

Biological Evaluation/Assessment  
For  
Federally listed and Forest Service Sensitive  
Aquatic Species

For the  
**Bald Fire Salvage and Restoration Project**

Hat Creek Ranger District, Lassen National Forest  
Shasta and Lassen Counties, California

USDA, Forest Service, Pacific Southwest Region

**April 27, 2015**

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## **I. INTRODUCTION**

This Biological Evaluation/Biological Assessment (BE/BA) has been prepared in accordance with direction in FSM 2670.3 and 2672.4 and considers the potential effects of the Proposed Action (Alternative 1) of the Bald Fire Salvage and Restoration Project (hereafter referred to as the Bald Project) on Forest Service designated sensitive and Federally listed aquatic species and/or Designated Critical Habitat. The species addressed in this document were identified from the Regional Forester's Sensitive Animal List (USDA FS PSW 2013a,b) and the US Fish and Wildlife Service (USFWS) list of Federally listed endangered and threatened species (USDI FWS 2015).

Aquatic species present within the Bald Project area and/or on adjacent lands were gathered from files available in the Supervisors Office of the Lassen National Forest (hard copy or electronic). General survey efforts and findings specific for the project area and vicinity are provided in Table 1 in Appendix A.

Of the aquatic species listed in Table 2 in Appendix A, only the black juga (*Juga nigrina*) is considered in this document, for reasons provided in the table.

## **II. CONSULTATION TO DATE**

There are no aquatic Federally listed species under the Endangered Species Act (ESA) with ranges within the project area or downstream (Table 2, App A.), so no aquatic Federally listed species would be affected from the proposed Bald Project. Thus, no consultation was necessary.

## **III. CURRENT MANAGEMENT DIRECTION**

Current management direction for the Lassen National Forest for the Bald Project can be found in the 1992 Lassen National Forest Land and Resource Management Plan (LRMP) and 1993 Record of Decision (ROD) (including response to comments) (USDA FS PSW Region 1993), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA) FEIS, FSEISs, and RODs (USDA FS PSW Region 2001 and 2004), and the Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment FEIS and ROD (USDA FS PSW Region 2007b) (hereafter referred to as the "Forest Plan"). Further management direction can be found in the Forest Service Region 5 Best Management Practices (USDA FS PSW Region 2011), Forest Service Manual (FSM), the National Forest Management Act (1976), and the Endangered Species Act (1973, as amended).

Direction specific to management of fish, water, and riparian areas is found as goals, objectives, and standards and guidelines in Chapter 4 of the Lassen LRMP, as well as in the SNFPA, which includes an aquatic conservation strategy. The aquatic conservation strategy is found in its entirety in the SNFP amendment to the LRMP. All LRMP standards and guidelines, however, have been consolidated and are "posted" (USDA FS LNF 2013a,b) in a spreadsheet (LNF\_LRMP\_SNFPA\_summary\_Ver\_04\_16\_2013.xlsx). The water and riparian area direction applicable for the Bald Project area is found in the Water-Riparian-Fish-Non-Anad tab and RCA-Non-anadromous 2.2.14 tab.

## **IV. DESCRIPTION OF THE PROPOSED ACTION (Alternative 1) and Alternatives 2 and 3**

### **Project Location and Description:**

The proposed action was developed to accomplish the purpose and need for the Bald Project by evaluating existing vegetation conditions, fire burn patterns and intensities, and land allocations within the fire perimeter. Preliminary estimates of treatment acres were based on the Bald Fire Rapid Assessment. These acreages have been adjusted since original scoping based on analysis for wildlife habitat needs, considerations for riparian area and aquatic feature protection, and archeological sites. Additional pockets of merchantable timber (commercial salvage) have been identified in areas initially designated for fuels treatment. Areas identified for commercial salvage would also receive follow-up fuels treatments if needed to meet desired fuel loading. These treatments may include mechanical, hand, and prescribed fire<sup>1</sup> treatments.

Large and medium patches of existing burned forest habitat interspersed throughout the burned area would be left untreated under the proposed action to allow for natural recovery.

To provide for snags and down woody debris across the treatment areas, retention islands would be designated in all treatment units except road hazard removal units. Retention islands would consist of small-untreated patches within the boundary of treatment units that range in size commonly between two to five acres, and would comprise 20 percent of the acres within each unit. Retention islands would be distributed across the unit to provide a variety of burned conditions representative of those present in the unit prior to treatment.

Snag retention differs in the the riparian conservation area (RCA) land allocation to provide for future coarse woody recruitment that would provide aquatic habitat structural diversity and hydrologic function such as sediment routing. No treatment would occur within the RCA of the Beaver Creek mainstem with the exception of limited hand treatments of fuels within one sensitive area, hazard tree felling adjacent to fences that require repair, and possibly small patches of site prep prior to planting riparian vegetation (if monitoring deems artificial regeneration necessary). Within the RCA of the tributaries to Beaver Creek, other ephemeral and intermittent drainages within the project area, and the special aquatic features at Sheeps' Flat and Negro Gulch, integrated design features (IDFs) would be implemented. No treatments are proposed around Willow, Coble, and Gibbs Springs.

Treatments proposed under Alternative 1 include hazard tree removal, area salvage, area fuels treatments, and planting only treatments (Table 2). Treatments would use a combination of mechanical, hand, and prescribed fire. All acres, unless specifically noted, were analyzed for mechanical equipment. All acres proposed for treatment would also be analyzed for planting.

**Table 2. Proposed treatment and estimated acres in the Bald Project**

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<sup>1</sup> Prescribed fire is an inclusive term that refers to underburning, broadcast burning, and pile burning. All burning would be completed within prescription as well as in accordance with all State and County regulations.

<b>Alternative 1</b>	<b>Estimated Acres</b>	<b>Percent of Project Area</b>
Hazard Tree Removal	4,815	15%
Area Salvage	3,632	12%
Area Fuels	5,499	18%
Reforestation Only	417	1%
<b>Total proposed for treatment</b>	14,363	46%
<b>Natural Recovery</b>	16,961	54%

### **Hazard Tree Removal**

Hazard trees within approximately 150 feet along maintenance level 2 (ML2) or higher roads within the fire-affected<sup>2</sup> area would be felled and removed. Hazardous trees along the Burlington Northern Santa Fe railroad easement would also be felled. Depending on access, these trees would be removed or left in place.

Hazard tree marking guidelines would be based upon both the fire-injured tree marking guidelines and the hazard tree marking guidelines developed by Region 5 Forest Health Protection. The objectives of these guidelines are to: 1) remove those trees that are dead or have a high probability of mortality due to fire-injury or that have structural defects that indicate high failure potential to abate potential hazards to visitors and improve safety and access and 2) retain those trees that would likely survive to maintain visual quality, wildlife habitat, and recreational values. This balance aims to retain healthy forested conditions while providing for safety and access to the area. The marking guides for hazard tree removal would be based on a probability of mortality of 60 percent (Pm-0.6).

Sub-merchantable trees and non-merchantable hazard trees would be felled and left in place, or piled and the piles burned, depending upon the amount of surface fuel loading present.

### **Area Salvage Harvesting**

Fire-killed and fire-injured trees within the Bald Fire perimeter would be harvested. Merchantable trees would be removed as sawlogs if operations occur before the wood deteriorates. Non-merchantable trees would be removed as biomass, masticated, felled and lopped, machine piled and burned, or broadcast burned to meet desired fuel conditions.

Fire salvage marking guidelines to be used are based upon the fire-injured tree marking guidelines developed by Region 5 Forest Health Protection<sup>3</sup>. The marking guides for area salvage would be based on a probability of mortality of 70 percent (Pm-0.7). The objectives of these guidelines are to balance the need to remove hazardous trees to allow for safety in accessing National Forest lands and the need to retain the healthier trees for other resource needs.

<sup>2</sup> In addition to roads and the railway within the fire perimeter, incidental hazards along the perimeter roads would be treated.

<sup>3</sup> Report #RO-011-01, Smith and Cluck, May 2011 developed by Region 5 Forest Health Protection.

The salvage harvest operations would utilize ground-based, mechanical harvesting to remove fire-killed and fire-injured trees from treatment areas on slopes 35 percent or less. Activity-generated fuels would be masticated, broadcast burned, piled mechanically or by hand, and the piles burned. On slopes greater than 35 percent, hand felling would be used to create openings for artificial regeneration and activity fuels would be hand treated.

### **Area Fuel Treatments**

In areas that burned at moderate and high severity, and where timber does not meet merchantability standards, hazard abatement, fuels reduction, and site preparation for reforestation would be accomplished by biomass removal, mastication, felling and lopping, machine piling and burning, or broadcast burning. Ground based mechanical harvesting would be used on slopes 35 percent or less. On slopes greater than 35 percent, only hand operations would be allowed. In all areas, trees designated for removal would use the same guidelines as discussed above under Area Salvage. Activity-generated fuels would be broadcast burned or piled mechanically or by hand, and piles burned.

### **Reforestation**

Reforestation would be implemented on approximately 12,200 acres within the project area following salvage, fuel treatments, and site preparation. Prior to planting, concentrations of activity-generated fuels and sub-merchantable trees would be removed to facilitate reforestation, help protect planted trees once they become established, and reduce the risk of a possible reburn.

Site preparation would include a variety of treatment methods that include machine or hand cutting and piling followed by pile burning, mastication of fire killed shrub stems, and/or broadcast burning. In addition, sprouting shrubs and vegetation may need to be treated adjacent to planted trees to reduce competition for site resources in order to assure establishment. This may be done through manual or mechanical cutting methods such as grubbing, mastication, or use of brush cutters. Ripping may be done prior to planting. Reforestation would need to occur within two years to increase the probability of survival of the planted trees with the competing brush.

Tree planting strategies would be implemented to comply with Region 5 Stocking Guidelines over time. These guidelines define future minimum and recommended stocking levels by forest type and site class, ranging from 75 to 300 trees per acre. Lower quality sites would have lower stocking levels than higher quality sites, contributing to a heterogeneous forest structure across the landscape. Planted tree species would represent the historical tree community for each site. This mixture of tree species would include Jeffrey, ponderosa, or sugar pines, as well as Douglas fir, and incense cedar. Only native tree species grown from locally adapted seed sources would be planted.

Planting strategies proposed for reforestation include conventional planting, founder stands, cluster planting, and natural regeneration. Reforestation strategies are based upon the primary objectives for the landbase. On the T (timber emphasis) and K (timber emphasis on rocky ground) designated management prescriptions, the objective would be to create conditions of a fully stocked stand. On A and B (range-wildlife emphasis) designated management prescriptions the growth and production of timber is a lesser objective. Reforestation objectives on A and B areas would be to maintain a tree component on the landscape. Natural regeneration is a reforestation strategy that would be used in areas where live trees remain on site or in the

adjacent areas, in areas dominated by montane chaparral or juniper, in areas that are economically or technically infeasible, and in retention islands.

Reforestation strategies include considerations for vegetative diversity where it exists within the project area. Since no reforestation would occur in retention areas, once the snags fall, these areas would temporarily function as openings within a re-forested conifer-dominated landscape. Hardwood trees would be encouraged and promoted.

In conifer plantations, survival examinations would occur at one year and three years after planting. Planted units would be assessed for seedling survival and whether competing vegetation may need to be treated. The proposed action includes at least one release treatment using manual or mechanical methods such as hand grubbing, mastication, or brush cutting to control competing vegetation within one to three years and a second treatment conducted within two to five years of planting. Planted sites would be certified of establishment five years after planting. Animal control actions such as protective barriers or trapping may be used.

### **Managing Road Infrastructure**

Where possible, the existing forest transportation system roads would be used to provide access to proposed treatment areas. Road maintenance, including surface protection and erosion control, would be performed on portions of system roads as needed for project implementation. A dust abatement plan would be included to control wind-caused erosion from road use. National Forest System (NFS) roads and non-paved county roads used for haul would receive pre-, during-, and post-haul maintenance.

Approximately 2.2 miles of non-system roads within the project area would be needed for project implementation (salvage, fuel treatments, and reforestation) and long-term future management. These non-system roads would be added to the Forest transportation system as maintenance level 2 roads. Temporary roads may be constructed to access proposed treatment areas. Following project implementation, these roads would be decommissioned. All water sources proposed for use in this project for dust abatement meet best management practice (BMP) standards. The following water sources would be used for dust abatement:

- Halls Flat (T33N R6E, N ½ sec. 1) and
- Bidwell Pond (T34N R4E, S ½ sec. 1).

### **Alternative 2 – No Action**

Under the No Action alternative, none of the activities proposed under Alternative 1 would be implemented. The No Action alternative would not preclude activities already approved in this area or activities planned as separate projects. No fuels treatments, site preparation, or reforestation would occur. Current management practices such as road maintenance and fire suppression would continue.

Hazard tree felling could occur along roads currently open to the public as part of road maintenance as per LRMP direction. These hazard trees would be felled and left in place.

### **Alternative 3 – Road Hazard Only**

To respond to concerns raised during public scoping, the Responsible Official has proposed limiting treatment to hazard tree removal (along approximately 129 miles of NFS roads and

approximately 10 miles of the Burlington Northern Santa Fe railway). Commercial sized hazards would be felled and removed along ML2 and higher roads. Sub-merchantable hazards would be felled and left in place or piled and burned. No other site preparation or reforestation would occur along these roads. No other management activities (besides those previously authorized) would occur. The total footprint of treatments on National Forest lands under Alternative 3 would be approximately 4,736 acres. Existing roads used under this alternative would be repaired and maintained.

### Integrated Design Features – Alternative 1 and 3

The following are resource protection measures that are incorporated as part of the Action Alternatives for the project. The following IDFs would be in addition to standards and guidelines from the Forest Plan, as amended. California Best Management Practices would be implemented for the entire project. CA BMPs are described in *Water Quality Management for Forest System Lands in California, Best Management Practices* (2011). They are implementation parameters that would be incorporated into treatments, contracts, or used to guide Forest Service personnel in conducting implementation.

**Table 3. Integrated Design Features**

IDF	Requirement	Alternative	
		1	3
<b>Air Quality</b>		<b>1</b>	<b>3</b>
1.	A dust abatement plan would be developed and implemented. Fugitive dust would be controlled where logging and vegetation management activities with rubber-tired vehicles are operating on haul routes. Water for dust abatement would be trucked-in. A dust palliative may be approved which could include magnesium chloride, calcium chloride, lignin sulfate, or an approved equal. Dust palliatives would not be used within 25 feet of water bodies and seasonal wetlands. Dust palliatives would be stored and mixed outside of RCAs.	x	x
<b>Threatened, Endangered, Forest Service Sensitive (TES) and Special Interest Plant Species</b>		<b>1</b>	<b>3</b>
2.	All known occurrences of <i>Eriastrum tracyi</i> , <i>Hackelia cusickii</i> , <i>Limnanthes floccosa</i> ssp. <i>floccosa</i> , <i>Mimulus pygmaeus</i> , and <i>Thermopsis californica</i> var. <i>argentata</i> (with the exception of LNF occurrences #10 and #29) and low sagebrush plant communities would be protected from project activities through flag-and-avoid methods.	x	x
3.	The <i>Eriastrum tracyi</i> occurrence along road 35N14 located within T35N R6E section 32, in the vicinity of Coble Spring, would not be bladed or scraped during pre-haul maintenance or during project implementation activities.	x	x
4.	Tree planting would not occur within 25 feet of all known occurrences of TES, Special Interest plant species, or low sagebrush plant communities (with the exception of <i>Astragalus inversus</i> , for which no planting buffers would be required).	x	
5.	New occurrences of TES and Special Interest plant species discovered before or during ground-disturbing activities would be protected from project activities through flag-and-avoid methods and no tree planting would occur within 25 feet of these occurrences (with the exception of <i>Astragalus inversus</i> , for which no special protections would be required).	x	x
<b>Invasive Plants</b>		<b>1</b>	<b>3</b>
6.	Staging of equipment would be done in weed free areas.	x	x

7.	Known invasive plant infestations would be identified, flagged where possible, and mapped for this project. Locations would be displayed on contract maps. Identified invasive plant sites within or adjacent to the project area containing isolated patches with small plant numbers would be treated (hand pulled or dug) by forest botany staff prior to project implementation. Any larger or unpullable infestations would be avoided by harvesting equipment, or equipment used would be washed on site before leaving the infested area and entering un-infested areas to prevent spreading invasive plants within the project area.	x	x
8.	New small infestations identified during project implementation would be evaluated and treated according to the species present and project constraints and avoided by project activities. If larger infestations are identified during implementation, they would be isolated and avoided by equipment, or equipment used would be washed on site before leaving the infested area and entering un-infested areas.	x	x
9.	Hazard trees would be hand felled and left in place where they occur within invasive plant infestations.	x	x
10.	Post-project monitoring for implementation and effectiveness of invasive plant treatments and control of new infestations would be conducted as soon as possible and for a period of multiple years following project completion.	x	x
11.	If project implementation calls for mulches or fill, they would be certified weed-free. Seed mixes used for re-vegetation of disturbed sites would consist of locally adapted native plant materials to the extent practicable.	x	x

<b>Cultural Resources</b>		<b>1</b>	<b>3</b>
12.	Class I (eligible properties) and Class II (potentially eligible properties) historic properties within or adjacent to treatment areas, activity areas (i.e., landings, water sources etc.), or access roads would have their boundaries flagged and tagged as non-entry zones for all project activities. No project-related activities shall occur within site boundaries.	x	x
13.	Class I and Class II historic properties located within the project area but not in close proximity to identified treatment areas shall be protected from indirect project impacts such as use of sites for staging equipment or vehicles (i.e., timber harvest equipment; water trucks; road construction, reconstruction or maintenance equipment; Forest Service vehicles etc.) or any other activities. A Forest Service project manager would be apprised of all site locations to insure protection from direct as well as indirect effects; permanent tags shall define the site boundary.	x	x
14.	Linear sites such as historic roads, ditches, or communication lines may be crossed on a limited basis in previously disturbed areas. All crossings would be made perpendicular to the site, and the site would be returned to its original design at project completion. All crossings would be designated by heritage personnel.	x	x
15.	Hauling on NFS roads that bisect historic properties would continue. Vehicles and equipment using these roads must stay on the road prism in areas that bisect historic properties. New road construction, reconstruction, decommissioning, or modification of the existing prism within site boundaries would not occur without additional review and/or consultation.	x	x
16.	Forest system spur roads and non-system roads that bisect archaeological sites shall not be used except under the following circumstances: heritage properties have been evaluated and determined ineligible for the NHRP, or protective material is placed on roadbed in sufficient quantity to protect surface of site from disturbance.	x	x
17.	Hand piles will not be constructed or burned within the boundaries of historic properties unless locations (e.g., a previously disturbed area) have been specifically approved by the Historic Program Managers (HPM) or qualified Heritage Program staff.	x	x
18.	Felling and removal of hazard trees within historic properties may occur under the following conditions: <ul style="list-style-type: none"> <li>• Trees may be limbed or topped to prevent soil gouging during felling;</li> <li>• Felled trees may be removed using only the following techniques: hand bucking, including use of chain saws and hand carrying, rubber tired loader, crane/self-loader, helicopter, or other non-disturbing, HPM-approved methods;</li> <li>• Equipment operators shall be briefed on the need to reduce ground disturbances (e.g., minimizing turns);</li> <li>• No skidding or tracked equipment shall be allowed within historic property boundaries.</li> </ul>	x	x
19.	Tree planting by hand following a wildfire may occur within a historic property when a low impact method is used (e.g., planting bar; no mechanical auger), and where heritage personnel have determined that such activities would not affect the integrity of historic properties.	x	
20.	If cultural resources are identified during project implementation (unanticipated discovery) all work would cease immediately in that area until the situation is reviewed and an assessment and mitigation plan instituted to insure protection of the site.	x	

<b>Fuels</b>		<b>1</b>	<b>3</b>
21.	Fire lines would be constructed for prescribed fire operations, except where existing roads, skid trails, or natural barriers would serve as control lines. Hand lines would not be constructed within RCAs and wet meadow areas where graminoid and forb indicator species of a wet site are present.	x	x
22.	Pile burning and ignition for underburning would not occur within 25 feet of low sagebrush plant communities or dry meadow areas; or where graminoid and forb indicator species of a wet site are present; however, low intensity fire would be allowed to back into portions of these areas.	x	x
23.	Post treatment, activity generated fuels would be treated to reduce fuel loading to five to seven tons per acre.	x	x
<b>Range</b>		<b>1</b>	<b>3</b>
24.	Livestock grazing would be deferred within the fire perimeter until desired vegetative conditions are established. Desired vegetative conditions means all rangelands are in satisfactory or better ecological condition with stable or upward trends.	x	x
25.	Fences damaged during the fire and necessary to control cattle from entering the fire perimeter would be repaired prior to returning grazing animals to the allotments.	x	x
26.	Exclosure fences damaged during the fire would be repaired prior to livestock returning to the allotments.	x	x
<b>Recreation and Visual Quality</b>		<b>1</b>	<b>3</b>
27.	The Lassen Backcountry Byway would be protected during operations <ul style="list-style-type: none"> <li>• Informational signs would be posted in advance of project implementation.</li> <li>• Cut tree marking would be applied within 150 feet of the Byway in areas where residual green trees are greater than 50 percent.</li> <li>• Operations-created slash within 50 feet of the Byway would be piled, and piles burned or removed within one-year post treatment. In areas where residual green trees are greater than fifty percent, piles would be located a minimum of 50 feet from the edge of the Byway.</li> <li>• In salvage units, trees removed within 50 feet on either side of the Byway would leave a maximum eight-inch stump.</li> <li>• Equipment crossings of the Byway would be limited to designated crossings. The trail tread would be restored at crossings.</li> </ul>	x	x
28.	Within areas with the recreational opportunity spectrum (ROS) designation of semi-primitive, non-motorized (SPNM), impacts of mechanical treatment would be minimized.	x	x
29.	In areas of high recreational use, some vegetation, where available, would be left along the edge of trails and roads. Residual vegetation can act as a visual barrier to discourage future unauthorized routes.	x	x
<b>Riparian Conservation Areas</b>		<b>1</b>	<b>3</b>
Table 4 identifies the waterbodies and features specific to the Bald Fire Salvage project area and RCA widths allocated along these areas in accordance with the 2004 SNFPA ROD.			

Table 4. RCA Widths		
RCA Type	RCA Width	Project Feature
Perennial Streams	300 feet (each side of stream), measured from bank- full edge of stream	Beaver Creek
Seasonally Flowing Streams (includes ephemerals with defined stream channel and evidence of scour)	150 feet (each side of stream), measured from bank- full edge of stream	Scattered throughout the project area
Streams in Inner Gorge (slopes > 70% gradient)	The top of the inner gorge	Beaver Creek Gorge
Special Aquatic Features (includes wet meadows, wetlands, and springs)	300 feet from edge of feature or riparian vegetation, whichever width is greater	Scattered in the project area including Sheep Flat, Beaver Creek Wetlands, Gibbs Spring, Negro Camp Spring, Coble Spring, etc.

30.	Treatments are proposed within the RCAs. Table 5 lists the site-specific design features (*Roadside hazard tree removal is exempt from these design features)	x	x
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Table 5. Site-specific Design Features and Snag Retention Guidelines*		
Project Water Feature	Site-specific Design Features	Snag Retention w/in the RCA
Main stem of Beaver Creek	No treatment would occur within the RCA (as defined in Table 4) with the exception of limited hand treatments of fuels in a sensitive area (approx. 14 acres), the area adjacent to fences that require repair, and possibly small patches of site prep prior to planting native riparian vegetation (if monitoring deems artificial regeneration necessary)	No additional requirements
Tributaries to Beaver Creek	No treatment would occur within the inner 25 feet of the RCA	Retain 8-10 snags per 100 linear feet in the larger size classes
Sheep Flat spring and meadow	No treatment within the first 25 feet of the high water mark or indicator of riparian vegetation	No additional requirements
Negro Camp springs, reservoir, and wetlands Ephemeral/ Intermittent drainages in the Negro Camp Gulch, Bald and Lower Beaver Creek Watersheds. Special Aquatic Features (not listed above)	No mechanical treatment within the inner 25 feet of the RCA: <ul style="list-style-type: none"> <li>• Machinery may reach in</li> <li>• Hand treatment of fuels may occur</li> </ul>	Retain 8-10 snags per 100 linear feet in the larger size classes

31.	<p>When mechanical operations occur within the RCA the following IDFs would be implemented:</p> <ul style="list-style-type: none"> <li>a. Soils must be dry at 10-inches deep before equipment could be operated.</li> <li>b. Use of existing landings would be limited to the outer 50 feet and would be agreed to and designated on the ground prior to use. New landings would not be constructed.</li> <li>c. Conifers would be harvested with feller-bunchers. Track widths would be 24-inches or greater.</li> <li>d. Turning of equipment would be minimized.</li> <li>e. Where extant, conifers necessary for stream bank stability would be retained.</li> <li>f. Ground-based equipment would be kept off areas with slopes greater than 20 percent.</li> <li>g. When no longer needed, skid trails would be covered with 90 percent ground cover. Slash, mulch, straw, etc. would be used.</li> <li>h. Biomass removal, grapple piling, handwork, mastication, and prescribed fire would be the only permitted fuel reduction techniques.</li> <li>i. Stream crossings would be limited to ephemeral and/or intermittent channels and designated prior to implementation. <ul style="list-style-type: none"> <li>(1) Crossings would be perpendicular to the channel.</li> <li>(2) When there is loose soil that is likely to be displaced, erosion control measures, such as wattles, silt fences, or a functional equivalent would be deployed down channel from the crossing. When the need is passed, they and any backed up material would be removed.</li> <li>(3) At the conclusion of activities, the channel would be remediated, with the flow path restored and any detrimental soil disturbance corrected.</li> </ul> </li> <li>j. Temporary roads would not be constructed within RCAs.</li> </ul>	x	
32.	When prescribed fire operations occur within proximity to the RCA, prescribed fire could be backed into the RCA.	x	
33.	For aquatic features in hazard tree units, ground based mechanical equipment would be restricted to the road prism. Trees would be felled onto the road and skidded to the nearest landing. When hazard trees cannot be felled onto the road they would be felled parallel to the contour of the slope and left in place.	x	
<b>Silviculture</b>		<b>1</b>	<b>3</b>
34.	Black oak, aspen, and other hardwoods, alive or dead, would be retained and protected within treatment units within the limits of safety and operability.	x	x
35.	Conifers would not be planted within 20 feet of live California black oak and white oak tree crowns, including sprouts greater than three feet tall.	x	
36.	Conifers would not be planted within 150 feet of aspen and cottonwood communities on the east, south, and west side of the stand or 100 feet on the north side to maximize light to the stand and allow for expansion. Where browsing inhibits recruitment of regenerating aspen and cottenwoods, fencing would be constructed to protect regeneration until suckers and sprouts exceed the browse line.	x	
37.	Along stream channels with existing riparian communities (e.g. willow, alder, sedges, juncus, etc.), reforestation of conifer species would not occur within 20 feet of the riparian plant community.	x	
38.	No conifer planting would occur within 50 feet of a meadow edge. From 50 feet of the meadow edge and out, planting density would increase using the planting strategy and spacing based on the surrounding forest stand condition.	x	
39.	Monitoring of riparian areas within the project area during the growing season of 2015 would be done to determine the amount and effectiveness of natural regeneration. If vegetation regrowth does not appear to be sufficient, hand plantings of willow, aspen, sedges, and/or other appropriate riparian species would be prescribed for follow-up treatment.	x	
40.	All stumps 24 inches in diameter and greater within 200 feet of NFS roads would be treated in all vegetation types except aspen, with Sporax®, Cellu-Treat®, or a similarly	x	x

	registered product, to prevent the spread of annosus root disease. No Sporax or Cellu-Treat would be applied within 25 feet of known Forest Service Sensitive and Special Interest plant species, streamcourses, and/or special aquatic features, shown on the contract map.		
41.	Once ecological conditions have been achieved and livestock are returned to the portion of the allotment within the fire perimeter, management would be adjusted to allow for conifer response following planting. Site-specific changes to grazing management may include but are not limited to deferred grazing, complete rest, temporary fencing, and/or other means for distributing livestock away from planted areas.	x	x
<b>Soils</b>		<b>1</b>	<b>3</b>
42.	In treatment units outside of RCAs, soil moisture conditions would be evaluated using Forest established visual indicators before equipment operations proceed. Lassen National Forest Wet Weather Operations and Wet Weather Haul Agreements would be followed to protect the soil and transportation resources.	x	x
43.	Areal extent of detrimental soil disturbance would not exceed 15 percent of the area dedicated to growing vegetation. Soil porosity would be at least 90 percent of undisturbed conditions.	x	x
44.	Following implementation, the project site would be evaluated by a qualified specialist to determine if detrimentally compacted ground exceeds the LRMP standard of 15 percent areal extent (as required in item 43). If restoration is needed to achieve compliance an appropriate subsoiler, ripper, or other implement would be used to fracture the soil in place leaving it loose and friable. Landings no longer needed for long-term management would be remediated as described. Where landing construction involved cut and fill, the landing would also be re-contoured to match the existing topography.	x	x
45.	To the extent possible, existing landings and skid trails would be utilized.	x	x
46.	Mechanical equipment would not operate on slopes greater than 35 percent.	x	x
47.	A minimum of five logs per acre, representing a range of decomposition classes, would be retained. This may include the three logs retained on the landscape for wildlife habitat.	x	
48.	On slopes greater than 20 percent, in addition to waterbars, slash would be placed on all skid trails to achieve a minimum of 75 percent soil cover (rock, woody debris, vegetation, and litter). On rhyolitic soils, if slash is not available, weed-free straw would be used. Outside of RCAs, retain litter and duff at a minimum of 50 percent. Activity-generated slash would be piled to minimize the amount of soil displaced into burn piles.	x	x
49.	Ripping, if determined necessary as part of site prep for planting, would only occur on T ground outside of RCAs and on non-rhyolitic soils with slopes less than 20 percent	x	
50.	Biomass removal, grapple piling, or mastication would be the only permitted techniques for machine based fuel reduction and site preparation for planting in the following units: 113, 135, 136, 137, 157, 112-157, 506, 507, 806, 807, 810, 811, 815, 818, 819, 820, and 841. Handwork would also be permissible.	x	
<b>Wildlife</b>		<b>1</b>	<b>3</b>
51.	A limited operating period (LOP) would be in effect from February 15 through September 15 within ¼ mile of active northern goshawk PACs unless surveys confirm that northern goshawks are not nesting. Harvest activities may occur in northern goshawk habitat that has been rendered unsuitable as determined by the wildlife biologist and documented within the Biological Evaluation.	x	x
52.	In addition to the overall snag retention, retain large diameter cull trees that may be of use as dens sites by bears or other wildlife.	x	

## V. EXISTING ENVIRONMENT

### Species and Habitat Account - Black Juga (*Juga 'nigrina'*)

Recent analyses on anatomy and genetics has established that the black juga is a composite and as presently understood taxonomically, is restricted in California to the upper Sacramento system (USDA FS PSW 2014a), which includes the upper Sacramento, McCloud, and Pit River systems (Frest and Johannes 1995).

The black juga is an aquatic mollusk occupying perennial stream and spring habitat. General suitable habitat for this species has been identified as perennial streams and springs with prominent channel substrate being comprised of boulders/cobble, gravel, sand, and mud (Brim Box 2002).

Habitat for black juga is threatened by excessive sedimentation resulting from various land management activities including mining, logging, road and railroad grade construction, and grazing (USDA FS PSW 2014a). Increased sedimentation may result in smothering of suitable channel substrate, increased stress and mortality, and impairment of egg-laying or survival of eggs and young. Livestock utilization in close proximity to suitable habitat may result in reduced dissolved oxygen levels and elevated water temperature (Ibid).

Specific life history information on *J. nigrina* is not available (USDA FS PSW 2014a). Studies on *J. silicula*, a closely related stream-dwelling species found on the Coast and low Cascade ranges of Oregon, and other members of the genus to which this species belongs indicate that individuals live for several (5-7) years (ibid). Reproductive maturity is reached in about three years. Dispersal of individuals is typically very low; *J. silicula* generally disperse no more than a few meters during the summer months.

### Species Distribution

#### *Scale of the Lassen National Forest*

According to Brim-Box (2002), the black juga is not restricted to a particular area on the Lassen National Forest and is known from the mainstem and seeps/springs in the Pit River FERC 3 reach and other large rivers, streams, and springs including: Hat Creek, Lost Creek, Deer Creek, Gurnsey Creek, Domingo, Davis Spring, Soldier Creek, Beaver Creek (a tributary to Deer Creek), Antelope Creek, and the North Fork of the Feather River.

#### *Bald Project area and proximity*

Results of aquatic mollusk surveys conducted in Beaver Creek in 2001/2006 (Frest and Johannes 2007), and just upstream of the Bald fire perimeter and Bald Project area, determined the presence of an undescribed species of *Juga* (sites # 36, #37, and #38). Based on communications with Dr. Stephanie Clark (e-mail dated February 6, 2015), the

Juga species collected is in the process of being formally described. Since the species has yet to be described, the best scientific information available at this time indicates the 'nigrina,' like Juga species '9' found in Beaver Creek, should be treated as *Juga nigrina* (e-mail correspondence with S. Clark 2015). As such, the Juga species 9 of Beaver Creek is considered as the black juga (*J. nigrina*) for purposes of this analysis.

For larger context on the distribution of Juga species 9, it is found in the Pit River and small springs and streams flowing into it from above Shasta Lake to about Horse Creek and including the Fall River in Shasta and Lassen Counties (e-mail with S. Clark 2015). Juga species 9 occurs widely in the Pit River and co-occurs with *Juga occata* in the mainstem Pit River (ibid).

### **Potential Distribution of Habitat for the black juga in the Bald Project Area and vicinity**

According to the National Hydrography Dataset (NHD), the perennial reach of Beaver Creek in the vicinity of the project area originates in the Beaver Springs area and flows north to approximately one mile upstream of the forest boundary, after which point, the stream is mapped as an intermittent on the remaining NFS lands. A little over one mile of an intermittent section of Beaver Creek also occurs between perennial reaches within the project area, from approximately ¼ mile downstream of the NFS 22 road crossing to approximately ⅓ mile downstream of the railroad crossing.

For purposes of this analysis, the potential distribution of suitable habitat for the black juga is considered to be approximately 5.1 miles of mainstem perennial reaches of Beaver Creek within the project area and approximately 1.8 miles of mainstem perennial reaches upstream of the project area to Beaver Creek springs, as mapped according to the NHD.

This area is considered as potentially suitable habitat for this species for the following reasons:

- *Juga 'nigrina'* is documented from perennial sites upstream of the project area (Beaver Springs vicinity) .
- A Juga-like, but unconfirmed, mollusk shell was found on Beaver Creek downstream of the railroad grade (T35N, R6E, Sec36) during a brief field reconnaissance on Nov. 12, 2014 (personal observations).
- Beaver Creek may provide suitable habitat conditions for the species as it is a perennial channel and conditions are similar to where the species has been found elsewhere on the forest (e.g. substrate comprised of boulders/cobble, gravel, and sand).
- No detections of any Juga were found in the following waterbodies surveyed in the project area or vicinity including: Coble springs (#32), Negro Camp springs (#33), Gibbs Springs (#34), Mud Springs (#35), and Moonsprings (sites # 29, 30, 31) (Frest and Johannes 2007).

Beaver Creek downstream of NFS road 22, is a low gradient channel (averaging 2% gradient) with substrate composition of cobble, small boulders, gravel, sand, and silt at

varying dominance throughout the stream (USDA FS LNF 1994). When water is present, the habitat types consist mainly of low gradient riffles, runs, shallow glides, and few pools. The stream channel width averages five to eight feet.

Within the Bald Project area, the entire estimated 5.1 miles of perennial Beaver Creek was affected by the fire which consumed all riparian, in channel downed wood and upland vegetation (primarily conifers).

Prior to the Bald Fire, fences controlled livestock use within the Willow Springs allotment. Approximately 1.7 miles of the 5.1 miles of perennial Beaver Creek that was excluded from livestock grazing by fencing was burned in the fire. Upstream of the Bald Project area/fire perimeter, there is approximately 1.5 miles of perennial Beaver Creek within existing livestock exclosures and approximately 0.3 miles of perennial Beaver Creek outside exclosures.



Photo of Beaver Creek taken on November 12, 2014, T35N, R6E, Section 36



Photo of Beaver Creek taken on November 12, 2014, T35N, R6E, Section 36

## **VI. POTENTIAL EFFECTS OF THE PROPOSED ACTION – ALTERNATIVE 1**

The primary action categories proposed in the Bald Project and considered for analysis include proposed vegetation treatments that involve mechanical and/or hand treatments (salvage harvest, fuels treatments, reforestation, and hazard tree removal) and connected actions (such as transportation needs). These are the primary actions addressed as these activities have the greatest potential to create soil disturbance that could lead to increased erosion and sedimentation following precipitation and runoff. In addition to the primary action categories proposed, deferral of livestock grazing (IDF # 24) is also considered in the analysis since implementation of this action affects aquatic features and associated riparian vegetation.

While hazard tree felling adjacent to fences that require future repair is proposed, and small localized site prep might occur (e.g. planting of riparian vegetation if needed), these activities are limited in scope within proximity to the channel and any further analysis would not alter the degree of general effects described and/or the determination; therefore, these actions are not addressed further in the analysis.

Potential effects are categorized as either short term or long term. Short term effects are defined in this analysis as those occurring from approximately zero to five years after project implementation. Long term effects are defined as those occurring approximately five to 20 years or longer after project implementation.

### ***Area of Effect***

Effects of the actions are considered at two general scales: on-site at the scale of Beaver Creek (perennial) and its RCA, its tributaries and their associated RCAs (direct/indirect), plus perennial Beaver Creek/RCA upstream of the project area to Beaver Creek springs (cumulative). The cumulative effects area was selected because it incorporates the known populations and represents the area of primary concern for potential hydrologic connectivity and influences to the aquatic system in the given landscape. There are no (or very limited) private lands within this area of effect so only NFS lands are addressed.

Riparian Conservation Areas were selected as a key indicator for assessing potential effects (e.g., direct and/or indirect) to aquatic biota. This is because RCAs are land allocations adjacent to aquatic features (e.g. 300 feet on both sides of a perennial stream) that serve the purpose of maintaining, protecting, and/or restoring riparian processes important to aquatic and riparian communities, through active and/or passive management of functional processes important to the communities associated with them.

### ***Direct, Indirect, and Cumulative Effects***

Direct Effects: There is no potential for direct effects to black juga from the proposed actions as there are no activities occurring in Beaver Creek proper. There may be potential beneficial effects over the short term from deferral of livestock (IDF #24) as they would not have access to any aquatic areas where the black juga may reside (e.g. the risk of eggs or other life stages of the mollusk being directly affected from trampling would be eliminated).

Indirect Effects:

Indirect effects are caused by the action and are later in time, or further removed in distance, but are still reasonably foreseeable. Changes to riparian vegetation, channel morphology, and/or microhabitat conditions are examples of effects from management activities that can occur to the aquatic environment. These effects can be beneficial or negative and indirectly influence aquatic organism distribution and abundance due to alterations of the habitat.

In general, aquatic habitat can be negatively affected if there is damage to and/or direct loss of riparian vegetation. Riparian vegetation is important for bank stability (channel morphology), providing shade, regulating water temperatures, and providing hiding cover for organisms. Aquatic habitat can also be negatively affected by increased sediment loading from accelerated erosion induced by ground disturbing activities, including livestock trampling of streambanks. Increased sediment loading can reduce habitat available for aquatic organisms by filling in pools. Shallow pools provide less cover than deep pools and limit the available space, particularly during low flow or drought conditions. Increased sediment can also reduce the available space around gravels (embeddedness). When finer material increases in a stream-type water body and 'embeds' around larger material such as gravel, space is reduced, thereby decreasing the quantity and quality of microhabitat for aquatic taxa such as mollusks.

Potential indirect effects to black juga habitat that could occur from the proposed actions that are of concern are limited to changes in sediment production and water surface stream shade (as linked to stream temperature).

Sediment: Sediment levels for optimum habitat for black juga have not been quantified to date. However, sedimentation has been identified as a threat to this species (USDA FS PSW 2014a). Because mechanical ground disturbing activities (primarily salvage and fuels treatments) are proposed within the Upper Beaver Creek subwatershed containing potential habitat for the black juga, the concern is the potential for project generated sediment to enter the mainstem of Beaver Creek, especially over the short term. There is also the potential for a reduction in sediment to Beaver Creek with deferral of livestock grazing along Beaver Creek proper. Overall, the risk of short-term increased sediment production to potential suitable habitat for the black juga from management proposed under the Proposed Action is expected to be low and minimized, for the following reasons:

- No salvage harvest is proposed within the 300 RCA/inner gorge of the mainstem of Beaver Creek (including ~ 5.1 miles total of perennial stream).

- Roadside hazard tree removal may occur along travel segments that intersect the perennial stream/RCA but the action is limited in scope with approximately 26 acres, or 7% of the total estimated 374 acres of the mainstem RCA of Beaver Creek. These RCA treatment acres would be associated with an estimated maximum of 0.34 miles of perennial stream, or 7% of the total perennial miles of Beaver Creek within the project area.
- Within a portion of the mainstem RCA of Beaver Creek, only hand treatment of fuels is proposed and the treatment area is limited in size to approximately 14 acres, or 4% of the total 374 acres of RCA. The lineal distance of the perennial mainstem in proximity to this action would be along a maximum of approximately 0.22 miles of Beaver Creek (or 4% of the total 5.1 perennial stream miles).
- With livestock grazing deferred within the fire perimeter (IDF #24), no livestock grazing would occur on up to 5.1 miles of perennial Beaver Creek, thus eliminating potential sediment being generated from direct disturbance of streambanks recently disturbed by the fire.
- By deferring grazing until desired vegetative conditions are established (e.g. satisfactory or better ecological condition with stable or upward trends; IDF #24) and with reconstruction of enclosure fences, there may be potential short term and possibly long term benefits to streambank conditions with an increase in riparian plant growth and vigor. Improved riparian vegetation would help trap sediment and contribute to streambank building.
- Implementation of salvage and fuels treatments proposed along ephemeral and intermittent tributaries that drain into Beaver Creek would follow Forest Plan standards and guidelines for these activities as well as the following key IDFs, which would minimize the potential for sediment delivery:
  - No treatment would occur within the inner 25 feet of the RCA.
  - Conifers would be harvested with feller-bunchers.
  - Soils must be dry at 10-inches deep before equipment could be operated.
  - When no longer needed, skid trails would be covered with 90 percent ground cover. Slash, mulch, straw, etc. would be used.
  - Use of existing landings would be limited to the outer 50 feet and would be agreed to and designated on the ground prior to use. New landings would not be constructed.
  - Stream crossings (limited to ephemeral and/or intermittent channels) would be perpendicular to the channel, erosion control measures would be implemented where soil is likely to be displaced, and the channel crossings remediated at the conclusion of activities.
  - Temporary roads would not be constructed within RCAs.
- There would be no new construction of permanent road within the project area.
- Of the approximately 0.24 miles of non-system roads proposed to be added to the National Forest Transportation System within the Upper Beaver Creek subwatershed, no physical change (e.g. reconstruction) to the existing road prism would be necessary.

### Water Surface shade:

Stream shade is important in regulating stream temperatures, for reducing summer highs and insulating from extreme cold winter temperatures. The concern is the potential for project activities to influence stream shade which in turn can affect stream temperatures. No change to current water surface shade would be expected because stream shade has been reduced already by the trees that have now died from the effects of the fire. The felling of hazard trees is very limited in scope (approximately 26 acres of perennial RCA) and only minimal hand treatment of fuels (smaller trees up to approximately 14 acres) is proposed in *potential proximity* to the perennial reaches of Beaver Creek (approx. 0.22 miles). Potential beneficial effects to localized water surface stream shade along 5.1 miles of perennial Beaver Creek is possible over the short term and potentially long term from deferral of livestock grazing as increased riparian plant growth and vigor would be expected along Beaver Creek.

### Cumulative Effects:

According to the Council on Environmental Quality NEPA regulations, 'cumulative impact' is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such actions (40 CFR § 1508.7). To understand the contribution of past actions to the cumulative effects of the proposed action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. By looking at current conditions, residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. Thus, past actions are based on current conditions. Potential contributions of the proposed action to cumulative effects are therefore considered along with ongoing and reasonably foreseeable future actions.

As with indirect effects, the greatest potential for cumulative effects would be from increased delivery of sediment, in addition to sediment from past, ongoing, or future land-disturbance activities that could cause an adverse cumulative change to black juba habitat within Beaver Creek. The primary future action associated with perennial Beaver Creek within the project area/fire perimeter and upstream to Beaver Springs is deferral of livestock grazing within the Willow Springs allotment in the near term, but eventual return of livestock grazing (approximately 3.7 miles of stream) and continued exclusion (approximately 3.2 miles of stream total) following reconstruction of enclosure fences within the fire perimeter along Beaver Creek after ecological conditions have been met.

Quantification of sediment levels pre and post fire in Beaver Creek is not available. Some sediment was generated and delivered into Beaver Creek as a consequence of the fire and following precipitation events. The proposed Bald Project (Alt 1), however, is expected to have a low potential for additional incremental negative indirect effects on black juba habitat. This is because the beneficial action of deferring livestock grazing along the mainstem of Beaver Creek (approximately 5.4 total perennial stream miles subjected to the fire effects and/or grazing outside enclosures), including portions of the Beaver Creek springs area where the species occurs, is combined with actions designed to minimize the

risk to potential suitable habitat from short-term increases in sediment from the primary ground disturbing activities (vegetation treatments). The risk of adverse cumulative effects over the short term due to sediment delivery is considered low. Over the long-term, the potential for increased sediment should be minimized with proper implementation of Forest Plan standards and guidelines for grazing in riparian areas once livestock are returned and exclosure fences are in place.

In regards to water surface stream shade, there may be a cumulative and localized beneficial effect along approximately 5.4 miles of potential suitable habitat, including around the Beaver springs populations, with potential for riparian vegetation conditions to improve from deferral of livestock grazing until desired vegetation conditions are met.

## **VII. POTENTIAL EFFECTS OF ALTERNATIVE 2 AND 3**

### ***Direct, Indirect, and Cumulative Effects (Alternative 2 – No Action)***

Direct Effects: There is no potential for direct effects to black juga from Alternative 2 as there are no activities occurring in Beaver Creek proper.

#### Indirect Effects:

*Sediment:* No indirect effects to potential suitable black juga habitat (perennial Beaver Creek) are anticipated from increases in sediment as any felling of hazard trees that *might* occur along roads would be left in place.

*Water surface shade:* Water surface shade would not be affected as shade has been reduced already by the trees that have now died from the effects of the fire and any felling of hazard trees that *might* occur is very limited in scope (up to approximately 26 perennial RCA acres out of 374 perennial RCA acres).

#### Cumulative Effects:

There are no proposed actions in Alternative 2, therefore there are no direct or indirect effects that would result in cumulative effects.

However, there are reasonably foreseeable future actions under Alternative 2 that are related to deferral of livestock grazing within the Willow Springs allotment in the near term (see Range Report 2015). Eventually livestock grazing would return to the allotment (on approximately 3.7 miles of stream) and continue to be excluded (approximately 3.2 miles of stream total) following reconstruction of exclosure fences within the fire perimeter along Beaver Creek after ecological conditions have been met. There may be potential short term and possibly long term benefits to streambank conditions with an increase in riparian plant growth and vigor. Improved riparian vegetation would help trap sediment and contribute to streambank building.

In regards to water surface stream shade, there may be a cumulative and localized beneficial effect along approximately 5.4 miles of potential suitable habitat, including around the Beaver springs populations, with potential for riparian vegetation conditions to improve.

### ***Direct, Indirect and Cumulative Effects (Alternative 3 – Hazard Tree Removal)***

#### Direct Effects:

There is no potential for direct effects to black juga from Alternative 3 as there are no activities occurring in Beaver Creek proper. There may be potential beneficial effects over the short term from deferral of livestock as they would not have access to any aquatic areas where the black juga may reside (e.g. the risk of eggs or other life stages of the mollusk being directly affected from trampling would be eliminated).

#### Indirect Effects:

*Sediment:* There is a slight risk for increasing sediment because hazard trees felled along roads within the perennial Beaver Creek RCAs (approximately 26 acres) would be removed creating ground disturbance that might result in contributions of sediment to Beaver Creek. The risk for increases in sedimentation is much lower than Alternative 1 because no vegetation treatment actions are proposed within the Upper Beaver Creek watershed within the project area, with the exception of limited hazard tree removal and fuels treatments in RCAs associated with roads that cross ephemeral and intermittent channels.

As with Alternative 1, there is also the potential for a reduction in sediment to Beaver Creek over the short term. Deferral of livestock grazing along Beaver Creek proper would eliminate potential sediment from being generated due to direct disturbance of streambanks recently disturbed by the fire. Improved riparian vegetation would help trap sediment and contribute to streambank building.

*Water surface shade:* As with Alternative 1, potential beneficial effects to water surface stream shade along 5.1 miles of perennial Beaver Creek is possible over the short term and potentially long term from deferral of livestock grazing as increased riparian plant growth and vigor would be expected along Beaver Creek where nearstream riparian vegetation was consumed by the fire.

#### Cumulative Effects:

Alternative 3 is expected to have a very low potential for additional incremental negative indirect effects on black juga habitat. This is because the beneficial action of deferring livestock grazing along the mainstem of Beaver Creek (approximately 5.4 total perennial stream miles), including portions of the Beaver Creek springs area where the species occurs, is combined with actions (hazard tree removal and associated fuels treatments)

that are limited in scope (e.g. removal may occur along travel segments that intersect the perennial stream/RCA within approximately 26 acres, or 7% of the total estimated 374 acres of the mainstem RCA of Beaver Creek). Over the long-term, the potential for increased sediment should be minimized with proper implementation of Forest Plan standards and guidelines for grazing in riparian areas once livestock are returned and enclosure fences are in place.

In regards to water surface stream shade, there may be a cumulative and localized beneficial effect along approximately 5.4 miles of potential suitable habitat, including around the Beaver springs populations, with potential for riparian vegetation conditions to improve from deferral of livestock grazing until desired vegetation conditions are met.

## VIII. DETERMINATIONS

The determinations for the TES aquatic species for the Bald Project alternatives are addressed below and presented in Table 2 in Appendix A.

After considering available life history requirements, current conditions, available survey information, and IDFs, it is my determination that implementation of the proposed activities for the Bald Project (Alternative 1) is “may affect individuals, but not likely to trend toward a loss of viability or Federal listing” for the black juga, *Juga nigrina*.

The “may affect” determination is made because the analysis indicates that potential effects (positive and/or negative) to habitat potentially occupied by the black juga, is likely to occur.

The “not likely to trend toward a loss of viability or Federal listing” determination is made because:

- The potential exists for short term increased sediment production to result from the proposed action to potential suitable habitat for the black juga. However, the risk in Beaver Creek is low, due to the design of the proposed actions (e.g. implementation of standards and guidelines, BMPs, IDFs, and limited scope of activities within the perennial RCAs).
- The known occurrences of black juga are upstream and outside of the fire perimeter and proposed project area, thus there is no potential for an effect to these occurrences from vegetation management activities.
- The action of deferred grazing from within the fire perimeter would directly and indirectly benefit habitat recently affected by the fire and where there are known occurrences of black juga upstream since implementation of livestock deferral would be done at the scale of the allotment.
- Considering the findings from mollusk surveys (Brim-Box 2002) and current taxonomy, the black juga appears to be widely distributed across the Lassen National Forest.

The determination for Alternative 3 is also “may affect individuals, but not likely to trend toward a loss of viability or Federal listing” for the black juga, *Juga nigrina*. This is because disturbance within the RCAs from road side hazard tree removal and associated fuels treatments increases the risk for sedimentation into potential suitable habitat. Like Alternative 1, there would also be potential beneficial effects to individuals as well as potential suitable habitat from deferred grazing over the short term.

## APPENDIX A

Table 1. List of readily available survey efforts from within the Bald Project area and/or on adjacent lands and, summary of aquatic species found.

<b>Waterbody Surveyed location (year)</b>	<b>Protocol/Survey Objective(s)</b>	<b>Aquatic Species Detected</b>	<b>Observer/Data Source</b>
Beaver Creek on BLM lands (T36N, R6E Sec 22) downstream of project area (1981)	Fish sampling (electrofishing)	Pike minnow Rainbow trout Pit Sculpin Speckled dace Sacramento Suckers Roach Lamprey ammocetes*	1981 BLM stream survey field form, USDA FS LNF (1994)
Beaver Creek mainstem (1994)	General field reconnaissance to assess existing conditions	No fish observed	USDA FS LNF (1994)
Jelly Springs; Beaver Creek and springs; Coble Springs; Negro Springs; Mud Springs Gibss springs (1993)	Informal Amphibian (Visual Encounter) Surveys (VES), Lassen NF	Pacific (chorus) frog and western toad (One or both species found at various sites noted)	USDA FS LNF (1993)
Moonsprings (sites # 29, 30, 31); Coble springs (#32); Negro Camp springs (#33); Gibbs (#34); Mud (#35). Beaver Creek Springs area (sites #36, 37, 38, 39) (2006 primarily, some in 2001)	Freshwater mollusk surveys	<i>Fluminicola ahjumawi</i> and <i>Juga n. spp</i> @ sites 36, 37, 38  <i>Pisidium insigne</i> @ site 39  <i>Physella gyrina</i> , <i>Fossaria modicella</i> and <i>Pisidium casertanum</i> @ site 32	Frest and Johannes (2007) Hershler et al. (2007)

\*Pit Brook lamprey, *Entosphenus lethophagus*, is the species of lamprey in Beaver Creek as no other taxa occur above Shasta Dam (e-mail comm. S. Reid 2014)

Table 2. Aquatic Threatened, Endangered, or Sensitive (TES) species considered for the Bald Project and species determinations.

Species (Listing Status)	Species or Potential Suitable Habitat Present and/or potentially affected (Yes/No)	Rationale for level of species analysis and species determinations	Species Determinations for the Bald Project Alt. 1 and 3
Black juga ( <i>Juga nigrina</i> *) (S)	Yes	Black juga, as presently understood taxonomically, occur in Beaver Creek in proximity to the Bald Project area.	“may affect individuals, but not likely to trend toward a loss of viability or Federal listing”
Nugget pebblesnail ( <i>Fluminicola seminalis</i> ) (S)	No	Project area lacks suitable habitat for species: large creeks and rivers with cool, clear flowing water and gravel-cobble substrate. Various springs in the project area and vicinity (Gibbs, Negro, Coble, Mud, Beaver) have been surveyed for mollusks and this species was not found (Frest and Johannes 2007). <i>Fluminicola</i> ssp found in Upper Beaver Creek, identified as <i>F. Ahjumawi</i> (Hershler et al. 2007).	No effect
California floater ( <i>Anodonta californiensis</i> ) (S)	No	Project area lacks suitable habitat for species: "lakes and slow rivers" (Taylor 1981), "generally on soft substrates (mud-sand), in fairly large streams and lakes only, in relatively slow current; a low elevation species" (Frest and Johannes 1995).	No effect
Great Basin ramshorn ( <i>Helisoma newberryi newberryi</i> ) (S)	No	Project area lacks suitable habitat for species: larger lakes, large, slower rivers, large spring sources and springfed creeks; with cold, highly oxygenated water, mud substrate, and slow water velocities (Taylor 1981; Frest and Johannes 1993).	No effect
Montane peaclam ( <i>Pisidium ultramontanum</i> ) (S)	No	Project area lacks suitable habitat for species: larger, perenial water bodies, slow spring-influenced rivers, streams, lakes and spring pools with sand or gravel substrate (Taylor 1981; Frest and Johannes 1993;1995).	No effect
Scalloped juga ( <i>Juga occata</i> ) (S)	No	Project area lacks suitable habitat for species: large rivers at low elevations, with swift, unpolluted, cold, well-oxygenated waters with cobble/boulder substrates (Frest and Johannes 1993; 1995).	No effect
Topaz juga ( <i>Juga acutifilosa</i> ) (S)	No	Various springs in the project area and vicinity (Gibbs, Negro, Coble, Mud, Beaver) have been surveyed for mollusks and this species was not found (Frest and Johannes 2007).	No effect
Kneecap lanx ( <i>Lanx patelloides</i> ) (S)	No	<i>Lanx patelloides</i> is found in fast flowing, cold, well-oxygenated water on cobble and boulder substrates in large streams and sometimes in large limnocrenes (i.e. large, spring-fed pools, with or without outlets) (USDA FS PSW 2014a). These habitat types are not found within the project area.	No effect
Cascades frog ( <i>Rana cascadae</i> ) (S)	No	The geographic range of the species is outside the project area (USDA FS PSW 2014b; Fellers et al. 2008).	No effect
Foothill yellow-legged frog ( <i>Rana boylei</i> ) (S)	No	The geographic range of the species is outside the project area (Koo et al. 2004).	No effect
Eagle Lake Rainbow trout ( <i>Oncorhynchus mykiss aquilarum</i> ) (S)	No	The geographic range of the species is outside the project area. The Eagle Lake rainbow trout is endemic to the Eagle Basin (Moyle 2002).	No effect

Hardhead ( <i>Mylopharodon conocephalus</i> ) (S)	No	The geographic range of the species' is outside the project area. Project area lacks suitable habitat for species: large low- to mid-elevation drainages to the Sacramento River (Moyle 2002).	No effect
Goose Lake redband trout ( <i>Oncorhynchus mykiss</i> ) (S)	No	A population exists in Davis Creek on the LNF, east of the project area. No extant populations occur in Beaver Creek (UCD CWS 2011). Project area does not provide potential suitable habitat for this species.	No effect
Pacific lamprey (S)	No	The geographic range of the species is outside the project area (Reid 2014).	No effect
Sierra Nevada yellow-legged frog ( <i>Rana sierrae</i> ) (FE)	No	The geographic range of the species is outside the project area (USDI FWS 2014).	No effect
California red-legged frog ( <i>Rana aurora draytonii</i> ) (FT)	No	The geographic range of the species is outside the project area. (USDI FWS 2002).	No effect
Shasta crayfish ( <i>Pacifastacus fortis</i> ) (FE)	No	The geographic range of the species is outside the project area (USDI FWS 1998).	No effect
Central Valley Spring-run chinook salmon (FT); California Central Valley Steelhead (FT); winter-run chinook salmon (FE)	No	The geographic ranges of the species are outside the project area (Moyle 2002).	No effect
Delta Smelt (FT), Conservation fairy shrimp (FE), vernal pool fairy shrimp (FT), vernal pool tadpole shrimp (FE)	No	The geographic ranges of the species are outside the project area (Moyle 2002; USDI FWS 1994; Rogers 2001).	No effect

Note: FT = Federally listed under the Endangered Species Act as Threatened, FE = Federally listed under the Endangered Species Act as Endangered, and S = Pacific Southwest Region Forest Service Sensitive Species.

For the Federally listed species that have designated critical habitat (DCH), there is no DCH in the project area and/or downstream; thus, there would be no effect to any DCH.

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