Blue Mtns. Biodiversity Project comments on So. George project continued...

Purpose and Need	Alternative A	Alternative B	Alternative C	Alternative D
		stages that are outside of HRV (Chapter 3, Table 3-29).		stages that are outside of HRV (Chapter 3, Table 3-38).
Forest Tree Density Existing tree density classes are not within the historical range of variability. Acres moved from high density to low or moderate density in order to resist insects, diseases, and stand replacing wildfire(s). Before implementation dry upland forest PVG had 2 tree density classes that were outside of HRV and moist upland forest PVG had no classes that were outside of HRV (Chapter 3, Table 3-22). So why is moist upland forest being logged? (*)	No silvicultural activities would occur to change tree (stand) density levels on the total forest vegetation affected environment (about 14,060 acres) see Chapter 3, Table 3-21. Density class / Acres / Percent Low / 5,060 / 36 Moderate / 5,200 / 37 High / 3,800 / 27 (*) Why is moist forest w/ no classes of density outside of HRV shifted to 2 classes outside of HRV? What's the justification? Not in the purpose + Need stated for the project!	Implementation of this alternative on the total forest vegetation affected environment of about 14,060 acres would result in the following change in acres in tree density classes (Chapter 3, Table 3-31). Density class / Acres / Percent Low / 7,050 / 50 Moderate / 4,830 / 34 High / 2,180 / 16 After implementation dry upland forest PVG has 1tree density class that is outside of HRV and moist upland forest PVG has 2 tree density classes that are outside of HRV (Chapter 3, Table 3-32).	Same as Alternative B	Implementation of this alternative on the total forest vegetation affected environment of about 14,060 acres) would result in the following change in acres in tree density classes (Chapter 3, Table 3-40). Density class / Acres / Percent Low / 6,140 / 44 Moderate / 5,420 / 39 High / 2,500 / 18 After implementation dry upland forest PVG has 1tree density class that is outside of HRV and moist upland forest PVG has 1 tree density classes that is outside of HRV (Chapter 3, Table 3-41).
Fuels: Treat forest stands in Condition Classes 2 and 3 to begin to restore vegetation characteristics and fire return intervals characteristic of historical fire regimes.	Existing Condition Classes would remain the same in the project planning area. • Class 1 Acres – 65 Percent –<1% This is hard to believe - junk data in, garbage out.	Condition Classes post treatment of project activities for Fire Regimes I, III, and IV • Class 1 Acres – 7,950 Percent – 39%	Same as Alternative B	Condition Classes post treatment of project activities for Fire Regimes I, II, III, and IV • Class 1 Acres – 5,170 Percent – 24%

Purpose and Need	Alternative A	Alternative B	Alternative C	Alternative D
	• Class 2 Acres 17,940 Percent 87% • Class 3 Acres - 2,550 Percent 13%	• Class 2 Acres – 10,480 Percent – 52% • Class 3 Acres – 2,065 Percent – 10%	(*) No real significant difference for the most departed condition class	• Class 2 Acres – 13,295 Percent – 65% • Class 3 Acres – 2,100 Percent – 10%
Fuels: Crown fire potential – decrease the probability of uncharacteristic high intensity wildfires by lowering stand densities, and reducing existing ladder, surface, and canopy fuels	Existing Crown Fire Potential: Dry Forests • High – 2,760 acres • Medium – 840 acres • Low – 35 acres Moist Forests High – 10,035 acres Medium – 1,470 acres Low – 0 acres	Crown Fire Potential post treatment: Dry Forests • High – 955 acres • Medium – 670 acres • Low – 1,975 acres Moist Forests • High – 6,415 acres • Medium – 935 acres • Low – 4,155 acres	Same as Alternative B (*) Most fuels are probably naturally medium-high crown fire potential, so it is unnatural + undesirable to shift them artificially to low potential	Crown Fire Potential post treatment: Dry Forests • High – 1,855 acres • Medium – 730 acres • Low – 1,045 acres Moist Forests • High – 7,375 acres • Medium – 1,050 acres • Low – 2,083 acres
Timber Production There is a need to provide sawlogs and wood fiber for utilization by regional and local economies	N/A	See Economics in Table 2-13 below	See Economics in Table 2-13 below	See Economics in Table 2-13 below
Wildlife Habitat There is a need to continue to provide and manage over time, for wildlife habitat and its components (cover and forage).	See Wildlife Habitat in Table 2-13 below	See Wildlife Habitat in Table 2-13 below	See Wildlife Habitat in Table 2-13 below	See Wildlife Habitat in Table 2-13 below

We find it grossly misleading to the public that alt Summary D is claimed to maintain existing old forest but actually requires loss 430 acres of old forest, 180 acres of old forest corridors + 620 acres of trees over or equal to 21" dbh.

(*) You can't convert logged forest to old forest stand structure sorry - it would take many years (decades) of growth to redevelop as OG.

Table S-6 – Comparison by Alternative of Key Issues and Other Resource Issues

Resource	Alternative A	Alternative B	Alternative C	Alternative D
OLD FOREST HABITAT– Key Issue				
Acres of old forest affected by proposed activities	0 acres	1,010 acres	1,010 acres	430 acres
Acres of old forest connective corridors affected by proposed activities	0 acres	180 acres	180 acres	180 acres
Acres where trees ≥21 inches DBH may be removed.	0 acres	620 acres	620 acres	620 acres
Acres converted to old forest stand structure	0 acres	640 acres	640 acres	640 acres
ACCESS MANAGEMENT – Key Issue				
Miles of temporary road construction (decommissioned after use)	0 miles	3.0 miles	0 miles	2.25 miles
Miles of system road decommissioning	0 miles	0 miles	31 miles	0 miles
Miles of non-system unauthorized roads and trails	0 miles	0 miles	15.5 miles	0 miles
Extension of seasonal road closure	No	No	Yes	No
SOILS				
Detrimental soil disturbance (DSC) in the following: • harvest units (acres)	57 acres	248 acres	244 acres	183 acres
• Non-commercial thinning units (acres)	23 acres	40 acres	40 acres	40 acres
• Temporary road construction (acres)	0 acres	7.2 acres	0 acres	5.5 acres

(*) Avoid creating detrimental soil disturbance above that now existing or above Forest Plan limits.

Resource	Alternative A	Alternative B	Alternative C	Alternative D
• Roads and trails rehabilitated (acres)	0 acres	0 acres	94 acres	0 acres
Effective Ground Cover	Within acceptable condition, and meets Forest Plan standards	Within acceptable condition, and meets Forest Plan standards	Within acceptable condition, and meets Forest Plan standards	Within acceptable condition, and meets Forest Plan standards
HYDROLOGY				
Road density – opened and closed by subwatershed (miles per square mile)	S. Fork Asotin Creek – 2.5 Upper George Creek – 3.5	Remain the same as existing condition	S. Fork Asotin Cr. – 2.1 Upper George Cr. – 1.8	Remain the same as existing condition
Number of stream crossings	S. Fork Asotin Creek – 42 Upper George Creek – 40	Remain the same as existing condition	S. Fork Asotin Creek – 30 Upper George Creek – 12	Remain the same as existing condition
Water Temperature	Would improve slowly over time as near channel vegetation grew and provided more shade	Change to water temperature would not be measurable. Effects would be negligible.	Same as Alternative B	Same as Alternative B
Sediment	Sediment is not detectable as streams leave National Forest Service lands	No measurable effect No detectable increase	Same as Alternative B	Same as Alternative B
Equivalent Treatment Acre Model – Percentages by subwatershed	S. Fork Asotin Cr. - 3.1% Upper George Cr. – 3.1%	S. Fork Asotin Cr. – 13.4% Upper George Cr. – 8.9%	S. Fork Asotin Cr. – 13.2% Upper George Cr. – 8.2%	S. Fork Asotin Cr. – 8.9% Upper George Cr. – 5.5%
TES AQUATIC SPECIES				
Snake River Steelhead and Critical Habitat (MIS and ESA – Threatened) - Biological determination	No action How does this jive w/ "No detectable increase" of sediment finding? Contradictory..	Biological determination of *May Effect – Not Likely To Adversely Affect (ME-NLAA)* Short-term potential for sediment introduction during seasonal high flows. No measurable offsite effects to hydrologic function, water temperature, or sediment load. Roadwork would reduce erosion.	Same as Alternative B	Same as Alternative B

No increase!

Resource	Alternative A	Alternative B	Alternative C	Alternative D
AIR QUALITY				
Tons of Particulate Emission $PM_{2.5}$ (over a 5-10 yr period) Activity Fuels Landscape Burn Pile Burning	 0 0 0	 1,035 tons 364 tons 478 tons	 Same as Alternative B	 699 tons 364 tons 297 tons
WILDLIFE SPECIES and HABITAT				
Deadwood Habitat	Additional snags and large down wood would be created as overstory mortality occurs.	Potential reduction of snags wherever harvest activities would occur (4,150 acres maximum). Snags within harvest units would be retained above the minimum levels required in the Forest Plan. The number of acres with 2-4 snags per acre would increase and be more in line with reference conditions.	Same as Alternative B	Potential reduction of snags wherever harvest activities would occur (2,900 acres maximum). Snags within harvest units would be retained above the minimum levels required in the Forest Plan. The number of acres with 2-4 snags per acre would increase and be more in line with reference conditions.
Management Indicator Species (MIS) Forest Plan Standards – Satisfactory Cover – 15% MA C4 - HEI - 60 **MA C3 - HEI - 70** Acres of Habitat	**Rocky Mountain Elk –** Satisfactory Cover – 34% MA C4 - HEI - 71 MA C3 -HEI - 80 **Primary Cavity Excavators** The area would continue to provide snags and down large wood for cavity dependent species	**Rocky Mountain Elk** Satisfactory Cover – 19% MA C4 - HEI - 68 MA C3 - HEI - 77 **Primary Cavity Excavators** Overall direct, indirect, and cumulative effects would result in a small negative habitat trend for primary cavity excavators. The project would affect less than	**Rocky Mountain Elk** Satisfactory Cover – 19% MA C4 – HEI – 69 MA C3 – HEI – 77 **Primary Cavity Excavators** Same as Alternative B	**Rocky Mountain Elk** Satisfactory Cover – 24% MA C4 - HEI - 68 MA C3 - HEI - 77 **Primary Cavity Excavators** Same as Alternative B

(*) How "small" a negative trend for primary cavity excavators? Cumulatively this could be a large trend across the region.

(*) How is this maintaining big game (elk) habitat even w/ alt D? Retain all existing satisfactory cover & HEI values.

(*) Have any population surveys been done for primary cavity excavators or other MIS? If not, ~~how~~ how can population viability be assumed?

This is not reflective of scientific accuracy or professional integrity to pretend that cumulative impacts of numerous similar projects won't cause changes to cavity excavator & other MIS populations by looking at each project in isolation as a small % of the total forest.

Summary

Resource	Alternative A	Alternative B	Alternative C	Alternative D
		1 percent (.006) of the forested land on Umatilla National Forest. The amount of effect is too small to cause changes to cavity excavator populations.		
	Pileated Woodpecker There are approximately 200,000 acres of source habitat on Umatilla National Forest and about 7,800 acres of habitat distributed throughout the project planning area. Existing habitat would remain in its current state in the short-term. In the mid and long-term additional habitat would become available.	**Pileated Woodpecker** Harvest and fuel treatments would affect about 2,800 acres of existing habitat in the project planning area. The remaining 5,000 acres of pileated woodpecker habitat would not be affected by timber harvest and fuels reduction activities. Thinned stands as well as other areas that currently do not quite qualify as habitat now would eventually develop into complex, mature stands and provide more pileated woodpecker habitat.	**Pileated Woodpecker** Same as Alternative B * This is a large impact to Pileated woodpecker, removing over 1/3rd of available habitat in the project area. Even alt D would remove about 1/6th of existing habitat in the project area.	**Pileated Woodpecker** Harvest and fuel treatments would affect about 1,300 acres of existing habitat in the project planning area. The remaining 6,500 acres of pileated woodpecker habitat would not be affected by timber harvest and fuels reduction activities. Thinned stands as well as other areas that currently do not quite qualify as habitat now would eventually develop into complex, mature stands and provide more pileated woodpecker habitat.
	Three-toed Woodpecker The approximately 7,000 acres of potential foraging habitat in the project planning area (approximately 4% of the 170,000 acres of forest-wide habitat) would remain in its current state in the short-term.	**Three-toed Woodpecker** About 2,530 acres foraging habitat (36 percent of habitat in the project planning area) and about 540 acres of possible nesting habitat (19 percent) would be affected by timber harvest and fuels	**Three-toed Woodpecker** Same as Alternative B * This would be a huge impact to Three-toed woodpeckers over 1/3rd of foraging habitat & 19% of nesting habitat under B+C foraging & 18% of habitat in Alt D.	**Three-toed Woodpecker** About 1,250 acres foraging habitat (18 percent of habitat in the project planning area) would be affected by timber harvest and fuels treatments. No nesting habitat would be affected.

Resource	Alternative A	Alternative B	Alternative C	Alternative D
	There may be increases in insect outbreaks, which would benefit three-toed woodpecker. **American Marten (Pine Marten)** Existing marten habitat (about 2,800 acres in the project planning area) would remain in its current state in the short-term. In the long-term additional habitat would be available. Umatilla National Forest currently has 100,000 acres of source marten habitat.	treatments. The remaining 4,470 acres of potential three-toed woodpecker habitat would not be affected by timber harvest and fuels reduction, and would continue to provide foraging and nesting opportunities. **American Marten (Pine Marten)** About 735 acres of marten habitat would be affected by harvest. Overall direct, indirect, and cumulative effects would result in a small negative habitat trend for marten. Because the project impacts less than 1 percent (.007) of the marten habitat on the forest (about 100,000 acres on Umatilla Forest) the amount of effect from this project is too small to cause changes to the population.	**American Marten (Pine Marten)** Same as Alternative B We are concerned by potential impacts to Pileated & Three-toed woodpeckers, & American marten - We are in favor of No logging in most old forest as in Alt D but also want no logging of	The remaining 5,750 acre potential three-toed woodpecker habitat woul not be affected by timber harvest and fuels reductic and would continue to provide foraging and nest opportunities. **American Marten (Pine Marten)** Marten habitat would not affected by harvest becau no harvest would occur i moist old forest. trees over 15" dbh old or matur & no logging o ≥21" dbh may in underdeve & areas of pot wilderness.
Endangered and Sensitive Terrestrial Species Biological determination (T) – Threatened (S) – Sensitive * NE-No Effect **NI-No Impact ***MI-May Impact	No action	Biological determinations: Canada Lynx – (T)-NE* Gray Wolf – (S)-NI** CA Wolverine – (S)-NI Townsend's big-eared bat-(S)-NI Preble's shrew – (S)-NI Bald Eagle – (S)-NI Peregrine Falcon – (S)-NI	Same as Alternative B	Same as Alternative B

(*) = Reason for our concern that Table 3-3 Existing Detrimental Soil Condition seems unusually low and that any new soil impacts would last a long time.

The South George project planning area is in the northern-most part of the large anticline that is the Blue Mountains of northeastern Oregon and southeastern Washington. The rock type is dominated by Columbia River Basalt (CBR) group and comprised of the Grande Ronde and Wanapum lava flows (McKee 1972, as cited in Clark and Bryce 1997).

Soils are dominantly volcanic ash overlying basalt and andesite residual soils in varying depths. Some of the more stable soils in this area have a thin subsurface layer of loess on top of the (basalt/andesite) bedrock. Even the shallowest soils in non-forest positions have considerable volcanic ash mixing in the surface, and (therefore) exhibit some characteristics of deeper ash soils, notably dustiness.

Within units, soil type is quite variable, with the primary difference the depth of volcanic ash on the surface. This directly influences the plant communities that can grow there with the deeper ash soils supporting greater density of trees and moisture-demanding varieties. Ash soils are typically more susceptible to compaction and displacement impacts when dry. Shallower soils in the area are more susceptible to puddling and displacement impacts, especially when wet.

Additional descriptive characterization and dominant representative soil series typical of land type associations (LTA) in South George project planning area are located in the project file (Soils Report and Appendix E of this document). The Umatilla National Forest Soil Resource Inventory (SRI) was used for soil type identification and field verified by the Forest Soil Scientist for harvest units visited.

Detrimental Soil Condition (DSC)

Forest Plan standards and guidelines for management induced soil disturbance are described in terms of the amount of area of an activity unit (for example, a harvest unit) exceeding certain levels of soil impacts in degree and extent. Impacts that are considered include compaction, displacement, rutting (puddling), and severe burning from prescribed fire. Changes from natural conditions from any permitted or management directed activity (e.g. livestock grazing) is included in assessments. Impacts from compaction, displacement, and puddling, in particular, tend to be persistent and last many years in this area. A study in central Idaho indicates that natural recovery of the soil may take 40 to 70 years (Froehlich & McNabb 1984). The persistence of compacted soil over time, for example, determines its affect on stand response and the long-term effect on forest productivity. How long soils remain compacted is determined by natural recovery rates or tillage operations or both (McNabb and Froehlich 1983). As such, these impacts from previous soil disturbing actions are still observable. Not all soil disturbance is detrimental. Exceeding certain threshold values triggers characterization of that disturbance as detrimental. For example, compaction is considered detrimental if bulk density is increased more than 20 percent for ash soils.

Harvest units in the project planning area were assessed for the extent and degree of previously impacted soil using field observation starting in the fall of 2005, the soil resource inventory (SRI) with field verification by the Forest Soil Scientist, prior history of activity (including harvest entries), and prior knowledge of sites from previous assessments by both district and Forest staff. Observations and ratings were done by field layout crews that had previous experience and training.

Units with prior harvest history and the likelihood for greater existing impacts were evaluated by the Forest Soil Scientist for quantitative assessment relative to Forest Plan standards and guidelines for detrimental soil condition. Soils have (also) been examined in the field by the Forest Soil Scientist during other project monitoring of previous management activities within the area. An estimate of DSC as a percentage of the area was assigned for each activity unit to provide a consistent tracking measure (see Appendix E, Table E-5).

(*) We are concerned that (strangely) low detrimental soil condition acreage should not be seen as liscense to cause alot more detrimental soil conditions through clearcutting, seed tree cutting, tractor logging, skyline, etc.

* Are these detrimental conditions within proposed logging units or across the area as a whole?

The following table shows existing detrimental soil conditions within the project planning area:

(*) This is an incredibly low amount of existing detrimental soil conditions - Does this mean almost all the proposed units have never been logged?

Table 3-3 – Existing Detrimental Soil Condition in South George Project Planning Area

Area	Acres*
Harvest Units	57 acres
Temporary Roads	0 acres
Non-commercial thinning units	23 acres
Total	80 acres

*See Appendix E, Table E-6 for acres by unit.

While previous entries are an indicator of silvicultural activity, it is not necessarily a strong indicator of current soil detrimental conditions as the reasons for entries (treatments) and impacts from them vary considerably. The historical entries data ranges from low disturbance thinning (often completed by hand) to higher disturbance activity such as tractor skidding, but under a variety of conditions producing highly variable effects. Natural recovery from these activities also varies considerably depending on soil type, location, weather, and other factors. (*) Yet alot of previous logging entries were clearcuts, judging by DEIS photos re: scenic integrity - Were these areas taken into consideration when calculating total area detrimental soil disturbance? Mechanical thinning units observed have low levels of observable residual disturbance, and some moderate levels of detrimental soil conditions similar to proposed harvest units.

Effective Ground Cover

Forest Plan standards and guidelines describe minimum effective ground cover percentages (Table 3-2) after soil disturbing activity based on soil erosion hazard classes. Effective ground cover typically recovers quickly and is not a long-lasting condition. Effects to ground cover are also used as an erosion and sedimentation factor in the Hydrology section where erosion is discussed and modeled.

Effective ground cover in proposed activity units is within acceptable condition and Forest Plan standards. Accelerated erosion is not evident currently within units with little to no current ground disturbing activity that would create bare soil subject to erosion risk. Portions of units that received prior disturbance of ground cover removal have recovered. Vegetation typically recovers quickly from disturbance in these soil and climatic conditions that are found in this area.

(*) = Reasons for our concern re: Forest Service plans to try to prevent the natural mixed to high severity wildfires for moist & cold forest types in the project area.

Coarse and Fine Woody Debris

(*) Maintaining soil productivity over the long-term generally requires presence of soil organic material and fire effects characteristic of the natural fire regime. Most fires characteristic of the historical fire regime or moderate severity prescribed fires are likely to enhance soil development and fertility over the long-term by periodic release of nutrients. However, extremely severe fires or large severely burned areas within fires, brought on by either rare natural events or humans, are likely to be highly detrimental to forest soils (Harvey et al. 1989). Graham and others (1994) developed conservative recommendations for leaving coarse woody debris (CWD) after timber harvesting to ensure enough organic matter was left to maintain long-term forest productivity, amounts adjusted based on the vegetation types. These vegetation types are a primary component of classification of forests into fire regimes (Agee 1993, Brown 1995).

The concern for woody debris levels is one of balancing retention of sufficient quantities of woody debris for organic matter retention and soil surface stabilization needs versus (too) large quantities such that wildfire in future years would create undue severity to the soil. The amount of coarse woody debris (CWD) that provides desirable biological benefits, without creating an "unacceptable" fire hazard or potential for high fire severity reburn, is an optimum quantity that can be useful for guiding management actions (Brown et al. 2003). High fire intensity ("severity") is natural for moist & cold forest types & the Forest Service should not be trying to prevent this through removal of CWD naturally at high levels for the area or by altering tree species composition.

(*) What is the science source for "recommended" levels of woody debris – and what forest type (probably dry, not moist) is it based on? We suspect misuse of the science.

Current levels of woody debris are within or above "recommended levels" in most units. Typically fine material type is relatively quickly decomposed and incorporated into forest duff layers and eventually into the soil. Additional discussion of current conditions of fuel loads can be found in the Fuels section of this chapter. (*) Probable Forest Plan violation (see below) as 20% maximum soil detrimental condition should apply to the whole area, not just sale units – otherwise cumulatively soil impacts over the project area could greatly exceed 20% from past heavy logging plus current logging.

ENVIRONMENTAL CONSEQUENCES

Most concerns to the soil resource resulting from ground disturbing activity center on potential detrimental effects to soil productivity, hydrologic and biological function, and risk of accelerated erosion.

This analysis discloses environmental effects relative to soil disturbance exceeding criteria for detrimental soil condition described in the Forest Plan, effects to effective ground cover, and coarse and fine woody debris as compared to Forest Plan guidelines. Other relevant soils issues are briefly discussed with references made to other sections in this EIS where these issues are further addressed.

(*) Restriction of analysis of detrimental soil condition extent to proposed logging unit boundaries greatly biases the outcome of the analysis to smaller extent of detrimental soil conditions than what actually exist in the project area.

This analysis takes into consideration local experience and knowledge of past harvest activities and comparison of activity units in this area having the same soil characteristics. This analysis is spatially bound by the harvest unit boundaries. (*) We question the scientific accuracy and consistency with the Forest Plan of confining detrimental soil condition analysis to proposed "harvest unit" boundaries when it is meant to apply to total area.

Alternative A- No Action

Direct/Indirect Effects – Alternative A

Detrimental Soil Condition (DSC)

This alternative would produce no increase or reduction in detrimental soil disturbance (detrimental soil condition) from logging or thinning operations and associated activities. No rehabilitation and native seeding of existing landings, skid trails, or unauthorized roads would occur. No road decommissioning or unauthorized trail rehabilitation would occur to improve soil productivity on detrimentally altered sites.

Effective Ground Cover

Effective ground cover would remain on all acres at current rates, with no temporary reductions due to surface disturbance and yarding of logs or burning of slash. Because the prescribed burning of piled logging slash would not occur, the potential for high burn severity sites from this activity would not be realized from piling. This would not exclude the potential of high burn severity from wildfire occurring with high fuel loads.

Coarse and Fine Woody Debris

Dead wood amounts would remain at current levels. Total dead wood amounts would be within or above the range recommended (Brown et al. 2003) on units that would otherwise be treated in action alternatives. The positive effects of higher wood amounts over the long-term would be accompanied by increased risk of high severity fire (Brown et al. 2003).

Cumulative Effects – Alternative A

For the No Action alternative, South George project would not be authorizing any actions; therefore it would not be adding anything to the effects of past, present, and reasonably foreseeable future actions. Based on the definition provided in the CEQ regulations (p. 3-1), there would be no cumulative effects for the No Action Alternative.

(*) Please send us print copies of the Forest Plan section on thresholds and methods to be used for determining detrimental soil condition extent - including the intended scale of analysis - and Forest Service Manual, Pacific Northwest Region Supplement 2500.98-1.

Effects Common to All Action Alternatives

(*) = Reasons for our concerns re: impacts to soils from proposed management activities

Direct/Indirect Effects – Alternatives B, C, and D

Detrimental Soil Condition (DSC)

Vegetation Removal – Harvest - Logging activities would create direct effects to soils due to disturbance from harvest and yarding machinery driving over the soil and dragging of logs. Effects are primarily in the form of soil compaction, displacement of topsoil, and puddling (rutting in wet soil). Prescribed burning treatments following harvest activities would create some high burn severity where fuels levels are concentrated and burn for a long time (residence time). Another effect would be the exposure of mineral soil due to machine traffic and dragging of logs (primarily with whole-tree tractor and skyline systems), creating an erosion risk that may or may not be realized.

(*) Is "activity area" referring to the project area or only to proposed sale unit areas?

(*) The intent of Forest Plan standards and guidelines for detrimental soil impacts is to minimize the extent (area) of detrimental levels of soil disturbance. Specifically, the total area in an activity area (e.g. harvest unit) should be 20 percent or less in area exceeding criteria for detrimental disturbance. Different types of impacts are combined together to produce detrimental soil condition (DSC).

(*) Request hard copies

Not all soil disturbance is detrimental to ecological processes or productivity, or creates an erosion hazard. Effects can vary by degree, extent, duration, and distribution depending on the highly variable soil and site characteristics (Jurgensen et al. 1997). Thresholds for detrimental thresholds for compaction, displacement, puddling, and severe burning are described in the Forest Plan or Forest Service Manual, Pacific Northwest Region Supplement 2500.98-1. Compaction is typically measured using bulk density changes, with a 20 percent or greater increase in ash soils, common in this area, considered exceeding detrimental thresholds. Displacement, puddling, and severe burn impacts have separate criteria for detrimental thresholds.

Project operational features with the objective of reducing the extent and degree of potential effects to soil are incorporated in design features for all action alternatives (see Chapter 2, Table 2-5). Contemporary ground based harvest system operation proposed for this project is capable of extracting timber with minimal area effects on soil resources. This requires careful control. It is common for operations on Umatilla National Forest using ground-based systems to impact less than 8 percent of an activity area. Skyline and helicopter systems have even lower results; typically less than 5 percent of an activity area is affected. Anticipated environmental effects are based on monitored results of previous timber harvest operations on Umatilla National Forest.

(*) Soil mycorrhizael populations can be affected by harvest operations as machinery travels over the soil surface causing soil compaction, rutting or displacement affecting roots (Dumroese et al. 2009) or slash burning of large piles (Esquilin et al. 2007). Design criteria (Chapter 2, Table 2-5), timber sale contractual controls, and overall limitation of disturbance effects that could be detrimental to soil organisms are intended to minimize potential adverse effects to soil's physical, chemical, and biological character and processes. Rehabilitation work before final completion of unit operations further ameliorates long-term site effects. Response of soils and stands to earlier harvest activities with much greater disturbance levels than proposed in this project indicates that ecotypes (soils and vegetation) in the project planning area are resilient to disturbance. Tree growth and soil surface recovery is excellent in plantations in the area, providing indication of recovery of mycorrhizae populations. Positive repopulation in highly disturbed sites is observed in Harvey et al. 1997.

(*) Tractor yarding operations typically produce exposed mineral soil surfaces on skid trails where tree bundles are dragged back to landing areas. Compaction from machinery driving over areas being

(*) We are concerned that subsoiled only loosens compaction but mixes soil layers and may cause impacts to soils, and also that subsoiling may not be funded or implemented as mitigation

harvested, with some displacement of surface soils in multiple-pass trails results in the majority of negative effects to soils. Trails average 80-100 feet apart with average-sized units in this area. The area within the trails that is detrimentally disturbed is highly variable. Downed wood and slash that is dropped in the trail and also driven over by the skidders and harvesters distributes the weight of the machinery and reduces compaction levels. Displacement of volcanic ash soils can occur when skidding operations occur (*) during the driest parts of year and soil conditions need to be monitored to minimize dust production and loss of fine soil from this process.

In addition to avoiding adding excessive detrimental soil effects by operational design, mitigation in the (*) form of subsoiling treatments in areas of highest compaction (landings, high-use skid trails) and revegetating with native species (grasses and trees), serves to reduce the total area of soils that would otherwise be in a detrimentally compacted condition. Some areas of previously compacted or puddled soil that would be reentered in this proposed project would also receive treatment, thereby reducing a portion of the existing detrimentally disturbed soil.

(*) What is the methodology used that determines such low levels of net increase in total detrimental soil condition? Why is this methodology not disclosed? Is this total detrimental soil condition after subsoiling (which may never take place)?

Table 3-4 below displays the total acres of detrimental soil condition by alternative. Alternative B shows a net increase of about 191 acres in total detrimental soil condition, Alternative C an increase of about 187 acres, and Alternative D an increase of about 126 acres. Remediation due to subsoiling would reduce areas in a highly compacted condition, but is not readily quantifiable due to the variable extent that it would be needed. It is not anticipated that subsoiling would be needed on skid trails except for some main trails adjacent to landings.

Non-Commercial Thinning and Planting – Manual hand thinning operations have no adverse effects to soils. Thinning slash, whether left in place or hand-piled, remains largely within units. Burning, if prescribed, often occurs from 1 to 3 years later allowing for needles to fall from branches and reduce fire threat to residual trees. Piles in residual stands are normally small enough that fire intensity from pile burning rarely gets hot enough to produce severe burning effects on the soil.

Planting activity has no direct adverse effects to soils, because effects are limited to walking and using a shovel or similar instrument to make a planting site for the seedlings. Indirect effects would be those related to transportation to and from the sites (road use) and associated effects from crews moving through the area.

(*)

Mechanical Fuels Treatment- Thinning - Mechanical thinning and or grapple-piling equipment is proposed in portions of the project planning area on about 800 acres. This equipment is usually grapple or mastication heads mounted on small-body excavators that have wide tracks. This type of equipment has relatively low ground-pressure and can work on top of downed logs and existing or created slash, and can produce additional compaction and some displacement while turning. Operation on downed slash and other woody material and use of existing trails keeps additional compaction and displacement effects low. Past monitoring of grapple-piling or mechanized thinning operations on Umatilla National Forest indicates detrimental soil impacts in the 0-2 percent range.

Riparian Habitat Conservation Area (RHCA) Mechanical Thinning (RHCA units 1 and 2) - The approximately 25 acres of fuels treatments proposed in riparian areas would be expected to create similar or lower disturbance levels as other mechanized equipment operations. Detrimental soil conditions would be expected to be similar or less than other mechanized operations, and would not add measurably to total estimates of DSC for action alternatives.

Landscape Prescribed Burning - Broadcast or landscape burning prescriptions would be expected to create little to no detrimental soil condition. Prescribed fire can create areas of high burn severity where concentrations of fuels provide for long (fire) residence times. Areas burned are expected to be spread

⊛ = Reasons for our concerns re: potential impacts to soils from this project & cumulatively.

designed so that no activity unit would exceed Forest Plan effective ground cover standards and guidelines.

Coarse and Fine Woody Debris

⊛ Soil productivity is irreplaceable in human timescales and should be protected (Beschta et al. 1995). Organic matter in the soil surface horizon plays a role in the regulation of water availability, movement and storage, soil structure and soil stability. Alteration of organic resources has a great influence on both biotic and abiotic properties of any given site (Harvey et al. 1987). The interactive roles of wildfire, forest management practices, and organic matter decay are critical for forest productivity in this region.

⊛ Yet wildfire is being suppressed & this project would try to reduce or prevent wildfire.

Professional experience and extensive research has shown that increased fuel loads can result in increased fire intensity and severity. In other words, given the same weather and topographic conditions, areas with higher fuel loads would burn hotter, have longer flame lengths, have greater potential to convert to crown fires, be more difficult to contain, pose greater risks to firefighters, kill more vegetation, and damage soils more severely than areas with lower fuel loads. Literature shows that when dead and live tree biomass increase, so does flame length and fireline intensity (Rothermal, 1983) and while large woody fuels have little influence on the spread of the initiating fire, they can contribute to development of large fires and high fire intensity and severity (Brown, et al. 2003), especially where fuel loads are continuous.

Slash burning has the potential to cause nutrient loss to the extent that forest duff and vegetation is consumed. This effect would be greater where post harvest underburn treatments are proposed.

Coarse woody debris (CWD) enhances microsite conditions and habitat, but is not in itself a great source of nutrients. Nutrients captured in coarse wood are brought to CWD habitat by animals and recycled by decomposers such as fungi. The environmental effects of log removal are primarily through wildlife habitat alterations.

Compared to no action, the direct effects of the proposed logging would reduce levels of snags (largely for safety reasons) and coarse wood in harvest units. In terms of both short and long-term soil productivity, the tree harvest represents some fundamental trade-offs to the nutrient cycle that organic matter fosters. ⊛

⊛ Tree bole removal would remove a long-term source of organic matter, while reducing the risk of localized severe fire effects in the future by reducing fuel loading where amounts are considered excessive.

⊛ Maintenance of adequate levels of soil and soil surface organic matter are key to mycorrhizael populations and healthy soils (Graham et al. 1994). Proposed actions are designed to maintain coarse wood levels to Forest Plan standards and recommendations by Graham.

Effects that Differ between Action Alternatives

Direct/Indirect Effects – Alternative C

Differences in the three action alternatives for harvest and associated activities are related to the switch to helicopter yarding in Alternative C. Helicopter acres increase to 550; skyline decreases to 625 acres; and tractor decreases to 2,725 acres (see Table 2-11, Comparison of Alternatives). The primary difference between the two, other than total units and differences in affected acres, is the miles and or acres of new temporary road construction and existing unauthorized use and road rehabilitation. Temporary road construction is eliminated in Alternative C, approximately 31 miles of system road decommissioning is proposed, and 15.5 miles of unauthorized roads and trails would be decommissioned. This represents about 75 acres of road rehabilitation, and about 19 acres of non-system road and trail rehabilitation.

(*) = Reasons for our concern re: soil impacts from project activities & cumulative impacts to soils

Direct/Indirect Effects – Alternative D

In comparison to the proposed action (Alternative B), acres of skyline logging are reduced to 500 acres and acres of tractor logging to 1,800. Total acres are reduced in Alternative D by dropping units.

Cumulative Effects - Alternatives B, C, and D

The impacts to soil productivity would be created by the equipment used to implement this project. (*) Therefore, this analysis is spatially bound by harvest unit boundaries, temporary access routes to those units, and the time it would take the soil to recover from the impacts and soil mitigations of proposed activities. (*) The amount of detrimental impacts to soils and detrimental soil conditions now in past logging areas in the project area should be disclosed in this DEIS for consideration of cumulative impacts to soils in the project area.

Detrimental Soil Condition (DSC)

Project proposed activities are designed with a considered balance between potential site effects and the feasibility of operations. Previous management activities disturbed soils to varying degrees and extent, (*) with some effects still exceeding levels considered detrimental as described in the Forest Plan and Regional Guides. Existing soil disturbance is scattered across proposed activity areas, and concentrated on more level ground that is readily accessed. It is primarily in the form of old skid trails and access roads that were sufficiently disturbed at the time of their use and they remain in exceedance of criteria for (*) detrimental disturbance levels. This existing detrimental soil condition is often referred to as legacy disturbance, and is factored into assessments of cumulative effects for new management actions.

A certain amount of overlap occurs when logging activity occurs in units with existing detrimental soil condition as machinery reuses some trails and landing sites. This tends to reduce the amount of added, new detrimental soil impacts. However, this was not used to reduce the estimated increase percentage in DSC in the assessment due to uncertainty on the extent of this effect on a specific unit. This would likely lead to some overestimation of total potential DSC in units with existing soil disturbance from previous activity. Tree planting activities would not contribute measurably to detrimental soil condition.

The reasonably foreseeable Eastside Burn prescribed fire (p. 3-3) is adjacent to activity areas in the South George project planning area. Treatment acres (burned) are anticipated to be spread out over several years, lighting different areas in subsequent years. This would keep excessively large areas from being in a burned condition which can increase erosion hazard during the following few months until vegetation has recovered. Vegetative recovery (in grasslands) is typically more robust than before the burning activity due to the release of nutrients and increased growing space. (*) Amounts of additional detrimental soil condition need to be quantified and assessed as to their longevity & cumulative effects.

Detrimental soil condition would be expected to be "very slight" as discussed in landscape burning above and would not be on the same acres as other land disturbing activities described in action alternatives.

Non-commercial thinning activities listed in the summary of reasonably foreseeable actions (p. 3-3) would be on different acres than proposed units in action alternatives, therefore, no additive detrimental soil condition would occur due to this activity. "Little" to no increased erosion hazard would occur due to thinning activities, therefore there would be no cumulative erosion hazard increase.

For Alternative C, road decommissioning of existing unauthorized roads and trails would increase acreage with improved productivity compared to current as these areas would be back into improved productive capacity and stabilized. This activity would also reduce the area with detrimental soil condition.

(*) This is another reason to implement road decommissioning.

(*) Table 3-4 displays cumulative effects within proposed new project activities - not cumulative effects of this project with the effects of past logging, roading, fuel reduction, burning, livestock grazing, etc. This is inadequate cumulative effects analysis.

Table 3-4 below displays cumulative effects to detrimental soil disturbance by Alternative.

(*) How can there be "detrimental soil condition" on so few acres compared to the total logged, burned, roaded, etc.? There is something wrong with this analysis that is systematically underestimating total detrimental soil conditions.

Table 3-4 Summary of Cumulative Detrimental Soil Condition (DSC) by Alternative

	Alternative			
	A (Existing Condition)	B	C	D
Detrimental Soil Condition – Acres	57	248	244	183
Temporary Road - Acres	0	7.2	0	5.5
Non-commercial Thinning - Acres	23	40	40	40
Roads and Trails Rehabilitated - Acres	0	0	94	0

Effective Ground Cover

With the exception of road surfaces, effective ground cover is minimally recovered within the timeframes mentioned on page 3-5 and essentially recovered within 3 to 5 years after cessation of disturbing activities (Umatilla NF monitoring). Therefore, effects within harvest units are assessed as short-term, direct, and indirect effects.

Coarse and Fine Woody Debris

When considering the incremental impacts of this project, then adding past, present and reasonably foreseeable future activities within the project area; it is determined no meaningful adverse cumulative effects to effective ground cover can be attributed to any of the action alternatives (Soils Report, Archuletta, page 4, project file). (*) This conclusion is only possible if analysis is confined to proposed sale units rather than to the project planning area as required.

FINDINGS OF CONSISTENCY

All alternatives would be consistent with Forest Plan standards and guidelines for achieving soil quality maintenance objectives. Action alternatives have been designed to achieve project objectives with minimal soil disturbance of any kind, especially activities that would create added erosion hazard, while balancing operational feasibility considerations. Existing areas of detrimental soil disturbance (DSC) that would be reused (e.g. old landings), and additional DSC from proposed activity, would be mitigated with decompaction treatments as needed and native seeding, thereby ameliorating existing detrimentally disturbed area. In addition, some of the existing roads and unauthorized trails (Alternative C) would be rehabilitated. This would improve their existing productive capacity, and move those particular units, and the project area as a whole, on an improving trend. Implementation of this project (also) meets guidance included in the Forest Service Manual, Pacific Northwest Region 6 Supplement 2500.98-1.

(*) Is this mitigation guaranteed funding & guaranteed to be implemented? usually not.

(*) Please send us a print copy of the Soils Report, Archuletta, from the project file, & the Forest Service Manual, Supplement 2500.98-1 cited on this page.

HYDROLOGY

This section incorporates by reference the South George Hydrology Report contained in the project analysis file at Pomeroy Ranger District. Specific information on the methodologies, assumptions, and limitations of analysis and other details are contained in the report. A summary of the current conditions of the affected environment and the predicted effects of the Proposed Action and its alternatives are discussed in this section.

AFFECTED ENVIRONMENT

Variability of forest types from this

Elevations in South George project planning area range from about 3,200 feet where South Fork Asotin leaves NSF lands to about 6,000 feet at Wickiup Campground. Annual precipitation ranges from about 22 inches per year at lower elevations to 30 inches per year at the highest elevations. Ninety percent of the precipitation occurs between September and May with 30 percent of the winter's precipitation falling as snow. Tributaries and headwaters of South Fork Asotin Creek, from Dark Canyon south to Sheriff Gulch, drain the northern portion, and George Creek headwaters and tributaries south to Coombs Canyon drain the southern portion of the project planning area.

Topography of the area consists of uplifted Columbia River Basalts rocks. Folding and uplifting of the underlying bedrock has resulted in a plateau tilted slightly to the north and east. The increase in elevation from this uplift caused streams to cut down and form very steep, and generally narrow, v-shaped canyons.

Hydrologic Function and Condition

The following table shows road density by Asotin Creek subwatersheds.

Table 3-6- Road Density by Subwatershed

Subwatershed Number	Subwatershed (SWS) Name	Existing Road Miles (opened and closed)	Decom-missioned Road Miles	Existing Road Density (open and closed) mi per sq. mi.	Number of Stream Crossings
170601030201	N. Fork Asotin Creek.	56	5	1.4	na
170601030202	Lick Creek	24	30	1.8	na
170601030203	***S. Fork Asotin Creek**	**46**	**18**	**2.5**	**42**
170601030204	Charley Creek	64	20	4.4	na
170601030206	***Upper George Creek**	**48**	**2**	**3.5**	**40**
***SWS are in the South George project planning area.**					

Approximately 18 miles of road has been decommissioned in South Fork Asotin Creek SWS within the last twelve years. Road density declined from 3.3 to 2.5 miles per square mile, and riparian habitat conservation area (RHCA) roads in that SWS declined from over 9 miles to less than 2 miles. Full recontour and revegetation of these roads has reduced connectivity with and expansion of the drainage network. Routing of surface runoff and subsurface flow has been moved towards pre-management characteristics. However, localized water quality effects continue to occur. Upper George Creek SWS road density is 3.5 miles per square mile. Both SWS have few miles of road in RHCAs and about the same number of stream-road intersections. Many of these are ephemeral or intermittent crossings.

Unauthorized ATV trails are found over most of the project planning area. These unauthorized roads and trails are located throughout the planning area but are concentrated in upper elevation which is relatively flat and located off of Forest roads (FRs) 4302, 4300, 4304, and 4305060. In these locations many of the trails are old timber sale skid trails, or temporary roads which were never decommissioned and are kept open by illegal users. Lower elevation areas are less forested and user-developed ATV trails are found on most ridges leaving the project planning area and NFS lands. These trails increase the effective road density. Most are located in areas that do not drain into channels or cause sedimentation, but some unauthorized ATV use has localized hydrologic condition and water quality effects.

(*) Some sentences make no sense as printed and are marked with "?"

ENVIRONMENTAL CONSEQUENCES

? National Forest Service (NFS) lands are located in the highest elevation, headwater location of the subwatersheds and cannot be analyzed to the same detail or using the same methodology as those on NFS comprise less than half the acres of each of the two subwatersheds in the project area (Table 3-5). Topographic and vegetative characteristics change gradually from the head to mouth of the subwatersheds as elevation and precipitation decline. Information on actions on non-NFS lands is limited lands and cannot be analyzed to the same detail or using the same methodology as those on NFS lands.

Cumulative effects for all hydrologic indicators are analyzed using HUC 6 subwatersheds. This geographic extend encompasses the area that reasonably could be affected by the South George project.

Cumulative effects for water quality are analyzed for short-term one day to one week and for long-term, up to one year. These time scales were chosen to display short-term concentrated effects, and longer-term seasonal effects that are sometimes seen during spring runoff.

Cumulative effects for water yield are calculated using records of timber harvest activity dating to the 1960s. The Equivalent Treatment Acre (ETA) model has a 33 year time-frame for the slowest sites to recover hydrologically (collection, storage, and release of precipitation). Although vegetation management proposed in the project may occur over a number of years, the calculation is done as if it all occurs in one year, therefore shows the maximum effect that could be expected.

Alternative A – No Action

Direct/Indirect Effects - Alternative A

Hydrologic Condition and Function

No change to the existing road system is foreseen under this alternative. Road density and proximity to channels would remain the same. Few of the project planning area roads have regular maintenance. Problems identified in the existing condition section would remain, and through time would worsen to some degree as weather and use degrade road drainage.

Water Quality

Water temperature -Water temperature would improve slowly over time as near channel vegetation grew and provided more shade. The magnitude of this change is unknown and related to the degree that shade currently departs from site potential. Disturbance events like fires and floods could reverse this trend. The timeframe for shade and water temperature improvement is long, related to the growth rate of site potential vegetation, which in the case of conifers is measured in decades.

Sediment -Ongoing use by ungulates and continued lack of road maintenance would be the primary management related sources of accelerated erosion. Natural disturbance regimes like flood and fire would be the dominant sediment risks for the future.

Water Yield

The affected environment disclosed above discusses analysis methods and results. In subwatersheds with existing recent harvest, vegetative recovery through time would reduce ETA values. Current values of ETA suggest that there is no measurable difference between current conditions and those with no harvest. Additional growth of conifer stands into the future would not measurably change water yield or peak flows.

Cumulative Effects -Alternative A

For the No Action alternative, South George project would not be authorizing any actions; therefore it would not be adding anything to the effects of past, present, and reasonably foreseeable future actions. Based on the definition provided in the CEQ regulations (p. 3-1), there would be no cumulative effects for the No Action Alternative.

Effects Common to All Action Alternatives

Direct/Indirect Effects - Alternatives B, C, and D

Water Quality

Non-commercial thinning up to what dbh, & how close to the stream? How much removal? see alt. D fuels map

Water Temperature

RHCA Fuels Treatment – non-commercial mechanical thinning (RHCA units 1 and 2) - All action alternatives propose removing some trees in the RHCA along about 0.6 miles (approximately 25 acres) of an unnamed tributary to George Creek. This stream is a PACFISH Category 2, perennial non-fish bearing stream. Removal would occur across the entire RHCA on both sides of the channel to reduce probability of crown fire initiation, disrupt crown continuity, and use prescribed fire to reduce existing and created ground material. The treatment would occur in two units located near or at the Forest boundary. This entry is designed to protect the stands from fire moving up the drainage from private lands (project file, Fuels RHCA Specialists Report, p. 1).

Summer stream temperature increases due to removal of riparian vegetation are well documented and have lead to development of BMPs (Appendix D) to protect shade. The sun's angle (zenith- height above the horizon) and sun position through the day (azimuth) together with vegetation and channel characteristics influence shade and its effectiveness in protecting and maintaining water temperatures, vegetation height, location, and density, stream width, orientation, and steepness of adjacent uplands. Peak stream temperatures occur in July and August.

Many variables are involved in determining water temperature and the effect shade removal can have on water temperature. Differing results are seen in the literature. Two studies cited below discuss the effect of harvest on small headwater stream temperatures and the downstream temperature effect to fish bearing reaches.

A 1991 study of water temperature effects of riparian harvest in small perennial headwater streams on larger fish bearing streams of riparian harvest in small perennial headwater streams found very minimal influence on downstream water temperature. This was attributed to the difference in stream size, relative amount of flow between the treated and the receiving waters. The study found that water temperature in small streams was responsive to localized conditions and quickly came into equilibrium with downstream conditions. Higher than expected shade levels were found in logged reaches, including logging debris and understory brush in these western Washington streams (Caldwell et al. 1991).

More recently, the water temperature effect of headwater riparian harvest was evaluated in a northern Idaho study. Two treatment types were evaluated; clearcut or partial cut (thinning) on 50 percent of the drainage. One clearcut site showed an increase in peak water temperature in the stream reach of the clearcut, the downstream effect was slight. Temperature effects in the partial cut watershed ranged from very slight to no change. Long-term monitoring sites on downstream fish bearing streams showed no

With a stream (George Creek) 303d listed for temperature, no further increase in temperature is allowed - Drop RHCA units 1+2, as an increase in water temp. is acknowledged

change in the extent or timing of summer maximum water temperatures. Annual variation in precipitation, snow pack, and summer air temperatures, as well as ground water influence, and increased base flow contributed to these results (Gravelle et al. 2007).

The proposed treatment would reduce RHCA basal area by about 20 percent and overall stand canopy closure would drop by 10 percent (project file Silviculturist RHCA Report, p. 1). The tributary channel is perennial non-fish bearing with a few subsurface segments in late fall. Field measurements and estimates were made in July 2009.

Mid summer flows in the tributary are low <0.5 cfs, and make up about one-quarter of the flow of George Creek at the confluence which is about 0.25 mile below the end of treatments at the Forest boundary. Water temperature was cool, 9° C at the Forest boundary (11:30 am, July 14, 2009). The stream drains to the northeast and is shaded by vegetation on the northwest facing slope (southeast side of the creek). A steep inner gorge (approximately 70 percent) is present and the overall gradient of the adjacent slope is approximately 50 percent. The valley bottom is 10-12 feet wide and in some places is entirely occupied by spring high flows. Shade is provided by the lower levels of the conifer canopy as well as the over-story canopy.

Specific design features will be implemented (Chapter 2, Table 2-5) for the RHCA thinning project.

Model derived shade nomographs were used to evaluate the site potential effective shade, that is, the shade that protects water temperature. Using these nomographs and based on local site conditions; channel width and orientation and the height and density of over-story vegetation, existing effective shade in the proposed treatment area is estimated at about 90 percent (USDA, 2005).

Shade reduction from this treatment would be low, but could lead to a short-term small increase in water temperature in the small stream. Shade would recover over 10 to 20 years as the conifer crowns fill in the area (Forest Silviculturist, personal communication). Increased shrub growth would depend on reduced shading and is unlikely to be strong (D. Powell, Forest Silviculturist, personal communication).

This project proposes treatment on about 0.50 mile of channel. Water temperature increase in the tributary due to this project would be expected to be small based on design criteria that would limit shade reductions to 10 percent leaving an estimated 80 percent effective shade. The treatments end at the Forest boundary, about 0.25 mile above the confluence with George Creek and the treated tributary is about one-quarter of the flow of George Creek at the confluence.

A small reduction in shade would occur with these treatments and there is potential that water temperature in the tributary could increase slightly due to the treatment. Since the tributary flow is a small portion of George Creek, about one-quarter of the flow, only a small effect on George Creek would be expected. It is unlikely that there would be a measurable water temperature increase in George Creek from the RHCA fuels treatment (RHCA units 1 and 2). This fuels treatment would not be expected to prevent attainment or retard recovery of the water temperature Riparian Management Objective (RMO).

Monitoring would be used to evaluate the effects of RHCA thinning on water temperature (Chapter 2, p. 2-22). – too late to prevent an increase

These conclusory statements don't ensure that no measurable stream temp. increase would occur in George Creek.

We support keeping all planned activities outside of RHCA PACFISH boundaries.

Other Proposed Activities - Commercial harvest activities, activity fuels treatments, and landscape prescribed fire, would not occur inside of interim PACFISH RHCAs. RHCA widths range from 1-2 tree heights depending on flow regime and the presence and or absence of fish (Umatilla National Forest, 1990). Shade is controlled by about 1 tree height (FEMAT, 1993). There would be no effect to water temperature from these treatments.

Fire ignition for landscape prescribed fire or activity fuel treatments would not occur inside RHCAs but fire would be allowed to back into RHCAs. No ignition and increased moisture in RHCAs would cause fire intensity to drop and reduce fuel consumption. Shade would not be significantly reduced and potential effects to water temperature would be negligible.

Danger trees would be felled along all haul routes used for the proposed timber sales. They would be left on the ground inside RHCAs and commercially removed elsewhere. Most stream crossings on haul routes are ephemeral or intermittent with no or very low summer flows. Danger trees felled on haul routes within RHCAs of perennial streams would have a negligible effect on shade density for affected streams. Are all stream crossings on haul routes over ephemeral or intermittent streams with no or very low summer flows? If not, what are the exceptions - how many crossings over what class of stream w/what flow?

Sediment

RHCA Fuels Treatment-non-commercial mechanical thinning (RHCA units 1 and 2) - Special design features for tree removal in about 25 acres of RHCA are listed in Chapter 2, Table 2-5. Hand felling, full suspension tree removal systems with no yarding related soil disturbance in the RHCA, overall limit of 10 percent soil disturbance within RHCAs, and protection of bank and channel stabilizing trees would protect ground cover and prevent detectable erosion and sedimentation due to implementation of this project. No measurable effect to water quality would be expected. Effects from hazard tree removal? What size of trees & how many would be removed? Why are trees being removed from within the RHCA?

Road Drainage on Haul Routes - Timber sale road maintenance work, in advance of timber sale use, would add drainage features and spot rock in areas that currently erode into surface waters on haul routes. The road surface approaching and leaving the culverts carrying water under FR 4302 would be resurfaced with gravel. The length of resurfacing would be approximately 200 feet either side of the culvert. Inlets of the perennial drainages would be armored also. Stream crossings on Forest Roads 4300 and 4304 would also be improved. These are ongoing sources of sedimentation into surface waters. Improved drainage provided by proposed timber sales would reduce this sedimentation and prevent or minimize additional sedimentation from timber haul. Armoring culvert headwalls on FR 4302 would also serve to harden some locations where cattle have traditionally watered from the road. This annual source of channel damage and sedimentation into streams would be reduced or eliminated.

A culvert on FR4300130 would be removed before haul. This undersized culvert has plugged from excessive erosion and sedimentation caused by unauthorized ATV use. This is an open road and the channel is an early season intermittent stream with no fish use. This culvert would be removed and the channel recontoured to natural dimensions after the stream has dried up for the year. A rock ford would be constructed to protect the channel. Completion of work after flow has ceased, and rocking the channel would minimize erosion and sedimentation from the culvert removal. Sedimentation caused by water flowing over the road due to the plugged culvert would be eliminated for a net benefit to water quality.

So how would these two stream culvert areas be left into the future? with no culverts?

Coombs Canyon culvert on FR 4304060 has plugged in the past, causing the creek to cross on the surface of the road creating small gullies and washing sediment into the creek. This is a fish bearing stream with habitat above the culvert. For this sale and if necessary for post sale activities, normal drainage maintenance would be performed. After the completion of activities the culvert would be removed and the crossing reshaped to match the plan and profile of the stream. An existing gate would be moved from its current location past the culvert, back toward the beginning of the road. Culvert work would be done

Consequences from traffic vs. sedimentation of streams in the future?

during the instream work window and water would be diverted around the work site for the instream portion of the work as required by the memorandum of understanding (MOU) 2005 with Washington Department of Fish and Wildlife (WDFW) for instream work. Other specific design criteria in Attachment A of the MOU would be followed. Short term, less than one day, sedimentation and turbidity would occur during this work and as the flow of Coombs Canyon Creek was returned to the channel. Coombs Canyon has very low summer flows, less than 1 cfs. The channel has step-pool morphology with pools formed by downed wood (personal communication Del Groat, District Fish Biologist, 2010 field surveys) that provide a depositional environment. It is unlikely that measureable sediment would pass the National Forest boundary. Higher flows, associated with spring runoff would complete the process of washing fines from the new channel bottom. Sediment contribution from this very limited extent of channel disturbance, less than 30 feet, would not be detectable in the background sediment load of spring runoff.

Natural Fuels Treatments - Non-commercial mechanical thinning and ladder fuel removal would occur on about 800 acres, hand thinning and ladder fuel removal would occur on about 650 acres and landscape burning would occur on approximately 3,000 acres. No mechanical or hand thinning would occur in RHCAs (except for the area mentioned above in RHCA thinning). No ignition would take place inside RHCAs during landscape prescribed burning though fire would be allowed to back into RHCAs; there would be very little effect to existing down material and vegetation density in near channel positions. The potential for sediment to reach channels from these treatments is negligible.

(*) This seems to be inadequate analysis of sedimentation of streams potential from hazard tree removal - How many hazard trees would be removed near/above streams, & how close to the streams? How much dirt would be displaced? There needs to be quantified site specific analysis.

Danger Tree Removal - This activity would occur along haul routes. Danger trees felled inside RHCAs would be left on the ground and no ground disturbance would occur. Removal of danger trees outside of RHCAs could lead to ground disturbance as equipment traveled off-road or trees were winched to the road. Slope distances would be short and erosion and sedimentation would be unlikely. Undisturbed RHCAs would protect channels and surface waters from sedimentation that might occur.

Alternative B – Proposed Action (Preferred Alternative)

Direct/Indirect Effects – Alternative B

Hydrologic Condition and Function

Roads - This alternative does not propose any change to the existing road system. Road density and proximity to channels would remain the same. Road maintenance as described in Chapter 2 would occur on haul routes. This maintenance would be expected to improve drainage as discussed above. Road density in Upper George Creek SWS is high. Stream crossings are used as an indicator of the degree of connectivity between the road system and the drainage network. To the degree that these roads are connected to the drainage network the risk of road sediments reaching surface waters is increased. The drainage network is lengthened and the potential for precipitation to drain more quickly with less residence time in the watershed is increased.

Three miles of temporary road would be constructed in Alternative B (see maps in Appendix A). The road locations would be upslope of channel formation on relatively flat ground with no hydrologic connectivity. Cut and fill construction would be negligible. Decompaction, pulling of berms, recontouring, camouflage of entrance, and revegetation would be used to completely decommission these roads at the completion of timber harvest. No effects to watershed function would occur.

Past road decommissioning in South Fork Asotin Creek SWS has reduced road densities and connectivity with channels. There has been little road decommissioning in Upper George Creek SWS.

(*) We are opposed to skyline yarding due to erosion channels created on steep slopes - 3-6 ft wide from the bottom of sale units to the landing.

We're opposed to helicopter logging as this facilitates the degradation of pristine back country areas & inadvisable removal of trees on steep slopes. It is also expensive, so usually involves the removal of large trees that should be left on the landscape.

Table 3-10 Road Density, Stream Crossings, and Road Decommissioning

		Alternatives A, B, and D				Alternative C After Road Decommissioning			
Subwatershed Number	SWS Name	Opened and Closed Roads (miles)	Previous Decom-missioned Roads (miles)	Rd. Density mi/ sq. mi. (open and closed)	# of Stream Cross-ings	Opened and Closed after Decom	Miles of System Road Decom	Rd. Density mi/ sq. mi (open and closed)	# of Stream Cross-ings
170601030203	S. Fork Asotin	46	15	2.5	42	39	7	2.1	30
170601030206	Upper George	48	2	3.5	40	24	23	1.8	12

GIS layers were used to generate a report of number of stream crossings which is used to indicate the level of connectivity between roads and streams. Limitations in the accuracy of the stream layer and in the degree of resolution (+- 30 ft.) make the data useful only as an indicator and not as an exact count of crossings.

Water Quality

Sediment -Alternative B would commercially harvest about 300 acres with helicopter systems, about 850 acres with skyline logging systems, and approximately 2,750 acres with conventional ground based logging systems with tops attached to the last log. Fuels treatments on these acres would include a mix of about 820 acres of grapple pile and burn, and about 2,030 acres of prescribed burning.

With the exception of the 25 acres of RHCA fuels treatment (RHCA units 1 and 2) design features (Chapter 2, Table 2-5) for these actions would include no harvest in RHCAs using PACFISH interim widths, and slope gradients that would not exceed 35 percent on ground based harvest units. These design features would prevent damage that could contribute to erosion and sedimentation into channels and streams (Belt et al. 1992). Slope gradients would not exceed 35 percent on ground based harvest units. In units logged with helicopter systems mineral soil exposure would be minor and scattered on an otherwise undisturbed ground surface. Skyline systems are low disturbance systems with an average trail spacing about 100 feet apart and at least one-end suspension. Ground disturbance in corridors would be expected from the bottom of the unit to the landing, one to two meters wide (Craig Busskohl, Forest Soil Scientist, personal communication). Erosion control consisting of waterbars and mulching where surface roughness was not sufficient to divert water from the corridor would reduce erosion but not eliminate erosion potential. Corridors typically fan out from a tower setting and do not concentrate runoff beyond their individual drainage. Generally infiltration would occur before surface runoff accumulated to the degree necessary for erosion. Waterbars would drain corridors at spacing which would normally prevent the development of erosive surface velocities. The combination of limited drainage area and erosion control would reduce and generally prevent surface erosion. Conventional logging systems with tops attached to the last log would have the potential for more soil disturbance. Average trail spacing would be 100 feet, which helps to reduce the overall quantity of disturbance. Infiltration and mulching with logging slash and/or water bars would prevent surface erosion. Surrounding undisturbed vegetation and RHCA protection would prevent transport of any eroded sediment into surface waters.

With the exception of the approximately 25 acres discussed above, no fuels treatment would occur in RHCAs. No ignition would occur in RHCAs during fuels treatments though fire would be allowed to back into them where they are adjacent to prescribed fire. There would be very little effect to existing down material and vegetation density in near channel positions. The potential for sediment to reach channels from these treatments is negligible.

*We request (by FOIA if necessary) the BE & Report for Aquatic Species

Road maintenance would occur on about 79 miles of system roads used by timber sales and would include blading, ditch relief culvert cleanout, and ditch cleanout on portions of road where needed. Culvert cleanout and necessary ditch cleanout would lead to immediate reductions in risk from the road system. Closed roads would be left in a self-maintaining condition. Detrimental effects from ditch cleanout would be short-term, less than one year.

Erosion and sedimentation effects of log haul on forest roads have been the subject of numerous studies. Log haul has been demonstrated to increase sedimentation from hydrologically connected roads during precipitation events, with the effect decreasing as traffic is reduced or ends (Reid 1984). Dry season use of roads or restricting logging traffic during surface runoff from roads can reduce this effect by interrupting or reducing the road-stream connectivity. Design criteria include the halting of log haul when turbid water leaving roadways had a potential to enter surface waters.

In a study of sediment production from forest roads, newly cleaned ditches were found to have a sediment yield substantially more than blading of the road surface or traffic use (Luce and Black 2001). This is likely due to the disruption of armored or vegetated surfaces, leading to a larger supply of fine, erodible sediment in a feature that carries water during storms. Ditch clean out would be used only when ditch function was compromised and would minimize disturbance of existing vegetation and natural armoring, practices which are common on the Umatilla National Forest. Road use restrictions and minimized ditch cleanout would reduce sediment production from road use to the extent possible.

Cumulative Effects – Alternative B

Hydrologic Function and Condition

The current road system would not change in Alternative B, and temporary road construction would be located and managed such that there would be no effect to the drainage network. Projects proposed in Alternative B would have no measurable direct affects to hydrologic function and condition. There is some potential that harvest units may increase the accessibility of stream channels to cattle (BE and Report for Aquatic Species, Project File) which could lead to damage to stream banks and riparian vegetation. There would be negligible effects downstream of NFS lands therefore; cumulative effects with ongoing activities and effects on private lands would be negligible.

*The conclusion does not follow that there would be no cumulative effects with ongoing activities.

Water Quality

*What are the effects of the expected "low" potential for measurable effect to water temp. in George Creek?

Water Temperature –The proposed RHCA fuels treatment (RHCA units 1 and 2) would have a low potential for measureable affect to water temperature in George Creek. Downstream of NFS lands some private home development, in the riparian area of George Creek downstream of NFS lands, may affect water temperature. It is unlikely that water temperature effects from the RHCA fuels treatment (units 1 and 2) would be measurable and cumulative water temperature effects would be negligible.

Sediment - Road work that would occur with proposed timber sales would reduce erosion and sedimentation from stream crossings that are currently causing localized impacts leading to a localized improvement in water quality. Short-term, less than one day, measurable turbidity is likely to occur during removal of the culvert on Coombs Creek, a perennial channel. This effect is not likely to be measurable below the Forest boundary, approximately 3 miles downstream.

There is some possibility that harvest units may increase the accessibility of cattle to stream channels which could lead to trampling in stream channels. Based on the magnitude and offsite effects currently seen on FR 4302 from cattle access to streams, sedimentation from increased cattle access would be small

(*) yet cumulative sediment effects can affect fish even if they don't overlap if they prevent fish survival or use in different segments of the stream, preventing upstream spawning & use of historical habitat.

and the small volume of water instream and the amount of woody debris in the channels of the area would prevent measurable quantities from traveling far. Current logging on private lands in Upper George Creek subwatershed drains into George Creek about 2 miles below the Forest boundary and there is negligible opportunity for cumulative sediment effects with direct or indirect effects of project activities proposed in South George Vegetation and Fuels Management Project.

(*) Inadequate cumulative effects analysis

Water Yield

Effects of past harvest and road building, proposed harvest, and landscape burning on water yield and peak flows were analyzed and cumulated with the Equivalent Treatment Acre (ETA) Model as described in the Affected Environment section above. Table 3-11 displays the results of the analysis. Harvest prescriptions have varying ETA coefficients depending on residual stand post harvest and activity fuel treatment. ETA percentages increase in the two subwatersheds of the South George project planning area. The increases are below levels at which effects have been seen to water yield, peakflows, or timing of peakflows, as discussed in the Affected Environment section above. Proposed harvest and landscape burning would have no measurable effect to hydrologic functions; capture, storage, and release of water.

Table 3-11 Equivalent Treatment Acres by Percent in 2010

Subwatershed Number	Subwatershed Name	Alt. A	Alt. B	Alt. C	Alt. D
170601030201	N. Fork Asotin Creek.	1.9%	1.2%	1.2%	1.2%
170601030202	Lick Creek	5.8%	4.1%	4.1%	4.1%
170601030203	***S. Fork Asotin Creek**	**3.1%**	**13.4%**	**13.2%**	**8.9%**
170601030204	**Charley Creek	12.9%	12.9%	12.9%	12.9%
170601030206	***Upper George Creek**	**3.1%**	**8.9%**	**8.2%**	**5.5%**
*** indicates SWS in project planning area**					
**calculated for Upper Charlie EIS, ongoing, not in harvested data base at this time					

>13% ETA is ~~get~~ getting uncomfortably close to the 15% potential hydrologic effects point. This is another reason for less logging, as in Alt. D

Ongoing Activities and Future Foreseeable Projects - The Eastside landscape prescribed burning project will treat 4,500 acres over 10-year period. The list of design criteria for this project includes the stopping of ignition 600 feet from streams. Backing fire is very unlikely to enter RHCAs. No affect to shade or water temperature would occur and no measurable sediment would reach surface waters. Ongoing pre-commercial thinning projects totaling about 1,500 acres would not mechanically thin inside RHCAs and hand thinning would not remove any existing shade on channels. Grazing and unauthorized ATV use as described in the Affected Environment section above would continue.

South George project planning area overlaps the Asotin C&H Allotment. Restoration and protection measures would be implemented at spring sites and stream crossings to reduce impacts from cattle. It is expected that these projects would be implemented as money becomes available, over the next ten years.

Springs have been identified for protection and or restoration and ongoing efforts are making improvements. Cold Spring water trough was replaced and re-plumbed in 2010, ending the muddy conditions in the area. Other springs identified for improvement include Park Spring, Seven Sister's Spring, Round Prairie pond and spring, and Hostetler Springs. Actions would include as necessary: replacing troughs, moving troughs away from springs and stream channels, hardening areas around trough areas, revegetation work as needed. Spring protection would be replaced or improved as needed by rebuilding spring boxes and enlarging or rebuilding fenced out areas.

Several areas along the Hogback Road (FR 4302) and two other areas near problem culverts have been identified as sites where cattle watering at stream crossings cause localized bank disturbance. These sites