

## APPENDIX D

# Riparian Conservation Objective Analysis

### *Alder Creek Project*

#### Introduction

The Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (USDA, 2004) requires that a site-specific project-level analysis be conducted to determine whether activities proposed within Riparian Conservation Areas (RCAs) meet the Riparian Conservation Objectives (RCOs). This document describes how the action alternative proposed for the Alder Creek project would meet the Riparian Conservation Objectives and the management requirements and mitigation measures that are incorporated to meet these objectives.

#### Riparian Conservation Areas

As defined in the Sierra Nevada Forest Plan Amendment Record of Decision (ROD), RCAs “are land allocations that are managed to maintain or restore the structure and function of aquatic, riparian, and meadow ecosystems. The intent of management direction for RCAs is to (1) preserve, enhance, and restore habitat for riparian- and aquatic-dependent species, (2) ensure that water quality is maintained or restored, (3) enhance habitat conservation for species associated with the transition zone between upslope and riparian areas, and (4) provide connectivity within the watershed.” RCAs are delineated and managed consistent with the riparian conservation objectives defined in the ROD.

RCA widths vary with the type of water body. The types of water bodies are designated as follows: (1) perennial streams; (2) seasonally flowing streams (includes ephemerals with defined stream channel or evidence of scour); (3) streams in inner gorge; (4) special aquatic features (lakes, meadows, bogs, fens, wetlands, vernal pools, and springs); and (5) other hydrologic or topographic depressions without a defined channel. All of these types exist within the Alder Creek project. The SNFPA ROD defines RCA widths as follows:

<b>Stream Type</b>	<b>Width of the Riparian Conservation Area</b>
Perennial Streams	300 feet measured from bank full edge
Seasonal Flowing Streams	150 feet measured from bank full edge
Streams In Inner Gorge	Top of inner gorge if beyond 300 feet
Meadows, Lakes, Springs, and Ponds	300 feet from edge of feature or riparian vegetation, whichever is greater
Other hydrologic or topographic depressions without a defined channel	These features will be protected as needed. There is no specified RCA. Distance for equipment exclusion will be determined on a site by site basis.

## Proposed Activities within RCAs

The Alder Creek project proposes to treat 261 acres within the RCA boundaries and with 42 acres within seasonal flowing (primarily upland ephemeral) RCAs will be mechanically treated and the remaining 219 acres will using a combination of over the snow tree removal, mastication, skyline, helicopter or hand thinning operations.

Each RCA was visited to create a site specific prescription and management strategy to meet management goals and resource conservation objectives (RCO). Treatments, restrictions and mitigations were tailored to the site to protect and/or restore water quality, aquatic habitat, and riparian habitat by preventing sediment movement to streams and protecting the riparian corridor.

In areas where ground based equipment will be operating within the RCA management requirements include: prohibiting equipment from operating near stream banks and other sensitive areas, inner gorge slopes, springs or meadows; requiring equipment to work perpendicular to the stream corridor and operating in a fashion that will minimize disturbance of the duff and soil; limiting equipment to slopes  $\leq 20\%$  where equipment would operate directly above stream channels; and mulching any bare ground created by operating equipment. A summary of all BMPs and management requirements to protect watershed resources is attached as Appendix 5.

Vegetation and fuels treatment within “Tractor Keep Out” areas (TKO) would in general be accomplished by low impact harvesting methods such as over the snow operation and/or hand felling and endlining the material out. No trees that provide bank stabilization either adjacent to the stream or within an inner gorge or gully bordering the stream will be cut, that is to say no trees will be removed beyond the break in slope along stream channel or within 10 ft of the stream whichever is greater. No new skid trails, roads or landings would be constructed within any RCA without consultation with a riparian specialist. The use of high ground pressure equipment (skidder) within RCAs would occur on a limited site-specific basis and when possible main skid trails (>3 passes) should be located on existing roads. No new stream crossings of perennial or intermittent streams will be used and the number of ephemeral crossings will be minimized.

## Riparian Conservation Objectives

The ROD defines the standard and guidelines for management activities within RCAs. RCOs provide the criteria for evaluating whether a proposed activity is consistent with the desired conditions described in the Aquatic Management Strategy. For projects that include proposed activities within RCAs, all applicable RCOs and associated standards and guidelines must be achieved. How the proposed project meets the applicable RCOs and standards and guides is described below.

***RIPARIAN CONSERVATION OBJECTIVE #1: Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and***

*guidelines will protect the beneficial uses. (RCO #1 is linked to the following AMS goals: #1: Water Quality; #2: Species Viability; #7: Watershed Condition)*

The State Water Board designated beneficial uses of Alder Creek and Prosser Creek. These include: municipal and domestic water supplies, irrigation and water supply for agriculture, groundwater recharge, contact and non-contact recreation, commercial and sport fishing, cold freshwater fisheries and spawning habitat, wildlife habitat, rare, threatened or endangered species habitat, migration of aquatic organisms (CRWQCB, 1998). The Alder Creek project will protect these beneficial uses of water.

The California Regional Water Quality Control Board (CRWQCB, 2000) for the Lahontan Region sets water quality standards and objectives for these watersheds. The objectives applicable to this project include sediment, turbidity, temperature, oil and grease and pesticides.

The State and Regional Boards entered into an agreement with the U.S. Forest Service which requires the Forest Service to control non-point source discharges by implementing control actions certified by the State Board as Best Management Practices (BMPs). BMPs are designed to protect water quality including issues with sediment, turbidity, and water temperature.

It is not expected that water temperature will be substantially augmented. The proposal includes some thinning within a distance of the stream channel that could affect stream shading and the microclimate within treated riparian corridors may be slightly altered in the short-term. The same result is occurring naturally along Alder Creek due to Lodgepole mortality due to persistent insect activity. Much of the current shading is provided by standing dead and as these snags loose needles and fall over the shading is being reduced naturally. The natural process is also adding to the already high volume of downed fuels in the RCA and is placing the RCA at risk of a catastrophic wildfire.

In the short term, there will be a reduction in the stand density along some stream channel segments as the overstocked, small diameter trees are removed. This may result in increased air solar radiation within the RCA. It is anticipated that retaining the canopy cover within the RCA's will provide adequate summer and winter temperature regulation. As time progresses, the residual canopy cover will expand and thermal regulation should be increased. Water temperatures would not be expected to be significantly increased as the changes are expected to be discontinuous along the length of the RCA and the 100 foot buffers along Alder Creek where only dead standing, understory trees, and touching crowns would be removed.

Historically, Lahontan cutthroat trout (LCT), *Onocorhynchus clarki henshawi*, inhabited the Lahontan Basin. Streams within the Little Truckee watershed were used by LCT as rearing and spawning habitat. On going recovery efforts will likely include the re-introduction of LCT into the Little Truckee River (refer to Biological Evaluation and Assessment, Amphibians, Reptiles, Fish and Invertebrates, Alder Creek Project). The benefits that could be expected as a result of the proposed action including, increased soil water availability, and habitat improvement for riparian flora and fauna associated with aspen habitats. Thinning is designed to improve the long-term health and vigor of conifer stands and their growth should maintain or improve conditions necessary for LCT.

***RIPARIAN CONSERVATION OBJECTIVE #2: Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens,***

wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species. (RCO #2 is linked to the following AMS goals: #2: Species Viability; #3: Plant and Animal Community Diversity; #4: Species Habitats; #5: Watershed Connectivity; #6: Floodplains and Water Tables; #8: Streamflow Patterns and Sediment Regimes; #9: Streambanks and Shorelines).

The Alder Creek project does not propose any vegetation treatment activities that would affect any of the geomorphic characteristics of the perennial and seasonal streams within the project area. All management activities would incorporate Tahoe National Forest Land and Resource Management Plan (LRMP) Standards and Guidelines, Soil Quality Standards, Best Management Practices, and additional protection measures to prevent sediment movement into streams and protect stream banks and the riparian corridor.

The Alder Creek project provides many key aquatic and riparian habitat elements. The project is designed to maintain these features including: requirements for select retention to maintain long-term and near-term availability of standing wood for recruitment to aquatic habitats, specific requirements to create downed logs in aspen stands, specific selection for removal of logs where they are available in excess, separate treatments in RCAs to provide for shade retention along the perennial and intermittent streams; ground cover requirements to reduce sediment transport and erosion, and maintaining bank stability and hydrologic regime by providing low compaction producing logging systems and site specific access requirements. Protection measures of key aquatic and riparian habitat elements are presented in the management requirement, mitigation table and contract requirements.

There are several existing roads and non-system user trails identified within the project area that intercept, divert, and disrupt natural surface and subsurface water flow paths from hillside sheet flow and some ephemeral drainages. Road surface drainage to minimize the interception and concentration of water would be maintained or improved in conjunction with the proposed project.

No issues were identified with barriers to fish passage in relation to the proposed project. BMP 2-21 Water Source Development is included in is designed to minimize streamflow fluctuation, maintain water quality, and protect fish habitat. Water supplies and mitigation measures for aquatic dependent species shall be developed in consultation with the hydrologist or fisheries biologist.

***RIPARIAN CONSERVATION OBJECTIVE #3: Ensure a renewable supply of large down logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the RCA. (RCO #3 is linked to the following AMS goals: #2: Species Viability; #3: Plant and Animal Community Diversity)***

Currently the areas proposed for treatment are overstocked with trees. Many of the trees are small growing underneath the larger trees. The proposal is to remove many of the smaller trees and only removing the larger trees when they are considered too dense to meet desired conditions.

The Alder Creek project is designed to retain a renewable supply of large down logs in specific RCA areas, along perennial and intermittent streams, and restricts removal of large downed

woody debris. Bank stabilizing trees either adjacent to streams, within an inner gorge or gully and bordering streams will be retained.

***RIPARIAN CONSERVATION OBJECTIVE #4: Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species. (RCO #4 is linked to the following AMS goals: #2: Species Viability; #7: Watershed Condition).***

Physical and biological characteristics of aquatic and riparian habitats within the Alder Creek project area should be enhanced or maintained when management activities and associated BMPs and management requirements designed for this project are implemented (see list of BMPs and management requirements). All proposed actions are designed to minimize impacts to aquatic- and riparian-dependent resources while improving forest health and treating existing fuels conditions.

Each RCA proposed to be treated was visited in the field to develop site specific prescriptions. Equipment access, restrictions, and mitigations were tailored to the site to protect and/or restore water quality by preventing sediment movement and by minimizing compaction. Management requirements for operations within the RCA include: equipment prohibition from operating near stream banks or inner gorge slopes, equipment access is perpendicular to the stream corridor, equipment operations will minimize disturbance of the duff and soil, equipment limitations are on slopes  $\leq 20\%$  where operating directly above stream channels, back blade requirements for any berms created by equipment that could concentrate water, and mulch requirements for bare ground created by equipment operation. A summary of all BMPs is found in Appendix 5 and additional management requirements are found in Chapter 2 of the EA.

In addition to reducing the risk of high-intensity fires, thinning the RCA's including treatment within aspen stands will allow the ecosystem within this corridor to return to a more historic condition. In the non-aspen areas, it is anticipated that mortality rates will decline and over time the crowns of larger, more fire tolerant trees will expand providing historic levels of shading. In the short term the existing stream shading may be reduced within the outer portion of the RCA and to a lesser extent if at all in the near stream area. It is not expected that water temperature will be significantly altered. In the short-term, the microclimate within treated riparian corridors may be slightly altered. Solar radiation will be increased in cleared areas; scale and variability of solar radiation changes along perennial streams, existing influencing factors and potential moderating changes such as soil moisture availability would result in no significant effects to water temperature. Within three to five years the trees will begin to expand their canopy into open areas. In the long term, the trees will grow larger and the forest canopy should trend towards more historic levels of shading.

In the aspen treatment areas it is anticipated that there will be a flush of aspen sprouts and rejuvenation of aspen associated riparian understory. There may be a risk of increased sediment during the operating period, and from 1 to 3 years following implementation; however, BMPs requiring ground cover and the proposed monitoring plan should greatly reduce this risk. As forbs, grasses and sedges grow in association with the aspen benefits to hydrologic function occurs. Soil water availability will increase due to reduced transpiration from conifer removal, and the replacement with aspen sucker that have significantly reduced transpiration rates this process can last from 10 to 20 years, until the stand fully matures (N.V. DeByle and R.P.

Winokur 1985). The aspen stand may be more efficient at regulating water discharge because it provides high transpiration rates when water is available in the spring, increases again with autumn rains, and slows when moisture is limiting. Aspen experience an overall reduction in transpiration, when compared with conifers, by three to seven inches of soil water per year. Aspen improve soil organic matter from relatively quick decay processes and has a higher water holding capacity. The aquatic environment may benefit due to more efficient water cycling. Nutrient cycling in aspen stands has been shown to have higher water quality when ungrazed (N.V. DeByle and R.P. Winokur 1985). Overall the treated aspen stand and the physical and biological characteristics for aquatic and riparian species should be improved over existing conditions.

Prescribed fire will be used to treat some of the thinned areas within RCA's potentially leaving small isolated areas of bare soil. Potential on-site erosion of these areas will be low to none and will decrease over time as needle cast from the residual canopy cover is deposited onto the barren areas and understory vegetation increases. The project is designed to avoid negative impacts of sediment movement within RCA's.

It is not expected that the proposed action alternative will have any substantial effects upon nutrient cycles. Any change to nutrient loads within stream channels is likely to be minute and/or imperceptible.

With the implementation of the proposed action, treatments within the RCA's are expected to decrease the impacts to riparian areas in the event of a large wildfire. Over time, vegetation within riparian areas is expected to trend towards more historical levels of stand density. The design of the project should maintain water quality. In the long term, the riparian and aquatic areas ecosystems are expected to become more productive.

Prior to drafting from a water site an aquatic biologist would be notified so that any necessary coordination may occur during water drafting operations to help insure sensitive aquatic species are not disturbed by the proposed activity.

***RIPARIAN CONSERVATION OBJECTIVE #5: Preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas. (RCO #5 is linked to the following AMS goals: #1: Water Quality; #2: Species Viability; #3 Plant and Animal Community Diversity; #4: Special Habitats; #7: Watershed Condition; #9: Stream Banks and Shorelines)***

Special aquatic features identified within the project area including springs and meadows would be protected during the proposed vegetation and fuels management activities.

***RIPARIAN CONSERVATION OBJECTIVE #6: Identify and implement restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species. (RCO #6 is linked to all AMS goals)***

The proposed actions of the Alder Creek project are designed to maintain or improve existing watershed conditions, water quality, and riparian and aquatic habitats. Some existing road and some skid trails being used for OHVs will be properly drained and closed to improve watershed

conditions. Aspen stand treatments are designed to enhance and/or restore upland and riparian aspen habitats. Additionally, the project is designed to improve forest stand health within RCAs.

**Conclusion:**

The proposed Alder Creek project is consistent with the Aquatic Management Strategy for the Sierran Forests, as required by the Sierra Nevada Forest Plan Amendment ROD (USDA 2004). This project incorporates LRMP Standards and Guidelines, Soil Quality Standards, Best Management Practices, and additional management requirements in Chapter 2 and in Appendix 5. The potential for direct, indirect, and cumulative effects within the project area and within RCAs associated with the proposed project will be minimized through implementation of identified protection measures.

**References:**

California Regional Water Quality Control Board, 2000. The water quality control plan for the Lahontan Region. South Lake Tahoe, CA.

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