Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project
Aquatic Conservation Strategy Report
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The LRMP contains the components, objectives and standards and guidelines for the ACS as recommended by the ROD.

The four components of the ACS, as given on pages 4-34 through 4-36 of the LRMP, are: 1) Riparian Reserves, 2) Key Watersheds, 3) Watershed Analysis and 4) Watershed Restoration. The Project does not occur in a **Key Watershed**, the project planning team used information from the **Watershed Analysis** when locating and designing the proposed activities, and the project is recognized as one step toward overall forest health. **Watershed Restoration**, which includes fish passage improvement, decommissioning, and storm damage repair, is an ongoing program on the District and the Forest. This particular project does not propose direct watershed restoration, but should reduce the amount of watershed degradation that can occur from a high intensity wildfire in the area by changing vegetative condition classes to reduce the extent and intensity of a wildfire.

Activities in **Riparian Reserves** were developed to improve, protect or have neutral effects to RRs conditions in the long term. Particular objectives were designed for thinning in RRs (Attachment 1a). Activities in RRs consist of mechanical thinning, underburning and hand piling, water withdrawal, hazard tree removal, construction of two temporary road segments (the lengths of these temporary road segments are 0.07 and 0.15 miles, respectively), maintenance of two existing landings, and road maintenance, and decommissioning of eleven road stream crossing sites (see Attachment 1b). These activities were evaluated to determine the effects to RRs at the 5th field watershed scale in the long term to meet the requirements in the 2004 amendment for the ACS. The effects of these activities were evaluated in detail in the Watershed Report for the project (Snavely, 2007), the Biological Assessment/Evaluation for effects to anadromous fish (Thomas, 2007), and the Fisheries Specialist Report (Thomas, 2007a). Snavely and Thomas concluded that the activities in RRs met the ACS objectives, as stated on pages 4-6 and 4-7 of the LRMP because there were no significant changes to stream temperatures or flow and sediment regimes--the primary processes affecting the ACS objectives. Also, by maintaining habitat conditions in the long term and minimizing direct impacts, there should be no change to aquatic biota within the project area.

5th field watersheds in the project area:

Beaver Creek: The principle stream in this 5th field watershed is the mainstem of Beaver Creek. Anadromous and resident fish occur in Beaver Creek throughout this 5th field.

Cottonwood Creek: The principle stream in this 5th field watershed is the mainstem of Cottonwood Creek. Anadromous and resident fish occur in Cottonwood Creek approximately 1.2 miles downstream from project activities.

Effects to surface erosion, mass wasting, and flow regime are indicated by the use of three models; the applicable results are displayed in Attachment 2. Per the hydrologist's and geologist's review of the modeled values, the risk of affecting watershed conditions is not significant – with the risk of impacts to the sediment regime below 1.0 after project implementation and then a reduction in risk by implementing future actions (see Attachment 2). The modeled values are clarified and verified by field review and professional experience at the site level (Snavely, 2007) to determine impacts to ACS objectives.

The nine ACS objectives on pages 4-6 and 4-7 of the LRMP are applicable to all alternatives (**Alternatives 2, 4 and 5**) of the proposed Mt Ashland LSR Habitat Restoration and Fuels Reduction Project:

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

Thinning with fuel treatment would occur where wildfire, and resulting fire suppression activities, may alter features to which species are uniquely adapted. Thinning of some of the stands, while underburning in others, would reduce fuel loading and simultaneously leave material to provide diversity and complexity. Reduced fuel loading would help stands progress to toward conditions where the natural fire regime is restored.

BMPs and Project Design Features will minimize impacts from the following project activities that will occur within or adjacent to RRs: thinning, underburning and hand piling, water drafting, road improvements/decommissioning, new landing construction/landing maintenance, and hazard tree felling. There is the possibility that cable corridors and skid trails will cross RRs. In that event, the trail or corridor crossing would have BMP including waterbarring and spreading of mulch. Water drafting, and the stream crossings on roads that will be decommissioned, will have controls to protect aquatic habitat. Effects, if any, would be slight and short term. Therefore, there would be no long-term effect at the 5th field watershed scale (Thomas, 2007).

Maintain and restore spatial and temporal connectivity between watersheds.

Flows are not significantly changed by the activities in RRs (Snavely, 2007) in the long term. By reducing the risk of large, high severity wildfires, the project activities reduce the chance of increased flow and sediment regimes. Within harvest areas, 2–5 snags/acre and 5–20 pieces of Coarse Woody Debris (CWD) would be maintained. Fuel treatments within Riparian Reserves are designed to create conditions that minimize disturbance of riparian ground cover and vegetation and benefit RR function in the long term.

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

Opportunities to deliver key wood to streams will be maintained by leaving at least 5 – 8 snags/acre in upslope riparian reserves. All snags would be left in those riparian reserves well connected to suspected fisheries habitats.

The risk of affecting the physical integrity of the aquatic system is not significantly changed by the proposed action since water temperature, flow, and sediment regimes are not adversely affected, as shown in the tables in Attachment 2 and discussed in (Snavely, 2007) and(Thomas, 2007).

Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems.

This project is consistent with riparian reserve guidelines, which prohibit and regulate activities in the riparian reserves that may prevent or retard attainment of the Aquatic Conservation Strategy. The project overall, including activities in RRs, will have minor direct, indirect, and cumulative effects on water quality within the project area (Snavely, 2007). Water quality is expected to remain at pre-fire conditions. Maintenance of water quality would be achieved through minimizing sediment delivery to stream courses (Snavely, 2007).

Alternative 1, the no action alternative, has no direct effects, although the risk of potential impacts from a high intensity wildfire will not be reduced. The proposed action reduces the potential risks, while resource protection measures (Biological Assessment/Evaluation for anadromous fisheries, pages 11-14) reduce the risk of project implementation to water quality.

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

Soil erosion occurs when soil cover is burned off. In the short term, post-fire soil erosion could show an increase (Snavely, 2007). This is being mitigated to a certain extent by the Project Design Measures presently as proposed. The long term total sediment production is predicted to be lower if areas are thinned and burned under controlled conditions, as compared to another wildfire.

The proposed thinning and fuel reduction activities will increase stand health and decrease risk of large severe wildfires in the long term. Reducing the risk of stand replacing fire and implementing a natural fire regime in the long term would have the most influence on maintenance and restoration of the sediment regime. The project overall, including activities in RRs, will have minor direct, indirect, and cumulative effects on land stability within the project area (Mt. Ashland LSR Geologic Report (De La Fuente, 2007)). The long term total sediment production is predicted to be lower if areas are thinned and burned under controlled conditions, as compared to another wildfire (De La Fuente, 2007).

Maintain and restore in-stream 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.

The proposed project includes the thinning of overstocked stands, controlled introduction of fire, and post harvest fuel treatment. No activities are planned that would directly divert or reduce stream flows. There may be a short term lessening of evapo-transpiration levels in the area, resulting in an increase in phreatic and vadose flows (Snavely, 2007). This will be countermanded in the long term by increased stand vigor and fire resiliency. At the 5th field scale, and over the entire analysis area, no changes in flows are expected from the proposed action.

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

Since this project only proposes the harvest of thinned timber, any effects to the water table would negligible, because the remaining stands would be more vigorous and efficient as evapo-transpiration mechanism. There are no treatments in meadows

Maintain and restore the species composition and structural diversity of plant communities in riparian areas.

The activities in RRs do not adversely affect the plant communities in riparian areas. Species composition of plant communities in riparian areas would be maintained or restored during project implementation and protected in the long term by reducing the risk of stand replacing fires. Structural diversity of the vegetation in riparian areas would be maintained or restored by allowing fire to burn in low intensity in riparian areas, prohibiting active treatment in riparian vegetation and leaving snags in areas connected to the aquatic system.

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

A well-distributed mix of riparian habitats would maintain the riparian distributed species.

Reducing the risk of a stand replacing fire increases the likelihood of a maintaining a well-distributed mix of habitats. Olson and Agee[1] concluded from their study of fires in riparian forests, it will be necessary to reintroduce fire to riparian forests in order to restore forests to historical conditions. They also observed that, "if upslope forests are treated for fuels reduction [as for this project], either with prescribed fire or other silvicultural treatments, then perhaps a wildfire ignited within the upslope forest would be less likely to gain the intensity needed to burn within the moister portion of the riparian zone." The proposed fuel reduction is designed to reduce fuels in the upslope areas and in portion of RRs to change fire behavior in a way that is more similar to historic, desired conditions that will promote native plant and invertebrate riparian dependent species.

[1] Olson Diana L. and James K Agee. 2005 Fire Ecology, Vol 1. No. 1

Attachment 1: Activities in Riparian Reserves		
UNIT	Watershed	ACTIVITY with NOTES
Water Drafting	From Beaver Creek 5th field, Long John Creek 7th field, and Beaver/Grouse Creek 7th field; following NOAA 2001 guidelines to prevent adverse impacts to anadromous fish and their habitat	For Beaver Creek, Long John Creek, Cow Creek, and Grouse Creek, following NOAA 2001 guidelines to prevent adverse impacts to anadromous fish and their habitat
Landings in RRs	Long John Creek 7th field	Two existing landings in RRs will be used, no effects from their use is expected per BMPs.
Construction of Temporary road Segments in RR	Long John Creek 7th field	There are two new temporary roads proposed in Riparian Reserves. One crosses an unnamed perennial tributary to Long John Creek in the SW ¼ of Section 31. This road (T401) begins where road 40S15 crosses this stream and accesses units 401 and 252. The other road (T206B) crosses an RR at the headwaters of an unnamed intermittent tributary to West Branch Long John Creek and connects to the new skyline landing in stand 206. These roads are 2.3 and 1.5 miles upstream of SONCC coho salmon CH, respectively. No adverse impacts to SONCC coho salmon and their CH, steelhead trout, Chinook salmon and their habitat expected since these road segments are not located adjacent to/over fish bearing streams.
Decommissioni of 11 stream crossings.	Long John Creek and Beaver/Grouse Creek 7th fields.	Resource Protection Measures and BMPs will prevent adverse impacts to SONCC coho salmon and their CH, steelhead trout, Chinook salmon and their habitat.
Under burning	Throughout project area	Low intensity in RRs to avoid removal of large woody material, and no fire lines within RRs. Fire can be allowed to back down into RRs from ignition points upslope of RRs.
Variable Density Thinn >9" >9" DBH	Beaver/Grouse Creek, Long John Creek and Deer-Beaver Creek 7th fields.	No adverse impacts to SONCC coho salmon and their CH, steelhead trout, Chinook salmon and their habitat expected since variable density thinning will occur within the second site potential tree height only and no tractor yarding will occur in RRs and the fuels reduction method used with the trees felled will be handpile and pile burn.
Thinning <9 DBH	Beaver/Grouse Creek, Long John Creek and Deer-Beaver Creek 7th fields.	No adverse impacts to SONCC coho salmon and their CH, steelhead trout, Chinook salmon and their habitat expected since no yarding will occur in RRs and the fuels reduction method used with the trees felled will be handpile and pile burn.
Hazard Tree Removal	Throughout project area	Hazard trees (or portions there of) felled in RRs will be left on site to provide for LWD.

ATTACHMENT 2: CWE Model Tables (USLE, GEO and ERA for Alternatives 2, 4, and 5)

Table A-1: Model-Estimated Risk of Sediment Delivery [USLE – Surface Erosion] Alt 2			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek with proposed action	1.17	1.18	1.18
Entire analysis area [2]	1.12	1.13	1.13

Table A-2: Model-Estimated Risk of Sediment Delivery [USLE – Surface Erosion] Alt 4			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek with proposed action	1.17	1.18	1.18
Entire analysis area [1]	1.12	1.13	1.13

Table A-3: Model-Estimated Risk of Sediment Delivery [USLE – Surface Erosion] Alt 5			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
Beaver/Grouse Creek	0.94	0.99	0.99
Long John Creek	0.88	0.96	0.96
Upper Cow Creek	0.66	0.66	0.66
Deer-Beaver Creek	0.94	0.95	0.95
5th field – Beaver Creek with proposed action	1.17	1.18	1.18
Entire analysis area [1]	1.12	1.13	1.13

[2] Entire Analysis Area equals the Beaver Creek 5th field watershed, Headwaters Cottonwood Creek 7th field watershed and the all 7th fields in the Beaver Creek 5th field outside of the project area boundary.

Table A-4: Model-Estimated Risk of Sediment Delivery [GEO – Mass Wasting] – Alt 2			
7th-field Watershed	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek with proposed action	0.91	0.90	0.90
Entire analysis area [1]	0.91	0.90	0.90

Table A-5: Model-Estimated Risk of Sediment Delivery [GEO – Mass Wasting] – Alt 4			
7th-field Watershed	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek with proposed action	0.91	0.91	0.91
Entire analysis area [1]	0.91	0.90	0.90

Table A-6: Model-Estimated Risk of Sediment Delivery [GEO – Mass Wasting] – Alt 5			
7th-field Watershed	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek with proposed action	0.91	0.90	0.90
Entire analysis area [1]	0.91	0.90	0.90

Table A-7: Model-Estimated Risk of changes in flow [ERA- Equivalent Roaded Acres] – Alt 2			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek	0.79	0.86	0.86

Table A-8: Model-Estimated Risk of changes in flow [ERA- Equivalent Roaded Acres] – Alt 4			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek	0.79	0.85	0.85

Table A-9: Model-Estimated Risk of changes in flow [ERA- Equivalent Roaded Acres] – Alt 5			
7th-field Drainage	**Risk Ratio relative to inference point** (Current)	**Risk Ratio Post Action**	With Future Actions
5th field – Beaver Creek	0.79	0.86	0.86

Literature Cited:

De La Fuente, Juan. 2007. Klamath National Forest. Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Geologic Report. 2007.

Snavely, William. 2007. Klamath National Forest. Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Watershed Report. 2007.

Thomas, Brian. 2007. Klamath National Forest. Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Fisheries Biological Assessment. 2007.

Thomas, Brian. 2007a. Klamath National Forest. Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Fisheries Specialist Report. 2007.