

**Response to Comments
on
Draft Order No. R1-2020-0001**

Waste Discharge Requirements

For

**Discharges Related to Green Diamond Resource Company's
Forest Management Activities Conducted Within the
Upper Elk River Watershed
Humboldt County**

Prepared by:
Staff of the North Coast Regional Water Quality Control Board
February 6, 2020

Procedure

On October 2, 2019, the North Coast Regional Water Quality Control Board (Regional Water Board or RWB) issued a Notice of Public Hearing for Draft Order No. R1-2020-0001, Waste Discharge Requirements for Discharges Related to Green Diamond Resource Company's Forest Management Activities Conducted Within the Upper Elk River Watershed Humboldt County (draft Order). The purpose of the draft Order is to update waste discharge requirements for Green Diamond Resource Company's (GDRCo) forest management activities conducted in the Upper Elk River Watershed to be consistent with applicable requirements of the Action Plan for the Upper Elk River Sediment Total Maximum Daily Load (TMDL Action Plan). The draft Order updates those portions of Order R1-2012-0087, *Waste Discharge Requirements for Discharges Related to Green Diamond Resource Company's Forest Management Activities Conducted Within the Area Covered By its Aquatic Habitat Conservation Plan in the North Coast Region* (GDRCo Forest Management WDR), specific to forest management activities conducted by GDRCo on its timberlands in the Upper Elk River watershed.

The Public Notice stated that Regional Water Board would conduct a public hearing to consider adoption of the draft Order and Subsequent MND on February 6 or 7, 2020, at 8:30 a.m., at the Regional Water Board's office in Sonoma County, or as announced in the Regional Water Board's agenda and on its website:

<https://www.waterboards.ca.gov/northcoast/>.

The initial Public Notice stated that the comment period would end on November 1, 2019. Subsequently, based on a request by GDRCo, the comment period was extended an additional 15 days and on October 30, 2019, the Regional Water Board issued a revised Public Notice extending the end of the public comment period to November 15, 2019. Both Public Notices were posted on the Regional Water Board's website, sent out to the Lyris email subscription list and emailed directly to known stakeholders. Substantive comments

received during the October 2 to November 15, 2019 comment period are summarized below, followed by Regional Water Board staff's responses. Where commenters have made similar comments, those comments are summarized, and a single response is presented. Original copies of all written comment letters will be made available to interested parties upon request.

Comments received during the October 2 to November 15, 2019 Comment Period:

Tom Wheeler, Environmental Protection Information Center (EPIC)
Jerry Martien, Friends of Elk River
Jesse Noel, Elk River resident
Kristi Wrigley, Elk River resident
GDRCo, including sections by:
 Gary Rynearson, Manager Forest Policy and Communications
 Wayne Whitlock, Attorney for GDRCo
 Patrick Belmont, PhD
 Kevin Boston, PhD, RPF

Overview

In June 2010, the Regional Water Board adopted ownership-wide Road Management Waste Discharge Requirements (WDRs; Order No. R1-2010-0044) and in October 2012 the Forest Management WDRs (Order R1-2012-0087) for associated activities on GDRCo's property within the North Coast Region. The Road Management WDR covers systematic road upgrading and decommissioning, as well as maintenance and monitoring of the road system associated with the Road Management Plan from GDRCo's Aquatic Habitat Conservation Plan (AHCP). All activities carried out under the Road Management Plan comply with techniques and restrictions designed to prevent and minimize impacts to water quality, as detailed in the AHCP and the Master Agreement for Timber Operations. The Forest Management WDR covers activities associated with timber harvesting, including timber product harvest, silvicultural regimes and methods, timber stand regeneration and improvement, road construction and reconstruction, minor forest product harvest, and in-stream and riparian restoration.

Together the two WDRs provide complete, programmatic, ownership-wide WDR coverage to GDRCo's commercial timberlands within the area covered by its Aquatic Habitat Conservation Plan (AHCP) and Master Agreement for Timber Operations (MATO), including the Upper Elk River watershed.

Finding 22 of the GDRCo Forest Management WDR states, "At such time as the Total Maximum Daily Load (TMDL) is adopted, the provisions of the Elk River component of this Order and/or the South Fork Elk River Management Plan (SFERMP) will be reviewed and adjusted, as appropriate, to ensure compliance with the TMDL." On May 12, 2016, the Regional Water Board approved the TMDL Action Plan for the Upper Elk River Watershed. On April 4, 2018, the United States Environmental Protection Agency approved the Action Plan for the Upper Elk River Sediment TMDL, the final step in the process necessary for the Action Plan to be amended into the Water Quality Control Plan for the North Coast Region (Basin Plan), following approvals by the State Water

Resources Control Board on August 1, 2017, and the Office of Administrative Law on March 8, 2018.

The draft Order would update those portions of the GDRCo Forest Management WDR that apply to certain activities conducted by GDRCo on its timberlands in the Upper Elk River Watershed. The draft Order has been developed to be consistent with all of the hillslope indicators and numeric targets contained in the 2016 Action Plan for the Upper Elk River Sediment Total Maximum Daily Load (TMDL Action Plan) and ensure that all anthropogenic discharges of sediment are eliminated to the extent feasible and, if not feasibly eliminated, minimized, as soon as feasible, but no later than 2031.

TMDL Action Plan Program of Implementation

The Program of Implementation, one of the key components of the TMDL Action Plan, identifies a combination of regulatory and non-regulatory actions designed to lead to the attainment of water quality objectives, recovery of beneficial uses, protection of high-quality waters, and abatement of nuisance conditions in the Upper Elk River (UER) Watershed. The three main components of the TMDL Action Plan's program of implementation include: waste discharge requirements (WDRs), the Elk River Recovery Assessment (ERRA), and the Elk River Watershed Stewardship Program (Stewardship Program).

WDRs are designed to control the discharge of sediment loads to watercourses from new and existing sources in lands in the Upper Elk River Watershed and are the primary regulatory actions under the TMDL Action Plan's program of implementation. The goal of the WDRs in the draft Order is to establish a management framework to achieve compliance with water quality objectives in receiving waters through implementation of stringent management practices designed to eliminate to the extent feasible and, if not feasibly eliminated, minimize, as soon as feasible, but no later than 2031, all anthropogenic discharges of sediment from GDRCo lands.

The ERRA and Stewardship Program are two non-regulatory components of the TMDL Action Plan designed to be integrated, adaptive, and leveraged to inform an effective restoration strategy. The Regional Water Board has initiated the Stewardship Program to coordinate stakeholder participation in the efforts to recover the beneficial uses of the Elk River watershed and address nuisance flooding. The Stewardship Program fulfills the following roles:

- Coordinate directly with watershed residents, local, state, and federal resource agency staff, and other stakeholders to solicit input and transmit information on recovery program activities that are ongoing throughout the watershed.
- Provide a broad umbrella under which specific working groups form to coordinate resource management issues in a collaborative and transparent way.
- Seek to build partnerships, interpret technical studies for stakeholders, landowners, and the public, and identify pilot projects and future remediation actions that are feasible, fundable, and broadly supported by stakeholders.

In 2014, the Regional Water Board contracted with California Trout, Inc. (CalTrout), Northern Hydrology and Engineering, (NHE), and Stillwater Sciences (SWS) to conduct

the ERRA and develop a series of sediment remediation pilot projects (Pilot Projects). The ERRA is motivated by the need to better understand if sediment deposited in the Elk River channel since approximately 1988 will remain in storage and continue to impair beneficial uses and cause nuisance flooding even with successful future reduction in watershed sediment delivery that would be achieved under the TMDL Action Plan. The ERRA analyzes the system-wide fate and transport of this stored sediment under different management scenarios, including assessing the feasibility of various mechanical channel rehabilitation actions and identifying the extent to which these actions, in combination with reduced sediment load, will lead to sustainable recovery of beneficial uses and water quality, abatement of nuisance conditions, and recovery of ecosystem functions.

In November 2018, the Regional Water Board received the report *Elk River Recovery Assessment: Recovery Framework* from the ERRA Project Team. Included with the ERRA was the proposed design for the Pilot Projects, which were co-funded by the Coastal Conservancy, with cost shares from CalTrout and Humboldt Redwood Company (HRC). This project involved the removal of the road base at the Elk River Steel Bridge and removal of trees and sediment from a portion of the connected floodplain. CalTrout and its subcontractors successfully completed construction of this project in September 2017. The Regional Water Board serves as the lead agency for two additional sediment remediation pilot projects in the impacted reach of the Elk which are currently in the CEQA permitting phase.

State Water Board Adoption of the TMDL Action Plan

Within its Resolution No. 2017-0046 approving the TMDL Action Plan, the State Water Board described its understandings of the TMDL Action Plan's requirements in Finding no. 9 as follows:

- 1) The hillslope indicators and numeric targets in Table 2 apply throughout a discharger's area of land ownership and not solely in areas of active harvest;
- 2) The Regional Water Board's WDRs and any other orders for the two major landowners that conduct timber harvesting will incorporate specific provisions that implement all the hillslope indicators and numeric targets in Table 2, unless the Regional Water Board makes specific findings about why any omitted hillslope indicators or numeric targets are not appropriate or feasible;
- 3) The WDRs and any other orders for the two major landowners will also contain any additional specific provisions to ensure that all anthropogenic discharges of sediment are minimized and eliminated, and;
- 4) In the absence of a future amendment to the TMDL Action Plan, including an amendment based on successful implementation of the Watershed Stewardship Program resulting in expanded sediment loading capacity in the impacted reach, the WDRs and any other orders will require the landowners to achieve the zero load allocation for all anthropogenic discharges of sediment as soon as feasible, but no later than 2031.

In its resolution, the State Water Board directed the Regional Water Board to "review its WDRs for the two major landowners in the Upper Elk River Watershed that conduct

timber harvesting and revise the WDRs and adopt any additional orders as necessary to make them consistent with the State Water Board's understandings of how the TMDL Action Plan will be implemented as described in finding no. 9."

Subsequently, on October 15, 2018, State Water Board counsel provided a letter clarifying its understanding of item 3) in Finding no. 9 as follows, "The WDRs and any other orders for the two major landowners [GDRCo and Humboldt Redwood Company, LLC (HRC) will also contain any additional specific provisions to ensure that all anthropogenic discharges of sediment are ~~minimized and~~ eliminated to the extent feasible and, if not feasibly eliminated, minimized, as soon as feasible but not later than 2031" [strikeout and underline are from the original October 15, 2018 letter].

In June 2019, the Regional Water Board adopted Order Number 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*. This Order revised HRC's Elk River WDR adopted by the Regional Water Board in November 2016, in compliance with the State Water Board's directive.

Following adoption of the TMDL Action Plan and further discussions with Regional Water Board staff, GDRCo revised specific provisions of the SFERMP to implement the TMDL hillslope targets and load allocation, and on August 23, 2019, submitted the revised SFERMP (or plan). The revisions primarily address expanded riparian management zone (RMZ) protection measures, modified annual harvest limits, and yarding prescriptions. The plan applies to all GDRCo's timberlands in the Elk River watershed and is therefore referred to as the Elk River Management Plan (ERMP) (included as Attachment B of the draft Order). Regional Water Board staff found that the ERMP is expected to implement most, but not all, of the TMDL Hillslope Water Quality Indicators, but additional conditions are necessary to implement certain Specific Upper Elk River Watershed Indicators. With the additional protection measures for riparian zones included as requirements in the draft Order, the Regional Water Board determined that GDRCo's timber harvest and related management activities in the Elk River Watershed will be consistent with the TMDL Action Plan. The draft Order supersedes those provisions of Order No. R1-2012-087 that applied to the Upper Elk River Watershed and establishes revised requirements for GDRCo Forest Management Activities conducted within the Upper Elk River Watershed.

General Responses to Comments

As in our response to comments for the June 2019 adoption hearing for HRC's Elk River WDR, Regional Water Board staff acknowledge the impact to the lives and property of residents whose properties have been directly affected by sediment deposition and flooding in the Elk River Watershed due to accelerated rates of timber harvesting and excessive sediment loading that began following the acquisition in 1986 of Pacific Lumber Company by the Maxxam Corporation. Profound differences of opinion on the potential impacts of logging in the watershed, as well as a range of recommendations regarding appropriate courses of action to mitigate those impacts, are reflected in the comment letters.

As previously mentioned, the Regional Water Board strategy for recovery of the Elk River watershed is comprised of three complimentary components: WDRs, the ERRA, and the Stewardship Program. Although the WDR framework included in the draft Order should be viewed in conjunction with various aspects of the ERRA and Stewardship Program, the WDRs were not developed to address all aspects of the TMDL Action Plan's recovery strategy. Instead, the WDRs in the draft Order are meant to establish requirements to ensure elimination or minimization of sediment discharge to the maximum extent feasible from timber operations conducted by GDRCo in the Upper Elk River Watershed.

In developing the framework to address ongoing sediment impacts in the Upper Elk River Watershed, the Regional Water Board utilizes a combination of:

- 1) TMDL Action Plan requirements
- 2) Existing regulatory requirements (e.g., Forest Practice Rules, prescriptions derived from GDRCo's ownership-wide Aquatic Habitat Conservation Plan [AHCP]);
- 3) Additional measures proposed through GDRCo's ROWD;
- 4) Established science as presented in peer reviewed literature;
- 5) The TMDL Technical Report¹;
- 6) Knowledge/experience from people with longstanding experience in the watershed; and
- 7) Regional Water Board staff professional judgement.

Some comments regarding conditions in Elk River downstream of GDRCo's ownership are more appropriately addressed through the work of the ERRA Project Team and/or the Stewardship Program. GDRCo has submitted numerous comments addressing the TMDL and the supporting technical documents. While such comments, particularly those regarding the TMDL, Stewardship and the ERRA, are beyond the scope of the Regional Water Board's consideration regarding adoption of the draft Order, it may be helpful to address certain "out of scope" comments to provide a larger context for the following responses. We encourage commenters submitting technical comments, critiques or new research, or data regarding the TMDL and ERRA, to work within the adaptive management framework of the Stewardship Program on subsequent phases of the TMDL process.

As with previous proceedings to consider WDRs for timber harvesting in the Upper Elk River Watershed, commenters can be broadly categorized into two diametrically opposed groups based on their opinions regarding the potential for sediment discharge from past and present timber harvest activities, and whether any activities should be permitted by the Regional Water Board.

All commenters are generally in agreement with, or at least do not contest, the TMDL's findings that high levels of fine sediment deposited in the impacted reach of Elk River

¹ 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.

over the past 20 years were largely the result of ground disturbance from past logging and associated activities. The commenters also generally agree that these deposited sediments have resulted in channel aggradation, which continues to cause nuisance conditions for residents, including increased flooding magnitude and frequency, as well as impaired domestic and agricultural water supplies.

Elk River residents, whose properties and lives have been directly and profoundly adversely affected by elevated sediment loads, advocate for a complete moratorium on logging in the watershed until beneficial uses in the impacted reach have been restored.

In contrast, GDRCo maintains that the restrictions on harvesting proposed in the draft Order are unnecessarily restrictive, scientifically unsupportable, infeasible, would result in greater potential for sediment discharges, and are not required by the TMDL Action Plan or State Board directive. GDRCo maintains that its ERMP implement appropriate harvest restrictions and best management practices (BMPs) and suggest that no additional requirements for water quality protection should be included.

At the heart of the controversy regarding whether timber harvesting in the watershed should be allowed to occur, is the uncertainty regarding the degree to which ongoing sediment deposition in the impacted reach is the result of current timber harvesting activities, or whether it represents downstream propagation of the sediment pulse generated from intensive and highly disruptive past logging practices that occurred primarily in the 1980s and 1990s as well as reduced capacity to properly distribute and transport sediment due to management activities on the floodplain and lower reaches of the river.

This ongoing controversy is very real, and the Regional Water Board's decision-making relative to those competing realities has significant implications. First, Regional Water Board staff acknowledge the ongoing impacts to the lives and properties of affected residents in the lower watershed, as well as the degraded state of the beneficial uses of water in Elk River. We also acknowledge that the upstream property owners' continued operation of their businesses provides economic and social value to the community and may continue *provided* that their operations comply with all applicable water quality requirements.

If it could be clearly demonstrated, as some commenters contend, that it is not possible to conduct any timber harvesting activities without further exacerbating the watershed's impaired condition, and that a moratorium on logging is fundamentally necessary to eliminate the watershed's impairment, address nuisance flooding, and recover beneficial uses, then an outright prohibition on further logging would appear to be appropriate and necessary. However, the TMDL Action Plan and the supporting Technical Report, based on extensive studies of the association between land use practices and sediment production in the Upper Elk River watershed do not reach that conclusion.

Instead, the TMDL Action Plan calls for WDRs as the primary regulatory mechanism to be utilized by the Regional Water Board to require implementation of rigorous BMPs to

control the nonpoint source pollution resulting from past and ongoing timber harvesting activities. To that end, the TMDL Action Plan includes hillslope indicators and numeric targets, which primarily apply to timber harvesting activities and are designed to inform Board actions and to be incorporated into orders, as appropriate and to the maximum extent feasible.

The draft Order includes many of the same fundamental approaches that are used by other regional water boards regulating timber harvest activities throughout the state. The measures included in the draft Order are based on the following performance standards and are significantly augmented for this Order beyond typical standards because of the Regional Water Board's recognition of the inherently erodible nature of the Upper Elk River Watershed, minimal capacity for low gradient reaches to transport sediment delivered from upstream, and ongoing impairment:

- Retain sufficient trees to reduce hydrologic effects such as increased peak flow and soil moisture as well as loss of root strength;
- Establish harvest rate limits at the subwatershed scale in order to limit the overall extent of harvest related disturbance;
- Minimize exposed soil;
- Minimize excavations by road and skid trail construction;
- Minimize activity in riparian zones;
- Minimize hydrologic connectivity of roads; and
- Minimize disruption of natural drainage patterns.

As such, the Regional Water Board developed the draft Order, which includes stringent limitations on allowable activities, primarily based on GDRCo's ERMP, with expanded protection zones around watercourses designed to implement Specific Upper Elk River Watershed Indicators from the TMDL Action Plan, while maintaining GDRCo's ability to continue to conduct timber harvesting activities.

In the section below, Regional Water Board staff summarize common issues addressed by commenters, including opposing viewpoints on each issue, and then present a detailed discussion in our response. Some comments refer to very specific details and therefore are responded to individually. Wherever possible, staff present comments as direct quotes so that commenters exact words are represented. In response to some comments, Regional Water Board staff have made revisions to the draft Order, shown in redline-strikeout text in the Proposed Order.

Responses to Specific Comments

1. **Comment:** As stated above in our General Response to Comments, Ms. Wrigley, Mr. Noel, and Mr. Martien all strongly support a complete moratorium on logging until conditions have improved in the impacted reach. Mr. Noel asks that the Regional Water Board demonstrate why a moratorium is not feasible and cites *City of Marina v. Board of Trustees of California State University* for the proposition that "CEQA does not authorize an agency to proceed with a project that will have significant, unmitigated effects on the environment, based simply

on weighing of those effects against the project's benefits, unless the measures necessary to mitigate those effects are truly infeasible.”

Response: The Regional Water Board has not found that a prohibition on all logging is appropriate. A moratorium would be appropriate if the technical work conclusively demonstrated that a complete prohibition on logging was necessary to achieve recovery of the impacted reach. The TMDL Action Plan and the underlying scientific work presented in the Technical Analysis for Sediment developed recommendations and hillslope targets applicable to timber harvesting activities conducted primarily by the two industrial timberland owners. Nowhere in either of those two documents is there any support or recommendation for a prohibition on logging. The draft Order includes harvest rate limits, which support the TMDL and will promote elimination or minimization of sediment impacts and attainment of beneficial uses in the river.

The Regional Water Board has not weighed the significant, unmitigated adverse impacts that may occur through approval of this permit and found that they are nevertheless warranted to support competing concerns. Such a finding would be appropriate under Public Resources Code section 21081, and California Code of Regulations title 14, section 15093 if the Regional Water Board were certifying a final Environmental Impact Report and adopting a “Statement of Overriding Considerations” to support its approval of the project despite significant unmitigated impacts. Instead, the Regional Water Board is finding that all impacts can be mitigated to a less than significant level with mitigation imposed, and it is therefore approving the permit with the necessary mitigation measures that will reduce impacts to a less than significant level.

2. **Comment:** Mr. Martien’s letter includes the seven points addressed below [Mr. Martien’s comments underlined].

Response:

- i. Reduce harvest-related activities to zero sediment delivery.
As further discussed in our response to comment #4, the TMDL zero load allocation is implemented by establishing requirements designed to ensure that all anthropogenic discharges of sediment are eliminated to the extent feasible and, if not feasibly eliminated, minimized, as soon as feasible but not later than 2031.
- ii. Expand the original WDR’s moratorium on timber harvest to include all of Upper Elk River.
See response to Comment #1.
- iii. First recovery, then the phased re-introduction of logging.
See above responses regarding a moratorium on logging.
- iv. Regulatory action—adjustment of the zero load allocation—should occur only after the assessment of successful non-regulatory action.

- Agreed. The TMDL envisions revising the load allocation following an increase in the river's assimilative capacity. The adjustment of the zero load allocation is not automatic and requires additional regulatory action by the Regional Water Board.
- v. As monitoring shows effective sediment remediation, logging resumes incrementally.
Again, this comment references a logging moratorium, which the Regional Water Board considered and found not appropriate. Any future revision of the load allocation or modification of requirements will be informed by monitoring results.
 - vi. An Elk River Watershed Steward Group takes an active advisory role.
Agreed. The Stewardship Program is one component of the Regional Water Board's strategies to improve impaired conditions in the watershed.
 - vii. The Stewardship Program includes a Community Group.
The Stewardship Program is intended, and has been implemented, to include a wide range of participants from throughout the affected community.
3. **Comment:** Mr. Wheeler asserts that the Mitigated Negative Declaration incorrectly assumes no significant impact from the draft Order and that an Environmental Impact Report is required.

Response: Please see Finding 61 in the draft Order. In considering adoption of the draft Order, the Regional Water Board has relied on the Environmental Impact Statement (EIS) issued by the U.S. Fish & Wildlife Service and National Marine Fisheries Service for the AHCP. When a project requires compliance with both CEQA and the National Environmental Policy Act (NEPA), and the federal EIS is prepared first and meets the requirements of CEQA, CEQA provides that the state agency should use the EIS rather than preparing a separate EIR or negative declaration. (Cal.Code Regs. tit.14, section 15221.) The draft Order does not result in substantial changes to the environment as compared to the GDRCo Forest Management WDR and does not involve any new significant environmental effects or increase in the severity of an effect compared to that Order. Staff has not identified any new significant environmental impacts that would result from adoption of the draft Order that were not previously analyzed in the EIS². Pursuant to California Code of Regulations title 14, section 15162, none of the conditions requiring a subsequent environmental analysis have been triggered, therefore no additional CEQA documentation is required. All applicable mitigation measures from the prior environmental analyses are included as enforceable conditions of the draft Order and are listed in Attachment D.

² Potential environmental effects associated with the project were also analyzed under CEQA in the Initial Study/Mitigated Negative Declaration (IS/MND) prepared by the California Department of Fish and Game for the MATO and the Road Management WDR for GDRCo.

4. **Comment:** Mr. Wheeler states that the draft Order admits it cannot fulfill the TMDL Action Plan and that, “The TMDL Action Plan set out a zero anthropogenic load allocation by, at a minimum, 2031. The Regional Board established water quality indicators and associated numeric targets to measure and confirm progress towards attaining the 2031 zero anthropogenic load goal. Draft Order at 15. These indicators and targets are collected in Tables 2 and 3 of the TMDL Action Plan. Id. The Draft Order recognizes the importance of these targets, but in many places, acknowledges that the WDR could not achieve these targets.” Mr. Wheeler cites as an example the comparison of the TMDL target of “100% of road segments hydrologically disconnected from watercourses” from the Draft Order incorporating the ERMP provision to hydrologically disconnect roads to the maximum extent feasible.

Response: Other than for hydrologic disconnection as discussed below, it is unclear where the draft Order acknowledges that the WDR could not achieve the targets. Finding 25 through 44 of the draft Order provide a lengthy discussion regarding how each of the hillslope indicators and numeric targets, as well as the zero load allocation, are satisfied. In section III.A of EPIC’s letter, Mr. Wheeler refers to the [State Board’s] target deadline of 2031 to meet the zero load allocation. As stated in Finding 44 of the draft Order, “The Regional Water Board finds that the current management framework established under this Order is reasonable and appropriate and is expected to result in minimization and near complete elimination of anthropogenic discharge. Further, through ongoing annual monitoring and periodic review of progress towards TMDL implementation, the Regional Water Board will be able to track hillslope and instream indicators and target conditions and revise the regulatory framework of the program of TMDL implementation as necessary to comply with the State Water Board’s understandings.” As set forth in the TMDL Action Plan, the Regional Water Board will revisit the TMDL by 2031 and will revise it as necessary.

As Mr. Wheeler points out, Finding 30 of the draft Order states, “as it is impossible to hydrologically disconnect 100% of a road that crosses a watercourse, the remaining road surface immediately adjacent to a watercourse that cannot be disconnected will be stabilized to prevent or minimize mobilization and delivery of fine sediment.” This is an honest acknowledgement of the physical limitations of disconnecting roads from watercourses. Hydrologic disconnection of roads entails minimizing concentration of surface runoff from road surfaces to avoid channelized runoff that can deliver sediment laden water to a watercourse and directing dispersed road drainage to stable, preferably well vegetated areas away from watercourses. It is never possible to disconnect those portions of the road and associated fill slopes closest to a watercourse. Therefore, the draft Order incorporates the standard practice to stabilize those surfaces to prevent or minimize mobilization and delivery of fine sediment.

As stated in the TMDL Action Plan as well as the draft Order, “hillslope indicators and numeric targets in Table 2 are designed to inform Board actions and can be incorporated into orders, as appropriate and to the maximum extent feasible.” The draft Order would establish enforceable requirements and therefore, they must be feasible to

implement. The road related requirements of the draft Order adequately implement the numeric target.

5. **Comment:** Regarding the enrollment process reverting to automatic enrollment five years after adoption of the draft Order, Mr. Wheeler writes, “Discretion over enrollment is one way for the Regional Board can control sediment pollution—if a THP is too impactful, then it can deny enrollment. Why then would the Regional Board give up this power prior to the 2031 deadline if that target is not already achieved?” EPIC recommends retention of enrollment authority until the 2031 load allocation is met.

On the other hand, GDRCo maintains that the requirement that it must individually enroll THPs for the first five years following adoption of the Order is unnecessary. They maintain that automatic enrollment works well and that a key benefit of a property-wide WDR is providing consistency, predictability, and additional efficiency to the THP permitting process for the agencies, landowner and the public.

Response: Regardless of whether an application and enrollment process is required or whether THPs are automatically enrolled following a notice of conformance by CAL FIRE, the Regional Water Board takes an active role in the THP review process to ensure it will be consistent with Order requirements and retains the authority to deny enrollment of a THP deemed likely to result in noncompliance with the Order.

Section I.E states, “If a THP is subject of an unresolved non-concurrence or other water quality issue identified by Regional Water Board staff, the THP shall not be considered to be in conformance with the conditions of the Order and shall not be enrolled in the Order until such issues have been resolved.”

Section IV, Rescission and Denial of Coverage, provides the Executive Officer the authority to rescind or deny coverage under a range of circumstances when Regional Water Board staff determine there is a likelihood of a THP resulting in water quality impacts.

In addition, Regional Water Board staff are committed to a strong presence on the ground overseeing GDRCo’s timber harvesting activities, including participating in THPs and frequent active and post-harvest inspections.

With regards to GDRCo’s point that the enrollment process is unnecessary and refers to the benefits of automatic enrollment, we agree with the later point. Automatic enrollment provides efficiency and is the preferred process in some cases. However, when considered within the context of all the work that goes into development, review and oversight, approval, and implementation of a THP, the small administrative effort on the part of the plan proponent and the Regional Water Board to formally approve an enrollment is insignificant. Since 2004, the majority of THPs in the North Coast Region are permitted through the General WDR, Order No. R1-2004-0030, which requires the same application and enrollment process that the draft Order proposes for GDRCo for

the first five years following adoption. This provides the Regional Water Board a period of time in which to ensure a high level of scrutiny in its oversight of the revised program on GDRCo's timberlands in the watershed.

6. **Comment:** Mr. Wheeler states that the Humboldt Redwood Company (HRC) WDR, adopted in June 2019 is far more protective of water quality than the draft Order, and recommends that the Regional Water Board harmonize the draft Order with the HRC WDR. He cites difference in silvicultural practices, harvest limitations, no-harvest watercourse buffers, and that GDRCo fails to incorporate similar prescriptions for high risk areas as HRC does.

Response: GDRCo and HRC's timber harvesting activities in the Elk River Watershed are significantly different and therefore, need not be subject to the identical requirements. The Regional Water Board's approach is not to dictate how each company operates, but to establish requirements such that their operations comply with applicable water quality regulations, which in the case of Upper Elk River, consists primarily of the TMDL Action Plan. Both companies have invested a considerable amount of resources working with regulatory agencies, including the Regional Water Board, to develop management strategies that meet their operational objectives as well as protect public resources. The Regional Water Board recognizes that both companies have incorporated numerous prescriptions designed to protect water quality into their management strategies and that overall their operations are generally protective of water quality. In addition to significantly different operating practices, a primary distinction between the two companies with respect to their operation in the Upper Elk River watershed is that GDRCo owns 2,059 acres in the Upper Elk River Watershed and has been harvesting no more than 75 acres per year on average since 2006. HRC owns approximately 22,000 acres in the watershed and harvests a correspondingly larger area each year. As such, without mitigation, HRC's operations have the potential to result in more impacts than GDRCo's.

The Regional Water Board has evaluated GDRCo's management plan on its own merits and as stated in Finding 27 of the draft Order, "found that the ERMP is expected to implement most of the TMDL Hillslope Water Quality Indicators, but additional conditions are necessary to implement certain Specific Upper Elk River Watershed Indicators. With the additional protection measures included, the Regional Water Board finds that GDRCo's timber harvest and related management activities in the Elk River Watershed will be consistent with the TMDL Action Plan."

Specific assertions by Mr. Wheeler regarding the relative impacts from the two companies' practices does not account for the fact that they are individual companies with their own specific harvest practices. For example, his claim that, "the primary form of silviculture employed by GDRCo (clearcuts) is more impactful than HRC (selection harvest), particularly for increases to peak flow, and that GDRCo's ownership is primarily concentrated in the highest risk subwatersheds in Elk River". GDRCo, however, primarily utilizes shovel yarding with cable yarding on steeper slopes. Shovel logging commonly uses a specially equipped excavator-based machine with a 360-degree hydraulic grapple head that reaches with its hydraulic arm to pick up the

felled tree or log and swing it back towards the truck road or landing. Shovel yarding does not require use or construction of skid trails and following operations, timber harvest units are typically covered with a thick layer of slash. Although we agree that acre for acre, clearcutting is expected to result in greater increases in peak flow than partial harvesting, such peak flow increases result from partial harvesting at approximately a 2:1 ratio; that is, peak flow increases from an acre of clearcutting are roughly equivalent to that resulting from two acres of selection harvest. This is the reason harvest rates are normalized according to the Equivalent Clearcut Acres (ECA) method³. The Regional Water Board approaches the regulation of discharges from various proposed timber operations on a case-by-case basis and solely on a comparison to other types of operations.

Harvest Rate

Mr. Wheeler also compares harvest rates between GDRCo and HRC and state, "Finding 40 [HRC WDR] limits rate of harvest rate to 1.5% or less; GDRCo is set to 2.7%." Mr. Wheeler mistakenly claims that HRC's WDR establishes a 1.5% harvest rate. In fact, section I.A.3 of HRC's WDR state, "Where an individual, or multiple, THP(s) would result in an average annual harvest rate in any subwatershed above 2% equivalent clearcut acres over any 10-year period, the Executive Officer may decline to enroll the THP(s), or portions of the THP, or may require additional management measures, mitigations, or monitoring as a condition of enrollment."

Harvest rates have been a concern with respect to impacts from logging throughout the North Coast and in particular in the Elk River Watershed since the marked increase in sediment deposition and flooding in Elk River following an approximate four-fold increase in the rate of timber harvesting and excessive sediment loading that began following the acquisition in 1986 of Pacific Lumber Company by the Maxxam Corporation. While there is undoubtedly a correlation between potential for water quality impacts to occur with the proportion of watershed area harvested over a given time, the nature and magnitude of those impacts cannot be predicted based solely on harvest rate. A much less easily quantifiable factor affecting impacts from harvesting is the nature of the harvesting practices. Water quality impacts from harvesting result from tree removal with reduction of canopy and loss of root strength, which affect hillslope hydrology and slope stability. In addition to those impacts, and possibly even more significant, are impacts from ground disturbance from road, skid trail, and watercourse crossing construction and use. Improved practices for construction, operation, and maintenance of these facilities, such as have been developed and implemented by GDRCo, significantly reduce the potential impacts and therefore, also the compounding effect of elevated harvest rates. Thus, to state it in simple terms, the effects of bad harvesting practices likely increases exponentially with increasing proportion of watershed area harvested compared to the effects of good harvesting practices.

³ Equivalent clearcut area (ECA) is a widely used methodology developed by the USFS to account for the relative impacts of different types of silvicultural treatment. It assigns a weighting factor of one to clearcutting and a value less than one for partial harvesting silvicultural treatments. The weighting factor for a silvicultural treatment is multiplied by total area treated under each silviculture to arrive at a normalized disturbance calculation. Therefore, 100 acres of selection harvest, which is typically assigned a ECA factor of 0.5, would be counted as 50 equivalent clearcut acres.

However, regardless of how carefully harvesting is practiced, there will always be some inherent potential for water quality impacts to occur simply from tree removal and incidental discharge from roads and other disturbed ground. These impacts will compound so that impacts increase with increasing watershed area harvested over a given period of time. The challenge in setting harvest rate limits is establishing a reproducible method to analyze impacts. The TMDL target that comes closest to addressing harvest rates is peak flow. As discussed in Finding 39 of the draft Order, modeled peak flow increases from harvest rates throughout GDRCo's timberlands are well below the numeric target. The Regional Water Board's approach for WDRs for the two industrial timberland owners in the Upper Elk River Watershed is to establish robust requirements for logging practices and associated activities that minimize sediment discharge in combination with reasonable harvest rate limits. Existing studies evaluated impacts from logging activities conducted prior to adoption of current rules and practices (see discussion in Finding 40 of the draft Order). The increased harvest rates that were coincident with the period from the late 1980 to the end of the 1990s, when the worst of the sediment impacts in the impacted reach were occurring, also coincided in decreased quality of logging operations: From 1990 to 1997, the California Department of Forestry and Fire Protection (CDF) issued approximately 230 violation notices to PALCO for activities on PALCO's ownership. Of these 230 violations, 59 occurred in the Freshwater Creek watershed, 64 occurred in the North Fork Elk River watershed, 7 occurred in the Bear Creek watershed, and 54 occurred within the Eel River watershed (which includes the Jordan Creek and Stitz Creek watersheds)⁴. Logging practices in general were not as protective as current practices and PALCO was operating at a highly accelerated pace, during which time, quality control was not a priority.

High Risk Areas

HRC's Elk River Salmon Creek (ERSC) watershed analysis developed a suite of prescriptions for those areas of its timberlands underlain by the Hookton Formation, which including minimum tree retention and geologic review for operations on vulnerable slopes, enhanced erosion control, and no harvest within 10 feet of Class III watercourses unless associated with a stump clump. GDRCo's ERMP include roughly equivalent protection, including the 10 foot no harvest zone on Class II and III watercourse and 25 feet on Class I watercourses.

No Harvest Buffers

Watercourse buffers are one of the most important management measures with respect to water quality protection from timber operations. The primary functions of buffers are: 1) to set aside the zone nearest to the stream where disturbance will be limited thus minimizing the potential for direct impacts to the stream; 2) provide a zone adjacent to the stream with mostly intact vegetation that will filter and trap sediment delivered from ground disturbance occurring further up slope; 3) set aside a near-stream zone where trees will be retained and allowed to grow for future recruitment of large woody material;

⁴ North Coast Regional Water Quality Control Board, 2000, Staff Report for Proposed Regional Water Board Actions in the North Fork Elk River, Bear Creek, Freshwater Creek, Jordan Creek, and Stitz Creek Watersheds.

and 4) retain trees that provide shade to the watercourse to prevent impacts to water temperature.

As stated above, GDRCo's ERMP provides no-harvest zones on all watercourses. All of the objectives described above can be met with a no-harvest zone and/or with high tree retention within the riparian zone. In fact, provided selective harvesting in the riparian zone can be accomplished with minimal disturbance, light thinning and retention of the largest trees in the near stream area can promote growth on the remaining trees, thus enhancing large woody material recruitment potential and increasing canopy cover over time. When GDRCo's ERMP Riparian Prescriptions are considered in combination with the proposed requirement for minimum of 50% post-harvest forest overstory canopy cover within 300 feet of Class I and II watercourses and 150 feet of Class III watercourses (section I.C.3 of the draft Order), Regional Water Board staff are confident that riparian buffers are adequate to meet the TMDL requirements and protect watercourses from impacts from timber operations.

Riparian Shade

Mr. Wheeler expresses concern that removal of tall trees adjacent to streams may reduce shade and raise water temperature in violation of the Basin Plan Temperature Objective. Although Elk River is within the zone of marine influence (fog belt) and water temperature considerations are not as critical as for timber operations further from the coast, the requirements of the draft Order ensure retention of adequate tree canopy to prevent heating of watercourses. Class I and II watercourses will have 25-foot and 10-foot no harvest zones, respectively, with 85% overstory canopy retention upslope of that. The Regional Water Board has generally found that 85% overstory canopy retention within the zone immediately adjacent to perennial streams is sufficient to retain shade on watercourses. With the no-harvest zones, GDRCo riparian retention will exceed that.

Cable Corridors in Riparian Management Zones

Mr. Wheeler believes that significant damage can occur when logging occurs through riparian corridors and recommends that full suspension be required for all cable logging in the riparian zone.

Regional Water Board staff agree that full suspension is preferable but, due to topography, is not always feasible. GDRCo's ERMP specifies that "trees may be felled within Class I RMZs to create cable yarding corridors as needed to ensure worker safety, subject to the canopy closure requirements. Such trees will be part of the harvest unit." As GDRCo's financial success depends on growing healthy trees for future harvest, it has a powerful incentive to not damage residual trees. In our experience, we have seen little evidence of cable corridors in riparian zones impacting watercourses.

7. **Comment:** Mr. Wheeler states that, "Given the importance of these types of sediment sources [harvest related landslides], relative to other sources, Draft Order at Finding 14, EPIC recommends that a licensed geologist review all

operations in Elk River Area to determine the risk for slope stability, headwall locations, and other similar tasks requiring the characterization of landforms.”

Response: From Finding 35 of the draft Order, “Section B of the ERMP describes default Geologic Prescriptions that apply; when an RPF determines that any portion of a THP being developed meets the definitions for a steep streamside slope (SSS), headwall swale, deep-seated landslide or shallow rapid landslide; when to exercise professional discretion to avoid operations in unstable areas; and when to retain a California Professional Geologist to develop site-specific alternative prescriptions to the default prescriptions. Based on review of aerial imagery of GDRCo’s timberlands in the Upper Elk River Watershed from 2009, 2010, 2012, 2014, and 2016, GDRCo’s geology staff identified one landslide that occurred during that time period. The landslide initiated from a road fill slope failure in 2012 and discharged an estimated 520 cubic yards to a watercourse. Table 2 harvest related targets are anticipated to be met primarily through implementation of the geologic prescriptions described in the ERMP.” Regional Water Board staff believe that the success of GDRCo’s management strategy to prevent impacts to slope stability in combination with the enhanced TMDL riparian buffers provide a high level of protection to vulnerable slopes.

8. **Comment:** Mr. Noel’s comments address the impact on his and his family’s lives from the ongoing damage to his property from sediment impairment and nuisance flooding.

Response: As stated above in the General Response to Comment, Regional Water Board staff acknowledge the ongoing impacts to the lives and properties of affected residents in the lower watershed. The Regional Water Board has dedicated significant staff resources to the Elk River Watershed for the past almost 20 years and continues to dedicate an enormous amount of staff and Board resources towards improving conditions in the Elk River Watershed. With adoption of the TMDL Action Plan and its regulatory and non-regulatory programs of implementation, we believe that the Elk River Watershed has been put on a trajectory of improvement.

9. **Comment:** Mr. Rynearson states that the Regional Board should consider and credit Green Diamond for measures the company has already implemented and continues to implement for sediment control and cites the following areas where the success of their management plan should be recognized.
 - GDRCo has long recognized the unique geologic conditions in Elk River and the adjacent Salmon Creek drainage and developed the “Salmon Creek Management Plan” in 1993;
 - During the period from 1988 to 2000, Table 1 in the TMDL Action Plan shows significantly increased anthropogenic sediment loading. Green Diamond conducted minimal timber harvesting activities during this period;
 - Table 1 in the TMDL Action Plan identifies the two greatest sources of anthropogenic sediment were from “Management-Related Channel

Erosion and Streamside landslides” and “Open Slope Landslides”. GDRCo monitoring indicates these sources of sediment are not occurring on its lands.

- In 2006, GDRCo conducted a property-wide road assessment identifying all potential controllable sediment sources and then implemented a comprehensive road upgrade program. Since 2006, GDRCo has treated 215 sites and removed 29,542 cubic yards (2,954 dump truck loads) of material. Seventeen sites remain, which will be treated by 2021.
- Under its 2006 WDR followed by the South Fork Elk River Management Plan that is included in the 2012 Forest WDR, GDRCo implemented watershed specific management measures to reduce or prevent sediment introduction into Elk River.

Response: The Regional Water Board *does* consider and credit GDRCo for measures the company has already implemented and continues to implement for sediment control. Evidence of this is that the draft Order incorporates GDRCo’s ERMP in its entirety with the only additional requirement being extension of riparian buffer tree retention extending out to 300 feet on Class I and II watercourses and 150 on Class III watercourses. We agree that the points cited above reflect the high quality of GDRCo’s management practices. While the ERMP lays out a management strategy with robust water quality protection, it does not demonstrate that it fully implements hillslope indicators and numeric targets for riparian zones.

10. **Comment:** Mr. Ryneerson and Mr. Whitlock present several arguments against three specific requirements listed below which they find objectionable. Ryneerson describes the many months working with Regional Water Board staff to try to agree upon revisions to their management plan in the Upper Elk River Watershed that would full implement the requirements of the TMDL Action Plan, “Green Diamond reached the limits of feasibility and any rational basis for additional WDRs. Green Diamond believes that no additional measures are appropriate, necessary or justified to properly implement and comply with the TMDL,” and expands upon the following three objectional additional measures proposed in the draft Order:

- Expanded RMZs, which would improperly extend RMZ restrictions to encumber 52 percent of Green Diamond’s Elk River timberlands.
- An unreasonable 5-year Timber Harvesting Plan enrollment process requirement [this was addressed in our response to Comment #5 above].
- The indirectly imposed requirement to conduct or pay for sediment remediation and channel restoration activities offsite of Green Diamond’s timberlands by participating in the Watershed Stewardship Program in order to obtain relief from the WDRs’ unreasonable management restrictions.

Response: Regional Water Board response to each of the three measures is articulated below:

TMDL RMZs

To begin with we would hope to clarify Mr. Rynearson's claim that the proposed TMDL buffers would extend RMZ restrictions to encumber 52 percent of GDRCo's Upper Elk River timberlands. It would be instructive to know what percent of their Upper Elk River timberlands are currently encumbered under RMZ and Special Operating Zones (SOZs) as per the ERMP, and therefore, how much additional watershed area would have harvest limits under the TMDL RMZs. We acknowledge that the TMDL RMZs reduce the volume of timber that GDRCo can harvest from its Upper Elk River timberlands, but citing the 52 percent figure implies that the draft Order is solely responsible for impacting their ability to manage over half of their ownership, which Regional Water Board staff believe is simply not the case.

Additionally, the draft Order's canopy retention requirements in the TMDL RMZs ($\geq 50\%$ total overstory canopy) allow GRDCo to manage these areas in a significantly different and less restrictive manner than the ERMP RMZ and SOZs.

However, Mr. Rynearson's primary objection with the TMDL RMZ is the claim that they are infeasible and improperly convert the numeric targets for riparian zones into enforceable permit provisions.

Mr. Rynearson and Mr. Whitlock make the point that both the TMDL Action Plan as well as the State Water Board's directive to the Regional Water Board in its approving resolution allow the Regional Water Board significant flexibility in how it interprets and incorporates hillslope indicators and numeric targets as well as the zero load allocation into WDRs. These commenters maintain that the Regional Water Board is inappropriately translating hillslope indicators into prescriptive requirements. Regional Water Board staff was faced with the task of translating the TMDL Action Plan requirements into enforceable permit requirements that would have a high likelihood of achieving the objectives of the TMDL as well as being feasible to implement on the ground by GDRCo. A key consideration was how to implement the "conceptual" zero load allocation. Contrary to the expectation articulated by some stakeholders that this requires the actual elimination of *all* anthropogenic sediment discharge, which the TMDL Action Plan acknowledges to be impossible, our guiding understanding provided by the State Board is that "all anthropogenic discharges of sediment are minimized and eliminated to the extent feasible and, if not feasibly eliminated, minimized, as soon as feasible." As discussed in our response to comments from stakeholders who interpret the zero load allocation as mandating a complete prohibition on logging, we believe that the State Board's directive necessitates establishing the most stringent requirements feasible that are supported by the available science. Mr. Rynearson and Mr. Whitlock are correct that the State Board directed that the WDRs, "will incorporate specific provisions that implement all of the hillslope indicators and numeric targets in Table 2, *unless the regional board makes specific findings about why any omitted hillslope indicators or numeric targets are not appropriate or feasible* [italics added]." However,

considering our understanding of how to implement the zero load allocation, Regional Water Board staff do not believe the TMDL Action Plan supports a finding that the WDR not include the most literal and stringent interpretation of the numeric targets for riparian zones. Therefore, we directly incorporated indicator widths for RMZs from Table 2 and crafted requirements for post-harvest conditions expressed as overstory canopy retention that we believe implement the narrative targets. The requirement of 50% post-harvest overstory canopy is common in forest practice regulation in California⁵ and allows for harvesting significant number of trees while retaining a residual stand for protection of riparian function. The proposed TMDL RMZ requirements are essentially the same as those that are included in the WDR for HRC, Order No. R1-2019-0021, that was adopted by the Regional Water Board in June 2019. The TMDL RMZ requirements proposed in draft Order accommodate GDRCo's continued timber harvesting in the watershed while implementing the hillslope indicators, numeric targets, and zero load allocation.

Mr. Rynearson and Mr. Whitlock maintain that the TMDL RMZs are unnecessarily wide and makes a case that protection of streams and riparian function can be adequately achieved by the buffers proposed in the ERMP. Dr. Belmont maintains that GDRCo's current management is sufficiently protective as to satisfy TMDL requirements and that expanded riparian buffers will not result in further reductions in sediment discharge. Dr. Boston [Attachment 4 of GDRCo's comment letter] also provides a short discussion of a selection of scientific literature addressing riparian buffers role in providing shade on watercourses, large wood recruitment and sediment trapping. The Regional Water Board addressed these issues in our responses to comments on HRC's Elk River WDRs, Order No. R1-2019-0021. That response applies to the current action and is copied here:

"The TMDL Action Plan establishes numeric targets and indicators for riparian zones in Upper Elk River. The indicator is described as the characteristics of riparian zones and the zone was defined as the area buffering a stream at 300 ft and 150 ft distance from the streams' centerline for Class I/II and Class III watercourses, respectively. The accompanying target for the riparian zone indicator is "*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.*" Those targets speak to increasing wood recruitment for instream habitat; reducing mass wasting risk; and decreasing sediment discharge from overland flow, respectively. The term riparian zones refer to ecological systems which are distinct from riparian management zones (RMZ), which necessarily imply some adjacent anthropogenic land use. That is, the design and concept of RMZs are best management practices to reduce the impact of human activity. The following discussion will focus on those three with respect to RMZ widths. In particular, the discussion provides example instances where buffer widths are on a similar scale to those stated in the TMDL Action Plan.

⁵ 50% post-harvest overstory canopy is the California Forest Practice Rule requirement for Class I WLPZ outside of the Coastal Anadromy Zone (CAZ) of as well as in the outer zone of the Class I WLPZ within the CAZ.

Wood recruitment and delivery

The relevant metric on this topic is recruitment distance, which is the distance from which the wood source is recruited and is analogous to the buffer width. Wood recruitment occurs by disturbances such as bank erosion, landslides, debris flows, tree mortality and other mechanisms. The recruitment distance is a function of these mechanisms and their underlying factors, which include channel width, slope steepness; slope stability; forest composition and structure; and local wind patterns. In descending order, mean recruitment distances are greatest for landslides, followed by windthrow, stem breakage, falling of dead trees, and bank erosion. May and Gresswell (2003) found that recruitment distance differed significantly when comparing alluvial streams to colluvial channels draining steep hillslopes in Oregon's Coastal range; this study found that 80 percent of wood pieces and total wood volume originated from forests within 50 m (164 ft) of colluvial channels constrained by steep hillslopes, whereas for unconfined alluvial channels, that distance is 30 m (99 ft). Along steep second growth redwood forests in northern California, landslides resulted in recruitment distances extending over 60 m (197 ft). Johnston et al (2011) also found that large wood distances increased with increasing height of trees. Implied in the tree height relationship is the differences in recruitment distances between managed forests versus unmanaged forests. For example, Czarnomski et al. (2008) found significantly higher numbers of large wood pieces in stream segments adjacent to unmanaged mature and old-growth sites than in segments adjacent to 30- to 50-year old intensively managed sites. Nevertheless, the primary factor in recruitment distance is the delivery mechanism. Riparian areas where bank erosion is the dominant recruiting mechanism will have shorter mean recruitment distances than riparian areas where landslide mechanism dominates. Using LiDAR data collected by Stillwater Sciences, the median slope across the UER watershed is approximately 30 percent, and in such a steep forested terrain and for lower order streams, the mechanism is more likely to be landslides, which have the highest recruitment distances, as stated above. For higher order streams—that is, streams more likely to be Class I/II watercourses—recruitment distances can lay beyond 90 m (295 ft) for hillslopes prone to landslides in one study of coastal Oregon watersheds. In another study in Washington, recruitment distances can lay beyond 92 m (300ft) for fifth-order streams.

Mass wasting and slope stability

The Technical Analysis for Sediment identified the key sediment source categories that produce sediment in the UER watershed. By far the most significant sediment discharge source resulting from timber harvest and other land-management activities in the most recent analysis time period (2004-2011) are those associated with riparian zones: in-channel sources such as headward channel incision, bank erosion, and streamside landslides. Mass wasting in this context refers to shallow, streamside landslides. Slope stability may also refer to bank stability with regards to sediment discharge from bank erosion and failure. Landslide events occur as a combination of disturbances; characteristics of the soil substrate; precipitation and soil moisture; and vegetation. A thorough discussion of landslide physics is beyond the scope of this review. Riparian vegetation moderates soil moisture conditions in stream banks, and roots provide tensile strength to the soil matrix, enhancing bank stability. Specific numbers for RMZ widths for bank and slope stabilization are rare in the literature, and at least two

guidance documents discuss RMZ design in terms of site-specific conditions that include the site's slope; previous history of bank failures; vegetation type; vegetation density; and other factors. The TMDL Action Plan relied on the Forest Ecosystem Management Team (FEMAT 1993) report which uses one site-potential tree height (SPTH) as the recommended RMZ width; extrapolating from mature coast redwood trees, the SPTH and RMZ widths can range between 200 to 300 ft. A review by the United States Army Corps of Engineers recommends widths between 10 to 20 m (33 to 66 ft) for bank stabilization (Fischer and Fischenich, 2000). One recent study done by the Green Diamond Resource Company on their timberlands in Northern California suggest RMZ widths of 135 ft and 110 ft for Class I and II watercourses, respectively, are effective in significantly reducing management related sediment delivery associated with landsliding when compared to historical management practices.

Surface Erosion

RMZs should be designed or designated for the function of entrapping or otherwise preventing sediment from entering streams. Riparian buffer widths necessary for sediment removal vary considerably depending on site-specific conditions such as slope, vegetation density, drainage paths, and others. The body of literature for relating buffer widths to pollutant removal is immense. Meta-analyses of this literature found a wide-range of buffer widths for 90 percent sediment removal efficiency: 10, 23, and 52 m (33, 75, and 170 ft)(May, 2003). Removal efficiency also depends on sediment characteristics, with smaller particle sizes settling out at greater distances. Empirical studies have found a non-linear relationship between buffer width and sediment removal efficiency, necessitating disproportionate increases in width to achieve an incremental increase in sediment removal; in other words, the majority of sediment may be captured within the inner portions of a forested buffer, while an increasingly small proportion of sediment may be captured within additional buffer widths. The relationship between slope and removal efficiency is also non-linear, but not monotonic: removal efficiency increased as slope increased from 1 to 10 percent, but efficiency decreased as slope increased above 10 percent. Still, extrapolating these findings to different locations should be done critically. To narrow the focus to the UER's topographic setting and noting that the load allocation for the TMDL Action Plan is zero, the 99 percent removal efficiencies in a forested buffer with steeper slopes (≥ 15 percent) range between 20 and 596 m (66 and 1955 ft), based on the meta-analyses referenced above. While the wide range in buffer widths in these studies complicates any one-size-fits-all determination, the findings related to slope and nonlinear removal efficiencies supports a buffer on the wider end, particularly when considering the zero load allocation as well as the finer sediment encountered in the UER watershed."

Mr. Rynearson and Mr. Whitlock both argue that the TMDL RMZs are not feasible to operate under their current practice of shovel logging on slopes less than or equal to 35%. They maintain that shovel logging cannot be conducted in partial harvest operations and that GDRCo would have to revert to tractor yarding that would result in increased ground disturbance and potential impacts to water quality. Mr. Whitlock states that the TMDL RMZs would violate CEQA as they have the potential to result in increased water quality impacts, which were not evaluated in the existing environmental analysis.

Proposed TMDL RMZ are designed to, and are anticipated to, reduce the potential for impacts to water quality. Regional Water Board staff appreciate the apparent benefits of shovel yarding that result in minimization of ground disturbance and thick post-harvest ground cover from slash. Dr. Boston provides a thorough discussion on the interaction between various types of ground-based equipment and forest soils that supports the claim regarding the benefits of shovel logging. Mr. Rynearson asserts that if the Board chooses to implement the 300/150 foot buffer requirement, the requirement to shovel yard on slopes less than 35% must be removed from our ERMP. However, no such modification to the ERMP is required, as a footnote has been added to section I.C.3, which establishes implementation of the ERMP as an enforceable provision of the Order, acknowledging that alternate yarding methods may be utilized in areas where the ERMP specifies use of shovel logging equipment when dictated by site conditions and operational constraints. RMZ's as prescribed in the ERMP remain Equipment Exclusion Zones. We anticipate that any new tractor operations that would occur on slopes less than 35% would be properly drained and stabilized. We are confident that GDRCo can yard logs within 300 feet of Class I and II watercourses and 150 of Class III watercourses in such a manner as to prevent erosion and sediment discharge as is being routinely done on timberlands throughout the region, including by HRC on its timberlands in the Upper Elk River. Regional Water Board staff maintain that it is feasible to implement the proposed TMDL RMZs by retaining at least 50% overstory canopy.

Requirement to conduct or pay for sediment remediation and channel restoration activities

The draft Order does not require the GRDCo to conduct or pay for sediment remediation and channel restoration activities. Mr. Rynearson maintains that GDRCo conducted only minimal timber harvesting during the years when elevated sediment deposition began in the impacted reach, the implication being (and is expanded upon further by Mr. Whitlock in Attachment 5) that the company is not liable for sediment impairment in the watershed and therefore should not be held responsible for watershed recovery and restoration. The TMDL and draft Order make clear that the TMDL is intended to be phased and that successful sediment remediation and channel restoration resulting in increased assimilative capacity will lead to relaxation of requirements. Section I.C.6 requires that no later than five years from the date of adoption of this Order, the Regional Water Board will consider the Order requirements for riparian zone protection and after public notice and comment will provide staff direction on potential changes to the requirements. Relaxation of requirements may occur based on improving watershed conditions, regardless of whether GDRCo participates in recovery and conducts or pays for restoration, so there is clearly no foundation for the claim that the company is currently being held responsible for downstream work. It is hoped that the industrial timberland owners in the upper watershed contribute to the restoration efforts in the lower river. The liability for past impacts may be addressed elsewhere, including in potential future Board actions, but the requirements of the draft Order have been developed in order to hold GDRCo responsible only for controlling its ongoing sediment discharges. This is to be accomplished by minimizing or eliminating anthropogenic sediment discharge from ongoing timber operations conducted in the inherently sensitive watershed as informed

by the TMDL sediment source analysis, hillslope indicators and numeric targets, and zero load allocation.

11. **Comment:** Mr. Whitlock writes, “As reflected in the Basin Plan, ‘feasible’ means ‘capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.’ There is no evidence that the Regional Board has adequately considered the required factors, including the economic effects of the proposed restrictions. Just the expanded RMZ restrictions alone would severely restrict Green Diamond’s Elk River Watershed operations for no water quality benefit.”

Response: The Regional Water Board considered a variety of relevant factors when developing the TMDL Actions Plan and in drafting the WDR. As described above, when considering a range of reasonable alternatives, economics is an important factor. As with most of the Regional Water Board’s work toward protecting or restoring beneficial uses, the Board is aware of and appreciates the economic benefits provided when beneficial uses are adequately protected. Economic factors are also considered under Water Code section 13241. Contrary to Mr. Whitlock’s assertion, the Regional Water Board considers economics in determining whether alternatives are feasible. It is true that an economic tradeoff often results from environmental protection, yet Mr. Whitlock cites no evidence to support the claim that expanded RMZ restrictions alone would severely restrict Green Diamond’s Elk River Watershed operations for no water quality benefit.

The Regional Water Board is concerned especially with the health and safety threats to downstream residents, but also has considered the economic impacts experienced by numerous residents. For example, resident Jesse Noel cites the significant increase in annual flood insurance premiums and the cost of repairing a damaged bridge all due to increased flooding. Many Elk River residents continue to suffer economic impacts due to the costs of damaged water supply equipment and septic systems, damaged foundations, and missed days of work due to the impassibility of the intersection of Elk River Road and Wrigley Road. Kristy Wrigley has cited repeated damage to small agricultural operations, including apple farming, flower production, and general vegetable production. In addition, significant public resources have been, and will continue to be, required to address the sediment impacts and work towards recovery and restoration of beneficial uses and elimination of nuisance flooding. The Regional Water Board has sought to balance water quality protection with the right of industrial timberland owners to manage their timberlands, including within the TMDL RMZs, provided they can do so while eliminating sediment discharge, or if not eliminating, minimizing it to the extent feasible. GDRCo does not contend that its management plan will completely eliminate anthropogenic sediment discharge from its timber operations. GDRCo’s ongoing ability to discharge from its timber operations is subject to Regional Water Board regulation to protect beneficial uses and reduce nuisance flooding. The granting of WDRs does not create a vested right to continue to discharge, and

appropriate discharge conditions are subject Regional Water Board oversight, review, and amendment⁶.

12. **Comment:** Mr. Whitlock renews GDRCo's previously stated concerns that the TMDL Action Plan and State Water Board approval have led the Regional Board to propose the addition of what GDRCo considers to be unnecessary and unreasonable requirements.

Response: Concerns over the TMDL Action Plan and its State Water Board approval have been addressed on pages 11-12 of the Staff Responses to Public Comments⁷ during the State Water Board public comment period for the TMDL Action Plan. In addition, the Regional Water Board may review and revise WDRs at any time, with or without direction from the State Water Board, and often must do so to ensure its permits implement all relevant Basin Plan provisions.

13. **Comment:** Mr. Whitlock states that the State Board resolution weakened many of the Regional Water Board's TMDL "improvements".

Response: The State Water Board's Resolution No. 2017-0046 approved the TMDL Action Plan adopted by the Regional Water Board. In the interest of transparency, we have described our approach to complying with the Resolution to ensure that Regional Water Board Orders that implement the TMDL are consistent with the Action Plan and with the State Water Board's understanding of the Action Plan.

14. **Comment:** Mr. Whitlock contends that the Regional Water Board should revisit the TMDL and address its flaws before imposing new WDRs.

Response: The approved Action Plan for the Upper Elk River Sediment TMDL is established as a phased TMDL and will be updated and revised in the future, to acknowledge the expanded assimilative capacity of the river for sediment discharges, once sediment remediation and channel and habitat restoration projects are implemented and demonstrate such an outcome. Under Section VII. "Monitoring and Adaptive Management" of the TMDL Action Plan, Regional Water Board staff will conduct a formal assessment of the effectiveness of the implementation plan approximately five years after adoption. During that time, new data or information that address the TMDL Action Plan will be considered and incorporated into an evaluation of the WDRs effectiveness.

⁶ CWA § 13243 states, "No discharge of waste into the waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights."

⁷ Web link to Regional Water Board Staff Responses to Public Comment for State Water Board Meeting to Approve Resolution No. R1 adopting Action Plan for the Upper Elk River Sediment TMDL: https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/20170717_Upper%20Elk%20TMDL_RTC.pdf

15. **Comment:** Mr. Whitlock states that any new WDRs imposed on GDRCo must have a rational basis and reflect the limits of Regional Water Board authority, including limitations on feasibility.

Response: The Regional Water Board has developed an extensive public record documenting the sediment impairment and nuisance flooding conditions in the impacted reach, anthropogenic sediment sources, and an extensive program of implementation as describe in the TMDL Action Plan. We believe this record provides a rational basis, supported by evidence in the record, for the revised WDRs that are authorized within our mandate to protect and restore beneficial uses. The issue of feasibility has been addressed in our response to Comment #10.

16. **Comment:** Mr. Whitlock asserts that the Objectional Provisions of the WDRs violate Constitutional Limitations on Agency Regulatory Actions.

Response: This comment has been raised numerous times, including when the TMDL Action Plan was adopted in 2016 and has been addressed by the Regional Water Board in responses to comments on the TMDL and in the response to the HRC WDR. The circumstances at issue in the cases⁸ cited by Green Diamond are not relevant here. There is a direct nexus between the conditions the Regional Water Board imposes (e.g., restricting harvesting in riparian management zones) and its intent to minimize sediment discharges to restore beneficial uses in the Elk River. The Regional Water Board is not requiring GRDCo to mitigate beyond the effects of its operation or for impacts that are not a direct result of its land ownership.

17. **Comment:** Dr. Belmont provided the following comments and critiques of the TMDL: The Upper Elk River Watershed naturally produces a large amount of sediment, much more than is estimated by the Regional Water Board. The Elk River Valley naturally accumulates a large percentage of the sediment delivered from the watershed. Developing a successful plan for the restoration of Elk River requires accommodation of the extreme gradient of erosion and deposition that naturally occurs in this watershed.

The sediment source assessment that underpins the TMDL and WDR systematically underestimates erosion by natural processes and overestimates erosion related to modern timber harvest practices. Methods used to approximate sediment loading from natural and management-related factors were fundamentally flawed.

While there is no doubt that increased flooding experienced on the Elk River floodplain is partly due to sedimentation in the Elk River channel, the percentage of that sediment derived from natural versus historical land use activities is not known and should not be assumed based on anecdotal evidence or the

⁸ Green Diamond argues that the conditions are unconstitutional under the framework the US Supreme Court articulated in *Nollan v. California Coastal Comm'n* (1987) 483 U.S. 825 and *Dolan v. City of Tigard* (1994) 512 U.S. 374.

erroneous sediment source assessment.

Critique 1, bank erosion and streamside landslides are not estimated in a robust manner.

Critique 2, it is not supported to multiply poorly estimated bank erosion and streamside landslide rates by an even more poorly estimated drainage density.

Critique 3, there are no reliable, generalizable estimates of how much incision has occurred on low order channels, nor how such channels respond to various land use treatments in this heterogeneous landscape.

Critique 4, only a small fraction of (the relatively small amount of) sediment from skid trails, roads and timber harvest is delivered downstream, so any effects of additional hillslope prescriptions will not result in any measurable improvement in the mainstem Elk River.

Response: Staff thank Dr. Belmont and GDRCo for providing feedback and continued efforts to advance the science associated with the watershed conditions and sediment delivery processes of the Elk River. As mentioned in the response to Comment #14, new data and information will be used to update the TMDL in the next phase. Similar comments have been presented previously and responses to the comments/issues can be found on pages 3-5 of the Regional Water Board Staff's Responses to Comments document⁹ and pages 7-10 of the State Water Board Staff Responses to Comments (See footnote 7 above).

18. **Comment:** Dr. Belmont and Mr. Whitlock maintain that the Regional Water Board has not adequately addressed comments and critiques on the TMDL. In addition, Dr. Belmont asserts that the Regional Water Control Board has failed to adequately inform local residents regarding the unique natural setting of the Elk River, the risks associated with living in an active, naturally aggregational floodplain, and the range of solutions available to restore the health of the Elk River and suggests that a stronger public outreach/education effort is needed and may reduce tensions.

Response: As stated in response to Comment #17, responses to critiques of the TMDL have been previously provided based on data and information that had been gathered by staff before the TMDL adoption process initiated. In these comments, GDRCo and others have provided new information that question the basis of the TMDL source analysis; however, as stated on page 17 of the Regional Water Board Staff Responses to Comments: "given the continuing impairment to beneficial uses in Elk River, waiting until new science confirms or refutes the Regional Water Board's approach" would

⁹Web page link to Regional Water Board Response to Comments on the Draft TMDL Action Plan for the Upper Elk River Sediment TMDL:
https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/elk_river/pdf/160422/160318_RTC_Elk_TMDL_Total_EW.pdf

amount to “analysis paralysis” and do little to improve conditions in the impacted reaches. As the Regional Water Board evaluates the TMDL for its effectiveness in addressing sediment impairments in the river, the public and interested parties have the opportunity to present new evidence and information. The TMDL Action Plan was designed to be adaptive and the Regional Water Board has committed to periodic evaluations of the TMDL to assess its effectiveness and whether revisions are warranted. This ongoing evaluation does not mean the Regional Water Board should not implement the TMDL as adopted, in fact, the Regional Water Board is obligated to issue permits consistent with the TMDL. Along with participating in the Stewardship Program, Elk River residents have provided written and oral testimonies regarding their historical experience living in Elk River, attesting to their acknowledgement of the risks. One of the primary purposes of the ERRA and Stewardship Program is to perform public outreach and education, but the success of that Program requires all parties to be involved and engaged. To date, nearly all of the Elk River landowners have been engaged individually by Stewardship Program participants and/or Regional Water Board staff; provided with an overview of the ERRA, technical background material, maps, and; provided conceptual designs of possible projects on their respective properties.

19. **Comment:** Dr. Belmont asserts that long-term erosion rates measured using cosmogenic nuclides indicate that natural background erosion is much higher than is assumed by the Water Quality Control Board

Response: Staff have previously provided a response to this comment, which can be found on page 13 of the Regional Water Board Staff Responses to Comments. Staff do not doubt that beryllium (^{10}Be) is a promising avenue for estimating natural background erosion, and Dr. Belmont has expressed interest in conducting a “much more rigorous” study compared to the samples already analyzed, especially given the “considerable heterogeneity” within Elk River watershed. As with all new evidence submitted, the Regional Water Board staff will review the results of a more extensive study and evaluate its appropriateness for inclusion in the next phase of the TMDL.

20. **Comment:** Dr. Belmont states, “Beyond the flagrant errors in the sediment source estimates, the geographic scope of the TMDL is inappropriate insofar as it punishes two large and unpopular landowners, and yet excludes many other landowners that have influenced water quality conditions in the Elk River. The quantity and quality of sediment delivered from the Lower Elk River watershed is essentially unknown. [Dr. Belmont] encourages the Regional Water Board to better monitor the quantity and quality of sediment delivered from this part of the watershed and include upland restoration and management activities in the Lower Elk River watershed in the overall watershed restoration plan.

“The TMDL Action Plan and Waste Discharge Requirements should address all human-caused sediment sources, including those in the Lower Elk River Watershed

Response: This comment has already been addressed on pages 12 and 36 of the

Regional Water Board Responses to Public Comments and pages 5-7 of the State Water Board Responses to Public Comments. Another purpose of the Stewardship Program is to prepare a coordinated science and monitoring framework in order to address all sources of sediment, including the activities in the Lower Elk River.

21. **Comment:** Dr. Belmont states, “The mainstem Elk River and floodplain are subsiding (i.e., the land surface elevation is naturally decreasing), so it should be expected to accumulate sediment. Effective restoration design should be focused on controlling how the Elk River floods and accumulates sediment on its floodplain.

“Prior to human development, the Elk River would have utilized a much larger percentage of its floodplain to dissipate flow energy and deposit much of its naturally high sediment load. Grazing, residential development and infrastructure have artificially disconnected the river from its floodplain. The most sustainable and cost-effective way to restore the Elk River may involve giving the river as much access to its floodplain as possible.

“Poor land management practices in the late 1980s and 1990s contributed to excessive amounts of sediment delivered to the mainstem Elk River. Much of that sediment accumulated in and around the channel (instead of across the broad floodplain) due in part to activities that occurred in the Elk River Valley, including historical channel stabilization, channel manipulation, removal of woody debris, and mis-management of the riparian zone and floodplain. Thus, these historical channel, riparian and floodplain management practices contribute to the current flooding and water quality problems.

“The Elk River Recovery Assessment report acknowledges that the lower mainstem Elk River exists within a subsiding landscape, but they do not account for that subsidence in their design strategy.”

Response: The ERRA Recovery Framework does acknowledge the underlying geologic setting and the character of Elk River’s naturally aggrading coastal floodplain. The ERRA also indicates that it is not the aim of the Recovery Framework to overcome or offset natural geologic processes that affect landscape evolution in this area (such as subsidence). Rather, the Framework offers an array of possible solutions to remediate anthropogenically-derived factors that have created nuisance conditions in this basin that function on the order of years and decades. Subsidence and other underlying natural process at work in Humboldt Bay and its tributaries function on the order of centuries or millennia. Project-specific engineering design work associated with future recovery phases in the coastal zone of the Elk River will consider (and model) factors such as sea level rise, soil pressure, bearing capacity, land subsidence, erosion, scour, and shrink-swell potential, as appropriate given the scope and scale of those projects.

22. **Comment:** Dr. Belmont states, “The hydrodynamics and sediment transport model developed as part of the Elk River Recovery Assessment is a powerful tool for future planning efforts, but a) it has not been utilized in an effective

manner, and b) they rely to some extent on the fundamentally flawed information from the TMDL sediment source apportionment. I recommend using the hydrodynamics model further to explore a wider variety of potential channel-floodplain designs that will improve habitat conditions and allow the Elk River to better utilize its floodplain.

“Interpretation of model results and discussion of the implications for management of the Upper Elk River watershed rely on the flawed estimates of natural versus anthropogenic sediment from the Tetra Tech report.”

Response: The Regional Water Board appreciates the commenter’s acknowledgement of the strength and utility of the ERRA Hydrodynamic Sediment Transport (HST) model as well as the commenter’s recommendation. We disagree, however, that it was not used effectively. Its use was guided by a representative Technical Advisory Committee (TAC), whose role included the selection of input parameters and the specific scenarios to be tested by the model. We note that GDRCo actively participated in this TAC and frequently provided their technical perspectives on how the model was developed and utilized. The number of scenarios tested was directly related to the funds apportioned by the State of California for the project. The TAC understood these limitations and played a significant role in prioritizing the scenarios to be initially tested by the model. Since the completion of the ERRA, additional funds have been secured and contracted to expand the use of the model in the areas the commenter suggests.

The ERRA’s reliance on the TMDL sediment source analysis is not by design, but by necessity because at the time of the contract and scope of work development for the ERRA, the Regional Water Board’s source analysis was the synthesis of all existing data, science, and information. Naturally, new data, science, and information continue to emerge, but as stated previously in this document, the appropriate forum for assessing new information is in the next phase of the TMDL. Indeed, the HST model is currently set up so that new scenarios informed by new information can be readily applied in this next phase. Staff thank Dr. Belmont for providing additional recommendations and encourage him to be involved in the Technical Advisory Committee to help direct further exploration of potential solutions.

23. **Comment:** Dr. Belmont states, “[The ERRA] explores a very limited number of future restoration options, explicitly ignoring potential design strategies that would utilize the floodplain as it should be utilized, a place for excess flow energy to be dissipated and for sediment to be deposited.”

Response: See response to Comment #22 regarding the number of scenarios tested by the HST model. The assertion that the ERRA is “explicitly ignoring potential design strategies that would utilize the floodplain as it should be utilized, a place for excess flow energy to be dissipated and for sediment to be deposited” is incorrect. “Floodplain rehabilitation”, in fact, is one of the four main classes of recovery actions posited by the ERRA for the lower 18 miles of the Elk River, including “selective near channel floodplain lowering to historical elevations to reestablish floodplain sediment dynamics and connectivity with channel” (ERRA p. 130, Table 7-2). Ongoing design work taking

place under the Stewardship Program, incorporating guidance and analysis provided by the ERRA Recovery Framework, includes significant attention to floodplain enhancements and connectivity for the purposes indicated by the commenter.

It should also be noted that the vast majority of the floodplain below commercial timber holdings are privately held by more than 60 individual owners, many of whom are agricultural producers, and most of whom are being asked to consider varying degrees of floodplain actions on their properties, including but not limited to: creation of directed high flow pathways; sediment detention basins; riparian enhancements; selective topographic modifications; and other actions. Because of the existing ownership of this working landscape, recovery strategies designed to utilize the floodplain “as it should be utilized” must acknowledge, and to the extent possible, accommodate and/or enhance existing land uses, as negotiated with current owners.

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