

United States Department of the Interior

BUREAU OF LAND MANAGEMENT MEDFORD DISTRICT OFFICE 3040 Biddle Road Medford, Oregon 97504 email address: or110mb@or.blm.gov



IN REPLY REFER TO:

JUN 07 2007

Dear Interested Public:

The attached *Environmental Assessment* (EA) for the Star Gulch Aquatic Habitat Restoration Project is being advertised in the Medford's *Mail Tribune* newspaper for a 15-day public review period.

The Ashland Resource Area of the Medford District Bureau of Land Management (BLM) proposes to improve fish and aquatic habitat by adding large wood to Star Gulch and Lightning Gulch. I am confident this project will lead to enhanced survival of juvenile fish and increase spawning opportunities for adult fish.

We welcome your comments on the content of the EA. We are particularly interested in comments that address one or more of the following: (1) new information that would affect the analysis, (2) information or evidence of flawed or incomplete analysis; (3) BLM's determination that there are no significant impacts associated with the proposed action beyond those impacts addressed in the *Medford District Proposed Resource Management Plan/ Environmental Impact Statement*, and (4) alternatives to the Proposed Action that would respond to purpose and need. Specific comments are the most useful.

Comments, including names and addresses, will be available for public review. Individual respondents may request confidentiality. If you wish to withhold your name and/or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law but we cannot guarantee anonymity. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety.

All comments should be made in writing and mailed to Edward Reilly, Ashland Resource Area, 3040 Biddle Road, Medford, OR 97504. Any questions should be directed to the Ashland Planning Department at (541) 618-2497.

Sincerely.

John Gerritsma Field Manager Ashland Resource Area

1 Attachment:

- Environmental Assessment (EA) for the Star Gulch Aquatic Habitat Restoration Project (28 pp)

U. S. DEPARTMENT OF THE INTERIOR BUREAU OF LAND MANAGEMENT MEDFORD DISTRICT ASHLAND RESOURCE AREA

ENVIRONMENTAL ASSESSMENT

FOR

STAR GULCH AQUATIC HABITAT RESTORATION PROJECT

June, 2007

EA COVER SHEET

Resource Area: Ashland

EA Number: OR-116-07-05

Action/Title: Star Gulch Aquatic Habitat Restoration

Location:T39S R3W Section 19, 28 & 29; T39 4W Section 10,13,14, 15 & 24 Willamette Meridian, Jackson County, Oregon.

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Chapter 1: Purpose of and Need for the Proposed Action

I. Introduction

This Environmental Assessment (EA) will analyze the impacts of a proposal by the Ashland Resource Area, Medford District, Bureau of Land Management (BLM) to install fish habitat improvement structures in Star Gulch. The EA will provide the Ashland Resource Area Field Manager with the information needed to determine if impacts are within those anticipated in the Medford District Proposed Management Plan/Environmental Impact Statement and whether a Finding of No Additional Significant Impact (FONASI) is appropriate.

II. What is the BLM Proposing and Where?

The BLM is proposing to place large wood structures made from natural logs in specified locations within the stream channel of Star Gulch and Lightning Gulch. This project would be completed by October, 2008. Restoration sites were selected based on (1) stream reach fish habitat deficiencies (2) mechanical feasibility of improving habitat and (3) resource sensitivity (ie. Special Status Plants and archeological sites). The proposed project planning area is located in the Star Gulch drainage, within the Applegate watershed on lands administered by the Ashland Resource Area, Medford District, BLM (See maps in appendix). The project area consists of 30 restoration sites within Star Gulch, Lightning Gulch and the wood source areas.

III. Objectives for the Proposal

This project would improve fish habitat conditions on 4.2 miles of Star Gulch and 0.3 miles of Lightning Gulch (a tributary to Star Gulch). This restoration project is in conformance with the Medford District Resource Management Plan/ Record of Decision (RMP/ROD) (p. 31). The RMP/ROD (p. 31) direction is to "design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of Aquatic Conservation Strategy and Riparian Reserve objectives." Current fish habitat conditions in the Star Gulch watershed are limited due to deficiencies in large wood and a lack of pools. Large wood performs a variety of functions in streams including creating spawning and rearing habitat, increases nutrient and organic matter retention, and provides refuge from predators and cover during high winter flows (Beschta 1979).

IV. Decision Factors

In choosing the alternative that best meets project objectives and other management needs, the BLM will consider the extent to which each alternative would improve habitat conditions for salmonids.

A. Conformance with Land Use Plans and Other Documents

The proposed project is designed to conform with and is tiered to the *Medford District Record of Decision and Resource Management Plan* (RMP) and by the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines* (USDI, USDA 2001). The 1995 Medford District Resource Management Plan incorporated the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and the Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (Northwest Forest Plan) (USDA and USDI 1994).

The Medford District is aware of the following:

1. Ongoing litigation Pacific Coast Federation of Fishermen's Associations et al. v. National Marine Fisheries Service et al. (W.D. Wash.) related to the 2004 supplemental environmental impact statement for the Aquatic Conservation Strategy (ACS). The Magistrate Judge issued findings and recommendations to the court on March 29, 2006. The court has made no final ruling based on these findings and recommendations and thus has not found this amendment to be "illegal," nor did the Magistrate recommend such a finding. Given the court has not yet adopted the findings and recommendations; we will appropriately continue to refer to the current direction as amended in the 2004 ROD, until ordered otherwise. The environmental analysis completed for the Birdseye Project EA tiers to this document as the clarification of how to address the ACS. Since it was only a clarification, and did not alter any of the on-the-ground components of the standards and guidelines designed for achieving the ACS objectives, whether the court upholds the amendment or not should have no practical effect at the project level. In litigation over the Pickett Snake timber sale, the U.S. District Court of Oregon upheld the agency's interpretation of the appropriate use of the ACS objectives, even without the clarifying amendment. See Klamath Siskiyou Wildlands Center v. BLM (D. Or.).

2. The August 1, 2005, U.S. District Court order in <u>Northwest Ecosystem Alliance et al.</u> <u>v. Rey et al.</u> which found portions of the *Final Supplemental Environmental Impact Statement to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines* (January, 2004) (EIS) inadequate. Subsequently in that case, on January 9, 2006, the Court ordered:

- set aside the 2004 Record of Decision *To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern spotted Owl* (March, 2004) (2004 ROD) and
- reinstate the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines (January, 2001) (2001 ROD), including any amendments or modifications in effect as of March 21, 2004.

3. The November 6, 2006, Ninth Circuit Court opinion in <u>Klamath-Siskiyou Wildlands</u> <u>Center et al. v. Boody et al.</u>, No. 06-35214 (CV 03-3124, District of Oregon). The court held that the 2001 and 2003 Annual Species Reviews (ASRs) regarding the red tree vole are invalid under the Federal Land Policy and Management Act (FLPMA) and National Environmental Policy Act (NEPA) and concluded that the BLM's Cow Catcher and Cotton Snake timber sales violate federal law.

This court opinion is specifically directed toward the two sales challenged in this lawsuit. The BLM anticipates the case to be remanded to the District Court for an order granting relief in regard to those two sales. At this time, the ASR process itself has not been invalidated, nor have all the changes made by the 2001-2003 ASR processes been vacated or withdrawn, nor have species been reinstated to the Survey and Manage program, except for the red tree vole. The Court has not yet specified what relief, such as an injunction, will be ordered in regard to the Ninth Circuit Court opinion. Injunctions for NEPA violations are common but not automatic.

B. Relationship to Statutes, Regulations, and Other Plans

This project is covered under the August 15, 1997 Biological Opinion issued by the National Marine Fisheries Service (NMFS) for Ongoing Programmatic Activities within Riparian Reserves. The project is within the scope of the category of "fish habitat restoration and project construction/maintenance." Other Relationships to statutes, regulations and other plans include:

- Oregon and California Lands Act of 1937 (O&C Act). Requires the BLM to manage O&C lands for permanent forest production. Timber shall be sold, cut, and removed in accordance with sustained-yield principles for the purpose of providing for a permanent source of timber supply, protecting watersheds, regulating stream flow, contributing to the economic stability of local communities and industries, and providing recreational facilities.
- Federal Land Policy and Management Act of 1976 (FLPMA). Defines BLM's organization and provides the basic policy guidance for BLM's management of public lands.
- National Environmental Policy Act of 1969 (NEPA). Requires the preparation of environmental impact statements for major Federal actions which may have a significant effect on the environment.
- Endangered Species Act of 1973 (ESA). Directs Federal agencies to ensure their actions do not jeopardize species listed as "threatened and endangered" or adversely modify designated critical habitat for these listed species.
- Clean Air Act of 1990 (CAA). Provides the principal framework for national, state, and local efforts to protect air quality.
- Archaeological Resources Protection Act of 1979 (ARPA). Protects archaeological resources and sites on federally-administered lands. Imposes criminal and civil penalties for removing archaeological items from federal lands without a permit.
- Safe Drinking Water Act (SDWA) of 1974 (as amended in 1986 and 1996). Protects public health by regulating the Nation's public drinking water supply.

• Clean Water Act of 1987 (CWA). Establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water

V. What are the Relevant Issues?

A. Scoping

The Oregon Department of Fish and Wildlife, Oregon Division of State Lands, and U.S. Army Corp of Engineers were involved with the project review. This proposal was not scoped, nor was the public involved in its development.

B. Relevant Issues

1. Aquatic Systems:

Star Gulch has a low salmonid fresh water survival rate because of limited quality aquatic habitat. The short-term and long-term effects on aquatic habitat and salmonid freshwater survival of no treatment and treating the area by adding large wood were assessed.

2. T&E/Sensitive Wildlife Species

Surveys have been completed and no T&E species have been found within the area.

3. Special Status Animal Species

Special status animal species are located in the proposed area.

4. Cultural Resources

Surveys have been completed. Historic mining tailings and ditches are located along the riparian area of Star Gulch.

5. Sensitive Plants

Surveys have been completed. Special status plants are located in Star Gulch.

C. Issues Considered but Eliminated from Further Analysis

Issues were discussed during the ID Team meetings for these proposals (see Chapter V for a list of preparers). After discussing the issues, the ID Team determined that while these issues and concerns were real, many were outside the scope of the EA and others were not major issues that would affect the human environment for this proposal.

1)Transportation System

2) Visual Resources Management (VRM): Project meets ROD/RMP VRM standards.

3) Air Quality

VI. Decisions to be Made Based on the Analysis

This Environmental Assessment will provide the information needed for the authorized officer, the Ashland Resource Area Field Manager, to render a decision regarding the selection of a course of action to be implemented for the Star Gulch Aquatic Habitat Restoration Project. The Ashland Resource Area Field Manager must decide whether to implement the Proposed Action as designed or whether to select the no-action alternative. In choosing the alternative that best meets the project purpose and need, the Field Manager will consider the extent to which each alternative responds to the purposes identified for this project. The forthcoming decision will document the authorized officer's rationale for selecting a course of action based on the effects documented in the EA, and the extent to which each alternative:

- 1. Address the balance between positive and negative environmental effects;
- 2. Addresses the costs both short-term and long-term for managing the lands in the project area (project must be economically practical);
- 3. Maintains aquatic habitat for recovery of at risk stocks of fish;
- 4. Maintains and improves water quality within streams located in Star Gulch;
- 5. Maintains both short term and long term habitat for special status plant and animal species;

The decision will also include a determination whether or not the impacts of the proposed action are significant to the human environment. If the impacts are determined to be within those impacts analyzed and disclosed in the Medford District Resource Management Plan/EIS (USDI 1995) and the Northwest Forest Plan (USDA/USDI 1994), or otherwise determined to be insignificant, a Finding of No Additional Significant Impact (FONASI) can be issued and a decision implemented. If this EA determines that the significance of impacts are unknown or greater than those previously analyzed and disclosed in the RMP/EIS and the NWFP SEIS, then a project specific EIS must be prepared.

Chapter 2: What are the Alternative Ways of Accomplishing the Objectives?

I. Introduction

In this chapter you will find a description of the No Action Alternative and the Action Alternative. The project ID Team developed one action alternative to achieve the project objectives of improving aquatic habitat conditions in Star Gulch. The Applegate-Star/Boaz WA provided essential information used in the analysis.

II. Alternative 1 – No Action

Analysis of this alternative provides a baseline against which the effects of the action alternatives can be compared. For this EA, the No Action Alternative is defined as not implementing the aquatic restoration project.

III. Alternative 2

Using a mobile yarder, 27 wood structures would be constructed in Star Gulch and 3 in Lightning Gulch. Each structure would consist of four to six natural log wood pieces. The structures would be wedged between standing live trees along the banks in order to reduce the chance of movement during high flows. All wood pieces would be at least 2x bankfull width (~ 40 feet in length) (ODFW and ODF standards 1995). Each structure will have at least one log with a root wad attached to further increase within channel stability. Structures would simulate debris jams, recreating the watershed's historical salmonid condition. All areas disturbed by project activities would be seeded with native grass and mulched.

The wood sources are beetle killed roadside hazard trees (57), beetle killed riparian trees (13) and live trees (27) from an upland commercial thinning stand. Many of these trees will provide more than one wood piece for the project. Wood sources are located within the Star Gulch watershed (See Maps). A total of 70 trees/snags would be cut and a total of 27 trees would be pulled over with a cable yarder in a manner to keep the root wads attached (Table 1). All trees proposed for use would be within 200 feet of the road. Wood pieces would be dragged to the road with a cable yarder, loaded and hauled to restoration sites with a self loader and placed in the creek with the cable yarder.

Of the 57 roadside hazard trees identified, 49 dead snags are near the main Star Gulch Road and 8 snags are in a dispersed camping area near the mouth of Benson Gulch. The snags would be felled, yarded to a self-loader, and transported to the restoration sites. The snags are within 200 feet of the road. At least four snags per acre would be left on-site for wildlife snag retention needs. Disturbed areas would be seeded and mulch.

A total of 13 dead riparian trees would be pulled over into Star Gulch with a cable yarder. Many of these trees are hazard trees leaning away from the creek and towards Star Gulch road. Pulling the trees over will emulate the condition that occur when a tree is blown over in a wind storm. Disturbed areas would be seeded and mulched. A minimum of 4 snags per acre would be left standing in the project area.

Twenty seven (27) live trees would be harvested from a 3 acre unit in T39-4W section 10. This unit was originally proposed as part of the Deadman's Palm Timber Sale but was later dropped for low economic value. Fourteen of these trees would be pulled over with root wads attached, cable yarded to the road, loaded on to a self-loader, and transported to the restoration sites. These trees would all be within 50 feet of the road to minimize disturbance from yarding trees with root wads attached. All other trees would be cut within 100 feet of the road, cable yarded to a self loader, and transported to the restoration sites. The selected trees meet a 'thinning from below" silvicultural prescription. At least 60% canopy closure would remain after the trees are felled and disturbed areas would be seeded and mulched.

Table 1. Site types and locations

Star Gulch Restoration Site Locations					
Site Township Range Section					

Restoration Structure 1,2	39s	3w	28 NW1/4		
Restoration Structure 3,4	39s	3w	29 NE1/4		
Restoration Structure 5,6	39s	3w	29 NW1/4		
Restoration Structures 7,8	39s	3w	30 NE1/4		
Restoration Structures 9,10	39s	3w	19 SE1/4		
Restoration Structures 11-15	39s	3w	19 SW1/4		
Restoration Structure 16-20	39s	4w	24 NE1/4		
Restoration Structures 21-25	39s	4w	13 SW1/4		
Restoration Structures 26, 27	39s	4w	14 SW1/4		
Restoration Structure 28-30	39s	4w	24 SE1/4		
Large Wood Locations					
20 Snags 39s 3W 29 NW1/4					
17 Snags	39s	3w	19 NW1/4		
23 Snags	39s	4w	19 NW1/4		
6 Snags	39s	4w	13 SE ¼		
4 Snags	39s	4w	14 SE ¼		
27 Trees	39s	4w	10 SW1/4		

Vegetation disturbance would be limited to skid trails created by yarding trees from the harvest site to the loader and from the roadside staging areas to the stream channel. All access routes would be mulched, seeded with native grasses, and planted after project completion.

IV. Project Design Features

The following Project Design Features (PDFs) are included in the design of this project. The PDFs serve as a basis for resource protection in the implementation of the project and will be considered in the analysis of impacts in Chapter 3.

- 1. A mobile yarder would use full suspension to place logs near archeological mining sites.
- 2. All in-stream work would occur between July 1 and September 15 (both days inclusive) of any given year (2007 and 2008).
- 3. Seed all exposed soil areas with an approved native grass seed mix.
- 4. Cover all exposed soil areas with an approved mulch material to a depth of 4 inches.
- 5. Minimize channel disturbance and avoid channel disturbance near sensitive plant sites.
- 6. All access routes for machinery entering Riparian Reserves would be designated and approved in advance by BLM personnel.
- 7. Rip all access roads and landings to a depth of 12 inches using excavator bucket tines.
- 8. Set up yarder outside the active stream channel.
- 9. Require equipment operator to have current state operating permit to operate power

machinery. All state industrial fire regulations would be followed.

- 10. Require a hazardous material action plan and a containment and cleanup kit on-site.
- 11. Maintain fish passage at all times.
- 12. Activities would not be allowed during heavy rain events and 48 hours afterwards.
- 13. Clean all equipment before entering stream channel.
- 14. Leave 4 snags per acre in snag/hazard tree removal areas.
- 15. All project work will take place outside the critical breeding season for Spotted Owls (critical breeding season considered March 1 through June 30).
- 16. Activities will not be allowed do disturb talus areas.
- 17. All trees removed have been will be inspected for raptor nests prior to removal.
- 18. A "no disturbance" buffer will protect the one site of *Tripterocladulum leucocladulum*.
- 19. Noxious weed sites shall be flagged and avoided by all equipment and ground-disturbing activities.
- 20. Ground-disturbing activities shall be performed near the two weed sites after all other ground work has been done.
- 21. Equipment shall be cleaned prior to moving offsite.

Chapter 3: Affected Environment

I. Introduction

This chapter describes the current condition of the environment within the proposed project area that would be affected by the proposed action. The information in this chapter would serve as a general baseline for determining the effects of the alternatives. The information is organized around the major issues identified by the ID Team. Only enough detail has been given to determine if any of the alternatives would cause significant impacts to the human environment as defined in 40 CFR 1508.27.

II. General Description of the Proposed Project Area

The project area is located within a low, terrace-constrained stream approximately 1 to 4 miles upstream from the confluence of the Applegate River. Stream substrate is composed of bedrock, boulders, cobbles, gravels, sand, and silt with cobble and gravel being the dominant substrates. Management activities, such as road building, mining and logging, have reduced both quantity and quality of fish habitat in Star Gulch. Historic stream habitat conditions most likely contained a greater amount of large woody debris, spawning gravel and a higher amount pools (Applegate/Boaz WA p36). Current over story vegetation adjacent to the site is dominated by hardwoods (alder, maple) along the edge of the stream and by conifer stands in the uplands.

A. Fish, Aquatic Habitat, and Hydrology

A variety of resident and anadromous fish species are present in the Star Gulch watershed. Anadromous fish species that utilize Star Gulch and its tributaries are coho salmon (*Oncorhynchus kistuch*), Pacific lamprey (*Lampetra tridentata*), and summer and winter steelhead trout (*O. mykiss*). Resident fish found in Star Gulch include rainbow trout (*O. mykiss*), cutthroat trout (*O. clarki*) and reticulate sculpin (*Cottus sp.*). Coho salmon are listed as a threatened species under the Endangered Species Act (ESA) of 1973. Although coho populations are on a recent upward trend, their numbers remain low throughout their range in the Rogue River Basin. Pacific lamprey are a State of Oregon designated sensitive species.

The BLM has conducted juvenile coho density surveys in Star Gulch from 2002 to 2006. When compared to the benchmark estimated for juvenile coho densities in Oregon coastal streams of \geq 0.7 fish/m² (Rodgers 2000), production appears poor in the years 2003 and 2004, however in 2005 and 2006 production exceeded ODFW goals. Overall summer survival rates are poor as every year coho densities dropped significantly in late summer months (Graph 1). This is most likely due to a lack of quality rearing pools as indicated from ODFW habitat surveys (ODFW, 1999).



The BLM has conducted spawning surveys for adult coho in Star Gulch since 2002. Beidler (1980) recommends that goals for Oregon coastal streams should be just under 200,000 adult fish. To achieve this goal, there needs to be about 40 spawners per mile. Coho spawning surveys conducted in Star Gulch averaged 7.4 (2002 to 2006) adults per mile (Graph 2). These averages are considered poor when compared to Beidler's benchmarks.





The Forest Service studied the population health of adult steelhead within the Applegate Basin from 2000 to 2003 through adult spawning surveys. Star Gulch was found to be low in number of returning adults per mile, averaging 14 per year (Smith 2003).

ODFW (1999) conducted an intensive aquatic habitat inventory to assess the current condition of aquatic habitat of Star Gulch. Analysis of the inventory data revealed aquatic habitat in Star Gulch to be in fair condition based on relevant stream habitat condition indicators. The most notable stream habitat deficiencies are the absence of high quality pools, spawning substrate, and large wood. Star Gulch is identified as water quality limited for high summer stream temperatures on the Oregon Department of Environmental Quality's 303(d) list. Star Gulch has a reduced freshwater survival rate for salmonids as a result of these deficiencies.

C. Soils

The soils in the proposed project area are Caris, Offenbacher, Vannoy, Voorhies. These soils are deep and moderately deep and are well drained. Runoff is medium and the potential for water erosion is moderate on slopes less than 35 percent.

D. Archeology

The Star Gulch stream channel has extensive historic placer mining tailings scattered within the project area.

For a detailed description of the Star Gulch watershed, see the Applegate-Star/Boaz Watershed Analysis, completed in September 1998, which is available at the Ashland Resource Area, Medford District BLM Office.

E. Forestry

The green tree removal sites are dominated by mid-seral stands of Douglas fir with scattered ponderosa pine and incense cedar. Whiteleaf manzanita and ceanothus species are dominant understory species. Douglas-fir, referred to as the climax species, is replacing ponderosa pine and incense cedar because of its more shade-tolerant nature. Currently, the stocking levels of stands throughout Star Gulch and the project area is high. This is primarily due to the lack of

natural disturbance and fire suppression. The average relative density for the area is 0.88 and indicates that physiologically the trees are at the point of suppression. Bark Beetle infestations are common in Star Gulch as a result of the high densities.

F. Wildlife

General Habitat:

Plant associations in this project area are diverse and include a mosaic of white oak woodland, hardwood stands dominated by madrone and black oak, shrubland and early, mid and mature conifer stands. The primary tree species in the project area are Douglas fir, ponderosa pine, sugar pine, madrone and white oak. Shrub species include manzanita, deerbrush ceanothus, wedgeleaf ceanothus. Hardwood tree species in riparian areas include willow, ash and maple. This assortment of vegetations types provides for a wide array of wildlife species habitats and needs.

Threatened and Endangered (T&E) Species:

Spotted Owls

The effects of the project on Northern Spotted Owls (*Strix occidentalis caurina*) and designated critical habitat for the spotted owl were analyzed in the NLAA Biological Assessment dated April 27, 2007. That programmatic Biological Assessment of projects proposed to occur on Medford BLM in FY 07 that may affect, but are not likely to adversely affect Northern Spotted Owls or spotted owl designated critical habitat has been submitted to the US Fish and Wildlife Service (FWS). That consultation is currently under review by the FWS. This project occurs in CHU 74. Mandatory Project Design Criteria (Appendix A of the FY 07 BA) will be implemented as part of proposed projects under this consultation and Recommended PDC will be implemented as appropriate. The project will not occur until the FWS concurs on the may affect, not likely to adversely affect determination of effects through a Letter of Concurrence.

Owl Habitat

Within the proposed <u>planning</u> area, project trees are scattered throughout 60 acres of suitable nesting, roosting, foraging (NRF), and 20 acres of dispersal (D) habitat for Northern Spotted Owls (*Strix occidentalis caurina*). The trees to be removed are scattered through these acres so the actual area impacted is limited to the individual trees proposed for removal and the ground between the tree and the road along which the tree would be yarded. There are no known spotted owls in the project area. The nearest owl core is over ¼ mile away and the nearest nest site is over ½ mile away. Seasonal restrictions will be implemented. Suitable habitat includes nesting/roosting and foraging habitat and generally has the following attributes: high degree of canopy closure (approximately 60%+), multilayered canopy, large snags, and coarse woody debris. Dispersal-only habitat provides spotted owls some degree of protection and some foraging opportunity during dispersal and other activities, and generally has the following attributes: conifer stands with an average diameter of approximately 11 inches and 40-60 percent canopy closure.

Critical Habitat:

Approximately 107 acres of the <u>planning</u> area are in designated critical habitat for the Northern Spotted Owl Critical Habitat Unit (CHU) OR-74. Again, the actual area impacted by tree removal is limited to the area around the individual trees and the ground between the tree and the road along which the tree would be yarded. Critical habitat for the northern spotted owl was designated in Federal Register 57 and includes the primary constituent elements that support nesting, roosting, foraging, and dispersal. Designated Critical Habitat also includes forest land that is currently unsuitable, but has the capability of becoming suitable habitat in the future (FR57 (10):1796-1837). Collectively, nesting/roosting/foraging habitat is "suitable habitat" as described above. There are approximately 60 acres of suitable habitat and 20 acres of dispersal-only habitat in CHU OR-74 within the proposed project area.

Bald Eagles

There is limited suitable nesting Bald Eagle (*Haliaeetus leucocephalus*) habitat in the project area and treatments will not modify nesting habitat, nor affect bald eagles. The nearest known Bald Eagle nest site is 8 miles away and will not require seasonal restrictions.

Special Status Species:

Special Status Species are those species that are federally listed as threatened or endangered under the Endangered Species Act, proposed or candidates for federal listing as threatened or endangered, or are BLM designated sensitive, assessment or tracking species. The special status species listed below are known or suspected to be present in the proposed planning area. Only those species that could reasonably be present in the planning area are included – not species that wouldn't typically be found in the planning area.

Pacific Fisher

The project area may contain suitable habitat for the Pacific Fisher (*Martes pennanti*). Very little is known about fisher habitat requirements in southern Oregon. A high level of tree canopy cover is a common habitat component in current fisher literature (FWS 2006) and will not be affected by the proposed project. In addition, due to the large home range sizes and mobility of fishers, this dispersed project will not likely jeopardize the continued existence of the fisher. No fisher are known to occur within or adjacent to the project area. Snag retention guidelines will be implemented and potential cavity den sites will be maintained.

<u>Bats</u>

The project area has snags and mining adits which could be used as potential roosts for three Special Status bat species: Fringed Myotis (*Myotis thysanodes*), Townsend's Big-Eared Bat (*Corynorhinus townsendii*) and the Pacific Pallid Bat (*Antrozous pallidus pacificus*). The Townsend's Big-eared Bat is a Bureau Sensitive Species. Potential habitat will be protected as directed in the NWFP ROD Standard and Guidelines (2001). Typically, foraging bats are strongly associated with bodies of water. Project implementation would not remove or render habitat unsuitable for bats. There will be an increased number of pools created by the project which will have long term benefit for bats.

Northern Goshawk

The proposed action would modify approximately 20 acres of potentially suitable habitat for the northern goshawk. This habitat modification would not likely adversely affect the ability of

goshawks to breed, feed and shelter should they be present in the planning area. Although the proposed project could adversely affect the goshawk at the project level if it is present, the Standards and Guidelines of the NWFP accommodate the habitat requirements of the northern goshawk within the NWFP area and provides for persistence of the species at that scale (BLM 1997). The proposed project conforms to the Standards and Guidelines of the NWFP; therefore, the project would not lead to listing the species as threatened or endangered which complies with the BLM Special Status Species policy.

Northwest Forest Plan Survey and Manage (S&M) Species:

Great Gray Owls

The project area contains suitable Great Gray Owl (*Strix nebulosa*) nesting habitat. Large scale surveys were conducted in the past in the project area and the closest great gray detection was over 1¹/₂ miles away. No seasonal restrictions or further surveys are needed.

Red Tree Voles

The project area contains potentially suitable habitat for Red Tree Vole (RTV) (*Arborimus longicaudus*). Past landscape scale surveys were conducted in the watershed and only 2 inactive nests were located. No modification of tree vole habitat will occur except for one proposed wood source area which will provide "green" trees. This unit was surveyed for tree voles and no nests were detected.

Terrestrial Mollusks

The area contains suitable habitat for three S&M terrestrial mollusks: Chace Sideband (*Monadenia chaceana*), Oregon Shoulderband (*Helminthoglypta hertleini*) and the Evening Fieldslug (*Deroceras hesperium*). In 2004, 4,256 acres of landscape surveys were conducted in the Star Gulch watershed. Only 3 suspected S&M specimens were found. Applicable mollusk surveys were completed for this project footprint in the spring of 2007 using current survey protocol methods. No S&M mollusks were detected.

Siskiyou Mountain Salamander

The drainage that the project area is located in has potential habitat for the Siskiyou Mountain salamander (*Plethodon stormi*). Past landscape scale surveys have been conducted in the watershed. One Siskiyou Mountain salamander location is near a proposed wood source area. The habitat has been buffered and if any additional habitat is discovered during the implementation of the project, the habitat will be buffered or the proposed wood source will be eliminated. Additional habitat surveys were conducted in the project area footprint and no habitat was located. The proposed action will only be removing snags and there will be minimal change to the canopy closure. In addition, the proposed action will occur during the summer when salamanders have retreated to subsurface refugia so there will be a discountable effect to the species.

G. Botany – Special Status Species

Plant surveys for federally listed, state listed and bureau special status plants were conducted by

qualified botanists during spring and summer of 2004 for the Deadman Palm project. The project area is within the range of the federally listed vascular plant species *Fritillaria gentneri*, but was not found during surveys. Some fungi surveys were conducted in 2001. No special status fungi were found at that time. Table 2 lists the special status species that occur in the project area.

Table 2. Special Status Plant Species Project Area and District Occurrences				
Plant	Status ¹	PA sites ²	District ³	
Crumia latifolia	BAO	3	169	
Fissidens grandifrons	BTO	6	77	
Tripterocladium leucocladulum	BAO	1	164	
Total		77	2958	

¹BAO=Bureau Assessment Oregon, BTO=Bureau Tracking Oregon (BLM Manual 6840) ²Project Area Known sites.

³Medford District known sites prior to 2006.

Crumia latifolia (BAO) is a moss native to western North America and Russia. Its substrate is wet rocks or soil, often on calcareous rock in mixed hardwood or conifer woodlands. In the project area, there are three known occurrences.

Fissidens grandifrons (BTO) is an aquatic species that has a widespread distribution in North American. In the project area the moss occurs extensively on rocky streambed under canopy cover. There are six known sites in or adjacent to the project area.

Tripterocladium leucocladulum (BAO) is a moss known from western North America. Its substrate is soil, rock outcrops/talus, or trees in shaded conifer forests. There is one known site adjacent to the project area.

Noxious Weeds

Two small (<1 acre) infestations of Yellow Starthistle, *Centaurea solstitialis*, occur in or adjacent to the project area. These sites have been treated via handpulling or herbicide (glyphosate) for the past 3 years and appear to be diminishing in size and numbers.

Chapter 4: Environmental Consequences

I. Introduction

This chapter is organized by issue to describe the anticipated environmental effects of the alternatives, including the Proposed Action, on the affected environment. It provides the basis for comparing the alternatives presented in Chapter 2. The detail and depth of analysis is generally limited to that which is necessary to determine if significant environmental effects are anticipated.

Several resources were considered by the ID Team, but were not analyzed in detail because they

are either not found in the proposed project area or are not expected to be affected under the proposed action. These resources are Wilderness Values, Areas of Critical Environmental Concern, Air Quality, Prime or Unique Farmlands, Wild and Scenic Rivers, Native American Religious Concerns, Wetlands, and Flood Plains.

A wildlife biologist reviewed the wood sources for this project and determined the site is not located near any sensitive or Threatened & Endangered animal species. After removal of the identified snags needed for the restoration work, the area would continue to meet snag retention and coarse woody debris requirements.

II. Past and Future Actions

The cumulative effects of the past and future actions of BLM, Forest Service and private, must be considered in this analysis of the project area. The Forest Service is required to meet the same environmental protection standards including using Best Management Practices and protecting riparian areas as the BLM, while private timber companies are not. The BLM, Forest Service and private land owners are expected to continue proposing timber harvest and other landscape activities within the watershed in the future. Management activities that have occurred or are expected to occur in the near future in the Star Gulch Watershed are as follows:

Mining

Large scale hydraulic mining in the mid to late 1800's had a dramatic effect on stream channels, especially the lower part of Star Gulch. As a result the channels are more entrenched and sinuosities have been lowered as gradients increased. Star Gulch is still recovering from this period (Applegate-Star/Boaz WA p100). Present small scale "hobby" mining takes place throughout the project area in Star and Lightning Gulch.

Timber Harvest

Timber harvesting occurred in the Star Gulch Drainage in 1988 when timber was salvaged following the 1987 wildfires. Extensive clear cutting took place on public and private land in the mid to late 1980's in, Star, Benson, Alexander and Lightning gulch. These actions have led to higher water temperatures in the watershed because of less shade.

The Bureau of Land Management has planned the East Star (Deadman's Palm) project for 2007-2008. Harvest methods include using cable, tractor and helicopter methods totaling 615 acres. See Deadman's Palm Landscape EA (2004).

Forest Service – timber harvest of 132 acres. Star Gulch Fuel Reduction to be implemented in Fiscal Year (FY) 06-07. The Forest Service logged 20 acres in T39 3W section 28 in 1977 via cable yarding.

Several residential land owner defensible space and small acreage fuel reduction projects will be taking place. Boise land in T39S4W, section 36 (640 acres) has been cut in the last ten years and it is unlikely much additional harvest will occur in the next ten years. Superior land in 39S3W,

section 16 (640 acres) has been partially cut in the past and a portion of this section is likely to be cut in next ten years. There are 440 acres of timber older than 60 years and available for harvest (this is the standard used in the RMP). It is expected that more harvest would occur in private industrial timber land in the foreseeable future.

Aquatic Restoration

A concrete fish ladder was completed at the mouth of Star gulch in 1972 and improved in 1979. A fish restoration project took place in 1977 which entailed blasting resting pools in two locations in T39-3W section 29.

A BLM restoration project was completed in 1982 in T39-3W section 19, 29 and 30 (stream mile 2-3.5) in the project area. The project included placing 10 log weirs within the stream channel to provide cover for rearing fish and to collect spawning gravels.

Joint Fire Science study- landscape study of potential beneficial effects of fuels reduction in the riparian zone. The study is in the SE portion of the project area in sections T39 3W sections 21 & 29 (See JFS Fuel Reduction study EA, 2006).

III. Effects of Implementing Alternative 1 (No Action)

A. Fish, Aquatic Habitat, and Hydrology

Aquatic habitat conditions and current levels of fish production would be maintained over the short-term (less than10 years) until large wood recruitment adds sufficient large wood to the channels (50 to 100 years or more). The No Action alternative would result in a continued lack of instream structure, habitat diversity, and protective cover needed by fish. This would maintain the current reduced freshwater survival of anadromous salmonids in Star Gulch. The no action alternative would have no affect on hydrology as large wood and complex pools associated with large wood would remain deficient.

B. Soils

The no action alternative would have no affect on the condition of soils (see current condition). Past and future actions outlined above are not expected to affect the soil resource.

C. Archeology

The no action alternative would have no affect to archeological resources (see current condition).

D. Forestry

The condition of forest stands would remain unchanged under the no action alternative. Stocking densities and fuel hazards would remain high.

E. Wildlife

The no action alternative would have no affect on the wildlife resource (see current condition).

F. Botany

The no action alternative would have no affect on plants in the project area (see current condition).

III. Effects of Implementing Alternative 2 (Proposed Action)

A. Fish, Aquatic Habitat, Hydrology

1) Direct and Indirect Effects

This improvement project would have some short-term, negative effects, but both immediate and long-term positive effects on fish and fish habitat. Short-term negative effects to fish include reduced feeding opportunities from localized increases in turbidity and temporary displacement of fish from habitats where wood placement occurs. Experience observing similar restoration projects in creeks with similar gradient and turbidity patterns as Star Gulch indicates that the effects of both increased turbidity and fish displacement would be expected to only last several hours. This duration would be would be biologically insignificant because the disturbance only lasts a short time. Positive indirect effects to SONC coho salmon (and other fishes and aquatic organisms) would result from an increase in habitat quality. Increased spawning and rearing habitat would benefit the population of coho in Star Gulch in the short term and long term. The project is expected to increase individual fish survival rate and productivity in the Star Gulch drainage basin.

This improvement project would also have both negative and positive effects to aquatic habitat. Negative effects would include a short term (up to several hours) increase in turbidity as the wood is placed in the channel, and short-term (weeks or months) changes in downstream habitats as the stirred-up sediment settles out over substrate. The sediment would not initially move very far downstream, as all instream work would take place during periods of low flow. It is anticipated that the first pool downstream of each wood structure would accumulate and store some amount of sediment, potentially decreasing habitat availability for macroinvertebrates and reducing feeding opportunities for fish. Levels of sediment deposition would decline substantially below this first pool, and likely would not be noticeable three or more pools downstream. However, following the pattern of sediment movement in Star Gulch, deposited sediment would be flushed out during the first substantial flow event following wood placement, and transported to natural deposition areas in Star Gulch, or carried by high flows to the Applegate River as a very brief pulse of slightly increased turbidity. This turbidity would not be detectable above background turbidity levels.

Positive effects include long term benefits derived from the addition of large wood to the stream channel such as increased habitat complexity by the formation of pools and increased amount of cover provided by the wood. This would benefit juvenile rearing habitat in the main stem of Star Gulch. Aggradations of spawning gravels upstream of the wood, would increase spawning habitat available to adult salmonids. Wood additions would also increase the potential for lateral stream movement, possibly encouraging formation of slow water habitats (a crucial winter rearing habitat that is currently almost non-existent in Star Gulch), adding to habitat complexity in Star Gulch.

The project would not remove tree canopy along Star Gulch or its tributaries that provide shading to the stream and placement of the debris jam structures would create addition shade on the stream. This project would have little if any impact on stream temperatures, with only slight potential for some slight reductions in stream heating as a result of the additional shade and gradual channel improvement from placement of the large wood.

2) Cumulative Effects- Fisheries

Implementation of the proposed project would be expected to reduce the amount of degraded aquatic and riparian habitat in Star Gulch and eliminate some of the negative cumulative impacts which have occurred within the watershed in the past (See Cumulative Effects for Alternative 1). Short-term, localized increases to baseline stream turbidity levels and direct injury or mortality of fish could have negative effects on fish and aquatic resources, though cumulatively, this would be expected to be insignificant. Implementation of the appropriate PDFs is expected to reduce the anticipated direct effects of the proposed actions to negligible levels.

There will be some ground disturbance including the removal of some brushy vegetation and possibly a limited number of Douglas fir seedlings (<2" diameter breast height) along the roadway through the removal of the logs from the sites. This may cause some short term erosion in the immediate vicinity. Disturbed areas will be water barred, seeded and mulched after use to reduce the potential for long term soil erosion. Designated skid trails will be kept to a minimum.

C. Soils

Removing the whole tree (including root wad) would disturb the soil immediately adjacent to the root wad (approx. 10' radius) and the narrow yarding trail to the road. Erosion rates in these areas would increase by about 25 percent over the existing condition due to soil disturbance and slope. Most of the eroded particles would move only a short distance (ten feet or less) and settle out in the existing organic material (twigs, leaves, moss, etc.). The exception would be where the yarding trail is near or intersects waterways or drainage facilities and, in this situation, the eroded particles would most likely become suspended in solution enter the waterways. The amount of soil particles entering the waterways would be very low as a result of the proposed mulching and grass seeding of the disturbed areas.

D. Archeology

There are several historic tailing piles created during mining in the past. By using full suspension for log placement in the proximity of the tailing piles to avoid impacting the integrity of these features, or by completely avoiding tailing locations where full suspension is not possible, the project will be a "no adverse effect" undertaking relative to 36 CFR 800.

E. Forestry

By removing 27 live Douglas fir trees with the group selection prescription, pine and cedar species will be favored to increase their prevalence in the forest stands thus enhancing species diversity. The prescription meets specifications of restoration thinning and density management as outlined in the Medford District Resource Management Plan. Removing the snags along Star Gulch road would eliminate future tree damage from the snags falling on top of live trees and

would remove a safety hazard of trees falling across the road..

F. Wildlife

The combination of circumstances including protection measures, project design criteria, species status, number of occurrences of species in the project area versus number of occurrences and distribution of species as a whole, and the anticipated effects of the proposed action will not trend these species towards listing under the Endangered Species Act. Several components of spotted owl habitat, like prey cover and downed woody debris, could be affected by yarding out trees. Additionally, potential roosts and nest structures may be removed. Either activity may affect, not likely to adversely affect spotted owls.

The removal of trees and snags from these sites would decrease the amount of coarse woody material that would be available for wildlife habitat in the immediate vicinity. Surveys conducted at each location found adequate amounts of downed wood that would meet or exceed the minimum requirements for wildlife habitat. All coarse woody material requirements would continue to be met after snags are removed. A summary of impacts to threatened, bureau sensitive and Northwest Forest Plan species are listed below

Table 3. Summary of Impacts to Threatened and Bureau Sensitive Species				
Species	Species Status	Alternative 1	Alternative 2	
		No Action	Proposed Action	
Northern Spotted	Federally	No Effect	Not Likely to	
Owl	Threatened		Adversely Affect	
Bald Eagle	Federally	No Effect	No Effect	
	Threatened			
Pacific Fisher	ESA Candidate	No Effect	No Effect	
	Bureau Sensitive			
Northern Goshawk	Bureau Sensitive	No Effect	No Effect	
Townsend's	Bureau Sensitive	No Effect	No Effect	
Big-Eared Bat	Durodu Sonstrive			

Table 4. Summary of Impacts to Northwest Forest Plan Wildlife Species				
Species	Species Status	Alternative 1	Alternative 2	
		No Action	Proposed Action	
Great Gray Owl	Survey and Manage	No Effect	No Effect	
Red Tree Vole	Survey and Manage	No Effect	No Effect	

Chace Sideband	Survey and Manage	No Effect	No Effect
Oregon Shoulderband	Survey and Manage	No Effect	No Effect
Evening Fieldslug	Survey and Manage	No Effect	No Effect
Siskiyou Mountain Salamander	Survey and Manage	No Effect	No Effect

G. Botany

Special Status Plant Species

Since no *Fritillaria gentneri* occurs in the project area, there will be no affect to this species from implementing the proposed action. *Crumia latifolia* and *Fissidens grandifrons* occur on rocks in the creekbed. Where logs will be dragged and placed into the creek, small patches of moss will be crushed and dislodged from their substrate in the short term. However, the pools and dissipated energy resulting from the proposed action could have a beneficial effect on these bryophytes by providing additional habitat in the long term. Both of these species are secure in their range due to riparian reserves elsewhere in the Star Gulch drainage and adjacent watersheds. The one site of *Tripterocladulum leucocladulum* will be protected by a "no ground disturbance" buffer.

Although never found during previous surveys, there is a very slight chance that special status fungi could occur in the project area. However, since the scale of disturbance is so minimal in a spatial and temporal context, there will be no effect on special status fungi.

Noxious Weeds

Weed infestation should not expand at the two sites by implementing the project design features: avoiding ground disturbance at the infestation sites; performing the work near the infestation sites after all other work has been done; washing equipment prior to leaving the work site. Additionally, the infestations are diminishing due to the last three years treatments (handpull/herbicide) and continued future treatments.

I. PUBLIC PARTICIPATION

Public notice of the availability of this EA was provided through advertisement in Medford's *Mail Tribune* newspaper. A copy of this EA is available upon request from the Ashland Resource Area, Bureau of Land Management, 3040 Biddle Rd., Medford, OR 97540, (541)618-2497.

APPENDIX A: Star Gulch Aquatic Habitat Restoration Aquatic Conservation Strategy

The Northwest Forest Plan's (NWFP) Aquatic Conservation Strategy (ACS) has four components: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration. It is guided by nine objectives which are meant to focus agency actions to protect ecological processes at the 5th-field hydrologic scale, or watershed. How the four components of ACS relate to this project is explained below:

1. <u>Riparian Reserves</u>: Riparian Reserve widths for streams, springs, wetlands, and unstable soils have been determined according to the protocol outlined in the NWFPs Aquatic Conservation Strategy.

2. <u>Key Watersheds</u>: Tier 1 Key Watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. The Star Gulch/Boaz Fifth Field Watershed is not a Key Watershed.

3. <u>Watershed Analysis</u>: The BLM completed the Applegate Star/Boaz Gulch Watershed Analysis in 1998.

<u>4. Watershed Restoration</u>: The proposed project is part of a long term program of improving fish and aquatic habitat in the Star Gulch Watershed. Current populations of salmonids within Star Gulch are low but within the natural degree of variation. The proposed project includes placing approximately 30 large wood structures over 4.2 miles in Star and Lightning Gulch. This is consistent with the ACS as written: A comprehensive, long term program of watershed restoration to restore watershed health and aquatic systems, including the habitat supporting fish and other aquatic and riparian dependent organisms.

Evaluation of This Action's Consistency with Northwest Forest Plan Aquatic Conservation Strategy Objectives

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features <u>to ensure protection of the aquatic systems</u> to which species, populations and communities are uniquely adapted.

The intent of this project is to increase the diversity and complexity of Star and Lightning Gulch. Adding large woody debris (LWD) will increase instream habitat complexity and habitat types that are needed for all life stages of salmonids within Star Gulch.

2. Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.

Adding LWD will not affect the spatial and temporal connectivity within Star/Lightning Gulch. LWD structures would be designed in a manner that would not create barriers to any aquatic organisms.

3. Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.

Adding LWD to Star Gulch will maintain and restore the physical integrity of the aquatic system. Some shorelines, banks and bottom configurations will adjust to the LWD being added at individual sites, however, this will be a beneficial process that will increase habitat complexity and have long term benefits for the aquatic system.

4. Maintain and restore water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.

There would be no effect on water temperature, because shade would be maintained along all stream channels. Short term (one to three years) there would likely be some amount of fine sediment entering stream channels in the vicinity of the restoration sites. Upland work would have no effect on fine sediment levels, due to the filtering action of Riparian Reserve buffers. Any sediment increases resulting from the proposed project would be minor relative to existing sediment levels. This would ultimately benefit aquatic systems at site scales.

5. Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.

Adding large wood to Star Gulch would help create historical salmonid conditions when more wood existed in the stream channel. LWD controls local energy expenditure ,and consequent patterns of water depth, velocity, and sediment storage (A Macdonald, EA Keller).

6. Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.

Adding LWD to Star Gulch/Lightning Gulch will maintain and improve patterns of sediment, nutrient, and wood routing. As stated in ACS objective #5, adding LWD would help sort and store sediment and other substrate. Adding LWD to Star Gulch/Lightning Gulch would trap smaller pieces of wood and debris that would otherwise be flushed further down stream into larger tributaries where it would be unlikely to stay in the aquatic system.

7. Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.

Adding LWD to Star Gulch would increase flood plain connectivity and restore the timing, variability, and duration of floodplain inundation and water table within Star Gulch drainage.

8. Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter

thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.

This project would help restore the historical physical complexity and stability of Star/ Lightning Gulch by adding LWD. LWD slows the movement of gravel and sediment. This leads to island and bar formation within the aquatic zone which would provide a substrate for the growth of plants, provide nutrient filtering and side channels for winter fish habitat.

9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Site level benefits to native plants and invertebrates in riparian habitat would, at a minimum, maintain riparian populations at the restoration sites. The amount of habitat affected would be insignificant to be beneficial to the Star Gulch/ Boaz watershed compared to the past degradation that has impacted habitat in this watershed.





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