

**Decision Notice/Finding of No Significant impact:  
Upper Trout Creek Riparian, Stream Channel and Fish Passage Rehabilitation Project**

## **APPENDIX A – REQUIRED MITIGATION AND MONITORING PLAN**

### **MITIGATION**

(Note: BMP refers to Best Management Practices identified in the *Gifford Pinchot National Forest Land and Resource Management Plan* (1990). T&C refers to terms and conditions required by the NOAA Biological Opinion for this project (2/20/2004).)

Mitigation measures 1 through 13 would be implemented to protect aquatic habitat from erosion and/or sedimentation.

1. All perennial watercourses adjacent to in-channel work will be snorkeled to locate adult and juvenile salmonids. Heavy machinery access and construction would be restricted from areas that contain adult steelhead or high densities of juveniles. BMP W-1

**Responsibility:** Contract Administrator, Fisheries Biologist

2. The use of mechanized equipment within the ordinary high-water mark would be held to a minimum. Approved equipment would be limited to tracked excavator and dozer GVW no greater than 70,000 lbs., portable winch, power saws and hand tools. BMP VM-2

**Responsibility:** Contract Administrator, Fisheries Biologist

3. A spill containment and hazardous material kit will be on site during in-stream operations. Petroleum absorbent containment booms will be placed downstream of in-stream construction sites as a precaution. BMP W-4, T&C 2.4

**Effectiveness:** High

**Ability to Implement:** High

**Responsibility:** Contract Administrator, Fisheries Biologist

4. All equipment used for instream work will be cleaned of external oil and grease prior to entering the two-year floodplain. Untreated rinse water will not be discharged into streams or rivers. T&C 2.3

**Responsibility:** Contract Administrator

5. Areas for fuel storage, refueling, and servicing of equipment and vehicles will be at least 150 feet from the stream channel. Fueling and maintenance activities will take place within a contained area. Areas will be designated for overnight storage of vehicles and equipment. T&C 2.7

**Responsibility:** Contract Administrator

6. No trees will be cut within 25 feet of the edge of any stream. This measure is intended to ensure that shade-producing trees and trees that are essential to bank stability are retained in the immediate vicinity of all streambanks. T&C 1.2

**Responsibility:** Contract Administrator, Fisheries Biologist

7. All trees to be cut within Riparian Reserves will be identified and marked prior to initiation of cutting. The intent of this measure is to ensure that silvicultural prescriptions are followed and that resultant forest conditions retain the intended level of canopy closure.

**Responsibility:** Contract Administrator, Fisheries Biologist

8. Access points used to allow heavy machinery to enter streams will be rehabilitated and protected following use. This will include shaping the disturbed area to a stable configuration, revegetating it, and applying rock or woody debris where necessary to further protect the site from subsequent erosion, and to block vehicular access to the stream. The objective of this is to limit erosion and sediment delivery from disturbed areas immediately adjacent to the stream. T&C 1.2

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**Responsibility:** Contract Administrator, Fisheries Biologist

9. Control methods such as diversion of water away from excavation sites, use of filter fences, temporary settling ponds, and check dams would be required in order to minimize downstream sedimentation and turbidity. These structures will be in place prior to commencement of excavation, instream construction or structure placement. BMP R-13, T&C 2.1

**Ability to implement:** High

**Effectiveness:** High

**Responsibility:** Contract Administrator, Hydrologist

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10. Mulch, willow cuttings and native grass would be used on areas of ground disturbance in order to reduce surface soil erosion and sedimentation. BMP VM-3.

**Ability to implement:** High

**Effectiveness:** High

**Responsibility:** Contract Administrator, Hydrologist

11. Access roads would be rehabilitated upon completion of the project. These roads would be waterbarred and seeded with native grasses in order to prevent noxious weed infestation. BMP R-7, R-23.

**Ability to implement:** High

**Effectiveness:** High

**Responsibility:** Hydrologist

12. LOP for in stream work: In stream work would be limited to the time period designated by the State on the Hydraulic Permit. In stream work would be limited to the period of low flow which is typically between July 15 - September 30. To comply with the Terms and Conditions of the Biological Opinion, instream work will be completed by August 31. Any extension on the in-water work period will first be approved by, and coordinated with, NOAA Fisheries. T&C 1.1

**Ability to implement:** High

**Effectiveness:** High

**Responsibility:** Contract Administrator, Hydrologist

13. During excavation, native streambed materials will be stockpiled out of the two-year floodplain for later use. (BO, T&C 1.3)

**Responsibility:** Contract Administrator

Mitigation measures 14 through 25 are prescribed to protect and/or enhance wildlife habitat and botanical resources within riparian areas.

14. To retain diversity, retain remnant old growth conifers, cottonwoods, and existing large woody debris.

**Responsibility:** Contract Administrator, Silvicultural Operations

15. To retain and/or protect snag habitat, retain snags, trees that have been girdled by bears, or have other physical defects predisposing the tree to early mortality.

**Responsibility:** Contract Administrator, Silvicultural Operations

16. In upland stands, 10 trees / acre will be designated for conversion to coarse woody debris and left on site or left standing for conversion to snags. The Wildlife Biologist would designate these trees. The rest of the trees designated for cutting would be cut and skidded to the stream to be used as material for constructing structures.

**Responsibility:** Contract Administrator, Wildlife Biologist

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17. Individual trees with dbh greater than 30" would be left within all treatment units. Where feasible, large leave aggregates should be designated around these trees. The rest of the trees designated for cutting would be cut and skidded to the stream to be used as material for constructing structures.

**Responsibility:** Contract Administrator, Wildlife Biologist

18. To provide for bat habitat, retain trees that contain cavities, have deeply furrowed bark, loose bark, or evidence of hollow interiors.

**Responsibility:** Silvicultural Operations Technician

19. To provide for future snag habitat, funding would be requested to top trees to create snags in green trees selected for future snag habitat. Blasting tops would not be allowed.

**Responsibility:** Silviculturist, Wildlife Biologist

20. To protect spotted owls, implement a seasonal restriction in the project area for felling or mechanized operations. These operations would not be allowed from March 1 to June 30. Activities also include helicopter operations, and instream work. In addition, to the extent possible, confine helicopter and instream work to one reach or tributary at a time.

**Responsibility:** Silviculturist, Wildlife Biologist

21. In order to prevent harassment to wintering deer and elk, no felling or mechanized operations would be allowed during the December 1<sup>st</sup> through April 1<sup>st</sup> winter stress period.

**Responsibility:** Contract Administrator

22. In order to ensure protection of botanical and wildlife Sensitive species, felling, skidding, and structure construction would be avoided within protection buffers. Twenty-nine acres in Compass Creek, 25 acres in Crater Creek, 22 acres in Layout Creek, 3 acres in Trout Creek and 9 acres in Planting Creek have been designated by the district Botanist and Wildlife Biologist. Any target species found during implementation would be given the same consideration.

**Responsibility:** Silviculturist, Botanist, Wildlife Biologist

23. Establish a 132-foot protection buffer around known occurrences of coldwater *Corydalis* in the project area. If additional populations are found, they too would be given the same protection buffer. All project activities are prohibited within these buffers, except with Botanist approval.

**Responsibility:** Botanist

24. All project activities within the Compass Creek, Crater Creek and the upper reaches of Trout Creek, Layout Creek, and Planting Creek, including construction of channel and floodplain structures, road, skid trail and landings, and riparian thinning and release treatments (including "buck and chuck"), must be reviewed and approved by the District Botanist.

**Responsibility:** Contract Administrator, Botanist

25. If a goshawk nest were found, it would be protected with a 660' no-thin protection buffer. No felling or mechanized project related activities would be allowed within ¼ mile of the nest during the March 1 through Aug 1 nesting period.

**Responsibility:** Silviculturist, Wildlife Biologist

Mitigation measures 26 through 32 would ensure stand diversity within riparian areas.

26. Pacific yew, Black Cottonwood, and Bigleaf maple trees would be protected during felling and log removal. Yew, Cottonwood, and Bigleaf maple trees would not be an included species to be cut. The following stipulations would apply: 1) directional felling away from the Pacific yew, Cottonwood, and Bigleaf maple would be required, and 2) should yew, cottonwood, or maple be severely damaged from log removal, it would be high stumped (minimum 1 foot) in order to promote basal sprouting.

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**Responsibility:** Contract Administrator, Silvicultural Operations

27. Ground Based Skidding Restriction. In areas proposed for commercial thinning, ground based skidding operations will be suspended during the period of sap flow to prevent damage to the boles of leave trees (bark slough). The sap flow period lasts from the time of bud break in the spring (May 1<sup>st</sup>) to the time of bud set in Midsummer (July 15<sup>th</sup>).

**Responsibility:** Silvicultural Operations

28. Leave Tree Preference. Leave tree species preference for retention in commercial thinning units: Western red cedar, western white pine, noble fir, grand fir, western hemlock, Douglas fir, and Pacific silver fir.

**Responsibility:** Contract Administrator, Silvicultural Operations

29. Conifer Stump Height Restriction. Stump heights to be no more than 12" in height.

**Responsibility:** Contract Administrator, Silvicultural Operations

30. Riparian Enrichment Planting. The thinned areas (second growth), of the riparian, will be underplanted with a mixture of western hemlock, grand fir, western white pine, and western red cedar trees to enhance structural diversity. Included in this process would be cutting/bucking/placing material from the previous thinning/falling operation over selected seedlings to mitigate expected animal browsing. Plant a mix of species [Western red cedar (50%), western white pine (10%), grand fir (20%), and western hemlock (20%)] on a 12' x 12' spacing. Utilize thick slash to "hide" seedlings from browse animals.

**Responsibility:** Silvicultural Operations

31. Young Stand Thinning. Trees will be cut (maximum dbh cut = 7 inches) and spaced 14' x 14' (approximately 220 to 250 trees/acre) utilizing a "site adapted/structure based approach to young stand thinning. Minor tree species (western red cedar, western white pine, and noble fir) are retained and just the tree species that are causing the density problem (ie. Douglas fir) will be thinned.

**Responsibility:** Silvicultural Operations

32. 12 inch diameter and larger Douglas fir logs. To help prevent the Douglas fir beetle from producing brood in these host logs, trees of this diameter and larger should only be cut no earlier than July 1 and no later than the September 30. These logs should be placed in sunny locations as much as possible.

**Responsibility:** Silvicultural Operations

Measures 33 through 40 would minimize the potential for exacerbating noxious weed infestation.

33. To minimize the potential for the transporting and/or infestation of noxious weeds, mechanized equipment would be required to be cleaned of foreign plant material prior to entering the National Forest.

**Responsibility:** Contract Administrator

34. Monitor the establishment of any noxious weeds resulting from ground disturbance. If noxious weeds are found during monitoring, they would be eradicated by the most appropriate means available as recommended by the Botanist.

**Responsibility:** Botanist

35. Within the project area, one or more weed zones may be designated by the District Botanist as a method to control the spread of weeds in the project area. All equipment working within a particular weed zone will be washed using a high-pressure water spraying system to clean off weeds and weed seeds prior to departing the zone to reduce the risk of transporting and introducing weeds to other areas within or outside the project. The debris washed off the equipment shall either be contained and removed from the area to an appropriate site for disposal, or buried onsite and monitored for

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subsequent weed infestations. Ensuring that equipment is cleaned before departing these zones will be the responsibility of the Contract Administrator, with assistance from the Botanist. Designation of cleaning sites and methods will be the responsibility of the District Botanist and project manager, and may be worked out in cooperation with the contractor

**Responsibility:** Contract Administrator, Botanist

36. Prior to ground-disturbing activities, selected weed species (at the discretion of the District Botanist) will be treated along segments of roads 3300, 3301, 4200 and 4300 to prevent their dissemination into the project area. Implementation of this project will be the responsibility of the Implementation of this project will be the responsibility of the Contract Administrator and Botanist. T&C 3.1

**Responsibility:** Contract Administrator, Botanist

37. Prior to ground-disturbing activities, selected weed species (at the discretion of the District Botanist) will be treated at weedy streamside sites where trees are to be yarded and stockpiled. The intent is to reduce the risk of transporting weeds from these weedy streamside sites to other areas of the project via skidders. These treatment areas are to be selected by the District Botanist in consultation with the project manager and Contract Administrator. T&C 3.1

**Responsibility:** Contract Administrator, Botanist

38. Skid trails and other sites of disturbed soils will be revegetated to limit the potential for weeds to become established in these areas. These sites should be seeded with native grass seed from seed lots collected locally by the Forest Service (blue wildrye *Elymus glaucus* and slender hairgrass *Deschampsia elongata* may be available), and fertilized and mulched with certified weed-free straw. Landings or other areas where soils are compacted will be scarified prior to seeding. Specifications for seeding rates, fertilizer application rates, and mulching will be designated by the District Botanist. T&C 3.2

**Responsibility:** Contract Administrator with assistance from the Botanist

39. Surface application of nitrogen fertilizers will be at least 50 feet from any water body. T&C 2.9

**Responsibility:** Contract Administrator

Measures 40 through 42 were developed to protect cultural resources

40. No bank structures would be constructed within 100 feet of the boundary of identified archaeological sites. No mechanized equipment will operate within the boundary of identified archaeological sites.

**Responsibility:** Contract Administrator, Archaeologist

41. No riparian thinning will occur along the east bank of Trout Creek, south of Forest Road 42 and north of the confluence of Layout and Trout Creeks.

**Responsibility:** Contract Administrator, Archaeologist

42. All heavy equipment access points will be identified prior to project implementation, and will be reviewed by an archaeologist.

**Responsibility:** Contract Administrator, Archaeologist

Measure 43 was developed to reduce the risk of fire during project operations

43. To reduce the risk of wildfire that may occur due to project activities associated with mechanized equipment, it is required that contractor provide a portable pump equivalent to a Mark III at all locations where mechanized equipment is being used. In addition to the pump, 350 feet of one and a half inch, and 600 feet of one inch fire hose and associated fittings will be provided for initial attack of a fire. Contractor shall also provide a sealed box to be opened only in the event of a fire. This box should contain a combination of pulaski's and shovels and equal in number to crewmembers on site.

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**Responsibility:** Contractor, USFS Fire

Measures 44 through 48 were developed to protect soils resources in the numbered units and riparian areas where ground based equipment will operate.

44. Areas where rutting exceeds 6 inches in depth for a length of ten feet or more will be prohibited from further ground-based equipment passes to prevent detrimental rutting of the soil. The objective of this measure is to limit the degree of soil compaction, rutting, and puddling as well as reduce the potential for offsite stream sedimentation. This mitigation is appropriate for all skid trails and landings within units and treatment areas outside of the units.

**Responsibility:** Contract Administrator

45. Skid trails will be pre-designated for all ground-based equipment operations, and will be spaced a minimum of 150 feet apart for tractor units and 400 feet apart for loader units. Timber will be felled to lead to the skid trail locations. Rubber tire tractors will remain on skid trails and winch logs as necessary. Loaders operating off designated skid trails must operate over slash beds that are as thick and continuous as practicable. The objective of this measure is to limit the extent and the degree of soil damage, displacement, and disturbance. This mitigation is appropriate for all skid trails and landings within units and outside of the units.

**Responsibility:** Contract Administrator, Silvicultural Operations

46. Landings will be subsoiled to a depth of 18 inches (minimum). Subsoiling must be done immediately following treatment. Any proposed alternative methods to subsoiling must be approved by a qualified earth scientist in consultation with the contract administrator. To prevent re-compacting the treated areas, no ground-based equipment will be operated on subsoiled portions of landings after subsoiling is completed. Available woody debris will be placed across the subsoiled landing surface. Subsequent vehicular access to these areas will be prevented by construction of a 4-foot high earth berm backed up by a 4-foot deep trench at the entrance to the landing. Closure to vehicles is required to prevent these areas from being re-compacted and to allow vegetation to develop. The objective of this measure is to rehabilitate areas compacted during management activities, accelerate recovery of compacted soils, and facilitate water infiltration and revegetation on those disturbed areas. This mitigation is appropriate for all skid trails and landings within units and outside of the units. Equipment access points within riparian areas and skid trails which have been used for three or fewer passes are exempt from this mitigation.

**Responsibility:** Contract Administrator

47. Slash within reach of the grapple will be mulched and scattered onto skid trails and landings subsequent to activities, but prior to subsoiling as prescribed by Mitigation Measure 46. The objective of this measure is to maintain the amount of organic matter in amounts sufficient to prevent short or long-term nutrient and carbon cycle deficits, and to avoid detrimental physical and biological soil conditions. This will also provide ground cover for exposed soils in order to reduce the potential for offsite erosion. This mitigation is appropriate for all skid trails and landings within units and outside of the units. Equipment access points within riparian areas and skid trails which have been used for three or fewer passes are exempt from this mitigation.

**Responsibility:** Contract Administrator

48. Upon uprooting a tree, or before the root mass is moved, the soil material attached to the roots will be shaken off, over the hole left by the uprooting. The objective is to return as much soil to its origin as is practicable. The objective of this measure is to limit the amount of detrimental soil displacement due to uprooting trees, maintain soil nutrients from the root zone of desired vegetation and protect the soil from the forces of erosion. This measure is also intended to limit the amount of sediment introduced into the stream.

**Responsibility:** Contract Administrator, Silvicultural Operations

Measure 49 was developed to ensure public safety during helicopter operations.

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49. During helicopter stockpile operations, forest roads and dispersed recreation sites which cross under the flight path will be closed or have traffic control.

**Responsibility:** Forest Service Helicopter Flight Supervisor and Contractor.

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## **MONITORING**

### **Effectiveness Monitoring**

Monitoring will be undertaken to evaluate project performance relative to project objectives. The following lists the project objectives and the monitoring items that are designed to assess whether these objectives have been met:

1. accelerate the recovery of riparian forest and canopy cover to improve bank stability, stream shade and reduce water temperature;
  - Estimate canopy cover and stream shade % (Solar Pathfinder <sup>TM</sup>) within the riparian treatment areas on a 3 to 5 year interval
  - compare pre- and post-project canopy cover and stream shade within the treated reaches by using low-level aerial photography, solar pathfinders, or other means. Monitoring should be done at 3-5 year intervals (Replace the bullet above with this one)
  - monitor water temperature annually and compare to pre-treatment baseline
2. restore the volume of in-stream large woody debris to aggrade stream channels to restore floodplain connectivity, stream sinuosity, off-channel habitat, and reduce peak flow velocities;
  - conduct stream surveys at 3-year intervals for 9 years following treatment to evaluate stream channel characteristics
3. rehabilitate sediment and nutrient deposition/routing;
  - same as 2.
4. restore pool quality and frequency to provide high quality habitat for threatened steelhead;
  - same as 2.
5. restore the historic characteristic structure and complexity to Late Successional Reserves;
  - conduct stand exams within the thinned units to evaluate stand structure and canopy density
6. restore optimal cover for deer and elk within their winter range;
  - same as 1 and 5.
7. accelerate the growth rates and recovery of riparian stands;
  - Establish controls and measure diameter at breast height (dbh) on released trees.
8. and restore fish passage.
  - compare channel characteristics at treated crossings before and after treatment.

### **Monitoring *Corydalis aquae-gelidae* (COAQ) Populations**

Compliance and effectiveness monitoring are essential elements of the mitigation required for the Upper Trout Creek Restoration Project. This mitigation will require funding by this project to be accomplished.

#### *Compliance Monitoring*

In regard to project activities, the Species Management Guide for COAQ (Guide) requires monitoring of all Baseline and Support populations within the project area to ensure compliance with the Guide and pertinent Environmental Assessment reports. The results are to be documented and included in the Guide as addenda.

To accomplish this, all Baseline populations (there are no Support populations in the project area) in the project area will be reviewed in the field to determine whether or not appropriate buffer dimensions and restrictions to project activities have been adhered to. This review is to be completed within two years of the project's completion.

#### *Effectiveness Monitoring*

To assess the effectiveness of mitigation with regard to COAQ, Trout Creek and its tributaries within the project area will be surveyed twice within five years of completion of the project. Information is to be collected on the presence, location (UTM), population size, age class structure, general habitat description, and observations of the effects of project activities in regard to habitat conditions, for all known sites. The results are to be documented and included in the Guide as addenda.

### **Monitoring for Sensitive Species**

Compliance and effectiveness monitoring are essential elements of the mitigation required for the Upper Trout Creek Restoration Project. This mitigation will require project funding to be accomplished.



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All known sites for Sensitive species in Upper Trout will be revisited twice within five years of completion of the project to determine the presence and abundance of the species at the site, to determine the size of the buffers that were created, and to assess the condition of the habitat within the buffer. The results of these monitoring visits are to be compiled and documented in the project file and District Wildlife and Botany files.

**Monitoring Noxious Weeds and Invasive Species**

The following monitoring plan is an essential element of our mitigation for weeds regarding the Upper Trout project. This plan will require funding by this project to be accomplished. The District Botanist is responsible for implementing and completing this monitoring plan.

*Weed Monitoring Plan*

Areas of ground disturbance will be monitored for three growing seasons following the completion of the project to assess: (1) compliance to mitigation measures, and (2) the effectiveness of weed mitigation.

*Compliance Monitoring*

Compliance monitoring will be accomplished by determining whether or not skid roads were successfully scarified, seeded and mulched, by reviewing equipment cleaning sites to determine whether or not weeds and weed seeds were successfully disposed of, and by assessing the overall degree disturbance caused by the project with respect to observed, or potential, weed introduction and dissemination into the area. Areas to be monitored will include a representative sample of: harvest units, major skid roads (particularly those used to access stream channels), and riparian and stream channel areas (particularly where heavy equipment was used). The project area will be monitored twice within five years of the completion of the project.

*Effectiveness Monitoring*

The effectiveness of weed mitigation will be monitored accomplished by conducting an inventory of weeds in the project area. Information will be collected on: weed species composition, location, habitat description, and abundance. Areas to be monitored will include a representative sample of: harvest units, major skid roads (particularly those used to access stream channels), and riparian and stream channel areas (particularly where heavy equipment was used). The project area will be monitored twice within five years of the completion of the project.

**Monitoring Erosion Control Measures**

*Compliance and Effectiveness Monitoring*

All erosion control measures (Mitigation 3, 8, 9, 10, 11) will be monitored during implementation for compliance and effectiveness of the structures at preventing surface erosion and sediment from reaching streams.

**Monitoring Riparian Planting**

*Compliance Monitoring*

All riparian planting will be monitored to ensure at least 80% survival over three years. Failed plantings will be replaced over a period of three years. If successive plantings have failed, an equally sized area will be planted in the project vicinity.

**Monitoring of Protection of Cultural Resources**

*Compliance Monitoring*

Monitoring will be conducted by an archaeologist during project operations involving heavy equipment when operations are in close proximity to known sites.