State of California
Department of Fish and Wildlife

Memorandum

Date: October 6, 2014

To: Matt St. John, Executive Office
North Coast Regional Water Quality Control Board
5550 Skylane Boulevard, Suite A
Santa Rosa, CA 95403-1072

From: **Neil Manji**
Regional Manager
Region 1 – Northern

Subject: **Elk River Total Maximum Daily Load Analysis and Technical Report**

In 1998, Elk River, tributary to Humboldt Bay, was listed as sediment-impaired pursuant to the Clean Water Act (CWA) section 303(d), resulting in the North Coast Regional Water Quality Control Board (NCRWQCB) assessing sediment deposits and inputs through the Total Maximum Daily Load (TMDL) process. The TMDL analysis confirms that Elk River is cumulatively impacted by sediment and the TMDL describes the sources of impairment and measures to address these sources.

On June 18, 2009, the California Department of Fish and Wildlife (CDFW) provided preliminary comments to NCRWQCB for activities the TMDL implementation may be required to cover. Subsequently, a Peer Review Draft Staff Report to Support the Technical Sediment Total Maximum Daily Load for the Upper Elk River (Technical Report) and the Response to Peer Review Comments were prepared for the NCRWQCB. On several occasions, CDFW staff has met with NCRWQCB staff to discuss the technical analysis and implementation measures identified in the Technical Report and Response to Peer Review Comments.

CDFW Roles and Responsibilities

Fish and wildlife resources are held in trust for the people of the State of California. Pursuant to Fish and Game Code (FGC) section 711.7, CDFW is designated as trustee for the State's fish and wildlife resources. FGC section 1802 grants CDFW jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species. As trustee agency for the aquatic resources in this State, CDFW has a material interest in assuring that water flows and water quality within streams are maintained at levels that are adequate for long-term protection, maintenance, and proper stewardship of these resources.

As a responsible agency, CDFW administers the provisions of the FGC, including California Endangered Species Act (CESA) (FGC §2080 et seq.), Lake or Streambed Alteration Agreement (FGC §1600 et seq.), Water Pollution (FGC §5650), and other

FGC sections intended to conserve the State's fish and wildlife public trust resources. CDFW offers the following comments and recommendations on the Technical Report in our roles as a trustee and responsible agency pursuant to the California Environmental Quality Act (CEQA; California Public Resource Code section 21000 et seq.).

Elk River is a regionally important fish- bearing stream supporting listed species including coho salmon. Elk River coho salmon are an important population to maintain or improve the coho recovery. Dramatic declines in the abundance of Chinook and coho salmon and steelhead trout have not only resulted in these fish being protected under the federal Endangered Species Act (ESA), but resulted in economic decline from revenue losses formerly generated by commercial and recreational fisheries in the State. In 2008 and 2009, the Governor of California declared State of Emergency for commercial salmon fishing, resulting in an estimated loss of over $500 million dollars to California's economy and thousands of jobs (Governor's State of Emergency Proclamations 2008 and 2009).

CDFW's report *The Recovery Strategy for California Coho Salmon* has as its goal the return of a viable tribal, recreational, and commercial fishery in California (DFG 2004). It lists actions contributing to coho salmon recovery including implementing existing laws, regulations, and permits such as various FGC sections, Port-Cologne Water Quality Control Act, Water Code section 13000 et seq., Clean Water Act (CWA) section 303(d), and TMDLs. CDFW believes the NCRWQCB must consider coho salmon recovery as a high priority during TMDL implementation.

CDFW is providing comments to NCRWQCB on the TMDL concerning fish listed under ESA and CESA, California Species of Special Concern (Table 1), rare and sensitive habitats, and FGC requirements for activities the TMDL implementation may require.

Table 1. Listed species and species of special concern in Elk River watershed (FT-federally threatened, ST-State threatened, CSSC-California species of special concern).

Common Name	Species	Status
Coho salmon	*Oncorhynchus kisutch*	FT, ST
Chinook salmon	*O. tschawytscha*	FT
Steelhead trout	*O. mykiss mykiss*	FT
Coastal Cutthroat trout	*O. clarki clarki*	CSSC
Longfin smelt	*Spirinchus thaleichthys*	ST
Tidewater goby	*Eucyclogobius newberryi*	FT, CSSC
Southern torrent salamander	*Rhyacotriton variegatus*	CSSC
Western pond turtle	*Emys mammorata*	CSSC
Northern red-legged frog	*Rana aurora*	CSSC
Foothill Yellow-legged frog	*R. boylii*	CSSC
Bank swallow	*Riparia riparia*	ST
Western lily	*Lilium occidentalis*	FE & SE

In addition to the listed and sensitive species listed in Table 1, Elk River watershed also supports potential rare and sensitive riparian and wetland vegetation types. Vegetation types designated with a State (S) ranking of S1, S2, and S3 are considered rare and include:

Coastal Freshwater Marsh	S2.1
Freshwater Swamp (tree dominated)	S2.2
Coastal Brackish Marsh	S2.1
Northern Coastal Salt Marsh	S3.2
Red Alder Riparian Forest	S2.2
Shining Willow Groves	S3
North Coast Black Cottonwood Riparian Forest	S1.1
North Coast Alluvial Redwood Forest (mature)	S2.2

Both the Pacific Lumber Company (now Humboldt Redwood Company [HRC]) and Green Diamond Resources Company (GDRC) own land in Elk River and both have Habitat Conservation Plans (HCP). CDFW is a signatory agency to the HRC HCP and has a consistency determination for the GDRC HCP. The overall Aquatic Conservation Plan goal in the HRC HCP is for watershed conditions to trend toward properly functioning conditions (PFC) as defined in the National Marine Fisheries Service (NMFS) PFC matrix. In Elk River, HRC annually monitors for metrics contained within the PFC matrix including those related to pool habitat depth, quantity, and sediment parameters to determine if the watershed is trending toward PFC as a measure of recovery of instream habitat for salmonids.

Beneficial Uses of Water and Effects of Water Quality Impairment

Many California rivers no longer support native species or sustain healthy ecosystems (Poff et al., 1997). Ecosystems, including forests and wetlands, are natural infrastructures which provide essential services such as water flow regulation, flood control, and water purification to communities (Gartner et al., 2013). Strategically using the natural infrastructure (natural lands, working landscapes, and other open spaces) to conserve ecosystem values and functions will not only benefit fish and wildlife but also people (Gartner et al., 2013). Elk River and many other rivers are experiencing widespread biodiversity loss, degraded watershed ecology, and altered hydrology. Water quality impairment in Elk River is a result of increased turbidity, settleable sediment stored instream, and altered hydrology resulting in increased flooding and degraded low-flow conditions. These impaired conditions impede recovery of listed and sensitive species. CDFW supports TMDL actions that are consistent with the California Water Action Plan (2014) for "Increased Flood Protection" to protect listed and sensitive species.

According to the Technical Report, Elk River watershed has an estimated 640,000 cubic yards of fine sediment stored in its main channels resulting in reduced cross-sectional channel area, increased flooding, increased embeddedness, and decreased

grain size of sediment. These water quality impairments and altered hydrology negatively affect the listed and sensitive species and the sensitive habitats in Elk River. Because Elk River is tributary to Humboldt Bay, sediment is transported downstream to Humboldt Bay. Humboldt Bay is impacted by turbidity and sediment deposition, and dredging of Humboldt Bay channels is necessary for maintaining channel depth. Aquatic species that live or rear in the channels in Humboldt Bay are affected by turbidity and sediment from Elk River and other tributaries to Humboldt Bay. Controlling sediment at the source will reduce turbid conditions and lessen sediment inputs in Humboldt Bay. Reducing sediment inputs by controlling them at the source may also reduce the frequency of dredging in Humboldt Bay and impacts to fish and wildlife.

The Elk River watershed supports many beneficial uses of water. CDFW agrees with the TMDL that water quality impairment in Elk River affects beneficial uses of water for listed and sensitive species in the watershed and in Humboldt Bay. The intent of the TMDL is to protect beneficial uses of water through prohibitions, best management practices, and other measures. Beneficial uses that afford protection to listed and sensitive fish and wildlife and their habitat are consistent with FGC section 1600 et seq., section 2080 et seq., and sections 5650 and 5901. The only wildlife-related beneficial use of water discussed in the Technical Report related to fish is Cold Freshwater Habitat. Many beneficial uses are inter-related and critical to recovery of listed and sensitive fish in Elk River. Given the large number of listed and sensitive species and sensitive habitats in Elk River, CDFW recommends the Technical Report expand its discussion of the beneficial use of water to include:

- Rare Threatened or Endangered Species (RARE) must be included as an important beneficial use because the Elk River watershed supports five listed fish species. These populations are important for listed species recovery efforts.
- Commercial and Sport Fishing must be included because Elk River coho salmon are a key population for recovery of the species and this beneficial use aids in meeting the CDFW's Recovery Strategy for California Coho Salmon goal to return coho salmon populations to a level where tribal, commercial, and sport fishery can be supported.
- Migration of Aquatic Organisms (MIGR) must be included because the Technical Report indicates sediment and turbidity are impacting channel capacity and pool depth. Because of reduced surface flows and loss of channel capacity, salmonid ability to migrate readily between pools during low-flow periods may be affected, and salmonids will be more susceptible to predation from loss of pool depth.
- Spawning, Reproduction, and/or Early Development (SPWN) must be included because the loss of channel capacity from sedimentation reduces spawning success and because redds can be capped by sediment preventing fish from exiting redds, or from sediment infiltrating

redds, which smothers eggs and larvae in place. Turbidity effects development of eggs and rearing fish. Depending on the level of turbidity, as indicated in the Technical Report, fish may have had their feeding response slowed, reduced, or eliminated, and are subject to other impacts from turbidity, ranging from sublethal to lethal. One of the sublethal effects is reduced growth rates of out-migrating smolts. Smaller out-migrants are less likely to survive ocean conditions and subsequently less likely to return to spawn.

- Wetland Habitat (WET), Estuarine Habitat (EST), Groundwater Recharge (GWR), Freshwater Replenishment (FRSH), Water Quality Enhancement (WQE), and Flood Peak Attenuation/Flood Water Storage (FLD) are all beneficial uses that protect riparian and wetland habitats. Protecting these beneficial uses through implementation of the TMDL will also assist in recharging groundwater aquifers that are the source of Elk River surface flow during the summer period.

Any actions in the TMDL intended to protect and restore the Elk River will also help meet California Water Action Plan (2014) actions and goals that benefit fish and wildlife. CDFW supports the TMDL goals, actions, and conclusions found in the Technical Report. CDFW also believes implementing the TMDL actions will help protect listed and sensitive fish and wildlife. Restoring forest health through ecologically sound forest management and protecting and restoring degraded stream ecosystems to assist in natural water management and improved habitat are actions under the California Water Action Plan (2014) that should be considered when implementing the TMDL. CDFW recommends that in implementing the TMDL, the NCRWQCB meet the three "broad" objectives in the California Water Action Plan: (1) provide more reliable water supplies; (2) restoration of important species and habitat, and (3) support a more resilient, sustainably managed water resource system (e.g., water supply, water quality, flood protection, and environment).

Water Supply and Diversion

According to the California Water Action Plan (2014), CDFW is tasked with coordinating with other agencies and stakeholders to develop at least ten off-channel storage projects and implement at least ten large-scale habitat projects to restore key estuaries to the benefit of local water systems and help defend against sea level rise. CDFW has success in working with non-profit organizations to develop additional storage to minimize stream diversions during low-flow periods of the year. As trustee and responsible agency, CDFW has authority over water diversions from streams as they may affect fish and wildlife resources. Elk River water is relied upon by residents for domestic and agricultural uses and by timber companies for dust abatement and other timber harvest plan (THP) related uses. Water diversions in Elk River are adding to the already degraded water quality during summer low-flows; therefore, CDFW recommends water diversion be addressed as a covered activity in the TMDL.

Water supplies at low-flow are critical not only for people but also for fish and other aquatic life. Low dissolved oxygen and low flows in Elk River also affect listed fish by reducing available rearing habitat. To meet human demand while protecting listed and sensitive aquatic species, CDFW recommends water storage during higher flow periods for use during lower flow periods. CDFW, along with other entities, has funded a storage and forbearance program in the upper Mattole River, which has been a success at providing secure water supply for human use during low-flow periods while protecting flows for listed salmonids and other aquatic life. To that end, CDFW wishes to collaborate with the NCRWQCB staff and other stakeholders to find adequate water storage for domestic and other uses in the Elk River watershed.

Elk River Restoration

To address the estimated 640,000 cubic yards of sediment in the "middle reach" of Elk River, CDFW is supportive of working cooperatively with NCRWQCB and interested and affected parties to restore the Elk River. CDFW is willing to participate in coordinated restoration efforts to plan, permit, potentially help fund, and implement restoration of Elk River. During restoration efforts, CDFW would like to ensure the restoration is done in a manner that promotes a healthy riparian condition. Flow resistance from riparian vegetation can also ameliorate downstream flood height. Removal of riparian vegetation has been proposed by some as a means for improving flows; however, removal can also impact important functions and habitat values for fish and other wildlife, and lead to degradation of riparian and wetland habitats. CDFW recommends that vegetation management projects be designed to ensure adequate riparian conditions to support fish and wildlife.

CDFW is concerned about subsidence and sea level rise around Humboldt Bay. Sediment excavated during Elk River restoration efforts may potentially be used in areas around Humboldt Bay where subsidence has occurred or to ameliorate sea level rise. CDFW anticipates cooperating with the NCRWQCB to determine if the excavated sediment may be used in subsided and low-lying areas around Humboldt Bay where an improvement to estuarine habitat could be demonstrated.

Rate of Harvest and BMPs

CDFW is concerned about the potential effects on hydrology from high rates of harvest (ROH), which has been shown to affect sedimentation to streams. Studies revealed timber harvesting in the Caspar Creek watershed (Ziemer 1998, Lewis 1998, and Reid 1998) nearly doubled the suspended sediment load to streams due, in part, to increased runoff and peak flows in the smallest and unbuffered tributaries. Timber harvesting can increase runoff and soil moisture content by removing substantial amounts of leaves and stems, which in turn may reduce the pre-harvest stand's rainfall interception and water trans-evaporative abilities (Chamberlin et al., 1991).

THPs acknowledge timber harvesting can affect sedimentation but assume the timber harvesting will not significantly increase runoff by retaining conifers for regeneration and by application of Watercourse and Lake Protection Zones on Class I and Class II watercourses and equipment limitation zones adjacent to Class III watercourses. Strategies of zero-net-increase in suspended sediment load and offsetting mitigations may not prevent changes in runoff and peak flow in the smallest tributaries (Reid 1998). Reid (1998) found the effect was an indirect result of canopy volume removed in timber harvesting areas and that the hydrologic change could not be easily mitigated.

To address sediment impacts, THPs rely on Best Management Practices (BMPs) to address the likelihood to add to existing suspended sediments and bed load deposits. CDFW supports comprehensive use of BMPs to address site specific sediment sources and erosion sites. BMPs such as road repairs and watercourse buffers have helped to reduce site specific erosion from operations. However, BMPs are not always sufficient for all site conditions, and degradation of water quality may still result in watersheds where too much of the land base is harvested over a relatively short time period.

CDFW has had a consistent concern for rate of disturbance, sedimentation, and flooding from timber harvesting in the Elk River watershed. Hence, CDFW supports the idea of a watershed ROH as proposed with an adaptive management monitoring to evaluate its effectiveness.

Cumulative Watershed Effects and Rate of Harvest

THPs are required to disclose harvest history by planning watershed for the preceding ten years, as well as reasonably foreseeable future activities. Ten years was chosen for reasons that include the effects of silviculture treatments and tree-root die-back. Sediment yields from timber harvest may persist for more than ten years as noted in Klein et al., (2011). Because the effects of silviculture treatments may persist for more than ten years, CDFW considers harvest history for at least 15 years to better understand how the current THP may or may not add to existing cumulative watershed effects (CWE).

ROH is one method for addressing CWE by providing a scale with which to compare watersheds with similar geology, harvest histories, and watershed conditions. ROH is an important implementation strategy for recovery of ecological function and overall health of the watershed, water supply, and recovery of listed and sensitive species. Watersheds with particularly high ROH, as Elk River has experienced, have demonstrated a disturbance "signature" consistent with high road, skid trail, and stream crossing densities, riparian vegetation impairments, and a low incidence of late-seral forests and late-seral elements.

The concept of ROH at the watershed level is not new (Klein 2008). Munn and Cafferata (1992) suggested that the California Department of Forestry and Fire Protection draft harvest guidelines for "sensitive" watersheds where timber harvest exceeded 20 percent within a ten-year period (2% ROH), while Tuttle (1992) recommended a 1.5 percent ROH could be a threshold to determine if impacts to beneficial uses, including those pertaining to fish, are impacted. Over the last 15 years, CDFW has also expressed concerns with ROH and sediment in THP inspection reports (DFG 1998, Floerke 2005, Floerke 2006(b), Stacey 2008, Stacey 2009(a), and Stacey 2009(b)).

Klein et al. (2008) provided a recent quantitative linkage between past THP activities, CWE, and anadromous salmonids using clear cut equivalent (CCE). Modeled turbidity impacts to salmonids from CCEs between 0 to 15 percent indicated that between 1.4 percent and 2.3 percent CCE per year could cause significant CWE including impacts to anadromous salmonids (Klein et al., 2008). When annual average CCE harvest rates were above 1.4 percent, Klein et al. (2008) recommended more scrutiny of potential impacts from additional timber harvest proposals to avoid CWE.

Based on HRC's 2012 Fisheries report (Simpson 2013), coho salmon, steelhead and cutthroat trout currently occupy most of the Elk River sub-basins. Each sub-basin varies widely in turbidity levels (% time >25 NTU range from 0.2% to 84.1%). Salmonid drift feeding is reduced significantly at turbidity levels greater than 25 NTU (Sweka and Hartman 2001a), while benthic feeding is limited at levels greater than 100 NTU (Harvey and White 2008, and White and Harvey 2007). It has been shown that energy gained through winter feeding is an important part of the year-round energy budget of salmonids, and in association with habitat and stream flow, significantly influences overwintering survival/growth (Harvey and Wilzbach 2009). Based on these findings, it appears the proposed ROH restrictions as identified in the Technical Report will have the greatest affect in sub-basins where turbidity levels are limiting fish feeding, spawning, and growth.

By maintaining a high percentage of Class II watercourses at or near background turbidity levels, Class I watercourse turbidity levels would also be maintained at levels supportive of fisheries needs. CDFW believes the 1.5 percent harvest restriction in the Technical Report will have measureable benefits at the sub-basin level by minimizing first-year logging-related turbidity increases, spatially and temporally focused on a low percentage of Class II watercourses.

Sediment Source Analysis and Load Reductions

The Technical Report identifies numerous non-point source management related sediment inputs with the highest inputs from small streamside landslides, road-related shallow landslides, and road surface erosion. The Technical Report attributes less bank erosion and small streamside landslides to natural background rates than does the HRC Watershed Analysis (WA). The Technical Report only considers the number

of low-order streams in the undisturbed Headwaters Forest verses those on managed lands and by using only bank erosion to determine background rates while the HRC WA counts both bank erosion and soil creep as background sediment sources. The use of Headwaters Forest as a reference stream informs important gaps in the understanding of natural processes in Elk River, especially in Class III watercourses. The Technical Report identifies the important role of Class III watercourses in managing sediment delivery, building on information from the HRC WAs.

The drainage density analysis in the Technical Report indicates the stream density in managed land is triple that of undisturbed lands and that the drainage density has continued to increase under recent management, which includes ten years of implementation of the HRC HCP. This indicates HCP measures may not address the processes that influence the expansion of the drainage network and associated increased sediment delivery. Hillslope sources as quantified in the sediment source analysis are based upon data also used in the HRC WA. The HRC WA attributes approximately three times as much sediment inputs to background sources as does the Technical Report. While sediment budgets are substantially different in HRC's WA and the Technical Report, both indicate controllable sources of sediment are present and sediment loads remain an issue for listed and sensitive species. Additionally, at several trend monitoring sites in Elk River, bulk sediment samples and pool depths are not trending toward PFC matrix targets as required by the HRC WA. These trends indicate ongoing fine sediment inputs are still problematic in the Elk River watershed.

Loss of pool depth, fine sediment increases, turbidity, and suspended sediment concentration are critical parameters limiting fish recovery. CDFW believes implementing a TMDL loading capacity that will achieve water quality objectives and restore the beneficial uses of water related to fish is important for fish recovery.

TMDL Numeric Sediment Targets

CDFW is particularly concerned with historic logging impacts in headwater streams and potential impacts associated with future logging practices. Legacy sediment stores in streams deposited by historic logging practices in combination with sediment mobilization caused by current logging practices are likely contributors of increased sediment loads from timber harvesting in second growth watersheds (Klein et al., 2008, and Lewis 1998). Differences in fine sediment storage were major between pristine watersheds when compared to old second growth watersheds, demonstrating historic logging impacts were still influencing habitat quality (Knopp 1993).

The TMDL identifies instream salmonid habitat targets, which are consistent with the PFC matrix. CDFW acknowledges the PFC matrix is not exhaustive because the only water quality parameter is median water ambient temperature and does not include targets for peak flows, turbidity, or dissolved oxygen. The Technical Report identifies some water quality conditions that may be harmful to aquatic species in Elk River. The TMDL numeric targets compliment HCP goals by addressing: (1) important gaps

in the PFC matrix related to water quality; (2) flooding, and (3) impacts from Elk River watershed lands not covered by HCPs.

In Elk River, trend monitoring indicates pool depth is decreasing rather than increasing toward the PFC metric of pool depth 3 feet deep or greater. At some cross-sections, the cross-sectional area trend indicates the channel is still being filled with sediment. The PFC matrix target for fine sediment of less than 14 percent for a D84 for fine sediment is still being exceeded 15 years after implementation of the HCP. The Technical Report indicates in some segments of Elk River sediment-related indicators of PFC are not improving. CDFW supports the TMDL targets for sediment source reductions not already being explicitly controlled through current efforts under the HCP for HRC and GDRC.

Peak Flow Numeric Target

Altering a river's natural hydrological variability is ecologically harmful for many reasons (Poff et al., 1997). When the peak flow hydrograph is increased, its recession is decreased, and the low-flow hydrograph may also be reduced. These alterations in the watershed's hydrograph negatively affect fish by altering spawning, migration, and rearing flows. A potential approach to address the altered hydrograph is implementing small-scale groundwater recharge projects in Class III watercourses. These types of projects will aid in recovery of peak flows, recharge groundwater supplies, and capture sediment at the source. This approach may provide a more rapid recovery of peak flow-related numeric targets in areas where riparian vegetation will not soon recover on its own. CDFW recommends the Technical Report include a hydrology objective and implementation measures to meet the beneficial uses of water including FRSH, FLD, and GWR.

The Technical Report discusses the propensity for Class III gullies to form in the Elk River watershed, which may be exacerbated by increase in peak flows on soft geology prone to soil piping. By limiting the peak flow increases, timber harvest activities could be implemented in a manner addressing increased drainage network, reduced channel capacity in response reaches (e.g., the middle reach), and resulting impacts on reduced summer low-flows that cause impacts to rearing coho salmon and other listed and sensitive species in those reaches.

The Technical Report addresses peak flow increases and the associated suspended sediment load increases resulting from timber harvesting. The TMDL links control of peak flows to control of bank erosion and streamside landslides. The HRC WA also identified that bank erosion and streamside landslides were the dominant sources of sediment. The HRC WA prescriptions for headwall swales require a 25-foot buffer with 50 percent conifer canopy retention to prevent sediment inputs associated with mass wasting. Peak flow must be reduced along with measures to control in-channel sources and the expanded drainage network. Protecting headwall swales is an additional targeted protection for diminishing ground disturbance in Class III

watercourses and is reasonable and warranted in Elk River. This approach will result in less head-cutting and more infiltration. CDFW is supportive of the TMDL numeric target to limit increase in peak flow to ten percent above background and in a manner that protects listed fish and sensitive aquatic species.

Riparian Areas Target

The Technical Report identifies many processes that are supported by riparian setbacks or buffers, but does not discuss wildlife using the buffers for migration and habitat. Conserving riparian buffers is consistent with FGC section 2050 et seq. (threatened and endangered species), section 3503 (bird nests and eggs), and section 3503.5 (birds of prey). Any restoration projects will need to assess potential listed and sensitive riparian or wetland species, and protection or mitigation, which may be required. Elk River supports a large number of riparian and wetland vegetation types as designated by the California Natural Diversity Database as rare, which have ecological importance and conservation status. In addition to the ecological services and wildlife habitat they provide, sensitive or rare riparian vegetation may need protection or mitigation strategies to prevent their further decline. Vegetation types designated with a State ranking of S1, S2, and S3 are considered rare. CDFW recommends the Technical Report discuss the importance of riparian buffers as wildlife migration corridors and habitat, and as sensitive vegetative types.

Buffers with tree retention improve bank stability, metering of sediment, leaf litter, insect drop, and contribute woody debris input. Class III watercourse buffers with tree retention helps slow sheet flow from timber harvest areas resulting in more rainfall absorption, which will reduce peak flows, channel incision, and assist in recovery from past impacts such as skid trails in Class III watercourses. CDFW is supportive of the numeric target for riparian buffers in the TMDL.

Conclusions and Recommendations

Elk River and its tributaries are designated as sediment-impaired pursuant to the CWA section 303(d) indicating they are cumulatively impacted. Implementation of the TMDL will control sources of sediment not currently being addressed through HCPs or through BMPs required in THPs. Without additional BMPs and other fish and wildlife protective measures, sediment will deliver to Elk River and its tributaries. The substantial adverse effect of such sediment discharges on salmonids and other aquatic species is well-documented.

Based upon the biology and habitat requirements of the listed and sensitive species and vegetation types listed above, the sediment inputs will cause deleterious effects on aquatic species and their habitats. The sediment delivered to streams from controllable sources is contributing to a sediment-impaired watershed and is a cumulative watershed impact (Reid 1998). CDFW has the following recommendations for the NCRWQCB:

1. The TMDL implement actions which are consistent with the California Water Action Plan (2014) for "Increased Flood Protection" to protect listed and sensitive species.

2. The Technical Report include RARE, MIGR, SPWN, WET, EST, GWR, FRSH, WQE, and FLD beneficial uses.

3. The TMDL meet the three "broad" objectives in the California Water Action Plan (2014) which are: (1) provide more reliable water supplies; (2) restoration of important species and habitat, and (3) support a more resilient, sustainably managed water resource system (e.g., water supply, water quality, flood protection, and environment).

4. Vegetation management projects be designed to ensure adequate riparian conditions to support fish and wildlife.

5. The TMDL adopt a watershed ROH as proposed with an adaptive management monitoring component.

6. The TMDL address targets for sediment source reductions not already being explicitly controlled through current efforts under the HCPs for HRC and GDRC.

7. The Technical Report include a hydrology objective and implementation measures to meet the beneficial uses of FRSH, FLD, and GWR.

8. The TMDL implement the numeric target to limit increase in peak flow to 10 percent above background and in a manner that protects listed fish and sensitive aquatic species.

9. The Technical Report discusses the importance of riparian buffers as wildlife migration corridors and habitat and as sensitive vegetative types.

10. The TMDL implement the numeric target for riparian buffers.

Thank you for your time and consideration in this matter. CDFW looks forward to continued collaboration with the NCRWQCB staff and other stakeholders. If you have any questions or comments regarding this matter, please contact Senior Environmental Scientist (Specialist) Jane Arnold at 619 Second Street, Eureka, California 95501 or telephone (707) 441-5671.

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