



**File Code:** 1950; 1570  
**Date:** April 8, 2015

Michael Krochta  
Forest Watch Coordinator, Bark  
PO Box 12065  
Portland, OR 97212

Dear Mr. Krochta:

This letter is in response to your objection (#15-06-06-0001-218(B)) to the draft Decision Notice (DN) and Finding of No Significant Impact (FONSI) for the Lava Restoration Project, located on the Hood River Ranger District, Mt. Hood National Forest. I have read your objection and reviewed the project record, the draft DN, and the final Environmental Assessment (EA). My review of your objection was conducted in accordance with the regulation at 36 CFR 218 (2013).

### **PROJECT DESCRIPTION**

On January 9, 2015 the legal notice was published announcing the Predecisional Administrative Review (Objection) Period for the draft DN/FONSI and final EA for the Lava Restoration Environmental Assessment. The draft DN selected the Proposed Action Alternative, which includes the following:

- Plantation thinning on 1,447 acres;
- Planting 127 acres;
- Sapling thinning on 164 acres;
- Firewood removal on 58 acres; and
- Huckleberry enhancement on 35 acres.

### **OBJECTION ISSUE DISCUSSION**

Specific to your objection, you raised issues regarding best available science, the Aquatic Conservation Strategy, and temporary roads. I am enclosing a written response to your objection issues. My final response to the District Ranger is summarized below. In addition, your organization sent a letter on March 5<sup>th</sup>, 2015 declining to attend an objection resolution meeting, so no resolution meeting was held. In that letter, your organization believed that the Forest was fully informed about your objection and that clarifications should be sent in writing or by phone, should we have any questions. The review team did not have any questions related to your objection points and no other remedies or resolutions were suggested by the review team.



## RESPONSE

Based on my review of the record, final EA, response to comments and draft DN, I conclude the following:

- The draft decision clearly describes the actions to be taken in sufficient detail that the reader can easily understand what will occur as a result of the draft decision.
- The draft decision considered a range of alternatives that was adequate to respond to the Purpose and Need. The purpose and need and alternatives considered in the final EA reflect a reasonable range of alternatives, consistent with law, regulation, and policy.
- The draft decision is consistent with the Forest Plan standards and guidelines, including the Aquatic Conservation Strategy.
- The draft decision is consistent with all policy, law, direction, and supporting evidence. The record contains documentation regarding resource conditions and the Responsible Official's draft decision is based on the record and reflects a reasonable conclusion.

This concludes my written review of the project and is the final administrative review by the Forest Service or the Department of Agriculture [36 CFR 218.10(b)(2)]. By copy of this letter, the Responsible Official may sign her decision and notify interested and affected persons in accordance with the regulation at 36 CFR 218.12 and 36 CFR 220.7(d).

Sincerely,



SHARON WALLACE  
Acting Forest Supervisor



**Lava Restoration Project Environmental Assessment (EA)**  
**Objection Statements and Responses**  
Hood River Ranger District  
Mt. Hood National Forest  
March 2015

**Objectors**  
Bark

**Objection Number**  
15-06-06-0001-218(B)

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***Best Available Science and the Aquatic Conservation Strategy (ACS)***

**Overview and Suggest Remedies/Resolution:** This objection issue is focused on how the project impacts key watersheds and riparian areas. Suggested remedy is to remove all commercial logging from Riparian Reserves.

**Objector Statement #1:** Objector states that commercial logging in Riparian Reserves is prohibited unless the Agency “makes an affirmative finding that it is needed to attain ACS objectives.” Bark at 3. Objector believes that the 129 acres of logging and 0.6 miles of temporary road building in Riparian Reserves (which the Agency states is needed to attain ACS objectives) is not supported by the best available science (the Coast Range Association’s ACS Report by Pollock and Beechie and Spies et. al.) and that instead, these actions will retard the ACS objectives. Bark at 3.

**Response:** I find that the Responsible Official adequately analyzed, discussed, and concluded that the project complies with the ACS objectives. I also find that the Responsible Official provided a complete list of literature relied upon to analyze potential effects, referenced scientific sources, and discussed responsible opposing viewpoints submitted by objector.

An Environmental Assessment (EA) must briefly describe the need for the project. 36 CFR 220.7(b)(1). The need for action should discuss the relationship between the desired condition and the existing condition. FSH 1909.15, 11.21. The National Forest Management Act of 1976 (NFMA) requires that all projects implemented on national forest system lands comply with approved Forest Plans. 16 USC § 1604. The Lava Restoration project responds to goals and objectives of the Mt. Hood Land and Resource Management Plan (LRMP), as amended by the Northwest Forest Plan Record of Decision for Amendments to the Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (NWFP). USDA Forest Service, 1990a; USDA Forest Service, 1994. The Northwest Forest Plan (NWFP) states that the “Aquatic Conservation Strategy must strive to maintain and restore ecosystem health at watershed and landscape scales to protect for fish and other riparian -dependent species and resources and restore currently degraded habitat.” NWFP at B-9. The NWFP outlined this strategy’s objectives and states that these objectives will be met and activities will not prevent attainment of these objectives. NWFP at B-9 through B-11. Generally, standards and guidelines for Riparian Reserves prohibit or regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives. NWFP at C-31. However, Standard and Guideline TM-1, allows timber management activities where silvicultural practices for Riparian Reserves are to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. NWFP at C-32.

The purpose and need of the Lava Project is to improve forest health conditions by reducing competition, promoting increased growth and vigor, and increase structural and species diversity within

selected stands. EA at 1-3. Within the Riparian Prescription section, the rationale is further described, and it tiers and references to the Northwest Forest Plan (ACS objectives), Mt. Hood Forest Plan, East Fork Hood River Watershed Analysis, Middle Fork Hood River Watershed Analysis, and West Fork Hood River Watershed Analysis. EA at 2-15 through 2-18. As stated in the Riparian Prescription, “[r]iparian treatments would be designed to maintain and improve stream and wetland function.” EA at 2-17. Also see Table 2-4: Unit Specific Purpose for Riparian Thinning Treatment for further rationale on riparian treatments. EA at 2-18.

Section 3.7 Aquatic Conservation Strategy identifies indicators that may affect the different ACS objectives and where in the EA document the analysis is found. EA at 3-154. Table 3-42: ACS Objectives Indicators for each Alternative summarizes and compares the effects to each indicator by alternative. EA at 3-155. Summary statements on the project effects to the Riparian Reserves and how the project is meeting ACS objectives are found in the EA at 3-152. The proposed action maintains the majority of indicators and slightly improves the following indicators: Physical Barriers, Large Woody Debris, Pool Frequency, Width/Depth Ratio, Drainage Network Increase, and Riparian Reserve. EA at 3-156.

In terms of context and intensity, the proposed action treats a very small portion of the riparian reserve in this landscape. The 129 acres proposed for treatment within the Riparian Reserve makes up 0.4% of the action area. EA at 3-137. In other words, 99.6% of the riparian reserves in the action area would continue on their current trajectories, providing both small and large wood to riparian ecosystems over time. Of the 0.6 miles of temporary road construction within Riparian Reserve, all are reconstructed on old road grades, and 3 of the 4 stream crossings are on intermittent streams. EA at 3-70. All culvert replacements sites are at non-fish bearing streams. EA at 3-126. Also, Project Design Criteria (PDC) and Best Management Practices (BMPs) would be employed, e.g. operating during the low-water period, isolating the work site from water exposure, and re-vegetating disturbed areas. EA at 3-74. Overall, impacts to aquatic habitat are expected to be small in context. Post project, 0.8 mile of road in Riparian Road will be decommissioned, which would include removal of 4 culverts. EA at 3-74.

I have reviewed the research cited by the objector, Pollack & Beechie, 2014, and the authors do state that passive management (no treatment) might be the best option in some riparian areas; however, the authors also state that “light or medium restoration thins may be an option that provides some increase in diameter growth of live trees, while minimizing production losses of large diameter deadwood.” This paper looks at five different structural habitat requirements of species that utilize riparian forests for all or part of their life stages, including large down wood in streams, large down wood on the forest floor, large standing snags, large live trees and canopy gaps. The paper describes that while a particular structural habitat requirement may be beneficial to some species (such as abundant deadwood), other species require or prefer another habitat (such as large trees). In the discussion section of this paper, the authors state that “consideration of the structural attributes that different species utilize and the effect that different restoration treatments have on the abundance of these structural elements suggests that passive management may often be the treatment that will best enhance biological diversity in degraded riparian forests, but that in some cases thinning may be beneficial.” Although the objectors believe that this paper justifies taking no action, the authors of the paper fully recognized the importance of stand characteristics that can be developed by thinning, as described above. The article states that, “since different species have a variety of needs in terms of the size and abundance of large live trees and large deadwood,” the author suggest “that from a restoration perspective, there is no one “ideal” management regime, but that a range of passive and active management options should be considered for the purposes of creating biologically diverse riparian ecosystems, commensurate with the structural attributes needed by the species of concern.” Pollack & Beechie, 2014. The authors offer the

caveat that thinning should be limited to situations where the need for large live trees outweighs the need for species that utilize large deadwood. The Final EA contains a complete list of current literature relied upon to analyze potential effects. EA at Ref-1 through Ref-20.

In addition, these references are cited throughout the EA and used to support analysis conclusions. The Final EA Response to Comments includes a discussion on how cited literature from the objector was addressed. EA at Appendix 3 at 3-53. Potential effects, both adverse and beneficial, are recognized and discussed throughout Chapter 3 of the Final EA and are sufficient to describe the effects associated with the project actions.

In conclusion, it is evident that the Responsible Official relied upon accurate current scientific analysis and public scrutiny to provide the basis for an informed decision.

Additionally, the authors and the District utilized the same FVS Model for forest stand projections. The authors were using a data set specific to their study area (i.e. west of cascades), and the district used a data set specific to the project area (i.e. east of cascades).

I believe that the Responsible Official has shown that there are benefits that can be achieved with the prescribed variable density thinning, which allows for flexibility to achieve overall treatment objectives. EA at 2-7. Variable density thinning (VDT) allows emphasis to be placed on leaving vigorous trees of all sizes without concern for spacing. Leave trees spacing associated with variable density thinning (VDT) will vary within and between units. Tree density will be measured by basal area, canopy closure, trees per acre or relative density depending on the circumstances for each unit. EA at 2-7. Given that riparian thinning is proposed to occur on only 0.4% of the riparian reserves located in the project area, which means 99.6% of the riparian areas will be passively managed as suggested by the research paper, I find that the Responsible Official has demonstrated that they considered the trade-offs associated with riparian thinning. EA at 3-121 through 122.

**Objector Statement #2:** Objector states that none of the streams in the project area currently comply with the Forest Plan standard (FW-095) of 106 pieces of suitable large wood per mile of stream. Objector concludes that the developing science around riparian thinning demonstrates that removing trees from Riparian Reserves would decrease the number of trees likely to become instream large wood, which is not an acceptable solution to this problem. Bark at 5.

**Response:** I find that the Responsible Official followed the Forest and Rangeland Renewable Resources Planning Act (RPA), as amended by National Forest Management Act (NFMA). Specifically, the project meets the Mt. Hood Land and Resource standards and guidelines (S&Gs), in particular, Forestwide S&G FW-095 for riparian area in-channel large wood recruitment.

The Forest Plan implements the National Forest Management Act (NFMA) and provides overall direction for natural resource management activities and establishes management standards and guidelines for the Mt. Hood National Forest. It describes resource management practices, levels of resource production and management. LRMP at 1-1. Forestwide standards and guidelines describe the bounds and/or constraints within which all activities necessary to implement the Forest Plan must operate. Specific terminology used in the standards and guidelines identifies the type of management direction and degree of compliance required. Three "action" words are used to differentiate among the three categories, i.e. shall, should, and may. The verb "should" is defined as an action required; however, case by case exceptions are acceptable if identified during interdisciplinary project planning environmental

analyses. Exceptions must be documented pursuant to the National Environmental Policy Act of 1969. LRMP at 4-45. Riparian S&G, FW-095 states that 20 logs per 1,000 lineal feet of stream with 80 percent of the logs greater than 12 inches in diameter, and 20 percent greater than 20 inches in diameter, and a minimum of 35 feet in length should be maintained. LRMP at 4-60.

Riparian thinning treatments are proposed in 22 units where the project's Interdisciplinary Team (IDT) identified a need for recruitment of instream wood to improve stream channel stability and sediment storage. Specifically, the IDT evaluated past management, stand exams and site evaluations of hydrology and fisheries. EA at 2-17, 3-111 to 3-112, and EFHR and MFHR Watershed Analysis (USFS 1996). Table 2-4 in the Environmental Assessment (EA) summarizes by individual unit the riparian values being improved. Further, Chapter 3 of the EA analyzed the short-term and long-term impacts from thinning in riparian reserves. EA at 3-65 through 3-82 and 3-84. In summary, there is an expected short-term loss of small diameter material due to thinning; however, in some units proposed tree falling would occur to enhance current lack of instream wood. EA at 3-136.

In addition to mitigate short-term impacts, EA at 2-29 through 2-31, Project Design Criteria/Mitigation Measures for unit specific protection buffers. These protection buffers would serve to help maintain current small wood recruitment to streams and maintain snags for standing and down wood recruitment. Long-term benefits are expected to bring in stream wood levels closer to Forest Plan S&Gs. EA at 3-138, Appendix 3 at 3-29. This is because the project is specifically designed to improve species composition, enhance structural diversity, and improve future quality of downed wood, in particular, large wood. EA at 2-16.

In conclusion, the Responsible Official has included adequate analysis in the EA to support the finding that the Lava Restoration Project complies with S&G FW-095.

**Objector Statement #3:** Objector states that the EAs documents that the project is inconsistent with ACS Objective #8 because by reducing the rate of instream wood recruitment potential, the project will not "maintain or restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion and channel migration to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability." Bark at 5.

**Response:** I find that the Responsible Official documented how the project complies with the ACS, specifically ACS objective #8.

The regulation at 36 CFR 220.7(b)(3)(iii) directs the agency to describe the effects of the proposed action and any alternatives in terms of context and intensity. Forest Plan water standards and guidelines-FW-54 to FW-79 and FS-BLM-Instruction Memorandum No. OR-2007-060 (2007) mandates project consistency with the nine ACS objectives.

In the Aquatic Conservation Strategy (ACS) section 3.7, benefits to the Riparian Reserve are documented and the beneficial effects from the project would lead to the attainment of the ACS objectives. EA 3-156. The fisheries section further discusses the effects of the thinning to large wood recruitment potential, and identifies the trade-off of removing smaller trees to promote growth of larger trees in the long-term; and the benefit of the wood lasting longer on the ground. EA at 3-136 through 3-137.

There is an expected short-term reduction in small diameter trees, due to the proposed thinning. However, effects are expected to be minimal and ACS Objective #8 would be maintained. The total amount of Riparian Reserve being treated across the landscape is small, only 0.4% of the planning area. EA at 3-137. Additionally, varying no cut stream buffers will be applied to all streams in the project area, which would retain smaller wood recruitment to streams. EA at 2-29, A-2. In addition, wood is being proposed to be added to selected streams in eight units, by felling trees into streams. EA at 3-136. The EA concludes that "There is little likelihood of diminished in-stream wood supply to LFH/EFH from Riparian Reserve thinning in the action area, not only due to a lack of transport capability, but also due to protection buffers that will supply large wood for the foreseeable future, protection buffers exceeding existing average short tree heights, the remaining number of trees in treated areas that will remain available to fall into streams (Table 3-35), and small area of thinning within the Riparian Reserve adjacent to tributary channels (Table 3-36)."

**Objector Statement #4:** Objector states that there is strong support (a letter to the Secretary of Agriculture signed by 31 organizations) for "generally keeping timber harvest out of riparian reserves because recent research underscores the original ACS presumption against timber harvest in aquatic emphasis areas, and now more clearly indicates that even harvest in the form of thinning and fuels reduction generally is inconsistent with attainment of ACS objectives." Bark at 5 and 6. Objector concludes that the Forest Service has "failed to establish the need for commercial thinning to attain ACS objectives." Bark at 6.

**Response:** I find that the Responsible Official adequately analyzed, discussed, and concluded that the project complies with the ACS objectives.

The Northwest Forest Plan (NWFP) states that the "Aquatic Conservation Strategy must strive to maintain and restore ecosystem health at watershed and landscape scales to protect for fish and other riparian-dependent species and resources and restore currently degraded habitat." NWFP at B-9. The NWFP outlined this strategy's objectives and states that these objectives will be met and activities will not prevent attainment of these objectives. NWFP at B-9 through B-11.

Within the Riparian Prescription section (2-15 through 2-18) the rationale is further described, and it tiers and references to the Northwest Forest Plan (ACS objectives), Mt. Hood Forest Plan, East Fork Hood River Watershed Analysis, Middle Fork Hood River Watershed Analysis, and West Fork Hood River Watershed Analysis. EA at 2-15. As stated in the Riparian Prescription, "[r]iparian treatments would be designed to maintain and improve stream and wetland function." EA at 2-17.

For further detail concerning how the Responsible Official addresses the Lava Project achieving ACS direction, see response to Objector Statement #1.

In addition, EA section 3.7 identifies indicators that may affect the different ACS objectives and where the EA documents ACS consistency. EA at 3-154. Table 3-42: ACS Objectives Indicators for each Alternative summarizes and compares the effects to each indicator by alternative. EA at 3-155. Summary statements on the project effects to the Riparian Reserves and how the project is meeting ACS objectives are found in the EA at 3-152.

**Final Remedies/Resolution:** District Ranger Janeen Tervo adequately analyzed and displayed the Lava Project's impacts to surrounding watersheds and riparian areas. Thus, no remedies or resolutions are needed.

### ***Best Available Science and Temporary Road Building***

**Overview and Suggest Remedies/Resolution:** This objection issue is focused on the impacts of temporary road construction and reconstruction. Suggested remedy is to remove construction of new temporary road (1 mile), reconstruction of road segments which have undergone recovery through active decommissioning (2.5 miles), and all segments proposed in Riparian Reserves (0.6 miles) from the proposed action.

**Objector Statement #5:** Objector states that temporary road construction and reconstruction are “contradictory to the best available science and to the objectives of watershed restoration.” Bark at 6. Objector states that the best available science recommends that federal agencies prohibit construction of new and reconstruction of existing temporary roads because of the long term impacts on “critical watershed elements and processes.” Bark at 6.

**Response:** I find that the Responsible Official considered, but eliminated from detailed study, an alternative that did not propose temporary road use. This alternative was eliminated from further consideration because this option would not allow the purpose and need to be achieved. EA at 2-40. Further, I find that the Responsible Official adequately displayed the potential resource impacts from temporary roads.

The regulation at 36 CFR 220.7(b)(3)(iii) directs the agency to describe the effects of the proposed action and any alternatives in terms of context and intensity. In addition, the regulation at 40 CFR 1500.1 outlines that the information used in a NEPA analysis “must be of high quality” and accurate.

The objector does not specifically say what the “critical watershed elements and processes” for which long term impacts from temporary roads are impacting. Watershed elements disclosed and discussed in the EA and specialist reports include the following: slope stability, soil erosion, water quality (sediment and turbidity) and water quantity. EA at 3-42 through 3-46; 3-57 through 3-85; 3-86 through 3-153.

The EA states that temporary roads would be used to access landings and are rehabilitated upon completion of all harvest activities. EA at 2-10. The analysis further states that temporary roads are constructed upon stable native soils and are intended for project use only and the states that the 14.7 miles of proposed temporary roads were only located on decommissioned roads that had an aquatic risk rating of low to moderate. EA at 2-11 and 3-32. The EA discloses that all temporary roads are located on stable ground and their construction or reconstruction would have no perceptible effect on slope stability. EA at 3-44. The EA summarizes that the risk of erosion and subsequent sediment delivery caused by the proposed action is extremely small. EA at 3-55. The EA then specifies project design criteria R-8, R-9, R-12, R-13, R-14, L-5, A-9 to A-13, I-2 to I-7 that would be an integral part of the proposed action to minimize road impacts. EA at 2-27. The effects analysis in Chapter 3 is based on these project design criteria and mitigation measures being implemented.

The EA discloses that there would be some turbidity associated with the first flushing flow after construction, but this should be minimal due to the small amount of fill, existing channel roughness and subsurface nature of the channels in unit 18. EA at 3-70. The EA further states that field work completed for this project, complimented by field observations through more than 25 years as a professional hydrologist, indicate that most road-related sediment would be trapped and stored in the



ditches or on the forest floor below cross drains. EA at 3-72. The implementation of PDC and BMPs for erosion control would further reduce the risk of sediment entering into streams. Any sediment delivered to streams during these activities would be minimal, short-term duration, and undetectable at a sub-watershed (6th field) or watershed (5th field) scale. EA at 3-72. Therefore, the probability of any degradation to water quality or fisheries resources caused by sedimentation due to road construction, reconstruction and maintenance is extremely low. Finally, the EA summarizes cumulative effects for sediment as not measureable, except for during road decommissioning, when culverts are being removed and the effect would be small and localized. EA at 3-75 through 3-81; Objection Record, Water Quality Report at 26.

Because increased peak flows can cause stream channel damage in the form of increased bank erosion, channel bed scour, channel widening, and sedimentation, a peak flow analysis was conducted. Objection Record, Water Quality Report at 30. The peak flow analysis disclosed that no cumulative effects are anticipated for water quantity because the modeled effect of this project is well below the 25% threshold value for effects. EA at 30; Objection Record, Water Quality Report at 26. Roads can also be used as a general indicator of potential problems associated with roads. Objection Record, Water Quality Report at 9. The EA identified a project-wide 3.5% reduction in road density, with a 19.9% reduction in open road density. EA at 3-38.

**Objector Statement #6:** Objector believes that “for the Forest to propose a ‘restoration’ project that includes 14.7 miles of roadbuilding is both disquieting and disingenuous” and that ACS objectives #1, #4 and #5 are not met by the proposed actions. Bark at 6 and 7.

**Response:** I find that the Responsible Official documented how the project complies with ACS objectives #1, #4, and #5.

The Code of Federal Regulation (CFR) at 36 CFR 220.7(b)(3)(iii) directs the agency to describe the effects of the proposed action and any alternatives in terms of context and intensity. Forest Plan water standards and guidelines-FW-54 through FW-79 and FS-BLM-Instruction Memorandum No. OR-2007-060 (2007) mandate project consistency with the nine ACS objectives.

Of the approximately 13 miles of old existing temporary or decommissioned roads that would be re-opened, only 0.6 miles are within Riparian Reserves. None of the new temporary road construction would be within Riparian Reserves. EA at 1-17. Table 3-42 summarizes the effects of the proposed action on ACS objective indicators to maintain and restore the ecological health of watersheds and aquatic ecosystems. EA at 3-155. In addition proposed treatments, unit boundaries, temporary road locations, and PDC have all been designed to minimize impacts to aquatic habitat across the action area. EA at 3-108.

ACS objective #1 requires maintenance and restoration of the distribution, diversity, and complexity of watershed and landscape-scale features. The EA documents the effects of the proposed temporary roads and concludes that there are no long term effects to the landscape features discussed below.

For the proposed action, stream crossings were minimized as much as possible when identifying the location of temporary roads. However, it is anticipated that three existing stream crossings over intermittent streams would need to be rebuilt and one existing stream crossing over a perennial spring would need to be reused. EA at 2-11. None of the culvert removal/replacements would occur in known fish bearing streams; therefore, no barriers to fish passage. EA at 3-134.

Levels of fine sediment were below Forest Plan standards in all streams within the action area except one tributary to Bear Creek and the lowest reach of Coe Branch. Streams particularly important to fish spawning and rearing (Clear Branch, Pinnacle Creek, Bear Creek, and Tony Creek) had very low levels of fine sediment. In the Middle Fork Hood River (MFHR), the level of fine sediment is naturally elevated below Eliot and Coe Branches due to their glacial source. The level of fines in the MFHR appears relatively high, but not above the range of natural variability given environmental conditions upstream. EA at 3-109. Direct effects from sediment deposition during culvert removal/replacement are unlikely, especially for juvenile and adult fish given that none of the streams directly affected are fish bearing. EA at 3-126.

Removing large wood from stream channels was a common practice into the 1970's thus the amount of large wood in many streams within the action area have less large wood than historic conditions. None of the actions proposed in this EA would directly reduce existing levels of large wood in any stream. EA at 3-141. Both the quantity and quality of pool habitat in the action area is expected to be maintained or improved in the future from the long-term improvements in large wood recruitment potential and erosion risk reduction. EA at 3-136.

The EA describes stream channel dynamics using the Rosgen classification system. EA at 3-63. Stream surveys conducted in Bear Creek and Middle Fork Hood River support the characterization of stable stream banks and channel bed in "B" type channels and fairly stable "A" type channels. EA at 3-64. The Rosgen classification describes streams based on width/depth ratios, gradient, sinuosity, entrenchment (flood connectivity) and substrate and provides a range of values that are representative of streams in a stable condition. As stated in the EA, these "A" and "B" stream types currently meet the description appropriate for stable channels.

Two elements that are indicators of unstable streams include changes to the sediment regime, bank stability and increases in peak flow. EA at 3-66 through 3-81; Objection Record, Water Quality Report at 30. The EA and Water Quality Report disclosed that there would be no significant direct, indirect or cumulative effects to sediment and peak flow due to the minimal impact the project has on the existing condition. Because there would be no effects to sediment regime, bank stability or peak flows, stream channel morphology would remain in the range appropriate to the respective stream type, as described by Rosgen.

See my response in Objector Statement #5 to see how the Responsible Official displayed the effects to peak flow.

ACS objective #4, water quality, requires maintenance and restoration of water quality necessary to support healthy riparian, aquatic and wetland ecosystems. As summarized in Table 3-42, water quality indicators of temperature, sediment and turbidity pertinent to this ACS objective would be maintained. EA at 3-155.

Temperature: Water quality in streams within the project area is generally good, with water temperatures well below Oregon Department of Environmental Quality standards. EA at 3-88. Due to meeting or exceeding primary shade width recommendations in the Sufficiency Analysis, plus the existence of additional factors that help protect stream temperature, treatments associated with the Lava Restoration Project are expected to have an immeasurable effect to existing stream temperatures. EA at 3-69. No detrimental cumulative effects are expected as a result of increased water temperature

due to PDC that maintain existing primary shade vegetation adjacent to perennial streams. EA at 3-81. Given existing cool water temperatures, abundant spring and groundwater sources, and the fact that larger shade producing trees would be retained, any shade reduction at road crossings would not measurably increase water temperatures over existing levels. EA at 3-127.

Sediment: The reopened temporary roads re-trace the alignment of older overgrown or decommissioned roads. These temporary roads can be reopened with minimal earth movement, without side casting material and would be rehabilitated after project completion. Re-opening these roads and the construction of new temporary roads would pose an overall low risk of introducing sediment to streams because almost all of these roads would be outside of the Riparian Reserves. EA at 3-70.

The EA at 3-129 disclosed that a potential source of increased sedimentation in action area streams could result from road maintenance, log hauling, culvert removal/replacement, and road decommissioning and reaffirmed that PDC and BMPs are in place to greatly minimize, if not eliminate, the chance of increased sedimentation in action area streams and other water bodies resulting from proposed activities. Any chance for such sediment introduction would be of a short duration. EA at 3-131. Direct effects from sediment deposition during culvert removal/replacement are unlikely, especially for juvenile and adult fish given that none of the streams directly affected are fish bearing. EA at 3-126. Table 3-28 (EA at 3-75) summarizes cumulative effects from the Lava project and other activities and concluded that the primary fine sediment producing activity in the Lava Restoration project is culvert removal during road decommissioning. EA at 3-81.

Major detrimental cumulative effects are not expected as a result of sediment introduction. Sediment from culvert removals may mix with sediment generated from road maintenance activities in the Bear Creek sub-watershed if these activities occur at the same time. This risk would be greatest the year following the road decommissioning/culvert removal work associated with the Lava Restoration Project. The cumulative effect is expected to be very small and localized due to the small amount of sediment expected from the Lava Restoration Project. EA at 3-82.

Turbidity: Natural turbidity in the form of glacial meltwater is present in several streams in the analysis area. Ladd Creek, Coe Branch and Eliot Branch all have glacial influence and higher natural turbidity rates. EA at 3-64. Three existing stream crossings over intermittent streams would need to be rebuilt and one existing stream crossing over a perennial spring would be reused. It is expected that there would be some turbidity associated with the first flushing flow after removing the crossing, but this should be minimal and localized due to the existing channel roughness and subsurface nature of the channel. In addition, erosion control measures described in the PDC section would be employed to reduce and/or eliminate erosion and potential sedimentation. The new temporary roads and re-opened temporary and decommissioned roads would be decommissioned and re-vegetated immediately following completion of harvest operations to help reduce compaction, increase infiltration rates, minimize surface erosion, and re-establish natural drainage patterns. EA at 3-70. Given the location of potential sediment producing actions and the low levels of turbidity expected, the impact on fish from increased turbidity would be negligible. EA at 3-129.

ACS objective #5, sediment regimes, requires maintenance and restoration of the sediment regime under which aquatic ecosystems evolved.

Sediment dynamics are discussed at EA 3-63 through 3-65. The EA specifies project design criteria R-8, R-9, R-12, R-13, R-14, L-5, A-9 to A-13, I-2 to I-7 specific to roads that would be an integral part of the proposed action which would reduce sedimentation delivery to streams. EA at 2-27. The effects analysis in Chapter 3 is based on these project design criteria and mitigation measures being implemented. Under the proposed action, the long-term sedimentation risk would be low because road problem areas would be fixed and additional roads would be closed, storm proofed or decommissioned, reducing sediment risk from the road system. EA at 3-84.

My response to Objection Statement #6 displays how the Responsible Official displayed the Lava Project's consistency with ACS objective 1 and 4 on the effects of temporary roads to sediment.

**Final Remedies/Resolution:** District Ranger Janeen Tervo adequately displayed the Project's impacts of temporary road construction and reconstruction; thus, no remedies or resolutions are needed.