YAKUS CREEK
FINAL
ENVIRONMENTAL IMPACT STATEMENT
Chapter 6 and Errata

Lochsa Ranger District
Clearwater National Forest

May 2008

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Yakus Creek

Lochsa Ranger District
Clearwater National Forest
Idaho County, Idaho

May 2008

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Abstract: *This Fianl Environmental Impact Statement (EIS) provides a chapter on Public Involvement and an Errata Sheet for the Draft EIS. (Public comments on the Draft EIS did not disclose any new issues or a need for new analysis.) The Notice of Intent to prepare an EIS was published in the Federal Register on August 26, 2005, and the Draft EIS was made available for public review and comment on February 8, 2008. The Yakus Creek project proposes timber harvest, watershed improvement, and access management activities within the National Forest portion of the 7,900-acre analysis area, located in the Yakus Creek drainage approximately 12 air-miles east of Kamiah, Idaho.*

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TABLE OF CONTENTS

Chapter 6 – Public Involvement **1**

A. Public Participation Opportunities 1
B. Tribal Consultation 1
C. List of Those Who Commented on the DEIS 2
D. Comments Received and Our Response 2
E. Consideration of Other Science/Literature Submitted by the Public 25
- Response to the Study Conducted by Rehfeldt et al. (2006) 29

F. Distribution List for the Final EIS 30

APPENDIX G – Letters Received from Federal and State Agencies

1. Idaho Department of Parks and Recreation
2. Idaho Department of Environmental Quality
3. United States Environmental Protection Agency

APPENDIX H – Errata to the Yakus Creek DEIS

List of Errata H-1

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CHAPTER 6
PUBLIC INVOLVEMENT

This chapter discusses public involvement conducted during the Yakus Creek analysis. Included are: (A) public participation opportunities; (B) Tribal consultation; (C) a list of those who commented on the Draft EIS; (D) comments received and our response; (E) consideration of other science/literature submitted by the public; and (F) a distribution list for the Final EIS.

A. Public Participation Opportunities

The Yakus Creek project first appeared on the Forest NEPA Quarterly Report in 2003. Since then the following public involvement activities have taken place:

2/10/04 – Scoping letters were mailed to the general public. Eight letters, one e-mail, and one phone call were received.

2/13/04 – A legal notice appeared in the Lewiston Morning Tribune (paper of record).

8/26/05 – A Notice of Intent to prepare an environmental impact statement for the Yakus Creek project was published in the Federal Register.

2/8/08 – The DEIS was released for public comment. The 45-day comment period ended on 3/24/08.

B. Tribal Consultation

In addition to the opportunities listed above, the following consultation occurred with the Nez Perce Tribe:

5/20/03 – A letter was sent to the Nez Perce Tribal Executive Committee inviting them to participate in an upcoming field trip of the project area with the interdisciplinary team.

11/21/03 – A letter was sent to the Nez Perce Tribal Executive Committee requesting an initiation of government-to government consultation regarding the Yakus Creek project. We were invited to Lapwai to present the project before their Natural Resource Subcommittee on 12/17/03.

12/17/03 – Lochsa District Ranger Cindy Lane gave a brief introduction of the project followed by a powerpoint presentation to the Nez Perce Tribe Natural Resource Subcommittee at their headquarters in Lapwai, ID.

2/6/04 – Scoping letters were mailed to the Nez Perce Tribal Executive Committee.

2/22/08 – A staff-to-staff meeting was held with the Nez Perce Tribe to discuss several ongoing projects, including the Yakus Creek project.

C. List of Those who Commented on the DEIS

The public was given 45 days (February 8, 2008 – March 24, 2008) in which to provide comment on the DEIS. Nine letters were received from the following individuals, agencies, businesses, and organizations:

1. Dick Artley, Grangeville, ID
2. Dennis Baird, Moscow, ID
3. Idaho Department of Parks and Recreation (IDP&R) – submitted by Jeff Cook
4. Idaho Department of Environmental Quality (IDEQ) – submitted by Daniel Stewart
5. Friends of the Clearwater et al. (FOC) – submitted by Gary Macfarlane – also representing the WildWest Institute, the Alliance for the Wild Rockies, and the Lands Council
6. Idaho Conservation League (ICL) – submitted by Bradley Smith
7. Three Rivers Timber, Inc. (Three Rivers) – submitted by Mike Hanna
8. Lewis-Clark ATV Club (LC ATV) – submitted by Jim McIver
9. United States Environmental Protection Agency (EPA) – submitted by Christine Reichgott

D. Comments Received and Our Response

Access

1. Comment: Most non-wilderness national forest land contains too many roads. They should be put to bed. (Dick Artley)

Response: We agree. Recent changes in logging technology and management priorities have lessened the need for forest roads. As a result, most project analyses complete a Roads Analysis to determine roading needs and excesses. Such an analysis was completed for the Yakus Creek project, where 11.5 miles of existing roads were proposed for decommissioning.

2. Comment: Considering ecosystem damage of uncontrolled ORV and ATV use on public land, the last thing that should be done is to spend my tax dollars to make improvements that will only draw more of these vehicles. (Dick Artley)

Response: National Forests are established for use by the American public for multiple purposes. When properly managed, OHV use is a legitimate use of National Forest System lands and currently exists within the Yakus Creek area. Improving the motorized recreation opportunities within the Yakus Creek analysis area serves to lessen environmental impacts by providing for motorized use in appropriate areas.

3. Comment: A small amount of timber would be accessed by the 1.6 miles of proposed new road, but given the already high road densities in this area, I wonder if the benefits of logging that extra timber might be outweighed by the impact of these new roads? (Dennis Baird)

Response: The new road is needed to access treatment in units 4 and 6 and will access area for future management. However, the greatest benefit of constructing this road is that it allows us to remove a large portion of FS Road 5017 that is located entirely within the riparian area of Nan

Creek and intercepts several seeps and three streams. This will reduce the potential sediment input into these streams over the long-term. The benefits of the new ridgetop road and the removal of the portion of FS Road 5017 that it replaces is explained in Chapter 4 of the DEIS (page 70).

4. Comment: Because of the extremely high road densities in the project area, we are adamant that the Forest Service base all project activities from existing roads. No new permanent or even temporary roads should be constructed as part of this project. If there is a need to conduct logging activities in areas inaccessible by roads, the Forest Service should consider helicopter logging, prescribed fire, or hand work. (ICL)

Response: Alternative 4, which would build no new roads (permanent or temporary), was analyzed in detail. It also excluded regeneration harvest. Compared to Alternative 2, it did not fully meet the purpose of improving forest health and was barely viable according to our economic analysis. Also, since access is still deemed necessary in the Nan Creek area, the portion of FS Road 5017 (discussed in comment #3) would remain under this alternative.

As for helicopter logging, its use to log the commercial thinning units was considered during 2005, but found to be unfeasible, mostly due to low timber volumes and the high cost of using a helicopter. Today, that method of logging would be even more unfeasible, considering current low timber market values and the high cost of fuel.

5. Comment: The Forest service should consider additional road decommissioning based on a thorough roads analysis process, prioritizing roads with the greatest risk, particularly those located within RHCAs. (ICL)

Response: A thorough roads analysis was completed for this project, and existing roads were reviewed for management recommendations, including decommissioning. Those recommendations can be found in Appendix D of the DEIS. Briefly, 11.5 miles of existing roads would be decommissioned, 8.3 miles of which are in RHCAs (Table 4.12, pg. 72). Another 3.0 miles would be placed in intermittent storage, which is somewhat similar to decommissioning in that each road would be closed to all motorized use and put in a self maintaining condition.

6. Comment: We are concerned that these (off-road vehicle trails proposals) are segmented from the larger comprehensive view taken by the ongoing forest-level travel plan revision underway. Our preference would be for such projects to be deferred until both the travel analysis process at 36 CFR 212.5 (a) and (b) are completed, and the decision in the travel plan revision has been made. (ICL)

Response: The travel planning process is currently underway for the Clearwater National Forest, which will include designation of motorized routes on the Lochsa Ranger District. This travel planning effort is broad in scale, however, and will not analyze ideas for routes that would require construction or heavy reconstruction or a change in travel restrictions. It is recognized that these types of decisions are influenced by very local resource concerns that cannot be evaluated at such a broad scale. Thus, it is through site-specific environmental analysis and documentation at the project level, such as the Yakus Creek analysis, that these types of access decisions will be made.

Nothing in the travel planning process requires reconsideration of past travel management decisions, and the agency expects that over time new roads and trails will be constructed and added to the designated system. Other existing roads and trails may be closed and removed from the designated system in response to environmental impacts or changing travel management needs.

7. Comment: Assuming the Forest Service does decide to continue to move forward with the off-road vehicle trails component in this project and other proposals on the Clearwater National Forest, such projects and increases in opportunities for off-road vehicle use should be clearly presented and articulated in the travel plan. (ICL)

Response: The travel plan will consider the decisions that are made in project specific analyses, including this project. See response to comment #6.

8. Comment: We appreciate that the DEIS describes the past, present and reasonably foreseeable future actions, but mention of the travel plan revision process is absent in the analysis. Thus there is no description of how recreation and access management in this project is related to the forest-level travel plan revision or how the proposed action in the travel plan would change as a result of this project. (ICL)

Response: When the cumulative effects analysis was done for the DEIS, the travel plan had not been scoped and no proposed action was available for analysis. The cumulative effects in the travel plan will consider all cumulative effects that may result from the Yakus project. At this time, the travel planning proposal is in the alternative development phase; therefore, it is not possible to conduct an analysis of the environmental effects of the travel planning alternatives. We anticipate that the effects of any alternative for travel planning will primarily be social rather than physical.

9. Comment: The Clearwater National Forest is currently revising its Travel Plan to be in compliance with the Motor Vehicle Use Rule. Is closing this drainage really necessary when the Travel Plan will be out relative shortly after this plan's FEIS? (IDP&R)

Response: See response to comment #6.

10. Comment: We do not support the obliteration or decommissioning of any roads in the area. Obliterating or decommissioning of existing roads reduces the recreational opportunities in the area along with limiting access to fight fires. (LC ATV)

Response: Many of the roads proposed for decommissioning are currently not drivable due to gates or the in-growth of vegetation. It is also recognized that the Forest Service needs to balance recreation opportunities with wildlife and resource concerns. Roads are being obliterated or decommissioned within the Yakus Creek area to provide optimal elk habitat, improve watershed conditions, and reduce costs associated with road maintenance. We cannot foresee the future location of fires and therefore do not know the access needs for their management.

11. Comment: The DEIS is in conflict with the ORV planning process currently taking place. Adding more ORV trails shouldn't be the purview of this DEIS. (FOC)

Response: See response to Comment #6.

12. Comment: The DEIS admits that the analysis does not look at where these trails would be located. It is also presumptive to suggest that connector trails are needed to link Pete King and Musselshell ORV routes. The DEIS does not explain how that ties in with the national ORV policy. (FOC)

Response: The footnote at the bottom of page 102 of the DEIS was in error (refer to the errata section of this document). The trails have been located on the ground as part of the analysis and are designed to add to the recreation opportunity based on existing routes. Also, see response to comment #6.

13. Comment: One of the DFCs is that OHV (sic) use occurs on designated roads and trails. That process is now being undertaken in the travel plan revision and designating and building more ATV routes is premature. Furthermore, the forest plan direction on page F-1 that does not permit vehicles of more than two wheels. (FOC)

Response: Once the forest-wide travel planning process is complete, motorized vehicles will be required to travel only on designated routes. As mentioned in response to comment #6, it is appropriate to analyze the inclusion and/or removal of motorized routes through site-specific analyses, such as the Yakus Creek project. It is anticipated that these connector routes will be incorporated into the upcoming travel plan.

Forest Plan direction allows for motor vehicles with more than two wheels on Forest development trails where specifically permitted (Forest Plan, pg. F-2). The Yakus Creek area and the proposed OHV activities are within designated uses as described in the 2005 Travel Guide, including those with more than two wheels.

14. Comment: We recognize that there is a need to provide the public with a broad array of recreational opportunities, but it is not clear in the DEIS whether opportunities for OHV recreation are limited. In general, decisions about new recreational facilities (such as trails) should be based on evidence and evaluation of: 1) increased public need; 2) the need to reduce concentration on, or conflicts at, existing sites; or 3) the need to reduce resource degradation from recreation use at existing sites. (EPA)

Response: OHV recreation has noticeably increased over the last 10 years and will likely continue to grow. It is recognized that OHV user groups are actively seeking riding opportunities that provide relatively long distance loops and to be off of system roads. The proposed connectors within the Yakus Creek analysis would provide for connectivity with state and private lands to the west and federal lands to the east and would provide for safer OHV use since there would be less mixing of large and off-highway vehicles (see DEIS, pg. 103).

15. Comment: Page 102 of the DEIS indicates that the proposed OHV connector trails would ultimately tie into connecting routes from the Pete King and Musselshell OHV areas. The document does not, however, analyze the potential for impact associated with increased OHV use in these areas. This is of particular concern as the 2003 Clearwater National Forest Roads Analysis Report identified Pete King Creek and Lolo Creek above Musselshell Creek as areas of concern due to road-related impacts. (EPA)

Response: The 2003 Forest Roads Analysis refers to the negative effects of high road densities on surface and sub-surface hydrology. The Yakus Creek project will reduce road density by decommissioning 11.5 miles of existing roads, many of which are located near stream channels. There are also additional projects with road decommissioning activities in the same general area.

The Pete King and Musselshell OHV routes currently exist, with the Pete King route discussed in the North Lochsa Face Recreation and Access Management Decision (2000). Motorized recreation users currently travel through the Yakus Creek area to access these routes. The planned connector trails will provide safer access for OHV users to these routes.

Cumulative Effects

16. Comment: There is no analysis of the cumulative impact of livestock and this timber sale on elk or any other species. (FOC)

Response: Cattle grazing was considered in the cumulative effects section for elk, where it was found to have a minor effect on elk when compared to the influence of motorized access (see page 92 of the DEIS). The cumulative impact of cattle grazing was also considered for the western toad, where the effects would remain unchanged from the existing condition (see page 95). Cattle grazing was not considered in the cumulative effects for American marten or fisher, since neither species would be affected by grazing.

17. Comment: The cumulative impact analysis in appendices A and B are also inadequate. They are a mere listing of activities and provide no analysis of their cumulative impacts. (FOC)

Response: Appendices A and B provided a list of past, present, and foreseeable activities within the Yakus Creek analysis area. Another list of past activities for the entire Lolo Creek drainage was kept in the project file. Not every activity listed affected every resource area. That determination was made by the resource specialist, who pulled applicable activities from these lists to complete their cumulative effects analyses (Chapter 4).

18. Comment: The DEIS fails to look at grazing. Page 15 erroneously ignores this issue by concluding that proposed logging units would not contribute to cattle moving off of the allotment. The major concern is that cumulative impacts of grazing and logging need to be considered. (FOC)

Response: Grazing was found to not be affected by the proposal for the reason stated on page 15 of the DEIS. However, grazing was considered as an ongoing activity in the analysis of cumulative effects for several applicable resource areas. Past, present, and foreseeable logging activities were considered in the analysis of cumulative effects for all resource areas (refer to Chapter 4 of the DEIS). The Yakus project was also analyzed in the cumulative effects sections under the Eldorado Canyon Allotment Management Plan (2005).

19. Comment: Cumulative impacts on Lolo Creek are dismissed in the DEIS. There is no quantification of impacts because of claims the watershed is too large. (FOC)

Response: The DEIS discusses that the effects of the project would not be measurable (detectable) at the Lolo Watershed scale. This is based on research by MacDonald (1989) who showed that the larger the stream order, the smaller the detectable change in sediment or water yield. The WATBAL cumulative effects model used was designed for watersheds between 4 and 40 square miles in size and is not appropriate for use at the Lolo Creek scale (pg.73) which is 123 square miles.

Economics

20. Comment: The DEIS fails to include all of the costs associated with logging. The agency's own data show that timber sales on the Clearwater National Forest lose money. The DEIS makes the unbelievable claim that this sale would make money. (FOC)

Response: Even with the current low timber market, the Yakus timber sale will make money (pg. 107). All of the monetary costs, including soil restoration, site preparation, reforestation, and associated road work were included in the analysis. Although most of the timber species have lost value in the current market, 25% of the volume is cedar which has increased in value.

21. Comment: The analysis omits crucial cost factors associated with logging. Implementing weed control on the new road construction (both permanent and temporary) is not addressed. Reforestation and planting of white pine and larch is not mentioned on page 107. Monitoring, maintaining and enforcing road closures for the new roads that this sale would produce are not mentioned. (FOC)

Response: Weed treatments (Mitigations pg. 24) would be included under the road work portion of the discussion and planting of white pine and larch is considered under reforestation even though not mentioned specifically. The majority of roads closed would be decommissioned and not travelable by vehicles and all decommissioned roads will be planted with trees. Those closed as a result of intermittent storage would have guard rail gates, or other obstructions in place to prevent access. The proposed newly constructed road occurs behind an existing guard rail gate. Monitoring and maintaining gates and closures are incorporated in our annual operating budget.

22. Comment: Perhaps the biggest question is the predicted stumpage value. The prediction is about $216 per mbf. Given the economic downturn and the fact the housing bubble has burst, this seems too high. (FOC)

Response: The economic analysis in the DEIS was assessed using the market values in October 2007. An updated analysis in March 2008 shows a bid prediction of about $126 per ccf for Alternative two, and $121 for alternative four that still results in a viable timber sale offering. To confirm these figures, a quick comparison was made to compare current timber value with recent logging costs, and it shows that the analysis value is in the ballpark. The primary things that affect logging cost are timber volume per acre, logging system, and haul distance to the mill. For the Yakus Creek project, these items all favor low logging costs. The species mix, which included western red cedar, keeps timber value up compared to the general timber market, where most of the other species have declined in value.

Laws, Regulations, and Policies

23. Comment: Conjuring up false Purpose and Need statements is a violation of NEPA. (Dick Artley)

Response: Our goal in defining the purpose and need statements was to properly describe the needs for taking action, which was in line with Section 1502.13 of the CEQ regulations for implementing NEPA that reads: "The statement shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." In the case of Yakus Creek project, a study team was assembled in 2001 to identify specific management needs addressing watershed restoration, access management, and timber management. These needs were rolled into three purpose and need statements that became the foundation of the Proposed Action that went before the public for review and comment.

24. Comment: The DEIS has failed to look at the EAWS as a document providing scientific information. Instead, it treats the EAWS as a document that sets forest plan direction. It can't, unless it goes through NEPA and the plan amendment process. (FOC)

Response: The Potlatch-Lolo Subbasin Ecosystem Analysis (EAWS), used in part to identify the purpose and need for action (p-3 of the DEIS), is not a decision document. Its assessment took a big picture look in describing existing conditions of the Lolo Creek watershed and making recommendations of potential management actions that could occur in the area. This type of document is frequently described as a stage-setting document that is prepared prior to NEPA decision documents. The use of non-NEPA documents is an acceptable practice (40 CFR 1502.21), and the use of the above EAWS is in compliance with NEPA.

25. Comment: The desired future conditions (DFCs) are specific goals identified in forest plans. The forest plan has not been amended to include the DFCs mentioned in this document. Please explain. (FOC)

Response: The specific conditions listed are based on a better understanding of forest ecosystems and supported by more recent science. The Forest Plan discusses them in more general terms and can be found on the following pages under Desired Conditions (pages II-16 and 17) and under Forest Plan Standards (pages 21-25, 28, 33, 34).

Soils

26. Comment: The project discusses the soil compaction in the drainage from past logging, yet it proposes to duplicate such impacts while simultaneously proposing to fix what was done in the past. (Dick Artley)

Response: Harvesting methods prior to the 1980's consisted of ground-based logging that often occurred on steep slopes (>35 percent) and machine piling of slash often removed organic material and topsoil. Forest practices have changed over the last few decades, so that the extent of detrimental soil disturbance is diminished. Project design measures, Best Management Practices, and Forest Plan guidelines have been developed in order to reduce the extent of disturbance and maintain soil productivity. Designated skid trails, retention of woody material, operating under dry conditions, and limiting ground based activities to slopes less than 35 percent are now common practices *(see DEIS, page 64- cumulative effects on soils*). Project design measures in the Yakus project also include the use of existing skid trails and landings whenever possible, which would reduce the estimated percent increase of detrimental soil disturbance as shown on page 62, Table 4.3 of the DEIS.

27. Comment: Two of the units proposed for timber harvest in the Yakus Creek project include areas rated high for mass wasting potential, including units 1 and 4 (p. 60). This is contrary to direction provided in PACFISH and INFISH. Buffers are supposed to be applied to areas rated high for mass wasting, and timber harvest avoided. (ICL)

Response: PACFISH direction requires buffers on landslide prone areas (PACFISH, pg. C-8). This project is consistent with PACFISH in that no activities other than road decommissioning would occur on landslide prone areas (DEIS, page 24). In the original design of the Yakus project, all landslide prone areas were dropped (DEIS, page 13). A clarification here is that "mass wasting"

as noted on page 60 is not the same as "landslide prone". Mass wasting refers to erosional processes based on landtypes alone. A landtype erosion potential analysis was conducted for each unit (*see Soils specialist report, Appendix B in the project file*). Based on this analysis, site-specific design measures were made for Units 1 and 4 to minimize the potential of mass wasting (DEIS, page 60).

An analysis of landslide hazard potential areas uses slope, aspect, elevation, geology, and landform in assessing the risk for a landslide. A landslide hazard analysis was completed for each unit, which showed no high landslide hazard areas within any of the units (*see Soils specialist report, Appendix A in the project file*).

28. Comment: As required by PACFISH, activities in RHCAs must demonstrate attainment of Riparian Management Objectives (RMOs). Instead, the DEIS discloses that for several RMO features, current objectives are not being met or no data exists. No rationale is provided that supports a determination that logging in landslide prone areas will contribute toward the attainment of RMOs. (ICL)

Response: No logging will occur on landslide prone areas as noted in the previous comment. A total of 0.4 miles of road decommissioning, however will occur on them and will have a beneficial effect by removing this potential landslide-generating source.

29. Comment: The Yakus Creek project proposes four units that would exceed the 15% standard, including units 4, 5, 26, and 27 (p. 65). The Forest Service must comply with the Regional Soil Quality Standard. We recommend that the agency reduce the size of the units, employ helicopter yarding (to eliminate skid trails), and/or increase the amount of proposed road decommissioning in the project to ensure compliance with the regional soil quality standard. (ICL)

Response: Because skid trails are linear and occur across the units, reducing the size of the units maintains the percent detrimental disturbance. As a project design measure, (page 24) existing skid trails and landings would be used whenever possible. This would reduce the amount of estimated increase in detrimental disturbance predicted in Table 4.3 (column 6), page 62 of the DEIS; thus reducing the likelihood that the 15% standard would be exceeded. An additional design measure would decommission skid trails after use, further reducing the detrimental disturbance within the unit. All units will be less than 15% when the project is complete. Post-project monitoring will occur to ensure levels are met. If they still exceed 15%, additional work will be completed to reduce them (DEIS, pages 24-25). The 15% standard only pertains to the activity units and associated temporary roads, so decommissioning permanent roads would not ensure compliance with the regional soil quality standard.

30. Comment: The major concern with soils is the fact that impacts will exceed soil standards on four units under the preferred alternative. There are two problems with this. First, mitigation measures after disturbance have limited effectiveness as admitted by the agency. Second, three of the four units that would exceed soil standards currently are in compliance. (FOC)

Response: See response to Comment #29**.** Decommissioning skid trails after use only moderately offsets compaction and displacement, but it increases water infiltration and provides for a quicker recovery time than if the skid trails were left untreated.

The detrimental soil impact assessment is only an estimate of whether or not a unit would exceed the 15% soil standard. The outcome of the assessment showed that three units would need additional design measures to reduce the likelihood that the units would exceed the 15% soil standard.

Project design measures were developed so that all units would meet Regional soil standards upon completion of the project, or if after monitoring indicates that units are still not below the 15% standard, additional work would be implemented (DEIS, pages 24 and 25).

31. Comment: It has not been the habit of the agency, at least recently, to drop below soil standards in an area unless it is already below those standards. In this case, the agency is violating its commitment to the public on soils. At the very minimum, an alternative should have been analyzed that did not exceed soil standards. (FOC)

Response: There is a possibility that during project activities the 15% may be exceeded (DEIS, pages 60-65), but due to project design measures, all units would be below those standards upon completion of the project. Regional guidance allows for exceedence, as long as work is completed to reduce the level to below regional standards. Post-project monitoring will occur to assure the standard is met.

Vegetation

32. Comment: Species conversion is an excuse to cut low value species and replace these trees with western white pine and western larch. True firs (sometime located in wet areas) are important and unique habitat for a variety of species. There is no reason to log them simply because they are grand fir and Douglas-fir species. (Dick Artley)

Response: The analysis area is concentrated in just three tree species; grand fir at 62%, western Redcedar at 17%, and 16% Douglas-fir, all of which are shade tolerant and late seral species in the Inland Empire. Western white pine and western larch each make up less than 1% of the cover types in the analysis area, (p. 50 DEIS). This is far more grand fir than existed just 70 years ago, as determined from the extensive forest examinations done in the 1930's by the US Forest Service.

It is good forest management practices to reduce the percentage of grand fir to avert future mortality and decay from the numerous insects and disease agents that use this species as their favorite host species and to capture this volume while it is sill a valuable commercial product. We are not proposing to eliminate grand fir, Douglas-fir or western redcedar with the proposed actions, but just to reduce their large presence and increase species diversity in the drainage, especially to some more shade intolerant species.

33. Comment: The project claims that the dense stands of grand fir and Douglas-fir are being affected by various insect and disease agents. So what. The bugs are food for birds and the diseased trees that die replenish the soil with organic matter. (Dick Artley)

Response: As with the response to #32, grand fir is at a very high percentage in this watershed and especially when compared to the data from the 1930's stand examinations. The stands we are proposing to commercially thin are composed of primarily grand fir, Douglas-fir, and western Redcedar. All have reached the age when competition from surrounding trees affect tree growth rates and tree vigor while increasing mortality from suppression and increased insect and disease

activity. If left unchecked, this will only increase as the trees age, causing an increase in dead and down fuels and associated wildfire risk. Since this land is allocated to timber management as its primary goal in our Forest Plan, we need to make every effort we can to harvest these trees when they can still be used as timber and prior to them becoming an increased fuel hazard and no longer a timber resource.

34. Comment: A significant shortcoming of the Yakus Creek DEIS is the lack of discussion of issues related to Global Climate Change (GCC). The notion that long-lived seral species should be favored neglects the foreseeable impacts, at various scales, of GCC. Research conducted by scientists at the Rocky Mountain Research Station Forestry Sciences Lab reveals significant prospective declines in both larch and ponderosa pine in the coming decades. By favoring these species so heavily, the proposed action fails to account for reasonably foreseeable events that have the very real potential to directly influence the effectiveness of this project. (ICL)

Response: This same comment was submitted on the Blacktail project of the Nez Perce National Forest and referenced a study conducted by Rehfeldt et al. 2006. Excerpts from their response to this study can be found in Section E of this document. Also, an expanded response to this comment made by the Yakus Creek project Silviculturist can be found in the project file.

Until now, the issue of global climate change was never raised on the Yakus creek project. However, it is acknowledged that forests and forest management are important influences on global warming (and vice versa). Forests help mitigate the effects of greenhouse gas emissions by removing carbon from the atmosphere and sequestering it in biomass (King et al 2007)[1]. Scientists estimate that U.S. forests and harvested wood sequestered 162 Tg (or about 178 million tons) of carbon per year over the period 1990 through 2005. This rate of forest carbon sequestration offset approximately 10% of total U.S. CO_2 emissions from fossil fuels (Woodbury et al 2007)[2]. Management actions designed to maintain or restore forests to healthy and productive conditions are critical to maintain carbon stocks and sequestration rates.

Planned vegetative treatments aimed at improving forest health in the Yakus Creek area are expected to reduce the potential impacts to forest values resulting from increased drought stress, susceptibility to insect and disease mortality, and increased fire risk associated with projected changes in climate. As described in Chapter 4 of the DEIS (Vegetation Section), proposed vegetative treatments would increase seral species composition and reduce tree stand densities. Over the long-term, this should have a combined effect of increasing tree vigor and CO_2 sequestration rates, plus converting to tree species that are less susceptible to insects and disease. Also, refer to Appendix H; addition of Section IX – Other Disclosures.

35. Comment: Alternative 6 (emphasis on patch size) should be reconsidered to convert an additional 180 acres of primarily grand fir and western red cedar forest types into the desired species composition of western larch and western white pine and still stay within the scope of the project. (Three Rivers)

Response: This alternative was dropped from further consideration, as explained on page 26 of the DEIS. The concern over old growth forest has not changed. Thus, this alternative cannot be reconsidered.

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[1] King et al. 2007. **The First State of the Carbon Cycle Report – The North American Carbon Budget and Implications for the Global Carbon Cycle.** Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research.

[2] Woodbury et al. 2007. **Carbon Sequestration in the U.S. Forest Sector from 1990 to 2010.** Forest Ecology and Management 241, pp. 14-27.

36. Comment: What date was to prove the so-called history on page 2 of the DEIS? Specifically, what data proves that white pine and larch were once the dominant species in the area? (FOC)

Response: The document used was the United States Department of Agriculture, Technical Bulletin No. 767 of May 1941, titled "Natural Regeneration in the Western White Pine Type" by Irvine T. Haig, Kenneth P Davis and Robert H. Weidman. A summary of the data for the southern part of the western white pine type, which includes the Yakus Creek area, is included on p. 51 of the DEIS. Please note that not all of the species listed would occur on every acre, since this is a large area. The Yakus Creek area does not have any western hemlock or lodgepole pine and few Engelmann spruce or ponderosa pine. Other more recent publications that support this are RMRS General Technical Report RMRS-GTR-35, August 1999, White Pine in the American West: A Vanishing Species-Can we save it? and 'Return of the Giants – Restoring White Pine Ecosystems by Breeding and Aggressive Planting of Blister Rust-Resistant White Pines", by Lauren Fins et al., publication Number 927 of the Idaho Forest, Wildlife, and Range Experiment Station, 2001.

37. Comment: Page three of the purpose and need is wrong and not based upon science. Altering species composition will do nothing for watershed. Indeed, the EAWS itself suggests that watershed health is the number one priority in this area. (FOC)

Response: The purpose of altering species composition is to improve forest health by re-establishing white pine and larch as major components of the forest ecosystem. Both of these species are generally more disease resistant. The Potlatch-Lolo Subbasin EAWS states that "vegetation management and production of wood products should be done in a manner that supports the primary goal of restoration and maintenance of the aquatic ecosystem and overall watershed condition." This project's vegetative treatments have been designed to adhere to that goal.

38. Comment: One of the biggest failures in the whole purpose and need is the over-emphasis on vegetative composition, based upon speculation of vegetative conditions 100 to 150 years ago. We addressed this issue in detail in our scoping comments and it was not mentioned in the DEIS. (FOC)

Response: Your scoping letter dated March 10, 2004 states "One of the biggest failures in the whole purpose and need is the over-emphasis on vegetative composition based upon speculation of vegetative conditions 100 to 150 years ago. The methodology and potential for surveyor bias in early inventories is not evaluated. Biases in surveys – all surveys are biased in some way or another – result from the assumptions that go into the survey, the training of the surveyors, and the particularly way the surveyor conducts a survey. Since the surveys of the early 1900's were based on different premises than today, the methodology was likely very different, and the surveyors are different, it is difficult to correlate past surveys with those of today."

The DEIS does not refer to vegetative conditions of 100 to 150 years ago. USDA Technical Bulletin No. 767 (May 1941) titled *Natural Regeneration in the Western White Pine Type* by Irvine T. Haig, Kenneth P. Davis and Robert H. Weidman was used to describe what the forest stands might have looked like and contained if blister rust **had not** decimated the western white pine in the Pacific Northwest. We do not agree that this research was based on any different premises than today, nor that the methodology used to collect data, mainly stand examination plots or timber cruise data, was any different than the same surveys done today, based on the assumptions and methodology used in their research.

For example, their research considered a stand to be in the white pine type by two different criteria: (1) a mature stand was considered in this type, if it contained 15 percent or more western white pine by volume; and (2) an immature stand was considered in this type, if it contained 15 percent or more western white pine by number of trees. The basis for the data displayed on p. 51 of the DEIS is from data obtained through comprehensive growth, yield and stocking studies made in stands ranging from 30-120 years old and containing 15% or more western white pine by volume, throughout the type's commercial range.

Today in the Northern Region, the dominant cover type of a stand, where the average diameter of the trees is more than 5 inches dbh, is determined by the species with the largest amount of basal area in the stand (DEIS, p 50). The relationships between these parameters are related, since basal area or diameter of a tree and its height can be used to calculate the trees board foot volume and are easily cross-walked. Therefore, we believe that data from the 1930's to 1941 are comparable in methodology to current field stand examination and timber cruising methods.

39. Comment: The suggestion in the DEIS that white pine is more resilient to insects and disease is absolutely wrong. White pines are more susceptible to a major pathogen, white pine blister rust. Until blister rust is eliminated … or until white pines evolve defense mechanisms which will not allow blister rust, even when it evolves, to harm them …, then the situation will remain as it is. (FOC)

Response: There has been a blister rust-resistant western white pine breeding program in existence in the Inland Empire since the summer of 1950. Currently, the western white pine tree improvement stock has an effective blister rust resistance level of 65% (+/- 30%) averaged across all hazard ratings. Western white pine is however far more resistant to the root diseases that are common to this area, such as Armillaria that thrives on grand fir or Douglas-fir. Also, white pine is not susceptible to Indian Paint fungus, Douglas-fir beetle or fir engraver beetle, all of which are present within the analysis area. With 62% of the cover type of this analysis area in grand fir and another 16% in Douglas-fir, mortality and dead fuels from these agents will only increase if these percentages are not reduced.

40. Comment: The reduction of vegetation density, ostensibly to reduce wildfire risk, is not based upon sound science. First, this region has large stand-replacing fires. Second, logging itself (see the Sierra Nevada Ecosystem Project) increases fire severity. Third, so-called historic norms are only snapshots in time and do not reflect the full diversity of historic vegetation since the retreat of the glaciers. (FOC)

Response: We agree that this region has had large stand replacing wildfire as its major disturbance mechanism, as evidenced by the 1910 through 1934 fires that burned over 3 million acres of forest in a few days in 1910. However, as stated on page 3 of the DEIS, the purpose of reducing tree density is to allow for increased tree vigor and vegetative health. Reducing wildfire risk is not a purpose of this project or a basis for the analyses conducted, but instead a by-product of the planned actions. Thus, all comments related to reducing wildfire risk are considered "not applicable" to this project, without the need for a response. This also applies to "historic norms", since they are not referenced or used in the DEIS.

41. Comment: The so-called vegetative history of the area and desired conditions seem to be ideological positions based upon what the agency wants to see than what the land did and can support. What data exist from the past as to vegetation type is as accurate and comparable to that of today? (FOC)

Response: The vegetative history of the area and current conditions are described on pages 50 and 51 of the DEIS. As stated in the response to comment #32, the purpose of planned timber harvest is not to eliminate grand fir, Douglas-fir or western redcedar with the proposed actions, but to reduce their large presence and increase species diversity in the drainage, especially to some more shade intolerant species. Such actions would avert future mortality and decay from the numerous insects and disease agents that use the current high percentages of grand fir and Douglas-fir as their favorite host species.

42. Comment: The past definitions of stands and dominance are different than those used today (DEIS, page 50). This gives skewed impressions of what forest conditions were like in the past. (FOC)

Response: The definition of a stand has not changed from what it was in the data set we are using as a reference. It was and is still defined as a community, particularly of trees, possessing sufficient uniformity as regards composition, constitution, age, spatial arrangement or condition to be distinguishable from adjacent communities, so forming a silvicultural or management entity (Terminology of Forest Science, Technology Practice and Products, Society of American Foresters, 1971).

What is defined as "dominance" can change from one research paper to the next, but nonetheless is normally defined in each by the researcher depending on what is being researched as is the case with the data table described on page 51 of the DEIS. The basis for the data displayed in the table is from data obtained through comprehensive growth, yield and stocking studies made in stands ranging from 30-120 years old and containing 15% or more western white pine by volume, throughout the type's commercial range. Today in the Northern Region, the dominant cover type of a stand, where the average diameter of the trees is more than 5 inches dbh, is determined by the species with the largest amount of basal area in the stand (DEIS, p. 50). The relationships between these parameters are related since basal area or diameter of a tree and its height can be used to calculate the trees board foot volume and are easily cross-walked.

43. Comment: Nowhere in the DEIS is western hemlock said to presently occur in the project area and, if it does, it would be extremely rare. Yet, it supposedly was part of the area pre blister rust (which does not affect hemlock). The absence of lodgepole pine in the current condition is also puzzling. (FOC)

Response: The species composition listing given on page 51 of the DEIS was of the southern portion of the western white pine type described in Hiag's Technical Bulletin 767. On page 2 of that document, Hiag states that commercial stands of western white pine are confined to a total range of some 2,700,000 acres in primarily northern Idaho, extending from the Canadian border south to the Lochsa River and including portions of northeastern Washington and western Montana. This is an extremely large area encompassing a varied climate region and occupied by many habitat types. The Yakus watershed is only 7,900 acres of this much larger area.

On page 51 of the DEIS it states: "Note: Not all of these species would likely be present on every acre of the forest." For example, western hemlock is within the western white pine type but does not occur in the Yakus area. It is found on the Palouse Ranger District of the Clearwater National Forest which defines the southern extent of its range in Idaho, and a few specimens can be found north of the North Fork Clearwater River in the bottom of Dog Creek.

Lodgepole pine is an ubiquitous species in the western United States with a wide ecological amplitude and can be found growing from 1,600 to 12,000 feet in elevation (Silvics of North America, USDA Agriculture Hanbbook 654, 1990). However, like western hemlock, it does not grow within the Yakus Creek watershed, where the highest elevation is approximately 4400 feet.

44. Comment: The information about the lack of competitiveness of larch and white pine in the DEIS (page 51) is in direct contradiction to the desired conditions and stated purpose and need. Also, Douglas fir trees, while shade tolerant, are also common in open, sunny areas. Please explain. (FOC)

Response: The desired future conditions on page 2 of the DEIS states that the forest stands are mostly even-aged, single storied, and contain a mix of western white pine, western larch, Douglas-fir, grand fir, and western Redcedar. The purpose and need recommends vegetative and forest health improvement by increasing the presence of western larch and western white pine, reducing tree densities, regenerating declining mature stands and those with insect and root rot problems.

Western larch is the most shade intolerant species that grows on the Clearwater NF or in Region 1. It can be shaded out of stands by other species. Neither western larch or western white pine lack competitiveness. In fact, western larch is the fastest height grower of all the species listed. Why? Because it is so shade intolerant and has evolved to grow faster in height than its surrounding competitors, so it can survive.

Except for its susceptibility to an introduced pest, blister rust, western white pine is a very competitive species in that it is long-lived, a fast height and diameter grower, and has a low crown bulk density. Its bole in maturity has a high lower crown height to deter ground fires from moving into its crown. Western white pine is also a generalist in its site requirements in that it can grow at low and high elevations and at many latitudes and longitudes and habitat types.

Shade tolerance means a tree will tolerate growing in shade, but says nothing about how it will respond in full sun. All of the species in the Yakus area will grow at their fastest rate when in full sun, once the seedling becomes established, even the most shade tolerant species, like western redcedar (Haig, 1941). Douglas-fir is very competitive and adaptable and will grow under a certain amount of shade in the Inland Northwest. Like western redcedar and grand fir, Douglas-fir will grow quite well in full sun, once it has become established as a seedling.

45. Comment: The DEIS also notes that the seral stages under the preferred alternative would result in less old forest than currently or historically. How can the agency claim an increase in health when age classes, one of the agency's big obsessions (or rather a convenient excuse to log) will be skewed away from older forests? (FOC)

Response: What is said in the DEIS on Page 99 is the effect of planned regeneration harvest would be a 220-acre or 4% decrease in the late seral (100+years) successional stage with a corresponding increase in the early seral stage (0-40 years) stage, as highlighted in Table 4.21. The late seral successional stage consists of trees 100 years or older in age (DEIS, page 52). All of the areas planned for harvest meet Clearwater National Forest direction (December 2006) that directs the Forest to defer regeneration harvest in stands that are within 20 years of meeting the North Idaho old growth definition (Green et. al. 2005).

46. Comment: The desire to prevent fire in the area is contradicted by the leaving of fine fuels (page 23) which will increase the fire risk. Please explain this inconsistency. (FOC)

Response: As previously stated, preventing fire in the area is not a purpose of this project (see response to comment #40). However, the purpose of mitigation #6 (referred to in this comment) is to leave activity slash on the ground through one wet season to provide for nutrients in the slash to be leached into the soil. Such practices increase soil productivity. The risk of fire is short term since the material would only be left for one season prior to burning for site preparation.

47. Comment: With regard to recreating the white pine stands of the past, three factors are important to remember. One is that conditions have changed and will likely continue to do so. The end of the Little Ice Age, human-induced global warming, and the blister rust makes white pine less fit, especially as a dominant species. (FOC)

Response: The purpose of this project is <u>not</u> to recreate the white pine stands of the past. In fact, the natural regeneration of grand fir, Douglas-fir, and western Redcedar is actually being encouraged to help restock the treated acres and maintain tree species diversity.

Local pollen studies indicate that the current forest composition of the Clearwater NF has been in place for about 1000-1500 years, with western redcedar the latest arrival (Vegetation Range of Variation Overview, Clearwater Forest Plan Revision document, 2006). The desire to reestablish white pine in the mix, even with the issue of climate change, can be related to several factors described in *Silvics of North America*, USDA Handbook 654, such as: (a) there is little geographic or ecologic differentiation of populations of western white pine; (b) the adaptation of western white pine to different geographic, climatic, topographic, and edaphic conditions is governed more by phenotypic plasticity than by selective differentiation; (c) there is little difference among populations of western white pine from coastal Washington and western British Columbia and northern Idaho; and (d) the small genetic variation detected in populations of western white pine in northern Idaho allows seeds to be transferred without regard to elevation, latitude, longitude, or habitat type.

As stated in response to comment #39, the western white pine tree improvement stock to be planted has produced an effective blister rust resistance level. However, if blister rust is to be the measure of fitness of white pine, then it needs to be pointed out that Douglas-fir has a higher rate of mortality due to root disease than white pine does to blister rust (grand fir is a bit lower on most sites). The important difference is the ability of true firs and Douglas-fir to regenerate under a wide variety of conditions, which is why the current forest has progressed to a near monoculture so quickly from forests that were once highly diverse.

48. Comment: Given blister rust, it is laughable to suggest white pines have greater resistance to disease than species currently occupying the area. There is even the question of whether white pine was as dominant as claimed. (FOC)

Response: White pine's resistance to root decay is an important basis for its relative dominance in forests before blister rust. Western white pine has demonstrated residual resistance genes to blister rust that are probably retained in progenitors that migrated to this continent from Asia. Resistance-breeding is yielding white pines that are better able to cope with blister rust (see response to comment #39), and it is appropriate to re-establish the tree in its habitat as quickly as possible.

Given the high rate of new exotic pest introductions, annually, into forests worldwide, it would not take long to run out of tree species to manage, if we simply gave up each time a disease became established. Given our current low rate of forest manipulation, vegetative treatments should be aimed at retaining and re-establishing pines and larch, because these species have lost so much ground. It should also be noted that the decreasing susceptibility of white pine to blister rust is in direct contrast to the increasing susceptibility of true firs and Douglas-fir to root disease and associated bark beetles.

49. Comment: The DEIS is almost devoid of evidence collected in the analysis area or interpretation of data done with adequate scientific veracity to show that there is genuinely a problem with forest or tree density, that shade-tolerant trees are less adapted than intolerant ones, or that logging will cure the supposed problems. (FOC)

Response: All of the stands within the Yakus treatment units have had either recent stand examinations (some as recent as one year ago), or they have been matched with a Most Similar Neighbor estimate. In addition, all treatment stands were recently field examined by a Region One Certified Silviculturist, and a stand diagnosis was completed on each stand that resulted in the listed stand treatment proposals. The stand diagnosis compares the existing condition of the stand to the desired stand conditions and identifies treatments (if needed) that would move the stand closer to the desired condition (R-1 Supplement 2409.17-95-1, R1 Silvicultural Practices Handbook).

50. Comment: There is research which shows logging increases rather than decreases disease. Please consider the large body of research for the FEIS that indicates logging, roads, and other human caused disturbance promote the spread of tree diseases and insect infestation. (FOC)

Response: Consideration was given to the literature submitted by the public and is discussed in Section E of this document. In most instances, review of the literature submitted found that the study areas had a pre-existing high level of disease that would have continued whether the site was disturbed or not. Also, some of the authors point out that conversion to less-susceptible species is the best solution for root disease, which is a purpose of this project.

Water/Fish

51. Comment: Develop a DEIS alternative that decommissions as many existing roads as possible, and reduce soil compaction on 90 acres of old skid trails and landings, without any proposed ATV connector trails and logging. (Dick Artley)

Response: This proposal was considered, but dropped from detailed study (refer to Alternative 5 on page 25 of the DEIS). Alternative 4, which was studied in detail, also excludes any new roads or ATV connector trails.

52. Comment: As usual, the topic of Appendix C-1 poses a real worry: plenty of valuable watershed restoration efforts are identified, but naturally without a funding source (although the DEIS is candid and honest on that point). (Dennis Baird)

Response: We have partnership funding available to complete all watershed restoration work. Our current track record for road decommissioning and culvert replacement indicates that we have successfully implemented restoration work associated with other similar projects.

53. Comment: Despite the requirements of both the Clean Water Act and the 1993 Settlement Agreement, WATBAL estimates of sediment yield following project implementation describe an increase in sediment yield for four years after project implementation (p. 77). The Yakus Creek project needs to be revised to include measures aimed at reducing sediment yield to Yakus and Lolo Creeks. (ICL)

Response: The increase in sediment to 47% within the first 4 years is associated with road building on private lands (DEIS, footnote on pg. 77) and is shown across all alternatives in Table 4.15. The increase to 47% would occur whether or not Yakus activities were conducted. As shown in the table, none of the Yakus project activities cause an increase in sediment over the Forest Plan standard. All alternatives provide for a decrease to below Forest Plan standards within 6 years of implementation. A predicted increase 6 to 12 years after construction of the Yakus projects permanent road is described on page 78, as is the reason we believe it will not actually occur (BMPs, road location). It also describes the benefits of building the permanent road in lieu of keeping the upper portion of Road 5017 (see also DEIS, Table 4.10). By removing Road 5017, there would be a net decrease in sediment yield over time (DEIS, pg. 78). We feel the Yakus project greatly reduces sediment yield through PACFISH buffer retention but primarily through road decommissioning and placing roads into intermittent storage.

54. Comment: A problem with the water quality analysis is there is a disconnect between observation and modeling. WATBAL often predicts recovery when monitoring proves otherwise. (FOC)

Response: Documentation describing the WATBAL model can be found in *Watershed Responses Model for Forest Management, WATBAL Technical Users Guide* (Patten and Jones 2005) and WATBAL's limitations are described in *Uses and Limitations of the WATBAL Model* (Jones 2005), which is included in Appendix F of the DEIS.

Analysis has been conducted to tie actual data to results from WATBAL model. In 2005, over 18,000 suspended sediment and 600 bedload sediment measurements collected between 1978 and 2004 were analyzed from seven different watersheds. Watersheds were selected with a variety of management intensity, underlying geology and long-term data sets that could be paired to evaluate WATBAL model runs. Based on the results, changes were made to the model in 2005. The overall mean accuracy for the seven watersheds combined improved to 99 percent. Further discussion can be found in *Calibration of the WATBAL Sediment and Water Yield Model* (Jones and Patten 2006), located in the project file.

55. Comment: You are well aware of the problems with WATBAL, which is used in the DEIS (as is WEPP). Objective, independent scientists outside the agency have criticized WATBAL. The DEIS omits any reference to those arguably more credible independent scientists and their papers. (FOC)

Response: WATBAL is a watershed response model designed to address the cumulative effects of timber harvest operations, roads and fire on watersheds generally between 4 ands 40 square miles in size. The model incorporates the concepts of the R1/R4 Sediment Guides, which focus on slope hydrology, erosion, stability and sediment delivery processes. It predicts average annual sediment and water yields, and is not intended to simulate individual or episodic storm, mass erosion events or extreme drought or flood. It was developed with data from the Clearwater National Forest and has undergone validation and calibration. The 'flawed model' concept is based on a paper (Hickey, 1997) that does not reflect the current status of WATBAL. Calibration efforts in 2002 adjusted runoff coefficients to reflect the annual hydrograph at gage sites and additional calibration in 2005 adjusted surface and mass erosion coefficients *Calibration of the WATBAL Sediment and*

Water Yield Model (Jones and Patten 2006). The overall mean accuracy of sediment production improved to 99 percent. The resulting r^2 (goodness of fit, with a range between 0 and 1) increased from 0.46 to 0.60 (Jones and Patten, 2006). The WATBAL runs for the Yakus Creek project were based on the 2005 version. Also, refer to Appendix F in the DEIS for a discussion of the WATBAL model.

56. Comment: WATBAL is predicting additional sediment from 2015 to 2021. Yet, the assumption in WATBAL is the logging will occur in 2009. Please explain. (FOC)

Response: Please see comment #53 regarding sediment input in 2015 and beyond. In addition, as noted on page 78 of the DEIS, the permanent road construction is the only activity responsible for the increase in sediment. Logging does not increase sediment largely in part due to PACFISH buffer retention.

57. Comment: Yakus is a water quality limited stream. An increase in sediment does not meet water quality standards, contrary to what is suggested on page 80 of the DEIS. (FOC)

Response: Please see comment #53 regarding the likelihood of sediment input from the permanent road and the overall benefit of removing the upper portion of Road 5017. Page 70 of the DEIS also describes that WEPP predicts there would be some surface erosion produced by the road, but essentially no delivery to Nan Creek. In addition, according to WEPP modeling, the probability of sediment delivery from logging ranges from 3 to 20% which is considered a low risk (DEIS, page 69). The implementation of BMPs and PACFISH buffers would keep the risk low (see DEIS, page 82).

58. Comment: Originally, the FS considered that alternative 2 would not meet water quality standards, according to the DEIS (page 25). As such, alternative 3 was developed. Please provide the information that led the agency to believe alternative 2 may not meet water quality standards. (FOC)

Response: During the early stages of the analysis, Alternative 2 proposed more treatment units and temporary roads. After reviewing the units in the field and running the WATBAL and WEPP models, it was decided that portions of Unit 1 and the associated temporary road would be dropped, due to the possibility of increased sediment delivery. Alternative 2 has also gone through further changes (mostly to meet concerns over old growth forest), as described on pages 4 and 5 of the DEIS.

59. Comment: The biggest problem with the DEIS is there is no monitoring data presented with which to verify the assumptions made by the models. The forest plan requires such monitoring and it is not presented in the DEIS. (FOC)

Response: Please see responses to comments #54 and #55. In addition, the Forest Hydrologist, Fisheries Biologist, and Soil Scientist conduct monitoring every year. Please see in the reference section the numerous reports, BMP audits, and monitoring reports under Jones (R-4 and R-5) and Murphy (R-6).

60. Comment: The fisheries/aquatic life analysis does show that current conditions are unsatisfactory (pages 41 and 42). However, trend data is not presented in the DEIS. The only trend information that can be gleaned is found on pages 42 and 43. This data suggests that cutthroat densities have dramatically decreased from what occurred 30 to 35 years ago. (FOC)

Response: The Clearwater National Forest has no Forest Plan requirement to provide trend data for project analyses. The DEIS does discuss existing habitat conditions (pgs. 40-42) and acknowledges past management influences on the aquatic environment (pgs. 43-45). While the data shows a decline of cutthroat over time, the Yakus project has been designed to have no measurable effect on aquatic species (pg.82). There would be short-term negative effects as a result of road decommissioning and intermittent storage activities; however there would be long term benefits to species as a result of these activities (pgs.83-84).

61. Comment: Cattle select for riparian areas, which are within PACFISH buffers. The assertion in the DEIS that they don't (page 45) contradicts every study and years of observation about cattle and riparian areas. (FOC)

Response: The paragraph describing the existing effects of cattle grazing on page 45 refers to habitat surveys completed in 1994 and 2004, with only two areas of trampling being observed along Molly Creek. It goes on to further describe where cattle in this area are found to spend most of their time and the presence of thick vegetation along the streams, which has all contributed to minimized cattle damage to area streams (pg. 45). The Yakus area contains transitory range as opposed to primary range. Many studies about cattle in riparian areas occur where primary range is dominant. Primary range is generally composed of large grassy areas throughout the allotment and next to streams. The Yakus area does not provide this type of habitat as noted in the DEIS and in the Eldorado Canyon Allotment EA (2005), of which Yakus was discussed.

62. Comment: We further believe obliterating roads will not have a positive impact on stream quality in the area, but instead has the potential for making water quality worse. Fixing existing culverts and cross ditching is a better alternative to obliterating and decommissioning. (LC ATV)

Response: The DEIS discusses how roads effect streams through sediment input and the creation of aquatic migration barriers (pg. 42-43). There is much research that supports the effects of roads on streams and also supports the removal of roads, especially near streams. While we would like to be able to maintain all of our roads for public use, the costs are going up and our budgets are going down. Stream bottom roads are particularly expensive due to the cost of culvert replacement. A typical crossing on a fish bearing stream can range from $20,000 to $100,000 per crossing depending on the site. Non-fish bearing crossings can run from $2000 to $10,000 per site. Using low estimates for cost Road 5105 in the Yakus project would probably cost a minimum $200,000 to upgrade due to its 3 fish bearing and 14 non-fish bearing crossings. We feel the cost of replacing these culverts would far exceed the benefits of providing 2.5 miles of seasonal access. We would prefer to spend the money on roads/trails that provide longer riding opportunities such as the OHV trail sections off of Road 455.

63. Comment: The Yakus Creek project is considered a nonpoint source activity by the Idaho Water Quality Standards and is subject to IDAPA 58.01.02.350, which requires a monitoring plan be provided to the Department if a project is reviewed for compliance. (IDEQ)

Response: A monitoring plan was created (located in the project file) and will be sent to IDEQ.

64. Comment: Approved best management practices (BMPs) that may apply to your project include IDAPA 20.02.02, IDAPA 37.03.07, and IDAPA 20.03.01. Specialized BMPs may be required to address water quality protection objectives not addressed by the above listed approved BMPs. (IDEQ)

Response: In addition to the above, specialized BMPS for the Yakus project were identified and are listed in Appendix E of the DEIS. Also, specialized project design measures were developed for the project and are discussed in the DEIS on pages 23-24.

65. Comment: For those road miles adjacent to water bodies, we recommend that the FEIS indicate which level of abandonment will be applied. Specifically, we note that 1.6 miles of permanent road would be constructed on the ridge south of Molly Creek to replace several road segments that currently run adjacent to Molly Creek and Nan Creek. We seek clarification of the level of obliteration to be applied to these road segments. (EPA)

Response: All roads proposed for decommissioning would be generally recontoured and revegetated. All culverts would be removed and road fill would be pulled back to allow for natural channel movement.

66. Comment: The DEIS indicates on page 36 that a search of water rights applications, permits, decrees, licenses, claims, and transfers was made for the Yakus Creek subwatershed, and that thirteen federal, private, and State of Idaho water uses were located (including 2 domestic and stockwater withdrawals from Yakus Creek). The DEIS states that none of the proposed activities would affect water rights, but it does not specify whether any of the proposed activities would potentially impact source water quality. (EPA)

Response: None of the Yakus activities would affect source water quality. The likelihood of sediment delivery is low and there would no alteration to stream channels or increase in peak flow.

Wildlife

67. Comment: The DEIS does not indicate the status of elk habitat effectiveness (EHE) during timber sale implementation. The issue isn't that the sale, after implementation, will meet the standard. It must meet the standard all through the process. If not, the standards are meaningless as there are sales occurring all of the time. (FOC)

Response: There is no Forest Plan standard directing that an activity "must meet the (elk habitat effectiveness) standard all through the process." (Refer to CNF Plan, pgs II-23, 5a and III-58, 2b for specific direction regarding elk summer habitat effectiveness). Some roads (Rd 5017, Nan Creek; and 5104, Rat Creek) are currently closed to motorized traffic. These roads would be used for timber harvest and/or to access sections designated for obliteration. A standard mitigation practice to reduce impacts on elk habitat is to limit motorized access on these roads to timber harvest and administrative traffic, only (i.e., continued closed to public motorized access). Because of motorized access limits, in conjunction with planned road decommissioning and intermittent storage activities, all action alternatives would enhance elk summer habitat effectiveness. The analysis indicates that there would be an improvement in Elk Habitat Effectiveness for both action alternatives and that alternatives all would exceed the Forest Plan standard of 25%.

68. Comment: The DEIS indicates that the Clearwater National Forest will implement the snag management protocol as part of this project. However, there is no description in the DEIS as to how the agency plans to do so. For example, how many snags per habitat type of treatment type will the forest target? How does the Forest Service propose to recruit additional snags absent a sufficient number to meet the protocol? (ICL)

Response: Planned actions exceed the Clearwater National Forest snag management guidelines and comply with the Northern Region Snag Management guidelines. Large snags (that do not pose a safety hazard to loggers) and live trees would be irregularly dispersed within harvested stands in clumps or as single, scattered trees. Though removal of some snags would occur, all alternatives provide habitat within untreated mid-seral and mature stands and forested riparian habitats.

69. Comment: There is no (population) trend or monitoring information. Please explain this deficiency. (FOC)

Response: Forest Plan monitoring is outside the scope of this project. However, monitoring direction can be found in the 1987 CNF Plan, pages IV-8 through 16. This section indicates that most monitoring items are "…applicable to specific management areas…" and that "other monitoring items are more applicable to broad areas or are Forest-wide in nature…" Numerous survey and monitoring efforts have been conducted on the Clearwater National Forest since the approval of the 1987 CNF Plan. Specifically:

- A cooperative program between the CNF and Potlatch Corporation is in place to reward individuals for reporting active goshawk nests.
- The Northern Region Landbird Monitoring Program and Clearwater National Forest are cooperating in the landbird monitoring program. The program was developed to provide long-term population trend monitoring, habitat-relationships, and management effects studies of forest birds (including CNF MIS and sensitive bird species) on USFS lands. Details of this monitoring program can be located at http://avianscience.dbs.umt.edu/research_landbird_data.htm.

Other monitoring activities conducted since approval of the 1987 CNF Plan, includes sensitive plant (Lichthardt and Mosely, 1994) and animal (Cassier 1991/1994) surveys, and sensitive animal and plant sightings (documented in the Idaho Conservation Data Center). The Clearwater National Forest is also cooperating with the Idaho Department of Fish and Game and the Rocky Mountain Research Station to assess fisher and wolverine presence and distribution (via trapping, radio monitoring, and winter tracking) in the Upper Lochsa River Basin (Lolo Pass Study Area).

70. Comment: The DEIS also ignores many species. For example, it eliminates many species from any analysis such as the black-backed woodpecker even though the DEIS states, "Suitable habitat occurs within the area." (FOC)

Response: Table 3.9 in the DEIS indicated a number of wildlife species (highlighted in gray), including black-backed woodpecker, that were not discussed further in the document. A thorough analysis of species and habitats are discussed and summarized in Attachment 1, in the *MIS & TES Wildlife and Plants Resources Status Report* (project file). With respect to black-backed woodpecker, the wildlife report indicated that approximately 180 acres of suitable black-backed woodpecker habitat occurs in the Yakus project area. Analysis results indicated that Alternative 2, would reduce suitable black-backed woodpecker habitat availability by 10 acres (i.e., by approximately 6% of the suitable habitat within the project area). The report further stated that the planned actions would affect 2% of the estimated 540 acres of available black-backed woodpecker habitat within its 29,600-acre cumulative effects area. Per the estimated available black-backed woodpecker habitat, the Yakus project would decrease currently suitable black-backed woodpecker habitat by approximately 0.001% on the CNF.

Black-backed woodpecker habitat is expected to: (a) be available in dead trees remaining in untreated areas and those retained within the treated areas (some killed by subsequent prescribed

fire); (b) remain substantially above the habitat that is needed (29,400 acres) to support minimum viable populations in the Northern Rocky Mountain Province; (c) continue well distributed throughout its range within the project, cumulative effects and CNF scales; and (d) persist as suitable nesting and foraging habitats in untreated mature forest stands and forested RCA habitats within the Yakus Project area. Because of these factors, the direct, indirect and cumulative effects of the planned actions in Alternative 2, are considered immeasurable (i.e., neither detectible nor quantifiable). Therefore, it was decided to not display the effects in the DEIS and dismissed from further analysis. The planned actions in Alternative 2, would be documented in the Biological Evaluation as ***"May impact individuals or habitat, but will not result in a trend toward federal listing or reduced viability for the population or species."***

71. Comment: The DEIS also fails to analyze goshawks and pileated woodpeckers, claiming that habitat would remain unchanged even though old, mature forests would be logged. This contradicts the DEIS with regard to the marten and fisher, which would lose 220 and 90 acres of old forest habitat respectively. (FOC)

Response: The Northern Region conducted extensive Conservation Assessments {Samson, F. B. 2005 (amended June 6, 2006) and Samson F. B. 2006} for six Northern Region wildlife species, including northern goshawk, pileated woodpecker, American marten and fisher. These assessments included:

- A brief overview of ecology, behavior, and habitat use;
- A brief overview of the habitat use in the Northern Region;
- Estimates of well distributed habitat and habitat amount by National Forest;
- Evaluation of short-term (today's landscape) viability;
- Evaluation of long-term viability (historic landscape) and ecosystem sustainability; and
- Established regional threshold levels that would be necessary to support self-sustaining populations.

Habitat attributes for American marten and fisher are described on pages 15 and 23, respectively, in the *MIS & TES Wildlife and Plant Resources Ecology and Management – NEPA Support* (project file). Analyses of American marten and fisher habitats and effects associated with the Yakus project area were based on the Regional Conservation Assessment.

72. Comment: The EIS does not analyze lynx because it claims the area is outside of lynx habitat. That is indeed curious as Lynx Creek occurs in the project area. On the Clearwater, anything below 4,000 feet in elevation is automatically eliminated. That is an arbitrary designation especially since the adjacent Idaho Panhandle National Forests use a lower elevation standard. In any case, some of the analysis area is above 4,000 feet in elevation. (FOC)

Response: Per the Northern Rockies Lynx Management Direction (NRLMD), Attachment 2-1, "Lynx habitat occurs in mesic coniferous forest that experience cold, snowy winters … and primarily consists of <u>lodgepole pine, subalpine fir, and Engelmann spruce</u> (emphasis added). It may consist of cedar-hemlock in extreme northern Idaho…on moist sites at higher elevations in central Idaho…." Canada Lynx habitat was mapped for the entire CNF using the criteria established in an August 22, 2000 Interagency Directive. As defined in the August 22, 2000 Interagency Directive and the depicted in the NRLMD, the Yakus project area does not contain substantial amounts of <u>lodgepole pine, subalpine fir, and Engelmann spruce</u>, is not considered suitable lynx habitat.

73. Comment: The DEIS claims that ancient forest (old growth) standards would be met and even exceeded as stands nearing old growth definitions would not be logged as they are needed for replacement old growth. However, the DEIS admits a loss of a few percent of old forests in the DEIS. The DEIS also suggests that some of the 37% (DEIS page 16) of old growth/old forest would be logged (DEIS page 99) in violation of the forest plan and supervisors order. Please explain. (FOC)

Response: What is said in the DEIS on Page 99 is the effect of planned regeneration harvest would be a 220-acre or 4% decrease in the late seral (100+years) successional stage with a corresponding increase in the early seral stage (0-40 years) stage, as highlighted in Table 4.21. The late seral successional stage consists of trees 100 years or older in age (DEIS, page 52). Not all of the 1,993 acres of late seral stands listed in Table 4.21 on page 99 meet the old growth definition, and is where timber harvest is planned.

All of the treatment areas have been field verified with stand examination data to assure that no timber harvest occurs in stands that are 130+ years old and currently have 10 trees per acre that are 21″ in dbh or larger. This criterion is in compliance with Forest Plan direction and the Forest Supervisor's order (December 2006).

74. Comment: There is no discussion of snag habitat in the DEIS. (FOC)

Response: Snags were not raised as an issue for this project. Also, see the response to comment #68.

Misc. Comments

75. Comment: This project should be offered as a Stewardship Contracting opportunity. The "restoration work" that has been identified with your analysis fits perfectly with the goals and intent of Stewardship Contracting. (Three Rivers)

Response: You are correct to say that this project would fit with the goals and intent of Stewardship contracting. Originally, this project was proposed to be implemented in such a manner. However, in order to maintain a balanced vegetation management program, the decision was made to offer this as a timber sale. The Forest Service has a commitment through our partner the Nez-Perce Tribe to complete all of the watershed restoration work within the project area. Since the restoration work is already funded, a timber sale will accomplish all stewardship objectives as well as provide opportunities to provide receipts to counties and vegetation management trust funds.

76. Comment: The DEIS's public involvement section refers to a notice on intent (NOI) that was issued on 8/26/05. Were comments requested for the NOI and were scoping letters sent out? (FOC)

Response: Scoping for this project was initiated on 2/10/04. Over a year later, it was decided to document the analysis in an EIS, instead of an EA, which resulted in the preparation of a NOI that was published in the Federal Register on 8/26/05. However, since the project had already been scoped, the purpose of the NOI was to give notice of our intention to prepare an EIS and not to request further comments. It was stated in the NOI that scoping comments already received would be included in the documentation for the EIS. The next public comment period was initiated with release of the DEIS on 2/8/08.

77. Comment: The DEIS discusses some suggestions received from letters but fails to acknowledge the request for a real restoration alternative, one that does not do more watershed damage through logging and roadbuilding. In chapter 2, the DEIS rejects such a restoration alternative even though it was not acknowledged as part of the public input process in chapter 1. Please explain this discrepancy. (FOC)

> **Response:** Public involvement is discussed in Chapter 2 of the DEIS (page 11). Public comments concerned about high road densities and the use of regeneration harvest were used to formulate Alternative 4, which was considered in detail. The request for a restoration alternative (without timber harvest) was considered as Alternative 5, but was later eliminated from detailed study, as explained in Chapter 2 of the DEIS (page 25).

78. Comment: The fact that the area is allocated to E1 does not preclude a restoration alternative. Indeed, it violates NEPA to exclude such an alternative as the agency has argued that forest plans do not make site-specific decisions. (FOC)

> **Response:** Part of the rationale for eliminating the restoration alternative (Alternative 5) is that a majority of the Yakus Creek area is allocated to Management Area E1. However, the rationale is not to preclude a restoration alternative, but instead to state that current watershed conditions do not preclude these types of actions, meaning vegetative treatments. The range of alternatives considered presented a balanced range between vegetative/habitat improvements, watershed improvements, and goods and services and did not consider the extremes.

79. Comment: The DEISs comparison of alternatives in chapter 2 is seriously flawed. The other alternatives are set up in the DEIS as straw men, thereby leaving only one choice. Alternatives that should have been evaluated were not because those would have compared more favorably to the proposed action (alternative 3 and a real restoration alternative). (FOC)

> **Response:** A total of six alternatives were initially considered, with three alternatives being later eliminated from detailed study for the reasons stated in Chapter 2 of the DEIS (pages 25 and 26). The remaining three alternatives were considered in detail. Based on how each alternative responded to the purpose and need for action, achieved the desired future conditions, and responded to issues and public comment, the project's Interdisciplinary Team recommended Alternative 2 as "preferred" in the DEIS.

E. Consideration of Other Science/Literature Submitted by the Public

Members of this project interdisciplinary team are considered proficient in their field of study by way of academic achievement, agency training, years of professional experience, and in some cases, certification programs. In addition, each team specialist has cited numerous scientific studies and literature used to support discussions and conclusions made in this project's analysis (refer to References). Other literature and scientific studies were brought forward during public review of the Draft EIS. Those references are listed below, along with rationale for each on whether or not it was used in this project's analysis.

Aho, P. E., G. M. Filip and F. F. Lombard. 1987. **Decay fungi and wounding in advance grand and white fir regeneration.** Forest Science 33: 347-355.	
Used	This research paper is consistent with other research on insipient decay in grand fir often caused by wounding, and is consistent with why we are not proposing to manage or release advance grand fir.
Arno, S.F., H.Y. Smith and M.A. Krebs 1997. **Old growth Ponderosa Pine and Western Larch Stand Structures: Influences of pre-1900 Fires and Fire Exclusion.** USDA Forest Service, Intermountain Research Station, INT-RP-495.	
Not Applicable	Not applicable to this area due to the habitat types here which are far more mesic – moist and wet.
Baker, William L. and Donna Ehle, 2001. **Uncertainty in surface-fire history: the case of ponderosa pine forests in the western United States.** Can. J. For. Res. 31: 12051226 (2001)	
Not applicable	Historic ranges of variability and mean fire intervals were not a focus of this project.
Barrett, SW, Arno SF et al. 1991. **Fire regimes of western larch-lodgepole pine forests in Glacier National Park, MT.** Canadian Journal of Forestry Research 21-1711-1720.	
Not applicable	Effects on fire regimes was not a focus of this project.
Beschta, Robert L., Christopher A. Frissell, Robert Gresswell, Richard Hauer, James R. Karr, G. Wayne Minshall, David A. Perry, and Jonathan J. Rhodes. 1995. **Wildfire And Salvage Logging: Recommendations for Ecologically Sound Post-Fire Salvage Management and Other Post-Fire Treatments On Federal Lands in the West.** Oregon State University, Corvallis, OR.	
Not applicable	This report was read for background information regarding fire treatments. As it specifically addressed post-fire treatments and salvage logging, it was not applicable to the vegetative treatment activities proposed under the Yakus Creek project.
Chavez, T. D., R. L. Edmonds and C. H. Driver. 1980. **Young-growth western hemlock stand infection by Heterobasidion annosum 11 years after precommercial thinning.** Canadian Journal of Forest Research 10: 389-394.	
Not applicable.	The Lochsa Ranger District has no western hemlock and no hemlock series habitat types. Thus, western hemlock is not present in any of the proposed treatment units.
Della Sala, D.A., et al., 1995a. **Forest Health: Moving beyond the rhetoric to restore healthy landscapes in the Inland Northwest.** Wildl. Soc. Bull. 23(3):1-11	
Not Used	The report is biased; written by members of the World Wildlife Fund with no explanation of how it was peer reviewed. The information and conclusions are questionable.
Edmonds, R. L., D. C. Shaw, T. Hsiang and C. H. Driver. 1989. **Impact of precommercial thinning on development of Heterobasidion annosum in western hemlock.** pp. 85-94 in Proceedings of the Symposium on Research and Management of Annosus Root Disease (Heterobasidion annosum) in Western North America. W. J. Otrosina and R. F. Scharpf, tech. coord. GTR-PSW-116. USDA Forest Service. Pacific Southwest Forest and Range Experiment Station.	
Not applicable	Western Hemlock is not present in the Yakus analysis area nor on the Lochsa Ranger District. *Annosus* (S-type) root rot can be found in Douglas-fir and true firs and is usually found in association with other root diseases (*Armillaria sp*.) which has a much greater impact on stands in the project area.
Filip, G. M. 1979. **Root disease in Douglas-fir plantations is associated with infected stumps.** Plant Disease Reporter 63: 580-583	
Not used	Although applicable, *Phellinus weiri* is more commonly found in unmanaged grand fir and Douglas-fir stands. To avoid this and other root diseases in DF - the plantations are to be planted to root disease resistant WP and WL. DF is but a minor component of the next target stand.
Goheen, D. J. and E. M. Hansen. 1993. **Effects of pathogens and bark beetles on forests.** pp. 175-196 in Beetle-Pathogen Interactions in Conifer Forests. T.D. Schowalter and G.M. Filip, eds. Academic Press. San Diego.	
Used for background information.	Although this study is applicable and consistent with other literature used in the analysis, it should be made clear that root disease is highly prevalent in true fir and Douglas-fir forests whether they have ever been harvested or not. There is little difference in the abundance of the disease between harvested and unharvested areas. The bark beetles associate with root disease whether the stands have a history of harvest or not. This is why favoring or regenerating root disease resistant species is so important.

Goheen, D. J., F. W. Cobb Jr., D. L. Wood and D. L. Rowney. 1985. **Visitation frequencies of some insect species on Ceratocystis wageneri infected and apparently healthy ponderosa pines.** Canadian Entomologist 117: 1535-1543.	
Not used	Applicable and consistent with other literature used in the analysis. Although, not a major cause of predisposition of ponderosa pine to bark beetle attacks in the project area and ponderosa pine is almost non-existent in the analysis area on these wet habitat types.
Goheen, E. M. and D. J. Goheen. 1989. **Losses caused by annosus root disease in Pacific Northwest forests.** pp. 66-69 in Proceedings of the Symposium on Research and Management of Annosus Root Disease (Heterobasidion annosum) in Western North America. W. J. Otrosina and R. F. Scharpf, tech. coord. GTR-PSW-116. USDA Forest Service. Pacific Southwest Forest and Range Experiment Station.	
Considered but not used	This study concluded that stands with multiple logging entries had more evidence of annosus root disease in grand fir than stands with a single entry. This conclusion is generally accepted but it should be noted that, as a retrospective study, it is possible, even probable that repeated harvest entries were in response to higher initial mortality rates due to root disease. Therefore, it is not possible to determine whether the harvests were the cause, or the result, of elevated levels of root disease. In reference to large stumps serving as infection foci, Filip and others (1992) found that infection of fresh stump surfaces probably plays an insignificant role in initiating infections in stands in eastern Oregon. High rates (89%) of stump infection in true fir stumps were measured following clearcut harvesting, but most were thought to have originated from mycelia already present in the trees before harvest. This observation is consistent with that of Garbolloto and others (1999), who also concluded that most trees already had root infections before tree harvest activity occurred.
Hansen, E. M. 1978. **Incidence of Verticicladiella wagenerii and Phellinus weirii in Douglas-fir adjacent to and away from roads in western Oregon.** Plant Disease Reporter 62: 179-181.	
Not used	Not applicable; *Verticicladiella wagenerii* has not been found in the project area and is rare in the state of Idaho and does not play a significant role in forests of north Idaho. .
Hayward, Gregory D., 1994. **Information Needs: Great Gray Owls.** Chapter 17 *In:* Hayward, Gregory D., and Jon 1Verner, 1994. Flammulated, Boreal, and Great Gray Owls in the United States: A Technical Conservation Assessment. USDA Forest Service General Technical Report RM-253.	
Not applicable	This project did not focus on "historical ecology" or historic ranges of variability. Instead, estimates of past vegetative cover were taken from USFS field surveys done in the 1930s.
Henjum, M.G., et al., 1994. **Interim protection for late-successional forests, fisheries and watersheds: national forests east of the Cascade crest, Oregon and Washington.** The Wildlife Society, Bethesda, MD	
Not Applicable	Not applicable, the habitat types in the Yakus project are moist and wet and unlike the high elevation, and much drier forests of eastern Oregon and Washington.
McDonald, G. I., N. E. Martin and A. E. Harvey. 1987. **Armillaria in the Northern Rockies: Pathogenicity and Host Susceptibility on Pristine and Disturbed Sites.** USDA Forest Service. Research Note INT-371. 5 p.	
Not used	Other science used was more appropriate. Although the results of the research indicate that the incidence of pathogenic *Armillaria* increase with disturbance on high productivity sites, this supports the proposed treatments to convert sites through regeneration harvest to non-host species such as WL and WWP.
Morrison, D. and K. Mallett. 1996. **Silvicultural management of armillaria root disease in western Canadian forests.** Canadian Journal of Plant Pathology 18: 194-199.	
Used	These authors point out that conversion to less-susceptible species is the best solution for root disease, which is a purpose of this project.
Riggers, Brian; Rob Brassfield; Jim Brammer; John Carlson; Jo Christensen; Steve Phillips; Len Walch; Kate Walker; 2001. **Reducing Fire Risks to Save Fish A Question of Identifying Risk.** A Position Paper by the Western Montana Level I Bull Trout Team, 2001.	
Not Used	This report was specific to bull trout, related to Montana habitat types and tied to fire risk reduction. The Yakus project area has no bull trout and is not similar in forest habitat types. The focus of the project is not on reducing fire risk.

Roth, L. F., L. Rolph and S. Cooley. 1980. **Identifying infected ponderosa pine stumps to reduce costs of controlling Armillaria root rot.** Journal of Forestry 78: 145-15	
Not used	Not applicable; this study is from an area in central Washington where *Armillaria* is an aggressive pathogen on PP. In addition ponderosa pine is almost non-existent on these moist and wet western Redcedar habitat types.
Smith, R. S., Jr. 1989. **History of Heterobasidion annosum in Western United States.** pp. 10-16 in Proceedings of the Symposium on Research and Management of Annosus Root Disease (Heterobasidion annosum) in Western North America. W. J. Otrosina and R. F. Scharpf, tech. coord. GTR-PSW-116. USDA Forest Service. Pacific Southwest Forest and Range Experiment Station.	
Considered but not used	*Heterobasidion annosum* in western North America consists of two inter-sterile (non-interbreeding) groups. These two types, 'fir' and 'pine', have very different host specificities. Ponderosa pine is the main host for the pine type. The hosts for the fir type include true firs, Douglas-fir, Engelmann spruce, western red cedar, and western hemlock. There are some very important differences in the ecologies of these species, so we can no longer get by lumping study results. We have, to date, found very little pine annosum in Idaho or Montana. Those infections found have been mostly on very dry ponderosa pine habitat types in western Montana. Therefore, only the fir-type annosum (which is as yet un-named) is of concern here.
Turner, M. et al. 1994. **Landscape dynamics in crown fire ecosystems.** Landscape Ecology 9(1): 59-77.	
Not applicable	Hazardous fuels (or fuel build-ups) was not a focus of this project.
Turner, M. et al. 1994a. **Effects of fire on landscape heterogeneity in Yellowstone National Park, Wyoming.** Journal of Vegetation Science 5:731-451.)	
Not applicable	Hazardous fuels (or fuel build-ups) was not a focus of this project.
Veblen, Thomas T. 2003. **Key Issues in Fire Regime Research for Fuels Management and Ecological Restoration.** USDA Forest Service Proceedings RMRS-P-29.	
Not applicable	Wildfire hazard reduction was not a focus of this project.
Wargo, P. M. and C. G. Shaw, III. 1985. **Armillaria root rot: the puzzle is being solved.** Plant Disease 69: 826-832.	
Used	It was inferred that Armillaria spreads into healthy stands from the stumps and roots of cut trees. This is not said by Wargo and Shaw. Instead, the fungus is not known to use freshly cut stumps to spread by spores. Thus, the mycelium must be present before the tree is cut in order for it to be present afterward.
Weir, JMH, et al. 1995. **Wildland fire management and fire regime in the Southern Canadian Rockies.** In: Proceedings: symposium on fire in wilderness and park management. 1993 March 30-April 1, Missoula, MT.. Gen. Tech. Rpt. INT-GTR-320. Ogden, UT: USDA, Forest Service, Intermountain Research Station.	
Not applicable	Effects on fire regimes was not a focus of this project.
Witcosky, J. J., T. D. Schowalter and E. M. Hansen. 1986. **Hylastes nigrinus (Coleoptera: Scolytidae), Pissodes fasciatus, and Steremnius carinatus (Coleoptera: Curculionidae) as vectors of black-stain root disease of Douglas-fir.** Environmental Entomology 15: 1090-1095	
Not used	Not applicable; Black-stain root disease (Lepotographium wagererii) was not detected in the project area and is rare in north Idaho and does not play a significant role in forests in north Idaho.

Response[3] to the Study Conducted by Rehfeldt et al. (2006)

Summary of the study: Rehfeldt et al. apply an analysis methodology known as "climate envelope modeling" to project possible changes in the distribution of 25 plant communities and nine tree species in the western United States. Their model uses the projection of future regional climate, based on a single scenario of future greenhouse gas emissions and the average of two global circulation models (GCMs), to project the location of the communities' and species' "climate profiles".

Strengths and limitations of climate envelope modeling: There is a large body of scientific literature addressing the strengths and limitations of climate envelope modeling to evaluate the effects of climate change on the distribution of species. One common conclusion is that model projections should be viewed with caution due to the limitations and uncertainties inherent in our ability to predict the future behavior of complex climate and biological systems.

There are several methodological limitations in climate envelope models, and many sources of uncertainty in their results. As pointed out by Rehfeldt et al., perhaps the most significant source of uncertainty arises from the methods and data used to project annual, monthly, and daily precipitation and temperature values over the next 100 years for the entire western United States at a scale of 1 km^2 (247 acres). Most research authors have concluded that several climate models, each with multiple realizations, are required to reveal the range of uncertainty associated with projecting species distributions in the future.

Furthermore, Rehfeldt et al. average the results of two GCMs, statistically "downscale" those results to the locations of established weather stations, and statistically interpolate those values to create a fine resolution ($1km^2$) continuous surface of projected climate conditions for the next 100 years. Although these downscaling methods are state-of-the-art, uncertainties cascade through this sequence of analytical steps. As Rehfeldt et al. note, "the accuracy of predictions from bioclimatic models ultimately is dependent on the aptness of the scenarios and the precision of the GCMs."

There are numerous additional sources of uncertainty in the methods of Rehfeldt et al., and climate envelope models generally. For example, Rehfeldt et al. define the "climate profile" of the nine tree species based on the observed climate conditions from 1961 to 1990 at locations where these tree species are known to occur. Although the availability of data limits the analysis to a relatively narrow time-slice, it is quite likely that these species have persisted though a wider range of climate conditions than the range captured in the period 1961-1990. Thus, the climate envelope model may underestimate the climate conditions suitable for these species.

In addition to uncertainties arising from climate analysis methods, uncertainty in climate envelope model results arises from their general inability to consider other factors that may substantially influence the distribution of suitable habitat for species. For example, climate envelope models do not directly address competitive interactions between species, which may play a critical role in the current and projected distribution of species. In addition, climate models do not directly consider how physiological factors influence the current or projected distribution of species. Finally, as noted in Rehfeldt et al. climate models do not consider how phenotypic variation or genetic adaptability may influence how species' distributions respond to climate change.

As a result of these limitations, many scientific publications counsel readers to apply the results of climate envelope models with caution and with full awareness of the uncertainties inherent in the results. Indeed, Rehfeldt et al. conclude their publication with a similar admonition: "Despite the availability of these powerful models, a thorough assessment of the effects of global warming is still distant."

[3] The response statements are excerpts taken from a draft document prepared by the Nez Perce National Forest in response to a comment submitted by ICL on the Blacktail project.

F. Distribution List for the Final EIS (Hardcopy or Web Document)

Tribal Organizations

Nez Perce Tribal Executive Committee

U.S. Congressmen

Representative Bill Sali
Senator Larry Craig
Senator Mike Crapo

County Officials

Idaho County Commissioners

Federal Agencies

Advisory Council on Historic Preservation
DOE – US Department of Energy
    Office of NEPA Policy & Compliance
EPA – Environmental Protection Agency
    Region 10 EIS Review Coordinator
FAA – Federal Aviation Administration
    Northwest Mountain Region
FHA – Federal Highway Administration
    Division Administrator
NOAA – National Oceanic & Atmospheric Admin
    National Marine Fisheries Service
    Office of Policy and Strategic Planning
NPPC – Northwest Power Planning Council
U.S. Army Engr. Northwestern Division
U.S. Coast Guard – Environmental Management
USDA – U.S. Department of Agriculture
    Deputy Director APHIS PPD/EAD
    Forest Service

Idaho State Agencies

Department of Health and Welfare
    Division of Environmental Quality
Department of Parks and Recreation

Businesses

Three Rivers Timber, Inc.

Environmental/Special Interest Organizations

Friends of the Clearwater
The Lands Council
WildWest Institute
Idaho Conservation League
Lewis-Clark ATV Club

Individuals

Dick Artley
Dennis Baird

Libraries

Lewiston Public Library
Moscow Public Library
Orofino Public Library
Kooskia Public Library
USDA – National Agriculture Library

Plus, individuals/groups that request a copy of the FEIS

APPENDIX G

Letters Received from Federal and State Agencies

The following letters were received from Federal and State Agencies in response to the DEIS:

1. Idaho Department of Parks and Recreation (IDP&R) – submitted by Jeff Cook
2. Idaho Department of Environmental Quality (IDEQ) – submitted by Daniel Stewart
3. United States Environmental Protection Agency (EPA) – submitted by Christine Reichgott

C. L. "Butch" Otter
governor

Robert L. Meinen
director

Dean Sangrey, Administrator
operations division

David Ricks, Administrator
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March 12, 2008

Craig Trulock, District Ranger
Lochsa Ranger District
Kooskia Ranger Station
Route 1, Box 398
Kooskia, ID 83539

RE: Yakus Creek DEIS

Dear Mr. Trulock:

The Idaho Department of Parks and Recreation (IDPR) staff reviewed the Yakus Creek Draft Environmental Impact Statement (DEIS). The Lochsa Ranger District proposes to harvest trees and decommission roads in the Yakus Creek drainage.

Our department originally commented on this project in 2004. In our scoping comments we were concerned about the road decommissioning portion of the project. We are pleased to see that at least one alternative addresses OHV Trail Connectivity (Alternative 2).

The DEIS presents two different action alternatives. Alternative 2 treats a total of 446 acres and develops two OHV connector trails. Alternative 4 treats a total of 214 acres and doesn't develop any OHV connector trails.

We encourage the Clearwater National Forest to bring the OHV connector trail proposal forward as a component of the final decision. The IDPR 2005 OHV User Survey found that "Creating more OHV Areas" was the most strongly supported facility item supported in the survey. Creating this trail connection would allow OHV riders to put two different trail systems together. This provides a better quality recreation experience for OHV recreationists.

The DEIS notes on Page 71 that "There would be no direct or indirect effects to water quality and quantity from the construction or use of these trails." The connector trail will have some wildlife impacts, but these impacts can be mitigated with proper design and travel management.

Both alternatives would close the drainage to cross-country OHV travel.

The Clearwater National Forest is currently revising its Travel Plan to be in compliance with the Motor Vehicle Use Rule. This rule restricts motorized travel to designated routes. Is closing this drainage really necessary when the Travel Plan will be out relative shortly after this plan's FEIS?

The DEIS addresses recreation effects on Pages 101 through 103. We concur with the assessment written in the report.

Thank you for the opportunity to review this DEIS. If you have any questions about our comments, please contact me at (208) 514-2483.

Sincerely,

Jeff Cook

Jeff Cook, Outdoor Recreation Analyst
Comprehensive Planning, Research and Review

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1118 F Street • Lewiston, Idaho 83501 • (208) 799-4370

C.L. "Butch" Otter, Governor
Toni Hardesty, Director

February 21, 2008

Ranger Craig Trulock
Lochsa Ranger District
Rt. 1, Box 398
Kooskia, ID 83539

RE: Yakus Creek Draft EIS

Dear Ranger Trulock,

Yakus Creek is included in water body ID 17060306CL027_02. Water body ID 17060306CL027_02 is currently listed in Section 3 of the Idaho 2002 Integrated Report as fully supporting its beneficial uses.

The Yakus Creek Project is considered a nonpoint source activity by the Idaho Water Quality Standards and is subject to IDAPA 58.01.02.350. IDAPA 58.01.02.350 requires a monitoring plan be provided to the Department if a project is reviewed for compliance. The monitoring plan, when implemented, will provide information to the Department adequate to determine the effectiveness of the approved or specialized best management practices in protecting the beneficial uses of the water, and will provide a process for modifying the approved or site-specific best management practices in order to protect beneficial uses.

Approved best management practices that may apply to your project include "Rules Pertaining to the Idaho Forest Practices Act" IDAPA 20.02.02; "Stream Channel Alteration Rules" IDAPA 37.03.07; and "Rules Governing Exploration and Surface Mining in Idaho," IDAPA 20.03.01. Specialized best management practices may be required to address water quality protection objectives not addressed by the above listed approved best management practices.

Please contact us if you have any further questions concerning State Water Quality Standards and non point source activities. Thank you for the opportunity to comment.

Sincerely,

Daniel D. Stewart
Watershed Monitoring Coordinator

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, WA 98101

March 24, 2008

Reply To
Attn Of: ETPA-088

Ref: 05-044-AFS

Tom Rielly
Forest Supervisor
Clearwater National Forest
12730 U.S. Highway 12
Orofino, ID 83544

Dear Mr. Rielly:

The U.S. Environmental Protection Agency (EPA) has completed its review of the draft Environmental Impact Statement (DEIS) for the proposed Yakus Creek Project (CEQ No. 20080037) in accordance with our authorities and responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act.

The Clearwater National Forest (the Forest) is proposing to treat the Yakus Creek project area to improve forest health; improve soil productivity and water quantity and quality conditions; and manage the landscape to provide for goods and services. The proposed action would treat approximately 2,165 acres within the 7,900 acre project area. The DEIS considers a no-action alternative and two action alternatives:

1. Alternative 1 – No Action. This alternative represents the existing condition.
2. Alternative 2 – Proposed Action and Preferred Alternative. Under this alternative the Forest would conduct 220 acres of regeneration harvest, 226 acres of commercial thinning, and conduct precommercial thinning on 1,620 acres. Road activity would include 1.6 miles of new road construction, 2.5 miles of road reconstruction, and 1.7 miles of temporary road construction. Following regeneration harvest, prescribed fire would be applied. Watershed restoration activities proposed include decommissioning 11.5 miles of existing roads, placing 3 miles into intermittent storage, reconstructing 2.5 miles of roads, and improving 90 acres of compacted soils on old skid trails and landings. Access management activities include constructing 1.4 miles of Off Highway Vehicle (OHV) connector trails, closing a total of 4.5 miles of road to full-size vehicles.
3. Alternative 4 – This alternative focuses on using the existing road system and excludes regeneration harvest. A total of 214 acres would be treated with commercial thinning, and 1,620 acres would be precommercially thinned. 1.6 miles of road would be reconstructed, 10.7 miles would be decommissioned, 4 miles would be placed into intermittent storage, and 80 acres of compacted soils would be improved.

Our review focused on Alternative 2, the preferred alternative. EPA is fully supportive of the identified purpose and need as it relates to improving forest and watershed health. We also

commend the Forest for the analysis that was undertaken during the scoping phase of this project to screen out areas with old growth characteristics and move the Forest toward meeting the 10% standard. We continue, however, to have questions about the level of obliteration to be applied to roads proposed for closure, the need for the proposed OHV connector trails, and potential impacts to sourcewater. These issues are detailed in the attached comments.

Based on the information provided, we are rating the DEIS as EC-1 (Environmental Concerns – Adequate). An explanation of this rating is enclosed. We appreciate the opportunity to comment on draft EIS. Please feel free to contact Teresa Kubo at (503) 326-2859 with any questions that you may have.

Sincerely,

Christine B. Reichgott

Christine Reichgott, Manager
NEPA Review Unit

Enclosures

EPA Detailed Comments on the
Yakus Creek Draft Environmental Impact Statement

Purpose and Need

Page 4 of the DEIS identifies the provision of "goods and services" among purposes of the Yakus Creek project. The document does not, however, clearly articulate the need for the establishment of new OHV connector trails. We recognize that there is a need to provide the public with a broad array of recreational opportunities, but it is not clear in the DEIS whether opportunities for OHV recreation are limited. In general, decisions about new recreational facilities (such as trails) should be based on evidence and evaluation of: 1) increased public need; 2) the need to reduce concentration on, or conflicts at, existing sites; or 3) the need to reduce resource degradation from recreation use at existing sites.

Recommendation:
We recommend that the DEIS further evaluate the need for an additional 1.4 miles of OHV connector trails.

Impact Assessment

Page 102 of the DEIS indicates that the proposed OHV connector trails would ultimately tie into connecting routes from the Pete King and Musselshell OHV areas. The document does not, however, analyze the potential for impact associated with increased OHV use in these areas. This is of particular concern as the 2003 Clearwater National Forest Roads Analysis Report identified Pete King Creek and Lolo Creek above Musselshell Creek as areas of concern due to road-related impacts.

Recommendation:
We recommend that the DEIS analyze any potential impacts that could arise from increased OHV use/access within and adjacent to the project area. This should include consideration of impacts to habitat, water quality, and the risk of introducing invasive species.

Water Quality/Aquatic Resources

Among the proposed watershed improvement activities, the DEIS identifies the decommissioning of 11.5 miles of existing road. EPA is fully supportive of this action as roads modify terrestrial and aquatic resources significantly, affecting fish, wildlife, water quality, and stream/wetland processes. Page18 indicates that there are four levels of road obliteration, ranging from full recontouring of the hill slopes (complete obliteration) to abandonment of the road. For those road miles adjacent to water bodies, we recommend that the FEIS indicate which level of abandonment will be applied. Specifically, we note that 1.6 miles of permanent road would be constructed on the ridge south of Molly Creek to replace several road segments that currently run adjacent to Molly Creek and Nan Creek. We seek clarification of the level of obliteration to be applied to these road segments.

Recommendation
1) For those roadmiles adjacent to waterbodies, we recommend that the FEIS indicate which level of abandonment will be applied.

Source Water

In our scoping comments dated September 22, 2005, we provided detailed comments on source water and recommended including a discussion of the sources in the watershed and analyzing the direct, indirect and cumulative impacts to these sources. The DEIS indicates on page 36 that a search of water rights applications, permits, decrees, licenses, claims, and transfers

was made for the Yakus Creek subwatershed, and that thirteen federal, private, and State of Idaho water uses were located (including 2 domestic and stockwater withdrawals from Yakus Creek). The DEIS states that none of the proposed activities would affect water rights, but it does not specify whether any of the proposed activities would potentially impact source water quality.

Recommendation

We recommend including a section on source water, protecting source water, and disclosing any potential effects in the FEIS.

APPENDIX H

Errata to the Yakus Creek DEIS

Summary, pg. vi, last two lines should read, "40 culverts removed to provide for aquatic habitat connectivity" (for Alts 2 and 4)

Pg. 28, Table 2.3, last two lines should read, "40 culverts removed to provide for aquatic habitat connectivity" (for Alts 2 and 4)

Pg. 30, Table 2.3, Economic Feasibility, the PNVs for each alternative have been updated based on current timber market values, and the analysis costs have been removed from the PNV calculation, as recommended by the Regional Economist. Current PNVs are:

Alternative 1 = $0

Alternative 2 = $649,670

Alternative 3 = $35,640

Pg. 30, Table 2.3, MIS and Sensitive Species of Wildlife, remove Black-backed Woodpecker from Alt 1 – No Action, Existing Condition

Pg. 42, last paragraph, should read, "Previous surveys by Falter (1975) … prevent anadromous fish migration upstream in Yakus Creek. It appears that densities have declined over time; however it may not be accurate to directly compare the 1975 data to current data given that there may be a difference in sampling and estimation techniques. It is likely that past management activities have negatively affected cutthroat populations. Current limiting factors…"

Pg. 44, paragraph 2 should read " there are an minimum estimated 11 culverts on fish bearing streams and 91 crossings on non-fish bearing streams…"

Pg. 44, Table 3.8. Lynx Creek should show 1 fish bearing crossing, and 5 non-fish bearing crossings.

Pg. 44, paragraph 3 (below table 3.8) should read "Culvert surveys have been conducted on the 6 mainstem Yakus Creek crossings on Forest Service lands."

For clarification the remainder of the paragraph should be removed and replaced with "All were determined to be impassable to either the juvenile or adult life stage of cutthroat trout at different times of the year. Three of these culverts are proposed for removal under this project (Road 5105). The remaining 3 below Rat Creek will continue to be partial barriers to juvenile fish at high flows. The two fish-bearing culverts on lower Rat and Stray Creek culverts were replaced in 2007."

Pg. 57, American Indian Relations – Forest Plan, remove quotes around trust responsibilities.

Pg. 84, paragraph 3, last sentence should read, "About 13 of the 35 crossings proposed for removal are known or suspected to have fish at them or within 0.1 miles of them downstream, where they may experience short term turbidity increases.

Pg. 85. paragraph 1, should read, "This alternative would remove 5 culverts, one of which is on a fish bearing stream…"

Pg. 85, paragraph 5, should read, "…The same 5 culverts would be removed as those in Alternative 2…"

Pg. 86, paragraph 6, should read, "There are a minimum estimated 110 perennial stream crossings on all lands in the watershed. The removal of at least 40 culverts, 5 of which are fish-bearing streams... This equates to 38% of the perennial stream crossings in the watershed."

Pg. 102, remove footnote # 12 at bottom of page. Refer to response to public comment # 12 in this document.

Pg. 107, Table 4.25, the PNVs for each alternative have been updated based on current timber market values, and the analysis costs have been removed from the PNV calculation, as recommended by the Regional Economist. Current PNVs are:

Alternative 1 = $0

Alternative 2 = $649,670

Alternative 3 = $35,640

Chapter 4, add the following section:

IX. Other Disclosures

This section responds to parts (e) and (f) of 40 CFR 1502.16 – Environmental Consequences.

(e) Energy requirements and conservation potential of various alternatives and mitigation measures.

There would be no unusual energy requirements for implementing any of the action alternatives. Conventional systems for timber harvest and road activities would be implemented with each alternative.

(f) Natural or depletable resource requirements and conservation potential of various alternatives and mitigation measures.

Each of the action alternatives would remove biomass as a result of harvesting and prescribed burning. This would reduce the amount of carbon stored in the treated stands. A portion of the carbon removed would remain stored for a period of time in wood products.

Recent scientific literature confirm some general patterns of changes in net ecosystem productivity (NEP)[1] and carbon stocks over the period of forest stand development and natural or induced disturbances. As overall context, our nations forests have and continue to sequester vast amounts of carbon (nationally a net carbon sink, sequestering far more carbon than is released), equivalent to approximately 10% of annual carbon dioxide emissions from burning fossil fuels (Heath and Smith, 2004; Birdsey et al., 2006). Law et al. (2003) evaluated changes in carbon storage and fluxes for Ponderosa pine stands in central Oregon. Their evaluation concluded that NEP is lowest and negative (carbon source) in young stands (9 – 23 years), moderate in young stands (56 – 89 years), highest in mature stands (95-106 years), and low in old stands (190-360 years). Most mature and old stands remained a net sink of carbon. Pregitzer and Euskirchen (2004) synthesized results from 120 separate studies of carbon pools and carbon fluxes for boreal, temperate, and tropical biomes. They found that in temperate

[1] Net ecosystem productivity or NEP is defined as gross primary productivity minus ecosystem respiration (Chapin et al. 2006). It reflects the balance between (1) absorbing CO2 from the atmosphere through photosynthesis (GPP) and (2) the release of carbon into the atmosphere through respiration by live plants, decomposition of dead organic matter, and burning of biomass (ER). When NEP is positive, carbon accumulates in biomass. Ecosystems with a positive NEP are referred to as a carbon sink. When NEP is negative, ecosystems emit more carbon than they are remove. Ecosystem with a negative NEP are referred to as a carbon source.

forests NEP is lowest, and most variable, in young stands (0-30 years), highest in stands 31-70 years, and declines thereafter as stands age. These studies also reveal a general pattern of total carbon stocks declining after disturbance and then increasing, rapidly during intermediate years and then at a declining rate, over time until another significant disturbance (timber harvest or tree mortality resulting from drought, fire, insects, disease or other causes) kills large numbers of trees and again converts the stands to a carbon source where carbon emissions from decay of dead biomass exceeds that amount of carbon removed from the atmosphere by photosynthesis within the stand.

The regeneration harvest proposed in Alternative 2 would result in a substantial reduction in existing carbon stocks on the 220 acres treated. The reduction of live trees, combined with the likely increase in down, dead wood, would temporarily convert the treated stands from a carbon sink (removes more carbon from the atmosphere than it emits) to a carbon source (emits more carbon through respiration than it absorbs). These stands would remain a source of carbon to the atmosphere, until carbon uptake by new trees exceeds the emissions from decomposing dead organic material. As the stands continue to develop, the strength of the carbon sink would increase until peaking at an intermediate age, followed by a gradual decline.

The commercial thinning actions proposed in both action alternatives would have similar effects on carbon fluxes and storage. However, the initial reduction in aboveground biomass would be less than the reductions with regeneration harvest. Commercial thinning would reduce the strength of the current carbon sink of these stands, but it is not clear whether commercial thinning activities would convert the treated stands from a carbon sink to a carbon source. Although commercial thinning would reduce standing carbon stocks, these treatments would reduce, compared to Alternative 1 (no action), the amount of carbon likely to be released to the atmosphere due to insect, disease and fire disturbance (Finkral and Evans 2008).

The watershed improvement activities proposed with each action alternative are aimed at fixing existing problems associated with sediment in streams and compacted soils. Such activities are expected to improve water quality and associated fisheries and repair soils damaged by past timber management activities.

Although 1.4 miles of OHV connector trails would be constructed/reconstructed under Alternative 2, proposed access management actions under both action alternatives would result in reduced access for both OHVs and full-size vehicles. Whether or not these actions would cause an overall reduction in emissions (i.e. greenhouse gases) from both types of vehicles is hard to say, since it is likely that the users of these vehicles would shift their use to other areas.