Appendix E - Response to Substantive Comments 2
Adequacy/Consistency 2
Economics 10
Fire/Fuels 12
Fish 18
Grazing 20
Timber Harvest 21
Herbicide Use 25
Historic Range of Variability 26
Noxious Weeds/Unwanted Vegetation 29
OHVs 30
Roadless Area 31
Roads 32
Water Quality 34
Wildlife 43

Appendix E - Response to Substantive Comments

A total of 25 letters were received during the comment period on the Draft Environmental Impact Statement, 6 of which were received after the comment period ended. Due to the length of most letters (some over 30 pages), quotes were selected from the letters to portray concerns. Often, several letters shared similar concerns, so those have been displayed together; and where concerns were very similar, only one or two of the letters were quoted to represent the concern. The Forest Service response follows the associated comments.

Adequacy/Consistency

Comment 1: *"The Forest Service's proposal does not adhere to state and federal policies. [T]he Governor of…Oregon…offered a 11-point strategy of ecosystem health restoration… He proposed the Forest Service "Plan and implement operations first in less controversial areas. In the short run, avoid operating in roadless areas, near fish habitat and old growth forests." …Chief Dombeck…testified "it is simply common sense that we avoid riparian, old growth, and roadless areas."* ***(Glenn Fullilove, Northwest Environmental Defense Center)***

FS Response: The Governor's "Proposed Consensus Approach to Eastside Ecosystem Health Restoration", as well as Chief Dombeck's concerns, was considered in the development of the Tower Fire Recovery Projects DEIS, although no specific reference was mentioned. A section has been added to Chapter 4 of the FEIS to highlight how these policies were considered.

Comment 2: "*The information, analysis, and disclosure within the EIS fails to comply with the legal requirements of the National Environmental Policy Act…*[the EIS] *and all its alternatives are illegal.* [The DEIS failed] *to accurately monitor and disclose the adverse impacts of recent Big Tower logging…*[The DEIS failed] *to honestly disclose what was wrong with the Big Tower EA and why it was ruled in violation of NEPA by Federal Court***.** ***(Asante' Riverwind, Blue Mountain Biodiversity Project)***

FS Response: The legality of the EIS and its alternatives is difficult to respond to without more detail, such as specific, numeric reference to the legal requirements that were not met. Based upon review at the District and Forest levels, the requirements of NEPA, NFMA, and other applicable laws have been met within the EIS (see Chapter 4 for further discussion). There were many other comments throughout the Blue Mountain Biodiversity Project's letter that accurate scientific analysis was not conducted as required. When available and applicable, the interdisciplinary team incorporated research papers and studies into their analysis, and these have been cited in the EIS. However, in many instances, information was not available or was not specific to wildfire in the vegetation type pertinent to the Tower area. In those cases, the interdisciplinary team relied on their own professional experience and judgment, extrapolating from various scientific sources to fit this situation.

In other cases, conflicting scientific research existed and the interdisciplinary team again used their professional experience and judgment to decide the most applicable information for the situation within the Tower Fire area.

Monitoring on the Tower Fire began soon after the fire was controlled. Results of the ongoing monitoring efforts, including the effects and results of timber harvest, are detailed in the 1998 and 1999 Monitoring and Evaluation Report for the National Forests of the Blue Mountains. Results from the monitoring efforts were used by specialists in the preparation of effects analysis reports and disclosed in Chapter 4 of the DEIS.

There is no legal requirement to disclose the what was "wrong" with the Big Tower EA in the EIS; the problems are recorded in Circuit Judge Fletcher's December 2, 1998, Opinion (which is available upon request). The Tower Fire Recovery Projects DEIS was prepared to correct these deficiencies. To summarize, the Big Tower EA was ruled in violation of NEPA by the 9th Circuit Court of Appeals because the Umatilla did not supply a convincing statement of reasons to explain why the Big Tower project's impacts, along with the cumulative effects of other proposed timber salvage, would be insignificant. The Big Tower EA specifically failed to:

- identify the location of proposed temporary road construction or the number of stream crossings;
- disclose estimated sediment or the impacts of increased sediment on fisheries habitat (especially in light of sediment already produced by the fire);
- support the conclusion that Best Management Practices to reduce erosion associated with the proposal would be adequate in a severely burned area where increased levels of erosion have already occurred.

Comment 3: "*We recommend that the EIS briefly present a purpose and need statement that specifies the underlying need for the project. Describe the need in one or two sentences. Having several different objectives listed as the purpose and need can result in contradictory or inhibitory situations where meeting one objective limits the ability of meeting others.*" **(Richard Parkin, Environmental Protection Agency)**

FS Response: The purpose and need for the Tower Fire Recovery Projects was designed not only to meet the direction in the CEQ Regulations (1502.13), but to also address the conclusion in the Judge Fletchers Opinion, which in part stated: "….the Forest Service made a clear error of judgment in its decision to prepare only an EA for the Big Tower Project and in its failure to analyze the combined effects of several salvage sales in the same watershed developed as part of a coordinated fire recovery strategy". Since it was necessary to address a wide range of projects in the EIS, the purpose and need statement included a high level of specificity so all projects (and alternatives to proposed projects) would be adequately considered in the development of the proposed action and alternatives.

Comment 4: *"Alternative #2 fails to meet the stated Purpose and Need…to restore forests to their historical composition. Nowhere in the DEIS is there evidence that supports the conclusion that the proposed alternative will prevent additional degradation of forest health and productivity. The…DEIS, Tower Fire Ecosystem Analysis, Tower Fire Salvage Environmental Assessment Water Resources Report and other documents…support that…this project will decrease forest health and productivity. The DEIS acknowledges that* [management activities that expose or compact soil, reduce

sediment trapping surface roughness, or improve sediment transport efficiency] *are going to occur at significant levels and therefore the conclusion that erosion will not be increased to a level that further degrades forest health is not reasonable. This alternative would…allow 4,344.27 acres of harvester/forwarder logging in the form of logging the DEIS recognizes as the… "most likely to reduce ground cover and compact soils, resulting in increased soil erosion potential." The effects of salvage logging following the Summit Fire…is the best evidence that the proposed action will not achieve the purpose and need.* [references Jon Rhodes, Columbia River Inter-Tribal Fish Commission monitoring]" **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: All action alternatives were designed to meet the purpose and need for the project, but in varying ways. Alternative 2 was designed to and intensively accelerate recovery of the fire and the analysis, summarized in Chapter 4, concluded that treated forests would be returned to their historical composition.

Some amount of impact, which may or may not even be measurable, will occur with almost any human activity. Many of the proposals are designed to improve long-term productivity and stability, yet have short-term risks. The DEIS does acknowledge that proposed activities, particularly harvest, would expose and compact soil. Mitigation is identified to minimize this (designated skid trail locations, no whole tree yarding, placing waterbars, etc.), and restore the site as soon as possible (subsoiling areas of compaction, placement of slash and logs in skid trails after harvest, seeding areas of disturbance, etc.) or provide for optimum natural recovery. Reforestation, planting and seeding of existing unstable areas, subsoiling of compaction related to past harvest, and repair of poor road conditions would remediate already existing sediment sources. Road decommissioning or obliteration, repair of road/stream crossings, and removal of culverts that are barriers to fish would also expose soil, but within about 3 years sediment would actually be reduced below the current level and fish habitat would increase where barriers are removed. Harvest also may have a long-term reduction in sediment, if it reduces the severity of future fire in treated locations. Harvest would benefit forest health and productivity by allowing a more healthy mix of tree species to develop in harvested stands (particularly within Armillaria root rot pockets). Therefore, the interdisciplinary team sees no conflict between the stated purpose and need and Alternative 2 (which is a series of actions and not just harvest).

This comment also contains an error in that tractor skidding, not harvester/forwarder logging, was identified as the logging system most likely to reduce ground cover and compact soils (DEIS, page 4-28). The DEIS stated that tractor skidding would occur on 1,844 acres, which is significantly less than 4,344.27 acres. In fact, the total proposed harvest in the DEIS for Alternative 2 is 3,919 acres, so the origin of 4,344.27 acres is rather puzzling. Also the impacts referenced would actually occur on 15% or less of the harvest area as required by Forest Plan Standards and Guidelines, so tractor harvest in the DEIS would actually impact about 277 acres.

Comment 5: *The Purpose and Need for* [the Lewis Creek Prescribed Fire scoping letter of June 4, 1998, Pomeroy Ranger District, Umatilla National Forest] *sounds similar to much of the Tower Project (facilitate recovery and improvement of wildlife habitat, reduce the risk of large high intensity wildfires…, and initiate the reintroduction of disturbance regimes…)*[but] *involves no commercial logging. …*[The EIS] *fails to disclose this environmentally preferred alternative and therefore fails to…analyze a reasonable range of alternatives…(Alternative 4 is…incomplete)…possibly including some prescribed fire in thick stands* **(Mike Peterson, The Lands Council)**

FS Response: The Lewis Creek Prescribed Fire project was initially designed to treat both relatively open ponderosa pine stands and grass stringers on southerly exposures and denser, mixed conifer stands on northerly exposures that had heavy fuel loadings. As analysis proceeded on the Lewis Creek Project, those stands on northern exposures were dropped from treatment, primarily because that interdisciplinary team felt some sort of fuels removal was required before introduction of fire. As a result, the Lewis Creek Prescribed Fire project now treats only those open ponderosa pine stands with some light understory encroachment and grass stringers on southerly exposures. The areas of heavier fuels accumulation in the mixed conifer stands on northerly exposures are being analyzed under the *"Paige Vegetation and Fuels Reduction EA"* which will be looking at the use of timber harvest to reduce fuels prior to fire introduction.

While there are many differences between the Lewis Creek project and the Tower EIS, one of the significant fuels differences is that in the case of Tower, the primary fuels concern is the amount of standing dead material that will pose a risk to recovering stands within the next 20 to 50 years. With the current levels of large-diameter fuels, short-term fuels such as grass and brush could not be treated effectively with prescribed fire in the future without killing the young regeneration.

Prescribed fire as a stand-alone treatment was used within the analysis area before 1996, primarily in the Oriental/Juniper Underburn project (implemented in 1995). This was possible because the areas treated were relatively open ponderosa pine stands with some encroaching mixed conifer in the understory. The areas proposed for timber harvest in the Tower EIS could not be treated with prescribed fire as a stand-alone treatment for a number of reasons. Grass is now prominent within stands on dry sites that experienced high fire mortality. Prescribed fire in these stands would result in unacceptably high mortality of recently planted trees. Removal of standing dead material from these stands would allow reintroduction of fire in twenty years or more when the regeneration is of a size that it will tolerate a low intensity burn.

On cool moist and cold dry sites, fire can used as a post-fire cleanup tool, but it will require a higher intensity broadcast burn (similar to how harvested units are treated). To get fire to spread and reduce fuels significantly on these sites, some of the standing dead material would need to be felled or treatment would have to wait for trees to fall naturally and provide a somewhat continuous fuel bed. Without fuels reduction, some of these stands will likely undergo a second, high intensity fire. While another high intensity fire would reduce fuel loading to a point that risk from future fires would be low for 50 to 100 years, it would also pose a high risk to fire fighters and kill any natural or artificial regeneration. Unfortunately, use of prescribed fire to alleviate risk of a second high intensity burn is limited due to difficult accessibility, fire control line availability, potential additional mineral soil exposure, and a desire to retain the regeneration (both natural and planted) that now exists on these sites.

Comment 6: *"The DEIS fails to consider a reasonable range of alternatives. Alternatives #2, #3, and…#6, are so similar that in practical terms they amount to merely one alternative.*

[T]*he DEIS consistently refers to the impacts of Alternatives #3 and #6 as identical to Alternative #2. Similarly, the impacts of Alternative #4 and #5 are listed as identical throughout the DEIS. The* [similarities in acreage logged] *is not consistent with NEPA's requirement that a range of alternatives be considered especially when given the repeated public requests that a restoration alternative be fully considered… An alternative should have been fully considered that consisted of removal and restoration of Forest Service roads, control of exotic invasive species…sediment control activities and other measures that would help recover the area to a healthier condition. While Alternative #4 comes close to meeting the need for a restoration alternative, the benefits of Alternative #4 and Alternative #1 were not adequately considered by the DEIS."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: The alternatives were designed with more than just harvest in mind. Alternative 3 was designed to show what would happen if chemical treatments were removed from the project mix, and as such would show no difference harvest-wise from the proposed action. Alternatives 4 and 5 took a more conservative approach, reducing risk to the status quo (Alternative 4 avoids harvest altogether, while Alternative 5 would allow helicopter logging, which has little impact on soil disturbance or compaction). Alternative 6 addressed the soil and sediment concerns associated with the proposed actions, while reducing fuel loads more than alternatives 4 or 5. Alternative 6 achieved this by restricting the length of temporary roads, avoiding stream crossings, and requiring full log suspension to lessen soil disturbance. These criteria would affect logging systems more than actual acres logged.

Many of the other proposed activities (fish barrier removal, slope stabilization, road obliteration, etc.) had only one or two viable action alternatives. Thus, impacts related to alternatives 3 and 6 would mimic those in Alternative 2 in many instances, since each alternative includes all 48 proposed activities. Alternatives 4 and 5 would be similar in many cases as well due to the emphasis on minimizing short-term detrimental impacts. The interdisciplinary team considered an extensive range of alternatives covering each of the proposed activities (see Chapter 2, alternatives dropped from further consideration) and chose to analyze what we believe to represent a reasonable range.

Comment 7: "[W]*e would like to see the analysis to show that any of the logging that is proposed will improve the soils, water quality, fisheries, or hiding cover for wildlife. Recovery is claimed as a driving reason to log, but…no evidence* [is] *provided to substantiate this claim.* **(Mike Peterson, The Lands Council)**

"[T]*he DEIS is lacking in authoritative cites from which it bases its information."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Logging was not proposed to improve any of the above, but to:

- maintain the vigor of live stands within the area by reducing overstocking and moving forest species compositions toward Armillaria resistant species (where this disease is known to occur) and toward historic compositions within warm dry/ponderosa pine ecological settings
- reduce fuel loads to desired levels (8-12 tons/acre) to facilitate use of prescribed fire in the future
- provide some economic benefits from the harvest of timber

The recovery value of the proposed logging lies in the reduction of future loads of large-diameter fuels that would otherwise increase fire intensity and resultant severity. Other proposed projects are specifically directed towards the long-term recovery of the soils, water quality, fish habitat, and wildlife cover.

There are many facets to the proposed recovery. Soil disturbance and compaction associated with use of heavy machinery would occur if the Tower projects were implemented, and not just because of timber harvest. However, the interdisciplinary team and supporting Forest specialists have concluded that with proper planning, system and equipment selection, and the listed mitigation, effects from harvest operations would not exceed Forest Plan standards and guidelines. For instance, many skid trails and temporary roads would be located on areas compacted by past harvest. This would serve a dual purpose: less new compaction would occur, and existing compaction would be reduced through subsoiling[1] of old skid trails, landings, and temporary roads. There are more such measures throughout the descriptions and mitigation in Chapter 2.

In the short-term, harvest and some of the other proposed activities would also reduce big game hiding cover. However, in the long-term, these same activities would allow for the re-establishment of diverse stands of trees within the larger unmanaged mosaic. The unmanaged areas would be left to cycle through the ecologic stages more slowly—grass/shrubland, lodgepole pine, etc.—for scores of years, until other tree species are able to gain a foothold again.

As for evidence to substantiate these claims, professional literature and research was cited throughout the DEIS and FEIS to support predicted effects and conclusions. A detailed bibliography was included in both documents. However, much of our analyses are based on site-specific analysis and professional judgment.

Comment 8: *"The DEIS fails to adequately consider the cumulative environmental impacts of the proposed project and past, present and future Forest Service activities. While the DEIS acknowledges the proposed alternative will cause erosion and sedimentation it does not adequately detail impacts.* [T]*he intensity of the Tower Fire was caused by Forest Service management…which created poor forest health conditions which made the area ripe for a high intensity fire. The DEIS laundry list of activities is not sufficient to meet the NEPA's requirement that cumulative effects be considered. The mere statement…that there will be future activities does not amount to a consideration of the effects of the future activities."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

"Recent past activities listed in the cumulative effects section of the DEIS fail to address the 19 million board feet that have already been 'salvaged' from the Tower Fire Area, and the impacts associated with these activities. Present activities include high levels of OHV use on an extremely pervasive road network…Future activities planned…include mining, thinning, the Camas Restoration Salvage, the Bull and Summit Salvages, the Falls Salvage, and the Cable Creek Salvage, as well as additional prescribed burning. The effects of these projects are much more serious than outlined in the DEIS." **(Adam Bishop, Alliance for the Wild Rockies)**

"The DEIS failed to disclose the cumulative impacts of livestock grazing and logging." **(Doug Heiken, Oregon Natural Resources Council)**

[1] Subsoiling uses blades mounted on a tractor to break up sub-surface compaction. This technique came into widespread use in the 1990s and was not available as a mitigation tool when the existing compaction was caused.

FS Response: The cumulative effects analysis began with a thorough documentation of activities in the planning area that could cause environmental effects in addition to the Tower proposals. This resulted in the detail included in Appendix A of the DEIS and FEIS. However, the team did not stop there. Upon review of CEQ's "*Considering Cumulative Effects Under the National Environmental Policy Act*", the interdisciplinary team considered each of the 11 methods listed for analyzing cumulative effects[2]. A detailed description of the cumulative effects analysis process has been added to Chapter 4 of the FEIS.

The results of cumulative effects analysis are summarized in Chapter 4 of the EIS for each resource. Analysis included the already harvested portion of the enjoined sales, as well as other post-fire activities. The Forest Service acknowledged in the DEIS and FEIS that fire suppression contributed to the forest conditions that resulted in the high intensity fire, however, the magnitude and extent is unquantifiable. Cumulative effects of foreseeable future actions were also difficult to quantify, since such actions have not been developed enough to provide information on road use, acres of harvest or prescribed burning, or other numeric detail. These actions were considered primarily using the Panel and Overlay Mapping/GIS methods.

Cumulative impacts of logging were considered as part of the sediment model discussed above, as well as through other methods. Cumulative effects of livestock grazing before the fire were discussed in the aquatic habitat conditions on pages 4-21, 4-31, 4-53, and 4-54 of the DEIS. The interdisciplinary team is unaware of any validated model that would permit quantitative estimates of the impacts of grazing in the Tower Fire area. Changes in grazing management strategies are not proposed in this project and are not anticipated, except the period of non-use that has already occurred. Future changes in grazing strategies would be analyzed through a different process: the Allotment Management Plan revisions.

The interdisciplinary team disagrees that the predicted cumulative effects are any more serious than already discussed in the DEIS, based on their knowledge of the area and past professional experience. Without more detail as to concerns or inadequacies or identification of alternative methods of analysis, the interdisciplinary team is unable to further satisfy the concerns contained in these comments.

Comment 9: *"The DEIS contrives a controversy over the Beschta Report to escape criticism of the controversy over fire salvage logging."* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

"The Beschta reports recommendations were not adequately considered because the specific recommendations of the report were not disclosed to the public. Nor did the DEIS analyze the benefits of implementing the recommendations of the Beschta report." **(Glenn Fullilove, Northwest Environmental Defense Center)**

"The EIS fails to present the content and findings of the report entitled "Recommendations for Ecologically Sound Post-Fire Salvage Logging and Other Post-Fire Treatments on Federal Lands in the West" by Dr. Robert Beschta, et al… Despite this report's peer reviewed, accepted status...the EIS fails to accurately present its findings… Instead the agency utilizes internal Forest Service reviews of the Beschta report…which have not been peer reviewed by the scientific community.

[2] In fact, the CEQ states in its handbook *Considering Cumulative Effects Under the National Environmental Policy Act* that "In a review of 90 individual methods, Granholm et al. (1987) determined that none of even the 12 most promising methods met all of the criteria for cumulative effects analysis. Most of the methods were good at describing or defining the problem, but they were poor at quantifying cumulative effects."

As such they do not carry the same weight of professional quality and critiqued accuracy as the Beschta Report. Further…the unprofessional manner in which they are simultaneously presented…violates NEPA's requirements for professional accuracy, high quality science, and the lack of agency bias. **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

FS Response: The purpose of the DEIS section on scientific controversy was to identify that there are conflicting scientific opinions on the value/risks of post-fire logging, and to outline the rationale and scientific basis that the interdisciplinary team used in responding to the Regional direction to consider the Beschta Report. The interdisciplinary team reviewed the known literature to determine which pieces of information best fit this particular site and situation.

We concur that the full contents of the Beschta Report, Everrett review, and Wilcox review were not displayed, and that they should be provided so that the public and decision maker can draw their own conclusions. Therefore, the three complete reports are contained in Appendix F of the FEIS.

Comment 10: *"As most of the analysis [area] is classified C-7 Special Fish Management Area, we feel that the activities proposed in the preferred alternative are highly inconsistent with your Forest Plan."* **(Adam Bishop, Alliance for the Wild Rockies)**

"Most of the analysis area, and nearly all proposed harvest activities, including roadbuilding, are within C7-Special Fish Management Area. Shouldn't that designation direct you to choose the alternative (4) that best protects and restores fish habitat within the project area?" **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: The Desired Future Condition for C7 states that in upland areas, "*management activities of all types will be observable*" (Forest Plan, page 4-167). The Desired Future Condition goes on to state that emphasis placed on careful timber harvest and road construction and maintenance would result in production of high quality water. Under the Standards and Guidelines for this management area (Forest Plan, page 4-169), timber harvest outside of riparian areas will occur on a scheduled basis, and salvage timber harvest is permitted within C7 riparian areas under certain circumstances (though none is proposed under this EIS). Therefore, this management allocation does not preempt harvest. Mitigation measures and location of harvest units and temporary roads would limit sediment production. Together with associated subsoiling and road obliteration, the sediment model indicates that sediment yield would actually drop slightly below pre-fire yields as early as 6 years after implementation. The reduction in future fuel loads would also reduce impacts of future fires on vegetative cover and, thus, sediment. Although the analysis disclosed that there would be some short-term effects from timber harvest and temporary road construction, we feel that harvest an integral component the overall restoration strategy and necessary to meet the long-term desired future condition as identified in the Forest Plan.

Comment 11: "[T]*he map packet was woefully inadequate, confusing, and nearly impossible to read."* **(Adam Bishop, Alliance for the Wild Rockies)**

"The DEIS is like a puzzle. The combination of inadequate maps and the listing of units by major drainages make it impossible to locate the proposed logging activities and determine the amount of logging and road activity that is proposed for each affected drainage…The maps are difficult to use… **(Mike Peterson, The Lands Council)**

FS Response: The interdisciplinary team concurs that the maps were confusing and difficult to use. In short, we did not get authorization from the Government Printing Office to use color in time for publication of the draft. Plans to provide transparencies with pertinent information such as topographic lines and roads fell through when the contractor discovered (within days of completing publication) they did not have the capability to produce them. Though we realized the maps would be difficult to use as a result, we felt it was also important to get the DEIS out in a timely fashion, so we chose not to halt publication. The FEIS now has colored maps, which should reduce confusion. Maps of alternatives 2 through 6 were still very busy with all of the projects associated with an alternative located together, consequently topography lines, fire severity, and subwatersheds could not be displayed on those maps. However, section lines and numbers were displayed on all maps so comparisons to subwatersheds, topography, and fire severity can occur,

Economics

Comment 12: *"The DEIS does not adequately consider the economic benefits of natural recovery. The DEIS erroneously asserts that ecosystem services, aesthetic, and the non-timber value of natural restoration cannot be quantified…One method that the DEIS should consider is contingent valuation. For a more accurate assessment of the costs and benefits of the proposed action, the DEIS should consider applying the economic valuation methods developed in the field of environmental economics. See Eban Goodstein, Economics and the Environment, Prentice-Hal Inc. (1995*)." **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: The economic analysis acknowledges the importance of the economic value of ecosystem services in the overall effects analysis. The costs or benefits of ecosystem services are not well defined at the project level in terms that provide comparison of commensurate dollar-quantified values. Contingent valuation methods for determining economic values of ecosystem services consist of extensive primary data collection that is expensive and generally undertaken for broad-scale, landscape decisions such as for basin-wide planning efforts. The economic analysis provides one aspect of the overall comparison of alternatives. The ecosystem benefits and environmental effects of natural recovery (Alternative 1) are addressed in the environmental consequences section of the EIS for ecological resources such as vegetation, terrestrial, soils and for social aspects such as scenery and recreation.

Comment 13: *"The DEIS is very weak on the social and economic impacts…focusing on the short term gain to the timber industry, and ignoring the cost to general public. What percent of the restoration, by project, could be funded from allocated Forest Service funds, and what percent must come from timber receipts? Will this sale lose money? Please show a more in depth accounting of costs and benefits, including non-market benefits, in the economic section…if the entire Tower projects area were closed to motorized traffic, and became a large roadless area, the economic benefits would far*

outweigh any benefits accrued to the logging company [cites ICBEMP Scientific Report].*"* **(Mike Peterson, The Lands Council)**

"Alternative 4 is the least cost restoration alternative and 'maximizes public benefits' (DEIS at 4-91). Why [does] the 'Economics/Social' section of Chapter 1…state "Without these [harvest generated] dollars, declines in Forest Service budgets may be too great to cover any restoration costs." (DEIS at 1-25) Is the [Forest] saying Alt. 4 could not be implemented because of budget constraints?" **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: Given the amount of deterioration that has occurred in the dead trees over the four years the District has been developing Environmental Assessments, in litigation, and now developing an Environmental Impact Statement, it is difficult to conclude that the DEIS is "focusing on the short-term gain to the timber industry". Though some people reject the following explanation, the need that harvest in the DEIS tried to address is reduction of future fuel loads, not recovery of economic value. The interdisciplinary team expended considerable energy to maintain restoration as the focus for proposed activities. Since additional deterioration has occurred since the DEIS was published, the economic analysis was updated for the FEIS (see Chapter 4, Economics/Social section). None of the alternatives would produce a viable timber harvest now. Non-market benefits for changes in ecosystem services such as recreation were not dollar quantified due to data limitations regarding the change in use in recreation that would occur in the area. Effects to recreation and other ecosystem services were discussed in their associated section of Chapter 4 in the FEIS.

The disclaimer in Chapter 1 about the ability to fund restoration projects is accurate: there is a risk that the proposed restoration projects may not be implemented due to lack of funding. To explain further, some projects have historically received funding and it is reasonable to expect that funding to continue. Reforestation is one of these projects, and is required if harvest were to occur. Funding of other projects, such as removal of fish barriers or road obliteration, is uncertain. These projects are extremely expensive, so when they are funded, funding usually only covers a small portion of the identified need. However, in recent years, funding for road obliteration and removal of fish barriers has been available and the Forest Service has also been successful in forming partnerships to accomplish otherwise unfunded projects. The most likely prediction is that funding will become available over the life of this NEPA document (~5 years) and most projects would eventually be implemented, even though they may be spread out through time.

Comment 14: "[T]*his projects is a huge money loser…over $7 million. That money could be much better spent on forest restoration and the Forest Service's failure to consider alternatives ways to spend these scarce resources constitutes and breach of the public trust."* **(Doug Heiken, Oregon Natural Resources Council)**

FS Response: The bulk of the costs referred to in this comment are restoration costs. The restoration costs range from $5.7 million in Alternative 4 to $6.8 million in Alternative 2, as recalculated for the FEIS. Even those actions that harvest timber are intended to restore forest conditions in the burned area by thinning, planting, and removing excessive fuels. Restoration projects are expensive, particularly because they do not directly generate revenue, but these expenditures are not considered "lost"; rather, they are invested in order to achieve greater value to the public. For instance, federal expenditures on fish habitat improvements are investments that generate value to the public through providing recreation, cultural heritage, or a sense of place.

Fire/Fuels

Comment 15: *"The DEIS and associated documents fail to adequately consider the beneficial impacts of fire and natural recovery… To assert that the proposed action is a benefit to forest health the FS must consider the benefits of fire to ecological systems within the forest. Without considering the benefits of fire, the balancing test as to whether a proposed action will help or hinder the forest is unreasonably weighted in favor of the 'treatment'. The possible benefits include: (1) the opportunity to study the natural fire recovery process, (2) increased wildlife habitat from undisturbed snags, (3) use for non-motorized recreation by the public…(4) significant cost savings to the public in the absence of active management."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Fire is an integral part of the ecosystem, and its benefits were thoroughly delineated in the Tower Fire Ecosystem Analysis and briefly summarized in Chapter 3 (particularly page 3-2). The benefits of the Tower Fire were identified in Chapter 4: increased stream base flows, increased recruitment of wood into streams, increased presence of a number of primary cavity excavating wildlife species, abundant summer and winter forage for big game, to name a few. In response to the specific points identified above:

(1) The natural fire recovery process could be studied in at least 63% of the burned area even under alternatives 2 and 3, which propose the broadest amount of management. Of the 37% that would be managed under those alternatives, 16% accounts for past management that has already occurred, and a large portion of the remaining 21% would only involve tree planting. The opportunity for studying natural fire recovery processes will not be foregone by any of the alternatives.
(2) Increased wildlife habitat from undisturbed snags was noted in the DEIS on pages 4-77 and 4-79.
(3) Between the North Fork John Day Wilderness and the South Fork-Tower Roadless Area, much of the area is already reserved for non-motorized recreation. It is not likely that expanding these areas would provide a measurable increase in use, particularly since the area is burned and travel will be difficult once snags begin to accumulate on the ground.
(4) There would be a significant cost savings to the public in the absence of active management as shown in Table 4.14 on page 4-86 and Figure 4.6 on page 4-92 of the DEIS. It should be noted that implementation of item 1 in this list would incur a cost.

The benefits of fire to the ecosystem are unquestionable, and as pointed out on page 1-8 of the DEIS, and reinforced throughout the document suppression of fire resulted in many undesirable changes to this ecosystem. The question is, did the Tower Fire benefit this area, and in most cases, due to the unnaturally high fuel loads contributing to fire severity, the conclusion of the DEIS is "No".

Comment 16: *"It appears from your maps that many proposed harvest units have been entered since 1979. If that is the case, why is there such a dire need for fuels reduction?"* **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: There are a number of units proposed for salvage that were harvested in the last 25 years. In the units in question, the type of earlier harvest left many trees, contrary to a widespread

association between "harvest" and "clearcuts". The proposed units are areas where fire intensity resulted in high mortality levels, resulting in large numbers of dead, standing trees, which will lead to high fuel levels when they fall in the future. This future fuel loading is the primary fuels concern.

Comment 17: *"In July 1997, EPA adopted the National Ambient Air Quality Standards for fine particulate matter ($PM_{2.5}$). While there is litigation surrounding this standard currently and its final form will not be finalized until 2002, the standard is in existence and states are required to conduct $PM_{2.5}$ monitoring. The DEIS air quality analysis only analyzed the effects on PM_{10}…"* **(Diane Riley, Idaho Division of Environmental Quality)**

FS Response: The Draft Environmental Impact Statement (DEIS) discussed an agreement that is currently in place with the State of Oregon regarding smoke management. As part of that agreement, parties have agreed to a smoke emission "cap" as well as procedures the agencies will follow so as to reduce smoke impacts, particularly to sensitive and non-attainment areas. For the purposes of calculating the smoke cap mentioned above, PM_{10} levels are currently used and as a result were the specifics analyzed in the DEIS. Reporting to the State of Oregon is done in the form of "tons consumed", which can be converted into both PM_{10} and $PM_{2.5}$ levels. $PM_{2.5}$ levels were calculated in the FEIS and are displayed in Table 4.15 of Chapter 4 under the Clean Air Act section.

In addition, nephalometers are currently in place in northeast Oregon that are reading $PM_{2.5}$ levels as part of our smoke management program. When the EPA finalizes their collection process and litigation is completed, it is expected that we will do all reporting based on $PM_{2.5}$ levels.

Comment 18: *"The DEIS, page 4-103, cites two other environmental assessments for the air quality analysis. More information is needed on these…*[and] *Oregon's Smoke Management Implementation Plan. Simply referencing these documents is not enough… Details such as how the public is notified of planned burns, what mitigation actions are taken for smoke intrusions, what procedures are followed for burn approval, etc. are needed."* **(Diane Riley, Idaho Division of Environmental Quality)**

FS Response: The Clean Air Act section of Chapter 4 has been revised in the FEIS to include more detail about the specifics of the air quality analysis. Under a current memorandum of understanding with the State of Oregon, an emissions cap has been agreed to for prescribed burning in northeast Oregon. As part of the management process, an Oregon Department of Forestry meteorologist issues a daily smoke management forecast during the burning season. In addition, the North Fork John Day Ranger District releases daily pi-balls and sends the readings to the Oregon Department of Forestry for use in daily smoke forecasting. Fire managers coordinate all burns with the forecaster and abide by forecast results. In addition, the three national forests of northeast Oregon have established personnel responsible for smoke management and smoke coordination. These individuals coordinate burning activity between forests in an effort to further minimize adverse smoke events, prioritize burns when conditions are limiting, and give a go/no go call to district program managers on a daily basis.

In terms of public notification, the District uses two processes. First, general public announcements are released to all local newspapers before seasonal burning (generally in April and again in September). These announcements include specifics about where, how

much, and when we anticipate burning. Second, local communities are contacted immediately before any ignition via gathering points such as general stores and/or residences very close to proposed burn areas. The District has also set up a smoke alert system for the community of Monument, Oregon under which we have a phone tree system developed as well as additional public notification sites.

All burns are registered with the State and the expected consumption and tonnage of material consumed are included with the registration. The actual consumption and acres burned is reported to the State on a daily basis. Data reported includes estimates of PM_{10} and $PM_{2.5}$ within the smoke. The FASTRACS program is used to produce the estimates of consumption and particulate matter production.

As for mitigation, burns are not conducted on days when the forecast indicates that smoke will impact population centers. If smoke does affect a community unexpectedly, the ignition is terminated and the prescribed fire is allowed to burn itself out.

Comment 19: *"EPA released the "Interim Air Quality Policy on Wildland and Prescribed Fires" in May, 1998… Federal land manage*[r]*s are to consider alternatives to using wildland and prescribed fire. The DEIS does not indicate if alternatives were considered and what the resulting emission reductions would be if alternatives were employed."* **(Diane Riley, Idaho Division of Environmental Quality)**

FS Response: Alternative fuel reduction treatments were analyzed in this project and are contained in the analysis file. For landing piles, we looked at chipping, scattering, or burning on site. Burning was selected because this alternative would be cheapest, anticipated overall tonnage to burn was relatively low, and burning could occur during fall/winter when smoke impacts would be minimal. The proposed underburn, while it may treat some commercial thinning slash, was designed for wildlife habitat improvement. Other methods of increasing forage without burning were discussed, but burning would be the most effective at increasing forage availability in this area due to the amount of existing brush. Based on past underburning experience in the same area (i.e. Oriental/Juniper Underburn) we are confident that any smoke effects from a forage improvement burn would be short-term and local in nature.

Comment 20: *"The project proposes logging in burned areas of Dedicated and Managed Old Growth in construction of the fuel break…The stands burned at low intensities. Construction of the fuel break would jeapardize the viability of these stands."* **(Adam Bishop, Alliance for the Wild Rockies)**

Could [the 300-foot-wide fuel break along the northern edge of the North Fork John Day Wilderness] *be used as an OHV trail? This would make a couple of shorter loops out of Winom Campground…to improve Winom."* **(Norvel Arbogast)**

"The construction of a fire break between the wilderness and the Roadless area would severely compromise the wilderness qualities…would fragment the area, disturbing wildlife habitat and migration routes." **(Adam Bishop, Alliance for the Wild Rockies)**

"The DEIS fails to provide any scientific evidence that the proposed fuelbreak will facilitate safe, efficient fire suppression. Linear fuelbreaks are…not supported by

scientific evidence or empirical data." **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

FS Response: A number of comments were received regarding various aspects of the proposed fuelbreak; the comments above represent the range of concerns. Internal review regarding the feasibility and implementation of the fuelbreak determined that a fuelbreak in this location would be prohibitively expensive to implement and maintain due to lack of accessibility. As a result of internal and public comment, this proposed project was dropped from alternatives 5 and 6 in the FEIS.

Comment 21: *"The project fails to comply the Federal Wildland Fire Management Policy…and Program Review, its Implementation Action Plan, or the recent revision of the Forest Service Manual…The FEIS needs to fully analyze and disclose the relationship of salvage logging to the Fire Policy's goal of restoring fire processes across the landscape.* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

FS Response: The Federal Wildland Fire Management Policy and Program Review Report and associated Implementation Action Plan provide federal land managers guidance in the management of fire and fuels programs. Key points relating to the Tower analysis include the confirmation that "...protection of life is reaffirmed as the first priority in wildland fire management.", that "..wildland fire, as a critical natural process, must be reintroduced into the ecosystem.", and that "Where wildland fire cannot be safely reintroduced because of hazardous fuel build-ups, some form of pretreatment must be considered, particularly in wildland/urban interface areas." The report goes on to require that all units with burnable vegetation have a valid fire management plan. Current Forest Plan direction allows the use of management ignited prescribed fire for purposes of fuels reduction. An amendment will be required to the Forest Plan prior to use of natural fire for resource benefit outside of the North Fork John Day Wilderness Area. When such an amendment is made or a new Forest Plan is completed, an updated fire management plan will be prepared in accordance with the Fire Program Review.

The fuel treatment activities analyzed in the Tower EIS were designed at varying degrees (depending upon alternative) to facilitate the recovery of the treated areas. On dry sites, treatment was designed to allow reintroduction of fire into these areas once regeneration was of a size that it could sustain a low intensity burn. On cool moist and cold dry sites, treatments were designed to mimic the results of a second fire, which would reduce fuels to a level that would allow stand development with a lower risk of fire mortality for the next 50 to 100 years.

Comment 22: *"The DEIS fails to disclose…that the Umatilla's fire exclusion policy will undermine the Project's alleged 'restoration' objectives. Considering…that the fire return interval averages three to ten years on warm dry sites…prescribed underburning in the next 20 years or so is a matter of 'too little, too late'."* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

FS Response: The fire management policy on the Umatilla National Forest as described in the Forest Plan calls for management action on all ignitions, natural or human caused. The appropriate suppression response is decided through a Wildland Fire Situation Analysis, and often incorporates a confinement strategy that allows the fire to burn to defined boundaries. This does not undermine the Tower EIS restoration objectives, because use of managed fire remains an option. Within the North Fork John Day Wilderness Area, a

fire management plan has been prepared that allows for the management of natural ignitions to achieve wilderness objectives.

We agree that the historic fire return interval averaged 3 to 10 years on warm dry sites in the Fire Management/Air Quality section of Chapter 3. However, due to the extensive area that was set back to an early seral stage by the Tower Fire, initial prescribed ignitions would likely be delayed 20 years so that regeneration (natural or planted) on dry sites would be of sufficient size to survive a low intensity underburn. Fire occurrence before this time (either naturally-occurring or prescribed) would likely be lethal to regeneration due to tree size and the expected quantity of grass and brush found on the burned areas. After the initial entry, prescribed fire could be applied at the shorter, historic intervals.

Comment 23: *"The DEIS confuses fire intensity with fire severity.* [T]*he DEIS failed to provide any quantitative data demonstrating that the intensity of the Tower Fire was outside the Historic Range of Variability. For example, moderate intensity/severity fires were natural events within the HRV; however, the DEIS (page 1-4) combines moderate and high severity burned acres into a single category to make fire effects appear outside HRV.* [T]*he fire return interval on cool moist and cold dry sites averages 100 to 300 years, and the natural fire regime for those sites is high-intensity stand-replacing fire, the DEIS failed to justify the need for any salvage…on those…sites for the sake of 'restoring' the HRV for stand density or fire severity. The effects of fire suppression are less than 90 years, and the effects of the Tower fire are…within the norm. The FEIS needs…maps of proposed salvage and thinning units identified by forest type and fire regime/fire return interval."* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

FS Response: The term "fire intensity" was based on categories taken from the Burned Area Emergency Rehabilitation Plan, which appears to have used "severity" and "intensity" interchangeably. This has been corrected in the FEIS.

The comment regarding cool moist and cold dry sites is correct. Within those areas, the rationale for fuels reduction relates to the natural process these ecosystems go through following a stand replacement event. Without treatment following a stand replacement event, fuels would begin to accumulate as dead trees decay and fall, while natural regeneration would provide finer fuel. At some point, a second fire event could be expected to reburn the area, reducing accumulated fuels to low levels and setting the stage for stand development under relatively low risk fuel conditions for up to the next 100 years. The intent of removing fire-killed material is to avoid the risk of a reburn of the area, which while it would achieve the same fuels reduction objective, would also kill the developing stand and poses significant risk to the investment made in regenerating the current sites.

On warm dry sites, the stand densities found prior to the fire were well above historical norms (in part due to fire exclusion) and, as a result, the high fire intensity experienced was well above expected norms, particularly in scale and continuity of high fire intensity. Additionally, the numbers of dead trees currently on site that will be falling for the next 10 to 50 years will make it difficult to reintroduce natural fire at a level that will not be lethal to regenerated stands.

Map 8 in the separate map package illustrates distribution of stands predicted to have historically been in either low intensity or high intensity fire regimes. The map groups the three fire regimes found within the fire area into two general categories, low and high intensity. Low intensity areas are based on those stands determined to be Warm, Dry Upland Forest (fire regime 1). High intensity areas are based on those stands determined to be Cool, Moist Upland Forest (fire regime 3) or Cold, Dry Upland Forest (fire regime 5).

While scale differences do exist between fire regimes 3 and 5, these regimes were mapped as one layer because they both occur under high fire intensities. In all cases, the base GIS map was constructed from the Umatilla National Forest's Existing Vegetation Layer. From this layer, potential vegetation classes were determined (i.e. Warm, Dry Upland Forest). Each potential vegetation class was then assigned to a fire regime, based upon current knowledge and research in the Blue Mountains (Agee, Hayerdahl, Columbia Basin Science Report). Due to the number and complexity of alternatives, proposed salvage and thinning were not included in Map 8; however, section lines and landmarks such as roads and streams are displayed so Map 8 can be easily compared to any of the alternative maps.

Comment 24: *"The DEIS claims that…in moderate and high severity areas, the fire killed too many trees…in low severity areas, the fire killed too few trees…The Umatilla wrongly dropped the option of using prescribed fire to thin stan*[d]*s because fire 'would not be selective with regard to desired tree species, condition, or spacing.' [DEIS; 2-7]."* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

FS Response: The fire resulted in mosaic of varying burned stand conditions, all of which have different restoration needs. For instance, moderate intensity fire within a ponderosa pine stand would leave many live trees, whereas moderate intensity fire within a sub-alpine fir stand would result in complete mortality. In some stands where fire burned with a low intensity, the tree stocking was so dense that fire-related mortality still did not achieve healthy stocking levels. With an objective of restoration (starting the area on the road to historic species compositions, stand structures, etc.), no one single treatment would be appropriate for all areas.

It is the intent of the District to continue to use fire within these stands to maintain future fuel loading and tree stocking as necessary, generally on a 10 to 20 year cycle. The Umatilla National Forest has utilized fire as a thinning tool, although the majority of work of this type has occurred in either young material or on a stand replacement basis. Thinning stands with fire at an intermediate age, particularly with the low current surface fuel loadings, would be difficult to implement and pose a significant risk of escape, as the fire would have to be applied under drier conditions and would be positioned low on the slope. Given the extent of mortality, further removal of green trees should require careful selection, which could not be achieved through prescribed fire.

Fish

Comment 25: *"[A]dherence to the PACFISH mandated buffers in this project will not adequately protect fish habitat, due to the low levels of vegetation in the Tower Fire Area."* **(Adam Bishop, Alliance for the Wild Rockies)**

FS Response: Belt, O'Laughlin, and Merrill (1992) state that "sediment can move overland as far as 300 feet through a buffer in a worst case scenario." Although a worst-case scenario no doubt existed right after the Tower Fire, it has now been four years since the burn, and vegetation regrowth has improved the effectiveness of buffers, so that a worst-case scenario no longer exists. The 300-foot-wide PACFISH buffers on Class 1 and 2 streams should now be adequate to protect fish habitat from sediment delivery from overland flow.

Comment 26: *"Alternative 4 provides the best measures to foster habitat recovery for depressed anadromous salmonids and bull trout, address high water temperatures and excessive sediment load, and recover riparian areas within the burn site without compromising currently poor fish habitat. Alternative 6 fails to adequately protect the [salmonids] habitat from further degradation in stream temperatures and sediment. The chosen alternative needs to eliminate activities that require mitigation measures for timber harvests that further compromise poor habitat conditions, anadromous salmonids, and consequently our Treaty Rights."* **(Antone Minthorne, Confederated Tribes of the Umatilla Indian Reservation)**

FS Response: The manner in which Alternative 6 fails to adequately protect salmonids habitat from further degradation in stream temperatures and sediment is unclear. Alternative 6 would not harvest within any riparian buffers, so stream shade (and associated water temperature) would remain unchanged. Much of the sediment that would be generated by Alternative 6 is related to projects that would benefit fish in the long-term, such as road obliteration and removal of fish passage barriers. Project-related sediment would only occur for an average of 2 years and chronic sediment from past management activities and the fire would actually decrease as a result of projects associated with Alternative 6. Alternative 6 would contribute toward water quality improvement, and a Water Quality Restoration Plan for 303(d) listed streams was prepared in compliance with the Clean Water Act and has been shared with the Confederated Tribes of the Umatilla Indian Reservation. Harvest under Alternative 6 was determined "May Affect, Not Likely to Adversely Affect" listed fish, and will only be carried out with the concurrence of the National Marine Fisheries Service and the US Fish and Wildlife Service within the Terms and Conditions specified by these Endangered Species Act regulatory agencies. Based on these outcomes, Alternative 6 would support treaty reserved rights and Tribal resources.

Comment 27: *"Resulting biological assessments and opinions should be developed concurrently with the draft EIS and their results summarized and disclosed in the document (40 CFR 1502.25(a)."* **(Richard Parkin, Environmental Protection Agency)**

"It is unclear how…PACFISH and INFISH relate to the project…the project does not even adhere to current INFISH standards and commitments. The short-term impacts of how…road reconstruction, log hauling, and logging will affect the fisheries are not disclosed in a quantitative way, the Biological Opinion and

consultation letters should be included in the FEIS." **(Mike Peterson, The Lands Council)**

FS Response: Prior to release of a Draft EIS, there must be sufficient information and analysis regarding effects of the alternatives on threatened, endangered, and sensitive species to allow the decision maker to identify a preferred alternative. This was done for the DEIS. A biological assessment of the preferred alternative (required for all EIS's) is summarized in the Threatened, Endangered, and Sensitive Fish and Aquatic Species section under Chapter 4 of the FEIS. Consultation is in progress and will be completed prior to, and referenced in, the Record of Decision.

The project area and, in fact, the entire Umatilla National Forest lies within anadromous fish habitat. PACFISH, not INFISH, applies to the Tower Fire area, and the project does follow PACFISH standards. The Umatilla Forest Plan has incorporated the direction in the Environmental Assessment for the Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) with a forest plan amendment. The Tower Fire Recovery Projects were designed to meet all the requirements of this amendment.

Sediment yield modeling included in the report does make quantitative estimates of the impacts of logging, including road reconstruction, to sediment yield. According to the best information we have found to date, science has not established a quantitative relationship between sediment yield and effects to fisheries.

Comment 28: *"The EIS should clarify whether or not any of the areas of historic bull trout habitat located within the analysis area have been designated as critical habitat for this species."* **(Richard Parkin, Environmental Protection Agency)**

FS Response: The U.S. Fish and Wildlife Service has not designated critical habitat for bull trout anywhere.

Comment 29: *"The draft EIS states that habitat changes caused by sedimentation could increase stress on fish, however the biological significance…is highly unknown. The EIS needs to evaluate these impacts more thoroughly rather that providing…possible impact scenarios. Because the soils in this area have already been greatly disturbed and there has been a high sediment yield due to the burn, the need for salvaging timber should be weighed against the need to recover the threatened salmonids populations. If one need is deemed more important than another, the EIS should discuss how and why this determination was made."* **(Richard Parkin, Environmental Protection Agency)**

FS Response: The biological significance of the levels of sedimentation expected from the Tower Fire alternatives is unknown in any quantitative way. We are unaware of any model that would produce reliable, quantitative, estimates of biological effects of changes in sediment levels. Lacking such a tool, estimates of effects must be qualitative, which is the approach taken in the Tower EIS analysis.

Actions that would represent a black and white tradeoff between timber salvage and salmonid recovery were not proposed and will not be undertaken. Both timber salvage and salmonid recovery have been identified as important in laws, regulations, and the Umatilla National Forest Land and Resource Management Plan. The timber salvage actions

proposed have been determined to "May Affect, Not Likely to Adversely Affect" listed fish species and will only be undertaken with concurrence from National Marine Fisheries Service and US Fish and Wildlife Service under the specified terms and conditions required by the Endangered Species Act. The Record of Decision is the appropriate place for discussing rationale used in reaching the decision; the EIS only presents the options, their risks, and their benefits.

Grazing

Comment 30: "[Y]*our decision to defer a decision on the issue of continued livestock grazing…is arbitrary and capricious… There is no merit to the assertion in the DEIS that "changes in allotment management do not fit the purpose and need of the project and are, therefore, beyond the scope of the analysis".* [T]*he DEIS repeatedly states that the purpose and need includes the protection of soil and water, fish habitat, forests, wildlife habitat, and recreation.* [T]*he DEIS concedes that grazing is part of the cumulative effect on water resources… The science is clear that grazing adversely affects all of the project resources, both individually and cumulatively* [cites Platts, 1991; Henjunn et al., 1994; Rhodes et al., 1994; Fleischner, 1994; Belsky et al., 1999; and Lusby, 1970]" **(Bill Marlett, Oregon Natural Desert Association)**

"*We disagree that grazing is outside the scope of this decision…*[if] *there is a need to control grazing by big game (DEIS at 1-11) there must be a concurrent need to control grazing by cattle. We recognize that you typically use other processes (AMP) to regulate grazing, however, you must recognize that grazing is a significant factor in restoring the area. The AMP's in place were written for a different condition…this process should amend those AMP's to reflect the current condition."* **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: Grazing in the Texas Bar Allotment, which includes portions of the Tower Fire, is conducted under the terms of an Environmental Assessment and Decision Notice. The existing term permits for grazing in the Texas Bar Allotment are based on the allotment EA and incorporate updated standards designed to protect soils, water, and habitat. NEPA requires that when a changed condition occurs (such as a wildfire) an interdisciplinary team must evaluate whether a decision is still valid. In the case of the Tower Fire and the Texas Bar Allotment, the Burned Area Emergency Rehabilitation team recommended, immediately following the fire, that the high intensity burn areas be rested from grazing for a period of two years (1997 and 1998). This recommendation was accepted and cattle were kept out of the high intensity burn areas for two years. At the end of the two-year rest period, an interdisciplinary team (composed of the District Range Conservationists, Silviculturist, and Fish Biologist, and Forest Hydrologist and Botanist) re-evaluated the fire area, to determine whether the area had recovered enough to again allow grazing (September 9, 1998, meeting notes). This team determined that vegetation and soils in the burned area had recovered adequately such that the allotment EA, decision, and permits would be adequate to protect the environment and meet established standards, with a few adjustments to the Allotment Operation Plan. The existing term permit allows administrative actions to be taken that will protect soils, water, and habitat and meet established grazing standards. Therefore, a need does not exist to make a new decision to permit grazing in the fire area of the Texas Bar Allotment. The effects of grazing under the existing decision were also considered within the cumulative effects analysis in this EIS.

Comment 31: *"It is…unclear from the DEIS what steps have been taken to reduce livestock impacts to the burned area. The DEIS at 1-24 states that livestock numbers have been reduced by 38%; at other points the DEIS states that livestock grazing within burned pastures has been halted."* **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: These statements do not contradict. The reduction in grazing discussed on page 1-24 of the DEIS describes the economic impact of resting the burned portions of the Pearson and Texas pastures--cattle numbers on the entire Texas Bar Allotment were reduced by 38% as a result of the rested pastures. The same size herd could not be maintained on the smaller number of acres without degrading vegetation and riparian areas.

Comment 32: *"The impacts of grazing are not disclosed in a quantitative manner. How many acres of riparian area will now be accessed, by how many cattle, and how will that change with the alternatives? Why was exclusion of grazing for an indefinite time not analyzed?* [Disclose] *the impacts of livestock on the new seedlings, native grass and brush."* **(Mike Peterson, The Lands Council)**

FS Response: The number of riparian acres that would be accessed by cattle is unknown, due to natural obstacles such as steep terrain, fallen trees, etc. However, Table 4.3 shows an estimate of acres that would be grazed per subwatershed, once livestock are allowed to return to the burned pastures. Nothing would change between alternatives with regard to cattle, with the exception that the fencing of additional riparian areas would not occur under Alternative 1. The indefinite exclusion of grazing was already considered and rejected by a separate interdisciplinary team, which analyzed the re-entry of cattle during a ground review on September 9, 1998 (see response to Comment #31).

Regarding the effect of grazing on seedlings, District experience of the effects of livestock grazing on seedlings includes occasional trampling and browsing. Trampling and browse damage has been consistently low under normal grazing practices, with significantly more damage to seedlings received from big game browsing. Several studies (Edgerton 1971, Kingery et.al. 1987, McDonald and Fiddler 1993, Ratliff and Denton 1995, Seidel et. al. 1990) document the effects of livestock grazing on seedlings; most finding that damage caused by livestock is minimal, and some find a beneficial effect of grazing from reducing grass competition for the trees. Allen and Bartolome (1989) found that "no significant trampling damage occurred and browsing damage to white fir and Douglas-fir seedlings was primarily caused by deer". Ratliff and Denton (1995) compared season-long grazing with other deferred- and rest-rotation regimes, finding that "pine seedling survival and damage did not differ [between regimes], but the seedlings were significantly taller, with longer leaders with season-long grazing than without grazing".

Timber Harvest

Comment 33: *"Nitrogen levels in the soil could have been reduced by as much as 97% in…high intensity areas of the fire. (Grier 1975 as cited in the TFEA at 40). Nitrogen and sulfur are two of the primary limiting nutrients in the project areas Water Resources Report at 5. The standing dead wood and existing 25 tons/acre of downed woody material is an important nutrient source…and removal…will cause a negative significant impact to the recovering forest. The FS does not adequately quantify the*

percentage of nutrients that would be removed from the proposed alternative." **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Needles and branches have a small proportion of a tree's biomass (15%), but contain its highest concentration of nutrients. Stem wood has the highest amount of biomass (61%), but relatively little of the tree's nutrients. Roots contain the remaining 24% of a tree's biomass; the woody portion of a root system has low nutrient concentrations, while the non-woody parts are high in nutrients. Most needles and surface organic matter were consumed in areas where fire burned with high severity, so only the stem, branches, and woody roots provide a nutrient reservoir on severely burned sites. Table 4.4 (Powers 1989) in Chapter 4 of the FEIS shows that, at most, only 8 percent of the total nitrogen on a site would be lost if every stem was harvested (which is far more severe than any harvest proposed under this EIS). In addition, mitigation, such as no whole tree yarding and protection of soil cover, would retain nutrients. Branches and unmerchantable material would remain dispersed throughout the harvest unit, instead of being brought to the landing and burned.

Comment 34: *"The* [DEIS] *maps…apparently show that the areas where much of the salvage logging is planned are areas that burned at low to moderate intensity. Wouldn't these area*[s] *be the least damaged, the most viable, and consequently the least necessary to 'salvage'. The…DEIS failed to outline the percentages of the area to be salvaged and their condition as a result of the fire."* **(Adam Bishop, Alliance for the Wild Rockies)**

FS Response: As stated, most of the proposed harvest would occur on parts of the landscape that experienced low to moderate fire severities. High severity areas were intentionally avoided where they occurred on steep slopes, in order to protect fragile soils. The designation of an area as having experienced low fire severity is misleading and does not necessarily equal lower tree mortality. Fire severities were identified by the Burned Area Emergency Rehabilitation Team immediately following the fire based on the condition of soils and soil cover. Many trees that appeared to be live at that time have since died due to bole scorch and unseen damage to roots. Chapters 3 and 4 of the FEIS give further detail regarding the condition of forest stands and amount of salvage.

Comment 35: *"Apparently, logging activity will occur in a narrow area between two portions of the wilderness area. This is highly inappropriate, and subtracts from the integrity of the area."* **(Adam Bishop, Alliance for the Wild Rockies)**

"The proposed thinning adjacent the wilderness area would destroy the buffer zone between logged areas and wilderness." **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: The Oregon Omnibus Wilderness Act of 1984, which established the North Fork John Day Wilderness, did not contain requirements for buffering the wilderness. There is also no Forest Service policy regarding the buffering of wilderness areas. Therefore, the acres adjacent to the North Fork John Day Wilderness are subject to the assigned management allocation detailed in the Umatilla National Forest Land and Resource Management Plan (Forest Plan). The land within the Tower Fire and adjacent to the Wilderness was allocated to A3-Viewshed 1 and C7-Special Fish Management. Both of these allocations include scheduled timber harvest and an expectation that timber salvage can follow large

wildfire events. Buffering the wilderness boundary is a decision that would appropriately be made in the Forest Plan. The Tower EIS is a site-specific, project level analysis that is subject to the direction from the Forest Plan, but does not attempt to re-make land use decisions.

Comment 36: *"The Proposed Alternative proposes to accomplish restoration through…activities - roadbuilding and timber harvest – that have…compromised the project area's ability to support fish and wildlife (DEIS at 1-4). The* [alternative] *relies on unproven methods, poses known risks, uses speculation to supply its justification, and provides no certain benefits other than the immediate economic benefits associated with timber harvest…In contrast, the adverse impacts that will result from implementation…are well documented."* **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: The reference on page 1-4 of the DEIS pertained to harvest and road construction that removed riparian vegetation. The proposed actions do not include timber harvest or road building in riparian areas (except if a temporary road were to cross a stream under Alternative 2 or 3). Furthermore, past timber harvest and associated road building were implemented using different standards, equipment, and methods. The activities proposed for the Tower Fire recovery projects would follow current standards and methods, which are much more protective of water and aquatic habitat. These standards and methods have been implemented before, including on fire salvage. Far from "unproven", all proposed activities have been applied previously throughout the Umatilla National Forest under a wide range of conditions. There are, however, risks as stated in Chapter 4 of the EIS.

Since five years of decay will have occurred by the time this EIS is completed, very little economic motivation remains for the proposed harvest. In fact, most units in the Cable Creek drainage were dropped from proposed harvest in the FEIS due to insufficient value. The reasons ("benefits") for harvest, as stated in the purpose and need of Chapter 1, are: (1) maintain the vigor of live stands within the area by reducing overstocking and moving toward historic species compositions within warm dry/ponderosa pine ecological settings, (2) reduce fuel loads to desired levels (8-12tons/acre) to facilitate use of prescribed fire in the future and, (3) break up fuel continuity between North Fork John Day Wilderness and the rest of the area to allow for future options in allowing prescribed natural fires.

Comment 37: *"In the areas…logged prior to the fire recruitment of new seedlings is poor and exotic weeds are present at significant levels. In the previously unlogged areas recruitment is good to excellent and the presence of weeds is minimal. Given this…it is not reasonable…to claim that this large scale logging…will have beneficial forest health impacts…The proposed alternative would…remove the only…shade which current* (sic) *provides some protection to seedlings. Removal of overstory…raises the afternoon temperature and increased windspeeds decrease relative humidity. (Geiger, 1975). The removal of standing deadwood will also cause a decrease in the boundary layer which will cause a decrease in soil moisture and adversely impact seedlings. (Hungerford, 1980). The value of this shade and wind protection on seedlings was not considered…"* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: A review of stocking survey[3] results in the Tower area prior to the fire showed that all units scheduled for reforestation had either been certified as "stocked" by the 3rd year following harvest or were close to being certified as such (see also Tower Fire Ecosystem Analysis, Appendix C). The fire destroyed 2,240 acres of these plantations and, since potential seed sources were removed by the previous harvest, these units have consequently experienced poor recruitment that necessitated replanting. Of the units already replanted, those completed in the first year following the fire have experienced good survival rates, while units planted in succeeding years are experiencing poor seedling survival due to competition from grasses and shrubs, as well as big game browse damage. Recruitment in previously unlogged areas is highly dependant on remaining seed sources, almost exclusively lodgepole pine. The dense regeneration of lodgepole pine currently observed will reduce species and structural diversity in the long-term.

In the units identified for salvage, there is little to no live overstory and the dead trees supply little in the way of buffering the forest floor from high temperatures or decreased relative humidity. Planting mixes would include ponderosa pine and western larch, which range from shade-intolerant to very shade-intolerant and generally do not thrive in shaded conditions. They are well adapted to conditions created by disturbances that open up the forest canopy, such as lack of shade and decreased humidity or soil moisture. Clearcuts planted in this area before the fire achieved "stocked" certification within 3 to 5 years even though most tree stems had been removed, so it is reasonable to expect similar planting success within burned areas proposed for harvest, barring competition from recovering vegetation.

Comment 38: *"Proposing to log green trees in a severe burn area where every remaining live tree is essential for wildlife, slope stability, and ecological recovery* [is a major failing]*."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

FS Response: With so many acres impacted by fire mortality, maintaining healthy live stands within the fire area has increased in importance. The burned stands will take many decades to begin providing mature tree structure/shade/etc., so the green stands that survived the fire must continue to provide those functions during the interim. Thinning of green trees is proposed in the southwest part of the fire, where stands were lightly underburned or untouched by the fire. Thinning of the densely stocked stands will provide for increased vigor of the remaining trees so they will become larger, healthier trees. A fully stocked stand will remain after harvest, but the reduction in tree competition will improve the health of the stand and reduce the risk that the entire stand will be lost to insects. For further reference, see:

Powell, David C. 1999. *Suggested Stocking Levels for Forest Stands in Northeastern Oregon and Southeastern Washington: An Implementation Guide for the Umatilla National Forest.* Technical Publication F14-SO-TP-03-99. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Umatilla National Forest. 300 p.

Blue Mountains Forest Health Report. 1991. La Grande, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Region, Malheur, Umatilla, Wallowa-Whitman National Forests. Irregular pagination.

[3] Stocking surveys are used to determine the success of establishing planted seedlings. These surveys consist of one plot per each acre of the planted area; live and dead seedlings are counted, and species and condition of each seedling on the plot is recorded. Plot information is averaged to give an estimate of planted trees per acre, species composition, and seedling health.

Comment 39: *"Are 7 million board feet of this DEIS part of the unlogged portions of the* [previous] *Big Tower…? There is no mention of the Blind Review of the Wenatchee Dry Site Strategy…published in June 1999,* [that] *states that logging is not needed for restoration of our dry sites…and that impacts on soils, stand dynamics and forest succession are often issues that are inadequately addressed."* **(Mike Peterson, The Lands Council)**

FS Response: Under the DEIS Proposed Action (Alternative 2) approximately 6.5 MMbf of the total harvest (12.5 MMbf) was associated with the unlogged portions of the enjoined Big Tower sales (Lone and Dragon). This varied under the other alternatives. Since publication of the DEIS, however, contracts for the Lone and Dragon Timber Sales have been cancelled so there is no distinction of these units in the FEIS.

In reviewing the summary of the Blind Science Peer Review, there was no reference to the above quote *"that logging is not needed for restoration of our dry sites"*. The fire ecology reviewer did state *"the National Park Service (NPS) has been using prescribed fire without prior thinning for several decades "* and the reviewer suggests that the Forest (Wenatchee) *"may have occasion to more broadly consider the use of fire alone to reduce stocking."* The reviewer took exception to the claim that *"fuel levels are so high that thinning must take place before prescribed fire can be used"* and stated that a fire-only strategy, while involved and expensive, could be implemented in a broad range of cases without thinning. When looking specifically at the LSR and MLSA stands in the Sand Creek projects, this same reviewer outlined several problems regarding a fire-only treatment option, including cost, reduced structural diversity in the stands, difficulty in thinning desired tree sizes, damage to residual trees, and smoke concerns. As related to precommercial and commercial thinning, a fire-alone option is a valid consideration in some areas of the Tower analysis. Areas being considered for commercial thinning could be treated by a fire-alone option in the future. However, such treatment is anticipated to be difficult to implement, primarily due to low surface fuel loading and the large size of trees that require thinning, which would require burning under drier conditions. This would pose a risk, both of higher than desired mortality and of an escaped burn, and would have a relatively high implementation cost.

Both the entomology and soils reviewers of the Dry Forest Strategy felt that potential negative impacts of suggested treatments and mitigation measures needed more in-depth description. The entomology reviewer felt that the description of vegetation and disturbance dynamics was too simple and homogenous, that discussion of the role of insects and pathogens was weak, and that the document inadequately addressed potential negative consequences of treatment alternatives and steps the Forest might take to minimize adverse consequences. The soil reviewer suggested that the strategy inadequately considered soils and their protection against compaction and erosion stemming from management treatments.

Herbicide Use

Comment 40: *"The use of herbicides in revegetation efforts has the potential to inadvertently contaminate the region's water resource."* **(Adam Bishop, Alliance for the Wild Rockies)**

"Proposing herbicide poisoning despite its known adverse impacts…[is in violation of] *the intent of the court mitigated agreements regarding herbicide use."* **(Asante Riverwind, Blue Mountain Biodiversity Project)**

FS Response: The effects of herbicides on humans is addressed in detail in the *Pacific Northwest Region Final Environmental Impact Statement for Managing Competing and Unwanted Vegetation*, pages IV-123 to IV-160, and in Appendices D and H, which are incorporated into this document by reference (USDA Forest Service 1988). The Record of Decision found that 13 herbicides, including triclopyr, glyphosate, and hexazinone, could be used with acceptable risk if reasonable precautions were followed.

The proposed methods for application of herbicide, as described in the Tower DEIS, would not introduce herbicide into water resources. Therefore, the only way water could be inadvertently contaminated would be through an accidental spill, which was addressed by mitigation listed in Chapter 2 and Appendix C of the Tower EIS. These mitigation measures were taken from the Record of Decision for the *"Managing Competing and Unwanted Vegetation"* EIS (as supplemented in 1992), which is directly tied to the mediated agreement. The projected site-specific exposures for the proposed Tower herbicide applications would not exceed the conditions modeled in the *Managing Competing and Unwanted Vegetation* FEIS risk assessment scenarios.

Silvicultural herbicides are non-toxic to wildlife and do not bioaccumulate if ingested. Laboratory studies showed that 95% of ingested glyphosate is eliminated within 5 days, and that 93% of hexazinone is eliminated in 24 hours. This differs from older phenoxy pesticides such as DDT that tended to accumulate in fatty tissues. To have an acute effect, an animal would have to consume a large amount of treated foliage. For example, a 150-pound deer would have to ingest all of the chemical sprayed on an area of 54 feet by 54 feet to consume enough hexazinone to reach the LD50 level (at an application rate of 2 gallons active ingredient per acre). Even assuming that the deer would find treated foliage palatable, consumption must occur rapidly since hexazinone is degraded quickly (McNabb 1991).

Some studies found wildlife impacts following herbicide treatments, but they were always associated with changes in the vegetation, not with the herbicides themselves (Lautenschlager 1993, Sullivan and others 1997). Since wildlife impacts are typically indirect and most often result from changes in vegetation density or species composition, they tend to persist for no longer than it takes the vegetation to recover (Norris 1981). In situations where herbicides are applied as "spots" around seedlings, rather than broadcast across an entire site, the impact on small mammals and other wildlife species is negligible.

Research found that the acute-dose (LD_{50}) values for glyphosate were greater than 1,000 mg/kg for five species of amphibians. A study in western Oregon examined the effects of an operational glyphosate application on amphibians. The study predicted that oral and dermal absorption of glyphosate after field application likely would not exceed 1.2 mg/kg for amphibians in the treated area. The investigators concluded that the effects of a glyphosate application on amphibians, if any, would therefore be attributable to indirect impacts such as habitat modification (Cole and others 1997).

(See also response to Comment #45)

Historic Range of Variability

Comment 41: *"The DEIS failed to disclose what were historic stand densities within the HRV. The DEIS makes an unsubstantiated claim that the preferred alternative will 'restore appropriate stand densities' on 12,716 acres* [DEIS; 2-54]. *The FEIS needs to include quantitative data on historic stand densities for all forest types."* **(Timothy Ingalsbee, Ph.D., Western Fire Ecology Center)**

"Historical range of variability/stand species composition types [were misapplied]*—such as "ponderosa pine park-like stands" to historic mixed conifer areas—calling such areas 'overstocked'…based upon misapplied hrv formulas and not site specific, ground truthed reality."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

FS Response: The earliest historic data available on stand composition comes from a forest type map prepared by the Pacific Northwest Forest and Range Experiment Station in 1937. At that time, the Tower Fire area had 43% dry forest, 30% mesic forest (i.e., mixed conifer type), 27% lodgepole pine, and less than 1% cold forest. The Tower Fire Ecosystem Analysis showed that dry forest types were reduced by almost 50% between 1937 and 1996.

The use of Historic Range of Variability for several recent bioregional assessment efforts (Hessburg and others 1999b, Lehmkuhl and others 1994) has several limitations due to the temporal baseline that was used. Early aerial photography was interpreted to establish an historical baseline for these assessments; however, the oldest photography dates from the late 1930s to the late 1940s and this resulted in a temporal comparison period of only 50 years or less (aerial photography from the late 1980s was used to characterize current conditions). The concern about this situation is that by the late 1930s, substantial changes in species composition and forest structure may have already occurred or were well underway, particularly those resulting from overgrazing in the late 1800s and early 1900s (Irwin and others 1994, Skovlin and Thomas 1995).

Comment 42: *"The 'forest health' justification for this sale is inherently flawed due to the use of inaccurate Historic Range of Variability estimates and flawed screens.* [T]*he HRV data used in the DEIS and as the justification for* [sic] *was based on data gathered after extensive logging… Examples of this…is well documented in The General Riot of the National* [sic] *Forest: Landscape Changes in the Blue Mountains (1994, Univ. of Washington, Ph.D. program) and represents important information that should be considered…but was not. HRV…also based on two flawed presumptions…that excess old growth exists in parts of the Eastside…*[and] *that silvicultural manipulation can reliably accelerate the return of ecologically healthy forests, including old growth..."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: A true "HRV analysis" in the sense of the Eastside Screens was not completed for the Tower fire area. This is primarily because the proposed precommercial thinning, commercial thinning, and salvage treatments meet specifications described in Forest Plan Amendment #11 as being exempt from the interim ecosystem standard[4]. However, the proposals still must meet the interim wildlife standard, which contains two scenarios, and it was decided to meet the more restrictive of the two – Scenario A. The proposed Armillaria treatment does not meet the exemption specifications; however, none of the treatments is within existing Late Old Structure, so Scenario A was applied here as well. None of the proposed treatments is within existing Late Old Structure, nor do the stands provide connectivity between existing Late Old Structure stands.

Even if the interim ecosystem standard *was* applied, Late Old Structure and most other structural stages were assumed to be below their range of historical variability because

[4] Forest Plan Amendment #11 established interim riparian, ecosystem, and wildlife standards for timber sales (these standards are generally referred to as the "Eastside Screens"). Five categories of timber sales are exempt from the interim ecosystem standard contained in that Forest Plan amendment: precommercial thinning; material sold as fiber; dead material less than 7 inches in diameter, with incidental green volume; salvage sales located outside mapped old growth, with incidental green volume; and commercial thinning and understory removal sales located outside mapped old growth.

much of the burned area was set back to an early stage. The same would hold true for species compositions. The statement regarding an excess old growth presumption would not have applied within the Tower Fire area. In the end, Scenario A of the wildlife standard would still direct management activity and limitations.

Comment 43: *"Explore alternative impacts of habitat restoration and soil stabilization with the types of native vegetation to be used in these projects and where the seed comes from. Provide alternatives that minimize the introduction of non-native or nuisance plant species…"* **(Antone Minthorne, Confederated Tribes of the Umatilla Indian Reservation)**

FS Response: Alternative impacts of habitat restoration and soil stabilizations were explored in alternatives 4, 5, and 6 and alternatives dropped from further consideration (see Chapter 2). Alternatives 2, 3, and 4 would use only native species to complete projects. All action alternatives contain mitigation that would minimize introduction of noxious weeds (such as treating known weed infestations prior to implementation, and seeding areas of soil disturbance).

Native seed and cuttings are collected locally on the south end of the Umatilla Forest. Native District stock that could be used within the fire area include:

Conifer Trees	**Seed**	**Cuttings**
Ponderosa pine	X	
Douglas-fir	X	
Western larch	X	
Englemann spruce	X	
Grand fir	X	
Western white pine	X	
Lodgepole pine	X	
Hardwood Trees/Shrubs		
Black cottonwood		X
Willow		X
Black hawthorn	X	
Red osier dogwood	X	X
Mock orange	X	X
Cascara buckthorn	X	
Mountain ash	X	
Rocky mountain maple	X	
Black elderberry	X	X
Red elderberry	X	X
Oceanspray	X	
Chokecherry	X	
Mountain alder	X	
Sitka alder	X	
Saskatoon Serviceberry	X	
Water birch	X	
Curlleaf mountain mahogany	X	
Antelope bitterbrush	X	
Twinberry honeysuckle	X	
Mallow ninebark	X	
Alder buckthorn	X	
Grass		

Conifer Trees	Seed	Cuttings
Mountain brome	X	
Blue wildrye	X	
Sandberg's bluegrass	X	
Prarie junegrass	X	
Idaho fescue	X	
Bluebunch wheatgrass	X	

Noxious Weeds/Unwanted Vegetation

Comment 44: *"Alternatives should consider weed treatment to mitigate spread of weeds resulting from past logging and grazing."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Mitigation to treat noxious weed infestations, regardless of cause, is located on page 2-37 of the DEIS: "Where existing inventories or pre-project inventories indicate that an infestation occurs on or near a ground disturbing project, the project will be designed in coordination with the District noxious weed coordinator to plan for the long-term management of the infestation and to prevent the spread of the infestation off-site." In addition, the North Fork John Day annually inventories for noxious weeds and treats sites as outlined in the Region 6 Managing Unwanted and Competing Vegetation Record of Decision and Mediated Agreement, and 1995 Forest Noxious Weed EA. Mitigation is planned to limit the establishment of noxious weeds in areas disturbed by planned restoration activities. Post-project surveys would be used to determine if existing infestations spread because of project activities or new infestations become established. If problem areas are found, they would be analyzed and treated using the procedures outlined in the Umatilla National Forest Management of Noxious Weeds EA. Existing infestations would be treated in the same manner.

Comment 45: *"How does the…DEIS comply with the Region 6 Managing Unwanted and Competing Vegetation* [FEIS and ROD] *and the Mediated Agreement. [Insufficient discussion] of the impacts of the logging alternatives on transport and invasion of noxious weeds. How many acres are currently infested and how many more will occur under all the alternatives? Noxious weeds sites should include type of weeds, acres infested, degree of infestation. How are the prevention steps followed…Why the use of herbicides, when natural processes will provide the right mix of tree and scrub species, and herbicides will hurt non target plants and animals."* **(Mike Peterson, The Lands Council)**

FS Response: Fire created a condition that favors "survivor" plants, which can recover rapidly because they can sprout from underground organs such as rhizomes, root crowns or caudexes. Some of these plants (grasses, sedges, and snowbrush ceanothus for example) compete aggressively with conifer seedlings, and when in enough abundance, make it difficult for them to seed in or survive. Once the competitive plants are established (as they are now in many areas of the fire), conifer regeneration could be pushed back many years.

Planting of early seral seedlings is proposed where natural conifer regeneration is lagging, and where it is desirable to influence species composition (to provide species and structural diversity in the future). It is necessary to remove the competing vegetation next to a planted seedling in order to give the seedling the growing space (available moisture, light, and nutrients) it needs to survive until it can overcome the influences of surrounding competition. Many methods are available for removing this competition, and herbicide

application was chosen due to its relatively low impact and high effectiveness. Other methods include mulch mats, large scalps, hand grubbing or pulling, etc., and this were discussed in Chapter 2. Non-target plants next to the planted seedling would be removed with many of these methods, and all methods have their own associated impacts (such as potential erosion from large scalps). See the "Competing Vegetation Analysis for South Tower" and "Competing Vegetation Analysis for Cable" for further discussion and a comparison of the various methods for reducing competing vegetation (these two analyses cover all of the fire area where planting is proposed).

(See also response to Comment #41)

OHVs

Comment 46: *"As much of the area has recently burned, and concerns about erosion and sedimentation practically dominate this DEIS, the appropriate thing to do would be to close the area off all together from OHV use.* [T]*he inclusion of* [the Roundaway 4 wheeler trail] *construction in the Tower Fire Project seems arbitrary, considering virtually no public comment was received supporting this issue prior to the publication of this document. (DEIS 1-21)"* **(Adam Bishop, Alliance for the Wild Rockies)**

"*We do not support use of* [the existing Roundaway Trail], *especially now due to the fragile condition of the soils. We request that the discussion of this trail be postponed and included in a separate Decision that reflects the OHV management throughout your District, or even Forest. OHV use has grown considerably, has substantial cumulative impacts, and the Tower Fire Project is not the place to be approving of new trails or OHV access."* **(Mike Peterson, The Lands Council)**

"[The EIS fails] *to adequately address Off Highway Vehicle issues, ecological damage, and alternatives in the area."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

"[T]*he North West Trail Rider Association has spent hundreds of hours over the past 8 to 10 years working with USFS people in developing the Winom/Frazier ORV trail complex. The Tower Fire impacted many of our trails and we desire the forest be managed in a manner that will enable our continued use of these trails."* **(Dave Riker, North West Trail Rider Association)**

FS Response: The Winom-Frazier OHV Complex resulted from several years of scoping and analysis. In addition to the letters received in response to the Roundaway trail construction proposed in the Tower EIS, the subject of OHV use has been a hot issue on the North Fork John Day Ranger District for over a decade. In 1984, legislation was enacted that designated the North Fork John Day Wilderness. At that time, a majority of the OHV trail system was located in the newly designated wilderness, so riding opportunities became limited. An environmental assessment for the development of a 33-mile OHV trail system was signed in 1986. In 1990, the Umatilla Forest Plan was signed, which identified the need for additional OHV opportunities. The District Motorized Access and Travel Management Plan, also signed in 1990, eliminated cross-country OHV travel and identified that OHV activity be confined to a complex of trails. The actual complex was developed through the Camas Off-Highway Vehicle Trail Complex EA (OHV Complex EA), which added another 34 miles of trail to the complex. Based on this history and the response to the comment below, consideration of the Roundaway Trail proposal in the Tower Fire Recovery Projects

EIS was not arbitrary. In addition, the purpose and need for the existing complex has not changed because of the fire, so reanalysis of its existence is not necessary. Instead, management and maintenance of the complex's trails needs to be adjusted to changed conditions.

Comment 47: *"We oppose the proposal to construct 6.5 miles of new OHV trail while leaving the old trail open. Four-wheelers are currently ignoring your closure signs on the existing trail, so there is no certainty that building a new trail will change this use pattern. Decisions* [regarding the Winom-Frazier OHV complex] *were made before the fire and do not take current conditions into account. Constructing the new trail adds more disturbance to an area that cannot tolerate further disturbance. On the other hand, the current trail is hazardous and causing degradation. The* [Forest] *should choose between improving the old trail or closing the old trail and building the new trail***."** **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: In response to various comments, the interdisciplinary team reconsidered options regarding the existing Roundaway Trail. The FEIS contains an addition to all the action alternatives that proposes a size restriction device be installed on the existing trail in order to stop 4-wheeler use of that section. Complete closure of the trail was still eliminated from further consideration because it would not meet the needs identified in the Camas Off-Highway Vehicle Trail Complex EA.

Before the fire, 4-wheeler use of the Roundaway Trail was small because vegetation confined use more to the tread. The loss of vegetation due to the fire now allows vehicles that have a 50-inch wheelbase (4-wheelers) to navigate the 18-inch-wide trail tread. The tread is limited to this width by the steepness of the slope and previous soil instability downslope. This has caused the existing hazard and degradation, not the original motorcycle use for which the trail was designed. Cessation of the 4-wheeler use should eliminate the hazard and degradation on this trail segment.

Roadless Area

Comment 48: *"The DEIS fails to disclose the specifics of where the boundaries of the* [South Fork Tower Roadless Area] *are in relationship to roads…or whether unroaded areas adjacent to the RARE II boundaries will be entered with roads or logging.* [Cites Smith vs. Forest Service #CV-93-00178-JQL stating that wilderness potential of such areas must be analyzed]*…discuss impacts of the alternatives and provide a map of all unroaded areas greater than 1,000 acres."* **(Mike Peterson, The Lands Council)**

FS Response: The boundary of the South Fork Tower Roadless Area is coupled with road locations on maps 3 through 7 of the map packet.

As for providing a map of all unroaded areas greater than 1,000 acres, one does not exist, nor is the time ripe to create one. The topic of unroaded areas is dealt with in the Forest Service Roadless Area Conservation Proposed Rule and FEIS. Proposed Rule section 294.13 (pages A-10 through 12) *"would require that the responsible official evaluate the quality and importance of the roadless area characteristics and determine whether and how the characteristics should be protected in the context of overall multiple-use objectives during forest plan revision…Proposed paragraph (b) (2) of this section sets out criteria for selecting other unroaded areas to be considered. At the time of forest plan*

revision, the responsible official must determine what unroaded areas are of a sufficient size, shape, and location to merit review. It is not the intent of the agency to create a situation where all unroaded areas, or areas of a certain size, must be mapped."

Roads

Comment 49: *"Temporary roads constructed for logging purposes would aggravate the already problematic drainage situation in the area, by intercepting and rerouting surface water flows. The amount of roads currently in Oriental Basin is a main factor in the listing of streams in these watersheds by the Oregon D.E.Q. The soil compaction associated with logging results from roads and also from the heavy equipment used in such an operation. This contributes to run off and erosion and decreases the possibility of the area from revegetating naturally."* **(Adam Bishop, Alliance for the Wild Rockies)**

FS Response: Temporary road construction has been reduced in the FEIS because a number of proposed harvest units were dropped in the Cable drainage due to deterioration and low value. Alternatives would result in varying amounts of temporary road construction as shown below:

Alternative 1: 0 miles
Alternative 2 & 3: 4.5 miles
Alternative 4: 0 miles
Alternative 5: 0 miles
Alternative 6: 1.8 miles

Several alternatives to proposed temporary road construction were analyzed. Alternatives 4 and 5 would contain no temporary roads—Alternative 4 does not contain harvest and Alternative 5 relies upon helicopter harvest alone. Alternative 6 addressed concerns regarding temporary roads through the mitigations of limiting road length to 1,000 feet or less and prohibiting stream crossings. Chapter 2 also contains a mitigation section, which proposes further constraints regarding temporary road construction in order to limit soil movement and improve water infiltration. Overall, effects would be localized, short term, and not detectable downstream. Furthermore, the net effect of all proposed road-related activities, including road maintenance and obliteration, would be to improve runoff (increase infiltration and reduce overland flow), reduce erosion, and speed vegetative recovery.

Comment 50: "[T]*he actions in* [Alternative 6] *that address roads do not go far enough in this attempt to mitigate the impacts that roads do have. Alternative 4…would obliterate nearly 10 times as many miles of road… Why is it that these additional miles of road need to be maintained in the area?"* **(Adam Bishop, Alliance for the Wild Rockies)**

"To address and mitigate the impacts of roads, the Forest Service has recently given Advance Notice of Proposed Rulemaking…for the development of a comprehensive roads policy and setting an Interior Columbia Basin Ecosystem Management Program road density goal of 0.7 miles/square mile. The draft EIS states the overall road density (open and closed roads) within the analysis area is 2.4 miles/square mile. Obliteration of additional road segments, as proposed in

Alternatives 4 and 5 may be necessary to reduce the current sedimentation problems and meet water quality standards. [W]*e believe the increased sedimentation associated with the construction of temporary roads will only serve to exacerbate the sedimentation problems associated with the fire and the existing transportation network"* **(Richard Parkin, Environmental Protection Agency)**

"[T]*he Department recommends that the Forest consider incorporating more road closures into the selected alternative."* **(Preston Sleeger, Office of Environmental Policy and Compliance)**

FS Response: Because of various comments pertaining to road densities and management, the interdisciplinary team reviewed the utility and condition of each system road, both open and closed, within the fire perimeter. This road analysis was based upon USDA Forest Service Miscellaneous Report #FS-643 published in 1999, entitled *"Roads Analysis: Informing Decisions about Managing the National Forest Transportation System."* As a result, an additional 5.6 miles of open road within the fire were recommended for closure and 33.6 miles of closed road were identified as unnecessary for administrative or public access and were in a location or condition that would benefit from decommissioning or obliteration. Decommissioning/obliteration of these roads was added to alternatives 4 and 6 in the FEIS and analysis of these alternatives was adjusted accordingly. These additional miles were not added to Alternative 5 because it conflicted with the alternative's theme of limiting short-term sediment potential.

Comment 51: "[The EIS fails] *to disclose…the high road density within the project area by averaging the heavily roaded portion's density with the adjacent roadless area, thus disguising it. Consequently* [the EIS fails] *to propose removing many miles of excessive, damaging roads while proposing harmful road reconstructions and "temporary" roads."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

FS Response: Table 3.9 in Chapter 3 shows a listing of open and total road densities by subwatershed exclusive of roadless and wilderness areas (see also Table 3.2 for road-related information). The Umatilla National Forest has been actively reducing the miles of road by closing, decommissioning or obliterating unneeded roads. This has been in response to several concerns: roads tend to be the largest source of human caused sedimentation in forested watersheds, vehicular traffic disrupts wildlife, and road maintenance funding has been decreasing. A comprehensive Access and Travel Management Plan, which was signed in 1992, reduced the open road length in the analysis area from 214 miles to 111 miles. Some of the closed roads were retained for future access, while others were identified for decommissioning or obliteration. Roads that have been overgrown with vegetation and are not eroding are considered naturally obliterated. During the last three years, the District has obliterated (recontoured) about 5 miles of road within the Texas, Oriental and South Fork Cable subwatersheds, and the DEIS proposed an additional 6 miles. A Roads Analysis, which was performed in response to comments received on the DEIS, showed that an additional 5.6 miles of open road should be closed and another 34.9 miles were not needed and should be decommissioned or obliterated. Alternatives 4 and 6 have been adjusted to include these additional miles.

The proposed temporary roads would increase soil disturbance and compaction while they exist. Mitigation listed in Chapter 2 was identified to limit erosion during construction and use. Also temporary roads would be returned to the original contour upon completion of harvest activities (2 to 3 years), and observations by Forest watershed specialists of past road obliteration has shown surface stabilization within two years after

implementation. However, the proposed road reconstruction would reduce existing problems and sediment through improved road drainage and surfacing, and should produce no harmful effects. The collective result of all road treatments, including temporary road construction, would be a decrease in sediment yield (in approximately 5 years).

Water Quality

Comment 52: *"In Blue Mountains Biodiversity Project v. Blackwood, the Ninth Circuit ordered*

> *"The proper evaluation should identify the impact of the increased sediment from the logging and roadbuilding on the fisheries habitat in light of the documented increases that already have resulted from the fire." 161 F.3d 1208 at 1213.*

The DEIS does not remedy the defects in the EA… As the court stated:

> *"We have warned that "general statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided." 161 f.3d at 1213.*

[S]alvage logging "would have the potential to elevate sediment yield 8% above existing conditions…" This is the type of indefinite statement that the…court warned against. The DEIS' discussion of the impacts of sedimentation is replete with unsupported assertions that logging will not cause significant erosion…" **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Judge Fletcher, in her December 2, 1998, Opinion found than the Tower EA did not adequately document estimates of sediment that would result from logging and road building. In response, the Forest South Zone Hydrologist used various models as well as professional judgment to calculate the estimates disclosed in the EIS. The EIS also details effects analysis methodology, assumptions, and limitations on pages 4-8, 4-9, and 4-22 through 4-31, providing the justification required by Judge Fletcher in 161 f.3d at 1213. The effects of implementation of various alternatives on the soil and water resource are found in the EIS on pages 4-19 through 4-36. The effects of implementation on Fish and Aquatic Habitat are found on pages 4-36 to 4-59. These discussions included specific estimates of potential sediment yields as well as many other parameters.

Definitive statements about actual sediment production are not possible because of the inherent variability in the mechanics of sediment production, transport, and deposition. With this in mind, the interdisciplinary team hydrologist determined that the best way to assess potential sediment production was through an established modeling approach. As noted, logging would account for an 8 percent increase above existing conditions during the first year following implementation. This is an estimate of the salvage logging contribution to total sediment increases and is a relative number. Modeling results are estimates only and best used to display the magnitude of fire effects and relative differences between alternatives. The resultant numbers are comparable to increases following the fire and to differences between alternatives, rather than considered as an absolute determination of sediment increases due to logging.

As for effects on fisheries, sediment produced from logging activities that reached streams would be finer-textured, mobile, and not expected to be retained within the local stream

system. In the larger context, where the sediment would eventually settle, the magnitude of effects would be obscured by contributions from other sediment sources, though it would contribute some small amount to cumulative sediment load. Effects of additional sediment on fish depends on several factors, among them:

1. Timing of delivery (which part of the life cycle would be affected): Timing of additional sediment delivery to streams would be episodic and would occur mostly during the spring runoff season, when the stream flow volume would be highest. This means that the volume of water available to dilute the sediment and flush it through the system would also be highest. The part of the life cycle affected here depends upon the fish species.

Amount of sediment already in the system: The amount of sediment already in the stream is mostly unknown, although some rough estimates of substrate sediment (embeddedness, particle size distribution) are available for some stream reaches.

Particle sizes of the sediment (suspended vs. bedload): Particle sizes of fine sediment that would be delivered to the stream would depend upon the parent material. That varies across the analysis area. Particle sizes of sediment are not known at this time.

Angularity and abrasiveness of the particles: Angularity and abrasiveness of potential sediment is not known at this time, and even were it known, its effect to fish could be stated only in general, not quantitative, terms.

Water velocity and turbulence (sediment suspension/deposition): Water velocity and turbulence would be known only in general terms and would vary both temporally and spatially.

Concentration of the sediment in the water: Accuracy of estimates of the concentration of sediment in the water depends on accuracy of estimates of sediment delivered to streams, plus knowledge of the stream flow at the time the sediment arrives at the stream.

Stream flow volume: Stream flow volume varies both spatially and temporally.

With so many estimated and unknown parameters as explained above, and since the modeled quantities of sediment are at best a very rough estimate, anything resembling a precise (numerical) estimate of effects to fish (i.e. number killed or grams reduction in growth) is simply not possible. Therefore, only qualitative and generalized statements of effects of the management activities to fish can be made.

(See also response to Comment #53)

Comment 53: *"The DEIS states that WATSED model, which was used to predict the effects…on water quantity and timing and sedimentation, could not accurately predict the impact of the proposed activities. The DEIS' admission of inadequacy of the predictability of the soil erosion coupled with the failure…to account for changed conditions at the site since 1997…does not comply with the mandates of NEPA."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: During the litigation of the Big Tower timber sales and scoping for the Tower Fire Recovery Projects EIS, a number of comments were made that qualitative discussion of sediment production was insufficient and that modeling would help set the context for proposed actions. Sediment modeling is an accepted analysis tool used to compare relative differences between background conditions and proposed activities in terms of predicted sediment yield. Modeling is also one of the primary methods identified for cumulative effects analysis (CEQ, 1997). The WATSED model used for analysis in Tower

is an established and commonly used model in the Northern, Intermountain, and Pacific Northwest regions of the Forest Service. The model is a simplified representation of complex watershed and stream systems. Results are presented as percent change in sediment yield over time and comparison of sediment yield estimates between alternatives. The discussion of the limitations and assumptions of this model is required by 40 CFR 1502.22. Few, if any, models are available that accurately predict sediment transport and stream response at the scale of the Tower fire (Bunte and McDonald, 1999).

Sites which the DEIS noted as being checked in 1997 were revisited in the summer of 2000. This has been updated in the FEIS.

(See also response to Comment #52)

Comment 54: *"The planned Tower Fire timber sales are located on very steep slopes with extremely fragile soils—prone to severe erosion and landslides… Logging activities have resulted in streams in and near the sale area being listed as "Water Quality Limited".* [E]*ven prior to the fire, measurement boxes placed in creeks in the sale area to monitor sediment levels were buried in sediment and lost after less than a month of installation…heavy summer rains…washed out two Forest Service roads, sending tons of sediment into Oriental Creek and the River below."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

"Past increases erosion and sedimentation due to previous logging and road building activities…make it clear that it is unreasonable for the FS to conclude that "erosion and sediment levels should be well within the standards and guidelines identified in the Forest Plan" **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Four streams within the Tower Fire were listed as State 303(d) Water Quality Limited due to high temperatures and habitat modification (see Chapter 3 Water and Soil section). The State's determinations were based on monitoring data and watershed analysis provided by the Forest Service.

In general, sediment monitoring has extreme variability because of natural variability and variability in sediment sampling. Techniques used in the past such as sediment boxes were inappropriate for local conditions (steep streams, high inherent sediment loads, and extreme variability in sediment supply). For this reason, physical measurement of channel properties was initiated immediately after the fire before any precipitation or channel-altering events occurred. This monitoring technique shows improved sensitivity to stream channel and sediment responses and is more readily measurable. Results are summarized in Chapter 3 of the FEIS.

Noted increases in sediment during the era of road network installation and logging within riparian areas are not comparable to any of the proposed actions. For instance, logging has changed significantly in the past 10 years—riparian areas are now buffered from harvest, subsoiling of compaction is commonplace, and full suspension logging systems have replaced most tractor skidding. Temporary road construction also does not compare to past system road construction due to different construction specifications and the mitigation of obliterating the road once activities are complete. Erosion risk from the proposed actions with mitigation is slight; many of the activities are intended to improve conditions and provide increased stability in the few areas where there are remaining problems. Modeling of activity effects shows sediment levels dropping below pre-fire conditions by the year 2006. Due to differences in design and mitigation, it is entirely

reasonable to conclude that proposed actions will be within Forest Plan standards and guidelines.

Comment 55: "[S]*oil surveys following the Juniper-Cottonwood and Placer timber sales showed that in areas that were harvested, soil conditions fail to meet Forest Plan guidelines. TFA at 80. Soil compaction similar to that which would result from the selected alternative is described as 'the primary problem' causing the poor soil conditions."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: The area of affected soils not meeting Forest Plan guidelines (as described in the Tower Fire Ecosystem Analysis) is very small (no more than 1-5% over in 2 or 3 units of total monitored). They are small areas within units of earlier timber sales that were not designed to achieve contemporary objectives, and in many cases are just over thresholds of what is defined as detrimental. The vast majority of areas (90-95% of units) affected do not exceed Plan guidelines. Plan guidelines are intended to ensure that new actions provide for efficient operations that produce no more adverse site impacts than is typical for prescribed harvest systems. Notation of areas with compaction effects or erosion hazard allows for determination of restoration needs and operational viability.

Comment 56: *"The soil's infiltration rate has already been decreased and the accompanying increase in peak runoff has been increased as a result of the fire.* [references Water Resources Report at 1.] *Further impacts to the soil's infiltration rates from the proposed alternative can hardly be seen as benefit to forest health."* **(Glenn Fullilove, Northwest Environmental Defense Center)**

FS Response: Most of the project proposals are aimed at improving infiltration or otherwise improving watershed conditions. Harvest would include mitigation to limit further decreases in the soil infiltration rate, in fact logging systems were designed to use existing roadbeds and compacted areas in order to limit new compaction and so that existing areas of compaction would be subsoiled upon completion of harvest. Decreases in soil infiltration rates associated with proposed harvest represent such minute increases as to be inconsequential at the subwatershed or watershed scale.

Comment 57: *"The EIS should demonstrate that the proposed projects would not exacerbate the exceedances of water quality standards for* [water quality limited] *listed waters or for any other waterbodies within and outside of the project area. The EIS should explicitly incorporate the guidance found in* ["Forest Service and Bureau of Land Management Protocol for Addressing 303(d) Listed Waters", May, 1999]:

1) *Validat*[e] *that listed streams are impaired*

2) *Documen*[t] *and implemen*[t] *sufficiently stringent management measures to prevent additional degradation*

3) *Us*[e] *Water Quality Restoration Plans…or other mechanisms (such as standards) to improve water quality over the long-term*

[W]*e recommend the EIS include more information on the status of the TMDL, including when the TMDL will be developed, and a description of what expectations there will be for the Umatilla National Forest to help Oregon implement the TMDL. If a TMDL implementation plan has or is…being developed, the EIS should describe how a WQRP will help meet standards in the interim."* **(Richard Parkin, Environmental Protection Agency)**

FS Response: Actions proposed in the FEIS would collectively improve water quality over a 5 to 10 year period. Some individual actions would directly contribute to water quality improvement, while others would have no effect or would have short-term, localized adverse effect. Specific actions that would improve water quality include riparian planting and fencing, road obliteration and reconstruction. Actions with potential for adverse effects include logging and associated temporary road and trail construction. BMPs described in Chapter 2 and Appendix B would reduce the likelihood of effects.

Guidance in the "Forest Service and Bureau of Land Management Protocol for Addressing 303(d) Listed Waters", May 1999 is incorporated under Chapter 4 of the FEIS. Included are: discussion of 303(d) listed streams, water quality management measures (BMPs and proposed actions for improving water quality); reference to a Water Quality Restoration Plan in preparation (separate document), and the Oregon schedule for preparing TMDLs in the North Fork John Day subbasin (HUC #17070206). Some of the actions proposed in the FEIS are targeted for water quality improvement of listed 303(d) streams. The Umatilla National Forest has demonstrated commitment to cooperation and assistance in preparation of TMDLs (see Umatilla TMDL and WQMP, October 2000 public review draft).

Comment 58: *"Rain On Snow events are ignored in the DEIS. The DEIS omits critical factors that determine the intensity and sensitivity of ROS events…slope, aspect, the amount of existing hydrologically unrecovered canopy, and the amount of proposed DFB canopy removal. DEIS seems to assume that dead trees do not effect or moderate water yield…Dead trees intercept snow as long as their limbs are intact…also moderate the wind patterns…Changes in the aerodynamics of the forest canopy after harvesting can significantly increase snow accumulations in the opening and decrease it in the surrounding forest* [references Effects of Timber Harvesting in the Snow Zone on Volume and Timing of Water Yield by Charles A. Troendle and Charles F. Leaf, undated, p. 232 Ibid. at 84 and Gary Kappesser, 1991]. *The DEIS fails to disclose how many dead trees will be left on site, or how many green trees will be logged…*[History of] *flooding…in the area…not analyzed in any detail in the Tower DEIS. Historically, floods occurred in any ten year period. Larger floods occurred less frequently…Rain On Snow events…contributed to many of the larger floods. The recent history of warmer winter weather should be considered* [in context with Rain On Snow events]. [Past management and disturbances] *have altered runoff patterns…increased water yield…timing and magnitude of peak flows…extended channel networks. The DEIS fails to disclose these impacts and how more logging and road use will restore the North Fork John Day watershed."* **(Mike Peterson, The Lands Council)**

FS Response: We acknowledge that rain-on-snow events do occur within the analysis area and can result in flooding (Water Resources Report pg 4), but the largest and most damaging flood events that have occurred since the Tower Fire and the nearby Summit Fire have been caused by isolated thunderstorms in the spring or summer (DEIS 3-14, 1-15).

Contrary to the assertion that the proposed timber salvage would create openings in the forest canopy that would result in increased snow accumulation, salvage logging would have little effect on forest canopy because the fire and subsequent weathering has removed most of the needles and branches from the tree boles. The current condition of forest canopy resulting from the Tower Fire is very open, so it's role in snow interception, shading and moderation of wind patterns is much reduced. The resulting increased snow accumulation, which this comment claims will occur due to timber salvage, is already occurring within the burned area. This comment is based upon misapplication of the cited article by Troendle and Leaf (1981) that describes the hydrologic effects of clear-cutting live forest in the Fool Creek Watershed of eastern Colorado, which does not accurately represent the conditions of the Tower Fire burned area. Research conducted on the Entiat Experimental Forest in north-central Washington that shows the hydrologic effects resulting from a 1970 wildfire and subsequent salvage logging would be more applicable (see DEIS 3-9). The 663 acres of commercial thinning would leave fully stocked stands (no openings would be created), so there would be little change in the canopy or snow accumulation.

Comment 59: *"Sedimentation resulting from the Tower Fire…is strictly a temporary and limited effect. The effects of sedimentation from logging operations are a bigger problem, as their effects are found to last longer and be more damaging. If the negative effects of logging and associated activities on fish habitat have been so well documented, why is the Forest Service proposing to do just that, in an area where sedimentation problems are already of great concern?"* **(Adam Bishop, Alliance for the Wild Rockies)**

FS Response: The Forest Service does not agree that the effects of a 50,800-acre wildfire are limited, though effects in many parts of the fire could be considered temporary. Studies have shown rapid increases in sediment production following wildfire, then a decline over time. For instance, sediment levels in the Entiat, Washington, experimental watershed remained elevated for seven years after a large fire in 1970, and were expected to remain above pre-fire values for many years (Helvey, 1980).

Post-fire logging has also been shown to exacerbate sediment production, primarily due to associated roads, skid trails, and landings. The persistence and severity of fire or logging effects depend on external factors including slope, soils, and climatic conditions. As described in the EIS, management-related sediment would be controlled by subsoiling, waterbarring, and other erosion control mitigation measures detailed in Chapter 2. In addition, many units proposed for salvage in the Cable drainage have been dropped in the FEIS. This would reduce temporary road construction and associated sediment considerably.

Sediment modeling (see Chapter 4) showed the Tower Fire and preexisting conditions[5] as the greatest contributors of sediment. Fire effects are predicted to persist for approximately 7 years before a return to pre-fire levels. The proposed actions would also contribute to sediment increases for several years following the activity; however, the proposed actions would collectively reduce sediment to below pre-fire levels within approximately 5 years of implementation, accelerating recovery. Some proposed actions would contribute directly to sediment reductions (riparian planting and fencing). Other proposed actions (logging, temporary road construction, road obliteration, fish barrier removal) have potential for short-term sediment increases that would be mitigated in part by implementing the BMPs described in Chapter 2 and Appendix B. The Forest Service

[5] As stated throughout this document, effects from past activities in this area are not equivalent to effects that could result from proposed activities due to changed methods and mitigation.

continues to pursue logging within the Tower area because reduction of future fuel loads in strategic portions of the fire area is critical for ensuring survival of regenerating forests and long-term protection of soil and water. Another severe fire in this area before trees are large enough to survive it would be devastating to vegetation and water alike.

Comment 60: *"…commitments to implement BMPs…", "…no good evidence that BMPs are effective at the watershed scale…", "…no good evidence that BMPs were effective at constraining the adverse effects of logging and roads…"* **(Jon Rhodes, Columbia River Intertribal Fish Commission)**

FS Response: Commitments to implement BMPs are addressed in Chapter 2 under Mitigation, and in Appendix B, Best Management Practices. The Forest Service considers that the most effective means for controlling nonpoint source pollution is in applying preventative and restorative watershed management practices. Nonpoint source pollution control is achieved through application of technology-based Best Management Practices. BMPs must be properly applied and maintained and it is the responsibility of the Forest Service to ensure adequate installation and maintenance of practices. While BMP effectiveness has been demonstrated in many studies (see for example Belt et al, 1992, Burroughs and King, 1989, and Luce, 1997) it is also acknowledged that control measures for on-site practices are difficult to relate to downstream water quality conditions. For this reason, the approach to assure maintenance and improvement of water quality is a monitoring strategy combining project-level implementation and effectiveness evaluations (on-site) with downstream ambient and reference reach monitoring (USDA, 1994).

Comment 61: *"consistency of the various alternatives with attainment of water quality standards and UNF Plan standards related to watershed and aquatic conditions, "The DEIS also completely failed to make a reasonable determination of the consistency of watershed and habitat conditions with the standards of the UNF Plan". "…the DEIS provides no reasonable basis for determining the consistency of any of the alternatives with the standards of the UNF Plan". "The DEIS also fails to analyze and disclose the consistency of the alternatives with the riparian goals of PACFISH." "…the DEIS fails to make any credible analysis of effects on turbidity and compliance with state water quality standards."* **(Jon Rhodes, Columbia River Intertribal Fish Commission)**

FS Response: References to Oregon's water quality standards and 303(d) status are contained in Chapters 1, 3, and 4. The FEIS examined pre-fire water quality and stream channel conditions and analyzed fire effects and proposed activity effects to water quality and streams. Beneficial uses, water quality standards designed to protect those uses, and water quality-limited status (303(d) list) were evaluated. Monitoring data were available for the following parameters: stream temperature, aquatic habitat, and stream channel morphology. A modeling approach was used to evaluate sediment in part based on limited availability of sediment monitoring data and relatively extensive fire area. Sediment modeling was used to approximate the production of sediment for the analysis area, to compare pre-fire, post-fire, and effects of alternatives. In general, higher levels of sediment predicted by the model would correspond with higher levels of turbidity since turbidity is an indicator of the presence of suspended sediment.

Discussions of consistency with Umatilla National Forest Land and Resource Management Plan (Forest Plan) standards and guidelines and PACFISH are contained in Chapters 1-4. Specifically, mitigation measures and monitoring requirements are

addressed in Chapter 2 and Chapter 4 provides analysis of environmental effects compared with requirements in the Forest Plan and PACFISH, among other requirements.

As noted in comments, Forest Plan Standards and Guidelines for riparian shade and created openings are not in many cases being met. Riparian conditions and effects are described in Chapters 3 and 4 in the Watershed Hydrology sections. Pre and post-fire vegetation, streamflow, water temperature, and sediment conditions, and land management activities that have impacted riparian areas in the past are described in Chapter 3. For example, the FEIS described past timber harvest within Riparian Habitat Conservation Areas, ranging from 0 to 47 percent of the subwatershed. The extent of fire effects to streams and stream shade is also described. The proposed actions in the FEIS for riparian areas are actions that would accelerate recovery; specifically, over 1000 acres of riparian planting, 60 acres of riparian fencing, and road treatments (over 40 miles of repair, reconstruction, obliteration). In the short term (days to months), some actions such as road treatments would carry a low risk for localized adverse effects because of initial ground disturbance. Over intermediate and longer timeframes (months to years) these actions would be a net benefit to riparian functions (improve shade, moderate runoff, slow erosion and reduce sedimentation). The risk would be lowered by applying BMPs during and after treatment, as described in Chapter 2 and Appendix B. Other actions that have potential to adversely impact riparian areas include salvage harvest, temporary road construction, and thinning. These activities would be designed and implemented to minimize adverse effects. Practices include prohibiting logging within RHCAs and timber sale BMPs (i.e. scheduling activities, implementing erosion control measures, rehabilitation of trails following use). The underlying premise for BMPs is that practices are properly implemented, monitored for effect, and adjusted if needed. The net effect would be to minimize any adverse effects to an undetectable level (within natural background variability).

Comment 62: *"…the DEIS fails to make a reasonable estimate of erosion and sediment delivery…", "the sediment modeling in the DEIS arbitrarily and greatly reduced erosion rates in the model…", "…skews the estimates of recent sediment delivery within the project area…", "…vastly and arbitrarily increased erosion rates for moderate and high intensity wildfire in the model…", "…the modeling in the DEIS fails to account for increased sediment delivery caused by road construction and traffic…", "…premised on data from the High Ridge area, which is not reasonable."* **(Jon Rhodes, Columbia River Intertribal Fish Commission)**

FS Response: A sediment model was used to estimate erosion rates and sediment yield in the Tower analysis area, and to predict accelerated levels resulting from the fire and proposed management activities (FEIS Chapter 4 and Appendix D). The model was based on the Region 1/Region 4, WATSED, and WWSED sediment models used on other national forests in the western United States. Modeling is an accepted and widely used technique to represent complex systems, however, few if any models are available that accurately predict sediment transport and stream response at the scale of the Tower Fire (Bunte and McDonald 1999). Results from modeling are representative of the *relative differences between alternatives* and not actual values of sediment production.

Assumptions used in the sediment model include identifying sources of sediment and estimating erosion rates and delivery to stream channels. Each component in the model is based on best available information for the analysis area. Sediment rates were based on existing methodology and professional judgment using comparable and local data, and observation. Most activities that have potential to contribute to sediment production were modeled. Some activities not in the original model were added such as trail construction, scalping, and subsoiling. Grazing was not accounted for because of the inherent problem

of quantifying extent and intensity of livestock grazing effects. Grazing is a widely dispersed activity with extreme variation in intensity.

Best available data, including data for existing roads, were used in the analysis. The Forest Service maintains data on publicly owned and managed roads. Roads may be underestimated in subwatersheds with private ownership. There are also some abandoned roads and trails on Federal lands not included in databases. In general, roads occupy a small portion of the total analysis area. Road widths are used in area calculations (percent watershed), and in modeling sediment. A 20-foot road width was used for calculating percent of the subwatershed in roads (FEIS Table 3.2). This represents the average width of the compacted running surface. Using total miles of road in Forest databases and a width of 15 feet, the percent of area in roads varied from 0.1 to 1.4, with an average for the analysis area of 0.7 percent. Assuming a road width of 20 feet and adding a hypothetical 100 miles of road, to account for potential underestimation, would increase the percent area in roads to 1. The purpose of the analysis was to evaluate the potential for road contribution to change in water yield. Even adjusting for potential underestimation, the total land area in roads is relatively low. Published literature indicates water yield changes due to roads alone would not be detectable at these levels (FEIS Chapter 4).

Road widths were also used in sediment model computations as follows. To calculate disturbed area, a road width of 20 feet was used for existing and obliterated roads, and 10 feet for temporary roads. Basic erosion rates used in the model were derived from the Region 1/ Region 4 (Boised version) sediment yield model (Potyondy 1991). Based on research in Idaho, “the standard road is assumed to be maintained, 16-foot wide, native material road with a sustained grade of 5 to 7 percent, constructed on granitic material on a 50 percent side slope” (Potyondy, 1991, page 12-49). These values were considered reasonable estimates based on local knowledge and research data.

Two geologic erosion rates were used in modeling road construction sediment yields. The rate for granitics, accounting for approximately 12 percent of the analysis area, is more than 5 times the non-granitic rate (first year). The purpose in the discussion of results from Starkey was simply to illustrate the variability in modeling results (Appendix D).

Estimates of sediment delivery were based on data and published research. Fire impacts on erosion and sediment were greater than management because of the extensive land area affected and relatively high proportion in moderate to high intensity burn. Erosion and sedimentation occur across the fire-affected landscape, in both managed (roaded) and minimally managed (roadless) subwatersheds within the Tower Fire. Management effects on erosion and sedimentation are described in the FEIS Chapters 3 and 4.

High Ridge data were used as a base starting point for sediment yields. As stated in the EIS, Chapter 4, results are to be compared as relative differences between alternatives not as absolute predictions of sediment yields. The average sediment yield from High Ridge 3, at 18 tons/mi^2/year was considered a reasonable estimate based on comparison with other published sediment yield data. For example, in the BoiSed model the “natural” sediment yield from small granitic watersheds with slopes of 60 percent was 25 tons/mi^2/year.

The literature sources used in the hydrology and aquatic habitat analysis are listed in the Literature Cited section of Chapter 5. More than 60 published reports addressing scientific and technical aspects of the analysis were included as references. This set of citations does not represent all of the available literature on the subjects of hydrology, forestry, and fisheries. Literature specific to the issues were used in the analysis and listed in the FEIS bibliography. Overall, there is limited scientific information on post-fire environmental effects and a definite need for further research (McIver and Starr, 2000).

Wildlife

Comment 63: *"In light of the many cumulative effects generated by other projects in the area, we believe that your analysis of the potential effects the Tower Fire Project may have on threatened, endangered, proposed, sensitive, and other wildlife species is flawed."* **(Adam Bishop, Alliance for the Wild Rockies)**

FS Response: Wildlife that depend on forest cover have already been extirpated by the fire itself (Tower Fire Ecosystem Analysis). Under Alternative 2, which contains the most proposed harvest, snag-dependant species would have still have at least 55% of the fire area untouched by harvest in the last 30 years (or assuming worst case scenario on private land, 50% of the fire area), coupled with the tremendous number of snags created by the fire. While harvest would decrease hiding cover for big game by approximately 15% in the short-term (post-fire harvest on Forest System Lands plus proposed salvage), proposed reforestation would enhance long-term forest cover and diversity on 25% of the area. Without specific identification of the "flaws" in the analysis, a more detailed response is not possible.

Comment 64: "[T]*he DEIS states that thermal cover for big game in the fire area is "greatly lacking." The minimal thermal cover did exist after the fire has been lessened by salvage activities…the restoration value of conducting further salvage logging, harvesting additional green trees, and constructing a 6.25 mile 'fire break' with minimum 20 foot spacing is questionable at best."* **(Brad Nye, Confederated Tribes of the Warm Springs Reservation of Oregon)**

FS Response: The silvicultural prescriptions for the proposed thinning in green stands would be designed to maintain big game thermal cover and the fuel break has been dropped from analysis. Harvesting dead trees that are currently falling over in the Tower Fire area would not reduce thermal cover more than would occur naturally. Hiding cover could be reduced temporarily, but hiding cover will become plentiful in the next decade as the young lodgepole pine trees that are currently blanketing the landscape begin to gain in height.

Comment 65: *"Please conduct* [lynx] *surveys using the new cheek-rubbing technique and confer with the USFWS on this project… Recent scientific findings suggest that timber harvest activities have a detrimental effect on snowshoe hare abundance and thus may threaten the lynx…The Tower DEIS failed to consider this new information. See Bull, E.L., Blumton, A.K., 1999, "Effects of fuel reduction on American martens and their prey", PNW-RN 539, March 1999."* **(Doug Heiken, Oregon Natural Resources Council)**

FS Response: Analysis tools for lynx habitat were not yet in place at the time the draft EIS was prepared. Since that time, 2 years of extensive cheek-rubbing surveys for lynx have been completed. None of the hair samples tested in 1999 were determined to be lynx. Results from the year 2000 surveys are not yet available.

The study cited is a very different situation from proposed salvage or thinning in the Tower Fire area. In Bull and Blumton's study, the objective was to reduce fuels in an unburned 1000-foot corridor on either side of a road to enhance the ability to control a potential wildfire from spreading from one watershed to another. The Tower Fire consumed most snowshoe hare habitat within its boundaries, so proposed activities would not reduce it. Snowshoe hare habitat will remain unsuitable in this area for the next 10-15 years, or until

dense conifer stands grow above the level of the winter snow pack. Harvesting dead trees in 2% of the potential lynx habitat that occurs in this Lynx Analysis Unit will not deter the development of large amounts of snowshoe hare habitat in the coming years.

Consultation with U.S. Fish and Wildlife Service for lynx was completed August 17, 2000.

Comment 66: *"This project used an outdated 1991 list of regional sensitive species."* **(Doug Heiken, Oregon Natural Resources Council)**

FS Response: At the time the DEIS was published, the 1991 Regional Forester's sensitive species list for terrestrial wildlife is the most recent. An updated list was released in November of 2000 and is used in the FEIS. In addition, since the draft EIS, the U.S. Fish and Wildlife Service provided a list of "species of concern", and impacts to those species are included in the final EIS.

Comment 67: "[T]*he Forest Service has…failed to conduct adequate surveys for* [various *wildlife* species and] *belittled their use as insignificant. Despite…evidence of extensive continued foraging in the area by pileated woodpeckers (numerous sightings and foraging excavations), the agency has…dismissed their use of the area as unlikely. Surveys for wolverines and lynx have been ridiculously scant and superficial* [references recent confirmed lynx sighting in the Blue Mountains and confirmed wolverine sightings including a dead juvenile]. *Failure to survey and monitor the Tower Fire area for Endangered Species Act listed and candidate listed species, as well as management indicator species and state listed species presence and use…and to accurately assess the likely impacts of the proposed alternatives."* **(Asante' Riverwind, Blue Mountain Biodiversity Project)**

FS Response: Wildlife conclusions are drawn primarily from assessments of habitat. The burned portion of the Tower Fire is not suitable reproductive habitat for pileated woodpeckers. No suitable reproductive habitat for pileated woodpecker will be affected by the proposed actions. Even though surveys have not yet detected wolverine or lynx, we assume these species could use the area at any point in time if the habitat is suitable. An updated assessment of lynx habitat has been included in the final EIS. We are not aware of any recent confirmed lynx or wolverine sightings in the Tower Fire Analysis Area. If you have information on possible sightings, please forward those observations to us.

Comment 68: *"The Service recommends the Forest consider incorporating measures to provide lynx habitat and connective corridors for movement…indicate which standards and guidelines* [of the Lynx Conservation Assessment and Strategy] *will be implemented within the project area. The Forest should conduct a post-disturbance assessment to evaluate potential lynx denning and foraging habitat…how much existing and potential lynx habitat there is remaining in each lynx analysis unit that was impacted by the fire…based on the existing condition of the landscape and plant association groups or potential natural vegetation.* [A]*n assessment of impacts…would need to consider project effects on potential natural vegetation and natural recovery processes, which maintain lynx habitat over time, as well as on existing habitat."* **(Preston Sleeger, Office of Environmental Policy and Compliance)**