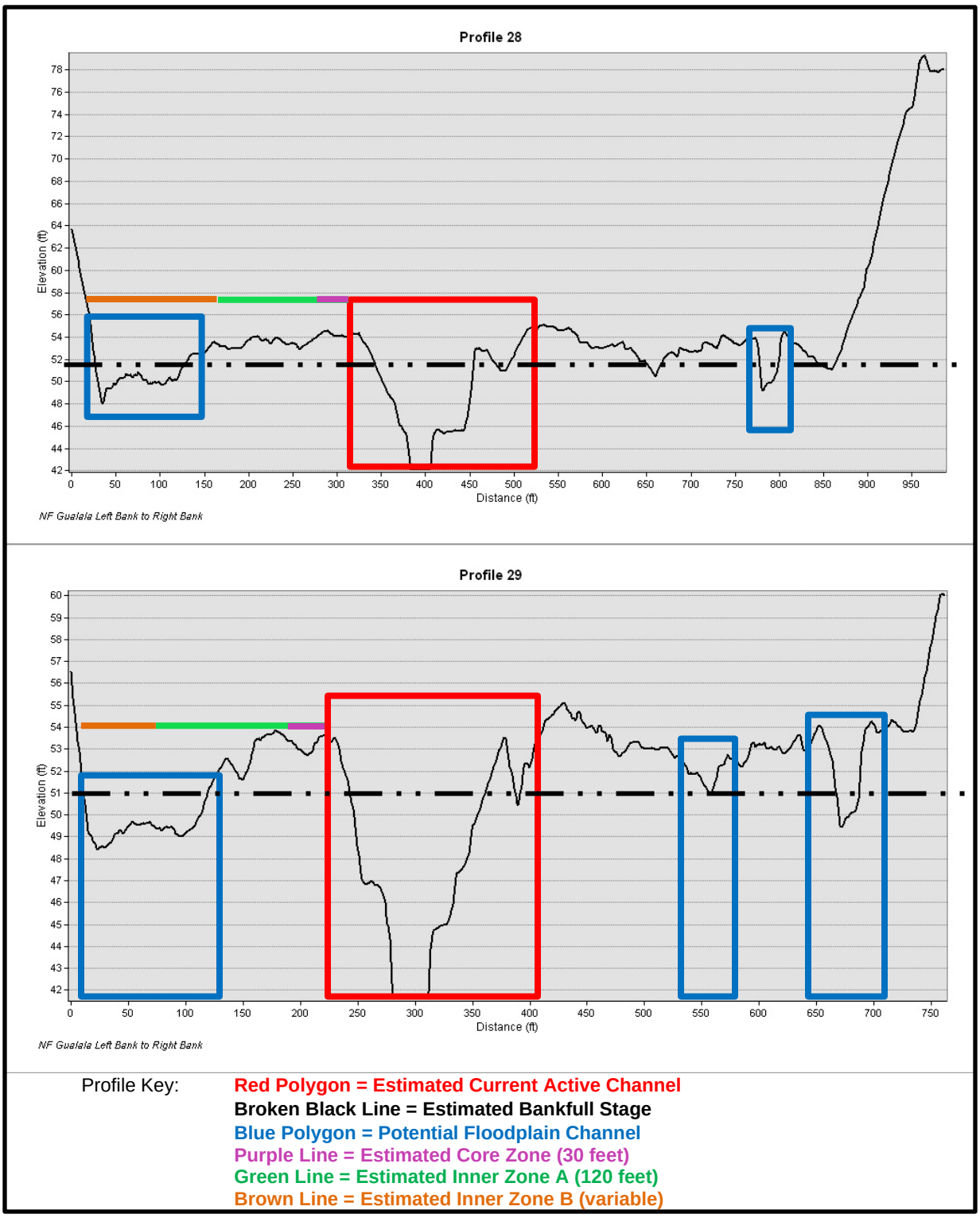

Figure 8. Desk-top estimated, Profile 28 and Profile 29, looking downstream show similarities in bankfull width between the left bank floodplain channel and the current active channel. The approximate Class I WLPZ Core Zone (purple line), Inner Zone A (green line), and WLPZ Inner Zone B (brown line) proposed in the THP have been added for comparison. See the Supplemental Information (in CalTrees) for profile locations.

The THP establishes Class I WLPZ Inner Zone A and Inner Zone B protections for the Flood Prone Area based on the current active channel location (see Figures 1 and 8). The THP is not proposing Channel Migration Zone protections, or measures to protect channels in the Flood Prone Area outside of the Channel Zone and Core Zone. The THP is proposing timber harvesting, seasonal road use, and other operations on multiple skid trails between the floodplain side channel and the Core Zone.

As described in the ASP Rules, Channel Zone, Channel Migration Zone, and Core Zone protections are important for facilitating the development and recruitment of large woody debris in areas that support salmonid rearing habitat and refugia. The Inner Zone A and Inner Zone B retention standards contribute to cooler water temperatures as well as large woody debris recruitment. When perennially or seasonally active floodplain channels are re-occupied in areas previously logged, salmonid habitat restoration goals and objectives in the ASP Rules may not be met. For example, in the event laterally migrating channels approach the landward edge of a floodplain, or the Channel Migration Zone (as suggested in Profile 28 and Profile 29), the watercourse may not receive the same long-term WLPZ protections as in more stable channel areas, such as confined channels. According to the THP, the lower hill slope adjacent to a channel will not receive a WLPZ where harvesting is proposed and outside the Flood Prone Area (see left side of Figure 8). As a case-in point, should the side channel become a Class I watercourse in the future or during floods, it will not receive the same protection as if it were considered part of the channel zone.

The second floodplain side channel is currently located in the proposed Inner Zone A WLPZ. This side channel appears to have avulsion risk since it is located upstream from a bank-slide and large wood jam. The RPF designee indicated the area proposed for harvest between the side channel and the current active channel will be removed from the THP. The Review Team was in agreement, “…potential for capture of the main channel or channel migration is present…” (see NCRWQCB PHI Report Recommendation 1). A portion of this channel occurs near the landward extent of the Flood Prone Area. Without the appropriate Channel Zone, Core Zone, and Inner Zone A protections, the watercourse may be susceptible to subsequent increases in stream temperatures, light levels, logging slash, and bank erosion, in addition to decreased supplies of large woody debris. While the ASP Rules address the degradation of salmonid habitat, protection measures in THP 1-19-00098 MEN do not appear to be fully applied as intended.

The third floodplain side channel is associated with the meander located downstream from the bank-slide and wood jam feature. Review Team Agencies observed an extensive linear feature consisting of alluvial gravel deposits between either side of the meander bend (see Figures 9 through 11). The THP appears to be lacking adequate Channel Zone, Channel Migration Zone, Core Zone, or Inner Zone A WLPZ protection measures for this feature. In the event the active channel laterally shifts into these alluvial gravel deposits, it will cut off the meander. For reference, the area between the alluvial gravel deposits and the current active channel, dominated by riparian hardwood, is identified as “Non-Timber”.

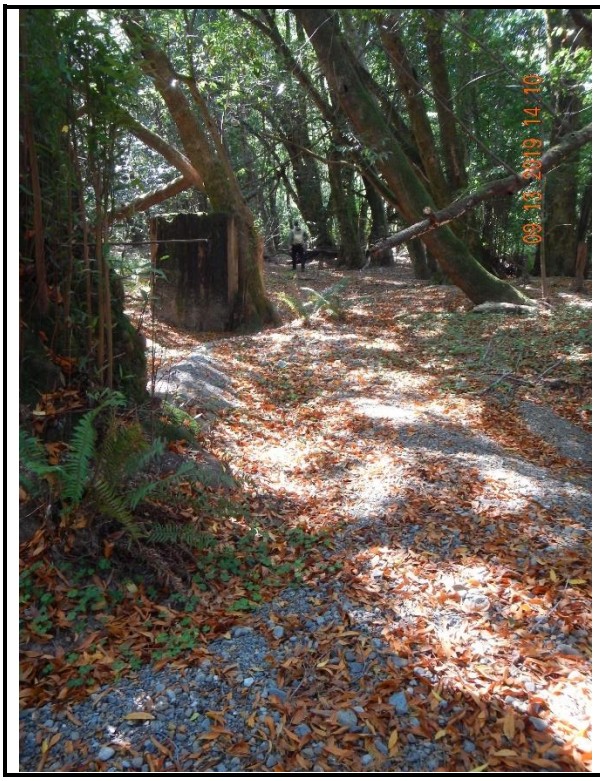

Figure 9. The North Fork Gualala River deposited alluvial gravel between reaches outside the current active channel.

Figure 10. Recent high flows have resulted in bedload alluvium deposits above the bankfull elevation inside a meander bend.

Without Channel Zone, CMZ, and Core Zone protections for all areas within the ‘amplitude’ of the meander, laterally shifting channels may be susceptible, as described above, to increased temperatures, bank erosion, streambed degradation and lower large woody debris availability amid areas logged with lower streamside protections.

In regards to potentially cumulative impacts, we reviewed the 1953 aerial imagery and THP harvest boundaries, specifically the right bank floodplain, where redwood trees appear to occur within 30 feet of the active channel in 1953. The THP proposes Inner Zone B protections to this area now, for trees that appear to be part of the historic active channel based on 1953 imagery (Figure 11) because the watercourse transition line is currently located streamward of the 1953 channel margin. This meander is clearly defined in the 1965 aerial imagery. Trees that used to border the watercourse just upstream of this stand in 1953 are no longer present and the current THP is proposing to harvest additional trees in what should be a Core, or Inner Zone A.

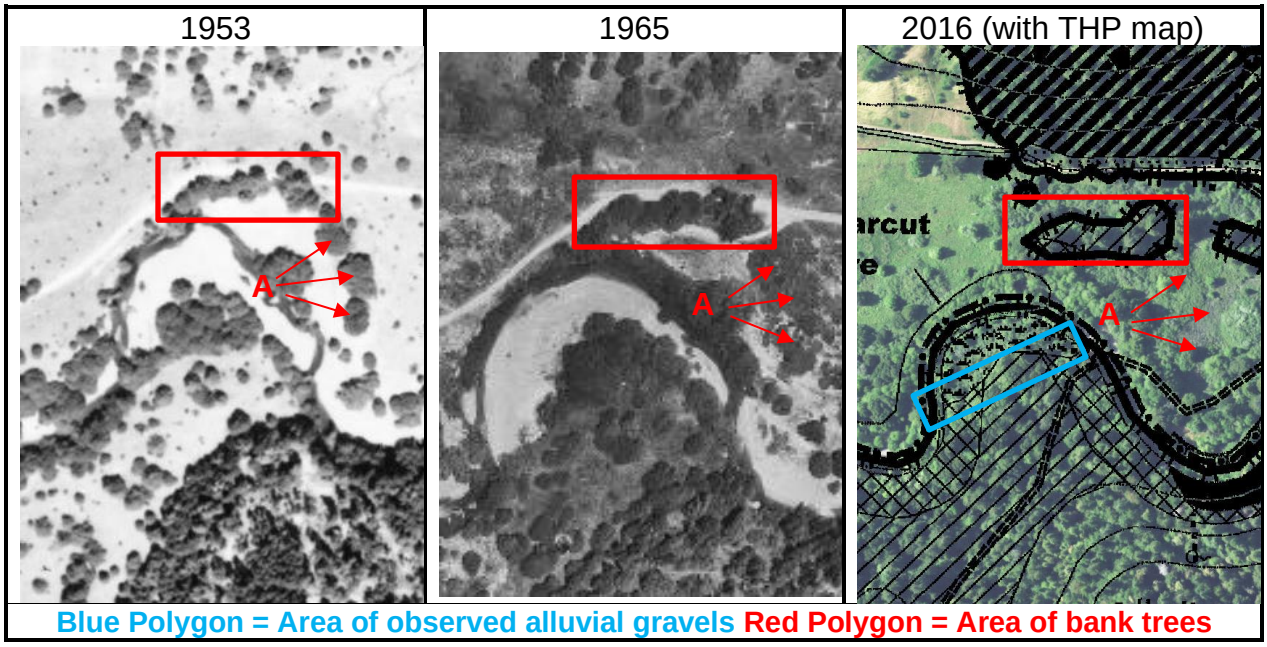

Figure 11. A detailed comparison of the 1953, 1965, and 2016 aerial imagery suggest Inner Zone B protections proposed for stands along a meander may have occurred at the edge of the active channel in 1953.. Tree-clumps that appear to be near the 1953 active channel meander (to the east of tree clump at **A**) can be seen in the 1965 image and are absent in 2016.

Recent changes within the bankfull stage of the active channel, including the bank slide and associated wood jam (identified as an unstable area in the THP), may contribute to lateral shifting of the current active channel (see Figure 12).

In support of the ASP Rules, CAL FIRE and CDFW provided clarification in determining the Channel Migration Zone (State of California, 2014) stating the following:

> *It is most appropriate to determine if channel migration has historically occurred using a combination of office methods (i.e., a series of aerial photographs covering a wide time frame, topographic maps) and field inspection. CMZs are found in areas with unconfined channels (i.e., valley floor width is greater than two (2) times the bankfull channel width). Field inspections will reveal past lateral movement of the channel, often age-progressive bands of trees (e.g., red alder) on the floodplain, and at least one side channel on the floodplain at or below bankfull elevation of the main channel (WFPB 2004).*

The THP does not appear to incorporate the methods described above in assessing the Channel Migration Zone.

Figure 12. This wood jam occurs at the base of a recent bank slide where the current active channel meets the toe of the slope on the left bank valley wall. The wood jam is between the Second Channel Area (upstream) and the occurrence of bedload deposits on the floodplain (downstream). The THP identifies the bank slide within the Inner Zone A WLPZ.

According to the Forest Practice Rules (Cal. Code Regs., tit. 14, sec 895), a Channel Migration Zone is defined as follows:

> …*the area where the main channel of a Watercourse can reasonably be expected to shift position on its floodplain laterally through avulsion or lateral erosion during the period of time required to grow forest trees from the surrounding area to a mature size, except as modified by a permanent levee or dike.*

Mature trees under the definition of the Forest Practice Rules follow Dunning’s classification and include trees at least 150 years old. Using the metric of mature trees for temporal assessment, consideration of potential channel migration should span at least 150 years before and 150 years after the present day. This temporal period would likely include past flood events.

Evaluation of lateral stability of the alluvial channel should consider that alluvial channels self-adjust to changes in flow, sediment load, and wood and have the potential to build floodplains and shift laterally (WFPB, 2004, p. M2-45). Floodplains located on flat valley floors are the result of lateral stream migration (FISRWG, 1998). In addition to CDFW staff observations during the PHI, evaluation of the historic imagery from 1953 and 1965 indicate the alluvial channel has shifted on the floodplain. PHI observations and historic imagery also indicate the channel is migrating on the floodplain. The four examples of lateral channel movement outside the current active channel clearly indicates channel

migration is dynamic in the portion of the North Fork Gualala River encompassed by the THP. Further, the new bank-slide and associated wood jam immediately adjacent to the THP may contribute to future lateral channel shifting (O’Conner et al., 2003).

Potential Impacts on Fish and Wildlife Due to Proposed Timber Operations in Channel Migration Zones

CDFW has determined the following impacts will likely occur to Coho Salmon and other salmonids due to proposed operations within the Channel Migration Zone:

- *Loss of Coho Salmon habitat over time* – Establishing Inner Zone A and Inner Zone B in a Channel Migration Zone is problematic because it could result in harvesting areas where the main channel could occupy the floodplain in the future as the channel migrates laterally. This may fail to protect streamside sensitive areas that provide whole trees with attached root wads for large woody debris recruitment. Trees with attached root wads are most effective at creating complex channel habitats (Fox, 2001 and Fox et al., 2007). The failure to protect these wood recruitment zones could adversely affect the development of zero velocity Coho habitat over time, including alcoves and backwaters. Alcoves and backwaters provide critical high flow refugia for juvenile Coho (Bell, 2001). In addition, not identifying the full extent of the Flood Prone Area, where fish may be present during floods or in lateral channel habitats, and by not appropriately applying Channel Migration Zones, could result in reasonably predictable impacts to Coho Salmon and other salmonids in the form of loss of, or damage to, rearing and refugia habitats.

- *Increased critical late summer stream temperatures* – When the channel migrates away from areas protected by Inner Zone A and Inner Zone B, it may predictably lead to increased summer stream temperatures in unprotected channels on the floodplain. Stream temperatures in the Gualala watershed are already an issue. The North Fork Gualala stream temperature data indicate the Maximum Weekly Average Temperature (MWAT) between 1994 and 2011 ranged from 15.5 to 22 degrees Celsius (Gualala River Watershed Council, 2019). The MWAT, or the optimum physiological temperature range for juvenile Coho is between 16.8 and 17.4 degrees Celsius (Reiser and Bjorn, 1979). Any increase in water temperature in the North Fork Gualala, due to, for example, reduction in the canopy cover could cumulatively impact the survival of juvenile Coho Salmon. Lastly, not identifying the full extent of the Flood Prone Area, where fish may be present in lateral channel habitats, and not appropriately applying the Channel Migration Zone, could result in reasonably predictable impacts to Coho Salmon and other salmonids.

Floodplains and associated habitat features, including off-channel ponds, oxbows, and secondary channels, are well documented as important salmonid habitat, and provide high quality habitat for other wildlife. Potentially significant impacts on the floodplain due to proposed timber operations should include an assessment of the following:

- Soil compaction and impacts from soil compaction on –

    - re-establishment of native vegetation and recovery of soil mycorrhiza;
    - invertebrates, and/or their habitat, that feed anadromous salmonids;
    - re-occupation of soil invertebrates in areas of compacted soils;
    - reduction of water infiltration and other alterations to the natural drainage patterns on the floodplain surface;
- Seasonal wetlands;
- Alteration of floodplain channels, including the bed, bank, and channel of overflow channels that provide winter refuge;
- Potential for stranding fish in disconnected side channels; and
- Impacts to wildlife that inhabit seasonal wetlands and sensitive surfaces within Flood Prone Areas.

THP 1-19-00098 MEN appears incomplete according to Cal. Code Regs. tit. 14 § 1034(w) for the following reasons: 1) the THP does not include the appropriate disclosure and analysis of lateral channel migrations; 2) the THP does not disclose the full extent of Class I watercourse habitats; and 3) the THP does not fully disclose potentially significant impacts on floodplain habitats, including habitat for listed anadromous fish and other wildlife species.

Absent accurate information on the presence and protection of the floodplain habitats within the Flood Prone Area and Channel Migration Zone(s), this THP as proposed does not fully assess the THP’s potentially significant impacts on the environment. Finally, CDFW cannot fully comment on the THP’s address of cumulative effects on stream temperature, watercourse condition (as it relates to large woody debris recruitment, streambed, and flow modification), and biological resources according to Cal. Code Regs. tit. 14 Technical Rule Addendum 2.

RECOMMENDATIONS

As Trustee Agency for California’s fish, wildlife, and native plant resources under Public Resources Code §21000, et seq., a Responsible Agency pursuant to CEQA §15381 and Trustee Agency pursuant to §15386, and a Review Team Agency under Cal. Code Regs., tit. 14, §1037.5(a), CDFW provides the following feasible and project specific recommendations to avoid or reduce potentially significant direct, indirect, and cumulative impacts in accordance with the Forest Practice Rules, Cal. Code Regs., tit. 14 §1037.5(f).

CDFW provided recommendations to CAL FIRE for the protection of biological resources, including justification and minimal background information, on August 22, 2019. The CalTREES uploaded recommendations are included below.

Prior to the THP’s second review team meeting, revise THP’s Section II and other appropriate sections to incorporate the following:

1. To assess potential impacts to salmonid habitat and aquatic biological resources, the THP shall identify areas where the lateral channel migration may result in floodplain features that provide important habitat to salmonids (such as floodplain channels, seasonal wetlands, and off channel ponds) within the time required to grow redwood trees to a mature size (150 years based on Dunning’s Classification). Please revise the THP to include an analysis of the lateral channel migration and resulting floodplain features and address past, current, and future channel migration in the North Fork Gualala floodplain.

2. CDFW is not able to fully assess the THP’s potential significant impacts to salmonids, in addition to other aquatic biological resources occurring in the North Fork Gualala River floodplain without an accurate delineation of the Channel Migration Zone. To reduce potentially significant impacts to salmonids and other aquatic biological resources:

    a. Revise the THP to provide all Channel Migration Zones Class I Watercourse and Lake Protection Zone (WLPZ) protections per Cal. Code. Tit. 14 §916.9(f)3; or,

    b. Revise the THP to include Alternative WLPZ protections per Cal. Code. Tit. 14 §916.6 and include a clear and complete explanation and justification.

3. The THP designates a single Northern Spotted Owl (*Strix occidentalis occidentalis*) *core area polygon* for the activity centers associated with MEN0179. The *core area polygon* includes the following: the 2002/2003 nest site, 18 acres within 500 feet of the 2002/2003 nest site, an area along the North Fork Gualala River that borders non-suitable habitat, and an area to the east that is comprised of stands overlapping the hillslope and a small portion of the floodplain. The designated *core area polygon* includes 53 acres beyond the 1,000 feet surrounding the 2002/2003 nest site. However, THP 1-19-00098 MEN does not propose a designated *core area polygon* for the 1991/1977 MEN0179 nest site activity center.

    CDFW observed high quality *nesting/roosting* Northern Spotted Owl habitat along the floodplain south of the designated *core area polygon*, including a multi-storied canopy with multiple age-classes of redwood trees, including trees greater than 24-inches diameter at breast height within 1,000 feet of the 2002/2003 nest site.

    To reduce potentially significant impacts to Northern Spotted Owls, including cumulative impacts to suitable nesting/roosting habitat, revise the THP to designate a minimum 100-acre Northern Spotted Owl *core area polygon* that includes the best available high quality *nesting/roosting* habitat contiguous with habitat within 1,000 feet of the MEN0179 2002/2003 nest site activity center and the MEN0179 1991/1997 nest site activity center.

4. Numerous timber operations are proposed to occur within the designated Northern Spotted Owl *core area polygons* listed in Section II (including within 1,000 feet of the MEN0179 2002/2003 nest site). The THP identifies the portion of the Northern Spotted Owl *core area polygon* within 500 feet of the MEN0179 2002/2003 nest site activity center. However, the THP does not identify the remainder of the *core area polygon*.

   To reduce potentially significant impacts to Northern Spotted Owl, revise the THP to include the entire Northern Spotted Owl *core area polygon* that includes a minimum 100 acres of the best available high-quality *nesting/roosting* habitat in the appropriate Section II maps.

5. The Marbled Murrelet (*Brachyramphus marmoratus*) is listed as State endangered pursuant to Fish and Game Code (Fish and G. Code) section 2050 et seq., federally threatened pursuant to section 1531, title 16, United States Code (16 U.S.C) et seq., and a sensitive species as defined by Cal. Code Regs. tit. 14, section 895.1.

   Marbled Murrelet habitat is known to occur in the Green Bridge Marbled Murrelet Habitat Area, located 0.25-mile from appurtenant roads to THP 1-19-00098 MEN. The THP proposes appurtenant road use within 0.25-mile of the Green Bridge Marbled Murrelet Habitat Area.

   To reduce potentially significant impacts to Marbled Murrelet, revise the THP to disclose the Green Bridge Marbled Murrelet Habitat Area on the THP Appurtenant Roads Map in Section II. In addition, Section II shall specify that GRT will re-consult with CDFW prior to commencing operations, including timber hauling, should operations within 0.25-mile of the Green Bridge Marbled Murrelet Habitat Area proceed after the beginning of the 2024 Marbled Murrelet breeding season.

6. The THP occurs in the range of Osprey (*Pandion haliaetus*) and includes potential nesting habitat within the biological assessment area. Osprey are a Board of Forestry sensitive species (Cal. Code. Tit. 14 §895.1 and §919.3(b)(5)). The THP does not provide protections should an Osprey nest occur within one quarter mile of the THP.

   To reduce potentially significant impacts to Osprey, revise the THP to include species-specific protective measures for Osprey.

7. The THP occurs in the range of Bald Eagle (*Haliaeetus leucocephalus*). A pair of Bald Eagles have occupied the lower Gualala River estuary since 2017 (personal observations). Potential suitable nesting habitat occurs within and adjacent to the THP. The Bald Eagle is a sensitive species as defined by Cal. Code. Tit. 14 §895.1. The THP does not provide protection measures for the Bald Eagle.

   To reduce potentially significant impacts to Bald Eagle, revise the THP to include species specific protective measures for Bald Eagle.

8. The THP overlaps the range of several species of heron, including the Great Blue Heron (*Ardea herodias*) and the Great Egret (*Ardea alba*). The THP is located less than 2 miles from the Gualala River estuary. High quality foraging habitat and suitable nesting habitat occur within and adjacent to the THP. The Great Blue Heron and the Great Egret are sensitive species as defined by Cal. Code. Tit. 14 §895.1. The THP does not provide heron rookery protections.

   To reduce potentially significant impacts to heron rookeries, revise the THP to include protection measures for heron rookeries that may support nesting Great Blue Herons and Great Egrets.

9. GRT has conducted foothill yellow-legged frog (*Rana boylii*) surveys within the Gualala River watershed and documented multiple breeding sites, including the immediate area around a proposed temporary crossing at Map Point 3. As a candidate species for threatened status, activities which may result in take of foothill yellow-legged frog are unlawful per Fish and Game Code.

   To reduce potentially significant impacts to foothill yellow-legged frogs, revise the THP to disclose known foothill yellow-legged frog occurrences within the proposed THP area. The survey information shall, at a minimum, include the following:

   a. Map of the surveyed areas;
   b. Map of foothill yellow-legged observations and known breeding sites;
   c. Field survey forms; and
   d. A discussion of findings.

10. To reduce potentially significant impacts to foothill yellow-legged frogs at Class I watercourse crossings where there is breeding habitat for *Rana boylii*, revise the THP to include the following protection measures:

    a. Exclusion fencing shall be used during the installation and removal of the watercourse crossing. Exclusion fencing is expected to be a temporary effective technique provided it is properly installed, both trenched in and vertically stout, and regularly maintained.
    b. A qualified biologist or person knowledgeable with all life stages of *Rana boylii* and similar species shall install and remove the fence and educate personnel on-site of the protection measures.
    c. Exclusion fencing shall be installed after surveys are completed, within 5 days prior to the watercourse crossing installation, and again within 5 days prior to the watercourse crossing removal.
    d. Exclusion fencing shall be installed upstream and downstream of the watercourse crossing and associated project footprint, on both river right and river left, a distance equal to twice the length of the crossing so that

any frogs dispersing from the watercourse will be excluded from the project footprint.

e. The exclusion fencing shall extend perpendicular to the wetted channel approximately 5 feet, and approximately 30 feet onto the bank, where feasible, to prevent tadpoles, juveniles, and adults from migrating into the work area.

f. Exclusion fencing shall be at least three feet high and the top few inches shall be folded over to curtail climbing frogs away from the construction area. The proposed design shall allow frogs to climb up and out of the impact zone while preventing them from climbing into the project area.

g. The fence shall consist of ¼-inch mesh or smaller opening material, preferably consisting of wire, or alternatively fabric netting if capable of withstanding flow.

h. Fencing must be sufficiently anchored to the gravel bar near the edge of the streambed to prevent immigration of frogs.

i. If any personnel encounter a foothill yellow-legged frog within or near the project site, work in the immediate vicinity of the sighting shall cease until the species has cleared the work area. The biologist and project proponent shall be informed of any sightings, and frogs shall be allowed to leave the area unharmed and on their own volition.

j. All sightings shall be reported to the Department by email @ CTP@wildlife.ca.gov

k. If any life stage of foothill yellow-legged frog cannot be avoided during project activities, work shall be suspended, the Department notified, and all required measures and/or permits shall be developed in agreement with the Department prior to recommencing activities.

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