Fisheries Specialist Report

Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project

Prepared by: Brian Thomas

Date: April 9, 2007

The Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project (the Project), as described in the associated Environmental Impact Statement (EIS), has activities within five 7th-field watersheds and two 5th-field watersheds on the Oak Knoll Ranger District that are direct or indirect tributaries to the Klamath River.

Methodology:
The effects from four alternatives were evaluated: Alternative 2 (The Preferred Alternative), Alternative 4, Alternative 5, and the No Action. The analysis area for the Project's potential effects on fisheries resources included the treatment sites and associated Riparian Reserves and the streams reaches within and downstream of the treatment areas at the 7th and 5th field watershed scales. The analysis for the anadromous fish habitat [coho salmon Critical Habitat (CH) (and the primary constituent elements), coho salmon and Chinook salmon Essential Fish Habitat (EFH), and steelhead trout habitat] was conducted by evaluating effects to relevant habitat Indicators and considering direct, indirect and cumulative effects to anadromous fish and their habitat. Relevant habitat Indicators are water temperature, substrate and turbidity, chemical contamination, physical barriers, large woody debris, pool quality and quantity, off-channel habitat, refugia, stream width-depth ratio, streambank condition, floodplain connectivity, peak and base flow, road density, increase in drainage network, disturbance history, and riparian reserves. Existing conditions and effects are described in the Project Fisheries Biological Assessment for Anadromous Fish (USDA Forest Service 2007). The basis for effects to resident fish (rainbow trout) was the analysis for anadromous fish expanded in scope to the distribution of resident trout (Management Indicator Assessment Report (MIS report)). I applied O'Laughlin's model (Figure 4 in O'Laughlin, 2005) to compare short-term fuel treatment implementation risk and long-term environmental risk. The cumulative effects analysis considered how past, present, and implementing the future foreseeable actions may influence the effects of the Project.

Fish Species Considered: (USDA Forest Service 2007, MIS Report)

Species listed under Endangered Species Act (ESA): SONCC Coho Salmon (Threatened)

Species listed as Forest Service Sensitive: Spring and Fall-Run Chinook Salmon, Steelhead trout.

Species listed as Management Indicator Species: Steelhead Trout, Rainbow Trout.

Effects to Essential Fish Habitat (EFH), as listed under the Magnuson-Stevens Act, were considered through the evaluation of habitat Indicators for Chinook and Coho salmon in the project Biological Assessment/Evaluation for Anadromous Fish.

Distribution of Fish in the analysis area: The distribution of fish, CH, and EFH were based on field reviews of habitat suitability, professional judgment, District fish survey records, and CA Department of Fish and Game information. This information was compiled into the KNF steelhead trout distribution layer in the KNF Geographic Information Systems electronic library. The steelhead trout distribution conservatively defines occurrence of coho and Chinook salmon, CH, and EFH except where site-specific field surveys refine coho and Chinook salmon, CH, and EFH distribution (such as the habitat is found to be inaccessible for coho salmon, Chinook salmon, or both). The use of the KNF Steelhead Trout Distribution layer to define EFH and CH is recognized as a conservative approach for assessment of effects to CH and EFH because coho and Chinook salmon occupy less stream miles as steelhead due to the differences in jumping abilities. The maximum jumping height for coho is 2.2 meters; Chinook salmon is 2.4 meters; and steelhead is 3.4 meters (Meehan, 1991). Therefore, steelhead trout can access more habitat than coho or Chinook salmon (i.e., steelhead trout can make a 3-meter jump to migrate up a stream, but coho and Chinook salmon cannot).

In the analysis area, rainbow trout occur everywhere anadromous fish occur and in Deer Creek, West Branch Long John Creek (extending 0.8 miles above the anadromous fish range), Long John Creek (extending 1.25 miles above the anadromous fish range), Grouse Creek (extending 2.3 miles above the anadromous fish range), and in an unnamed tributary to Grouse Creek.

Effects to the anadromous fish habitat (including coho CH and EFH) from Alternative 2 (the Preferred Alternative):

Potential **direct effects** are associated only with water withdrawal used to reduce dust to maintain safe driving conditions; there are no other activities occurring within flowing streams. The water withdrawal has resource protection measures to minimize direct effects to insignificant levels and there are no long term direct or indirect effects since the disturbance is short term and stream flow returns to background levels after drafting is completed.

Potential **indirect effects** are those relating to impacts to habitat Indicators because effects to habitat can impact fish later in time and place (downstream). Implementation of the Project will not cause significant effects to water temperature, substrate and turbidity, chemical contamination, physical barriers, large woody debris, pool quality and quantity, refugia, stream width-depth ratio, off-channel habitat, refugia, streambank condition, floodplain connectivity, peak and base flow, increase in drainage network, road density and location, disturbance history, and riparian reserves, because the functioning levels of the relevant fish habitat Indicators at the site, 7th field, 5th field and 4th field (Klamath River) watershed scales (USDA Forest Service 2007 and MIS Report) are not changed .

Since resident rainbow trout occur everywhere anadromous fish occur throughout the project area, the effects described below for anadromous fish and their habitat are the same for resident rainbow trout and their habitat. In areas where resident rainbow trout occur but not anadromous fish (such as Deer Creek and the unnamed tributary to Grouse Creek), the use of resource protection measures (including Riparian Reserve buffers and BMPs) prevent adverse effects to resident rainbow trout or their habitat from occurring.

Summary of Effects

The project Fisheries Biological Assessment for Anadromous Fish analyzes eighteen fish habitat indicators. Three of those indicators were chosen for analysis: Temperature and substrate embeddedness (settleable material) are objectives in the Basin Plan. Peak flow is a hydrologic condition that directly affects sediment delivery and channel condition.

Stream Temperature

The potential to reduce stream canopy shade from thinning is negligible to non-existent, because there is no variable density thinning within the first site potential tree height in riparian reserves adjacent to flowing or standing water. Canopy shade will not be affected by removal of trees <9" DBH and hand piling of material <9" DBH.

Vegetation manipulation associated with road crossing and culvert work may result in localized reduction of shade cover over streams in the immediate area, especially where vegetation is removed from road fill surfaces at crossings. While all riparian shade cover may be eliminated in areas where road crossing fills are removed, this loss of shade will be limited to fill surfaces on either side of crossings. Vegetation cover is expected to quickly recover at these sites. With the exception of these localized and short-term reductions in stream shade at crossings, Project activities will not reduce stream shade/canopy below 80%. Field research has shown that water temperatures did not increase when taken upstream (at greater than 80% shade canopy cover) and downstream of a stream reach with 80% canopy cover (McGurk 1988). Where localized reduction in canopy cover below 80% is unavoidable, field review by a fisheries biologist will ensure that these reductions are minimized, so that water temperature will not be adversely affected.

The slight amount of riparian vegetation removed by crossing work or hazard tree removal activities at stream crossings, and the addition of cool water entering the stream systems downstream of these activities crossings will result in neutral/undetectable stream temperature effects to anadromous fish and their habitat.

There are two existing landings planned for use that occur within RRs. Their use will have no effect on adjacent stream water temperature because none of the vegetation providing stream shade will be altered.

Vegetation clearing during construction of the 40 new landings will not affect stream shade or stream temperature, since all new landings will be located at least 170 feet from intermittent or non-fish bearing stream channels and 340 feet from fish-bearing stream channels in the Project area (i.e., outside of RRs). This will have a neutral effect on stream temperature (USDA Forest Service 2007).

Several tributaries will provide cool water that more than compensates for any possible small reductions in flow caused by water drafting in tributaries to Grouse Creek and Long John Creek. Affected flows are not reduced from levels otherwise naturally occurring at the point of diversion

by more than 10%. The effect of water drafting on stream temperature will be neutral (USDA Forest Service 2007).

Substrate and Embeddedness

Intact, functioning RRs will not be significantly affected by Project harvest activities, thus their sediment filtering and stream buffering capacity will be fully retained. In a review of the ability of RRs of different widths to buffer streams from adjacent disturbances, Broderson (1973) documented that riparian buffers of approximately one site potential tree height (170 feet on each side of streams in this Project) would be effective to remove sediment under most conditions.

The anticipated small amounts of sediment resulting from yarding are expected to be diluted and dispersed by discharge volumes during 'first flush' precipitation events occurring in the fall season. If any mobilized sediment were to actually reach a stream course, it would be diluted to insignificant amounts by increasing tributary flows downstream through the reaches containing SONCC coho salmon CH, Chinook salmon or steelhead trout habitat, being indistinguishable from baseline level conditions(USDA Forest Service 2007). Yarding will therefore have no adverse affects on stream substrate and embeddedness and is unlikely to adversely affect anadromous fish or their habitat.

Mastication will involve ground disturbance in treatment areas outside of RRs. This disturbance will remain localized, however, and the masticator will create a bed of mulch on which it operates. This mulching will protect any soil disturbed during mastication operations. Masticated mulch is expected to prohibit sediment mobilization from masticated areas down slope towards stream channels. If any mobilized sediment were to actually reach a stream course, it would be diluted to insignificant amounts by increasing tributary flows downstream through the reaches containing anadromous fish habitat (USDA Forest Service 2007).

Underburns will be conducted at low intensity and soil cover requirements will be met on site to minimize erosion. Burning outside RRs is not likely to adversely saffect anadromous fish in their habitat. There is a low probability of effects to suspended sediment, turbidity, and stream substrate from underburning since no underburning will be initiated in RRs, though fire will be allowed to back down into RRs from ignition points higher on the hillslopes (Mt. Ashland LSR Watershed Report (USDA Forest Service 2007a)).

Firelines will be constructed by hand outside of RRs. The intact and fully functioning RRs will buffer any sediment generated from fireline construction. If any mobilized sediment were to actually reach a stream course, it would be diluted to insignificant amounts by increasing tributary flows downstream through the reaches containing anadromous fish habitat.

Landing construction could elevate local surface erosion, but sediment delivery to streams would be minimal, because of size and location. Riparian buffers would filter sediment and landing runoff would not enter road drainage systems (USDA Forest Service 2007a).

There are only two existing landings located in RRs, and they are not associated with active slides or inner gorge areas (USDA Forest Service 2007a). These will be contour ripped (4 to 6

inches deep), seeded, fertilized, and covered with weed-free straw. They will be graded to disperse runoff away from stream courses. A sediment filtration trap will be installed at the outlet area of the landing to dissipate any sediment from reaching stream courses. Finally, the intact condition of RRs, in which these two existing landings are located, will help intercept and filter sediment that is mobilized down slope from them. Therefore, these two existing landings will have no adverse effects on sediment delivery to adjacent streams, and anadromous fish habitat down stream.

Construction of 40 new landings, and the use of, and leveling and blading of the remaining existing landings will have a neutral effect on anadromous fish or their habitat because the activity is of low intensity, BMPs will be followed (see Appendix B in the Project Fisheries Biological Assessment for Anadromous Fish (USDA Forest Service 2007) for list of BMPs applicable to landings) and confined to specific areas outside of RRs and away from anadromous fish habitat, so no effects to anadromous fish or their habitat is expected.

With the exception of decommissioning one existing unauthorized road (# 41S15.1) at the mouth of Long John Creek, the locations of temporary road work, road decommissioning, and road upgrading work, in the Project 7th field watersheds are outside of RRs within anadromous fish habitat or are well above anadromous fish habitat (see Table 7). These road-related activities are expected to have only localized sediment mobilization impacts. BMPs associated with road crossing work, grading, outsloping, and waterbarring will minimize sediment delivery to stream channels, especially during the first storm events in the fall. These benefits should accrue through design features such as using smaller fill volumes, larger sized fill material, and reducing the likelihood of stream capture capability ('pirating') by the adjacent roadbed. All road improvements will create intermediate to long-term benefits to water quality by reducing sediment delivery to nearby channels. No adverse short-term effects and long-term positive effects on stream substrate and embeddedness from these road-related activities are expected (USDA Forest Service 2007).

One stream crossing (unauthorized road # 41S15.1) within anadromous fish habitat will be decommissioned. This road crosses the mouth of Long John Creek. The crossing is a low water ford so no culvert will be removed, therefore no work will occur in the stream channel.

There are two new temporary roads proposed in Riparian Reserves. One crosses an <u>unnamed perennial</u> 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 anadromous fish habitat, respectively.

Effects of decommissioning unauthorized road #41S15.1, the two temporary roads, and the removal of culverts over perennial (2) and intermittent streams(9) at the end of the project will be minimized by Project Design Features, including scheduling Project decommissioning activities during the NOS of April 15 through October 15, and complying with WWOS (USDA Forest Service 2002). Any activities taking place within or near flowing channels at these crossing sites will include dewatering and diversion of the streamflow in conformance with applicable BMPs.

Specific dewatering methods (e.g., pipe, pump, cofferdam, etc.) at these two sites will be determined by the District and/or Forest engineer in consultation with either the district fish biologist or hydrologist. Project Design Features including (1) dewatering and diverting flows around stream crossing sites during construction activities; (2) stabilization, mulching, and seeding of treated areas; (3) long-term reduction of fine fill material; (4) armoring of unstable channel banks; and (5) reestablishment of natural drainage patterns will minimize erosion and sedimentation. Because the base of restored stream beds at the culvert removal sites will approximate natural channel elevations (Elder 2003), inconsequential streambed elevation adjustments will likely occur, thereby mobilizing only small amounts of fine sediment. No adverse short-term effects and a long-term positive effect on stream substrate and embeddedness from this road-related activity are expected.

Construction and subsequent decommissioning of the remaining twenty temporary roads and seventeen unauthorized roads will not occur within RRs, so these activities will not be hydraulically connected to any stream course.

Dust abatement will require water drafting from two established sites within anadromous fish habitat. One site is located on Beaver Creek about 100 yards upstream of the Hungry Creek confluence and the other is located on Cow Creek about 150 yards upstream of where Forest Service road #40N16 crosses the stream. Drafting site maintenance will include erosion control at drafting site access points and/or main roads, to prevent water spillage from initiating sediment movement to adjacent streams. Straw bales, rocking, and containment dikes will be used as needed at the sites to capture any spilled water and prevent runoff to adjacent streams. No new access roads will be built (see RR section below). There are two other water drafting sites in Beaver/Grouse Creek 7th field watershed, and one in Long John Creek 7th field watershed. These sites are located 1.3 to 2.5 miles upstream from anadromous fish habitat.

Sediment disturbance and mobilization from water withdrawal at the these sites is expected to be insignificant, due to flows in Beaver and Cow Creek that dilute low suspended sediment concentrations to levels undetectable from background conditions. No adverse effects to stream substrate and embeddedness are expected.

Peak Flow

In all four 7th field subwatersheds the thinning increases the modeled values for ERA, the indicator that best accounts for changes in flow. Therefore, specific field reviews were conducted to take a closer look at the risk and potential for changes in flows. The Project has resource protection measures and BMPs built into the project design (such as the stand prescriptions, layout, and mark) that minimizes risk of changes to flows. After field review of the thinning treatments, the hydrologist concluded that the prescription will serve to retain binding root strength of the residual vegetation and increase evapo-transpiration potential [water potential] in the soil, by decreasing competition for water and nutrients in the soil in the short term. This also will reduce peak flows by tying up groundwater in the longer term (USDA Forest Service 2007a).

The ERA model shows the greatest degree of proposed action impacts in the Beaver-Grouse and Long John watersheds. Once again this is because of the amount of non-cohesive granitic soils. This can be largely mitigated by project design measures. None of the 7th field watersheds reach their inference points of 1.0 in this model (USDA Forest Service 2007a).

After consideration of the modeled values, past conditions and site level review by the hydrologist, no adverse effects to flows are expected in all four 7th field watersheds and Beaver Creek 5th field watershed. There should be benefits throughout the project area from thinning in the long term by reducing risk of high intensity wildfires that could significantly alter stream flows.

Underburning occurs within thinned areas (approximately 2361 acres) and in two underburn stands totaling 120 acres. There is a low probability of causing changes to surface flows through underburning because of the regrowth in remaining vegetation that occurs after low intensity fires. The underburning will occur over several years, after thinning has created safe burning conditions, reducing the probability of effects to surface flow.

Underburning is expected to have a neutral effect on flows because existing vegetation will take up water made available by the vegetation removed by burning. There are neutral effects to anadromous fish and their habitat and watershed condition in the short term, with long term benefits to anadromous fish and watershed conditions in the long term by reducing risk of high intensity wildfires that could significantly alter stream flows.

The fire lines are not built in RRs and therefore have a low probability of affecting flows. The hand-constructed fire lines will be obliterated after use and therefore will not change drainage patterns that may affect flows.

The fire lines will be covered with slash and dirt so that erosion is minimized; no adverse effects to anadromous fish or their habitat are expected.

Except for the one short new temporary road (T206B) proposed within an RR and the short segment of another temporary road (T401) that crosses and runs parallel to an RR for a short distance, the construction of new temporary roads does not occur in proximity to RRs. The lengths of new road T206B and the short segment of road T401 within RRs are 0.07 and 0.15 miles, respectively. The remaining twenty temporary roads to be constructed are distributed in short segments throughout the project area.

Surface runoff from the two temporary roads within RRs are not expected to increase the probability of changing the flow regime because each road is located high up in the watershed and BMPs and Resource Protection Measures will minimize the probability of surface run-off from the roads entering stream channels. Hazard tree reductions involve individual trees scattered in the area, with no concentrated removals. Therefore, the probability of impacts from hazard tree removal is discountable (USDA Forest Service 2007).

No adverse effects to peak flows from decommissioning of 22 existing unauthorized roads (and ten stream crossings) are expected, with long-term positive effects, for the same reasons described in the stream substrate and embeddedness effects analysis above.

Impacts to peak flows from hazard tree removal is discountable. Because removal of LWD is limited in extent and intensity, per the Resource Protection Measures. When hazard trees must be felled, large trees recruitable to the stream will be left in RRs.

The use of existing landings will not cause a change in flows; there is no causal mechanism for such a change. No new landings will be constructed within RRs.

The new landings to be constructed outside the RRs have been accounted for within the ERA modeling (See Appendix A in the Project Fisheries Biological Assessment for Anadromous Fish: tables A-7, A-8, and A-9) and those results have been clarified by the hydrologist's field reviews. These landings are not hydrogically connected to any stream course so there is no probability that these landings will cause a change in flows. BMPs 1.12, 1.16, 2.3 and Resource Protection Measures are part of the project design.

The size of individual landings is guided by safety requirements and landings are kept to the smallest size practical, approximately 0.33 acres each. The construction and use of the new landings will have neutral effects to peak flows in Beaver Creek, Cow Creek, Grouse Creek and Long John Creek due to the small size of the landings, no new landings constructed in RRs, and the distance between the landing construction and anadromous fish habitat in Cow Creek, Long John Creek, Grouse Creek, and Beaver Creek.

At the site level, water drafting has the potential for short term, indirect effects downstream. Pumping rate will not exceed 350 gallons per minute or 10% of the flow of any anadromous stream and pumping is done in short periods (for example, six trips per day to a site and drafting for 20 minutes each time). Water drafting will result in only slight temporary decreases in flow over the course of a 24-hour period that is considered insignificant when drafting from Cow Creek and Beaver Creek because of their large flows. Therefore, the effects to flow (and to anadromous fish and their habitat) are considered insignificant in the short term and neutral in the long term. Screening and restricting withdrawal rates will minimize the potential for effects to anadromous fish and their habitat.

In all four 7th field watersheds the thinning increases the modeled values for ERA, the Indicator that best accounts for change's in flow. Therefore, specific field reviews were conducted to take a closer look at the risk and potential for changes in flows. The Project has resource protection measures and BMPs built into the project design (such as the unit prescriptions, layout, and mark) that minimizes risk of changes to flows. After field review of the thinning treatments, the hydrologist concluded that the prescription will serve to retain binding root strength of the residual vegetation and increase evapo-transpiration potential [water potential] in the soil, by decreasing competition for water and nutrients in the soil in the short term. This also will reduce peak flows by tying up groundwater in the longer term (USDA Forest Service 2007a).

The ERA model shows the greatest degree of Project impacts in the Beaver-Grouse and Long John watersheds. Once again this is because of the amount of non-cohesive granitic soils. This can be largely mitigated by project design measures. Since the change in risk ratios is below the

level of significance (1.0) in all four 7th field watersheds and Beaver Creek 5th field watershed, these modeled changes are considered insignificant (USDA Forest Service 2007a).

After consideration of the modeled values, past conditions and site level review by the hydrologist, effects to flows will be insignificant in the short term for all four 7th field watersheds and Beaver Creek 5th field watershed. There should be benefits throughout the project area in the long term by reducing risk of high intensity wildfires that could significantly alter stream flows.

Cumulative effects are the effects from foreseeable actions combined with the effects of past and ongoing actions and the proposed action. . A number of projects are *currently* being implemented (ongoing) to reduce the fire risk around the Project area. These burning and mechanical thinning actions were considered part of the baseline for fish habitat conditions (USDA Forest Service 2007) and had no or only insignificant effects to anadromous fish and their habitat. *Future foreseeable* actions for this project are also proposed for implementation: The Ashland Forest Resiliency Project. This project has a low risk of impacting fish or their habitat and has long term beneficial effects by reducing the fire risk around portions of the Project area. The present, ongoing, and future foreseeable projects modeled and qualitatively evaluated all have resource protection measures so that the fisheries resource is not adversely affected. Each of these actions are of low intensity across the landscape, have no or insignificant effects to fish and their habitat and are typically separated by time or space, or both. Many of the past, ongoing and proposed future projects compliment the proposed action in the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project by reducing the risk of high intensity wildfires and therefore protect life, property, and natural resources in and around the Beaver Creek Watershed. Because of the low intensity of these actions, cumulative short-term effects to anadromous fish and their habitat are considered insignificant. When considered together, the long-term effects of all these actions and the proposed action will be beneficial because the actions reduce fuels and improve forest health conditions.

An analysis for EFH is contained in the Project Fisheries Biological Assessment for Anadromous Fish (USDA Forest Service 2007) for anadromous fish by proxy through the evaluation of impacts to Chinook and coho salmon habitat. The distribution of EFH is equivalent to the distribution of SONCC Coho Salmon Critical Habitat (CH). The KNF has determined that there are no adverse effects to EFH through its ESA determination of "May Affect, is not Likely to Adversely Affect" coho salmon or its Critical Habitat.

Effects to the fisheries resource (including coho CH and EFH) from Alternative 4:

It was determined that Alternative 4 has less project activities and impacts, and therefore their effects would be less than the impacts/effects of Alternative 2. Alternative 4 has less skyline, tractor, tractor endline, combination ground-based systems and mechanical harvester acres than Alternative 2. The total acreage is less than Alternative 2 (3354 acres versus 3875 acres).

Alternative 4 has fewer numbers and miles of existing unauthorized roads to be decommissioned than in Alternative 2. Therefore, the effects are slightly less for Alternative 4. The effects of temporary road construction and decommissioning are the same for Alternatives 2 and 4 (insignificantly negative) and neutral for Alternative 5 (no temp road construction in RRs).

The effects from underburning, mastication, and fireline construction are slightly less in Alternative 4 (less acres of underburning and mastication versus Alternative 2). Therefore, there is less fuels risk reduction in Alternative 4 than Alternative 2 creating less long term protection for the watershed.

Effects from landing construction, hazard tree removal, and water drafting are the same for all three alternatives.

Effects to the fisheries resource (including coho CH and EFH) from Alternative 5:

It was determined that Alternative 5 has less project activities and impacts, and therefore their effects would be less than the impacts/effects of Alternative 2. Alternative 5 has less skyline cable, tractor, combination ground-based systems, and mechanical harvester acres than Alternative 2. Alternative 5 does have more helicopter acres than Alternative 2, but helicopter harvest is the least ground disturbing activity of the six harvest methods that will be used for the project.

Alternative 5 has fewer numbers and miles of existing unauthorized roads to be decommissioned than in Alternative 2. Therefore, the effects are slightly less for Alternative 5. The effects of temporary road construction and decommissioning are neutral for Alternative 5 (no temp road construction in RRs).

The effects from underburning, mastication, and fireline construction are the same in Alternative 5 (the acres of underburning and mastication are nearly the same as in Alternative 2). There is no detectable change in fuels reduction from these types of actions between Alternative 5 and Alternative 2.

Effects from landing construction, hazard tree removal, and water drafting are the same for all three alternatives.

The model-derived differences of a few hundredths do not reflect any meaningfully measured, detected, or evaluated differences in risks to watershed conditions between alternatives.

Effects to the fisheries resource from the No Action Alternative

Background: It is reasonably accepted that wildfire can cause fish mortality direct and indirectly by modifying habitat quality (O'Laughlin, 2005 Page 62). The effects to vegetation can accelerate soil erosion rates and sediment delivery to streams. As described in the EIS for this specific project, the conditions of federal Forests in the western United States has deteriorated to the point that puts many resources at risk from severe wildfire effects (O'Luaghlin2005). O'Laughlin emphasizes the need to review an action proposed to change current forest conditions to make sure the "cure is not worse than the disease" (O'Laughlin, 2005 page 63). While the occurrence of a wildfire is not predictable, it is assumed it will happen at some point in time, with a probability of occurrence to be 1.0 (O'Laughlin, 2005, Page 66). Biologists have predicted that sediment generated from wildfires can be 70 times the sediment generated from thinning used to reduce hazard fuels (O'Laughlin, 2005, Page 67-68).

Direct and Indirect Effects: There will be no management action under this alternative, there are no direct effects. Indirect effects are those which would occur if a wildfire were to burn through the area. The risk of impacts to watershed condition from implementing the proposed action in relation to the impacts without pre-emptive treatment (the No Action alternative) was evaluated by the project hydrologist, using the Water Erosion Prediction Project model[1] (WEPP) model. The assumptions made in the WEPP model runs were: A 20% reduction in canopy and ground cover between existing and post-project situations; and a 50% reduction in canopy and ground cover after the high intensity fire scenario. If an escaped wildfire burned through the area there, with no fuels reduction action, there would be a 50-fold increase in the runoff, with a resulting 837-fold increase in sedimentation (USDA Forest Service 2007a). The impacts to watershed condition could negatively impact the fish by impacting their habitat Indicators.

I found that the effects conclusions for the Project are consistent with the trends shown in Laughlin's model (Figure 4 in O'Laughlin, 2005) comparing short-term fuel treatment implementation risk and long term environmental risk. Although, unlike an assumption in the O'Laughlin's model, negative impacts to watershed function and fish from implementing the Proposed Action are not significant because of the overall project design and resource protection measures incorporated into the design. Therefore the Project has less risk to fish in the short term than was assumed in O'Laughlin's model. Similar to O'Laughlin's model, implementation of the Project has long term benefits to watershed conditions, and therefore to fish and fish habitat.

Cumulative effects: There will be no management action under this alternative; therefore there are no cumulative effects under this alternative beyond what is described under 'indirect effects' above.

Policy and Legal Direction

Management direction for maintenance of watershed conditions and aquatic species is contained in the Endangered Species Act (ESA), the Magnuson-Stevens Act, the National Forest Management Act, Clean Water laws, and the Klamath National Forest Land and Resource Management Plan (LRMP).

Klamath National Forest Land and Resource Management Plan: the Standards and Guidelines for Management Area 10 apply to the fisheries resource. The IDT team worked together to design the project with resource protection measures to assure the project was consistent with applicable Standards and Guidelines. The Aquatic Conservation Strategy objectives are met at the 5th field watershed scale.

The Endangered Species Act: Forest activities must be consistent with the ESA. Early consultation was conducted with NMFS in 2006. NMFS staff participated in field trips and

[1] The WEPP model (Flanagan and Livingston 1995) is a physically-based soil erosion model that can provide estimates of soil erosion and sediment yield considering the specific soil, climate, ground cover, and topographic conditions. It was developed by an interagency group of scientists including the U.S. Department of Agriculture's Agricultural Research Service (ARS), Forest Service, and Natural Resources Conservation Service; and the U.S. Department of Interior's Bureau of Land Management and Geological Survey. http://forest.moscowfsl.wsu.edu/fswepp/docs/distweppdoc.html#model

Interdisciplinary Team meetings. A final Biological Assessment with an agreed upon ESA determination of "May Affect, Note Likely to Adversely Affect coho salmon and its Critical Habitat was submitted to NMFS in April 2007.

The National Forest Management Act:

- The analysis has included the consideration of direct, indirect, and cumulative effects to aquatic species considered USDA Forest Service Region 5 Sensitive (USDA Forest Service 2007) and Klamath National Forest Management Indicator Species (MIS Report). The proposed action can have a beneficial effect on riparian and stream associated MIS species and populations by reducing the risk of high intensity fires that would degrade habitat (through sediment transport after a wildfire) or directly eliminate suitable MIS habitat.
- Chinook salmon and Steelhead trout are listed as Forest Service Sensitive species in Region 5. The LRMP includes provisions from the NFP ROD to protect and improve conditions for aquatic species, including salmon and trout: Implementation of the NFP ROD Standard and Guidelines were designed to "reverse the trend of degradation and begin recovery of aquatic ecosystems on federal lands within the range of the owl" (NFP ROD, page 46). The Northwest Forest Plan ROD also addresses the matter of long-term persistence of late seral and early seral dependent species stating that, "implementation of the ROD fully meets our statutory and regulatory requirements regarding fish and wildlife resources." Overall, implementation of the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project will help maintain the health of forested ecosystems by increasing stand health and resiliency to wildfires. The project design and Resource Protection Measures will prevent adverse effects to aquatic habitat (including that for Chinook salmon and steelhead trout) at the site scale and minimize effects to steelhead and Chinook habitat downstream at the 7th and 5th field watershed scales. Water withdrawal for dust abatement (for safe road use) in Sensitive anadromous fish bearing reaches may directly impact fish while the pump is being set up and is operating if fish are close to the pump during drafting. But the effects would not extend past the road use period and will be insignificant because screen size and pump rate restrictions (per NMFS 2001 guidelines) prevent adverse effects to individuals (RPM (v)4). Therefore, no individuals are expected to be adversely affected. Some mechanical thinning will occur in the Riparian Reserve land allocation; equipment use is excluded from wetted stream channels to prevent impacts to riparian habitat. Prescribed fire would only be permitted to creep into these riparian areas and, except for two short (0.07 and 0.15 miles long, respectively) sections of road, temporary roads are not proposed in Riparian Reserves. Therefore, there would be only minimal and/or short-lived effects on fish and their habitats. No habitat would be removed for rainbow or steelhead trout, so project activities are not likely to adversely affect salmonid populations. For example, the effects analyses in the Project Fisheries Biological Assessment for Anadromous Fish show that there will be no change to the overall functioning of the relevant Indicators for anadromous fish habitat. The Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project will not reduce species' viability (USDA Forest Service 2007).

  A trend toward listing under the ESA is not anticipated and viability is not at risk because the Project meets Standards and Guidelines, does not adversely modify its habitat in the long term, and individual Chinook salmon and steelhead trout are not expected to be

adversely impacted by Project activities and there are beneficial effects to habitat in the long term, as analyzed in Section VI of the Project Fisheries Biological Assessment (USDA Forest Service 2007). Biodiversity of aquatic species is maintained through the use of Standards and Guidelines in the LRMP, including development of Resource Protection Measures, compliance with the ACS, use of RR buffers, and evaluation at the 5th field watershed scale in Watershed Analyses. The effects to the 5th field watershed (Beaver Creek) and the mainstem of the Klamath River were also considered: Potential negative impacts to aquatic habitat were found to be insignificant in the short term, and the long term effects were found to be beneficial to aquatic species at these different scales (USDA Forest Service 2007 and MIS Report). The proposed action would reduce sediment transport to channels in the event of a wildfire and would therefore provide a beneficial long-term cumulative effect for riparian and stream associated species.

- Streamside Management Zone: protection of streamside management zones is accomplished through designation of RR buffers and equipment exclusion zones (BMP 1.10) and field verification of specific activities within RRs.
- Overall, the Project has been designed to prevent loss of life, property and natural resources by changing fuels conditions to reduce the risk of high intensity fires.

The Magnuson-Stevens Act: An analysis for EFH is contained in the Biological Assessment for anadromous fish by proxy through the evaluation of impacts to Chinook and coho salmon habitat. The KNF followed the 2004 and 2001 Guidance from NMFS for "Integrating Magnuson-Stevens Fishery Conservation and Management Act EFH Consultations with Endangered Species Act Section 7 Consultations National Marine Fisheries Service." The KNF is not requesting consultation or conservation recommendations for EFH because the KNF has determined that there are no adverse effects to EFH through its ESA determination of "May Affect, is not Likely to Adversely Affect" coho salmon or its Critical Habitat. The distribution of EFH is equivalent to the distribution of CH.

The Clean Water Act: Implementing BMP's, meeting water quality objectives (suspended sediment, turbidity, and temperature), and protecting beneficial uses (USDA Forest Service 2007a) ensures compliance with the Clean Water Act and North Coast Regional Water Quality Board Basin Plan.

SIGNIFICANCE ELEMENTS

Effects Relative to Significance Elements

Significance elements include consideration of both context and intensity. These elements are addressed here in relation to the action alternative.

(1) Impacts may be both beneficial and adverse. A significant effect may exist even if, on balance, effects are believed to be beneficial.

The IDT developed Resource Protection Measures to minimize the effects of the project on aquatic resources. The Project will have insignificant negative effects in the short term and beneficial effects in the long term on fisheries resources. As shown in the Project Fisheries Biological Assessment, the intensity of effects, described by "magnitude" is insignificant to individuals (direct effects) and to all habitat indicators (indirect effects). No direct effects to fish populations are expected by implementing the proposed action (USDA Forest Service 2007 and MIS Report). Fish populations would be beneficially affected by reducing the risk of degrading watershed conditions via uncharacteristic wildfires' impact on soils and vegetation. Snavely concluded that 5th field watershed conditions would be maintained or improved in the long term (USDA Forest Service 2007a).

(2) **The degree of effects on public health or safety.** See Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Watershed Report (USDA Forest Service 2007a).

(3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

The 107 miles of the Klamath River is designated as Wild and Scenic on the KNF. Wild and Scenic Rivers shall be preserved in free flowing condition; they and their immediate environment shall be protected for the benefit and enjoyment of future generations. No Project activities occur along the Klamath River. Project activities do occur in watersheds that contain tributaries to the Klamath River. The objective of the project is to protect the forests around a portion of the Beaver Creek 5th field watershed from high intensity wildfires, promoting healthier forest. The project is designed to achieve this objective without causing adverse effects to fish (USDA Forest Service 2007 and MIS Report).

(4) The degree of controversy over environmental effects.

The proposed action was reviewed in the field and in Interdisciplinary Team Meetings with staff from the NMFS. The NMFS staff acknowledged the current condition of the landscape and agrees with the findings in the Project Fisheries Biological Assessment (via personal communication during project development and through responsive comments to draft Biological Assessment. The Proposed Action and the associated effects analysis for fisheries is consistent with the direction to the agencies responsible for implementing the ESA to evaluate and balance the long term benefits of fuel treatment projects, as well as the long term risk of catastrophic wildfire, against any short or long term adverse effects (Williams and Hogarth, 2002).

(5) The degree to which the possible effects on the human environment is highly uncertain or involves unique or unknown risks.

The type of effects predicted for fisheries resources are not highly uncertain, not unique, nor are they unknown. The fuels reduction activities that are proposed are similar to other activities conducted on National Forest land. The photograph below was taken by NMFS staff in June 2006. It is an example of a riparian reserve area that is within the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project area. This area is scheduled for thinning within the second site potential tree height. The thinning will be trees <9" DBH.

Conclusions from recent monitoring of forest restoration through conifer removal were similar to conclusions regarding impacts to aquatic habitat conditions from the proposed action. On the Lassen National Forest, Tate found the effects to temperature and water quality after removing trees near streams to be insignificant (Tate 2004). On another project, the KNF staff monitored the Glassups timber sale in the fall of 2004. The Glassups timber sale proposed timber harvest in a more intensive manner than what is proposed for the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project, and the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project treats a larger number of acres dispersed across a larger area. Therefore, based on the

level of intensity for the Project and the site specific monitoring that was done for Glassups, I assumed that the conclusions from monitoring the Glassups project could be applied to the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project with equal or better results. The monitoring group (DelaFuente and Haessig, 2004) found that much of the Glassups Timber Sale project activity was on gentle dormant landslide terrane in the Jessups Gulch watershed and there was very good application of BMP's to this project overall. Some activities which looked very good were:

a) There was very little if any project-related delivery of sediment to streams;
b) Minimal disturbance to soil and residual trees in and adjacent to cable corridors;
c) Water hole development and protection
d) Minimal earthwork in landing construction, and staying on gentle ground;
e) Addressing wet areas (placement of rock and fabric) and avoiding unstable land (active landslide) in reconstruction of an existing road;
f) Decommissioning of the temporary spur in unit 165.
g) Streamside areas were protected by the marking crew.

For the Glassups project, one activity which could have used improvement, but didn't result in sedimentation was the landing in Unit 165. It could have used better reshaping (crowning). This condition did not affect fish or their habitat because it didn't result in sedimentation to streams.

(6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The project is part of a strategy to reduce the risk from uncharacteristic wildfires by changing lands in Condition Class 2 and 3 to Condition class 1. This is a positive effect on the local environment.

(7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment

The present, ongoing, and future foreseeable projects modeled and qualitatively evaluated all have resource protection measures so that the fisheries resource is not adversely affected. Each of these actions are of low intensity across the landscape, have no or insignificant effects to fish and their habitat and are typically separated by time or space, or both. Many of the past, ongoing and proposed future projects compliment the preferred alternative in the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project by reducing the risk of high intensity wildfires and therefore protect life, property, and natural resources in and around the Beaver Creek 5th field watershed. Because of the low intensity of these actions, cumulative short-term effects to anadromous fish and their habitat are considered insignificant. When considered together, the long-term effects of all these actions will be beneficial because the actions reduce fuels and improve forest health conditions.

(8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. (n/a for fisheries)

(9) The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.

> **Fish –** The Project has an ESA determination of "Not Likely to Adversely Affects coho salmon or its Critical Habitat". The project has the potential to have beneficial effects to coho salmon and it Critical Habitat in the long term (USDA Forest Service 2007). The Project will not affects Lost River and short nose suckers because the project area is outside their range and does not contribute water to streams within their range.

(10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

The beneficial uses for the middle Klamath River (including the tributaries in the analysis area) include coldwater fish habitat, and multiple domestic water sources. Suspended sediment, turbidity, and temperature are the relevant water quality objectives for this project as defined in the North Coast Regional Water Quality Control Board Water Quality Control Plan. Best Management Practices (BMPs) to maintain water quality for those beneficial used during the Project are contained in the EA. These State-wide BMPs, certified by the State of California Water Quality Resources Control Board, and approved by the Environmental Protection Agency, were developed to help the Forest Service comply with Section 208 of the Clean Water Act. The Project specific BMPs will be used to meet water quality objectives specified in the Water Quality Control Plan for the North Coast Region (State of California, 1993).

Early consultation was conducted with NMFS in 2006. NMFS staff participated in field trips and Interdisciplinary team meetings. Level 1 agreed to the ESA determination of "May Affect Not Likely to Adverse Effect" coho salmon and its Critical Habitat on June 13, 2006.

References:

- **Broderson, J. M. 1973.** Sizing buffer strips to maintain water quality. M.S. Thesis, University of Washington, Seattle, WA.

- **Elder, Don. 2003.** Road Stormproofing and Decommissioning Objectives, Definitions and Treatments. USDA Klamath National Forest, Supervisor's Office, Yreka, CA.

- **Klamath National Forest. Specialist Reports for Mt Ashland LSR Habitat Restoration and Fuels Reduction Project: 2007:**

    - Aquatic Conservation Strategy Report (included as Appendix II in the Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Watershed Report).
    - MIS Project Level Assessment Parts I And II. 2006. Prepared By Dave Johnson And Brian Thomas.
    - USDA Forest Service. 2007. Biological Assessment/Evaluation For Threatened, Endangered, And Sensitive Anadromous Fish Species That May Be Affected By Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project. Prepared by Brian Thomas.

- USDA Forest Service. 2007a**.** Klamath National Forest. Mt. Ashland LSR Habitat Restoration and Fuels Reduction Project Watershed Report. Prepared By William Snavely

- **McGurk, Bruce J. 1988. Predicting Stream Temperature After Riparian Vegetation Removal.** *In* Proceedings of the California Riparian Systems Conference. Davis, California. 1988. Pages 157-164.

- **O'Laughlin, Jay.** 2005. Conceptual Model For Comparative Ecological Risk Assessment Of Wildfire Effect On Fish, With And Without Hazard Fuel Treatment. Elsevier – Forest Ecology And Management 211 59-72.

- **Meehan, William R. Editor. 1991. Influences of Forest and Rangeland Management on Salmonid Fishes and Their Habitats.** American Fisheries Society Special Publication 19. U.S. Department of Agriculture. Forest Service.

- **State of California.** 1993. Water Quality Control Plan for the North Coast Region. California Regional Water Quality Control Board North Coast Region. http://www.swrcb.ca.gov/rwqcb1/programs/basinplan/bpdocs.html

- **State of California,** 1995. Fish Species of Special Concern in California. California Department of Fish and Game. Page 239.

- **Tate, Kenneth W.** 2004. Long-Term Environmental Effects of Conifer Removal to Achieve Aspen Release in Near-Stream Areas within the Northern Sierras. Annual Report. (Pages 14-18).

- **USDA Forest Service. 2002.** Field Guide for Use with Wet Weather Operation Standards (WWOs). Klamath National Forest

- **USDC National Marine Fisheries Service.** 2001 Guidance for Integrating Magnuson-Stevens Fishery Conservation and Management Act EFH Consultations with Endangered Species Act Section 7 Consultations. National Marine Fisheries Service. January 2001. http://swr.nmfs.noaa.gov/hcd/guidance1.pdf

- **USDC National Marine Fisheries Service.** 2004. Essential Fish Habitat Consultation Guidance. April 2004. Version 1.1. Page C5 and C6

- **Williams and Hogarth.** 2002. Evaluating the Net Benefit of hazardous Fuels Treatment Projects. Memorandum, direct US fish and Wildlife Service and Assistant Administrator for Fisheries, NOAA. December 10. (as cited in O'Laughlin, Forest Ecology and Management 211 (2005) Page 15-27). http://endangered.fws.gov/consultations/healthy_forest.pdf