2015 RMP Review

Draft Resource Management Plan/Environmental Impact Statement – Western Oregon

July 12, 2015/August 20, 2015

RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

(also delivered electronically to: BLM OR RMPs WesternOregon@blm.gov)

RE: Draft Resource Management Plan/Environmental Impact Statement – Western Oregon (hereinafter DRAFT)

Summary

This reviewer appreciates the time and energy of BLM in presenting to the public BLM's proposals for managing public resources over the next decade. The numerous citations, references and analysis give the public an opportunity to have direct involvement in the management of their resources.

The four volumes, comprising over 1600 pages (including separately numbered indexes, appendices and glossaries) contain a great deal of information. The presentation of that information, however, lacks a cohesiveness that would allow the public to fully understand what will happen on public lands over the next ten years. Numerous references to limits by the "scope of analysis" and deference to future actions (e.g., TMP), limit this document to an overview lacking the specifics necessary for a truly informed public.

None of the alternatives presented are acceptable as written. While some components of the alternatives may form the basis for a truly transparent and workable plan, the aforementioned limits must be addressed before an acceptable alternative may be developed.

This reviewer is disappointed that BLM continues to limit public access to information about the management of public resources. Citizens with significant expertise will comment on this plan, myself included, but the information in this DRAFT will remain obscure to the majority of the public. The bottom line is that BLM has failed to deliver a clear and understandable document for public review.

These comments, however, are intended to provide direction to BLM in revising the DRAFT and to address some of the aforementioned issues. This reviewer's knowledge base is considerably higher for Southwest Oregon and the Medford District BLM than for other O&C lands, so much of the foreseeable impacts of BLM's plans are primarily based on that knowledge.

Table of Contents

Summary 1
Introduction 2
Purpose and Need 3
Issues by Subject Matter 5
Response to Scoping Comments 16
Conclusions 19
Substantive Comments 19
Qualifications 19
Contact Information 20

Introduction

The Planning Process steps include "3. Analyze management situation" but BLM has failed to present a clear picture of the current state of public lands for public review.

"Guidance for Development of All Action Alternatives" contains a bullet point which says, "Designate areas as open, limited, or closed to off-highway vehicle use in accordance with 43 CFR 8342.1. Develop a range of travel management area scenarios in relationship to various land use allocations and management objectives among the alternatives. Defer implementation level travel and transportation management planning until after completion of the RMP revision process. For those areas designated as limited in the RMP, define interim management objectives and clearly identify the process leading from the interim area designation of 'limited to existing roads, primitive roads and trails' to the development of a designated network of roads, primitive roads and trails, consistent with BLM Handbook 8342 – Travel and Transportation Handbook (USDI BLM 2012c)." (Underline emphasis by reviewer.)

As an active participant in the RMP process, this reviewer attended several BLM workshops. A clear definition of what is meant by "limited to existing roads and trails" was not available. Specialists and Managers both referred to a future Travel Management Plan (TMP) and this DRAFT sets a timeline of five years to complete a TMP. Thus this one statement makes every reference to a future TMP a de facto No Action Alternative. In the DRAFT BLM refers to significant public interest in Off Highway Vehicles (OHVs) and there are thousands of comments to BLM over the past fifteen years documenting increasing conflicts between area residents and OHVs. BLM has done little to nothing to resolve these conflicts and has promoted OHV activity at the expense of local residents. The status quo is therefore completely unacceptable and BLM should address the problems more deliberately in their planning document.

Purpose and Need

"The purpose of this proposed action is to make land use plan decisions to guide the management of BLM administered lands." This DRAFT goes far beyond making land use decisions, setting management protocols for the next decade, many of them specious in nature and unclear to the public. If BLM were presenting only a plan for land use decisions, it would be unlikely to run to 1600 pages.

A footnote (p4) states: 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.' These terms are not synonymous in silviculture nor by any dictionary definition and certainly not as commonly understood by the public.

"Annual productive capacity" of land is the entirety of productive results, including non-merchantable species, water impacts, wildlife capacity, woody biomass as separate from timber sales and other attributes contributing to the full production of the landscape over time. "Annual productive capacity" is science-based.

"Annual sustained yield capacity," within the context of the O&C Act, means that volume of merchantable timber that can be removed from the landscape without negatively impacting the ability of the forests to produce a similar capacity on an annual basis. Sustained yield capacity in this context does not apply to non-merchantable species and only includes other attributes as detailed in the O&C Act. As noted in the DRAFT, environmental considerations for set-asides and other uses will render the "sustained yield capacity" as considerably less than "annual productive capacity." "Annual sustained yield capacity" is science-based.

"Allowable sale quantity" may be based on sustained yield capacity but current forest conditions preclude this association since BLM lands are not now on a sustained yield basis. Allowable sale quantity must be calculated on the basis of complete forest management, including expenses for pre- and post-harvest management. (Note: The failure of federal agencies to properly perform silviculturally prescribed post-harvest management is a major contributing factor to current heavy fuel loads and fire danger.) Therefore allowable sale quantity will be below sustained yield capacity until such time as the landscape has recovered to a true sustained yield basis. "Allowable sale quantity" is economics-based.

Distinction between these terms is noted in the original O&C Act. BLM's use of the terms as synonymous creates confusion in the minds of the public and does a dis-service to the scientific expectations of a government agency.

If BLM plans "to deliver a predictable supply of timber" from lands under their management, a longer view is required. Ten year plans may set guidelines, but the full range of management history should aid BLM in dealing with the mis-steps of the past and restoring the landscape to its true purpose. To that end, BLM must recognize the distinction between the terms above and apply the appropriate principles to a full historical review.

Use of the Purpose and Need to re-define basic terms takes away from an otherwise valuable recitation of requirements for the plan. While the Need to develop realistic plans for our public lands is inarguable, the Purpose stated in this document is unfulfilled and provides no clear picture to the public. Laws are meant to provide guidance, but truly engaging the public requires more than just abiding by the law.

BLM cites compliance with a wide variety of laws, again compartmentalizing issues that should be integrated. Compliance with laws may or may not result in a truly balanced and sustainable forest management plan. An applied view is missing in this document.

Issues by subject matter

Air Quality

BLM admits that air quality will decrease under all action alternatives. The document is very detailed about air quality, the charts and maps and graphs of particulate matter. Though the RMP is a future-looking document, there no discussion of reducing impacts to air quality with emerging techniques, like biodigestion. The failure to present future options and an over-reliance on historical statistics will not lead this government agency to reduce impacts to air quality. The content is similarly lacking in the discussion of Climate Change.

Throughout the Affected Environment and Environmental Consequences BLM provides a worthy education in how these areas and impacts are measured for specific data. This chapter suffers from the same fragmented qualities as previously mentioned. The areas described are done so in isolation from other areas, often by type (e.g., forests) or species.

Lands with Wilderness Characteristics

Only Alternative A would protect these areas from non-compatible use, particularly OHV use. Table 3-91 shows the Wellington unit in the Medford District, an unroaded natural area (not harvested) only a few miles from this reviewer's home. Reductions under all alternatives would, in essence, eliminate the wilderness characteristics of this area and thus fails to provide the protection required under BLM's management directives.

Minerals

The reviewer is required to compare Tables 3-124 and 3-125 to determine actual sales of minerals to permits in the decision area, yet they are not a like comparison. Table 3-124 lumps mineral sales with permits while Table 3-125 shows mineral production. The reader is thus not informed as to the actual comparison.

The discussion of mineral entry is limited to areas withdrawn by designation, yet no discussion is presented of areas that might be withdrawn for other reasons.

Rare Plants and Fungi

Under Off-highway Vehicle Use BLM again admits limits to their ability to analyze impacts from OHV use and again uses the term limited to "existing or designated roads and trails," while failing to provide information for the public as to how that term is defined.

This analysis relies primarily on identified species without regard to those plants or flora that are unique but not listed. As in Visual Resources, BLM fails to recognize that many small, unique areas exist across the landscape and should be preserved for their rarity and scenic values.

Recreation and Visitor Services

It is good to note that BLM has recognized "changed circumstances and new information," particularly the conclusion that "changes are particularly indicated for....off-highway vehicle (sic)....." This reviewer has a forty-year history of contact with the off-highway vehicle situation in southern Oregon. Given the deference of a TMP for five years and an undefined limit to "existing roads and trails," this DRAFT fails to address the changes noted above.

BLM is again confusing the public in that pictures in Figure 3-135 fail to correspond to the descriptions in Table 3-125.

"The BLM conducted a recreation demand analysis throughout the planning area in 2013-2014." Despite being an engaged and active member of the public, particularly with regard to recreation issues, this reviewer was unaware of this research until this DRAFT. Table 3-127 shows a significantly higher response rate for "Riding OHVs" than any other form of recreation, seconded by "Mountain Biking." These results differ considerably from the data in both Table 3-126 and both the actual and projected use in Table 3-136. It can be concluded from this conflicting information that BLM's public outreach efforts were more focused on the OHV community

In discussing BLM lands being "intermingled" with private lands, only access is covered, while conflict issues (trespass, noise, etc.) are missing. At the core of minimizing conflicts in recreational areas, greater attention must be paid to the unique issues of private, residential land intermingled with BLM lands. Many of these lands have been used for residence since the late 1800's, thus having established precedence regarding neighboring public lands.

BLM's "extrapolating from available trail miles per acre under current conditions allows an approximation" for each alternative puts the entire analysis on a false foundation. Under current conditions there are miles of user-created trails that may or may not be appropriate in their current locations. The statement that "there are approximately 395 miles of trails on BLM administered lands in western Oregon" indicates that BLM does not recognize these trails. That conclusion, however, means BLM is ignorant of these user-created trails. It also indicates that increasing trail miles in alternatives that do so will incorporate these non-recognized user-created trails. Table 3-138 shows Medford District as having 278 miles of trails though there is no Record of Decision designating any of those that might be user-created.

Table 3-110 shows high to extremely high introduction of invasive species by OHVs in the Medford District. Since invasive species often reduce the overall viability of the landscape, introduction of OHV use fails to fulfill BLM's directive to manage public lands.

SocioEconomics

The Key Points focus on social capacity and resiliency relative to economics. Cultural impacts are not included in the analysis, making it incomplete.

Cultural Resources

Cultural Resources are based on archaeological sites and cultural artifacts and a United Nations definition of cultural meaning. Archaeology and artifacts should be separately addressed as unique, while cultural considerations are local as well as national. The DRAFT fails to give any analysis of local culture. In the Medford District the local culture is extremely diverse and value-based. This is an overall failure to take into account local cultural conditions and local residents.

Fire and Fuels

"The BLM-administered lands constitute only a small portion of the entire interior/south dry forest landscape." BLM lands comprise more than fifty percent of the lands in both Jackson and Josephine Counties. For the Medford District, this statement is false.

"Currently, many of the dry forest stands are overly dense." The following discussion focuses primarily on fire suppression, growth in wildfire size and intensity and projected fire regimes. Little discussion is provided for mechanical removal of density (e.g., fuel reduction, pre-harvest thinning, post-harvest thinning." Yet BLM says, "In the absence of natural fire as a disturbance agent, management activities, including prescribed fire and mechanical management of vegetation, can serve as a partial surrogate for natural disturbance, and promote and maintain desired structural and compositional changes." While BLM acknowledges "....less departure from reference conditions represents greater fire resiliency," the analysis describes changing conditions only in relation to timber harvest with no information provided on other approaches to restoring "reference conditions." Only in a brief discussion of wildfire in developed areas does BLM mention mitigation, but the analysis following focuses on incidents of human-caused fire in these areas. BLM later states, "All of the alternatives have similar management objectives and management direction regarding noncommercial natural hazardous fuel reduction treatments. Therefore, the BLM assumed in this analysis that similar types and amounts of treatments that have occurred over the past decade would continue in the future under any of the alternatives..." In essence this is a statement of no change from current policies, making it a "No Action Alternative" that omits any other alternative for this activity. Current policies have failed to restore BLM lands to a sustainable basis and therefore must be changed.

"A spatial delineation of both current and future forest vegetation structure using BLM structural stages cross-walked to seral stages and gradient nearest neighbor (GNN) imputation datasets derived from inventory field plots, environmental gradients and Landsat imagery (Ohmann and Gregory 2002) classified into seral stages (Haugo et al. 2015)." This statement fails, *prima facie*, to meet federal standards for the use of clear and unambiguous language.

Fisheries

Again, BLM bases analysis on current conditions without objectively analyzing whether or not current conditions are optimum to meet natural resource requirements.

The discussion of Riparian Reserve Width is primarily focused on woody debris and temperatures without accounting for wildlife, climate change or other factors. As a future-looking document, this document fails to present a rationale for maintaining current standards in the face of increasing drought cycles in the analysis area.

Forest Management

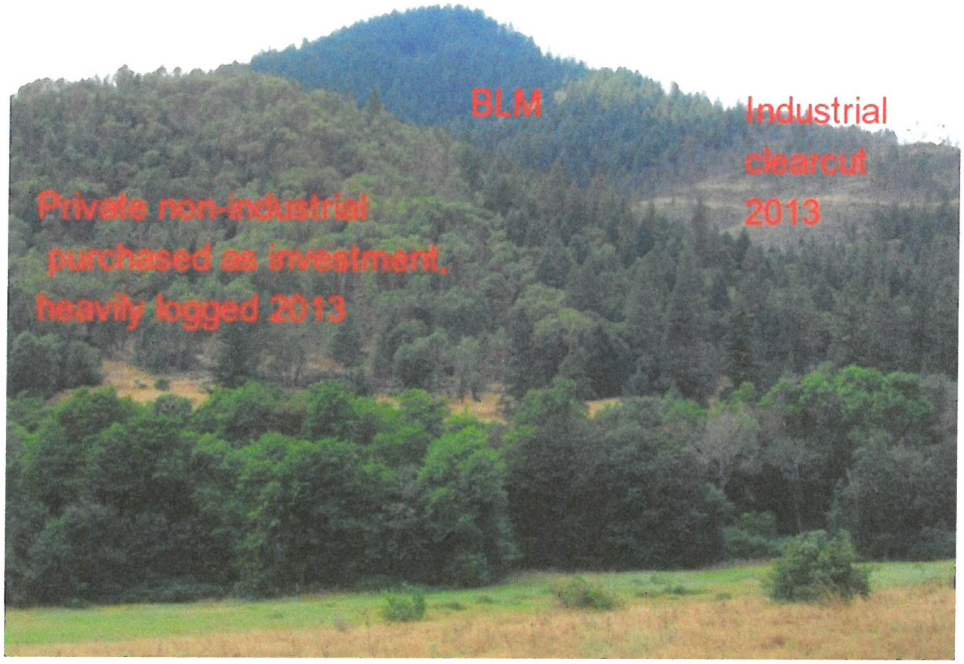
In discussing Conservation of Species the BLM distinguishes "Large, Contiguous Blocks of Late-Successional Forest" and "Older and More Structurally-Complex Multi-Layered Conifer Forests." While these are valuable assessments, they set the stage for managing for forest types without placing them in a landscape view. The ability of a plan to be flexible to local circumstances is constricted by this method of typing.

"Even-aged systems with clear-cutting would produce more uniform stands in a mix of age classes without structural legacies." This statement is oxymoronic in that "even-aged systems" cannot, by definition, produce "a mix of age classes."

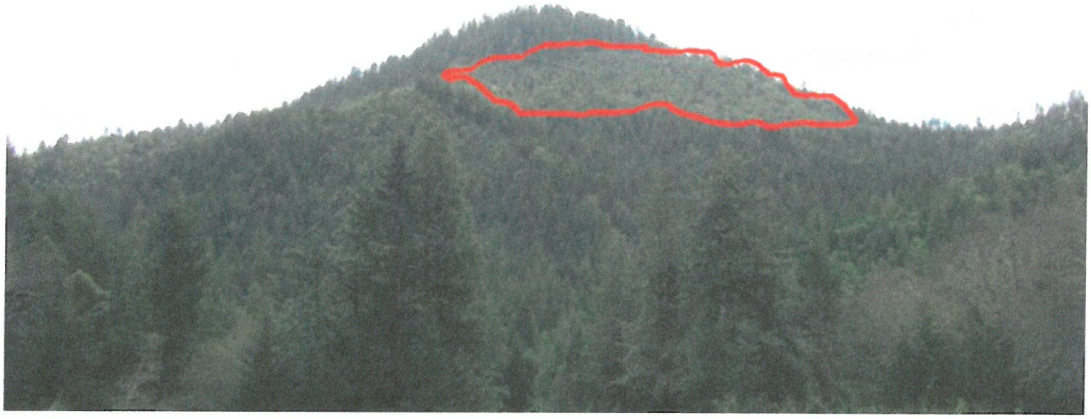
Table 3-58 presents a clear picture of excessive (unsustainable) harvest during the three decades from 1960-1990. Table 3-55 shows the results of high harvest and failure to conduct adequate post-harvest management with little natural restocking. Age classes in Table 3-55 indicate a sustainable harvest age of 80-110 years, which would produce more open space forests, greater natural restocking and greater predictability in timber supply. These goals cannot be accomplished with clearcutting. All of the alternatives (Figure 3-61) show a decrease in this harvest base with the exception of Alternative C, which places the 80-110 year age class in reserves.

Table 3-56 presents percentages of land base subject to different classifications. Alternatives A, C and Sub-C indicate large percentages of the land base would be classified High Intensity management areas, which includes clearcutting. While there may be BLM lands within Oregon that are suitable for clearcutting, most of the BLM lands in the Medford District (excepting some lands in the Butte Falls Resource Area), are unsuitable for clearcutting for a variety of reasons. The steep slopes, thin soils, biodiversity and climate of the southern Oregon region are severely negatively impacted by clearcutting. Monocultures crated by current clearcutting post-harvest planting are highly susceptible to high intensity fire.

To illustrate:



This photo, taken at the 5-mile marker on Forest Creek Road, shows private, non-industrial land that was heavily logged in 2012 after being purchased by an investment partnership, industrial forestland owned by a Real Estate Investment Trust and clearcut in 2013, and BLM land, including Mount Isabelle, in the background. Reviewer's family trust land is at extreme center right in photo.



This 2013 photo shows the North face of Mount Isabelle, BLM land clearcut in 1986. Despite re-planting, nearly 30 years later the site is poorly re-stocked and prone to high-intensity fire. A smaller clearcut to the left of the highlighted area shows similar results.

Figure 3-63 makes the same communication error as in much of this analysis, suggesting that various forest types exist in distinct blocks and thus not delivering a matrix, landscape view. The Inventory of Merchantable Timber does nothing to inform the reader of the complexity of timber inventory nor how potential harvest methods would utilize that inventory and impact future inventory.

In discussing annual productive capacity (Issue 2, Forest Management), BLM again makes the error in footnote 47 that 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.' As noted above, these terms are not synonymous by definition and are based on different standards (i.e., science v. economics). The discussion that follows notes variability in the ASQ based on non-merchantable factors that are not a part of annual productive capacity.

Table 3-58 and Figure 3-73 show conflicting figures for standing timber volumes and harvest levels over time. If Figure 3-73 is accurate, then only the figures from 1999 and 2001 show harvest below inventory. Similarly, Table 3-64 shows harvest levels that exceed the inventory figures presented in Table 3-58.

The discussion of harvest types and silvicultural methods (Issue 5) once again includes clearcutting, a practice that must be very limited in the O&C lands for reasons discussed above.

While Table 3-68 shows historical accomplishments for non-harvest silvicultural treatments, BLM admits "The 1995 RMPs estimated levels of silvicultural treatments that would occur because of implementation of the plan, but the BLM has generally not achieved these levels of treatments." The succeeding analysis is thus based on statistics reflecting a failure to fulfill management requirements.

In presenting the impacts of timber harvest by alternative, the DRAFT suggests various methods of reforestation under regeneration (i.e., clearcut) harvest, referencing "standard practices." See the illustrations above as to the effectiveness of "standard practices." Again, the document refers to the Harvest Land Base as a whole and fails to differentiate to accommodate the complexity of various landscapes.

Restrictions to Timber Harvest highlights the weakness of the analysis by repeated citing of "potential" impacts that would change the ASQ.

The overall emphasis on timber harvest within the analysis of Forest Management fails to give the reader a clear view of overall impacts across the landscape. This RMP was

prepared for the entirety of O&C lands in Western Oregon, yet a truly informative presentation would be better served by presenting RMPs for each District.

Hydrology

Having been caretaker of the headwaters of a mountain creek for forty years, this reviewer found the discussion of Hydrology as lacking in scope and the type descriptions never presented an integrated view of water management across our public lands. A future-looking document that does not consider all sources of water makes the DRAFT again a failure. According to a United Nations report our government should be doing everything possible to protect every drop of public water.

"The United Nations reports that we have 15 years to avert a full-blown water crisis and that, by 2030, demand for water will outstrip supply by 40 percent. Five hundred renowned scientists brought together by UN Secretary-General Ban Ki-moon said that our collective abuse of water has caused the earth to enter a "new geologic age," a "planetary transformation" akin to the retreat of the glaciers more than 11,000 years ago. Already, they reported, a majority of the world's population lives within a 30-mile radius of water sources that are badly stressed or running out."

The discussion of Source Water Protection relies solely on BLM lands and fails to take a landscape view that would include consideration of private lands with Source Water.

BLM's analysis and proposed Alternatives presents fixed-width figures for riparian retention, eliminating the more site-specific site tree distances now used. The use of fixed-width figures eliminates the possibility of considering unique characteristics in any harvest unit and restricts the ability to best manage streams.

The discussion of slope stability and road impacts leads this reviewer to conclude that, lacking a Transportation Management Plan, the analysis assumptions are hypothetical at best.

Scenic Amenities

BLM recognizes "Scenic amenities are important to....those who live or work near BLM-administered lands" but concludes this section by considering only increased property values. No analysis of other values is presented.

Cultural Meaning

Limiting the aforementioned amenities to economic value is in conflict with 'The Millennium Ecosystem Assessment defines cultural services as including "nonmaterial benefits people obtain through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (Sarukán and White 2005).' These values are not applied to Scenic Amenities though BLM admits "it is not possible to characterize all aspects of cultural meaning in the monetary language of economics." The DRAFT again shows the limits of its analysis in value by stating "Cultural meaning is perhaps more valuable from an economic perspective than other resources because the resources that have cultural importance are irreplaceable." Non-economic values from "spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" are equally irreplaceable.

Contributions by BLM to Local Economies

A great deal of background information and extrapolated analysis shows the failure of making "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" synonymous. The first dictate of the O&C Act is to manage public lands sustainably for a predictable and stable supply of resources. Only in the second section of the Act is distribution of funds addressed. Much of this analysis assumes that managing resources for money takes precedence, subordinating and failing to address the first mandate of the Act.

SocioEconomic Conclusions for Timber

"With respect to the BLM's impacts, the way the BLM manages timber is by far the number one issue of concern among the communities. The primary concern is economic. The community representatives share a common view that the BLM is party to a worldview that no longer allows for economic use of a (timber) resource that is abundant and renewable." In essence, people feel that BLM should be delivering more money into local coffers while providing more jobs. This was not the view of the 1950's, '60's, '70's or '80's. The yield from BLM lands was rich during those decades and people understandably expected it to remain the same. New information about the total value(s) of forest resources and a failure to maintain sustainability contribute significantly to BLM's inability to meet community expectations. The community views are unlikely to change in the short term and will only change in the near future if BLM clearly explains how they intend to return to economic stability so that the long-term community view of BLM management can again be positive.

Soil Resources

"Until the BLM completes route designations through implementation level planning, the BLM cannot identify which routes would be designated in any alternative." "In this analysis, the BLM assumed that OHV users would operate vehicles consistent with BLM decisions about OHV use." This analysis fails by referencing future action and making an assumption not supported by current realities. Since the impacts to soil from OHV use are well-documented, this DRAFT fails to incorporate appropriate analysis for this topic.

Sustainable Energy

This analysis looks only at biomass as fuel and wind sites for energy generation. Geothermal development is mentioned as having potential but is not fully addressed. Once again the document fails to be future-looking. Failure to consider new and emerging technology shows BLM is not planning for a future of alternative energies (e.g., biodigestion, energy storage), a requisite to address climate change. A singular focus on biomass and leasing sites shows BLM has considered only one form of sustainable energy.

Trails and Travel Management

"The BLM currently has designated a network of trails and travel management areas within the planning area to address particular concerns…" This is not true in the Medford District. Medford Resource Area Manager John Gerritsma, in response to a question from this reviewer, publicly stated that there are "no designated OHV trails" in the Medford District, despite a two-decade history of conflict concerning OHV use.

All of the alternatives state lands "would be limited to existing OHV use until the BLM completed implementation level travel planning." Thus the entire analysis of Trails and Travel Management with regard to OHV use is a de facto No Action Alternative. This is unacceptable to the public who continue to face conflicts with OHVs and is a failure of the document to present analysis required by NEPA that "a range of alternatives" should be presented.

"…recreational OHV use occurs within the existing Timber Mountain OHV area." This is a false statement. No "Timber Mountain OHV" area exists because analysis of the area has not been completed nor a Record of Decision issued. Medford District BLM

continues to promote the area illegally and uses Categorical Exclusions to formalize many trails and staging areas within the proposed area. The only "designation" of a "Timber Mountain OHV area" is 41 characters in the 1995 RMP describing areas "to be managed" for OHV use. No written description was provided in that RMP nor were there any maps showing the 16,880 acres thus "designated." The public never saw a map of the area until 2006 and that map has since changed numerous times. Saying this is an "existing" area is a false statement and renders all discussion therefrom as inaccurate.

The "average road ratios" are unbelievable and biased toward "regeneration harvest" (clearcuts). These unattributed ratios would suggest significant differences in management practices for different types of harvest. If management practices are consistent across the landscape, such differences should not exist.

BLM has, in the past two decades, made permanent many of their forest roads and also some of their harvest roads. Some forest roads contribute to driving for pleasure on public lands while some are blocked by gates. Harvest roads, however, should be temporary in nature and will take from the growing stock if made permanent or not re-planted. The standard in the 1950's and when this reviewer studied forestry in the 1970's was to "rip and re-plant" harvest roads that would provide additional harvest when re-opened. Harvest roads should be designed to both produce timber and be the best choice for future management practices.

Tribal Interests

Treaties made with tribes by the U.S. Government make them independent nations. As landholders within their nations, we must abide by their laws.

Visual Resources Management

The BLM provides no criteria for how Visual Resource Inventory classes are determined. For Visual Resource Management, BLM provides descriptions lacking in detail and emphasizing what activities can take place in these areas. No consideration is given to those visual resources which may exist in small plots (e.g., groves) and/or isolated natural scenic attributes (e.g., waterfall, exceptional trees, shrubs or flowers).

Wildlife

Separating this discussion by species fails to present a unified picture. The Middle Applegate region is the last mid-elevation wildlife corridor in the Medford District, yet little discussion of migratory corridors is contained in this analysis. What discussion does occur is limited to the analysis for a single species and a range of impacts with little discussion of the value of the species to the overall ecosystem or efforts to encourage desired species.

Response to Scoping Comments

This reviewer submitted Scoping Comments for this RMP on July 5, 2012. These comments were accepted without challenge by BLM and must therefore be addressed or an explanation provided as to why they were not addressed in the DRAFT. This DRAFT fails to do so in the following particulars:

"BLM's new RMP should reflect the flexibility to manage for site-specific conditions." This DRAFT categorizes public land into distinct classifications without allowing the flexibility requested.

"Small sales to local loggers for more complete use of timber resources would provide a more stable economic benefit while increasing forest health." While the DRAFT provides information on harvest prescriptions, it is silent on small-scale harvest methods.

"BLM's RMP revisions should contain a clear definition of, and planning for, true sustainability." This DRAFT fails to define inventory appropriately to address the differences between "nondeclining even flow" and "total fiber content." While the draft does provide figures and tables for harvest volume, the information is confused by BLM presumption that 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.'

"BLM must make every effort to coordinate their forestry management plans with neighboring landowners." Reference to activities on neighboring lands in this DRAFT are speculative and do not represent "coordination."

"Maintaining a truly viable landscape across southern Oregon cannot be achieved by creating different types of forests, but by integrating natural biodiversity

across the district." The segmentation of forestry types in the DRAFT fails to provide an integrated view of BLM's management plans.

"Given the increasing values of water resources, BLM should also plan to identify and protect independent springs on their lands. Even small springs promise to become valuable sources of water in the future." The DRAFT discusses hydrology and riparian management based on streams and does not mention independent spring resources.

"Citizens want to know how much a government program will cost. BLM must therefore develop and analyze data showing the cost of implementing programs contained in their RMP, including potential litigation costs. BLM has, in the past, developed planning documents that agency personnel admit will be subject to litigation; such costs should be unacceptable to the agency and to all interested publics. An example of such cost analysis would be to consider the costs of law enforcement necessary to adequately manage recreational activities." Harvest income projections alone are insufficient to address this comment.

"The interests of society must be evaluated separately from purely economic issues." The DRAFT analysis addresses social impacts based on community resiliency in limited studies, but even that is primarily economic based.

"Data such as Values and Lifestyles (VALS) surveys and other social indicators should be developed and evaluated in BLM's planning process." As noted above, the socioeconomic analysis fails to include such data, nor is any reason presented for not doing so.

"Off-road machine recreation areas across the checkerboard pattern of O&C lands directly impact the neighbors of public lands. These impacts must be studied in any BLM planning effort." This DRAFT addresses "conflicts" primarily from the standpoint of other recreational activities. Executive Order 11644 and 43 CFR require "Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors." No analysis of noise and impacts on residential (i.e., populated) lands is included in this DRAFT. The deferral of a TMP for five years and the lack of a definition for "existing roads and trails" means that the documented impact of OHV noise and other issues impacting residential lands will continue unaddressed for half the life of this RMP.

"BLM listed 13 areas within the Medford District for off-road machine recreation emphasis, more than twice as many areas as any other district. Because these areas are located primarily in rural settings, the issue of environmental justice arises." BLM analyzes environmental justice solely from the standpoint of economics without analyzing the value of place. As noted above, the current situation presents an urgent need to conduct additional analysis and move quickly to restore equity to the issue.

"BLM's change from a resource management agency to a multiple-use agency has failed to accommodate societal changes in both information quantity and information delivery systems." This DRAFT fails to analyze public information systems, relying on a formulated list of cooperating agencies. Public workshops held for this DRAFT were the same as past efforts, with small table open Q&A, but no opportunity to publicly address the whole of the issue. If the public does not know the questions being asked, the agendas being pursued, the level of information delivered to the public is so isolated and fragmented as to make any chance of consensus impossible. BLM constantly creates very segmented information internally and presents it to the public with a strictly defined process for action. BLM fails to set up the big tent that includes and involves their full audience, the citizen-owners of the land BLM is charged with maintaining. Extremely large files limit electronic information to a small segment of society. The lack of a citizen review platform eliminates the critical inclusion of full discussion. BLM's public information record fails to be pro-active and fails to provide useful information, yet this was not addressed in the DRAFT.

"BLM's review and analysis for planning purposes should show integrated relationships between the various disciplines (e.g., wildlife, botany, timber management, et al) applied in developing a comprehensive planning document. Failure to show integrated relationships fails to provide the public with complete information necessary to commenting on any DRAFT plans." This is the most obvious failure of the DRAFT.

"BLM should therefore incorporate previous public comments on RMP processes, as applicable, to the current planning process." BLM refers to analysis done for previous RMPs, but does not acknowledge public input from those same RMPs.

"BLM, particularly in the Medford District, has an unfortunate history over the past few decades that reflects an inability to present planning and project proposals to the public in a complete, comprehensive and fully informative manner. " This DRAFT does not qualify as "complete, comprehensive and fully informative".

Conclusions

The only reasonable conclusion to this review is to find that BLM does not have a clear and cohesive plan for managing our public lands. This DRAFT fails to conform to the requirements of the O&C Act by failing to show how BLM will restore these lands to the truly sustainable basis that was lost during the 1960's into the 1990's. The DRAFT fails to show how BLM's management will lead to a stable and predictable supply of resources.

It is disappointing and frustrating that the well-paid public servants who put so many hours into this work have seen it come together in such an uncoordinated way. This reviewer has put in well over 100 hours reading the DRAFT and preparing comments. This DRAFT does a dis-service to both BLM employees and the public they serve.

Substantive Comments

BLM has a policy of not considering testimony it determines is not "substantive." The definition of "substantive" appears arbitrary and capricious and often fails to consider valid considerations from a social or integrated perspective. These Comments to the DRAFT are considered by this reviewer to be substantive in their entirety and in each individual part and any determination by BLM to the contrary must be explained to me in writing. (40 CFR)

[redacted]

[redacted]

Respectfully submitted,

John F. (cka Jack) Duggan

Copies

Secretary of the Interior Sally Jewell
Senator Jeff Merkley
Senator Ron Wyden
Rep. Peter DeFazio
Rep. Greg Walden

Additional copies of these comments have been circulated to a private list held by the reviewer.

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 12:17 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Draft RMP/EIS for Western Oregon

---------- Forwarded message ----------
From: [redacted]
Date: Thu, Aug 20, 2015 at 4:48 PM
Subject: Re: Draft RMP/EIS for Western Oregon
To: [redacted]
Cc: blm_or_rmpwo_comments@blm.gov

Jack and Diane,

This is an ecellent response to the Draft RMP/EIS. As a rockhound and recratinist hat travels to Oregon I concur and support your comments. Your response and comment are well written and to the point addressing the needs of all rokhounds.

Thank you for being the voice or all of us,

Dick and Betty Pankey
****

On Wed, 19 Aug 2015 20:44:30 -0700 "Jack Caufield" [redacted] > writes:

> Thank you for the opportunity to comment on the Draft RMP/EIS.
>
> We have reviewed the draft document and find several areas deficient. While we would normally refer to specific areas of the RMP/EIS in our comments, we find that isn't possible. See the following comments:
>
> 1. The document ignores the needs of those with disabilities and senior citizens. Data is available for 2012 for instate population numbers of those 65 and over, no estimate is made of those with disabilities. We found no estimates of the number of visitors to Oregon from out of state many of whom are senior citizens and/or have disabilities. We need the maximum number of OHV roads for motorized use.
>
> 2. While we did find a few Tables with Rockhounding listed, we found that it was not addressed in the analysis. Many out of state visitors arrive in the dry season to rockhound and attend the many Gem and Mineral Shows in Oregon each year. Many of these shows include rockhounding trips for large groups. Alternate B drastically reduces the number of possible rockhounding sites. They're found all over Western Oregon, not just near the large population centers. We also use the OHV roads to access our collection sites. We also use the OHV roads for sight seeing.
>
> 3. The data used in the alternatives is very confusing for OHV. Only miles of road should be evaluated not acres. Even if alternate B is chosen, the number of OHV miles needs to be increased.
>
> 4.Table 3-126 What is the basis for these numbers? Do they include out of state visitors? All socioeconomic data needs to include visitors, not just the 12 larger population areas.

5. Table 3-127 is based on only 2,265 responses from 12 larger communities in the RMP area. This doesn't represent the population using the BLM areas. Many of these BLM areas get high out of state visitor usage. This table should be eliminated or a better source of data used.

6. We are a good example. We come to Charleston to clam and crab each year while also rockhounding. We go elsewhere in Oregon to go rockhounding other times of the year along with many friends. We both are senior citizens and disabled and can't walk long distances. We spend a considerable amount of money each year in Oregon.

7. While we understand the importance of timberland in the RMP and support it. Recreation is done by the public and that whole section needs to be rewritten and enlarged with more detail, so we can understand what each alternative does. We know that you can use measures from the other alternatives then the chosen one to improve the recreation opportunities. Please do it and include rockhounding. We also fish too.

Jack and Diane Caufield
[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 12:19 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Resource Management Plans for Western Oregon

---------- Forwarded message ----------
From: **il.com** [redacted]
Date: Thu, Aug 20, 2015 at 7:11 PM
Subject: Resource Management Plans for Western Oregon
To: blm_or_rmpwo_comments@blm.gov

Non of the four proposed alternatives are acceptable.

We all know that the 1937 O&C Act specifically states that these 2.5 million acres are to be used for production and production only. None of the alternatives ensure a stream of revenue to the O&C Counties as was intended in the original O&C Act. Nothing in the draft specifically call on the BLM to increase logging on its lands. But the only way for the O&C Counties to get substantially more revenue from federal timber harvests is for the harvests to go up.

I do not think we need any more acres set aside as reserves. The agency is setting itself up for an increase in catastrophic wild fires due to the lack of management on these lands. In the last 20 years, due to lack of management, the fuel loads have increased tenfold, thinning of trees is growing,etc. Possibly an alternative that increases the harvest, through a lighter harvesting on more acres.The ASQ in each of the alternatives is to low. The O&C lands timber stock volume growth is about 1.2 billion board feet. I also feel that the alternatives overestimate the value of recreation-oriented economy created by federal forests in rural Oregon.

I would like to see the Alternative with the highest timber volumes in the WOPR of 2007 back on the table. I realize that plan was thrown out by the courts because the BLM didn't consult sufficiently with the USF&W and NOAH Fisheries. However, I would think that has been done with this Plan and why don't we see that alternative back in the mix.

You all know how productive these lands are, Why don't you do what is right as far as the management of these lands is concerned and set all of the politics aside. You need to be held accountable to what your mission is in regards to these lands.

Thank you for allowing me to comment.

Anna Morrison
Former Lane County Commissioner
[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 12:46 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: RMP Comment
Attachments: RMP Comment-Forestry.docx

---------- Forwarded message ----------
From: **Luke Ruediger** [redacted]
Date: Fri, Aug 21, 2015 at 12:38 AM
Subject: RMP Comment
To: "blm_or_rmpwo_comments@blm.gov" <blm_or_rmpwo_comments@blm.gov>

Attached is my RMP Comment for forestry issues.
Thanks, Luke Ruediger

August 20, 2015
Jerome E. Perez
State Director Washington/Oregon Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Submitted via Email:

RMP Comment: Forestry Issues:

My name is Luke Ruediger, I am a life long resident of Southern Oregon, Having practiced forest restoration and fuel reduction in Southern Oregon and Northern California for 17 years, I have a unique perspective on forest management in the area. I have recently collaborated with the BLM in developing the Community Alternative to the Nedsbar Timber Sale, a community based forestry project proposed by residents of the Applegate Valley and viable timber sale alternative that will be analyzed in the EA as an alternative in the Nedsbar Timber Sale.

I am also an environmental advocate and author. Having published *The Siskiyou Crest: Hikes, History & Ecology*, a natural history and hiking guide for the Siskiyou Mountains, including BLM lands, I also have an intimate knowledge of the remaining wildlands, wildlife populations, rare plants, wild rivers and late seral forests scattered across Southern Oregon.

I have submitted detailed comment for the RMP comment period regarding OHV and recreation management actions proposed in the DEIS. I also submitted an OHV monitoring report created by Klamath Forest Alliance and the Applegate Valley OHV Monitoring Project documenting specific OHV impacts on the Medford District BLM due to irresponsible use by OHV enthusiasts and inadequate management on behalf of the BLM.

I find the BLM interpretation of the O&C Act very troublesome and biased towards timber production. It often feels that the BLM has forgotten that they manage public land for the public benefit, not industrial land for timber production and profits. It seems the BLM sees timber production as the only way they can contribute to the local economy, despite the increasing economic influence and contribution of recreation, tourism, real estate, quality of life concerns, and other economic drivers. Timber is a declining portion of our economy. It does not produce the same number of jobs it once did, nor do these jobs pay as well as they did many years ago. Much of this is due to economic, technological, and internal industry practices, not environmentalists. Simply put, timber is not Oregon's growth industry and it is not a cure to all our economic woes. In fact, continued dependence on timber may be one of the main obstacles to economic sustainability in Oregon. The further dependence on timber for economic revenue will impact other bourgeoning industries. Furthermore, the impact of increased timber production on public lands will put us one step behind other western states as we struggle of economic security. Businesses will locate were the quality of life and recreational experiences are high, property values will respond to scenic and aesthetic values, and tourists will visit those areas that develop their public lands for ecological and scenic qualities.

The O&C Act mandates forest management that supports many important societal values and needs. These mandates include recreation, water quality, regulation of streamflow, wildlife habitat, and contributing to the economic stability of local communities and industries. Yet the BLM seems to manage O&C lands for one dominant resource, timber, at the expense of these other resources, values, and industries. For instance, local rafting, mountain biking, hiking, and other forms of outdoor recreation will be harmed by increased logging. Property values will drop due to aesthetic and scenic impacts, wineries, bed and breakfasts, fishing guides, hunting guides, and other business built around our natural beauty will be impacted. Tourists and new businesses will choose other areas with higher qualities of life to locate and visit. Our water supply and waterways will be impacted in municipal watersheds, on farms, rural areas, recreation areas, on Wild and Scenic Rivers and through urban areas with sedimentation and temperature increases associated with increased logging and road building.

The O&C Act mandates sustainable timber production on a sustained yield basis. The sustainability of logging practices proposed in the RMP is questionable, especially given the uncertainty of climate change, the BLM's computer models, and the ability of the agency and industry to continue mining timber without compromising future timber supply. If sustainability is also defined by maintaining water quality, health forests, characteristic fuel loads, wildlife populations, ESA species and habitat, etc, then the sustainability of proposed logging practices are suspect.

The O&C Act does not mandate that timber be the dominate value or that timber should be the sole contribution of public lands in maintaining economic stability for local communities. In fact, in many situations increased timber production will undermine local communities and their economic stability by harming the industries that are currently creating our economic well-being. Much of the area has made the transition from a timber based economy, having diversified and kept pace with the modern economy. The BLM is asking us to step backwards and embrace the boom and bust cycle of industrial logging, a cycle that has left Oregon and its "timber dependent counties", in ecologic and economic crisis.

The issue of county funding and county services is not inherently tied to timber production. Those counties that have refused to diversify their economy and increase their tax base have irresponsibly managed their resources and are now attempting to hold our public lands and the citizens of their counties hostage. Their lack of accountability and independence has hampered the development of sustainable economies and functioning county governments. Throughout the country counties have found ways to support county services through appropriate taxation and other revenue sources. Why a handful of counties in Oregon cannot make ends meet has more to do with their stubborn insistence that resources extraction on federal lands should pay for their communities.

It is not the role of the federal government to provide basic county services and the vast majority of funding to these dependent, welfare counties, at the expense of public resources, clean water, wildlife habitat, public lands recreational opportunities, and the American people. Public lands are owned by all American citizens and should be managed so that future generations may enjoy clean water, healthy wildlife, ancient forests, and a quality of life that is as high or higher than the one we currently enjoy. The DEIS does not provide any alternatives that meet these needs or protect these resources for future generations. The counties of Oregon need sustainable solutions and diverse

economies rather than the regurgitated mistakes of the past. The timber industry will leave our communities as they did before, taking their profits with them when the timber supply dries up, leaving counties to once again have to revisit funding for basic services. The RMP does not provide economic stability because in my opinion we will be kicking the can down the road of deforestation and environmental collapse. We will be shutting the door on innumerable economic opportunities by putting all our eggs in the timber basket and severely impact the quality of habitat in western Oregon along with our quality of life.

Below are my basic concerns and comments regarding the recommendations and alternatives offered in the DEIS. These concerns are broad and very general. The ability of the public to meaningfully contribute public comment to the 1800 pages of the RMP is minimal. Even with the comment period extension, the very nature of the RMP process precludes meaningful public comment by analyzing the RMP on a scale that makes local site specific concerns largely meaningless. I would recommend that each BLM District create their own RMP with standards and guidelines, land allocations, and recommendations that reflect local influences and the unique needs of regional ecosystems. One management plan for all of western Oregon does not allow the detail or site specific hard look required by NEPA. One management plan for all of western Oregon does not allow for regional solutions and bioregional management that is both adaptive and science based. Public comment would be much more meaningful at this scale and land management activities could be better tailored to address the issues of most concern to a given region, community, and ecosystem. The current process allows for only overly generalized, homogenized approaches and politicized solutions that serve industrial interests rather than the public, who own these lands.

1) Maintain the Applegate Valley Adaptive Management Area (AMA).

The Applegate Valley AMA is an important management designation that has fostered community collaboration and oversight of BLM activities since its inception in the 1994 NW Forest Plan. It has also helped the local community understand the mandates and limitations of the BLM and has encouraged both parties to search for solutions to shared problems and towards shared goals. The community of the Applegate Valley has taken advantage of the designation by creating collaborative capacity and working with the BLM to implement successful public land projects. The AMA has enabled public citizens to develop a sense of place and advocate for region solutions. This is especially important due to the diversity and complexity of habitat conditions in the Applegate Valley.

The community has fostered public participation through the Applegator Newspaper, public meetings, field trips with BLM, and the development of community groups and non-profits such as Applegate Trails Association, Siskiyou Upland Trail Association, Applegate Neighborhood Network, the Nedsbar Community Working Group, the Applegate Partnership, the Applegate Watershed Council, Save our Applegate Valley Environment, Klamath Forest Alliance, KS Wild, etc. The public has proposed viable community alternatives to the Bald Lick Timber Sale, Nedsbar Timber Sale and other collaborative efforts. Community members have been heavily involved in local OHV management and travel management planning, fuel reduction and thinning projects, the Secretarial Pilot Projects, the Williams IVM Project, Sterling Sweeper Timber Sale,

Nedsbar Timber Sale, Bald Lick Timber Sale, maintaining The Sterling Ditch Trail etc. The community has developed an Applegate Valley Fire Plan and has implemented hundreds if not thousands of acres of private land fuel reduction in the Wildland/Urban Interface. The Applegate Valley community is seen as a model for regional/community collaboration and the AMA has played a role in creating that dynamic.

We are told by BLM officials and policy makers that collaboration is the way forward, yet elimination of the AMA designation as proposed in the RMP would be a step backwards in that regard. The AMA is a functional collaborative process that mandates and encourages collaboration between the community, the agency, and private industries. The AMA has promoted innovative solutions to fuel reduction, habitat restoration and light touch timber harvesting practices. The Applegate Valley community has consistently risen to the occasion and has strived to be a model community for the AMA concept.

Support for the AMA in the Applegate Valley is widespread, reaching across nearly all political spectrums, philosophies, and ideologies. The local Forest Service has recently embraced the AMA and plans to revive the collaborative, innovative spirit of adaptive forest management on RR-SNF lands. They have publicly stated this intention at numerous meetings attended by local residents and with a recent article in the Applegator Newspaper. The situation serves to highlight the BLM's lack of commitment to collaboration and community values and is well noted by those who live in the Applegate Valley. Eliminating the AMA will do great harm to the relationship between the BLM and Applegate Valley residents. The action will only add to public mistrust of the agency and a feeling that the land management process is rigged towards industrial interests. The elimination of the AMA will dis-incentivize collaboration and increase litigation by NGO's and local residents. The AMA signifies the agencies willingness to collaborate and include the public in land management decisions. Elimination of the AMA will bring the agencies commitment to collaboration and to our community into question. Without a forum for collaborative processes the community will likely become more oppositional. Without an official voice in the process, the community is likely to focus more on litigation.

The elimination of the AMA would come with grave social consequences and would threaten the progress made since the gridlock of the timber wars. Removing important management designation to reduce transparency, public involvement and oversight may expedite projects, but is not consistent with collaborative land management approach expected in this day and age. The approach will maximize conflict and controversy, while minimizing innovation and un-litigated projects. In so doing we may also shatter the delicate trust created through years of collaborative process.

All alternatives of the RMP should maintain and expand the AMA network building collaborative process into the mandates of the BLM will build trust, encourage transparency, and create more positive outcomes from local land management projects. More specifically, the Applegate Valley AMA should be maintained. The community has invested in this experiment and it is working. We should not be punished for our years of commitment to the AMA. The AMA has helped build collaborative capacity, understanding, and community consensus about land management projects. The potential going forward is immense, that is if the BLM is interested.

2) Maintain riparian buffers on all BLM lands.

The proposal to reduce stream/riparian buffers on BLM lands is misguided and fails to address the needs of aquatic species, functioning riparian areas, large woody debris recruitment, and sensitive terrestrial wildlife that utilize these riparian reserves for dispersal, connectivity, and home range habitat. The decision to reduce streamside buffers is arbitrary and capricious and serves only to increase timber production while impacting many mandates associated with watershed protection and restoration in the NW Forest Plan, O&C Act, Endangered Species Act, Clean Water Act and others.

Riparian buffers have successfully improved water quality and fisheries habitat by increasing streamside shade and large woody debris recruitment since the 1994 Forest Plan. The improvements in water quality have been documented in the 20 year Monitoring Report for the NW Forest Plan.

The agency has admitted in table 3-89 that 275-372 miles of stream would be subjected to increased logging in the RMP. This would make effected streams "susceptible to shade reductions that could affect stream temperatures." Raising stream temperatures directly inhibits BLM watershed management goals and may result in violations of the Clean Water Act associated with TMDL listed-waterbodies. Increased logging in riparian areas will also necessitate increased road density within sensitive riparian habitats including roads within "sediment delivery distance" (DEIS P.317). The BLM did not quantify or analyze the amount of new road construction associated with this increased logging, nor did they quantify the amount of additional sedimentation associated with road construction, logging, and yarding activities.

Numerous important species including the northern spotted owl, pacific fisher, coho salmon, Chinook salmon, steelhead, ring-tail cat, and others benefit from streamside buffers. It has been shown in many scientific studies that northern spotted owl and pacific fisher both spend a disproportionate amount of time nesting, foraging, resting, and dispersing through riparian habitats. These habitats provide connectivity and should be protected. The agency has failed to analyze the impact of reduced streamside buffers on these important aquatic species. The agency has also failed to provide adequate documentation supporting their claim that streamside buffers are not necessary to maintain acceptable water quality standards or endangered fish populations. The analysis lacks information regarding the impact of increased logging within riparian areas and the implication of this logging on water quality, fisheries, terrestrial habitat, and late seral conditions. Impacts associated with reduced stream buffers will disproportionately impact ESA species such as coho salmon and the northern spotted owl, these reductions will also impact candidate species such as the pacific fisher and will contribute to populations declines in local steelhead and Chinook salmon populations. The DEIS did not adequately disclose or analyze these impacts.

3) Maintain Survey and Manage:

Survey and Manage was developed as an integral part of the NW Forest Plan with the intention of reducing the likelihood of species being listed under the ESA. Survey and Manage was implemented to identify sensitive populations and mitigate impacts associated with BLM activities. The program has greatly increased the information available in regards to sensitive species on public lands. It has also helped to identify important habitats and areas for the conservation of sensitive species. The

implementation of Survey and Manage has likely reduced the need for listing numerous sensitive species and encourages biodiversity, connectivity and ecological integrity on public lands.

Abandonment of Survey and Manage will increase extinction rates and reduce small sensitive species buffers that greatly augment habitat connectivity in the highly fragmented landscape of western Oregon BLM lands. The current LSR reserve network is highly fragmented and does not adequately protect species with limited dispersal capabilities. The Survey and Manage program has allowed for conservation of species outside LSR reserves and maintained habitat suitability for many species with limited dispersal capacity. The Survey and Manage program has and will continue to contribute significantly to scientific knowledge regarding sensitive species, this knowledge and understanding is very important in keeping populations viable and off the ESA list.

If the Survey and Manage program is abandoned extinction rates will increase, population declines will increase, scientific knowledge will decline, and habitat will be removed for innumerable rare and sensitive plant and animals species. Increased logging and decreased survey work will lead to widespread losses in sensitive biological communities.

Loss of survey and manage will also impact the local economy by removing numerous local survey jobs from the economy. These jobs provide a livelihood for many individuals, promote public lands conservation and provide for more detailed information and understanding of sensitive species populations on public lands. This is the very sort of employment public dollars and public lands should provide.

These impacts were not disclosed or analyzed in the DEIS. The decision to abandon Survey and Manage is arbitrary and capricious.

4) Maintain Aquatic Conservation Strategy

The ACS has been successful at reducing impacts to streamside habitats, water quality, and fisheries since implementation of the NW Forest Plan. Many important elements of the ACS have been proposed by the BLM to be discontinued including riparian buffers and key watersheds. The ACS has been shown to improve riparian conditions and the agency has shown no evidence that supports their proposal to discontinue ACS management. The proposal serves only one purpose; to increase timber production at the expense of many other important resources. The ACS should be maintained under all action alternatives and protection strengthened to reflect the population declines in coho salmon, northern spotted owl, and the pacific fisher.

5) Maintain Key Watershed designation

The BLM has proposed removing “key watershed” designations in the RMP. The decision to do so is arbitrary and capricious and is not based in the best available science. The key watershed designation was developed in the NW Forest Plan to protect the Coho Salmon from further population declines. The designation was developed before listing of the coho salmon under the Endangered Species Act. With ESA protection it would appear that the Key Watershed designation would be emphasized as a way of protecting important ESA habitat. In fact, given the ESA listing it is recommended that Key Watershed management be re-evaluated to increase stream and fisheries protections. Under no circumstance should Key Watershed designations be removed in the RMP.

On the contrary new management recommendations within Key Watersheds should be considered including 1) No new road development. 2) Reduction in road density in Key Watersheds. 3) Grazing should be eliminated in Key Watershed habitat 4) All ground disturbing activities within Key Watersheds should be analyzed with a NEPA documentation. 5) Key Watersheds should be prioritized for riparian/fisheries restoration projects.

6) Do not re-institute clear-cut/regeneration logging on BLM lands.

Reinstating clear cut/regeneration logging on federal forests in Oregon is a step backwards in many important ways. The proposal to reinitiate clear-cut/regen. harvest serves only one purpose, to increase timber production for private industry. Yet these lands are subject to mandates targeting a variety of important resources and values. Many of these resources would be harmed by increased regeneration logging. Regeneration logging has historically impacted such a wide variety of resources that public opposition is generally very widespread and has been the most controversial land management practice in the Pacific Northwest. Many in the state and across the nation will be outraged to see Oregon heading back into the timber mining practices of the 1950-1980's. Public opposition and protest should be expected if the BLM approves and implements regeneration logging practices on public lands.

Increased regeneration logging, including Variable Retention Regeneration Harvest (VRH) will drastically increase forest fragmentation, degrade complex late seral habitat, increase fuel/fire risks, and reduce habitat connectivity. An increase in regeneration harvest will impact fisheries and streams by increasing sedimentation and water temperature. An increase in VRH would also likely require significant new road construction.

The impact of VRH and Regeneration harvest to NSO, coho salmon, water quality and terrestrial habitat was not adequately analyzed in the DEIS.

Increased regeneration harvest will decrease the quality of life in western Oregon. It will also put us far behind other states in regards to the bourgeoning recreation economy. Regeneration harvest will impact scenic vistas, recreational trails, wildlife habitat and water quality. These impacts will minimize our ability to fully enjoy the economic impact of the outdoor recreation economy. This is very unfortunate and counter productive, especially in portions of the state known for their high quality of life and access to beautiful forest habitat.

Lastly, our current deficit in complex early seral habitat can be easily ameliorated by banning salvage logging in LSR lands and minimizing its scale, scope, and impact in matrix lands. The development of complex early seral habitat could be easily, cheaply, and efficiently created by protecting burned forests from post fire disturbance, logging is not a necessary, appropriate, or equivalent ecological process.

7) Impacts to Spotted Owls

The BLM is claiming in the RMP that northern spotted owl declines have little to do with loss of available late seral and structurally complex forest habitat. This assumption is simply not validated by the best available science. The northern spotted owl is currently declining at alarming rates and swift action must be taken to protect its

habitat. Science has shown that although competition exists between the spotted and barred owl, competition between these two species will increase, as late seral and structurally, complex forest is influenced by increased logging. The problem will be compounded if riparian reserves are reduced, further degrading the preferred habitat of the northern spotted owl. Simply put, science has shown that further fragmentation and late seral habitat degradation will provide an advantage to the barred owl, who can utilize slightly more altered forest habitat.

LSR habitat should be expanded in the RMP. Restrictions on logging quality northern spotted owl habitat should be instituted and the increase in regeneration logging proposed by the BLM should be abandoned.

Currently, habitat fragmentation is limiting connectivity between spotted owl populations in the Klamath Mountains and Cascade Mountains. In numerous places connectivity of habitat has been severed by aggressive logging practices increasing the likelihood of genetic bottleneck, isolation, and extinction. Further increases in public land logging will not serve to restore this connectivity, but will further degrade habitat conditions.

The analysis of northern spotted owl habitat and the implications of increased logging on BLM land is severely flawed and biased towards timber interests. All stands over 80 years old in moist forests and all trees over 80 years old in dry forests should be protected from industrial logging, including heavy commercial thinning. Increased regeneration logging should not be considered due to impacts associated with the northern spotted owl and other "old growth" dependent species.

An issue of particular concern is the proposal of the BLM to increase logging in scope, scale, and intensity throughout dry forests in western Oregon. Recent documentation in the Applegate Valley shows that the BLM has been routinely overcut northern spotted owl habitat, skewing the baseline data and failing to "treat and maintain" habitat elements necessary for the northern spotted owl. Numerous timber sales implemented in the Applegate Valley have badly degraded both NRF and dispersal habitats. The agency must analyze and disclose the impact of this overcutting in FEIS. The agency must also analyze the on the ground results of past timber sales intending to "treat and maintain" NSO habitat. In light of this overcutting it appears that perhaps the commercial timber sale program in the dry, marginal forests like the Applegate Valley and viable northern spotted owl populations could be mutually exclusive. Areas in which overcutting has been documented such as the Applegate Valley may need to be excluded from the current timber base. Maintenance of the Applegate AMA would allow a collaborative, adaptive framework from which the agency and local residents could explore innovative solutions and prescription options, utilizing small timber sales, service contracts and stewardship contracts.

The attempt by the BLM to blame NSO declines solely on barred owl competition is suspect and constitutes an arbitrary and capricious management decision. Habitat must also be protected and maintained.

8) Impacts to Siskiyou Mountain Salamanders

I am concerned that the proposed management of Siskiyou Mountain Salamander (SMS) sites in the RMP DEIS will undermine the current conservation agreement created to keep the salamander from requiring ESA protections. The BLM is a party to this

agreement. Much of this plan was based around existing land allocations pursuant to the NW Forest Plan. The idea was that these land allocations would be a fairly consistent and reliable form of habitat protection of the SMS. Many of the areas identified as high priority sites with high conservation concern are within riparian reserves the BLM is proposing to reduce in width. Likewise the agreement mentions that much of the conservation strategy is based on an assumption that clear cut logging would no longer be practiced on USFS or BLM lands in the region, the BLM is proposing to reinstitute regeneration logging on BLM lands and especially in lands designated as timber production areas or high intensity logging areas.

Page 5 of the SMS 2007 Conservation Agreement and page 5 and 40 of the 2007 Conservation Strategy indicate that "significant changes in Forest Service or BLM land-use allocation within the area of the conservation strategy" must trigger "immediate review of the Conservation Agreement." It appears this threshold would be triggered by implementation of the RMP as outlined in the DEIS and the conservation agreement must be revisited and amended to either reduce logging and ground disturbance impacts or proceed towards listing of the SMS due to new threats from BLM logging that far exceeds the standards of the NW Forest Plan and therefore the assumptions built into the Conservation Agreement and Conservation Strategy for this rare and elusive creature.

SMS sites including all high priority sites should be protected from ground disturbance, canopy reduction, overstory removal, or regeneration logging. Riparian reserves were incorporated into high priority SMS sites and should be retained at least to the extent that they exist today.

9) Impacts to fuels and fire risk

Proposed BLM timber management in the DEIS will increase fire and fuel hazards in western Oregon forests. The proposal to increase even-aged, regeneration harvesting on public lands is irresponsible and will significantly increase fire/fuel hazards throughout western Oregon. Heavy canopy reductions in dry forests and the "skips and gaps" treatments proposed in the RMP will also increase fire hazards, fuels, and fire/fuel management concerns in southern Oregon. The RMP admits that many of the alternatives provided in the DEIS will increase fire and fuel hazards by increasing logging slash, encouraging young age classes less resilient to fire and even-aged forest management. The proposal is contrary to the goals of community safety and forest resiliency, especially given the nature of BLM lands in western Oregon and their proximity to communities and rural homes. Given the cost of fighting fire in this modern era and the threat that fire poses to rural and urban communities in western Oregon, no alternative that increases fire/fuel hazards should be considered. This is, simply put, the largest forest management issue of our time.

The future of our forests, our local timber industry, and many important wildlife species including endangered northern spotted owl and coho salmon may depend on our ability to manage wildfire and fuel hazards in the era of climate change. Many communities will be impacted by increased fuel hazards and fire management concerns due to BLM logging proposals. To knowingly increase fuel hazards in western Oregon is arbitrary and capricious. It is also unjustifiable economically when the cost of wildfire suppression and increased fire severity associated with BLM logging practices are taken into account. Increasing fuel hazards through discretionary management actions and

decisions could be seen for what it is; the abandonment of rural communities and commitment to community protection needs.

Plantations and even-aged forests, filled with "regeneration" and choked with logging slash are the most flammable and dangerous forest fuels, yet the DEIS is proposing an increase in logging practices that promote these conditions. The presence of plantation forests and relatively even-aged forest regenerating from overstory removal, shelterwood harvesting, clearcut/regeneration logging, Variable Retention Regeneration Harvest and heavy commercial thinning can increase fire severity and overstory mortality in wildfire events. Overstory removal and heavy canopy reduction can create shrub response, increasing understory fuels in the years following treatment. This is especially true in the drier, more fire adapted forests of southwestern Oregon. The result is an increase in fuel hazards, including an increase in the density and continuity of live, woody understory fuels. This creates excessive fuel ladders that threaten the remaining forest canopy or retention aggregates. Fine understory fuels will also increase within treated stands following treatment. Logging slash, especially fine, flashy downed woody material will also increase due to proposed logging practices. Both shrub response and increases in fine fuels can be attributed to heavy canopy reduction. The increased sunlight and soil disturbance associated with logging create these results. The subsequent increase sunlight and exposure to drying winds will dry understory fuels, decrease fuel and soil moisture levels, fan the flames of wildfire, and increase drought stress due to impacts to forest canopies and micro-climate. The result will be increased fire severities and extended fire seasons, as well as increased fire severity and decreased community fire safety.

Contrary to industry rhetoric, increased logging across western Oregon will only compound current wildfire concerns. Shortened regeneration logging rotations will only compound the problem even further by encouraging a larger percentage of young age classes and more even-aged, uniform forests that are highly susceptible to fire. With these forest types embedded within and adjacent to late seral forest fragments and LSR reserves increased mortality in late seral forest types would be expected. This has negative implications that were not analyzed in the DEIS. Increased mortality in late seral forest associated with the logging practices and their relationship to fire will negatively impact northern spotted owl, coho salmon, water quality, forest connectivity, wildlife habitat, watershed health, and future wildfire resiliency.

A new emphasis is needed and should be proposed in the FEIS as a viable and reasonable alternative. This alternative should focus on fuel reduction, not canopy reduction, prescribed fire, community protection, and restorative fire management.

10 Habitat Fragmentation

The fragmentation of late seral habitat on forest lands in western Oregon is an issue of serious concern and is impeding the recovery of late seral dependent species such as the northern spotted owl and Pacific Fisher. Fragmentation of forest habitat has also degraded watershed values, fisheries habitat, and water quality. The dispersed logging units of historic public land logging and the proposed increase timber production in the RMP necessitate high density road networks that further compound watershed and fisheries impacts increasing peak flows, sedimentation and stream temperatures. The fragmentation of forested stands also reduces interior late seral habitat for species

needing large undisturbed blocks of late seral forest. Fragmentation of late seral forest also increases fire hazards by embedding young stands of very highly flammable vegetation within a mosaic of older forest types. As fires burn through these young, logged off, regenerating stands and fiber plantations severity often increases leading to high mortality and uncharacteristic fire effects in adjacent late seral forest habitats.

The checkerboard pattern of BLM lands in western Oregon further exacerbates these problems, making the conservation of public lands all that much more important. Every issue analyzed in the FEIS must acknowledge the prevailing management practices on adjacent private industrial forest land and the impact that management has on watershed values, fisheries, ESA habitat, landscape connectivity, and fire resiliency. The lack of available late seral habitat on private industrial forest lands should be mitigated by managing for the retention and development of late seral forest conditions on BLM lands.

Much of the forested landscape at low to mid-elevations in western Oregon has been fragmented and severely altered from historic conditions. The only portion of this landscape capable of providing for the ecosystem services and needs these forests, rivers and streams are known for, are public BLM lands. Land management decision should be made with this reality in mind. Conservation should be the main focus on public land as we can guarantee that private industrial landowners within the O&C checkerboard will not manage their lands for biodiversity, fisheries, ESA habitat, connectivity, water quality, or outdoor recreation. The O&C Act mandates many of these values be managed for on a sustainable basis.

11) Impacts to Pacific Fisher

The Medford District BLM harbors an important native population of Pacific Fisher. This geographic location of the population provides connectivity between the foothills of the Rogue/Applegate/ Illinois River watersheds to the Siskiyou Crest. The Siskiyou Crest is a vital for connectivity between the Northern California and Southern Oregon populations. Together these habitats, in the Klamath and Siskiyou Mountains represent the largest population of native Pacific Fisher on the west coast. The connectivity between these ranges is strongly associated with low elevation BLM forest lands in the Applegate and Little Applegate Valley's. Two connectivity corridors have been identified including one in the Tallowbox Mountain/ Burton/Ninemile LWC. This corridor was identified in the Middle Applegate Watershed Analysis. Another connectivity corridor was identified in the Applegate AMA Ecosystem Assessment in the area north of the Little Applegate River and extending south-west to the Upper Applegate Valley where it meets National Forest lands. The area extends from roughly Owl/Lick Gulch to Boaz Mountain. These corridors were not disclosed, analyzed, or adequately protect in alternatives identified in the DEIS.

The Pacific Fisher will be impacted by increased regeneration harvesting, increased commercial thinning, decreased riparian buffers, abandonment of the ACS, and increased road building proposed in the DEIS. This impact was not adequately analyzed in the DEIS document.

Interestingly, the BLM did not adequately quantify the Pacific Fisher population or the impacts of RMP implementation would have on the Pacific Fisher. Population estimates are available in numerous studies and ESA documents pertaining to the Pacific Fisher. The species is currently a candidate for listing under the ESA and is likely

warranted for protection. The BLM should be managing for the conservation of this species and providing adequate connectivity between populations. Key habitat elements should be protected including large old snags, trees, and forests, intact riparian reserves, large hardwoods, canopy coverage, habitat complexity, adequate downed wood, areas of closed canopy forest, large, block of contiguous late seral forest, and layered forest canopies.

A detailed analysis of the Pacific Fisher, its population, viability, and conservation status under different alternatives is needed in the FEIS. Likewise, management strategies that will encourage its conservation and population viability should be incorporated into all action alternatives. Special emphasis should be placed on creating habitat reserves for the Pacific Fisher in Southwestern Oregon to maintain native populations, genetic diversity, and connectivity between populations. Areas in SW Oregon such as the Siskiyou Mountains, Southern Cascades Mountains, Rogue-Umpqua Divide, Middle Rogue River, Upper Coquille, and Cow Creek watersheds should be particularly emphasized to allow dispersal from the Siskiyou Mountains to the Cascade Mountains and Coast Ranges.

12) Impacts to fisheries

13) Designate all Lands with Wilderness Characteristics (LWC) as Wilderness Study Areas (WSA).

Designation of all LWC as official WSA would provide important interim protection until the matter of Wilderness designation is resolved. This will protect the existing, irreplaceable, wilderness values from management activities that would irreversibly impact their natural and aesthetic values. The additional WSA will create a network of refugia for biodiversity, wildlife habitat, undisturbed plant communities, and help provide connectivity for late seral species, overwintering ungulates, and many other species. In many cases unroaded, relatively intact areas provide a disproportionate amount of habitat for rare plant populations, ESA habitat, breeding and overwintering grounds for game species, and primitive recreational opportunities.

WSA are areas already utilized by the public for wilderness-like experiences. They are also some of the few remaining portions of the landscape that can be managed for the primitive recreational experience. Degrading this experience would constitute an irreversible impact to a very finite resource.

14) Utilize natural wildfire effects for fuel reduction and creation of complex early seral habitat.

Recently, the BLM and others have expressed their concern that our forests are lacking in complex early seral habitat. In fact, our forests have an over-abundance of early seral habitat, but are lacking in habitat complexity and biological legacies. Much of the late seral habitat liquidated in the logging heyday of the 1950's-1980's was so thoroughly devastated and simplified that these early seral habitats are lacking in large downed wood, large standing snags, aggregates or dispersed overstory trees, and other biological legacies characteristic of natural disturbances such as wind, fire, or insect mortality. The majority of this habitat was converted into wood fiber plantations with very little biological complexity, fire resilience or habitat value.

The answer we are told is more logging and the conversion of more late and mid seral habitat into early seral regenerating forest. Yet, this sort of logging is untested and it

is not yet scientifically clear if these logged off landscapes constitute an appropriate surrogate from naturally regenerating, complex early seral habitat.

Although the concept is new to us, nature has been creating this sort of early seral, post fire habitat for thousands and thousands of years. Recently fire regimes in the Klamath-Siskiyou and Southern Cascade Mountains have become more active leading to fire regimes that are more similar to historic disturbance regimes than the fire suppressed landscapes common for the last 50 to 100 years. Much of the BLM landscape in western Oregon was historically effected by mixed severity fire regimes, including patches of high severity fire.

When forested stands are subjected to high severity fire, much of the existing overstory may be killed, but the sites biological legacies are often left relatively intact. This creates habitat complexity, diversity, and resilience by providing habitat and continuity as a new forest develops. This is very important for stand development in the region and provides vital habitat for many important wildlife species. Recent research has highlighted the use of high severity post fire landscapes by the northern spotted owl and Pacific Fisher.

Salvage logging and tree planting efforts following fire create novel landscapes with very few biological legacies, very little habitat complexity, and increased fuel risks when compared to naturally regenerating stands. Salvage logging should be banned within LSR reserves, roadless areas, Wilderness Study Area, riparian areas, and unstable geologic terrain. The concept of salvage logging is fundamentally flawed and does not mimic natural regeneration patterns, reduce fuels, restore historic forest structure, stabilize fire effected watersheds, or recover much of anything beyond timber volumes. Likewise, the ecological forestry concept that complex early seral habitat must be created through Variable Retention Regeneration Harvest is also flawed, because recent wildfires have been creating this sort of habitat in abundance. Unsalvaged, naturally regenerating stands subjected to high severity fire should maintained on the landscape to provide important habitat and stand development functions. These naturally regenerating stands will provide the complex early seral habitat necessary and regeneration logging is not needed.

Natural processes like wildfire are characteristic disturbances that have shaped the forests of western Oregon for millennium. To arrogantly “create” habitat that is already being naturally produced is foolish and has little to no merit. The proportion of the landscape that should be colonized by complex early seral habitat is a controversial topic with little scientific certainty. We may decide to create canopy gaps and swaths of complex early seral habitat in the proportion we deem adequate only to have a fire pick up in the small fragment of older, natural forest remaining. With high winds and low humidity the fire may rip through stands we thinned to make “fire safe” burning a high severity, the cumulative impact of wildfire (which can not be predicted or realistically modeled) and widespread Variable Retention Regeneration Harvest will likely result in significant forest fragmentation, an inbalance in seral stages and age classes, and decreased resilience to fire due to uncharacteristic levels of young, early seral growth.

Logging is not the ecological equivalent to high severity wildfire and salvage logging destroys the natural and biological legacies in post fire landscapes that allow for complex forest regeneration. Variable Retention Regeneration Harvest is simply a clear cut by another name, creating the same types of forest fragmentation, edge effect, and

structural simplification that historic clear cut logging has. The restoration of fire as a process should be a more important goal than the restoration of static structural conditions and reconstructed landscape mosaics based on computer models and theoretical, untested, overly optimistic silvicultural practices that better restore historic timber volumes than historic stand structures and fire regimes.

15) LSR Reserves

Under no circumstance should LSR Reserves be reduces in size, scale, or extent. The connectivity of the LSR system is already compromised by past forest management and the presence of abundant private industrial forest lands within the O&C checkerboard of BLM lands. Current, competition for habitat with barred owls will require the retention of more late seral forest, high quality NSO habitat, and mid seral habitat that will overtime transition into late seral forest. Maintain existing habitat and expanding the available habitat overtime will ensure less competition for remaining habitat suitable for both the NSO and barred owl. Recent research has shown that densely forested riparian areas and other high quality NSO habitats tend to harbor both northern spotted owls and barred owls at higher densities, with less competition than in more marginal habitats.

Fire and insects are also taking a toll on some LSR networks, impacting their functionality and the proportion of late, mid, and early seral habitat. The LSR network was specifically designed to sustain late seral species such as the northern spotted owl, but they were also designed to benefit many diverse species and maintain habitat complexity, connectivity, and resiliency. Many of the species predicted to benefit from LSR establishment are still in decline, thus larger, more contiguous LSR networks may be necessary. The acreage and mosaic of LSR forest must be at a minimum equivalent to historic levels of late seral forest in a given area. These areas should be in turn managed for late seral conditions and protected from regeneration logging, salvage logging, new road building, and any form of land management that does not recover or restore historic conditions, stand structures, and habitat types.

Thank You,

Luke Ruediger

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 12:48 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: RMPs for Western Oregon

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 7:52 AM
Subject: Fwd: RMPs for Western Oregon
To: blm_or_rmpwo_comments@blm.gov

****
Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **David Rogers** [redacted]
Date: Tue, Jun 9, 2015 at 12:03 PM
Subject: RMPs for Western Oregon
To: BLM_OR_RMPs_WesternOregon@blm.gov

Dear Forester,

I will be unable to attend your open house comment period, but would like to express my views in regards to the resource plan that you are developing for our state.

The lands managed by the BLM are valued by Oregonians for clean water, wildlife and recreation. The changes being considered by the BLM have the potential to weaken protections critical for maintaining these values.

- *Western Oregon's Regional Management Plan should be revised based on a regional peer-reviewed science synthesis.* At this time there is no scientific basis for weakening the current framework and standards**. This plan should be *strengthened* by using the best available science** regarding climate change, wildlife habitat needs, and other relevant new information. In response to *climate change*, plans should focus on
    - Reducing environmental stressors like *logging, road building, invasive species, and off-road vehicles*
    - Establishing large continuous blocks of forest for conservation of the Northern spotted owl

- **All mature (80 years and older) and old-growth forests should be off-limits to commercial logging** to protect wildlife habitat and carbon storage.

- Post-fire logging should be prohibited except to improve public safety in the immediate vicinity of roads and recreation areas.
    - Post-disturbance actions should prioritize road decommissioning or road drainage improvements, and suspension of livestock grazing to reduce harm under the increased hydrological stresses expected in post-fire forests.

- **Protecting and restoring *riparian areas and watersheds* should be a major emphasis of the plan revision**, consistent with the BLM's current Aquatic Conservation Strategy. The plans should **not** reduce the size or protective standards of the BLM's Riparian Reserves or Key Watersheds. Instead, the Forest Service should focus on reducing the harmful impacts of old logging roads on streams, water quality, and fish habitat, while maintaining public access to trailheads, campgrounds and day-use areas.

- The BLM should be adopting a **program for protecting sensitive species** which is **based on updated & reliable numerical population data**

- The BLM must take a **hard look at reducing the cumulative impacts of its current road system** on watershed health including water quality and habitat for aquatic and terrestrial wildlife. This could be done by adopting clear standards for reducing road density across all land designations.

- Activities on BLM lands should **minimize greenhouse gas emissions while maximizing carbon storage**
    - During this planning process, the BLM should describe those who would bear any remaining climate-related risks of the chosen alternative;
    - And clearly justify the chosen alternative by weighing the expected climate risks against the benefits of harvesting timber.

In closing, Please reconsider the impact that the current proposal would have for habitat and long range environmental impact and use realistic scientific data to substantiate future planning.

Sincerely,

David Rogers
[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 12:49 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Testimony/comments on the 2015 BLM RMP for O&C Lands

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 7:56 AM
Subject: Fwd: Testimony/comments on the 2015 BLM RMP for O&C Lands
To: blm_or_rmpwo_comments@blm.gov

****
Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **Hal Anthony** [redacted]
Date: Thu, Jun 18, 2015 at 1:23 PM
Subject: Testimony/comments on the 2015 BLM RMP for O&C Lands
To: BLM_OR_RMPs_WesternOregon@blm.gov
Cc: "Hal B. Anthony" [redacted]

Testimony/comments from Hal B. Anthony for the 2015 BLM RMP for O&C Lands:

Firstly, the current BLM data for recreation is incorrect. BLM claims that hang gliding in southern Oregon is a more popular use than the multitude of rafters, private boats, tour boats, fishing boats and swimmers using the Rogue River during the summer, not to mention the fleets of for-hire drift boats and crowds of shore fishermen that use the Rogue River during salmon runs. With only one hang gliding site in the entire SW Oregon, this BLM data about hang gliding is physically not even possible, completely misleads the public, and is impossibly disconnected with the regions real-time, factual recreation activities.

> It also disregards the swimming hole at Illinois River Forks State Park and the fact that 2,000 vehicles pack into the wild and scenic Illinois River below Selma every day during the summer.
>
> If these incorrect recreation demand numbers are retained in the RMP, they will lock in FALSE DATA about hang gliding as the top priority for funding and development, leaving water recreation, hiking, and other recreational activities squished into low priority. It would leave the RMP telling managers that the top priority is hang gliding! Please make a note to correct this data, before the media gets wind of it.

Secondly, I support the Natural Selection Alternative (NSA), in which tree extraction will occur where past tree extraction has occurred so that young natural community ecosystems will evolve to late successional natural community ecosystems. Optimal green plant productivity would be retained across the landscape by extracting only the dead and dying, conditional upon meeting other species needs. To extract sustainably, humans must protect and retain the water, soil, food, shelter, habitat, and reproduction and biotic recycling needs for naturally evolved species in each strata of ecosystem composition.

Further, it is a fact to the BLM, the scientific community, and the world that we need ecosystems to function worldwide for human beings to survive; and a funtioning ecosystem cannot be healthy without good soil. Since the forests provide their own soil, duff, and nutrients completely when left untouched; and since allowing this continuous food supply falling down to decompose into ecosystem nutrients lets the forest canopy grow and fill in, there becomes an eradication of light-produced fire hazard plant life and ladder fuels under the canopy. This trend continues as the ecosystem ages, diminishing scrub and dry brush growth until they disappear nearly completely. This process lets nature do the fireproofing work, and is accomplished by implimenting the NSA. The NSA meets all the goals of the BLM, with the only potential barrier being the time needed for the forest to grow itself into the more mature, firesafe mode. But the overall cost savings would be incalculable, and they would provide investment return immediately in property equities, water retention, tourism, fishing, etc. et al to values equaling or surpassing current levels, while also retaining these investments annually (see economist Ernie Nieme's data here http://pacificrivers.org/o-c-economic-analysis).

I don't believe the BLM is meeting its obligations under the Federal Land Policy and Management Act (FLPMA) of 1976, which "...requires public lands and resources to be managed under the principles of multiple use and sustained yield, without impairment of the productivity of the land and the quality of the environment...".The direction you are taking the current RMP, as indicated by the "misleading" hang gliding information mentioned above, is a perfect example of BLM's continuing failure to comply with the FLPMA directives in your own guidelines, but this failure is obvious throughout SW Oregon forests which BLM manages, as well. Mono-culture pine plantations do not even comprise an ecosystem, let alone a healthy one.

The Government Accountability Office included the Bureau of Land Management on its 2015 High Risk list for fraud, waste, abuse, and mismanagement due to how it collects its share of revenue from oil and gas produced

on public lands. Based on the false data for hang gliding, I hope the BLM will actually read these 2015 RMP citizen inputs and incorporate them intelligently into the new RMP. We are overdue in acting with wisdom regarding our dwindling carbon sinks. We owe it to ourselves, the world, and primarily to our children to reach the healthy, cost-saving, fire-reducing decisions that will provide a future of resources for them. Only sustainable actions can do that.

You are asking for public input, and so far to my knowledge have not been factoring it efficiently into your equations in ways that benefit our ecosystems and environment for the betterment of kids and future uses to come. Think soils, think water retention, think storm buffering, think beauty combined with property values, think tourism and hiking, think why people want to visit and live in SW Oregon! And don't forget to think soils, healthy, fertilized forest floors that close their canopies and make forests more fire safe than the tinder-setting programs currently being implimented by the BLM in Southwest Oregon.

Thank you for incorporating my comments for the BLM's 2015 RMP.

Respectfully,

Hal B. Anthony
[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 1:07 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Comments on Western Oregon RMP
Attachments: D_King comments Draft_RMP_EIS_Western_Oregon.docx; Ülo Niinemets and Fernando Valladares.docx

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 8:25 AM
Subject: Fwd: Comments on Western Oregon RMP
To: BLM_OR RMPWO_Comments <blm_or_rmpwo_comments@blm.gov>

****
Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **King, David A** [redacted]
Date: Mon, Jul 13, 2015 at 10:49 AM
Subject: Comments on Western Oregon RMP

To: BLM_OR_RMPs_WesternOregon@blm.gov

Dear BLM Planners,

Here are my comments on your Draft RMP/EIS for Western Oregon and also one of the references cited therein for your convenience.

Thank you for the opportunity to comment on this document.

David A. King
[redacted]

This EIS comprehensively addresses the challenging subject of how different management approaches would affect the variety of resources and social outcomes that the BLM is tasked to manage – over a 50 or 100-year period. The many sections provide helpful background information on the issues involved and are clearly the result of much effort by the authors of this report. One of the positive aspects of the report is its emphasis on past and future monitoring of resources, both in identifying what needs fixing and in assessing the need for future adjustments to the plan.

My comments are as follows:

1. A synthesis section is needed. There is no synthesis of the findings described in the many sections. I found no explanation of how the preferred alternative best meets the overall management objectives. There should be a discussion of the tradeoff between logging some BLM lands to provide funds to County governments and some regional employment and meeting the other objectives of the Plan. For example, there is a tradeoff between maximizing timber sale bid prices (per board foot sold) by minimizing regulations on logging procedures vs. protecting soil, aquatic and other ecological resources by requiring low-impact logging – which would increase expenses per board foot logged, thereby reducing bid prices.

There is also a tradeoff between dense replanting of Douglas-fir on the west-side lands and the quality and duration of the early-seral stage, as noted below. The value of BLM lands for maintaining biotic and structural diversity in a matrix dominated by monoculture plantations could also be noted in the synthesis section.

2. The forest management section gives no information on how reforestation of logged areas would be achieved. The method of reforestation affects the quality and duration of the early-seral stage that provides vital habitat for certain plants and wildlife. Early-seral acreages are listed for the alternatives, but no clear definition is given of this stage. Is it the time before planted conifers form a closed canopy? There is much early-seral habitat on adjacent private lands, but this may be of low quality, especially where herbicides are used to increase the growth rates of young Douglas-firs. Some mention of how reforestation would be achieved is essential if we are to judge how the Plan would serve the requirements of species other than timber trees. Relying on natural regeneration would likely increase the quality and duration of the early-seral stage and result in greater biotic diversity than planting a single timber tree, such as Douglas-fir – though the best course for promoting a robust early-seral stage will undoubtedly vary between sites. There are lots of young Douglas-fir plantations across western Oregon, so a different tact on BLM lands would increase regional biotic and structural diversity.

There is also no mention of which tree species and shrubs would be preferentially left in partial harvests. In the typical coniferous forests of western Oregon, trees and shrubs producing nuts or fleshy fruits are generally uncommon or unproductive due to shading, especially in industrial plantations. Such woody broadleaved plants

provide food for much wildlife – and even people. Preferentially leaving drought tolerant species may be a wise precaution, regarding the impending shift of climate into uncharted territory (see below).

3. I appreciated your recognition of climate change as a major factor to be dealt with and your review of climate change studies applicable to western Oregon. However, your description of regional climates on p. 142 is oversimplified. The coastal fringe is strongly maritime due to frequent summer fogs, but nearly all BLM lands are more than 10 miles inland (beyond the Sitka spruce belt) and can experience extreme summer drought. I would classify the western Oregon BLM lands as generally Mediterranean (high winter and low summer precipitation) but with substantial variation in drought severity. Although it may be moist on average, the north coast range experiences periods of extreme fire danger, albeit less frequently than interior areas of SW Oregon. Fire danger is currently (as of early July) very high in the north coast range.

The estimates of climate change vulnerability in Table 3-24 are of interest, though uncertain given the uncertainties in future climate and little experimental evidence on how forests would actually respond to rapid regional climate change of the magnitude envisioned, including a doubling of CO2 levels. Perhaps the most immediate threat is widespread death of existing trees due to periods of extreme drought and heat in combination with insect/pathogen attacks. Drought-tolerant species should be less vulnerable to such a threat, i.e., ponderosa pine, western juniper, incense cedar, Oregon white oak, madrone and chinkapin. Incense cedar may also be more fire resistant than Douglas-fir (Chris Dunn, OSU School of Forestry 2015 thesis defense). See the online appendix of Niinemets and Valladares (2006) for drought tolerance ratings for 800+ temperate northern hemisphere tree species, including nearly all of those of Table 3-24. I suggest that you include these tolerance ratings in this table, as they are likely more certain than the vulnerability ratings.

Regarding the recommended actions to deal with climate change given on p. 158, the long-term study of thinning effects by D'Amato et al. (2013) found that thinning young stands initially increased their drought resistance, but that this effect disappeared or was reversed some decades later. The study was done in the Great Lakes area, which typically receives substantial summer rain, and the degree to which its conclusions apply to western Oregon is uncertain. Nonetheless, it suggests caution in concluding that thinning will necessarily increase drought resistance in the long term.

Note that there seems to be an error in Fig. 3-29: The increase in annual min temperature for the Willamette Basin is too high. It should be the average of the four seasonal values shown in the figure.

4. The EIS treats landslide dangers in the section on hydrology, but does not consider a major landslide trigger; a magnitude 8+ earthquake on the Cascadia fault that appears likely during this century. Summarizing current knowledge of

earthquake risks, Olsen et al. (2015) state on p. 28 that "Oregon also experiences high seismicity. As an example, the Scott Mills (M 5.6) earthquake, a shallow, crustal earthquake, resulted in $30 million in damages. However, the most severe earthquakes in Oregon are derived from Cascadia subduction zone (CSZ), which is a convergent plate boundary extending from Vancouver Island to northern California (James et al. 2000). The CSZ has resulted in powerful earthquakes, which have occurred at least 40 times over the last 10,000 years, ranging from magnitude ~8 to ~9. Geologists estimate that the probability that a CSZ earthquake will occur in the next 50 years ranges from about 7 – 15% for a magnitude 8.7 to 9.3 earthquake affecting the entire Pacific Northwest to **about 37% for a magnitude 8.3 to 8.6 earthquake affecting southern Oregon** (OSSPAC 2013)." The last substantive Cascadia subduction zone earthquake was in January, 1700, with a magnitude of ~9.

Olsen et al. (2015) provide an extensive risk analysis of seismically generated landslides that should be consulted. A more conservative approach to road building and soil disturbance in the Coast Range – particularly in southern Oregon may be prudent. Given the gravity of the risk, discussion of potential earthquake effects is warranted.

5. The section on invasive species should mention the major threat to North American ash trees posed by the emerald ash borer, which has nearly eliminated ashes in parts of the East and Midwest. To my knowledge, this insect hasn't yet appeared in western Oregon, but my understanding is that all ash species are more or less vulnerable – even those in regions from which the borer came, which would be decimated but for natural enemies that keep the borer in check.

This section should also note that there is a new introduced pathogen that is killing chinkapins, particularly those near roads (Saavedra, Hansen and Goheen 2007). As this tree is one of the few nut-bearing species in western Oregon and is threatened by Sudden Oak Death over its southerly range, management practices should be adjusted to reduce introduction of this new pathogen to areas where chinkapin is frequent.

6. I was pleased to see that the BLM lands within 10 miles or so of Alsea Falls were nearly all designated as late successional reserves in your preferred alternative B, as this area contains a diversity of impressive trees, of both large diameter in the case of Douglas fir and impressive heights for this and other species. In searching these lands for the tallest specimens, I've found impressive heights for the following species, all on BLM lands within 7 miles of Alsea Falls:

Species	Maximum height (ft.)
Douglas-fir	288
Western hemlock	220
Western redcedar	218
Western yew	65
Big leaf maple	162

Red alder	146
Chinkapin	115
Bitter cherry	104
Pacific dogwood	73

The heights for the maple and alder are the greatest known among the few hunters of tall trees in the west coast region – pending new discoveries. Taller trees of these species undoubtedly exist on other BLM lands and the above listed finds have been quite serendipitous. Trees of great height are but one of the remarkable features to be discovered on these less-explored BLM lands.

To the south of Alsea Falls, in northernmost Lane county are some recently thinned forests with a substantive chinkapin component, mainly on south-facing slopes. These chinkapins may persist over much of this century, due to the removal of many of the second-growth Douglas-firs that would otherwise overtop them. Reserving such forests may allow this drought-tolerant, nut-bearing species to flourish.

References

D' Amato, A.W., J.B. Bradford, S. Fraver, and B.J. Palik. 2013. Effects of thinning on drought vulnerability and climate response in north temperate forest ecosystems. Ecological Applications 23, 1735-1742.

iinemets, ., and F. alladares. 2006. Tolerance to shade, drought, and waterlogging of temperate northern hemisphere trees and shrubs. cological Monographs 76: 521-547.

Olsen, M.J. et al. 2015. Impacts of potential seismic landslides on lifeline corridors. Final Report SPR 740 Available at http://www.oregon.gov/ODOT/TD/TP_RES/docs/Reports/2015/SPR740SeismicLandslides.pdf

Saavedra, A., E.M. Hansen, and D.J. Goheen. 2007. *Phytophthora cambivora* in Oregon and its pathogenicit to *Chrysolepis chrysophylla*. Forest Patholog 37, 40 -41 .

Thank you for the opportunity to comment on this draft resource management plan for Western Oregon.

David King

[redacted]

Ülo Niinemets and Fernando Valladares. 2006. Tolerance to shade, drought, and waterlogging of temperate Northern Hemisphere trees and shrubs. *Ecological Monographs* 76:521–547.

Appendix A. Shade, drought, and waterlogging tolerance for 806 species of wood plants from the temperate orthern hemisphere. As explained in the main article and Appendix B, tolerance scales range from 0 no tolerance to 5 maximal tolerance . Standard errors S are provided for tolerance estimates derived from two or more data sources. The region of origin and foliage physiognomy (logical fields, Y/N, "Evergreen" and "Gymnosperm") of each species are also shown. Two columns for the region of species origin are necessar to classif species that are native in two continents and for intercontinental h brids Data set1 and Data set 2 . Species nomenclature follows the latest version of W 3TROP COS database Missouri Botanical arden 2005 along with the Flora of China Chec list http://mobot.mobot.org/W3T/Search/foc.html . Microspecies that had been grouped together in the current anal sis as aggregate species are also highlighted (logical field, Y/N, "Aggregate species").

Species	Aggregate species	Data set 1	Data set 2	Evergreen	Gymnosperm	Shade tolerance	Drought tolerance	Waterlogging tolerance
Abelia × grandiflora (A. chinesis × A. uniflora)		ast Asia	ast Asia			3.5	2	1
Abies alba		urope	urope			4.6 0.06	1.81 0.28	1.02 0.02
Abies amabilis		orth America	orth America			4.21 0.37	0.83 0.17	1
Abies balsamea		orth America	orth America			5.01 0.0	1	2
Abies concolor		orth America	orth America			4.33 0.28	1. 1 0.12	1.02 0.02
Abies firma		ast Asia	ast Asia			4.5	3	1
Abies fraseri		orth America	orth America			5 0	2	2
Abies grandis		orth America	orth America			4.01 0.1	2.33 0.33	1.57 0.3
Abies homolepis		ast Asia	ast Asia			4.5	2.5 0.5	1.5
Abies lasiocarpa		orth	orth			4.83 0.15	2.02 0.02	0. 7 0.04

		America	America					
Abies magnifica		orth America	orth America			3.5 0.22	0.67 0.33	1
Abies mariesii		ast Asia	ast Asia			5	2	2 0.5
Abies nordmanniana		urope	urope			4.5	1	1.5
Abies procera		orth America	orth America			2.45 0.42	2.5	1
Abies sibirica		ast Asia	ast Asia			4.0 0.32	1.41 0.15	1.57 0.16
Abies veitchii		ast Asia	ast Asia			4.5	2.5 0.5	2 0
Acacia rigidula		orth America	orth America			1	5	1
Acer barbatum		orth America	orth America			4.5	2.5 0.5	1
Acer buergerianum		ast Asia	ast Asia			3	2.75	1.53
Acer campestre		urope	urope			3.18 0.14	2. 3 0.32	1.8 0.18
Acer carpinfolium		ast Asia	ast Asia			3.5	1	1.5
Acer circinatum		orth America	orth America			4.75 0.25	2	1
Acer ginnala		ast Asia	ast Asia			3 0	2.88 0.12	1.27 0.27
Acer glabrum		orth America	orth America			3.3 0.3	2.88 0.12	1.27 0.27
Acer grandidentatum		orth America	orth America			3 0	2.63 0.13	1.27 0.27
Acer griseum		ast Asia	ast Asia			3 0	1.53	1.53
Acer macrophyllum		orth America	orth America			4.14 0.14	2	2
Acer mono		ast Asia	ast Asia			4.25 0.25	2.67 0.33	1.5 0.5
Acer monspessulanum		urope	urope			2.66 0	4.31 0.41	1.04
Acer negundo		orth America	orth America			3.47 0.1	3.03 0.82	2.75 0.25
Acer nigrum		orth America	orth America			3 0	3.35 0.35	1.52 0.48
Acer opalus		urope	urope			3.48 0.1	3.72 0.17	1.04
Acer palmatum		ast Asia	ast Asia			4.1 0.31	1.77 0.23	1.52 0.4

Acer pensylvanicum		orth America	orth America			3.56 0.44	2	1
Acer platanoides		urope	urope			4.2 0.37	2.73 0.16	1.46 0.23
Acer pseudoplatanus		urope	urope			3.73 0.21	2.75 0.16	1.1 0.08
Acer rubrum		orth America	orth America			3.44 0.23	1.84 0.16	3.08 0.28
Acer saccharinum		orth America	orth America			3.6 0.31	2.88 0.12	3.37 0.22
Acer saccharum		orth America	orth America			4.76 0.11	2.25 0.25	1.0 0.08
Acer spicatum		orth America	orth America			3.31 0.1	2	2
Acer tataricum		urope	urope			3.48	3.37 0.32	1.47 0.06
Acer truncatum		ast Asia	ast Asia			3	2.75	1.53
Aesculus californica		orth America	orth America			2.5 0.5	2.88 0.12	1.77 0.23
Aesculus flava		orth America	orth America			4.14 0.14	2	1.12 0.12
Aesculus glabra		orth America	orth America			3.4 0.3	2.88 0.12	1.27 0.27
Aesculus hippocastanum		urope	urope			3.43 0.27	2.82 0.15	1.3 0.17
Aesculus pavia		orth America	orth America			4	2 0	2
Aesculus sylvatica		orth America	orth America			3.56 0.44	2	2
Aesculus turbinata		ast Asia	ast Asia			3.5 0.2	2.17 0.17	3 0
Aesculus × carnea (A. hippocastaneum × A. pavia)		orth America	urope			3	2.75	1.53
Ailanthus altissima		ast Asia	ast Asia			2.44 0.44	2. 6 0.12	1.52 0.27
Alangium platanifolium		ast Asia	ast Asia			3.0 0.42	2.5 0.5	1.5 0.5
Albizia julibrissin		ast Asia	ast Asia			1.17 0.17	4.47 0.47	1.52 0.48
Alnus formosana		ast Asia	ast Asia			2.5	2.5	2.5
Alnus glutinosa		urope	urope			2.71 0.5	2.22 0.66	3. 0.2
Alnus hirsuta		ast Asia	ast Asia			1.25 0.25	2.5 0.5	2.67 0.33

Alnus incana		urope	urope			2.3 0.25	1.8 0.2	2.84 0.34
Alnus incana ssp. rugosa		orth America	orth America			1	2	2.85 0.25
Alnus incana ssp. tenuifolia		orth America	orth America			1.5 0.5	2.03 0.03	3.18 0.18
Alnus japonica		ast Asia	ast Asia			1.5 0.5	2	4 0
Alnus maximowiczii		ast Asia	ast Asia			1 0	2	3
Alnus metoporina		orth America	orth America			1	2	3
Alnus oblongifolia		orth America	orth America			1	1	3
Alnus pendula		ast Asia	ast Asia			1.42 0.0	2	3
Alnus rhombifolia		orth America	orth America			1.5	1	3.5
Alnus rubra		orth America	orth America			1.83 0.21	2.5	2.56 0.72
Alnus sieboldiana		ast Asia	ast Asia			1.5 0.5	1.75 0.25	3 0
Alnus viridis		urope	urope			1.84 0.0	2.48 0.27	2.66 0.52
Alnus viridis ssp. sinuata		orth America	orth America			1.5	2	3
Amelanchier alnifolia		orth America	orth America			3 0	2.88 0.12	1.02 0.02
Amelanchier arborea		orth America	orth America			4.33 0.33	2.38 0.38	3.5 0.5
Amelanchier canadensis		orth America	orth America			2.86 0.14	2.52 0.52	1.3 0.3
Amelanchier laevis		orth America	orth America			3.06 0.06	3	3
Amelanchier ovalis		urope	urope			1. 3	4.72	2.5
Amelanchier utahensis		orth America	orth America			2.5 0.5	4.47 0.47	1.02 0.02
Andromeda polifolia		urope	orth America			1.2	0.53	4.27
Aralia elata		ast Asia	ast Asia			1.67 0.17	3	1

Aralia spinosa		orth America	orth America			1.25 0.25	4	2
Arbutus menziesii		orth America	orth America			3.32 0.34	3.83 0.17	1
Arbutus unedo		urope	urope			2.66	3.	1.04
Arctostaphylos alpina		urope	orth America			1. 3 0	2.62 0.42	2.5
Arctostaphylos uva ursi		urope	orth America			1. 3 0	3.88 0.84	2.5
Ardisia sieboldii		ast Asia	ast Asia			4	2	1.5
Asimina triloba		orth America	orth America			3. 5 0.05	2	1.37 0.13
Aucuba japonica		ast Asia	ast Asia			4.5 0	3	1.5 0.5
Berberis amurensis		ast Asia	ast Asia			1.75 0.25	3	1.75 0.25
Berberis thunbergii		ast Asia	ast Asia			1.5	3.5	1.5 0.5
Berberis vulgaris		urope	urope			1. 3	3.88	1.32 0.28
Betula alleghaniensis		orth America	orth America			3.17 0.16	3	2
Betula apoiensis		ast Asia	ast Asia			1 0	2	2
Betula ermanii		ast Asia	ast Asia			1.25 0.25	2	1.75 0.25
Betula grossa		ast Asia	ast Asia			1.5	2	1.5
Betula humilis		urope	urope			1. 3	0.53	4.27
Betula lenta		orth America	orth America			2.58 0.28	3	1
Betula maximowicziana		ast Asia	ast Asia			1.25 0.25	1.57	1.25 0.25
Betula nana		urope	orth America			1.56 0.1	0.11 0.42	4.27
Betula nigra		orth America	orth America			1.45 0.1	1.53 0.2	2.85 0.35
Betula occidentalis		orth America	orth America			3.28 0.55	1.27 0.27	2.63 0.37
Betula papyrifera		orth America	orth America			1.54 0.16	2.02 0.3	1.25 0.15
Betula pendula		urope	urope			2.03 0.0	1.85 0.21	1.67 0.12

Betula platyphylla		ast Asia	ast Asia			1.25 0.25	2.5	1.83 0.17
Betula populifolia		orth America	orth America			1.5 0.5	2.34 0.22	1
Betula pubescens		urope	urope			1.85 0.07	1.27 0.18	2. 8 0.21
Betula pubescens ssp. carpatica		urope	urope			1.2	2.21	1.04
Broussonetia kazinoki		ast Asia	ast Asia			1.5	4	1.5
Buddleja davidii		ast Asia	ast Asia			1.56 0.1	3.46 0.42	1.04
Buxus sempervirens		urope	urope			4.05 0.13	3.88 0	1.04
Calluna vulgaris		urope	urope			1.56 0.1	2.21	3.1
Calocedrus decurrens		orth America	orth America			3.21 0.53	3.7 0.11	1.27 0.27
Camellia japonica		ast Asia	ast Asia			4 0.2	2	1 0
Caragana arborescens		ast Asia	ast Asia			1.5	4	1
Caragana frutex		urope	urope			1.5	2.5	1
Carpinus betulus		urope	urope			3. 7 0.12	2.66 0.16	1.65 0.06
Carpinus caroliniana		orth America	orth America			4.58 0.21	2.02 0.02	2.3 0.5
Carpinus cordata		ast Asia	ast Asia			3.5 0	2	2.5 0.5
Carpinus laxiflora		ast Asia	ast Asia			3 0.2	2	2
Carpinus tschonoskii		ast Asia	ast Asia			2.83 0.44	3	1.5
Carya aquatica		orth America	orth America			2. 5	2 0	4.25 0.22
Carya cordiformis		orth America	orth America			2.07 0.07	4	2.5 0.5
Carya glabra		orth America	orth America			2.6 0.35	4 0	1.16 0.08
Carya illinoiensis		orth America	orth America			1.74 0.26	2	2. 8 0.45
Carya laciniosa		orth America	orth America			4.42	2	1.48 0.36
Carya myristiciformis		orth America	orth America			3.71 0.71	2	2
Carya ovata		orth America	orth America			3.4 0.2	3	1.38 0.08

Carya pallida		orth America	orth America			1.56	4	1
Carya tomentosa		orth America	orth America			2.2 0.48	3	1.26 0.11
Castanea crenata		ast Asia	ast Asia			3	2.5	1
Castanea dentata		orth America	orth America			3.06 0.06	3	1
Castanea mollissima		ast Asia	ast Asia			1.67 0.33	2.63 0.13	1.27 0.27
Castanea pumila		orth America	orth America			2.5	4	1
Castanea sativa		urope	urope			3.15 0.23	3.46 0.18	1.32 0.28
Castanopsis cuspidata		ast Asia	ast Asia			4.07 0.23	2.5 0.5	2
Castanopsis eyrei		ast Asia	ast Asia			3	3	1.5
Castanopsis lamontii		ast Asia	ast Asia			4	2	2
Castanopsis sieboldii		ast Asia	ast Asia			4 0.2	3	2
Catalpa bignonioides		orth America	orth America			2.67 0.33	2.58 0.3	1.27 0.27
Catalpa speciosa		orth America	orth America			2.33 0.33	4.22 0.35	1.27 0.27
Cedrus deodara		ast Asia	ast Asia			2.5 0.41	3.85 0.15	1.02 0.02
Cedrus libani		urope	urope			1.35	2.75	1.03
Celtis laevigata		orth America	orth America			3.31 0.58	3.56 0.3	2.73 0.27
Celtis occidentalis		orth America	orth America			3.17 0.17	3.85 0.15	2.65 0.16
Celtis tenuifolia		orth America	orth America			1.56	4	1
Cephalanthus occidentalis		orth America	orth America			2.75 1.25	3	4. 2 0.08
Cercidiphyllum japonicum		ast Asia	ast Asia			2.34 0.34	1.53	2.14 0.37
Cercis canadensis		orth America	orth America			3 0	4.05 0.4	1.31 0.0
Cercis occidentalis		orth America	orth America			2.0 0.0	3.35 0.35	1.03

Cercocarpus ledifolius		orth America	orth America			1.35	4. 7 0.03	1.27 0.27
Chamaecyparis lawsoniana		orth America	orth America			3.67 0.38	2.06 0.58	1.02 0.02
Chamaecyparis nootkatensis		orth America	orth America			4.15 0.32	2	1. 0.1
Chamaecyparis obtusa		ast Asia	ast Asia			4.38 0.13	2.88 0.13	1.52 0.4
Chamaecyparis thyoides		orth America	orth America			3.5 0.18	1 0	4.04 0.54
Chamaecytisus ratisbonensis		urope	urope			2.66	3.88	1.04
Chamaecytisus supinus		urope	urope			1. 3	4.72	1.04
Chamaedaphne calyculata		urope	orth America			1. 3	0.53	4.27
Chamaespartium sagittale		urope	urope			1.2	3.88	1.04
Chilopsis linearis		orth America	orth America			1.67 0.33	3.85 0.15	1.27 0.27
Chimaphila umbellata		urope	orth America			3.38	3.88	1.77
Chionanthus virginicus		orth America	orth America			3.83 0.83	2.42 0.22	1.51 0.2
Chrysoplepis chrysophylla		orth America	orth America			3	4	1
Cinnamomum camphora		ast Asia	ast Asia			3.5 0.2	2.75 0.25	1.5
Citrus limon		ast Asia	ast Asia			2	3	1
Citrus sinensis		ast Asia	ast Asia			2	4	1
Citrus × paradisi (C. maxima × C. sinensis)		ast Asia	ast Asia			2	3	1
Cladrastis lutea		orth America	orth America			3	2.88 0.12	1.02 0.02
Clematis alpina		urope	urope			3.38	3.04	1.04
Clerodendrum trichotomum		ast Asia	ast Asia			1.33 0.33	3	2
Clethra alnifolia		orth America	orth America			3	2	3.5 0.5
Clethra barbinervis		ast Asia	ast Asia			2	2.75 0.75	2.75 0.25
Cleyera japonica		ast Asia	ast Asia			3.5 0.2	2	1.75 0.25

Colutea arborescens		urope	urope			3.38	3.88	1.02 0.02
Cornus alternifolia		orth America	orth America			4	1.77 0.23	1.02 0.02
Cornus amomum		orth America	orth America			3	2	3 0
Cornus controversa		ast Asia	ast Asia			2 0.5	2.5 0.5	2 0
Cornus florida		orth America	orth America			4.87 0.12	2. 2 0.08	1.1 0.06
Cornus kousa		ast Asia	ast Asia			3	1.53	1.03
Cornus mas		urope	urope			2.68 0.33	3.17 0.42	1.77 0
Cornus nuttallii		orth America	orth America			4.5	2	1
Cornus racemosa		orth America	orth America			4	3	1.5 0.5
Cornus sanguinea		urope	urope			1. 3	3.04	1.88 0.11
Cornus sericea		orth America	orth America			2.86 0.14	2.48 0.27	2.12 0.15
Coronilla emerus		urope	urope			1. 3	4.72	1.04
Corylus americana		orth America	orth America			3.5 0.5	2.88 0.12	1.27 0.27
Corylus avellana		urope	urope			3.53 0.23	3.04	1.68 0.0
Corylus colurna		urope	urope			1.35	3.13 0.37	1.53
Corylus cornuta		orth America	orth America			3	2.88 0.12	1.27 0.27
Corylus heterophylla		ast Asia	ast Asia			3.5 0.5	2.75 0.25	1.75 0.25
Corylus sieboldiana		ast Asia	ast Asia			3.5 0.5	2.5 0.5	2 0
Cotinus coggygria		urope	urope			1. 3	3.74 0.14	1.04 0
Cotinus obovatus		orth America	orth America			3	3.6	1.03
Cotoneaster bullatus		ast Asia	ast Asia			1. 3	3.88	1.04
Cotoneaster horizontalis		ast Asia	ast Asia			3.38	3.46	1.04
Cotoneaster integerrimus		urope	urope			1.2 0	3.46 0	1.04
Cotoneaster integrifolius		urope	urope			1. 3	3.46	1.04
Cotoneaster simonsii		ast Asia	ast Asia			2.66	3.04	1.04

Cotoneaster tomentosus		urope	urope			1. 3	3.46	1.04
Cowania mexicana		orth America	orth America			1.35	4. 5	1.03
Crataegus chlorosarca		ast Asia	ast Asia			1.5	3	1
Crataegus crus galli		orth America	orth America			1.67 0.33	4. 8 0.02	1.27 0.27
Crataegus laevigata agg.		urope	urope			2.45 0.28	2. 0.15	1.1 0.08
Crataegus maximowiczii		ast Asia	ast Asia			2	3	1
Crataegus monogyna agg.		urope	urope			1. 3 0	3.46 0.42	1.68 0.0
Crataegus phaenopyrum		orth America	orth America			2.5 0.41	2.88 0.12	1.27 0.27
Crataegus viridis		orth America	orth America			1.67 0.33	3.85 0.15	2.13 0.13
Crataegus × lavallei (C. stipulacea × C. crus galli)		orth America	urope			3.25 0.25	3.6	1.27 0.27
Cryptomeria japonica		ast Asia	ast Asia			3.17 0.44	2.75 0.25	2 1
Cupressus arizonica		orth America	orth America			1.42 0.08	4.47 0.47	1.02 0.02
Cupressus sempervirens		urope	urope			1.35	4. 5	1.03
Cydonia oblonga		urope	urope			1.2	3.88	1.77
Cytisus scoparius		urope	urope			1.2 0	3.46 0.42	1.04
Daboecia cantabrica		urope	urope			1.2	3.04	3.1
Daphne alpina		urope	urope			1.2	3.88	1.04
Daphne cneorum		urope	urope			2.66	3.88	1.77
Daphne kamtschatica		ast Asia	ast Asia			4.17 0.44	2	1
Daphne laureola		urope	urope			2.66 0	3.46 0.42	1.04
Daphne mezereum		urope	urope			4.11 0	3.04 0	1.04
Daphne striata		urope	urope			1. 3	3.88	1.04
Daphniphyllum macropodum		ast Asia	ast Asia			3.5 0.2	2.5 0.5	2.5 0.5
Diospyros virginiana		orth America	orth America			4.21 0.21	1.5 0.5	2.6 0.21
Distylium racemosum		ast Asia	ast Asia			4.25 0.25	2	1.6 0.4
Dorycnium germanicum		urope	urope			1. 3	4.72	1.04

Dryas octopetala		urope	orth America			1.02 0.0	3.88 0	2.5
Elaeagnus angustifolia		urope	urope			1.35	4.47 0.47	1.52 0.48
Empetrum hermaphroditum		urope	orth America			1.2	2.21	3. 1
Empetrum nigrum		urope	orth America			1. 3 0	2.21 0	3. 1
Erica ciliaris		urope	urope			1.2	1.37	3. 1
Erica cinerea		urope	urope			1. 3 0	3.04 0	1.77
Erica erigena		urope	urope			1.2	0.53	2.83
Erica mackaiana		urope	urope			1.2	0.53	3.1
Erica tetralix		urope	urope			1.2 0	0.53 0	3.1
Erica vagans		urope	urope			1.2	2.21	2.83
Eriobotrya japonica		ast Asia	ast Asia			3.33 0.33	3.35 0.35	2.27
Euonymus alatus		ast Asia	ast Asia			4.33 0.33	2	2
Euonymus americanus		orth America	orth America			4	2.5	2
Euonymus europaeus		urope	urope			3.02 0.1	3.04 0	2.11
Euonymus latifolius		urope	urope			4.11	3.04	1.77
Euonymus oxyphyllus		ast Asia	ast Asia			3.67 0.67	3	2
Euonymus sieboldianus		ast Asia	ast Asia			2.75 0.25	3	2.5 0.5
Euonymus verrucosus		urope	urope			3.38	3.04	1.77
Eurya japonica		ast Asia	ast Asia			3.83 0.17	2.5 0.5	1.5
Fagus crenata		ast Asia	ast Asia			5 0	1.75	1.75 0.25
Fagus engleriana		ast Asia	ast Asia			4.5	1	1.2
Fagus grandifolia		orth America	orth America			4.75 0.14	1.5 0.32	1.5 0.06
Fagus hayatae		ast Asia	ast Asia			4.5	1.5	1
Fagus japonica		ast Asia	ast Asia			4.5	2	1.5 0.5
Fagus longipetiolata		ast Asia	ast Asia			4.5	1.5	1.2
Fagus lucida		ast Asia	ast Asia			4	1	1.2
Fagus orientalis		urope	urope			4.2	2.7	1
Fagus sylvatica		urope	urope			4.56 0.11	2.4 0.43	1.02 0.01

Forestiera acuminata		orth America	orth America			1.5	2	4.8 0.11
Frangula alnus		urope	urope			2.66 0	1.37 0	3.1 0
Fraxinus americana		orth America	orth America			2.46 0.21	2.38 0.38	2.5 0.18
Fraxinus anomala		orth America	orth America			1.17 0.17	2.88 0.12	1.27 0.27
Fraxinus caroliniana		orth America	orth America			3.5	2 0	5 0
Fraxinus excelsior		urope	urope			2.66 0.13	2.5 0.25	2.7 0.3
Fraxinus lanuginosa		ast Asia	ast Asia			3.25 0.25	2.5 0.5	2
Fraxinus latifolia		orth America	orth America			3	2	3
Fraxinus mandshurica		ast Asia	ast Asia			2.75 0.75	1.75 0.25	3.25 0.25
Fraxinus nigra		orth America	orth America			2. 6 0.43	2	3.5
Fraxinus ornus		urope	urope			3.02 0.38	4.31 0.41	2.5
Fraxinus pennsylvanica		orth America	orth America			3.11 0.11	3.85 0.15	2. 8 0.25
Fraxinus platypoda		ast Asia	ast Asia			3	2	3
Fraxinus profunda		orth America	orth America			3	2	5 0
Fraxinus quadrangulata		orth America	orth America			1.84 0.34	2.75	1.53
Fraxinus velutina		orth America	orth America			2.5 0.5	3.35 0.35	1.77 0.23
Fumana procumbens		urope	urope			1.2	4.72	1.04
Gardenia jasminoides		ast Asia	ast Asia			2.5	2	1
Gaultheria shallon		orth America	orth America			3	2	2.5
Genista anglica		urope	urope			1.2 0	3.46 0.42	1.77
Genista germanica		urope	urope			1. 3	3.88	1.77
Genista pilosa		urope	urope			1.56 0.1	3.46 0.42	1.41
Genista tinctoria		urope	urope			1.2 0	3.88 0	1.77

Ginkgo biloba		ast Asia	ast Asia			1.34 0.33	3. 0.47	1.13 0.27
Gleditsia aquatica		orth America	orth America			2	2	4.38 0.3
Gleditsia triacanthos		orth America	orth America			1.61 0.2	4. 8 0.02	2.6 0.25
Gordonia lasianthus		orth America	orth America			3	2 0	4.07 0. 3
Gymnocladus dioica		orth America	orth America			2.5 0.5	3.6	1.14 0.11
Halesia carolina		orth America	orth America			3.11	2 0	3
Hamamelis virginiana		orth America	orth America			3	2	1.5 0.5
Helianthemum alpestre		urope	urope			1.22	3.88	1.04
Helianthemum apenninum		urope	urope			1.22 0	4.72 0	1.04
Helianthemum canum		urope	urope			1.22 0	4.72 0	1.04
Helianthemum nummularium		urope	urope			1.56 0.21	4.2 0.2	1.04
Heteromeles arbutifolia		orth America	orth America			1.5	4.5	1
Hibiscus rosa sinensis		ast Asia	ast Asia			1	3	2
Hippophae rhamnoides		urope	urope			1.2 0	3.46 0.42	1.88 0.11
Hydrangea macrophylla		ast Asia	ast Asia			2. 2 0.58	3	3
Hydrangea paniculata		ast Asia	ast Asia			2.33 0.33	3	2
Hyssopus officinalis		urope	urope			1.2	4.72	1.04
Ilex aquifolium		urope	urope			3.86 0.1	3.04 0	1.3 0.3
Ilex cassine		orth America	orth America			4	2.5 0.5	4
Ilex cornuta		ast Asia	ast Asia			3 1	3	2
Ilex decidua		orth America	orth America			4	2	2.8 0.21
Ilex opaca		orth America	orth America			4.28 0.37	2. 2 0.08	1. 3 0.11
Ilex verticillata		orth America	orth America			3	2	3.6 0.54

Ilex vomitoria		orth America	orth America			2.5	4.5 0.5	1
Illicium anisatum		ast Asia	ast Asia			3.83 0.17	2.5	2
Itea virginica		orth America	orth America			4	2	4.5 0.5
Juglans ailanthifolia		ast Asia	ast Asia			2.75 0.75	2	2
Juglans cinerea		orth America	orth America			1.88 0.21	2.38 0.38	1.27 0.27
Juglans major		orth America	orth America			1.35	4. 5	1.77 0.23
Juglans nigra		orth America	orth America			1. 3 0.25	2.38 0.38	1.83 0.27
Juglans regia		urope	urope			2.27 0.24	2. 8 0.22	1.42 0.0
Juniperus chinensis		ast Asia	ast Asia			1.35	4. 7 0.03	1.02 0.02
Juniperus communis		urope	orth America			1.71 0.52	4.41 0.5	2.07 0.07
Juniperus deppeana		orth America	orth America			2	5	1
Juniperus monosperma		orth America	orth America			2	5	1
Juniperus occidentalis		orth America	orth America			1.67 0.16	5	1
Juniperus osteosperma		orth America	orth America			1.84 0.16	4. 7 0.03	1.02 0.02
Juniperus sabina		urope	urope			1. 3	4.72	1.04
Juniperus scopulorum		orth America	orth America			1.48 0.27	4. 7 0.03	1.02 0.02
Juniperus sibirica		urope	urope			1.2	4.07 0.1	2.14
Juniperus silicicola		orth America	orth America			1.5	5 0	1.5
Juniperus virginiana		orth America	orth America			1.28 0.0	4.65 0.33	1.1 0.12
Kalmia angustifolia		orth America	orth America			1.61 0.28	1.68 0.22	2.75 0.18

Kalmia latifolia		orth America	orth America			2.5	4.5	1 0
Kalopanax pictus		ast Asia	ast Asia			3 0	2.75 0.25	1.5 0.5
Koelreuteria paniculata		ast Asia	ast Asia			2.0 0.0	4.47 0.47	1.27 0.27
Laburnum × watereri (L. alpinum × L. anagyroides)		orth America	urope			1.17 0.17	2.38 0.38	1.53
Laburnum alpinum		urope	urope			1	2	2
Laburnum anagyroides		orth America	orth America			1	3	1.5
Lagerstroemia indica		ast Asia	ast Asia			2.5 0.5	2.88 0.12	1.02 0.02
Larix decidua		urope	urope			1.46 0.2	2.31 0.55	1.1 0.08
Larix gmelinii		ast Asia	ast Asia			1.23	2.3	3.11
Larix kaempferi		ast Asia	ast Asia			1.38 0.21	3 1	1.58 0.43
Larix laricina		orth America	orth America			0. 8 0.0	2	3
Larix lyallii		orth America	orth America			1 0	3	1
Larix occidentalis		orth America	orth America			1.35 0.23	2.42 0.08	1
Larix sibirica		ast Asia	ast Asia			1.35 0.15	1.63 0.26	1. 2 0.15
Larix × eurolepis (L. decidua × L. kaempferi)		ast Asia	urope			1.5	2.5	1
Larix × marschlinsii (L. sibirica × L. kaempferi)		ast Asia	ast Asia			1.56	2.21	1.04
Ledum palustre		urope	orth America			2.66	0.53	4.27
Lembotropis nigricans		urope	urope			2.66	3.88	1.04
Leucothoe grayana		ast Asia	ast Asia			3 0	3.25 0.75	2.5 0.5
Ligustrum lucidum		ast Asia	ast Asia			3.5 0	2.5	2
Ligustrum ovalifolium		ast Asia	ast Asia			1. 3 0.01	3.04	1.41
Ligustrum vulgare		urope	urope			2.2 0.1	3.46 0.42	1.88 0.11
Lindera benzoin		orth America	orth America			3	2	3 0
Lindera umbellata		ast Asia	ast Asia			2.88 0.63	3	2.75 0.25
Linnaea borealis		urope	orth			3.38 0	3.04 0	1.77

			America					
Liquidambar styraciflua		orth America	orth America			1.5 0.14	2. 2 0.08	2.6 0.14
Liriodendron tulipifera		orth America	orth America			2.07 0.27	2.6 0.3	1.3 0.12
Lithocarpus densiflorus		orth America	orth America			3.67 0.33	4	1
Loiseleuria procumbens		urope	urope			1.02 0.0	3.88 0	1.04
Lonicera alpigena		urope	urope			3.75	2.21	1.77
Lonicera caerulea		urope	orth America			3.38	1.37	3.1
Lonicera nigra		urope	urope			3.75	3.04	2.5
Lonicera xylosteum		urope	urope			3.38 0	3.04 0	1.88 0.11
Lycium barbarum		ast Asia	ast Asia			1. 3 0	3.04 0	1.77
Lycium chinense		ast Asia	ast Asia			1. 3	3.04	2.14
Maclura pomifera		orth America	orth America			1.45 0.2	4.22 0.35	1.27 0.27
Magnolia acuminata		orth America	orth America			3.03 0.03	1.27 0.27	1.52 0.48
Magnolia ashei		orth America	orth America			3	2 0	2
Magnolia denudata		ast Asia	ast Asia			2	2	1.5
Magnolia fraseri		orth America	orth America			3.06 0.06	2 0	1
Magnolia grandiflora		orth America	orth America			4.5 0.5	2.88 0.12	1.41 0.3
Magnolia kobus		ast Asia	ast Asia			3	2.88 0.12	2.5
Magnolia liliflora		ast Asia	ast Asia			2.5	2.5	1
Magnolia macrophylla		orth America	orth America			3.11	1	1
Magnolia obovata		ast Asia	ast Asia			2.5 0.5	2	2
Magnolia stellata		ast Asia	ast Asia			3 0	1.77 0.23	3
Magnolia tripetala		orth America	orth America			3.06 0.06	2	1

Magnolia virginiana		orth America	orth America			3 0	1.5 0.5	3.65 0.44
Magnolia X loebneri (M. kobus × M. stellata)		orth America	orth America			3	1.53	1.03
Magnolia X soulangeana (M. denudata × M. liliflora)		ast Asia	ast Asia			3	1.77 0.23	1.02 0.02
Mahonia aquifolium		orth America	orth America			3.24 0.24	3. 4 0.06	1.45 0.05
Mallotus japonicus		ast Asia	ast Asia			1.5	3.5	1
Malus angustifolia		orth America	orth America			1.5	2.5	1
Malus domestica		urope	urope			1. 3	3.04	1.04
Malus pumila		urope	urope			2.17	3.13 0.37	1.52 0.02
Malus sieboldii		ast Asia	ast Asia			2.5 0.5	3	1
Malus sylvestris		urope	urope			2.32 0.2	3.16 0.18	1.68 0.0
Melia azedarach		ast Asia	ast Asia			3	2.85 0.85	1.77 0.23
Mespilus germanica		urope	urope			2.66	3.88	1.04
Metasequoia glyptostroboides		ast Asia	ast Asia			3	2.38 0.38	1.52 0.48
Morus alba		ast Asia	ast Asia			1.35	2.88 0.12	1.27 0.27
Morus bombycis		ast Asia	ast Asia			2.5 0.76	3	1.5
Morus rubra		orth America	orth America			2.34 0.16	2.88 0.12	1.57 0.16
Myrica californica		orth America	orth America			2.5	2	2
Myrica cerifera		orth America	orth America			2	3 0	3.5 0.5
Myrica gale		urope	orth America			1.2 0	0.53 0	4.27
Myricaria germanica		urope	urope			1.2	1.37	2.5
Nyssa aquatica		orth America	orth America			3.47 0.53	1 0	5 0
Nyssa biflora		orth America	orth America			2	1	5 0
Nyssa ogeche		orth	orth			4	2	4.84 0.16

		America	America					
Nyssa sylvatica		orth America	orth America			3.52 0.28	2 0	1.87 0.2
Ostrya carpinifolia		urope	urope			3. 4 0.18	3.07 0.17	1.41
Ostrya japonica		ast Asia	ast Asia			2.5 0.5	3	2
Ostrya knowltonii		orth America	orth America			3.83	3.6	1.03
Ostrya virginiana		orth America	orth America			4.58 0.21	3.25 0.38	1.07 0.06
Oxydendrum arboreum		orth America	orth America			2.7 0.35	3 0	1.12 0.12
Pachysandra terminalis		ast Asia	ast Asia			3. 2 0.0	2	1
Paulownia tomentosa		ast Asia	ast Asia			2	3	1
Persea borbonia		orth America	orth America			4	2	3.57 0.43
Persea japonica		ast Asia	ast Asia			4.25 0.25	2	1
Persea thunbergii		ast Asia	ast Asia			3.35 0.15	3	1
Phellodendron amurense		ast Asia	ast Asia			1.67 0.33	4.1 0.5	2.27
Photinia pyrifolia		orth America	orth America			2	2	3 0
Physocarpus opulifolius		orth America	orth America			3	4	1 0
Picea abies		urope	urope			4.45 0.5	1.75 0.41	1.22 0.12
Picea breweriana		orth America	orth America			3.76 0.24	1.83 0.17	1
Picea engelmannii		orth America	orth America			4.53 0.07	2.58 0.3	1.02 0.02
Picea glauca		orth America	orth America			4.15 0.17	2.88 0.12	1.02 0.02
Picea glehnii		ast Asia	ast Asia			4 0.2	2.5	2.5 0.5
Picea jezoensis		ast Asia	ast Asia			4.25 0.25	2	1
Picea mariana		orth America	orth America			4.08 0.18	2	2
Picea obovata		ast Asia	ast Asia			3.82	1.86	2.07

Picea omorika		urope	urope			4.65	2.75	1.03
Picea pungens		orth America	orth America			3.54 0.32	2.88 0.12	1.02 0.02
Picea rubens		orth America	orth America			4.3 0.3	2.5	2
Picea sitchensis		orth America	orth America			3.85 0.36	1.52 0.15	1. 0.22
Pinus albicaulis		orth America	orth America			1	5	1
Pinus aristata		orth America	orth America			1.25 0.25	4. 7 0.03	1.02 0.02
Pinus attenuata		orth America	orth America			1.5	3	1
Pinus balfouriana		orth America	orth America			1	5	1
Pinus banksiana		orth America	orth America			1.36 0.33	4	1
Pinus bungeana		ast Asia	ast Asia			1	2.88 0.12	1.02 0.02
Pinus cembra		urope	urope			2.87 0.3	3.01 0.43	1.04
Pinus clausa		orth America	orth America			2.21	2.25 0.25	2.5
Pinus contorta ssp. contorta		orth America	orth America			1.73 0.24	4.04 0.38	2.7 0.4
Pinus contorta ssp. latifolia		orth America	orth America			1.48	4.21 0.38	2 0.5
Pinus coulteri		orth America	orth America			1.5	3.5	2
Pinus densiflora		ast Asia	ast Asia			1.35	3.38 0.63	1.03
Pinus echinata		orth America	orth America			1.86 0.36	4	1.16 0.08
Pinus edulis		orth America	orth America			1.44 0.05	4. 7 0.03	1.02 0.02
Pinus elliotti		orth America	orth America			2.65 0.32	3.5	2.57 0.57

Pinus flexilis		orth America	orth America			1.56 0.15	4.72 0.22	1.02 0.02
Pinus glabra		orth America	orth America			4.5	2.5 0.5	3.0 0. 1
Pinus halepensis		urope	urope			1.35	4. 7 0.03	0. 5 0.05
Pinus jeffreyi		orth America	orth America			1.74 0.26	4.17 0.17	0. 5 0.05
Pinus koraiensis		ast Asia	ast Asia			2	3	1.5
Pinus lambertiana		orth America	orth America			2.66 0.14	2.67 0.33	1
Pinus monophylla		orth America	orth America			1.17 0.17	4. 7 0.03	1.02 0.02
Pinus monticola		orth America	orth America			2. 7 0.02	2.42 0.22	1.02 0.02
Pinus mugo		urope	urope			1.72 0.18	4.23 0.47	1.03 0.01
Pinus muricata		orth America	orth America			2	2	1
Pinus nigra		urope	urope			2.1 0.43	4.38 0.47	1.3 0.38
Pinus palustris		orth America	orth America			0.87 0.13	4.75 0.25	2
Pinus parviflora		ast Asia	ast Asia			1.68 0.33	3.38 0.63	1.03
Pinus ponderosa		orth America	orth America			1.64 0.15	4.32 0.32	1.02 0.02
Pinus radiata		orth America	orth America			2. 7 0.03	3	1
Pinus resinosa		orth America	orth America			1.8 0.21	3	1
Pinus rigida		orth America	orth America			1. 0.51	4	2
Pinus sabiniana		orth America	orth America			1	4.5	1
Pinus serotina		orth America	orth America			1.47	3	3.5 0.4
Pinus sibirica		ast Asia	ast Asia			1. 3	3.13	3.32

Pinus strobiformis		orth America	orth America			1.35	2.88 0.12	1.52 0.48
Pinus strobus		orth America	orth America			3.21 0.2	2.2 0.38	1.03 0.02
Pinus sylvestris		urope	urope			1.67 0.33	4.34 0.47	2.63 0.08
Pinus taeda		orth America	orth America			1. 0.51	4.5 0.5	1.08 0.08
Pinus thunbergii		ast Asia	ast Asia			1.35	4.03 0.18	1.02 0.02
Pinus uncinata		urope	urope			1.2	3.88	1.77
Pinus virginiana		orth America	orth America			1. 0.51	4	1.5
Pinus wallichiana		ast Asia	ast Asia			1.35	2.75	1.03
Pistacia chinensis		ast Asia	ast Asia			1.35	4. 5	1.53
Pistacia vera		urope	urope			1.17 0.17	4. 5	1.53
Pittosporum tobira		ast Asia	ast Asia			2.75 0.25	4	1
Planera aquatica		orth America	orth America			4	2 0	4.8 0.11
Platanus occidentalis		orth America	orth America			2.86 0.16	2.25 0.25	2.71 0.15
Platanus orientalis		urope	urope			3	3.5	2
Platanus × acerifolia (P. orientalis × P. occidentalis)		orth America	urope			3	3.35 0.35	2.63 0.37
Polygala chamaebuxus		urope	urope			2.66	2.21	1.04
Populus alba		urope	urope			2.3 0.25	2.67 0.23	1.84 0.07
Populus angustifolia		orth America	orth America			1.35	1.77 0.23	2.63 0.37
Populus balsamifera		orth America	orth America			1.27 0.14	1.77 0.23	2.63 0.37
Populus deltoides		orth America	orth America			1.76 0.38	1.57 0.23	3.03 0.27
Populus fremontii		orth America	orth America			1.35	2.88 0.12	2.63 0.37
Populus grandidentata		orth America	orth America			1.21 0.27	2.5	2

Populus heterophylla		orth America	orth America			1.24 0.24	2	4
Populus maximowiczii		ast Asia	ast Asia			1 0	2	2.75 0.25
Populus nigra		urope	urope			2.46 0.0	2.2 0.38	3.7 0.3
Populus sargentii		orth America	orth America			1.5	2	3.48 0.28
Populus sieboldii		ast Asia	ast Asia			1 0	2.75 0.25	1.5
Populus tremula		urope	urope			2.22 0.07	2.85 0.25	2.07 0.04
Populus tremuloides		orth America	orth America			1.21 0.18	1.77 0.23	1.77 0.23
Populus trichocarpa		orth America	orth America			1.27 0.27	1.77 0.23	1.35 0.26
Populus × acuminata (P. angustifolia × . P. deltoides)		orth America	orth America			1.85	2	3
Populus × canadensis (P. deltoides × P. nigra)		orth America	urope			1.67 0.33	1.77 0.23	2.13 0.13
Populus × canescens (P. alba × P. tremula)		urope	urope			2.66	2.21	1.77
Prosopis juliflora		orth America	orth America			1.17 0.17	4. 5	1.03
Prunus armeniaca		urope	urope			1.35	2.75	1.03
Prunus avium		urope	urope			3.33 0.33	2.66 0.22	1.1 0.17
Prunus caroliniana		orth America	orth America			1.5	3	1
Prunus cerasifera		urope	urope			2.45 0.28	2. 0.15	1.77
Prunus cerasus		urope	urope			2.66 0	3.11 0.43	1.04 0
Prunus domestica		urope	urope			1. 3	2. 0.15	1.02 0.01
Prunus fruticosa		urope	urope			1.47 0.28	4.31 0.41	1.41
Prunus glandulosa		ast Asia	ast Asia			2	3	1
Prunus ilicifolia		orth America	orth America			2	3.5	1.5
Prunus japonica		ast Asia	ast Asia			3 0.5	2	1.1
Prunus laurocerasus		urope	urope			4.11	2.21	1.41
Prunus lusitanica		urope	urope			2.5	3.5	1
Prunus maackii		ast Asia	ast Asia			1.5	2	1.5

Prunus mahaleb		urope	urope			2.2 0.38	4.31 0.41	1.2 0.2
Prunus mume		ast Asia	ast Asia			2	2.5	1.1
Prunus padus		urope	urope			3.26 0.0	1. 3 0.1	3.1 0
Prunus persica		ast Asia	ast Asia			1.67 0.33	2.38 0.38	1.02 0.02
Prunus pumila		orth America	orth America			2.5 0.5	3	1
Prunus sargentii		ast Asia	ast Asia			2.13 0.0	2.88 0.12	1.62 0.3
Prunus serotina		orth America	orth America			2.46 0.34	3.02 0.02	1.06 0.06
Prunus serrulata		ast Asia	ast Asia			2.34 0.16	2.75	1.43
Prunus spinosa		urope	urope			1.86 0.44	3.46 0.42	1.68 0.0
Prunus ssiori		ast Asia	ast Asia			3 0	2	1.5 0.5
Prunus subhirtella		ast Asia	ast Asia			2.0 0.0	2.38 0.38	1.32 0.02
Prunus tomentosa		ast Asia	ast Asia			1.5	3	1
Prunus umbellata		orth America	orth America			2	2	1
Prunus virginiana		orth America	orth America			2.5 0.41	2.88 0.12	1.11 0.15
Prunus × incam (P. incisa × P. campanulata)		ast Asia	ast Asia			2	2.5	1.3
Prunus × yedoensis (P. serrulata × P. subhirtella)		ast Asia	ast Asia			2.17	2.88 0.12	1.22 0.02
Pseudotsuga macrocarpa		orth America	orth America			2.5	4	1
Pseudotsuga menziesii		orth America	orth America			2.78 0.18	2.62 0.41	1.7 0.12
Ptelea trifoliata		orth America	orth America			2.5 0.41	2.58 0.3	1.52 0.48
Pterocarya rhoifolia		ast Asia	ast Asia			2.25 0.25	1.75 0.25	2.25 0.25
Pterostyrax hispida		ast Asia	ast Asia			1.5	2 0.5	2 0.5
Pyrus calleryana		ast Asia	ast Asia			1.35	4.47 0.47	1.77 0.23
Pyrus communis		urope	urope			2.72 0.23	2.73 0.38	1.15 0.11
Pyrus cordata		urope	urope			2.66	3.04	2.14
Pyrus pyraster		urope	urope			2.26 0.42	3.31 0.5	1.77
Pyrus ussuriensis		ast Asia	ast Asia			2.0 0.0	3.35 0.35	1.27 0.27

Quercus acuta		ast Asia	ast Asia			3.33 0.44	3.5	1.5
Quercus acutissima		ast Asia	ast Asia			2.3 0.2	3. 0.4	1.64 0.37
Quercus agrifolia		orth America	orth America			2	5	1
Quercus alba		orth America	orth America			2.85 0.17	3.56 0.3	1.43 0.14
Quercus aliena		ast Asia	ast Asia			2.85 0.35	3 0.5	1.75 0.25
Quercus austrina		orth America	orth America			1.5	5	1
Quercus bicolor		orth America	orth America			2. 8 0.02	3.35 0.35	2.58 0.28
Quercus cerris		urope	urope			2.55 0.11	4.2 0.21	1.2 0.25
Quercus chapmanii		orth America	orth America			1.5	5	1
Quercus chrysolepis		orth America	orth America			2.5 0.5	5	1
Quercus coccinea		orth America	orth America			2.07 0.2	4	1
Quercus crispula		ast Asia	ast Asia			3.25 0.25	3	2.13 0.38
Quercus dentata		ast Asia	ast Asia			2.5	3.75 0.25	1 0
Quercus douglasii		orth America	orth America			2	5	1
Quercus dumosa		orth America	orth America			2	5	1
Quercus emoryi		orth America	orth America			3	4	1
Quercus falcata		orth America	orth America			2.5	5	1.65 0.32
Quercus gambelii		orth America	orth America			2.0 0.0	4. 7 0.03	1.27 0.27
Quercus garryana		orth America	orth America			2.4 0.3	5 0	2
Quercus gilva		ast Asia	ast Asia			3.4 0.38	2.7	2.5
Quercus glauca		ast Asia	ast Asia			3.25 0.25	4	1.5

Quercus ilex		urope	urope			3.02 0.1	4.72 0	1.04
Quercus imbricaria		orth America	orth America			2.0 0.0	3.85 0.15	2.43 0.21
Quercus incana		orth America	orth America			2.5	4.5 0.5	1.5
Quercus kelloggii		orth America	orth America			1.55	4.33 0.33	1
Quercus laevis		orth America	orth America			2	5 0	1
Quercus laurifolia		orth America	orth America			3.34 0.34	3 0	2.5 0.41
Quercus lobata		orth America	orth America			3 0	3	1
Quercus lyrata		orth America	orth America			2. 7 0.03	1	4.58 0.27
Quercus macrocarpa		orth America	orth America			2.71 0.27	3.85 0.15	1.82 0.15
Quercus marilandica		orth America	orth America			3	4	1
Quercus muehlenbergii		orth America	orth America			2.22 0.44	4. 7 0.03	1.26 0.15
Quercus multinervis		ast Asia	ast Asia			2.7	3	1.5
Quercus myrtifolia		orth America	orth America			1.5	4.5 0.5	1
Quercus nigra		orth America	orth America			2.24 0.76	3 0	2.47 0.53
Quercus nuttallii		orth America	orth America			2.24 0.76	1	3. 4 0.45
Quercus pagoda		orth America	orth America			2.24 0.76	2.5	2.0 0.0
Quercus palustris		orth America	orth America			2.4 0.51	2.38 0.38	3.4 0.17
Quercus petraea		urope	urope			2.73 0.27	3.02 0.15	1.2 0.2
Quercus phellos		orth	orth			2	1	2.8 0.44

		America	America					
Quercus prinus		orth America	orth America			2.85 0.18	3.5 0.5	1
Quercus pubescens		urope	urope			2.31 0.22	4.1 0.25	1.3 0.3
Quercus robur		urope	urope			2.45 0.28	2. 5 0.31	1.8 0.18
Quercus rubra		orth America	orth America			2.75 0.18	2.88 0.12	1.12 0.06
Quercus salicina		ast Asia	ast Asia			3.5 0	3.5	1
Quercus serrata		ast Asia	ast Asia			3	3	1.75 0.25
Quercus sessilifolia		ast Asia	ast Asia			3.35 0.15	3	1.5 0.5
Quercus shumardii		orth America	orth America			2.35 0.22	4.65 0.33	1.4 0.26
Quercus stellata		orth America	orth America			2.16 0.45	4.5	1.5 0.25
Quercus turbinella		orth America	orth America			2.17	4. 7 0.03	1.53
Quercus variabilis		ast Asia	ast Asia			2	3	1
Quercus velutina		orth America	orth America			2.72 0.22	3	1.07 0.0
Quercus virginiana		orth America	orth America			2.24 0.76	4.5	2.5 0.41
Quercus wislizeni		orth America	orth America			2.5	4	1.5
Quercus × bebbiana (Q. alba × Q. macrocarpa)		orth America	orth America			3	3.5	2
Quercus × pauciloba (Q. gambelii × Q. turbinella)		orth America	orth America			2.17	4. 5	1.53
Quercus × runcinata (Q. imbricaria × Q. rubra)		orth America	orth America			2.5	3.5	1.5
Rhamnus alpina		urope	urope			2.66	3.88	1.04
Rhamnus cathartica		urope	urope			1. 3 0	3.46 0.42	2.25 0.26
Rhamnus pumila		urope	urope			1.2	4.72	1.77
Rhamnus purshiana		orth America	orth America			3	3	1

Rhamnus saxatilis		urope	urope			1. 3	4.72	1.77
Rhododendron canadense		orth America	orth America			4	2	1
Rhododendron catwbiense		orth America	orth America			3.5	2.5	2
Rhododendron dauricum		ast Asia	ast Asia			3.5	2	2
Rhododendron ferrugineum		urope	urope			1. 3	3.04	1.77
Rhododendron hirsutum		urope	urope			1. 3	3.88	1.04
Rhododendron lapponicum		urope	orth America			1. 3	3.88	2.14
Rhododendron macrophyllum		orth America	orth America			3	1	1
Rhododendron maximum		orth America	orth America			3.5	3	2
Rhododendron obtusum		ast Asia	ast Asia			3	2.5 0.5	1
Rhododendron occidentale		orth America	orth America			3	1	1
Rhododendron periclymenoides		orth America	orth America			4	3	3.5 0.5
Rhododendron ponticum		urope	urope			3.38	3.04	2
Rhododendron viscosum		orth America	orth America			4	3	3.5 0.5
Rhododendron × intermedium (R. hirsutum × R. ferrugineum)		urope	urope			1. 3	3.04	1.04
Rhodothamnus chamaecistus		urope	urope			2.66	3.04	1.04
Rhus copallina		orth America	orth America			1.5	3	3
Rhus glabra		orth America	orth America			1.78 0.22	3	1
Rhus javanica		ast Asia	ast Asia			1.75 0.25	3.5	1
Rhus trichocarpa		ast Asia	ast Asia			2.17 0.34	3.5 0.5	1.5 0.5
Rhus typhina		orth America	orth America			1.56	4	1
Ribes alpinum		urope	urope			3.38 0	3.04	1.77

Ribes nigrum		urope	urope			3.75 0.1	1.37 0.84	2.83
Ribes petraeum		urope	urope			3.38	3.04	1.04
Ribes rubrum		urope	urope			3.38 0	1.7 0.42	1.77
Ribes spicatum		urope	urope			3.75 0.1	1.7 0.42	1.77
Ribes uva crispa		urope	urope			2.5 0.5	3.04	1.77
Robinia neomexicana		orth America	orth America			1.35	4.47 0.47	1.77 0.23
Robinia pseudoacacia		orth America	orth America			1.72 0.25	4.11 0.65	1.07 0.08
Robinia × ambigua (R. pseudoacacia × R. viscosa)		orth America	orth America			1.35	4.47 0.47	1.03
Rosa abietina		urope	urope			1.2	3.88	1.04
Rosa acicularis		ast Asia	ast Asia			2.5	3	1
Rosa agrestis		urope	urope			1.2 0	4.72 0	1.04
Rosa arkansana		orth America	orth America			1.5	3.5	2
Rosa arvensis		urope	urope			2.66 0	3.46 0.42	1.04
Rosa blanda		orth America	orth America			1.5	2.5	2.5
Rosa californica		orth America	orth America			1.5	3	2
Rosa canina		urope	urope			1. 3 0.38	3.46 0.42	1.77
Rosa carolina		orth America	orth America			1.5	3.5	1
Rosa ciezielskii		urope	urope			1.2	4	1
Rosa coriifolia		urope	urope			1.2 0	4.72 0	1.04
Rosa corymbifera		urope	urope			1.2	3.88	1.04
Rosa davurica		ast Asia	ast Asia			1.5	3.5	1
Rosa elliptica		urope	urope			1.2	4.72	1.04
Rosa gallica		urope	urope			1. 3	3.88	1.04
Rosa hybrida		urope	urope			1	4	1
Rosa jundzillii		urope	urope			1.2	4.72	1.04
Rosa majalis		urope	urope			2.5	3.04	1.77

Rosa micrantha		urope	urope			1. 3 0.38	4.72 0	1.04
Rosa obtusifolia		urope	urope			1. 3 0	3.88 0	1.04
Rosa pendulina		urope	urope			2.66	3.04	1.04
Rosa pimpinellifolia		urope	urope			1.2 0	4.3 0.42	1.77
Rosa rubiginosa		urope	urope			1. 3 0	4.5 0	1.04
Rosa rubrifolia		urope	urope			1.2	3.88	1.04
Rosa rugosa		ast Asia	ast Asia			1.2	4	2
Rosa scabriuscula		urope	urope			1.2	4.72	1.04
Rosa sherardii		urope	urope			2.66	3.04	1.04
Rosa stylosa		urope	urope			1.56 0.1	3.88 0	1.04
Rosa subcanina		urope	urope			1.2	3.88	1.04
Rosa subcollina		urope	urope			1.2	4.72	1.04
Rosa tomentosa		urope	urope			1.56 0.1	3.88 0	1.04
Rosa villosa		urope	urope			2.5 0.3	3.88 0.84	1.04
Rosa virginiana		orth America	orth America			1	4	1
Rosa vosagiaca		urope	urope			1. 3	3.04	1.77
Rubus allegheniensis		orth America	orth America			2.5 0.4	4	2
Rubus alumnus		orth America	orth America			2	3	1
Rubus caesius		urope	urope			2.2 0.1	3.04	2.5
Rubus idaeus		urope	orth America			2.66 0	3.04	2.5
Rubus mesogaeus		ast Asia	ast Asia			2.25 0.75	2.5	2
Rubus phoenicolasius		ast Asia	ast Asia			1.83 0.17	2.5	1
Rubus spectabilis		orth America	orth America			2.86 0.14	2.6 0.4	2.75 0.25
Sabal palmetto		orth America	orth America			2	4 0	3
Salix alba		urope	urope			1. 0.18	2 0.21	4.1 0.03
Salix alpina		urope	urope			0.84	2.21	3. 1
Salix amygdaloides		orth	orth			1.17 0.17	1.77 0.23	3.43 0.07

		America	America					
Salix appendiculata		urope	urope			1. 3	2.21	2.84 0.34
Salix arbuscula		urope	urope			1.2	3.04	3. 1
Salix aurita		urope	urope			1. 3 0	0.53 0	4.27
Salix babylonica		ast Asia	ast Asia			1.35	1.77 0.23	3.43
Salix bebbiana		orth America	orth America			1	1	3
Salix caprea		urope	urope			2.16 0.08	2.24 0.23	2.84 0.34
Salix caroliniana		orth America	orth America			1.5	2 0	4
Salix cinerea		urope	urope			1. 3 0	0.11 0.42	4.13 0.15
Salix daphnoides		urope	urope			2.66	1.37	3. 5 0.03
Salix discolor		orth America	orth America			1.5	2	4 0
Salix eleagnos		urope	urope			1. 3	1.37	3. 5 0.03
Salix foetida		urope	urope			1.2	1.37	3. 1
Salix fragilis		urope	urope			1.42 0.18	1.23 0.3	3. 4 0.02
Salix glabra		urope	urope			2.66	1.37	3. 1
Salix hastata		urope	orth America			1. 3	2.21	3. 1
Salix herbacea		urope	orth America			1.56 0.1	2.21 0.84	3. 1
Salix hultenii		ast Asia	ast Asia			1.5	1.5	3
Salix integra		ast Asia	ast Asia			1.33 0.33	2	4
Salix jessoensis		ast Asia	ast Asia			1 0	1.25	4.5 0.25
Salix lanata		urope	urope			1.2	2.21	3. 1
Salix lapponum		urope	urope			1.2	2.21	4.27
Salix matsudana		ast Asia	ast Asia			1.35	1.77 0.23	3.5 0.25
Salix myrsinifolia		urope	urope			2.2 0.1	0. 5 0.42	3. 5 0.03
Salix myrsinites		urope	urope			1.2	3.04	3. 1
Salix myrtilloides		urope	urope			2.66	0.53	3. 1
Salix nigra		orth America	orth America			1.34 0.12	1.77 0.23	4.68 0.17

Salix pentandra		urope	urope			1. 3 0	0.53 0	3. 5 0.03
Salix phylicifolia		urope	urope			1. 3	0.53	4.27
Salix purpurea		urope	urope			1.2 0	1.37 0	3.55 0.37
Salix repens		urope	urope			1.02 0.18	1.7 0.42	4.0 0.18
Salix reticulata		urope	orth America			1.56 0.1	2.21 0	3. 1
Salix retusa		urope	urope			1. 3	2.21	3. 1
Salix rosmarinifolia		urope	urope			1.2	0.53	3. 1
Salix sachalinensis		ast Asia	ast Asia			1	1.5	4
Salix scouleriana		orth America	orth America			1	3	4
Salix serpyllifolia		urope	urope			1. 3	3.88	3. 1
Salix sitchensis		orth America	orth America			1	1	4.5
Salix starkeana		urope	urope			1. 3	1.37	3. 1
Salix subfragilis		ast Asia	ast Asia			1	1.75 0.25	4
Salix triandra		urope	urope			1. 3 0	0. 0.3	3. 0.15
Salix udensis		ast Asia	ast Asia			1 0	1.5	4
Salix viminalis		urope	urope			1. 3 0	0.53 0	3. 0.15
Salix waldsteiniana		urope	urope			1. 3	2.21	3. 1
Salix × rubens (S. alba × S. fragilis)		urope	urope			3.38	0.53	3. 1
Sambucus cerulea		orth America	orth America			1.35	2.88 0.12	2.63 0.37
Sambucus ebulus		urope	urope			1. 3	3.04	2.5
Sambucus nigra		urope	urope			2.2 0.1	3.04 0	1.68 0.0
Sambucus racemosa		urope	orth America			2.66 0	3.04 0	2.5
Sambucus sieboldiana		ast Asia	ast Asia			2.5 0.42	2	3
Sassafras albidum		orth America	orth America			1.68 0.16	5 0	1.11 0.08
Sequoia sempervirens		orth America	orth America			4.21 0.21	2	0. 5 0.05
Sequoiadendron giganteum		orth America	orth America			3.05 0.24	2.88 0.12	1.27 0.27

Shepherdia argentea		orth America	orth America			2.12 0.62	4	1
Sideroxylon celastrinum		orth America	orth America			1.5	3.5	3
Sideroxylon reclinatum		orth America	orth America			2.5	3 0	3.5
Skimmia japonica		ast Asia	ast Asia			4.28 0.28	2	1.5 0.5
Sophora japonica		ast Asia	ast Asia			3	2.75	1.53
Sorbaria sorbifolia		ast Asia	ast Asia			2.5 0.5	2	2
Sorbus alnifolia		ast Asia	ast Asia			3.13 0.13	2.05	2
Sorbus americana		orth America	orth America			2.5 0.41	1.77 0.23	1.27 0.23
Sorbus aria		urope	urope			3 0.16	3.55 0.12	1.32 0.28
Sorbus arranensis (S. aucuparia × S. rupicola)		urope	urope			1. 3	3.88	1.04
Sorbus aucuparia		urope	urope			2.73 0.21	2.11 0.34	1.76 0.13
Sorbus bristolensis (S. rupicola × . S. torminalis)		urope	urope			2.66	3.88	1.04
Sorbus chamaemespilus		urope	urope			1. 3	3.88	1.04
Sorbus commixta		ast Asia	ast Asia			2.5 0	2	1.5 0.5
Sorbus danubialis		urope	urope			2.66	3.88	1.04
Sorbus domestica		urope	urope			3.53 0.18	3.52 0.26	1.04
Sorbus intermedia		urope	urope			2.66 0	2.21	1.04
Sorbus lancastriensis (S. aria × S. rupicola)		urope	urope			1.2	3.88	1.04
Sorbus mougeotii (S. aucuparia × S. aria)		urope	urope			1.2	3.88	1.04
Sorbus rupicola		urope	urope			1.2	3.88	1.04
Sorbus scopulina		orth America	orth America			2.5 0.41	2.38 0.38	1.27 0.23
Sorbus torminalis		urope	urope			3.38 0.2	3.74 0.13	1.04
Spiraea salicifolia		ast Asia	ast Asia			1. 3	2.21	3.35 0.16
Staphylea pinnata		urope	urope			1. 3	3.04	1.04
Stewartia malacodendron		orth America	orth America			3	2.5 0.5	1
Styrax americanus		orth	orth			2.5	2.5	1.5

		America	America					
Styrax grandifolius		orth America	orth America			3	2	1.5
Styrax japonicus		ast Asia	ast Asia			2.5 0.5	2.5	2.5
Styrax obassis		ast Asia	ast Asia			2.5	2	2
Swietenia mahagoni		orth America	orth America			3	4	1
Symphoricarpos albus		orth America	orth America			3.24 0.24	3.02 0.02	1.02 0.02
Symphoricarpos oreophilus		orth America	orth America			3.14 0.14	3.5	1
Symplocos chinensis		ast Asia	ast Asia			3.67 0.67	3	1.5 0.5
Symplocos tinctoria		orth America	orth America			2.5	2.5 0.5	2
Syringa reticulata		ast Asia	ast Asia			1.35	2.38 0.38	2.27 0.74
Syringa vulgaris		urope	urope			2.66	3.04	1.02 0.02
Tamarix ramosissima		ast Asia	ast Asia			1.35	4.1 0.3	3.36
Taxodium distichum		orth America	orth America			2.13 0.06	3.25 0.38	4. 3 0.06
Taxus baccata		urope	urope			4.43 0.13	3.01 0.17	1.32 0.28
Taxus brevifolia		orth America	orth America			4.86 0.14	2.5	1
Thuja occidentalis		orth America	orth America			3.45 0.4	2.71 0.38	1.46 0.48
Thuja orientalis		ast Asia	ast Asia			2.17	2.88 0.12	1.02 0.02
Thuja plicata		orth America	orth America			4.73 0.15	2.23 0.25	1.01 0.04
Thymus serpyllum		urope	urope			1.56 0.1	4.72 0	1.04
Tilia americana		orth America	orth America			3. 8 0.15	2.88 0.12	1.26 0.15
Tilia caroliniana		orth America	orth America			3.25 0.25	2 0	1 0
Tilia cordata		urope	urope			4.18 0.16	2.75 0.15	1.83 0.16
Tilia euchlora		urope	urope			3	2.75	1.27 0.27

Tilia heterophylla		orth America	orth America			3.77 0.65	2	1.12 0.12
Tilia japonica		ast Asia	ast Asia			3.75 0.25	2.5	2 0
Tilia maximowicziana		ast Asia	ast Asia			3.75 0.25	2.5	2 0
Tilia platyphyllos		urope	urope			4 0.2	2.52 0.16	1.02 0.02
Tilia tomentosa		urope	urope			3.34 0.34	2.81 0.12	1.52 0.25
Tilia × vulgaris (T. cordata × T. platyphyllos)		urope	urope			3.4	3.04	1.77
Torreya californica		orth America	orth America			5	2	1
Torreya taxifolia		orth America	orth America			4.5	2 0	1
Trochodendron aralioides		ast Asia	ast Asia			3.6 0.1	2.5	1.75 0.25
Tsuga canadensis		orth America	orth America			4.83 0.14	1	1.25 0.25
Tsuga heterophylla		orth America	orth America			4. 6 0.07	1.17 0.17	0. 5 0.05
Tsuga mertensiana		orth America	orth America			4.48 0.03	1 0	0. 5 0.05
Tsuga sieboldii		ast Asia	ast Asia			4.25 0.25	3 1	1.5 0.5
Ulex europaeus		urope	urope			1. 3 0	3.04 0	1.77
Ulex gallii		urope	urope			1. 3	2.21	2.5
Ulex minor		urope	urope			1.2	2.21	2.5
Ulmus alata		orth America	orth America			3.03 0.08	3.5 0.5	1.71 0.36
Ulmus americana		orth America	orth America			3.14 0.12	2. 2 0.08	2.46 0.26
Ulmus crassifolia		orth America	orth America			3	3	2.0 0.0
Ulmus davidiana		ast Asia	ast Asia			3 0	2	3 0
Ulmus glabra		urope	urope			3.53 0.13	2.41 0.13	2.03 0.44
Ulmus laciniata		ast Asia	ast Asia			3 0	2	2.75 0.25
Ulmus laevis		urope	urope			3.67 0.2	1.45 0.22	2.83
Ulmus minor		urope	urope			3.36 0.11	3.3 0.15	2.06 0.07
Ulmus parvifolia		ast Asia	ast Asia			2.5 0.5	2.88 0.12	1.27 0.27

Ulmus pumila		ast Asia	ast Asia			2.5 0.5	3.35 0.35	1.52 0.02
Ulmus rubra		orth America	orth America			3.31 0.1	3	1.73 0.24
Ulmus thomasii		orth America	orth America			3.22 0.28	2	1
Umbellularia californica		orth America	orth America			3.84 0.16	2	0. 5 0.05
Vaccinium arboreum		orth America	orth America			2	3 0	2
Vaccinium corymbosum		orth America	orth America			2	2	3.5 0.5
Vaccinium erythrocarpum		orth America	orth America			1	2	3
Vaccinium japonicum		ast Asia	ast Asia			2.83 0.6	4	2.5 0.5
Vaccinium macrocarpon		orth America	orth America			1. 0.01	1.68 0.32	3.1 0.1
Vaccinium myrtillus		urope	orth America			3.02 0.1	2.6 0.4	2. 2 0.08
Vaccinium oxycoccus		urope	orth America			1.56 0.1	0.32 0.42	4.45 0.18
Vaccinium smallii		ast Asia	ast Asia			2.67 0.67	4	2.5 0.5
Vaccinium uliginosum		urope	orth America			2.2 0.1	2.21	3.1
Vaccinium vitis idaea		urope	orth America			2.2 0.1	3.46 0.42	3.1
Veronica fruticans		urope	urope			1.2 0	3.46 0.42	1.04
Viburnum dentatum		orth America	orth America			4	2	2.5 0.5
Viburnum furcatum		ast Asia	ast Asia			3.33 0.33	1.5	3
Viburnum lantana		urope	urope			1. 3 0	3.46 0.42	1.68 0.0
Viburnum lentago		orth America	orth America			4	2	2.5 0
Viburnum opulus		urope	orth America			2.66 0	2.21	2.06 0.07

Viburnum rufidulum		orth America	orth America			2	3	3
Weigela hortensis		ast Asia	ast Asia			1.17 0.17	2.5 0.5	2.5 0.5
Yucca brevifolia		orth America	orth America			1.17 0.17	4. 5	1.53
Zanthoxylum ailanthoides		ast Asia	ast Asia			2	4	1
Zanthoxylum clava herculis		orth America	orth America			2.5	4 0	1
Zelkova serrata		ast Asia	ast Asia			2.0 0.0	3.35 0.35	1.02 0.02
Zizyphus jujuba		ast Asia	ast Asia			1.35	4. 5	1.53

Bac to M076-020

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:42 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: BLM Draft Resource Management Plan Comments: HRV Misinformation
Attachments: Zybach_BLM_20150821.pdf

---------- Forwarded message ----------
From: **Bob Zybach** [redacted]
Date: Fri, Aug 21, 2015 at 2:46 PM
Subject: BLM Draft Resource Management Plan Comments: HRV Misinformation
To: blm_or_rmpwo_comments@blm.gov

Hello:

Please accept the attached PDF file regarding my comments on the portion of the BLM Draft Plan dealing with the use of rudimentary and inaccurate "HRV" numbers and descriptions.

Thanks,

Dr. Bob Zybach, PhD
[redacted]

Review of Bureau of Land Management uses of "Historical Range of Variation" estimates cited in Volume II of the Draft Resource Management Plan/Environmental Impact Statement for Western Oregon.

Dr. Bob Zybach, PhD.
President, NW Maps Co.
August 19, 2015

This analysis specifically addresses pages 683-694 of Volume 2 of the current US Department of the Interior Bureau of Land Management (BLM) Draft Resource Management Plan/Environmental Impact Statement for Western Oregon ("the Draft Plan"), which lists estimated ages and areas of prehistoric forestlands in the Oregon Coast Range. This review focuses on the single document used by BLM to obtain Oregon Coast Range precontact forest age and extent estimates, a 2005 paper written by Etsuko Nonaka and Thomas Spies titled *Historical Range of Variability in Landscape Structure: A Simulation Study in Oregon, USA* (Nonaka and Spies 2005: 1727-1746).

In this review I generally address two related questions:

1) What is the scientific and/or forest management value of Nonaka and Spies' 2005 paper regarding mathematical modeling efforts to derive an "estimated average Historical Range of Variation" (HRV) for western Oregon forests?

2) Why is this single computerized student modeling exercise the only apparent source of information used by BLM in their Draft Plan to describe precontact and historical forest conditions, stand ages and locations, and "fire history" in the Oregon Coast Range?

The principal reason for questioning the quality and value of the information contained in the Nonaka and Spies study is because it contains so many obvious flaws in its methodology that the conclusions can be readily disproven or shown to be highly unlikely and/or speculative at best. Despite these shortcomings, BLM planners have apparently decided to use this single document as a standard for achieving desired long-term conditions for western Oregon forests under their care. As a result, the scientific and forest management inadequacies of the Nonaka and Spies paper will be the focus of this review. The management implication is, of course, that BLM should be more selective in determining their sources of information -- and should also include a much wider range of expertise during the data selection process.

The Nonaka and Spies paper was submitted and published shortly after the senior author had received her Masters degree from Oregon State University (OSU) in 2003. At that time Spies headed a program focused on Oregon Coast Range forest research titled "CLAMS" (Coastal Landscape Analysis and Modeling Study), funded by the US Forest Service, Oregon Department of Forestry, OSU College of Forestry, and the USDA PNW Research Station. This study was apparently funded in turn by CLAMS, perhaps including the cost of publication of the paper in a peer reviewed journal.

The Nonaka and Spies paper is basically a graduate student exercise in computerized modeling, with the Coast Range forests of western Oregon serving as a geographic "landscape-scale" for theoretical mathematical simulations using a mostly untested and rudimentary in-house computerized wildfire simulation model named LADS, and with which Spies and CLAMS were also financially involved. The same CLAMS connections also hold true for many of the primary references used in the construction of LADS and in the predictions described in this paper.

There is an obvious bias in the literature reviewed for constructing this model. For a topic claiming to deal with prehistoric Oregon "landscape scale" forest history and fire history, there is a noticeable bias in the sources that are cited. Where are the historians, historical ecologists, cultural anthropologists, archaeologists and other actual experts in these topics of western Oregon forest and fire history? Where are Lewis and Clark, David Douglas, John Leiberg, Henry P. Hansen, Thornton Munger, Carl Johannessen, Stephen Pyne? Sure, Robert Boyd is briefly cited, but how can his vast body of documented research on pre-white settlement western Oregon Indian burning practices (much of it based on the findings of many of the just-listed scientists) be so readily and superficially dismissed by Nonaka and Spies (2005: 1729):

> Fires were set by Native Americans in the coastal valleys and adjacent Willamette Valley for agriculture and hunting (Boyd 1999); some of these fires may have occasionally burned into the coastal foothills, but the evidence for this is not strong (Agee 1993, Whitlock and Knox 2002).

Actually, the evidence is overwhelming in support of Boyd's work and the findings of many others that the Indians of western Oregon regularly burned the hills and valleys of their homelands for thousands of years; and also that "coastal valley fires" almost always travel uphill through the "coastal foothills" – mostly,

probably, by design -- not just "maybe occasionally." To dismiss and misrepresent Boyd's research by citing the alleged opinions of a couple of other mathematical modelers regarding the perceived quality of Boyd's "evidence" is not good scholarship and is not very scientific. Perhaps Nonaka and Spies should have spent more time considering the large body of scientific literature, historic eyewitness accounts, historical maps and photographs, original land survey notes, and documented and personally observed western Oregon fire and forest vegetation patterns that Boyd and others have researched. That is how "historical research" is actually accomplished – not by unstated assumptions (Zybach 1993), estimates (Nonaka and Spies 2005: 1727), or the claimed opinions of other non-historian peers (ibid.: 1729). The obvious bias against actual historical documentation – and particularly when it apparently contradicts the mathematical models of the authors – draws into question the actual scientific merit, much less reliability, of any findings that follow.

On a more personal level, where is my own PhD research on this identical topic – the forest and fire history of the Oregon Coast Range, stretching back more than 500 years into <1500 AD precontact time (Zybach 2003)? I finished my Environmental Sciences PhD at OSU in 2003, the same year that Nonaka earned her Masters degree in ecological modeling at the same institution. Further, my research was well known – and had been for many years – to members of the CLAMS research team, including Nonaka's co-author. Disregarding my research apparently because my findings conflicted with the design of an obscure computerized model named LADS is curious. It is also another obvious instance of research bias. At the least, this exclusion is a good example of a poor literature review ultimately resulting in an unreliable product with no reasonable confidence in any of its subsequent "findings" or conclusions.

Here are some additional points, some relatively minor but indicative, to support these assertions:

1. Definition of "Historical."

The so-called "HRV" is supposed to stand for "Historical Range of Variation," but the actual historical record – which, by definition, can be documented and is not based on "estimates" or simplistic mathematical formulas – is hardly consulted at all in this exercise. Where are the known experts who have written and researched the actual historical record to describe past forested landscapes and fire history in western Oregon? Why weren't forest and fire historians at least employed to review the research methods and assertions of this study before it was published?

Instead, Nonaka and Spies (2005: 1728) assert: "We defined HRV in this study as the variability in the amount and spatial characteristics of forests of various ages under the [white] presettlement fire regime." The authors had previously claimed that the HRV was an "estimate" of the historical range of "the variability (HRV) of forest landscape structure under natural disturbance regimes." Apparently in their consideration of "natural regimes," the authors had not only eliminated the effects of people and human-caused fires from "presettlement time," but they also decided to exclude floods, windstorms, landslides, snowstorms, earthquakes, droughts and tidal waves from their implied working definition of "natural."

The word "historical" has two basic definitions in the English language: 1) the period of time that people have lived in a certain area; and 2) the period of time beginning with the first reliable first-person records for an area, including written eyewitness accounts, maps, sketches, photographs and other recognized forms of acceptable documentation. Despite the presence of the word "historical" in the title to this study and throughout all of the arguments for and simulations of HRVs that form the basis for the paper, it is not used in either commonly accepted definition of the word nor is it defined any differently anywhere in the text. This critical word is simply used inaccurately and without explanation from beginning to end.

On page 1730, directly under the heading "*Model Simulations*" and immediately adjacent to the subheading *"Historical Landscapes. –"* are the three following sentences ***[emphasis mine]***:

> ***Historical landscapes were simulated*** by using the Landscape Age-Class Dynamics Simulator (LADS), ver. 3.1 (***Wimberly 2002***). LADS is a spatially explicit, stochastic cellular-automata model ***designed to simulate forest landscapes dynamics under fire regimes specified by the user***. We applied this model ***to ask how forest age composition and spatial pattern in the Oregon Coast Range landscape varied historically.***

The fact that LADS is also a single mostly untested computer model developed more than 13 years ago [!] by a single obscure graduate student and that it has never gained general use or acceptance by anyone since is telling. The fact that it is fully intended to be manipulated in terms of "estimated fire regimes" as "specified by the user" should be even more telling to anyone with any intention of relying on this bizarre approach to "history." Especially for practical resource management purposes or other potential applications of historical data. The gobbledygook

simulated techno-babble should also be strong indication of the near complete lack of substance in taking this digital short cut to actual scientific historical research.

2. "Presettlement time."

Most archaeologists, anthropologists, historians, historical ecologists and many others believe people settled the Pacific Northwest more than 10,000 years ago. When the authors refer to the Oregon Coast Range forests of "presettlement time" (Nonaka and Spies 2005: 1727-1729) they are actually referring to "precontact time" in terms of white discovery and settlement. This lack of historical insight and apparent dismissal of the existence and effects – and permanent settlements -- of hundreds of generations of earlier Coast Range residents permeates the Nonaka and Spies paper, as it does many of the other like-minded sources cited by their paper in support of their mostly unstated assumptions (Zybach 1993) and mathematical formulas. Charles Kay (e.g., Kay 2002) and others have pointed out the underlying racist issues associated with this perspective of assuming precontact Indian people had only limited and occasional effects on the landscape they had successfully – and sustainably – managed and occupied for thousands of years.

The authors later refine their historical research period to: "the 1000-year time period prior to the change that occurred after Euro-American settlement" (Nonaka and Spies 2005: 1741): presumably, then, from about 825 AD to about 1825 AD; Nonaka and Spies don't provide actual dates. The rationale for selecting this time period -- which includes the entire Little Ice Age and the tragic decimation of western Oregon Indian families and communities from ca. 1500 through 1825 (Zybach et al. 1995; 2005: 299-301) -- was "because the fire regime and vegetation composition were relatively stable over that time period" (Nonaka and Spies 2005: 1741). Other than generally citing two localized and speculative studies of pollen counts and carbon settlement patterns on a few lake bottoms, nothing else is given in support of this highly unlikely statement of "fact" – the authors even admit as much, stating that their "choice of a reference period is, however, somewhat arbitrary, given the fact that fire regimes changed as climate and vegetation changed in the past . . ." (ibid.: 1741).

The bottom line then is that the number "1000 years" was selected arbitrarily and without much research, and for purposes of containing some kind of theoretical, presumably stable, and predetermined "fire regime" in order to mathematically estimate the "average history" for the forests of the Oregon Coast Range. This is not science and there is very little or no chance that any useful data can be

developed in this manner -- other than maybe for developing more capable computerized predictive models sometime in the future.

3. Wildfires vs. people.

The entire Nonaka and Spies paper is tied to the concept that periodic wildfire was the "most important" disturbance for at least 1,000 years (ca. 825 – ca. 1825) in pre-contact Oregon Coast Range forests (Nonaka and Spies 2005: 1728-1729):

> Large-scale wildfire is the most important disturbance that has shaped forests of the Oregon Coast Range (Agee 1993, Impara 1997). The fire regime was relatively stable for the 1000 years prior to Euro-American settlement [no citation].

For thousands of years and hundreds of generations, Oregon Coast Range families used fire every day; constantly gathered and stored firewood ("dead trees and large woody debris") in order to cook, and to provide heat and light; and seasonally burned patches of vegetation and broadcast burned millions of acres of oak savannah, tarweed, bracken fern and other desired food and fiber plants every year (Zybach 2003: 131-191). This is not the invented "fire regime" imagined by Nonaka and Spies; rather, it is the documented long-term use of purposeful fire in the environment, with predictable and observable results. Including "wildlife habitat" structure and location.

In light of the obvious and lasting cumulative effects of these widespread daily and seasonal actions and events over millennia, to say that "wildfire" had more effect on landscape vegetation and wildlife habitat than people and their prescribed fires is inherently ignorant. At the least, these facts need to be addressed by the authors if they are to continue to be taken seriously regarding their claims of "natural fire regimes" and the methods by which such claims are based.

4. Computerized modeling vs. traditional scientific methodology.

Scientific methodology has traditionally involved observation, hypothesis, prediction, experimentation, and replication as important steps in advancing knowledge. As stated throughout the Nonaka and Spies paper, mathematical modeling only approximates these standards, and even then with limited data and by arbitrarily choosing from competing, mostly unproven, methods. In the authors' own words (Nonaka and Spies 2005: 1741):

> Quantitatively estimating HRV imposes many challenges because available data are often insufficient and the methodology is not well established. Existing literature on HRV indicates a wide variety of approaches . . .

The results of using a "not well established methodology," "insufficient data" and "estimations" to approximate historical events and conditions in order to "quantitatively estimate" an average HRV does not sound like a formula for success. It is an admittedly compromised modeling formula, similar to those used by computer gamers, not a scientific method. The "lack of available data" excuse does not work when abundant amounts of such data can be readily obtained at a library or via traditional scientific research methods.

Here is an example of what estimated "historical" averages using rudimentary computerized simulation models for 200 claimed iterations actually yields (Nonaka and Spies 2005: 1743) ***[emphasis mine]:***

> Third, the oldest old-forest age class, 450-800 years and >800 years, which are largely absent from the Coast Range today, ***probably occupied a significant portion of this landscape under the HRV.*** Without a long-term commitment to growing old growth, ***this structurally distinctive stage of old growth*** (Spies and Franklin 1991) will not occur.

Not only will this "structurally distinctive stage of old growth not occur" -- even with a "long-term commitment" – it does not even exist, has not existed during historical time (the last 250 years), nor did it likely ever exist on the Oregon Coast Range during the past 1,000 years (Zybach 1993: 10-33). These numbers aren't "estimated" at all – they are completely fabricated. And they are based entirely on arbitrary modeling formulas and not actual observation. As a result, there is no way to document, verify, or replicate these claims. They are simply false to begin with.

For most of my adult life I have conducted formal and informal research regarding historical forest ages and conditions on the Oregon Coast Range. My 2003 OSU PhD dissertation is largely a product of that research. Appendix G of my dissertation (pp. 435-439) is a four-page table listing all of the oldest trees and earliest evidence of large-scale precontact forest fires in the Coast Range, including many citations in common with Nonaka and Spies. Very, very few living trees have ever been found that germinated before 1500, a little more than 500 years ago. Of these trees (at least any that remain living), all are still less than 600

years of age. At the time of "white settlement" they would have been only 300-350 years of age – not even 400-years-old, much less "450-800 years" or ">800 years." These are imaginary numbers, apparently invented and successfully promoted by the authors for some purpose other than accurately describing precontact forest ages and conditions in western Oregon.

I have not come across evidence of even a single 600-year-old conifer tree existing in the Oregon Coast Range during the past five centuries, much less 450- to 800-year-old stands, or even individual trees greater than 800-years-old! And prior to white settlement those same trees were nearly 200 years younger than they are (or were) now. Major stumps and snags of 300-year-old or so trees killed in the 1849 Yaquina Fire still exist in Lincoln and Lane counties to this time. If any such 400-800+-year-old trees ever actually existed at any time in the past 500 years, there would still be plenty of evidence of their existence to this day, whether via stumps, fallen trees and logs, charcoal deposits, timber cruises, drawings, reliable eyewitness accounts, and/or photographs.

This major error and exaggeration at mathematically estimating the average ages of precontact trees during the past 1,000 years -- and thereby demonstrating the significant inadequacies of many of the authors' referenced sources in the process – is compounded even further with the ridiculous claim that such fantastic ancient forests routinely existed over 1/2 of the entire Oregon Coast Range for most of the last 1,000 years! Simple arithmetic and a limited amount of research can be used to readily demonstrate the impossibility of this nonsense (Zybach 1993: 10-31).

On page 1730, Nonaka and Spies claim they ran "200 model simulations for 1000 years with 10-year intervals" of their specified equations to determine their result. The number of iterations is meaningless. This is the silk purse and sow's ear argument. You could attempt to make chocolate from dirt 200 times – or 2 million times -- too, but you will never get chocolate. The old techie term was "GIGO": Garbage In = Garbage Out.

5. Forest management implications.

In the portion of their paper dedicated to forest management implications of their estimated averages of supposed historical events and conditions – which should be of most interest to BLM planners – the authors make a series of candid, apparently incomplete, and contradictory statements (Nonaka and Spies 2005: 1730) ***[emphasis mine]*:**

> This study confirms the findings of previous work that ***several components of the current forest landscape structure are outside the HRV that probably occurred in the pre-European landscape*** (Wimberly et al. 2000). It goes beyond the previous work to demonstrate that additional characteristics of the landscape, such as ***current amounts of very old forest (>450 years old) . . . also lie outside the HRV***.
>
> The application of HRV concept to forest policy and management is problematic in the Oregon Coast Range. First, ***no federal or state policies or management plans use HRV as an explicit goal*** . . . A further major limitation is that not all landowners have the same ecological goals . . .
>
> Despite these significant limitations, ***knowledge of HRV can be useful in understanding how [white] humans have altered landscapes***, and if the goal is to retain or restore desired native species and ecosystems, ***HRV can provide insights that can help managers formulate biodiversity goals*** for inherently dynamic ecosystems.

By inventing a mythical and mathematical past in which Indians were isolated and inconsequential components of the environment, most old-growth lived to be more that 600 or 800 years of age and routinely existed over most of the landscape, and in which clockwork wildfire events ("fire return intervals") were said to have had the greatest influence on forest vegetation patterns over the last 1,000 years, the HRV probably does affect "understanding how humans have altered landscapes" – apparently referring to white humans during historical time, and apparently in a negative way. Otherwise, this statement is meaningless. And while it is probably true that some resource managers really are "formulating biodiversity goals for inherently dynamic ecosystems" (though probably not on non-government forested lands), it is difficult to see how an estimated average HRV devised as described in this paper would have any value at all for this type of theoretical exercise.

Despite the obvious bias and methodological inadequacies of the Nonaka and Spies' HRV modeling, BLM planners have given it remarkably significant weight in the DEIS ("Draft Environmental Impact Statement") portion of the current Draft Plan. Page 684 of the draft includes Table 3-248 that has a column of six "Structural Stages" in which "Structurally-complex Habitat" (however that might be defined), is identified as the nonexistent and mythical 450-800+ age class described by Nonaka and Spies:

> ***The 2008 RMP/EIS summarized the average historical conditions*** of forest structural stages in Western Oregon ***from Nonaka and Spies (2005), which is incorporated here*** by reference (USDI BLM 2008, pp. 211-212) . . . This characterization of average historical conditions correlates to 5 percent stand establishment, 15 percent young, 25 percent mature, ***and 55 percent structurally-complex, respectively*** . . .

Not surprisingly, Table 3-248 only shows only 7% "structurally complex" ancient old-growth existing today -- not the apparently 55% desired by the authors as found in "history" – for "All Ownerships." These are all arbitrary, manufactured numbers generated by an obscure, simplistic and unproven mathematical CLAMS model named LADS that was specifically designed to churn out results "specified by the user." None of those results seem to include actual data regarding the daily, seasonal, and situational burning practices of precontact or early historical western Oregon people, however. And the fantastical nature of the supposedly "historical" forest ages demonstrates the complete inadequacy of this methodology for generating accurate or useful data for planning and/or management purposes.

The current approach by the BLM of determining the "historical" condition based on a single deeply-flawed computer simulation should reasonably be abandoned and replaced by one that relies on actual historical data. BLM would provide more realistic forest management options if it relied on more realistic information when developing its proposed forest management plans. From my experience, bad data and/or research methods must certainly result in costly and counter-productive plans and planning processes -- and the proposed options document that concern.

I would like to submit the documents referenced below – and their own respective lists of citations -- as a beginning point in adopting factual information rather than theoretical estimations into the BLM western Oregon forest management planning process. My own dissertation was on this exact topic, and was developed simultaneous with the model described in this paper and contains a number of reasonable research beginning points in its own Bibliography section (p. 333): www.nwmapsco.com/ZybachB/Thesis/Zybach_PhD_2003.pdf.

Other actual experts on subjects of Oregon Coast Range forest and fire history and on research methodology for pursuing such topics, are listed early in this review and should reasonably be consulted by anyone truly interested in these topics, or who may have a professional interest in their use. The current use of such a limited, flawed and out-dated model is unacceptable, and particularly for long-term public forest management purposes.

References

FEMAT (Forest Ecosystem Management Assessment Team) 1993. *Forest Ecosystem Management: An Ecological, Economic, and Social Assessment*. Joint publication of the US Forest Service, National Marine Fisheries Service, Bureau of Land Management, US Fish and Wildlife Service, National Park Service, and US Environmental Protection Agency, Washington, DC.

Kay, Charles 2002. "Afterword: False Gods, Ecological Myths, and Biological Reality," IN: *Political Ecology: Aboriginal Influences and the Original State of Nature*, edited by Charles Kay and Randy Simmons, The University of Utah Press, Salt Lake City, Utah: 238-261

Nonaka, Etsuko and Thomas Spies 2005. "Historical Range of Variability in Landscape Structure: A Simulation Study in Oregon, USA," *Ecological Applications,* Vol. 15, No. 5: 1727-1746.

USDI Bureau of Land Management 2015. *Draft Resource Management Plan/Environmental Impact Statement for Western Oregon.* USDI Bureau of Land Management, Portland, Oregon: Vol. 2.

Zybach, Bob 1993. "Forest History and FEMAT Assumptions: A Critical Review of President Clinton's 1993 Northwest Forest Plan," IN: *Comments on the Draft Supplemental Environmental Impact Statement on the Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl*, Northwest Forest Resource Council and American Forest & Paper Association, Portland, Oregon, Appendix B: 101 pp.

Zybach, Bob, Mack Barrington and Thomas Downey 1995. "Converting Historical Information to GIS: Political Boundaries of the Douglas-Fir Region, 1788 to 1995," *Journal of Forestry,* Society of American Foresters, Vol. 93, No. 5: 15-20.

Zybach, Bob 2003. *The Great Fires: Indian Burning and Catastrophic Forest Fire Patterns of the Oregon Coast Range, 1491-1951*. PhD. Dissertation, Oregon State University, Corvallis, Oregon: 451 pp.

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:35 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Comments to the Draft RMP 2015
Attachments: RMP comments august 2015 Reilly.pdf; TNC V1 Rogue Basin Cohesive Forest Restoration Strategy 2015 FINAL.pdf

---------- Forwarded message ----------
From: **Edward Reilly** [redacted]
Date: Fri, Aug 21, 2015 at 10:36 AM
Subject: Comments to the Draft RMP 2015
To: blm_or_rmpwo_comments@blm.gov

Thanks for reading carefully.

Comments to 2015 Draft RMP EIS for Western Oregon BLM

August 20, 2015

Edward Reilly

[redacted]

It is helpful that the BLM is trying again to get some surety and predictability into the Oregon federal forest land base. There is some great analysis and work that has gone into the RMP so far. The NEPA process is about understanding flaws in analysis so I need to dwell on some of the deficiencies in the Draft RMP here.

I have had the great pleasure (mostly) of working in natural resource management in Southern Oregon over the last 35 years. Ten years were spent working on the Medford District leading ID teams, preparing timber sales, analyzing forest productivity, fire regimes, owl habitat and many other projects. That time spent studying forests in Southern Oregon and working for the federal agencies has provided me with a strong understanding and insight into the land base and challenges of the Medford District.

Much of my professional career was spent in collaborative settings with groups such as the Applegate Partnership and the Southern Oregon Forest Restoration Collaborative (SOFRC). Many projects and meetings with dedicated members of the public and passionate agency personnel have collectively advanced our notion of what forest management can become to achieve multiple societal goals. Since retiring in May of 2012, I have continued my work with the Southern Oregon Forest Restoration Collaborative (SOFRC). Much of the comments contained here are also reiterated in the comments from SOFRC, as I have been working closely with that group for a number of years.

I would really like to see a plan that can be implemented and is solidly defensible by the District staff. Currently the district staff has an extremely difficult time meeting the expectations for all the competing values and producing economically viable timber sales on the challenging landscape of Southern Oregon's dry forests.

1) Data and Analysis

I have concerns about some of the data used for analysis of current timber inventory and estimates of removal. The FOI data is a bit suspect. Site Index, volume per acre and removal volumes all seem a bit high from my experience.

It appears that the method of rating the productivity of the landscape (site class) and using a GIS imputation to map areas that were never sampled may have inflated the productivity ratings (site class). Regardless of the method, it is clear that the dry forest has many, many acres that are not suitable for economic timber production. I believe there is too much Site Class II and III.

Volumes seem very high for some stands with 50-60 mbf/acre in some of lower elevation, dry site ground in the Applegate (T39SR2W). I am not sure what procedure was used to come up with these volumes. Perhaps older inventory data was 'grown out' over several decades to predict current stocking levels and standing volume. Regardless of the methods, there are some stands with very high numbers that do not agree with usual stand conditions of this area. Conversely, there are stands with very low numbers – 0 (zero) that do have standing volume. I reviewed the RMP GIS data FOI_VEG_PUB_POLY. It is

unclear whether these are true zeros or incomplete information. Perhaps the posted data is different than what was used to model the Woodstock runs. Let's hope so!

Small over estimates of site potential along with additional over estimates of growth and yield rates can add up to unrealistic expectations. The RMP draft's estimates of volume per acre to be removed in uneven age prescriptions for the Medford District are over ambitious. They will need to be scaled down in order for the District to implement successfully. Don't set up the field units with unrealistic expectations that cannot be achieved.

Please review some of the base assumption data sets carefully for accuracy and field check or ask districts to critique the quality of the data.

2) Economics

I have never seen a reasonable review of the real questions of economics of federal forest management in a plan level document.

There is a cost to remove timber. There is a cost to build roads and maintain them. There is a cost to fuels removal and young stand thinning. There is a 'profit' from the selling of merchantable material. The draft RMP has much discussion of socio-economics at a high level and how much timber and payments have gone through counties and communities but nothing about the cost to get the timber out of the woods and to the mill. Can it be done everywhere with all material being sold for a profit? What are the cost centers? What are the benefits? Are there differences in the landscape that affect whether timber can be removed at a profit, breaks even or needs to be subsidized?

Cost of activities must be addressed to understand if an action is feasible or not.

The biggest deficiency in the Draft EIS is the lack of concern or analysis for economic viability of removing the timber. In the Medford District, , scattered timber, low volumes per acre and steep ground all add up to significant cost to remove the timber. The District has a long history of sales being marginally economic with a number going no bid.

Over the last five years, I have taken a great interest in understanding the economics of timber removal. It is one of the most important challenges that we face in the management of the dry forest of the western US. Along with a few colleagues, we have established a simple matrix of factors influencing whether timber can be removed at a profit, would need to be subsidized or must be actively paid for. These factors include the volume of material to be removed and the logging system and distance of material to be moved. These factors are based on cost centers derived from interviews with multiple contract loggers with decades of experience in Southern Oregon systems.

A GIS model was developed to define the logging system possible on the Medford District along with a set of prescriptions for removal of merchantable material to meet ecological objectives. The details of the plan are available in a document authored by myself and others under the SOFRC banner and titled *Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities v.1.* That document is being sent as an attachment along with these comments via e-mail.

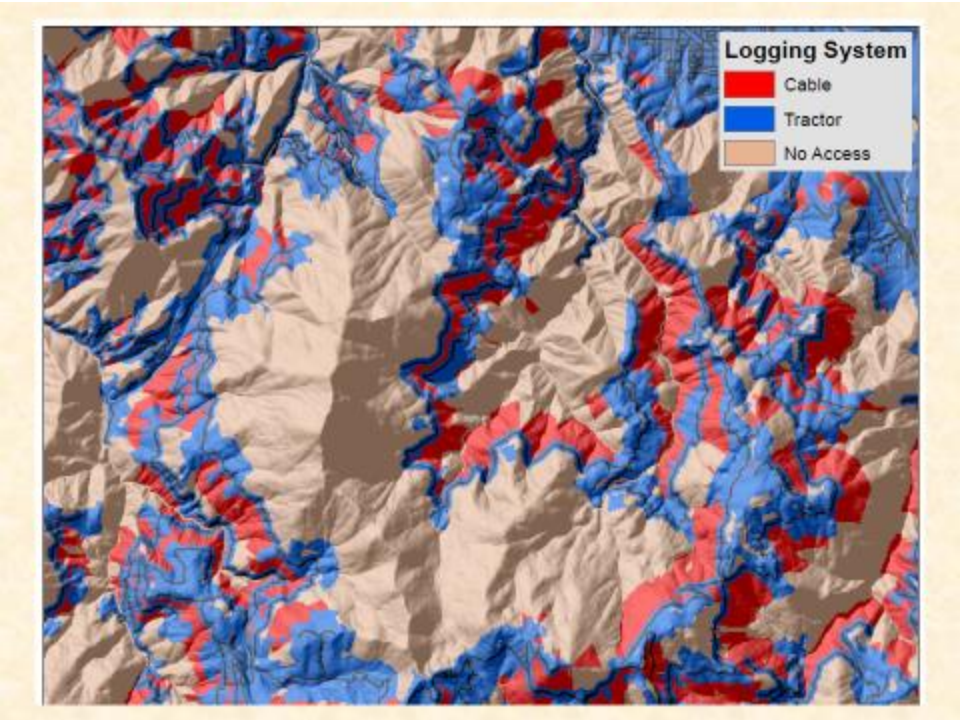


Figure 1: Example GIS model estimating locations of uphill yarding and tractor ground. Operational constraints on BLM ground generally preclude downhill yarding.

I used the 2012 Gradient Nearest Neighbor (GNN) vegetation data set to understand existing volumes, basal areas and removal options. When applying the SOFRC economic factors to the Medford District land base using the current land allocations ((1995 RMP), NSO recovery options, the SOFRC emphasis areas and removal prescriptions we come up with the following summary tables.

Table 1: Summary of board feet and acres by economic class for the Medford District. Assumptions include: existing road network, entry in matrix and LSR, no entry in NWFP riparian reserve network, SOFRC owl recovery strategy, SOFRC removal prescriptions.

Medford District	**Economics of Restoration Volume**		
BLM	**Board Feet**	**Acres**	***Avg BF/Acre***
Economically Viable	546,627,890	57,720	*9,470*
Needs Subsidy	374,502,696	94,645	*3,957*
Not Accessible/ 0 Volume	24,734,556	337,000	*73*
Total	**945,865,142**	**489,364**	***1,933***

Table 2: Detailed summary of acres by board foot class and logging system for the Medford District.

BLM	Treatable Base Only		SOFRC Strategy based on 1995 RMP		
Acres	0 bd ft	1-2500 bd ft	2500-6000 bd ft	6000+ bd ft	Grand Total
GROUND BASED	115,250	19,322	14,427	21,171	**170,171**
SHORT CABLE	70,542	14,080	8,328	11,743	**104,692**
LONG CABLE	11,729	2,448	1,562	2,051	**17,790**
HELI	121,733	24,506	14,080	18,647	**178,967**
NO ACCESS	12,869	2,364	1,078	1,433	**17,745**
Grand Total	**332,124**	**62,720**	**39,475**	**55,045**	**489,364**

Table 3: Detailed summary of removal volume by board foot class and logging system for the Medford District.

BLM	Treatable Base Only		SOFRC Strategy based on 1995 RMP		
Board Feet	0 bd ft	1-2500 bd ft	2500-6000 bd ft	6000+ bd ft	Grand Total
GROUND BASED	-	19,562,800	58,214,429	272,785,457	**350,562,686**
SHORT CABLE	-	14,726,143	34,446,310	153,291,168	**202,463,620**
LONG CABLE	-	2,532,741	6,388,960	27,890,526	**36,812,227**
HELI	-	24,984,298	56,515,955	249,791,799	**331,292,053**
NO ACCESS	-	2,527,727	4,244,397	17,962,432	**24,734,556**
Grand Total	**-**	**64,333,708**	**159,810,051**	**721,721,383**	**945,865,142**

Our analysis relies only on the existing road system and does not expect new roads to be built. There is already a large backlog of roads that are maintenance deferred because of cost of upkeep. It is not that I am opposed to new, carefully designed and constructed roads. However, in addition to the environmental concerns and constraints, there is the basic cost/benefit of building a road to reach patches of timber that are already economically constrained by removal costs. In order to justify the cost of a new road there must be sufficient material to be removed. If new roads are expected in the RMP, then an economic analysis needs to be done. It is not sufficient to state that BLM will build new roads as needed to reach timber to be managed.

In addition to the timber removal estimates and costs, my assessment is that there is in excess of 300,000 acres of forest stands with trees less than 10" that can benefit from density reduction. This is wholly subsidized work. Possibly some biomass utilization could offset a very small portion of the costs in favorable locations.

Please address the real cost of forest management in the Final EIS.

3) Northern Spotted owl Recovery

As stated previously, I would like a plan that is implementable by the district field staff. It will do no good to create a plan and a set of expectations that cannot be met. I fear some of the premises being analyzed will lead to a Decision that will not be practical to implement. This will lead to the same

difficulties currently seen in BLM project planning and project implementation. Reviewing the DRAFT RMP owl habitat analysis and owl strategy for southern Oregon I see some problems. First of all a large block strategy will not protect owls and aid in the recovery of owls in Southern Oregon. The existing owl habitat is widely distributed and on a fine scale. A finer scale approach to recovery and protection is needed instead of a large block reserve for the dry forest.

I downloaded the RMP GIS data set and did some simple queries. Only 15% of the known owl home ranges are 'protected' by the reserve network in Alternative B. This will lead to great difficulties in trying to create timber sales when consulting. This will not streamline project development and implementation. Fine grain protection measures are needed to aid in recovery of NSO populations.

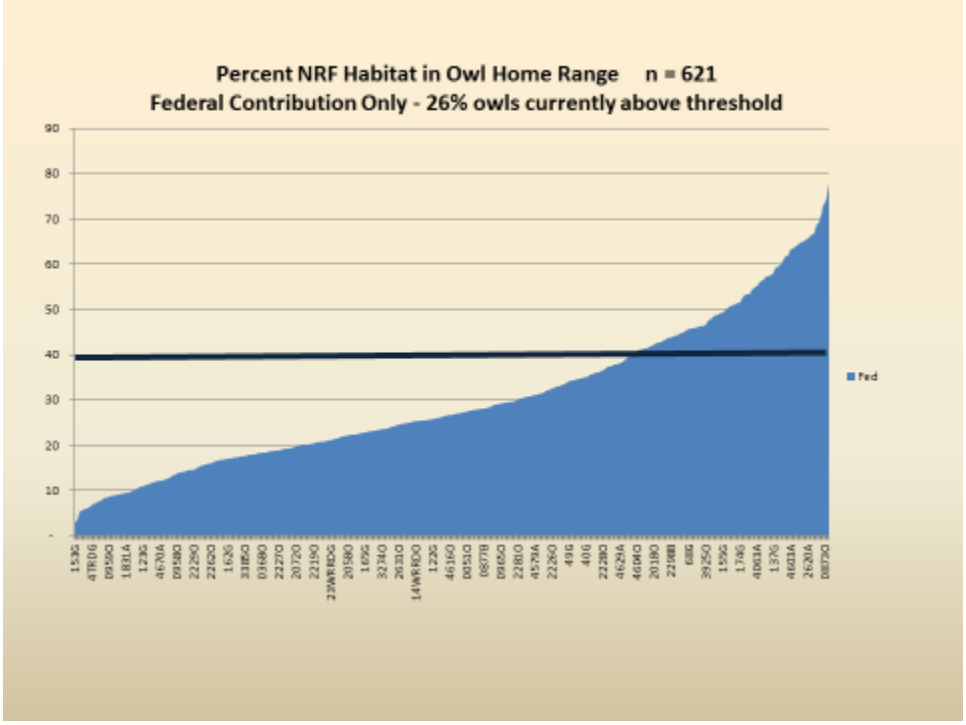


Figure 2: 2010 snapshot of NSO home ranges on Medford District showing the percent of NRF habitat in each home range, sorted by owls with lowest to highest home range habitat percentage.

Figure 2 is a very simple graph I made back in 2010 showing the amount of NRF habitat that each individual owl had in its home range at that time using the USFWS Owl Estimation Methodology (OEM). The graph is sorted by owls with the least to the most habitat. USFWS service has concluded that NSO need a minimum of 40% NRF habitat in a home range to thrive. The graph shows that only 26% of the owls are above the threshold. This means that before any ground disturbing action, the owl habitat is already in a deficit for 84% of the owls. It appears that the RMP analysis of habitat, includes private lands as contributing to NSO habitat. You cannot count on private land to meet the obligation of habitat for spotted owls. This is a flaw in the analysis assumptions.

This leads to the importance of Recovery Action 10, which recommends a robust analysis to understand the quality and history of each owl site to rank its contribution to recovery. On the Medford District an

owl by owl strategy is needed rather than a large block design. In 2012, I worked on a multiagency team to develop a well thought out approach and strategy to utilize the USFWS RA10 recommendations. The RA10 approach was used as a foundation in the SOFRC landscape strategy. The SOFRC approach takes a pro-active stance where owl recovery along with habitat conservation, maintenance and creation is the goal and timber is a by-product. SOFRC has identified themes of owl habitat conditions where a variety of management options can be achieved. These conditions have all been mapped and analyzed.

Complex Forest Habitat – This area identifies the dense, multi-story forest favored by the Northern Spotted Owl, and other species and values consistent with older, complex forest.
a. **Existing high quality** Northern Spotted Owl (NSO) habitat within older, complex forests and supporting other critical species is protected but where no treatments will occur.
b. **Near-range emerging** NSO habitat where light thinning will promote multiple canopy layers in relatively simple stands with large trees, accelerating development to high quality complex habitat within 50 years. Treatments to improve habitat function may generate timber byproducts.
c**. Long-range potential NSO habitat** where more thorough thinning is needed in young stands to accelerate development of large trees with large branches and deep crowns, providing high-quality complex habitat within 50-100 years. Treatments to improve habitat function may generate timber byproducts.

Using the USFWS Relative Habitat Suitability mapping, we come up with the following approach.

Abbreviation	Definition	Objectives
NRF high or NRF low within ½ known core	Existing NRF in high RHS	No treatment, maintain habitat
Dispersal high (Near Range NRF)	Dispersal habitat in high RHS setting	Promote development to NRF with thinning single canopied dense stands
Capable high (Long Range NRF)	Capable habitat in high RHS setting	Promote development to dispersal with thinning in young stands
NRF low	Existing NRF in low RHS **Outside of ½ mile core**	Reduce wildfire risk to adjacent NRF and encourage ecological resistance by maintaining large trees and more open forest in ecologically appropriate settings. **Site specific review is critical**
Dispersal low	Dispersal habitat in low RHS settings	Thinning to promote ecological resilience while maintaining NSO dispersal capability at the landscape scale
Capable low	Capable habitat in low RHS settings	Thinning to promote ecological resilience while maintaining NSO dispersal capability at the landscape scale

Analyze and providing implementation guidance for finer resolution owl habitat and owl site conservation than the large block reserve.

Here is my "Analysis of Management Situation" for the Medford District.

Fire and Fuels

The majority of the managed lands are in a historically high fire return regime of 10-20 years.

Wildfires have been suppressed for many decades.

Fire exclusion along with extensive timber harvest has created an abundance of young forest with a lack of the more resistant large, thick barked trees. Species shifts have occurred resulting in much higher proportions of shade tolerant Douglas-fir and lower proportions of pine and cedar species than were historical present. Structural conditions have shifted to an abundance of younger, denser stands and fewer multi storied complex structure stands. Former woodlands and scattered conifer forest have ingrown and become dense tangles of vegetation.

Private residential and private industrial lands in a checkboard ownership pattern with BLM lands limit managing wildfire for resource benefits. It is too risky to private land owners who don't want natural fire on their land. This results in a need for a full suppression strategy for Medford District BLM. All fires are attempted to be put out as soon as possible which denies the density reduction species alteration effects of natural wildfire. Repeated fire exclusion results in a cycle of increasing fuel loading and more volatile forest conditions.

Forest Conditions and Timber Harvest

The most productive portions of the landscape, those that formerly had mature trees (150-300 years old) and highest volumes per acre were harvested over the last fifty years in order to 'get the cut out' and help meet the desire for O&C receipts and payments to the counties. The majority of the easy ground that was able to be accessed and roaded has been harvested. What is remaining of larger mature forest is now needed to support other resource goals such as riparian or late seral / NSO habitat.

Many stands that have been managed over the last fifty years with clear cutting are now in various stages of regrowth but are generally young with closed canopies and even age distribution. A very limited number of plantations have been harvested on the Medford District over the last ten years. Those that were harvested had low value trees with many limbs and had to be partially subsidized to be removed. It will still be decades into the future before a significant number of these stands come 'on-line' to be harvested economically.

Post 1995 RMP/NWFP thinnings that created simple single age class stands are abundant. Theses stands have limited silvicultural options for another harvest other than to treat with small group openings or regenerate to start a new young stand.

Stands of timber on the Medford District are often scattered with intervening stretches of grass and shrub lands. Road building costs per mbf are very high in steep, and sometimes unstable geologic conditions. Community concerns, ecological considerations and basic economic cost/benefit preclude the development of major roading. Short spur roads and extension of existing road network are feasible in some situations.

There are hundreds of thousands of acres of young conifers, shrubs and hardwoods that are in desperate need of thinning to achieve fuel modification, habitat creation and growth and yield goals.

The ability of stands to 'differentiate' and become mature large conifer forest of the future is limited in the dry forest without disturbance such as fire or cutting.

Northern Spotted owls

The Northern Spotted Owl is declining in numbers in much of its range. The Klamath province (SW Oregon) has some of the best population numbers and potential for recovery within the range.

The topography and productivity of the landscape in SW Oregon leads to a naturally diverse mosaic of habitat. Much of the remaining and most productive mature forest is needed for NSO habitat retention.

Some silvicultural practices are compatible with NSO habitat maintenance and creation. The removal volumes in these actions may be marginally economic or need to be subsidized.

The requirement to aid in the recovery of northern spotted owl create quite a conundrum in preparing timber sales. The highest volume per acre ground tends to be owl habitat.

A true NSO recovery solution would provide for actions to conserve what habitat remains and take steps to create more habitat in the most productive locations that can persist through fire. Timber removal is not totally antithetical to this goal but it creates challenges.

Summary

I am not opposed to timber cutting and removal. In fact, it is necessary to aggressively treat large acreages and remove significant numbers of trees to restore resistance and resilience. Broad societal objectives including the draft RMP's listed purpose and need goals of restoring fire adapted systems and recovery of northern spotted owls can only be achieved by reducing densities and restoring species composition over large expanses of forest. This cannot be achieved by focusing on economic timber removal only.

The economics of timber removal are marginal for much of SW Oregon. Steep ground, low volume per acre, limited roads and large numbers of smaller trees to be removed all add up to higher logging costs than the rest of the western Oregon BLM lands.

An economic analysis of the costs of implementing the forest removal strategies by various alternatives needs to be included in the final. Without an economic comparison of cost/benefit of IMPLEMENTING proposed actions, managers cannot make informed decisions.

The DRAFT RMP strategy of large block reserves and mitigating effects to spotted owls when removing habitat in timber sale operations will not allow effective consultation with US Fish and Wildlife Service to get supportive Biological Opinions. Greater proactive recovery options need to be used to address site specific implementation and aid in recovery of NSO. A change in basic approach from attempting to mitigate negative effects and instead identifying and protecting the best owl sites, maintaining and improving existing habitat and creating conditions to improve habitat for the future should be adopted as the working premise.

Implementing large block reserves will likely result in a large portion of the landscape that is precluded from the ASQ base and therefore does not receive as much funding to perform important work. The entire district land base needs to receive funding for ecological restoration and timber production. In

the dry forest without fire disturbance events, active management is needed in younger and mid seral stands to create conditions that will provide the structure and habitat elements needed for NSO. The RMP alternatives do not provide for this.

The few places left on the landscape with 150+ year old mature trees suitable for economic timber harvest are now needed for other resource benefits. All of the easy to reach timber is gone. What is left is low volume per acre, lower productivity ground or needed for owl habitat or riparian protection. A dramatic shift needs to be made to manage the landscape in a streamlined fashion in order to allow funds to treat larger portions of the land base. New contracting methods are desperately needed.

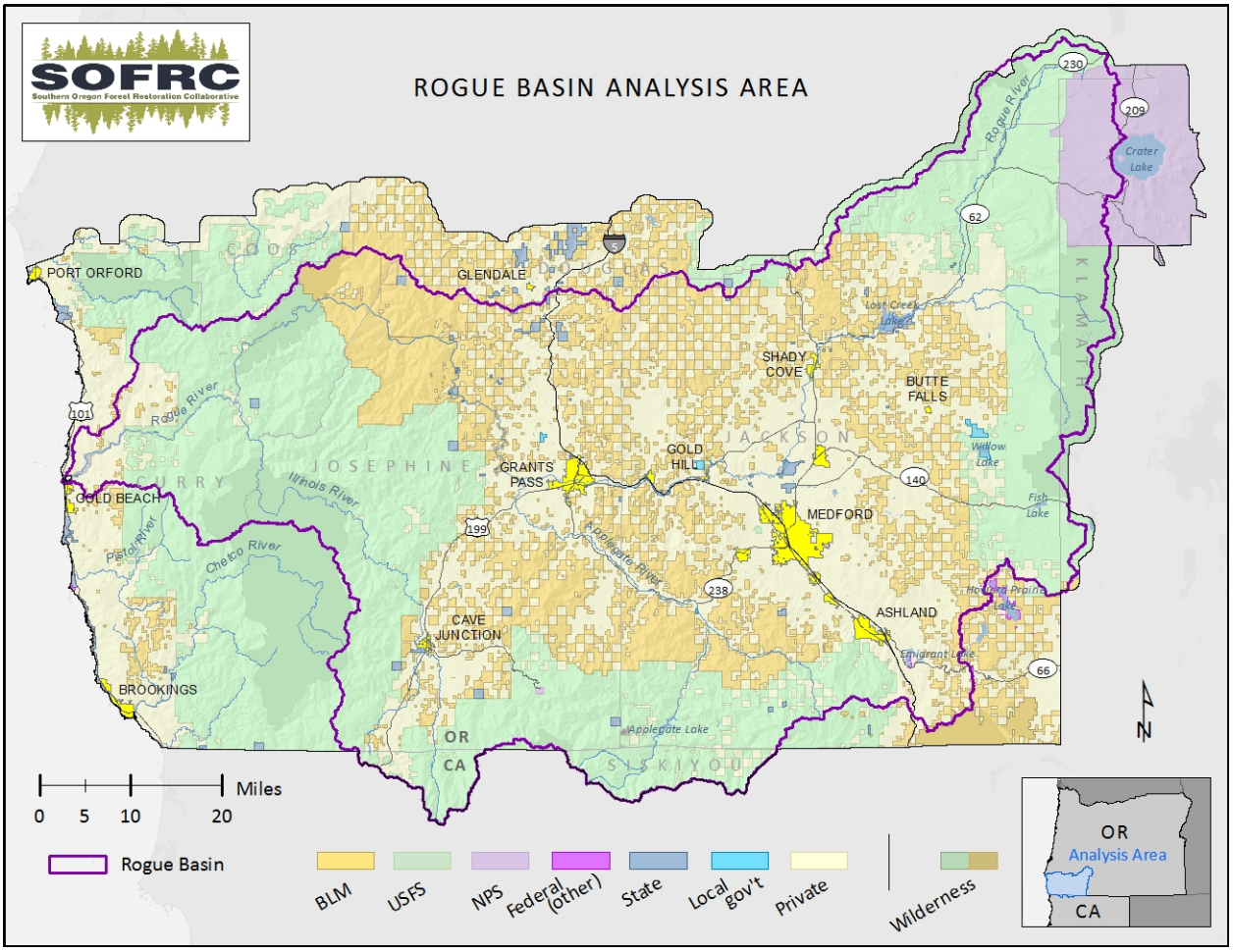
It will do no good to exhaust the value of the remaining economically viable stands and then have an entire landscape requiring subsidies to treat! I realize we have to work with the existing laws but a new model of reinvestment of 'profits' from the sale of timber into the rest of the landscape needs to be developed to achieve the larger societal goals.

Thank you for attempting to solve some of the important forest management questions and approaches.

Edward C Reilly

Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities v.1

1 August 2015



Submitted by:
The Nature Conservancy

Agreement Number ODF-2191A-14
Work Order Number 3
1 August, 2015

Executive Director

George McKinley

Board of Directors

Darren Borgias

Max Bennett

Jim Wolf

Blair Moody

Marko Bey

Jack Shipley

Richard Whitley

Funding support

Oregon Department of Forestry Federal Forest Health Program, Agreement #ODF-2191A

Oregon Watershed Enhancement Board Forest Collaborative Capacity Grant Program

Jackson County

Josephine County

USDA USFS Rogue River-Siskiyou National Forest

The Nature Conservancy

Acknowledgements

This assessment builds on a developing vision of collaboratively driven forest management that has been conceived and nurtured in southwestern Oregon by numerous parties. It relies heavily on participation of stakeholders and workshop participants as well as the technological capabilities and advice from a wide range of engaged individuals.

Contractors

Don Helmbrecht -- Wildland Fire Analyst, Forest Service, TEAMS Enterprise Unit, Bozeman, MT, for local fuel calibration and large wildfire simulation

Joe Scott -- Pyrologix LLC, Missoula, MT, for risk workshop facilitation and quantitative risk calculations

Julie Gilbertson-Day -- Pyrologix LLC, Missoula, MT, for quantitative risk calculations

Suggested Citation: Metlen, K. L.*, M. Bennett, D. Borgias, A. Jones, G. McKinley, D. Olson, E. Reilly, and C. Zanger. 2015. Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities v.1. The Nature Conservancy, Portland, OR, 49 pp.

* **Corresponding author:** *Phone: 541-770-7933 E-mail: kmetlen@tnc.org*

The Nature Conservancy, Oregon Forest Team

Mark Stern -- Director, Forest Conservation and Klamath Conservation Area

Darren Borgias -- Southwest Oregon Program Director

Kerry Metlen, Ph.D. -- Forest Ecologist

Derek Olson -- Spatial Analyst

Aaron Jones -- Spatial Analyst and Cartographer

Chris Zanger -- Oregon Forest Analyst

Technical Advisors:

Alan Ager, Ph.D. -- Operations Research Analyst, Forest Service, Western Wildland Environmental Threat Assessment, Pacific Northwest Research Station

Max Bennett -- Forestry/Natural Resources Agent, OSU Extension Service

Cindy Donegan – Wildlife Biologist, U.S. Fish and Wildlife Service

Shannon Downey -- Environmental Coordinator, USFS Rogue River-Siskiyou National Forest

Terry Fairbanks -- District Silviculturist, Bureau of Land Management Medford District

Patricia Hochhalter – Ecologist, USFS, Rogue River-Siskiyou National Forest

Jon Lamb -- Fire and Fuels Management, USFS, Rogue River-Siskiyou National Forest

Ed Reilly -- Retired Agency Planner/Analyst

Matthew P Thompson, PhD -- Research Forester, Forest Service, Human Dimensions Program, Rocky Mountain Research Station, Missoula, MT, for risk workshop facilitation

Jena Volpe -- Fire Ecologist, Bureau of Land Management Medford District

Jim Wolf -- Retired ODF, Consultant

Contents

Executive Summary 5
Introduction 6
Scope 8
Alternatives to evaluate 10
Inference of the Strategy 10
Vegetation and Related Fire-Potential Data 10
Wildfire Modeling Limitations 10
Limitations of Inference 11
Quantitative Wildfire Risk Assessment 11
Fire Behavior Modeling 11
High Value Resources and Assets 15
Wildfire Response 19
Optimization 20
Local Fire Community Risk 21
Large Wildfire Community Risk 23
Landscape Resilience 23
Northern Spotted Owl Habitat 24
Climate Resilient Landscapes 26
Structural Restoration Needs Assessment 26
Identifying Treatment Areas 30
Filters 30
Restoration Byproduct Timber 30
No-treatment Filters 31
Prioritized Project Areas 32
Federal Lands Alternative 33
All-lands scenario 34
Comparing Strategy Scenarios 36
Next Steps 37
References 38
Appendices 42

Executive Summary

The Southern Oregon Forest Restoration Collaborative (SOFRC) and stakeholders developed a Rogue Basin Cohesive Forest Restoration Strategy (Strategy) that integrates wildfire risk mitigation with multiple lines of ecological need for opening up uncharacteristically dense forests. This Strategy manifests the goals and components of the National Cohesive Wildland Fire Management Strategy. We aggregated, refined, and developed data to describe vegetation, fuels, high value resources and assets (HVRA), access and yarding capabilities, and identified no-treatment zones across 4.6 million acres. We used the large fire simulator FSim to model fire probability and likely intensity across the Basin. Through a series of workshops we collaboratively identified HVRA's, mapped them, and described their likely response to wildfire. The wildfire risk assessment (RA) describes the HVRA's and landscapes most at risk to wildfire and provides data to evaluate the sources of problematic wildfire. These data were used to strategically design treatments and as a baseline to evaluate different management scenarios.

Treatment placement was optimized with Landscape Treatment Designer (LTD), balancing five objectives 1) mitigating local fire community risk, 2) mitigating large wildfire community risk, 3) addressing landscape resilience measured as the proportion of seral states relative to the natural range of variability, 4) protecting existing and promoting future Northern Spotted Owl (NSO) habitat, and 5) promoting fire resistance in climate resilient settings. The analysis excluded congressionally withdrawn lands from any potential projects. Treatment placement excluded existing nesting, roosting and foraging (NRF) NSO habitat in high relative habitat suitability settings, in NSO historical ½ mile cores, or in the interim riparian reserves of the Northwest Forest Plan. These collaboratively derived sideboards ensured a conservative approach. Strategy implementation will need to be refined with site-level analysis.

The Strategy predicts restoration and fuels work needed, along with the restoration commercial byproduct generated, by applying four treatment themes: ecological resilience, fuel management, long-range complex habitat, and near-range complex habitat. Each theme sets target densities and stand structures specified by forest type and seral state. On average the treatments for each of the treatment themes would reduce canopy cover to 42%, 48%, 44%, and 54 % respectively, while reducing ladder and activity fuels with mechanical treatments and prescribed fire. Higher canopy cover would be maintained by excluding treatment in NSO habitat and Riparian Reserves.

The basin-wide assessment suggests that 2.1 million vegetated acres (47% of the landscape), is available and accessible to accomplish treatment objectives, operating within ½ mile of the existing road system. Approximately 17% of the landscape is inaccessible and 53% of the landscape is some combination of inaccessible and/or unavailable. Application of the treatment themes to the available and accessible federal lands (USFS and BLM) would treat 1.1 million acres and generate an estimated 2.1 billion board feet of restoration byproduct. Of that total acreage 883,000 acres would require subsidy but generate 1.2 billion board feet of restoration byproduct. A final 206,000 acres would be economically viable and generate ~0.9 billion board feet. The remaining 1.0 million acres will require subsidy to maintain resilient conditions and to treat vegetation <10 inches diameter at breast height to achieve the Strategy objectives of landscape resilience, enduring habitats, and fire adapted communities. This will require increased agency capacity for mechanical treatments in addition to increased social and agency support for prescribed burning on a large scale and the careful management of naturally ignited wildfire for resource benefits.

We provide draft results of the LTD runs to identify 15 potential treatment areas, rank them, and evaluate objectives among projects. The interim results reflect an even weighting of the five objective functions for projects in both a Federal Lands strategy (Forest Service and BLM lands) and an All-lands strategy including both public and private lands. These interim results are being vetted with stakeholders for feedback and suggested refinements. In the final LTD optimization, objective function weightings will be refined and we will generate 120 project areas ranging in size from 8,000-12,000 treated acres, covering the entire available landscape, parsed by relevant federal administrative units.

Introduction

Forests of western North America face significant stressors stemming from fire regime disruption, extensive even-aged management and other land-use (Sensenig et al. 2013, Stephens et al. 2013, Hessburg et al. 2015). A key regional assessment completed by the US Forest Service Region 6 and The Nature Conservancy suggests that thinning through mechanical treatments and fire is needed on 40% of Oregon and Washington's conifer forests to increase the proportion of open habitats and promote resilient landscapes (Haugo et al. 2015). Reflecting this, the Federal government has supported and currently supports restorative forest work under various programs, e.g. the National Fire Plan of 2000, ongoing fuels management programs, the Collaborative Forest Landscape Restoration Program initiated in 2008, and the Joint Chiefs' Landscape Restoration Partnership Program.

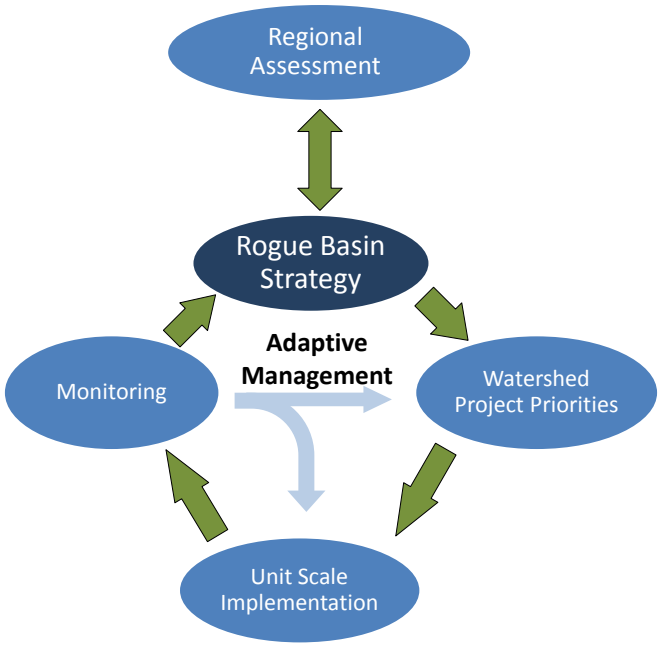


Figure 1: Increasing efficiency by integrating regional assessment with project planning, unit scale implementation, and monitoring.

The Southern Oregon Forest Restoration Collaborative (SOFRC) formed to address these issues locally, and has participated in pilot and demonstration restoration projects and ongoing dialogue and collaboration with the federal land management agencies and stakeholders. The SOFRC has developed this cohesive Rogue Basin Forest Restoration Strategy (Strategy) to accelerate forest restoration planning, implementation, and monitoring tiered to regional assessments to match the scale of need (Figure 1). For context, thinning through mechanical treatments and fire is needed on 2.1 million acres of dry forest across southern Oregon to increase the proportion of open forests and promote resilient landscapes (Haugo et al. 2015). We delimited a 4.6 million acre analysis area centered on the Rogue River Basin and subsuming the full extent of federal lands managed by the Rogue River-Siskiyou National Forest (RRSNF), the Medford District Bureau of Land Management (MBLM), and the National Park Service, along with the coastal watersheds south of the Rogue River (Figure 2). The assessment area encompasses 4.2 million acres of forested lands, and federal ownership covers 2.7 million acres, of which 2.6 million are managed by the RRSNF and the MBLM (Table 1).

Table 1: Analysis area characteristics, from forested to non-forested with significant developed areas not exposed to wildland fire and other non-burnable substrates. Bureau of Land Management (BLM) and US Forest Service (FS) lands are predominately Medford District BLM or Rogue River Siskiyou National Forest but include 117,000 acres of neighboring agency lands, largely the Crater Lake National Park.

Characteristics	BLM	USFS	Other	Total
Forest	883,804	1,768,273	1,506,637	**4,158,714**
Non-Forest, Burnable	10,652	13,480	68,381	**92,512**
Developed, Non-burnable	22,907	37,735	260,641	**321,282**
Total	**917,363**	**1,819,488**	**1,835,658**	**4,572,508**

The Strategy has at its core locally developed wildfire risk and restoration need assessments which support the National Cohesive Wildland Fire Management Strategy (Jewell and Vilsack 2014), key recovery actions identified in the Recovery Plan for the Northern Spotted Owl (U.S. Fish & Wildlife Service 2011), and collaboratively developed forest restoration principles (sidebar).

The Strategy considers the magnitude of restorative treatment need in forests as the basis to frame a comprehensive 20-year plan of work. This ecological perspective is balanced with a wildfire risk assessment which quantifies the urgency to abate threats and avoiding unnecessary uncharacteristic losses, with potential to increase wildfire management capacity (Figure 3). The Strategy also elevates a nested 5-year action plan which would integrate ongoing federal efforts with the highest priorities for treatment. The SOFRC Strategy identifies and prioritizes project areas that are roughly 40,000 acres in size, containing 12,000 acres of treatments, effectively dividing the work load into 120 projects, or 6 per year.

Forest Restoration Principles

i. *Inform management with historical fire return intervals and site productivity*

ii. *Take a fine grained approach for a fine grained landscape*

iii. *Utilize fire and mechanical harvest to promote and maintain desired ecological and economic outcomes*

iv. *Support fire adapted communities*

v. *Ensure enduring viability of critical habitats and species*

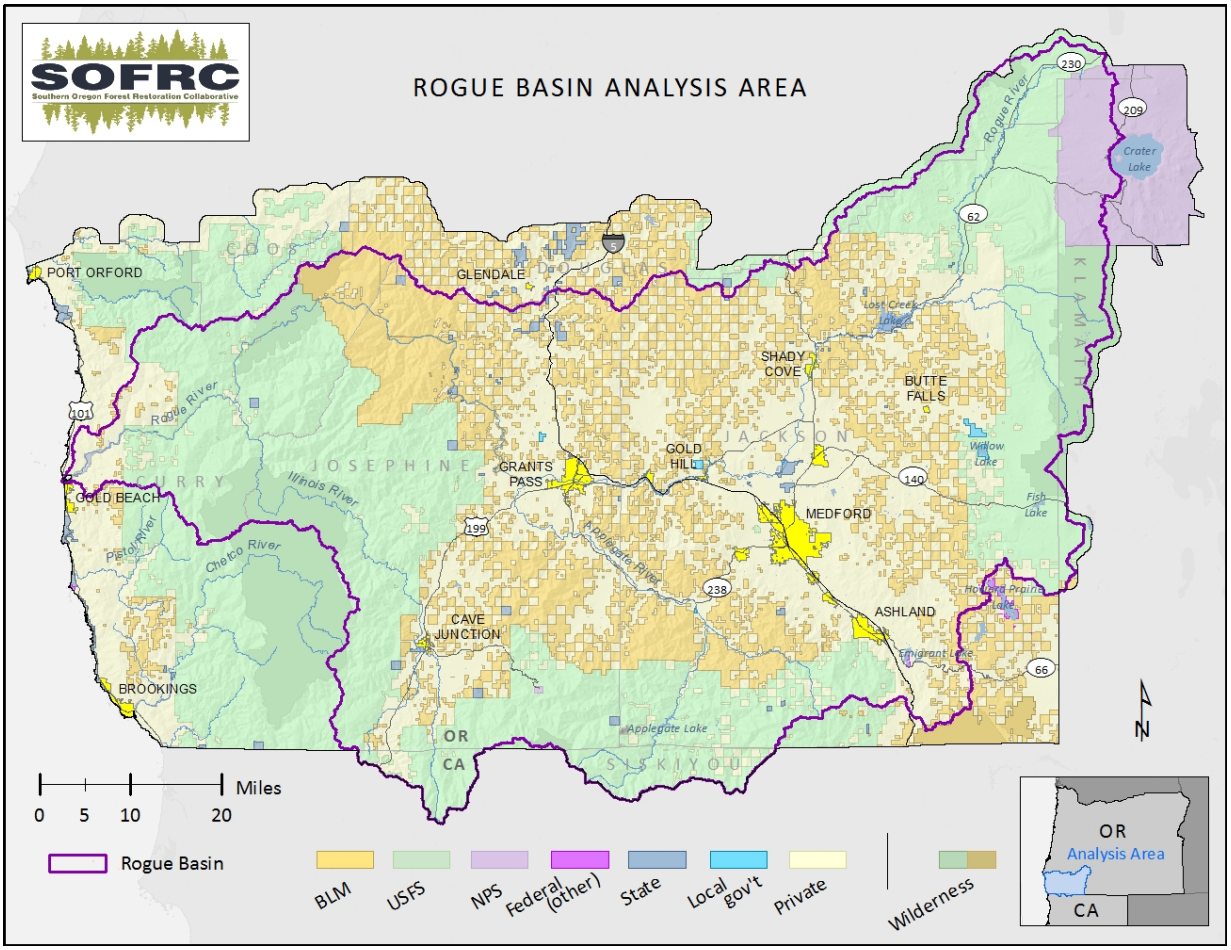


Figure 2: The Rogue Basin Cohesive Forest Restoration Strategy analysis area is 4.6 million acres across many ownerships and land allocations.

The Strategy is designed to inform and support the federal land management agencies, the State of Oregon, and private landowners in planning integrative and cohesive active management to promote resilient landscapes, diverse habitats, fire-adapted human communities, and a predictable flow of ecosystem services and economic benefits. The Strategy will also be integral to updating the Jackson and Josephine County Fire Plans and regional Community Wildfire Protection Plans with risk assessment and potential priorities for treatment.

Figure 3: This analysis integrates a strategic wildfire risk mitigation using the outputs of a quantitative Wildfire Risk Assessment with Analyses of Restoration need that evaluate critical complex forest habitat, the proportion of seral states, and forest density and structure.

A quantitative wildfire risk assessment (RA) was convened by SOFRC but supported broadly following the methods of Scott et al. (2013). In a series of local workshops starting in January 2015, participants refined fuels data for predicting fire behavior, identified high value resources and assets (HVRA), agreed on their relative importance, and established the likely wildfire responses for each. The RA guides effective treatment placement and project prioritization and provides a metric for how management scenarios preform.

The Strategy uses the optimization software, Landscape Treatment Designer, to define priority project areas and optimal treatment extents based on five critical objectives: 1) mitigating risk of local fires to communities, 2) mitigating risk of large wildfire to communities, 3) promoting landscape resilience by reducing ecological departure, 4) protecting existing and promoting near- and long-range future habitat for the Northern Spotted Owl and other complex forest habitat dependent species, and 5) promoting landscapes resilient to climate change. Priorities among project areas were based on their relative performance on the above objectives, and project areas were refined to spread acres of economically viable restoration byproduct evenly across projects in order to help achieve a predictable, even flow of economic activity.

Within project areas, the SOFRC collaboratively developed forest restoration principles to guide the prescriptive actions along treatment themes that include: 1) *fuel management* to ameliorate fire intensity and improve fire management potential to protect the Community at Risk, 2) *complex habitat management* protecting and promoting complex habitats for Northern Spotted Owl (NSO) and other species, and 3) *ecological resilience* to re-balance the landscape of open and closed forest to restore resilience to future wildfire in a changing climate. Collaboration, community engagement and generation of products, employment, and economic activity are important to the resilience of the local communities and critical for the success of all of the treatment themes.

Scope

The 4.6 million acre project area (Figure 2) is centered on the Rogue River Basin of southwest Oregon and overlaps with several of the driest forest regions in the range of the Northern Spotted Owl as identified in the Northwest Forest Plan (NWFP) including parts of the West Cascades, East Cascades, and the Klamath Mountains. The streams of the Klamath, Siskiyou and Cascade Mountain ranges support salmonid and other species and populations of considerable conservation significance. Diverse floras from several western US floristic provinces intermingle and thrive in the complex environmental and geomorphological gradients that characterize the landscape and which allowed it to function as a climate refuge in the past. In dry forests and woodlands of the northern Klamath Mountains and southern slopes of the Cascades, steep topographic gradients and a particularly strong Mediterranean

climate historically drove frequent fire regimes with mixed severity effects (Taylor and Skinner 1998, 2003, Halofsky et al. 2011, Perry et al. 2011). Dry forest types in the analysis area are largely dominated by Douglas-fir but include white fir, Jeffery pine, ponderosa pine, and tanoak dominated forests. Oak woodlands, comprised largely of tanoak with California black oak increasing in the mountains away from the coast and Oregon white oak in the inland valleys are abundant.

Residential development prevails in the lowland prairie, woodland and forested systems and timber resource management increases with elevation and productivity except where there are access limitations or where, federally protected wilderness, a national park and national monuments have been established. The analysis areas includes numerous important conservation opportunity areas identified at the ecoregional scale for representation of species and systems and or ecologically intact and less developed areas by several entities including The Nature Conservancy and the Oregon Department of Fish and Wildlife, among others.

Globally, Mediterranean forests and woodlands are of high conservation importance due to habitat conversion and lack of protection (Hoekstra et al. 2005). Fire regimes have been significantly disrupted for the last 100 years across the Mediterranean forests and woodlands of the Rogue Basin (McNeil and Zobel 1980, Agee 1991, Colombaroli and Gavin 2010, Sensenig et al. 2013), including lowland and mixed conifer riparian forests (Messier et al. 2012). Fire regime disruption, combined with extensive even-aged management and other land-uses, has resulted in forests at extensive risk to wildfire, insects, and disease, issues exacerbated by climate change (Sensenig et al. 2013, Stephens et al. 2013, Hessburg et al. 2015). These risks threaten complex forests habitats, the oldest most structurally important trees, and even the development of younger stands.

Heavily fragmented ownerships (Figure 2 and Table 1) complicate land management decisions. This region is known for past land management conflicts over timber and conservation. Integrating collaboration with project development has emerged with the growing awareness of fire risks to forest values and communities in southwestern Oregon, as elsewhere, and is critically important for building shared understanding and community support for restoration to promote forest health and resilience. The SOFRC has actively supported collaboratively designed projects in the region, including the Medford District Secretarial Pilot, Friese Camp Forest Management Project, Ashland Forest Resiliency Stewardship Project, Biomass Utilization, and South Fork Little Butte Creek. This wildfire risk assessment, Cohesive Forest Restoration Strategy, and other ongoing work are advances to continue to improve public dialogue and understanding and broaden support for collaboratively developed, ecologically-based restorative land management.

The SOFRC Strategy promotes and conserves critical closed canopy, old, complex forest habitats in appropriate landscape positions, restores open fire and drought resilient stands by recoupling vegetation and geomorphological characteristics in intervening areas, and encourages a fire adapted landscape and communities by promoting strategic fuels reduction in the public-private interface. We take a conservative approach to determining where active management might be permitted. The Strategy models no-treatment within the Northwest Forest Plan interim riparian reserves. Management of NSO habitat is grounded in the US Fish and Wildlife Service Revised Recovery Plan (U.S. Fish & Wildlife Service 2011) and designated critical habitat for the Northern Spotted Owl (U.S. Fish & Wildlife Service 2012), retaining existing nesting, roosting, and foraging habitat (NRF) in appropriate landscape positions and in historical ½ mile core areas, reducing risk of delivering severe wildfire to existing NRF, developing future habitat in appropriate landscape positions , and focusing on ecological restoration as the overriding management theme throughout the landscape. Congressionally withdrawn lands are also identified as no-treatment for this assessment, which is focused on integrating mechanical treatments and prescribed fire. Site specific review will be required to design the appropriate mix of treated and untreated forest on a project level basis. Operating within these robust protections built-in for species

dependent on complex habitats, active management generates ecosystem benefits, forest products and associated economic outputs, as well as attendant social benefits.

As stated in the National Cohesive Wildland Fire Management Strategy, landscape scale resilience and fire adapted communities can only be accomplished by working across all-lands with an all-hands approach (Jewell and Vilsack 2014). Accordingly, three management scenarios are evaluated by SOFRC, in addition to the existing landscape condition. These scenarios integrate wildfire risk mitigation with various approaches to meeting restoration need (Figure 3) to articulate the costs and benefits of different treatment footprints and scheduling over a 20 year period.

Alternatives to evaluate

To evaluate the trade-offs inherent in changing the pace and scale of treatment on Federal lands, as well as the relative contribution of an all-lands approach we compared three management scenarios:

Scenarios

1. **Business as usual over 20 years** – treatment of the Federal Land at the 10-year historical pace. Treatment placement in most optimal watersheds. Assuming 9,000 acres/year the likely footprint is 180,000 acres after 20 years.
2. **Federal Land** – treatment pace and scale increased to treat all forests on USFS and BLM in need of treatment within the existing road infrastructure over 20 years. Total treatable forested footprint is about 2.655 million acres. Total forested footprint that is treatable within the existing road network, assuming the potential of a ½ mile helicopter haul is 1.2 million acres.
3. **All-lands** – USFS and BLM lands treated as in #2 above, with the same proportion of acres treated on private lands as on Federal lands to provide rationale and guidance for landowners and public funding opportunities that support the Strategy objectives. Optimally all-lands treatments will build on Federal forest restoration projects.

The alternatives are compared on how well they maximize return on investment relative to performance indicators identified in the 'Comparing Strategy Scenarios' section below.

Inference of the Strategy

The scope and scale at which the data are interpreted is a critical consideration for applying the Strategy to on-the-ground action.

Vegetation and Related Fire-Potential Data

The LANDDFIRE and GNN data used in this assessment infer existing vegetation and fuel data remotely. The relationships are inherently correlations by nature and thus somewhat imprecise. We used extensive field reviews and a local fuels calibration workshop to refine the best available data. However, all such data should be evaluated, refined, and augmented at the project scale with local field data as appropriate. A known limitation of the s-class mapping appears to be over prediction of late seral stands nearer to the coast and under prediction of late seral stands further inland.

Wildfire Modeling Limitations

Wildfire is a complex and highly stochastic process, thus difficult to model. State-of-the-art wildfire modeling was employed for the quantitative risk assessment. This modeling relies on the quality of the underlying fuel data (see above), 20 years of historical fire occurrences, and many informed decisions made by the fire modeling specialist from the Forest Service Enterprise TEAMS unit. Fire modeling results must therefore be taken as models to evaluate relative wildfire effects between and

among scenarios/landscape within this assessment and not as absolute prediction of future fire behavior.

Limitations of Inference

The outputs of Landscape Treatment Designer are quite fine in resolution, but many of the input data sources are most appropriately interpreted at a scale larger than a HUC 6 (>10,000 acres). As such, the data generated here are excellent for identifying project areas, clarifying the objectives behind those projects, and ranking among projects. However, site specific data and analysis for individual project planning is required.

Quantitative Wildfire Risk Assessment

The Southern Oregon Forest Restoration Collaborative conducted the Rogue Basin Wildfire Hazard and Risk Assessment (RA) in 2015, a quantitative risk assessment (Scott et al. 2013). The RA incorporated fire behavior modeling using the large wildfire simulator, FSim, to characterize large wildfire likelihood and intensity as well as a stakeholder/expert driven process to identify high value resources and assets (HVRAs) and their wildfire susceptibility. This RA was unique in the level of collaborative development and ownership. Three workshops were held to ensure rigorous and broad-based input, understanding, and support for the RA; the participants of those workshops are listed in Appendix 1a and 1b.

Fire Behavior Modeling

Anticipated wildfire behavior and likely changes to anticipated fire behavior with proposed treatments where modeled by the Southern Oregon Forest Restoration Collaborative, Rogue-River Siskiyou National Forest, Medford District Bureau of Land Management and other partners, in conjunction with the Forest Service TEAMS Enterprise Unit. Large wildfire fire behavior (fires >35 acres) was modeled for a 10 million acre project area that buffered the Rogue River Basin and adjacent federal lands by ~15 miles. Modeled fire incorporates topography, weather, and vegetation or fuels. Vegetation fuel data from the national LANDFIRE (LANDFIRE 2010) were obtained and reviewed on extensive field tours. A deficiency was noted in how LANDFIRE mapped oak habitats in Map Zones 3 and 7. Vegetation data from the Integrated Landscape Mapping Project (GNN; Integrated Landscape Assessment Project 2014) were used to modify the initial LANDFIRE data on 252,720 acres, <3% of the landscape but characterized by high population density.

Collaborators hosted a workshop to review and further calibrate the mapping of fuels (21-24 January 2015) derived from the vegetation data. The local fuel calibration workshop relied on 13 technical team contributors from the Forest Service Region 6 office, RRSNF, MBLM, Oregon Department of Forestry (ODF), TNC, US Geological Survey, and National LANDFIRE (Appendix 1a and 1b). The team of professionals applied direct knowledge of the landscape, its vegetation, and how fire interacts with the vegetation with the objective of refining a product useful to the fire managers of the RRSNF, the MBLM, ODF and local fire districts. Key outcomes of the workshop were:

1. Addressed known concerns about homogenous surface fuel models representing the majority of the analysis area forests
2. Developed more nuanced models of vegetation types, including oaks
3. Assembled up-to-date spatial data on the extents of mechanical and fire disturbances
4. Defined rules for how mechanical and fire disturbances impact fuels

A 20-year fire occurrence database was assembled for the 10 million acre analysis area and used to build probability distributions of ignition locations and weather conditions under which the fires burned. The landscape was split into two fire occurrence areas (FOA) of relatively uniform large fire conditions: a coastal fire modeling zone and an interior fire modeling zone. We used Remote Automatic Weather Station (RAWS) weather data for the previous 20 years from the National Weather Service gathered at Bald 2 RAWS for the coastal FOA and Onion 2 RAWS for the inland FOA.

We determined the characteristic size of contemporary wildfires using the "balanced fires-acres percentiles" and Lorenz curve methods(Scott 2014) to determine that 98 percent of the area burned by wildfires was burned by fires >35 acres in the Coastal FOA and >36 acres in the inland FOA; settling on 35 acres as the large fire size threshold for the analysis.

The large fire simulation system, FSim, was then used to run 10,000 iterations, with each iteration representing a "fire year" with ignition points distributed and burn weather determined by historically informed probability distributions. This produced an annual burn probability (Figure 4) for each 18 acre pixel as well as a probability of burning at each of six fire intensity levels (Figure 5). Modeled fire occurrence, size and frequency were evaluated against the past 20 years of regional fire to refine model inputs. The final FSim run reflected the 20-year historical average fire years, with greater standard deviation as one could expect from 10,000 iterations compared to 20 annual observations (Table 2). Wildfire burn probabilities varied markedly across the 10 million acre project area, consistent with the recent historical observations, with the highest probabilities in the southwest corner and the lowest probabilities in the Cascade Mountains (Figure 4). Annual burn probabilities at the scale of 18 acre patches are of-course low, but when summed to a larger, more meaningful size such as a watershed they are significantly larger. The probability of fire intensity levels did not necessarily correlate with burn probability and notably there was a tradeoff between probability of low and higher severity fire (Figure 5). These probabilities are best interpreted as relative values and not as a prediction of annual fire frequency.

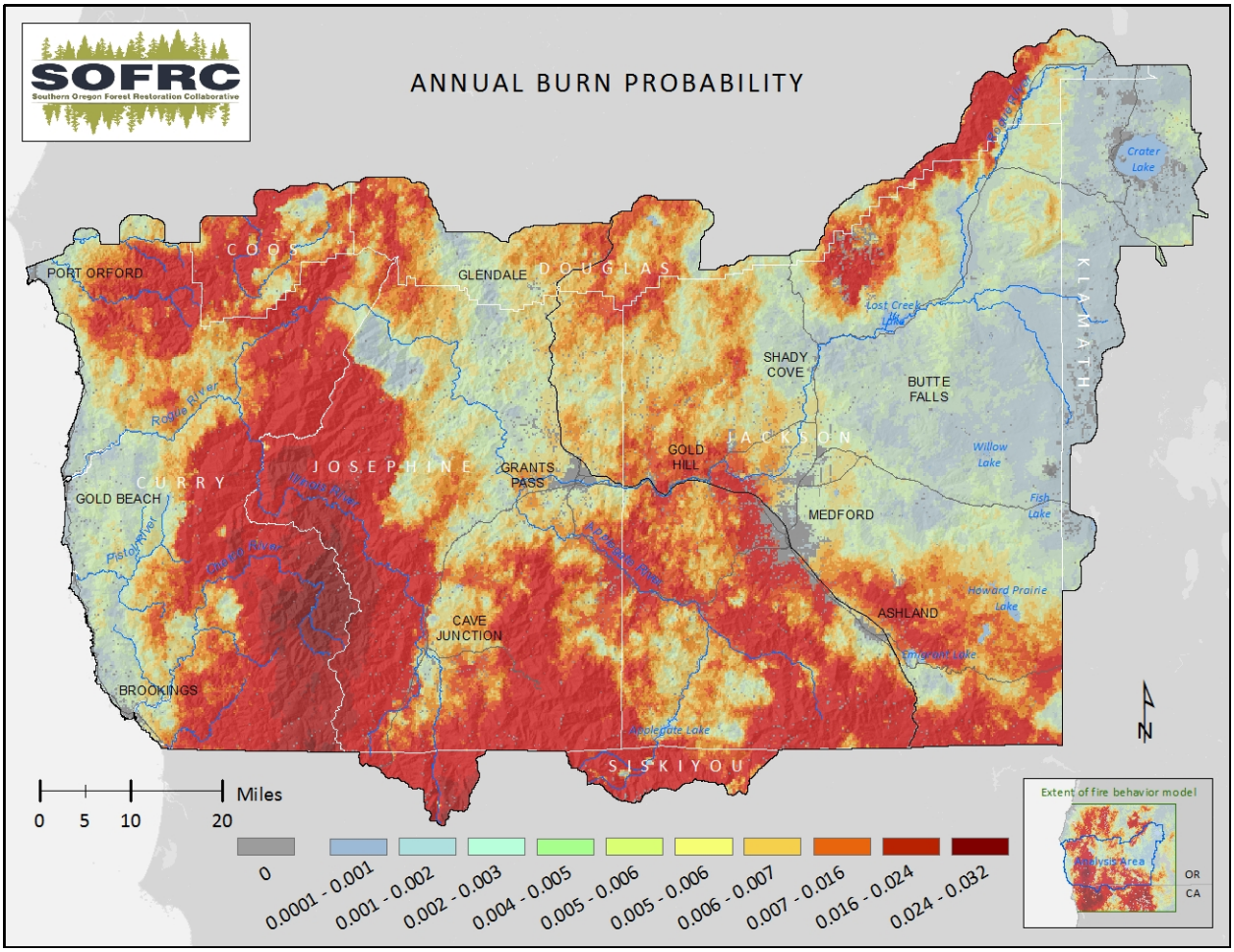


Figure 4: FSim generated annual probability of a 0.22 acre pixel burning in a fire >35 acres in a given year for the 10 million acre fire behavior modeling area (see inset) centered on the 4.6 million acre Rogue Basin Project area.

Table 2: Fire year parameters for the 10 million acre fire modeling analysis area for the years 1982-2012 and for 10,000 modeled fire year iterations.

Source	Parameters	Mean	Median	Standard Deviation
20-year record	Acres Burned	26,352	9,282	42,576
	Fire Size	1,415	959	1,493
	Fire Number	15	11	9
Modeled fires	Acres Burned	69,092	14,777	165,601
	Fire Size	2,645	826	4,943
	Fire Number	19	18	11

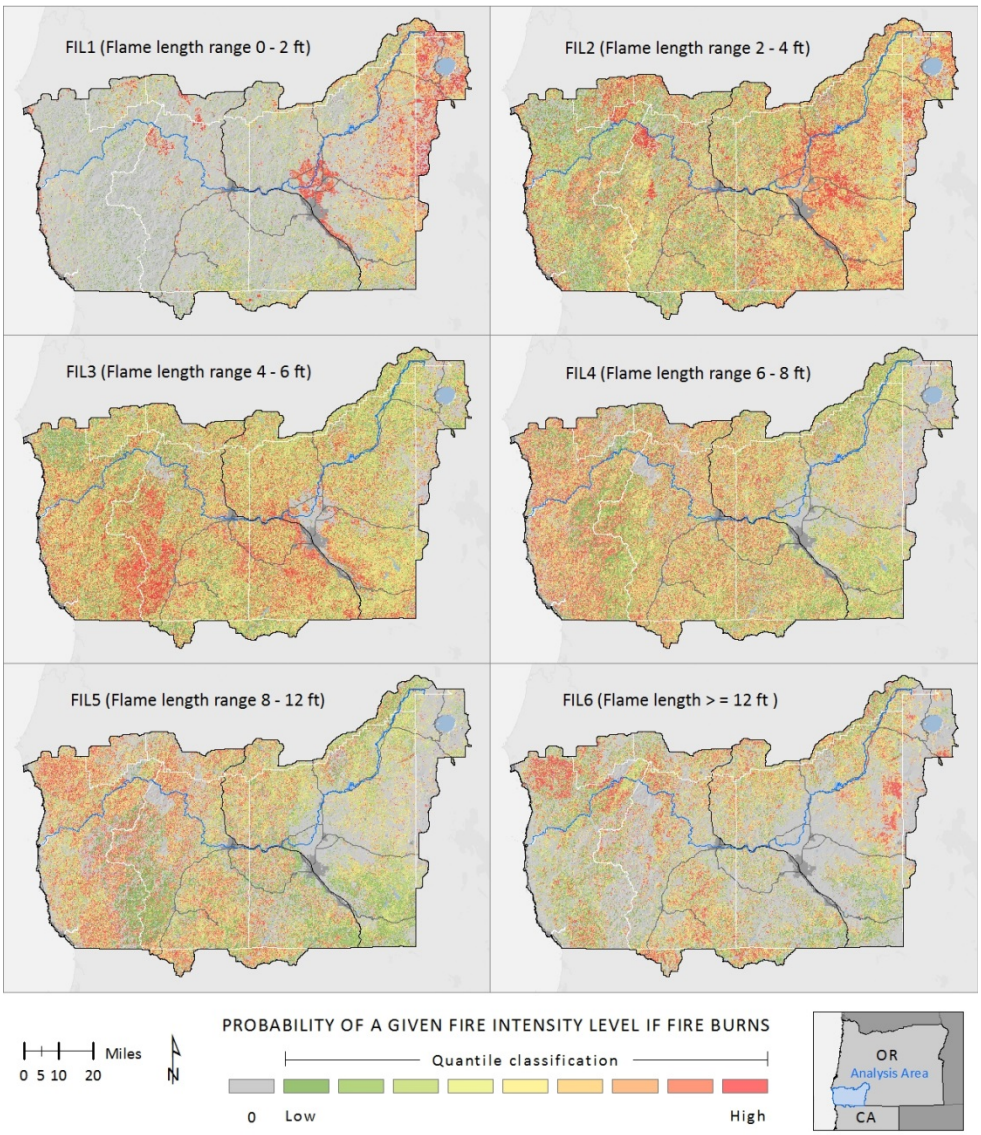


Figure 5: FSim generated probability of fire > 35 acres burning at six fire intensity levels (FIL) with one being the least and six the most intense when fire was predicted to occur across the 10 million acre fire behavior modeling area centered on the Rogue Basin.

High Value Resources and Assets

Local stakeholders identified high value resources and assets (HVRA's) at two workshops convened by the SOFRC and facilitated by Joe Scott of Pyrologix LLC, held 10-11 February 2015. These workshops were attended by 51 participants representing a wide range of local, state, and federal agencies as well as non-governmental organizations (Appendices 1a and 1b). Participants assembled an initial list of 59 values for subsequent mapping. After refining the list SOFRC mapped 12 HVRA's (Figure 6), split into 32 sub-HVRA's: 12 assets and 20 resources (Tables 3, 4, and 5). An asset is a human-built structure, such as a home, or cell tower, etc. Resources are natural features such as a forested wildlife habitat or a unique species for which the distribution can be mapped.

A second workshop series April 8-9 used a carefully structured and deliberative method to integrate science and value-based information to describe likely sub-HVRA wildfire responses (Tables, 3, 4, and 5) and weight their relative importance. This workshop was facilitated by Joe Scott (Pyrologix LLC) and Matt Thompson (Rocky Mountain Research Station) Agreement on relative importance varied across a range of interest groups, but the entire group quickly agreed to a rough averaging as fairly representative, and the result across HVRA's was fairly even (Figure 6a). After accounting for spatial extent, of each HVRA, the technical team reached agreement on calibrating adjustments of relative importance of each HVRA while also roughly reflecting the rank order of importance from the workshop (Figure 6b).

Figure 6: The relative importance of collaboratively identified high value resources and assets (a) as identified in the workshop and (b) after accounting for their relative extent and replacement value.

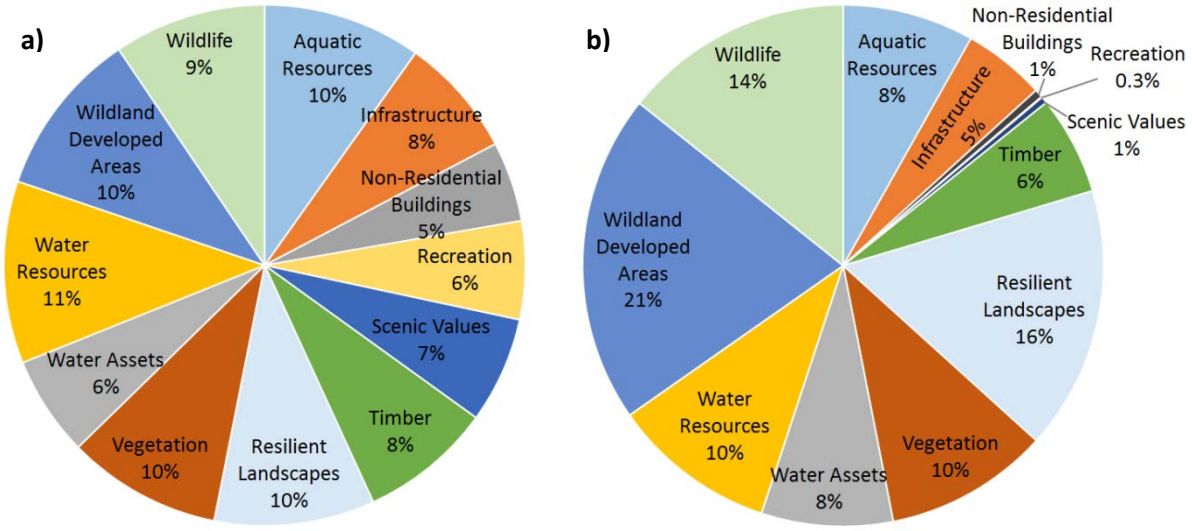


Table 3: Five classes of assets (HVRA) were identified and mapped as 18 individual sub-HVRA's. Their likely wildfire response was classed on a scale ranging +/- 100, with -100 representing a complete removal of the asset and +100 being a 100% increase in the asset value.

		Fire Intensity Level*					
HVRA	**Sub-HVRA**	**1**	**2**	**3**	**4**	**5**	**6**
Infrastructure	Comm Sites/Cell Towers	0	0	-10	-20	-30	-30
	Electric Trans-Line/Sub	0	0	-20	-20	-20	-20
Non-residential	Fire Lookouts	0	-10	-30	-60	-100	-100
	National Park Structures	-10	-20	-40	-80	-100	-100
	Ski Area Buildings	-10	-20	-40	-80	-100	-100
	USFS Cabins/Structures	-10	-20	-40	-80	-100	-100
Recreation	Recreation Sites	-10	-20	-40	-80	-100	-100
	Ski Area (Mt. Ashland)	0	0	0	-10	-20	-40
	Pacific Crest Trail	0	0	-10	-10	-20	-20
Water Assets	Canals-Irrigation	0	0	0	-10	-10	-10
	Reservoirs - Drinking	0	0	0	-10	-20	-40
Where People Live	Residences <1 / 40 ac	-10	-20	-40	-80	-100	-100
	Residences 1/10 - 1/5	-10	-20	-40	-80	-100	-100
	Residences 1/2 to 3/ac	-10	-40	-80	-100	-100	-100
	Residences 1/20 - 1/10	-10	-20	-40	-80	-100	-100
	Residences 1/40 - 1/20	-10	-20	-40	-80	-100	-100
	Residences 1/5 - 1/2	-10	-40	-60	-100	-100	-100
	Residences 3+/ac	-20	-60	-80	-100	-100	-100

*Fire Intensity Level: 1 = 0-2 foot flame lengths, 2 = 2-4 foot flame lengths, 3 = 4-6 foot flame lengths, 4 = 6-8 foot flame lengths, 5 = 8-12 foot flame lengths, 6 = >12 foot flame lengths

Table 4: Four of the seven classes of resources (HVRA) identified and mapped as 26 covaried sub-HVRA's (of 47 total). Their likely wildfire response was classed on a scale ranging +/- 100, with -100 representing a complete removal of the resource and +100 being a 100% increase in the resource value.

			Fire Intensity Level*					
HVRA	**Sub-HVRA**	**Covariate**	**1**	**2**	**3**	**4**	**5**	**6**
Aquatic Resources	Chinook Distribution		10	10	10	0	-10	-20
	Coho Distribution		20	10	10	0	-30	-40
	Lamprey Distribution		10	10	10	0	-10	-20
	Resident Fish Species		10	-5	-30	-40	-60	-80
	Steelhead	Intermittent	20	10	0	0	-10	-20
	Steelhead	Perennial	20	10	0	-10	-20	-30
Resilient Landscapes**	Biophysical Settings	Seral States	Many					
Scenic Values	Scenic Byways		10	0	-20	-50	-70	-90
	Wild and Scenic rivers		10	0	-20	-50	-70	-90
Timber***	Federal Timber	Restricted (A)	10	10	-100	-100	-100	-100
	Federal Timber	Restricted (B)	10	50	-10	-100	-100	-100
	Federal Timber	Restricted (C)	20	50	-10	-100	-100	-100
	Federal Timber	Restricted (D)	30	50	30	-100	-100	-100
	Federal Timber	Restricted (E)	30	50	30	-50	-100	-100
	Federal Timber	Unrestricted (A)	10	-20	-100	-100	-100	-100
	Federal Timber	Unrestricted (B)	10	50	10	-90	-90	-90
	Federal Timber	Unrestricted (C)	20	50	10	-90	-90	-90
	Federal Timber	Unrestricted (D)	30	50	30	-60	-70	-70
	Federal Timber	Unrestricted (E)	30	50	30	-50	-60	-60
	Private Industrial		10	20	10	-90	-90	-90
	Private Non-industrial	(A)	10	-20	-100	-100	-100	-100
	Private Non-industrial	(B)	10	50	10	-35	-40	-40
	Private Non-industrial	(C)	20	50	10	-35	-40	-40
	Private Non-industrial	(D)	30	50	30	-30	-35	-35
	Private Non-industrial	(E)	30	50	30	-30	-35	-35
	State Timber		10	20	10	-90	-90	-90

*Fire Intensity Level: 1 = 0-2 foot flame lengths, 2 = 2-4 foot flame lengths, 3 = 4-6 foot flame lengths, 4 = 6-8 foot flame lengths, 5 = 8-12 foot flame lengths, 6 = >12 foot flame lengths
**Proportions of seral-structural states relative to the natural range of variation
***Federal and private non-industrial timber lands were mapped by successional class where A=early, B=mid-closed, C=mid open, D=late open and E=late closed.

Table 5: Three of seven classes of resources (HVRA) identified and mapped as 21 covaried sub-HVRA's (of 47 total). Their likely wildfire response was classed on a scale ranging +/- 100, with -100 representing a complete removal of the resource and +100 being a 100% increase in the resource value.

			Fire Intensity Level*					
HVRA	**Sub-HVRA**	**Covariate**	**1**	**2**	**3**	**4**	**5**	**6**
Vegetation	Aspen		20	50	100	100	50	0
	Late Seral Forest	Dry, (D)	80	90	10	-10	-90	-100
	Late Seral Forest	Dry, (E)	70	30	-10	-50	-90	-100
	Late Seral Forest	Wet, (D)	80	90	10	-10	-90	-100
	Late Seral Forest	Wet, (E)	40	10	-30	-60	-100	-100
	Oak Woodlands		100	100	30	-40	-80	-100
	Tan Oak		100	100	100	80	10	-20
	Unique/Endemic	Fire dependent	30	50	100	100	60	30
	Unique/Endemic	Fire resilient	60	70	60	60	-10	-40
	Unique/Endemic	Fire sensitive	0	-20	-40	-60	-80	-100
Water Resources	Municipal Watersheds	Ground water	10	20	30	0	-10	-20
	Municipal Watersheds	Spring source	10	20	0	-10	-30	-50
	Municipal Watersheds	Surface	10	20	-10	-40	-60	-90
	Riparian Zones		20	10	-5	-40	-80	-100
Wildlife	Deer and Elk Winter Range		10	50	50	30	10	-40
	Dispersal NSO **		20	0	-30	-60	-80	-100
	NRF NSO ***		10	-10	-40	-80	-100	-100
	Marbled Murrelet		20	10	-10	-80	-100	-100
	Mardon Skipper		-50	-100	-100	-100	-100	-100
	Oregon Spotted Frog		10	-10	-30	-40	-60	-80
	Siskiyou Mountain Salamander		20	10	0	-40	-70	-90

*Fire Intensity Level: 1 = 0-2 foot flame lengths, 2 = 2-4 foot flame lengths, 3 = 4-6 foot flame lengths, 4 = 6-8 foot flame lengths, 5 = 8-12 foot flame lengths, 6 = >12 foot flame lengths
**NSO=Northern Spotted Owl
***NRF NSO=Nesting, Roosting, and Foraging Northern Spotted Owl Habitat

Wildfire Response

Relative importance, relative extent, and likely response to wildfire were combined with modeled fire behavior to generate wildfire risk across the project area. This allows identification of locales with the greatest the greatest likely consequence of wildfire when it burns (conditional net value change, cNVC), as well as the likely risk due to wildfire across the landscape (expected net value change, eNVC; Scott et al. 2013). Conditional net value change (cNVC) highlights the likely effects of a fire *when* it burns, e.g. the range of potential likely negative and positive effects in the Cascades (Figure 7a). These conditional responses are simply multiplied by the burn probability (Figure 4) to generate eNVC, and the Cascades illustrate lesser likely wildfire effects in line with lower fire probability (Figure 7b).

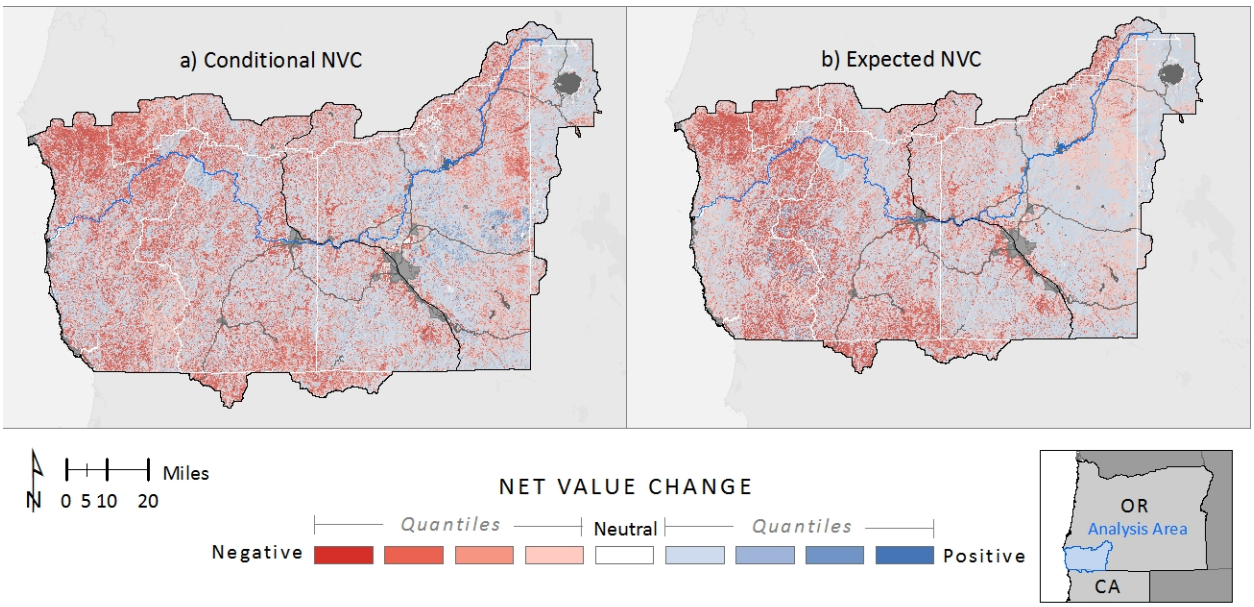


Figure 7: a) Conditional (cNVC) net value change and b) Expected net value change (eNVC) to all mapped high value resources and assets for the Rogue Basin analysis.

Probabilistic cNVC and eNVC can be used in a variety of ways to identify aggregations of potential wildfire impact, as well as the source of the fires that affected HVRA's. Similarly, the impact to HVRA's can be summed (Figure 7 or Figure 8c) or used for individual HVRA's (Figure 8 a, b, d). These risk data were used to prioritize risk-abatement treatments at the landscape scale, to evaluate the effectiveness of different strategies to reduce overall wildfire risk, and to inform safe effective wildfire response.

The patterns of likely wildfire responses vary widely across different resources and assets, and varied stakeholders' perceptions of risk can dramatically diverge depending on their interest and focus. On average, expected large fires effects on landscape resilience ranges from positive to negative (Figure 8a), contrasting sharply with largely negative predicted fire effects on timber resources, community assets, and NSO habitat (Figure 8b, c, and d). The balance of forest successional classes relative to the natural range of variability is an important metric of landscape resilience (Haugo et al. 2015) for which we modeled likely wildfire effect as the impact on transitions among successional classes by biophysical setting, and the relative benefit or detriment of the transition to the proportion of seral states at a landscape scale (Scott et al. 2014). For many forest settings where fire functions as a thinning agent, facilitating favorable transitions from both mid- and late-seral closed to open states, or transitions that fill deficits of complex early seral, it alleviates departure and thus builds landscape resilience, though it might also threaten people and homes, degrade standing timber, or reduce extent of NRF for the NSO.

Note that the relative value of change to HVRA's covaries; for example, timber value varies among ownerships, land allocation, and successional classes (Table 4).

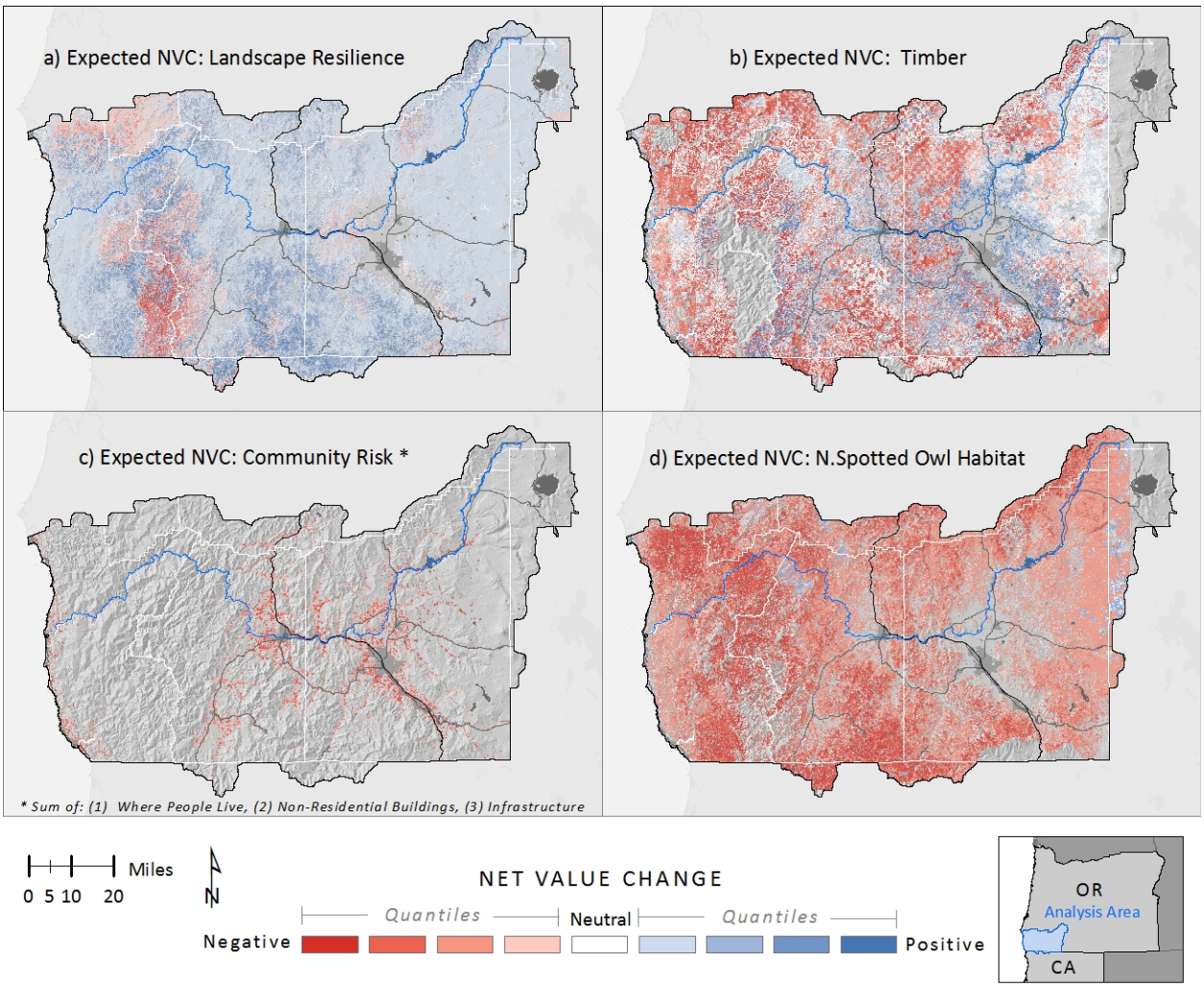


Figure 8: Expected net value change (eNVC) for a) landscape scale ecological resilience as reflected in the proportion of seral states, b) timber value varied by ownership and land allocation (as in Table 4), c) the cumulative eNVC on assets mapped that impact community values, and d) Northern Spotted Owl dispersal, nesting, roosting, and foraging habitat.

As a rule, assets are negatively impacted by wildfire, though susceptibility and replacement cost, as well as likely fire behavior, drive variable wildfire risk (Table 3). Many assets were mapped, but only a subset directly impact fire adapted communities. A strength of the qualitative risk assessment is the ability to sum the response of multiple values to wildfire. For example, in Figure 8c the eNVC for three classes of assets are summed: where people live(Oregon Department of Forestry et al. 2013), non-residential structures, and infrastructure. This represents the risk to community assets, scaled to likelihood of large wildfire.

Optimization

The SOFRC Strategy integrates wildfire risk and ecological restoration objectives (Figure 3). As in the National Cohesive Wildland Fire Management Strategy (Jewell and Vilsack 2014) resilient

landscapes and fire adapted communities are key overarching objectives (Table 6). Along with incorporation of goals from the National Cohesive Strategy, the SOFRC Strategy is acting on key components of the National Cohesive Strategy that have been identified to facilitate implementation: strategic alignment, collaborative engagement, and programmatic alignment (Jewell and Vilsack 2014). This has been accomplished with broad-based collaborative meetings driving the assessment (participant lists in Appendix 1a and 1b), frequent collaborative engagement at SOFRC meetings, and periodic updates and reports to the agencies. Programmatic alignment ultimately will require incorporation of SOFRC Strategy components into agency resource management plans but ongoing collaboratively-based restoration projects are already demonstrating convergence on shared goals and approaches.

Each project area developed by the Cohesive Forest Restoration Strategy optimizes performance on five objective functions (Table 6) that tier directly to the National Action Plan for the National Cohesive Strategy (Suh and Bonnie 2014). The spatial overlap of the objective functions (Figure 9) was evaluated in Landscape Treatment Designer (LTD; Ager et al. 2012) and aggregated to form optimized treatment areas. Performance indicators were identified for each of the objective functions for optimization.

Table 6: The Rogue Basin Cohesive Forest Restoration Strategy designs proposed planning areas that optimize performance on five objective functions, all of which tier to key elements of the National Cohesive Wildland Fire Management Strategy National Action Plan (Suh and Bonnie 2014).

Objective Function	Description	National Cohesive Strategy Goals
1. Local fire community risk	Risk of fires originating within the Community at Risk	*Fire-adapted communities; Wildfire response*
2. Large wildfire community risk	Risk of fires to community assets from fires >35 acres	*Fire-adapted communities; Wildfire response*
3. Landscape resilience	Balancing the proportions of open and closed forest habitats	*Restore and maintain resilient landscapes*
4. Protecting and promoting Northern Spotted Owl habitat	Maintaining existing habitat and reducing adjacent wildfire risk while promoting complex forest in appropriate landscape settings	*Restore and maintain resilient landscapes*
5. Climate resilient landscapes	Prioritization of limited resources to landscapes most climate resilient	*Restore and maintain resilient landscapes*

Local Fire Community Risk

"Community At Risk" (CAR) focuses on a geographic area within and surrounding permanent dwellings (at least 1 home per 40 acres) with basic infrastructure and services, under a common fire protection jurisdiction, government, or tribal trust or allotment, for which there is a significant threat due to wildfire (Healthy Forests Restoration Act (HFRA) 2003). We defined our CAR beginning with the results of a statewide task force which established a uniform CAR framework for the state of Oregon (Oregon Department of Forestry 2006). This base CAR was augmented with the data on where people live generated by the Westwide Wildfire Risk Assessment using LandScan data from 2009 and people per housing unit from 2010 census data, integrated with a rigorous methodology (Oregon Department of Forestry et al. 2013).

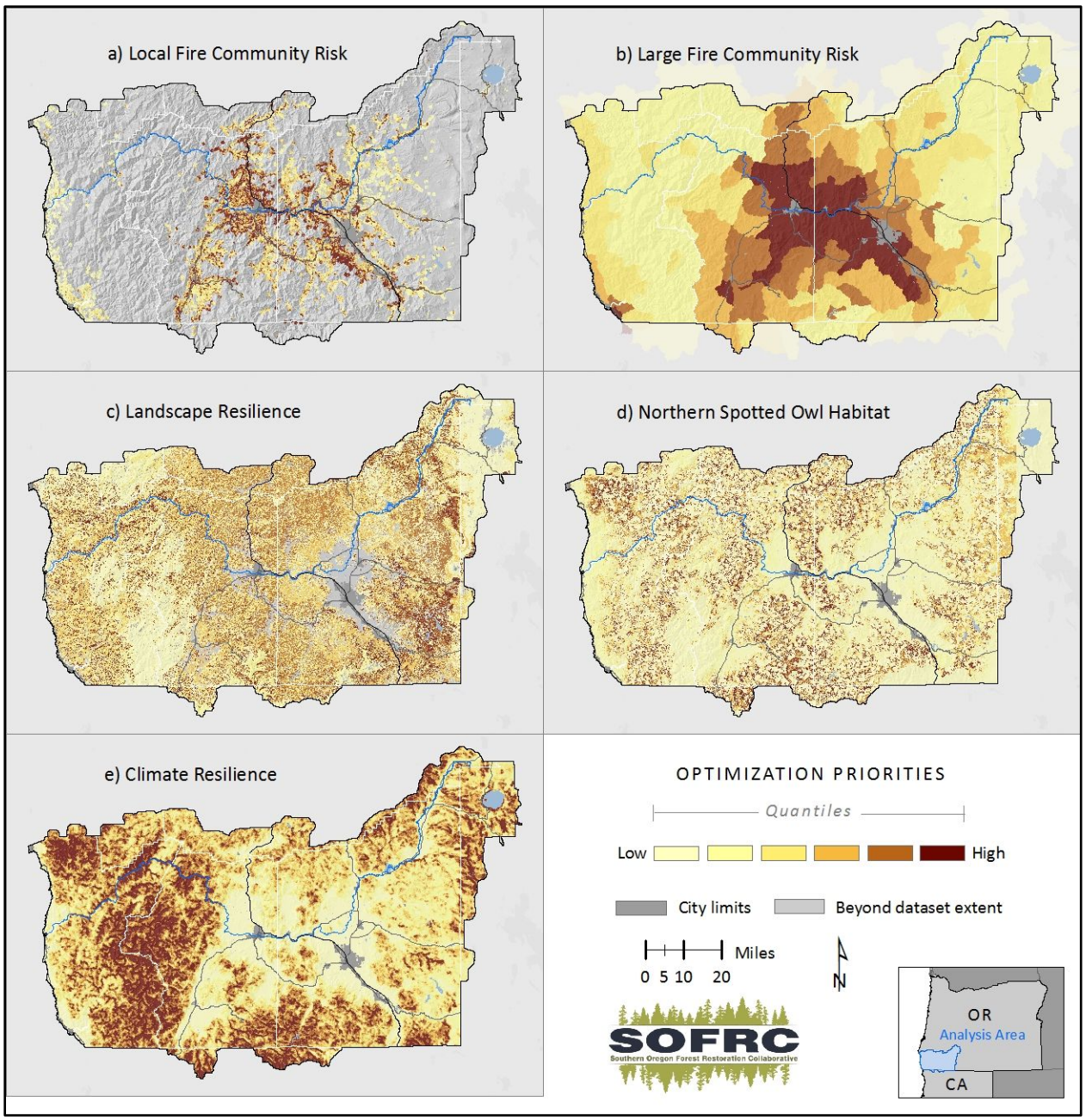


Figure 9: Forest restoration thinning and fuel reduction treatments were prioritized across the Rogue Basin project area based on five priorities a) fuel reduction to reduce local fire community risk b) fuel reduction to reduce large wildfire community risk c) thinning to promote landscape resilience d) thinning to promote and protect complex forest habitats e) thinning in settings likely to be resilient to climate change.

Analysis of the potential consequence of fires smaller than 35 acres was not a component of the SOFRC's quantitative large wildfire risk assessment. Suppression capabilities within the CAR generally keep fires small, although fires smaller than 35 acres have potential to impact community values due to highly aggregated assets. The Westwide Wildfire Risk Assessment (WWRA; Oregon Department of Forestry et al. 2013) utilized an ignition density grid of all fires, including the very small fires that can have high consequence for communities. Correspondingly, we supplemented our large fire risk

assessment by creating a layer for Local Fire Community Risk using the Fire Risk Index from the WWRA within a 0.25 mile buffer of the SOFRC Communities at Risk (Figure 9a).

Large Wildfire Community Risk

The quantitative wildfire risk assessment developed for the Rogue Basin modeled likely large wildfire intensity for fires >35 acres and produced a quantified large wildfire risk metric for every pixel for a number of collaboratively derived resources and assets. Community assets evaluated for large wildfire community risk were: where people live (Oregon Department of Forestry et al. 2013), non-residential structures, infrastructure, and the only surface-water municipal watershed (Ashland, OR) in the analysis area. We aggregated the conditional net value change for each of these assets for every simulated wildfire, and then attributed the ignition source for those modeled fires with the likely consequence of that fire for our community assets. We then averaged the cumulative conditional net value change to community assets risk to the 12-digit/6th level hydrologic unit code (HUC) to quantify the likely consequence to communities of fires >35 acres igniting in a given spot on the landscape (Figure 9b). The intent was to guide fuel reduction treatments, in part, toward locations most prone to producing wildland fires that damage the community.

Landscape Resilience

Treatments were prioritized to restore resilient landscapes by addressing ecological departure as in Haugo et al. (2015), utilizing data from appendices to the published paper. The data describe the potential vegetation type (PVT) and the successional class (s-class) for each 30-meter pixel, as well as the status of that s-class attributed as similar, deficit, or excess relative to the natural range of variability (NRV) at the appropriate landscape analytical extent for the vegetation type. Landscape analytical spatial extent is a key context needed to understand the status of a particular s-class relative to the natural range of variability. Landscape resilience was evaluated at the landscape scale appropriate for the fire regimes associated with vegetation types. For Fire Regime I this was the 10-digit/5th level hydrologic unit code (HUC), which averaged 84,993 acres across our project area. For Fire Regime Group III the 8 digit/4th level HUC was used, averaging 633,169 acres across our project area. To identify appropriate places to apply restoration treatments we identified strata: biophysical settings associated with Fire Regime I and III (excluding subalpine woodland), in a closed s-class, evaluated at their appropriate landscape scale (Appendix A Haugo et al. 2015).

In addition to strata, vegetation types that historically experienced more frequent fire analyzed at their appropriate landscape scale, topographic position and solar insolation are important facets that influence vegetation composition and structure (Lydersen and North 2012). We attempt to recouple vegetation patterns with topographic facets (sensu Hessburg et al. 2015) by prioritizing thinning treatments on appropriate landscape positions. The vegetation data were intersected with solar insolation and topographic position creating two facets: bottoms and cool midslopes as appropriate locations to maintain more closed forests and ridges and warm midslopes as locations to more actively promote open forest. Thus, strata facets were the intersection of biophysical setting, s-class, topographic position, solar insolation, and landscape scale analytical unit.

Thinning relatively small, shade tolerant trees to reduce canopy cover, protect and promote larger trees was prioritized in excess late-closed forest if it was in appropriate landscape positions -- ridges or warm mid-slopes. The greater weight given to thinning excess late seral forest in these settings was to represent the significant greater ecological investment in growing large old trees. Thinning was also prioritized in mid-seral closed stands on ridges and warm mid-slopes, landscape settings which are most appropriate for more open conditions (Table 7). Priority for treatment to open the forest from closed s-classes to open s-classes was calculated using Equation 1, giving an alternating ridge/bottom pattern of priority across the entire project area (Figure 9c). Across the 4.6 million acre project area, 4

million acres were vegetated, with 2.7 million acres in strata where thinning could be appropriate (s-class B or E, fire regime I or III). Across these strata there were 2.1 million acres of excess closed forest, suggesting a need for active treatments to promote more open forest conditions on about 51% of the forested landscape (Figure 9c).

Equation 1: $$\boldsymbol{Ecological\ Departure\ Priority = M_{ED} * \left(\frac{E}{C}\right)}$$

Where:

M_{ED} = Priority Multiplier from Table 7
E = Excess acres of that strata facet
C = Current acres of that strata facet

Table 7: Priority for thinning forests to promote landscape resilience was limited to closed seral classes (s-classes) and favored in appropriate topographic positions (facets).

S-class (Code)	Facet	Priority Multiplier
(E) Late-closed	Ridges and warm mid-slopes	**2**
(B) Mid-closed	Ridges and warm mid-slopes	**0.5**
(B) Mid-closed	Bottoms and cool mid-slopes	**0.3**
(E) Late-closed	Bottoms and cool mid-slopes	**0.2**
(C) Mid-open	All	**0**
(E) Late-open	All	**0**
(A) Early	All	**0**

Northern Spotted Owl Habitat

Development and maintenance of complex forest associated with Northern Spotted Owl habitat in accordance with NSO habitat recovery plans RA 10 and RA 32 (U.S. Fish & Wildlife Service 2011, 2013) and NSO critical habitat designation (U.S. Fish & Wildlife Service 2012) is an essential feature of the analysis. Key actions are thinning in young forests to accelerate their development into old growth, thinning smaller trees to reduce wildfire hazard adjacent to existing NRF in appropriate landscape settings, and light thinning in simplistic second-growth stands to promote complex canopy layering. Extensive analysis utilizing remotely sensed data were used to generate likely treatment areas to inform treatment unit prioritization and estimates of likely work needed and restoration byproduct. As on-the-ground projects are developed, **site-specific analysis will be needed for every project** to appropriately balance short-term impacts and long-term benefits for NSO conservation and other objectives**.**

Treatment areas were prioritized based on existing NSO habitat and two classes of relative habitat suitability (RHS; U.S. Fish & Wildlife Service 2013). Exiting NSO habitat was modeled using the GNN data (Integrated Landscape Assessment Project 2014) and locally derived vegetation thresholds (U.S. Fish & Wildlife Service 2013) to identify NRF and dispersal habitat. The RHS layer utilized the same GNN data but also incorporated abiotic and biotic variables (e.g. slope position, aspect, and core use area size) that are associated with successful NSO habitat use patterns (U.S. Fish & Wildlife Service 2011). For this analysis, areas classified as high RHS ranged from 35-127 and low RHS was classified <35. These classifications were identified by Rogue Basin FWS, BLM, and USFS wildlife specialists and informed by the NSO recovery plan (U.S. Fish & Wildlife Service 2013). Combinations of existing NSO habitat and RHS were used to identify treatment priorities and objectives (Table 8).

Meaningful aggregations of habitat were emphasized by running a majority filter on modeled existing habitat. The majority filter was based on the classification of the neighboring eight cells, and we then ran a boundary clean function. To ensure treatment placement would optimally benefit existing NRF in high RHS, an adjacency function was used where pixels closer to existing NRF high were prioritized for treatment. Wildfire risk was also considered by including the expected net value change to NRF and dispersal habitat for that pixel. These factors were combined as in Equation 2 to rank forests for thinning to promote and protect complex forest habitats (Figure 9d).

Equation 2: $Northern\ Spotted\ Owl\ Priority = M_{NSO} * 1/D_{NRFH} * R_{Habitat}$

Where:

M_{NSO} = *Priority Multiplier from Table 8*
D_{NRFH} = *Distance to High RHS NRF scaled to max*
$R_{Habitat}$ = *Wildfire risk to NSO NRF or dispersal habitat for that pixel scaled to the max*

Table 8: Northern Spotted Owl (NSO) existing habitat and relative habitat suitability (RHS) classes used to prioritize active management. Priority of 0 indicates no proposed treatment. Priorities are further weighted by adjacency to existing Nesting Roosting and Foraging (NRF) habitat in high RHS settings. *Site specific review is critical for every project.*

Abbreviation	Definition	Objectives	Priority Multiplier
NRF high anywhere and NRF low within ½ mile known core	Existing NRF in high RHS or within any historic core	No treatment	**0**
Dispersal high (Near Range NRF)	Dispersal habitat in high RHS setting	Promote development to NRF with thinning single canopied dense stands	**1.5**
Capable high (Long Range NRF)	Capable habitat in high RHS setting	Promote development to dispersal with thinning in young stands	**1.4**
NRF low	Existing NRF in low RHS **Outside of ½ mile core**	Reduce wildfire risk to adjacent NRF and encourage ecological resistance by maintaining large trees and more open forest in ecologically appropriate settings.	**1.3**
Dispersal low	Dispersal habitat in low RHS settings	Thinning to promote ecological resilience while maintaining NSO dispersal capability at the landscape scale	**1**
Capable low	Capable habitat in low RHS settings	Thinning to promote ecological resilience while maintaining NSO dispersal capability at the landscape scale	**1**

Climate Resilient Landscapes

Areas of high geophysical diversity and landscape permeability to migration are expected to be the most resilient to climate change (Anderson and Ferree 2010, Buttrick et al. 2015). Climate change is predicted to increase the likelihood of fire (Westerling et al. 2006, Whitlock et al. 2008, Littell et al. 2009), fire severity (Brown et al. 2004, Van Mantgem et al. 2013), and suppression difficulty (Fried et al. 2004) across western North America. In the Mediterranean forests and woodlands of the Rogue Basin, this is expected to increase the amount of fire and shift the conversation from *if* fires will burn to *how* they will burn. A key climate change adaptation strategy is to reduce forest loss and thereby avoid rapid state changes (McKinley et al. 2011, Peterson et al. 2011, Stephens et al. 2013). Climate change will impact forests of the Rogue Basin in a numbers of ways, but uncharacteristically severe fire is a key change agent likely to cause rapid change (Meyer et al. 2013).

Fuel reduction treatments with thinning and burning can effectively mitigate wildfire effects (Fulé et al. 2012, Safford et al. 2012, Martinson and Omi 2013) on mortality of large old trees (Ritchie et al. 2007, Prichard et al. 2010, Martinson and Omi 2013) and long-term carbon sequestration (North et al. 2009, Wiedinmyer and Hurteau 2010, North and Hurteau 2011, Loudermilk et al. 2014). Wildfire probability is key for determining if fuel treatments are a net carbon benefit (in the event of a wildfire) or simply a net carbon source (Mitchell et al. 2009, Campbell et al. 2011, Campbell and Ager 2013). Small differences in base analytical assumptions of wildfire likelihood, likely wildfire severity, and the life cycle of carbon after harvest or fire can quickly change interpretation of fuel treatments as a net carbon benefit or cost, so many practitioners simply operate as if they are functionally carbon nuetral (Restaino and Peterson 2013).

Mechanical restoration treatments combined with low-mixed severity fire to promote forests with large fire resistant trees are proposed to facilitate dry-forest adaptation to a changing climate while minimizing undesirable state changes (McKinley et al. 2011, Peterson et al. 2011, Stephens et al. 2013). Synergistically, treatments to restore fire adapted forests and woodlands with thinning and fire are proposed to promote a resilient landscape (Haugo et al. 2015), focused on promoting fire resistant stands dominated by large trees of fire tolerant species while retaining variation in forest density and species composition at the landscape scale (e.g., Covington et al. 1997, Kolb et al. 2007, Franklin and Johnson 2012). Here we prioritize forest restoration and fuel reduction treatments in landscapes likely to be resilient to climate change as mapped by Buttrick et al. (2015) and then rescaled to our project area (Figure 9e). These settings tend to have high geophysical diversity and relatively high landscape permeability to migration, making them good locations to focus on treatments intended to maximize biodiversity retention and increased capacity to adapt to climate change.

Structural Restoration Needs Assessment

Central to the SOFRC cohesive restoration strategy and this assessment is the designation of three landscape treatment themes, each with distinct management guidance. These treatment themes articulate a target stand density and structure, given treatment is recommended by the optimization process. Using restoration forestry principles and practices specific to the forest types of southwest Oregon, the varied sets of objectives outlined for each of the mapped treatment themes provide a macro to zoom lens through which to view and discuss restoration need and opportunity in the Rogue Basin.

Proposed management recommendations for these areas outline compositional and structural goals from a desired ecological restoration and fire response perspective, with timber production derived only as a byproduct of meeting restoration goals. The guidance is robust, yet allows agency managers flexibility to use site specific actions as projects and plans require.

Where active management is proposed, managers will use a blend of ecologically restorative thinning to maintain forests with reduced density and prescribed fire to reduce fuels and return natural

processes (sunsu Franklin and Johnson 2012, Hessburg et al. 2015). Openings will be created to maintain existing shade intolerant trees (e.g. pines and oaks), foster their regeneration, and restore understory plant diversity. The combination of the treatment themes and stand-based guidance helps promote structural heterogeneity at stand and landscape scales.

Initial treatments will provide flexibility for future management, anticipating that sustained forest resilience will be fostered through the most economically appropriate blend of under-burning, mechanical treatments, and merchantable harvest at regular intervals, tiered to historic fire return intervals and stand productivity. The SOFRC has yet to develop an analysis to estimate ongoing needs for sustainable harvest, however, maintenance treatments with thinning or fire will be needed over the long-term.

Landscape Treatment Themes include:

1) **Fuels Management** – This area occupies a quarter-mile buffer around Communities at Risk as defined in the RA and is largely not in public ownership, limiting access. Here, fire resistant forests of larger trees and simple structure are promoted and the primary goal is to reduce asset losses from fire and create safer suppression conditions by reducing surface and ladder fuels and raising canopy height.

2) **Complex Forest Habitat** – This area identifies the dense, multi-story forest favored by the Northern Spotted Owl, and other species and values consistent with older, complex forest.

    a. **Existing high quality** Northern Spotted Owl (NSO) habitat within older, complex forests and supporting other critical species is protected but where no treatments will occur.
    b. **Near-range emerging** NSO habitat where light thinning will promote multiple canopy layers in relatively simple stands with large trees, accelerating development to high quality complex habitat within 50 years. Treatments to improve habitat function may generate timber byproducts.
    c**. Long-range potential NSO habitat** where more thorough thinning is needed in young stands to accelerate development of large trees with large branches and deep crowns, providing high-quality complex habitat within 50-100 years. Treatments to improve habitat function may generate timber byproducts.

3) **Ecosystem Resilience and Forest Productivity** – This treatment theme embraces broad forest management objectives. Restoration of open forest habitats and promotion of fire and drought resistant tree species is expected to promote long-term sustainable forests resilient to a variety of stressors, and in combination with controlled burning management, the potential to provide economic return from harvest. Restoration goals of this treatment theme include:

i. Maintain and restore diversity of habitat, species, and stand structure
ii. Reduce loss to fire, insects, and drought (increase resistance and resilience)
iii. Conserve old trees and stands in and outside complex forest habitat areas
iv. Establish conditions for controlled underburning to maintain landscape resilience
v. Foster conditions for timber production using restoration forestry principles
vi. Generate ongoing products and employment through long-term maintenance/timber harvest

Acreage of SOFRC treatment themes in the analysis area by forest type, plant series, moisture availability, and insolation are provided in Appendix 2. The most abundant PVT's in the mapped available and accessible landscape are Douglas-fir – Dry, White fir – Intermediate, and Tanoak – Douglas-fir – Moist. Density targets for each treatment theme in terms of Relative Density Index (RDI) and Stand Density Index (SDI) are provided in Appendix 3 and vary by treatment theme, vegetation type and, solar insolation. Proposed density targets and associated removals are used to guide prescription development and are the basis of estimated trees/acre to be removed and subsequent restoration byproduct volume as well as investment needed.

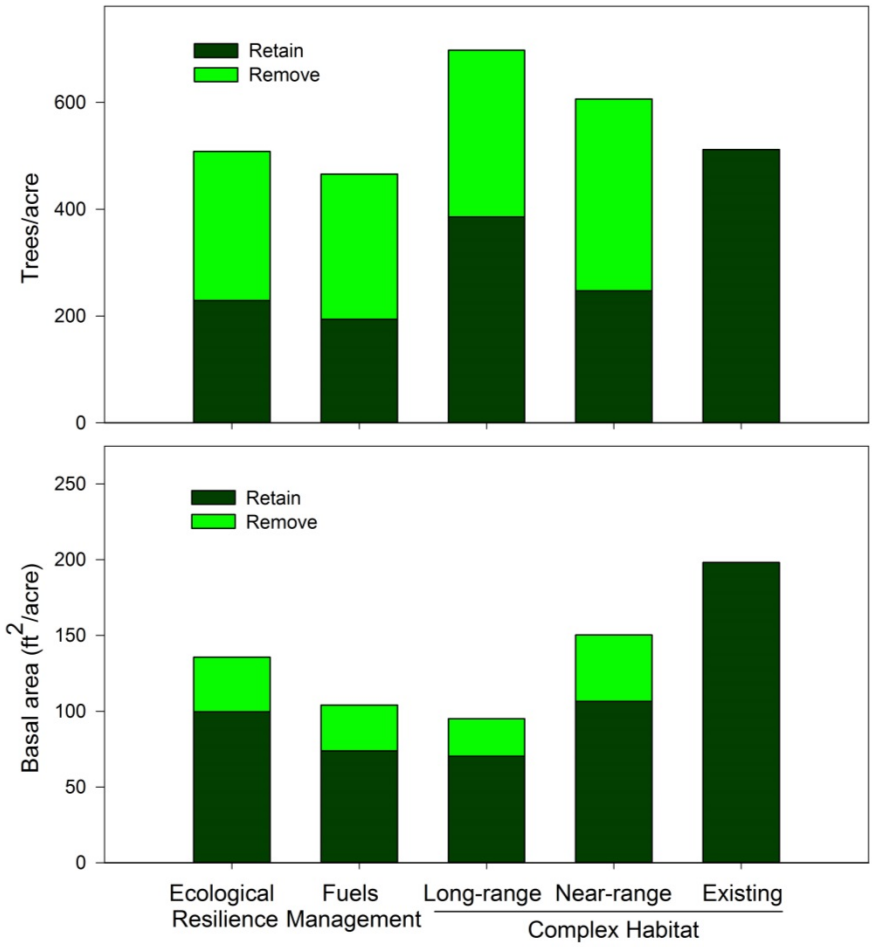


Figure 10: Average existing trees per acre and basal area for each of the treatment themes with proposed trees retained (dark green) and removed (light green) through application of SOFRC restoration strategies to the available and accessible portions of the analysis area.

Work needed and restoration byproduct volume was calculated by comparing desired stand density and structure to existing vegetation using collaboratively derived restoration targets and existing vegetation data from GNN (Integrated Landscape Assessment Project 2014) (Figure 10). This analysis predicted likely work needed and restoration byproduct timber volume in treated areas to a 30 m x 30 m pixel (0.22 acres). Meaningful aggregations of volume were emphasized by running a majority filter with an 8 cell neighborhood on predicted restoration volume. We then ran a boundary clean function to remove very isolated pixels. Average current conditions and treatment intensities vary across the

treatment themes with the greatest basal area in the existing complex habitat but the highest density of trees per acre in the long-range treatment theme (Figure 10). Similarly, for actively managed treatment themes the target densities vary across the diameter distribution (Figure 11). As below articulated, restoration work needed was further summed to an 18 acre fishnet for identification of potential treatment areas.

To validate assumptions about how treatments would affect canopy cover, a key metric of forest structure, we used the Forest Vegetation Simulator (FVS; Dixon 2002) on a subset of plots representative of 57% of the potentially treatable landscape. For each actively managed treatment theme we selected the 5 most abundant PVT/insolation classes for each treatment theme. This evaluation suggests that the post treatment canopy cover will by marginally higher (~4%) in cool insolation settings than in warm insolation settings, and will average about 42%, 48%, 44%, and 54% canopy cover for the ecological resilience, fuel management, long-range complex, and near-range complex treatment themes respectively. Post treatment canopy cover will be lowest in the least productive PVT's, most notably the Oregon white oak PVT with an average post treatment canopy cover around 25%.

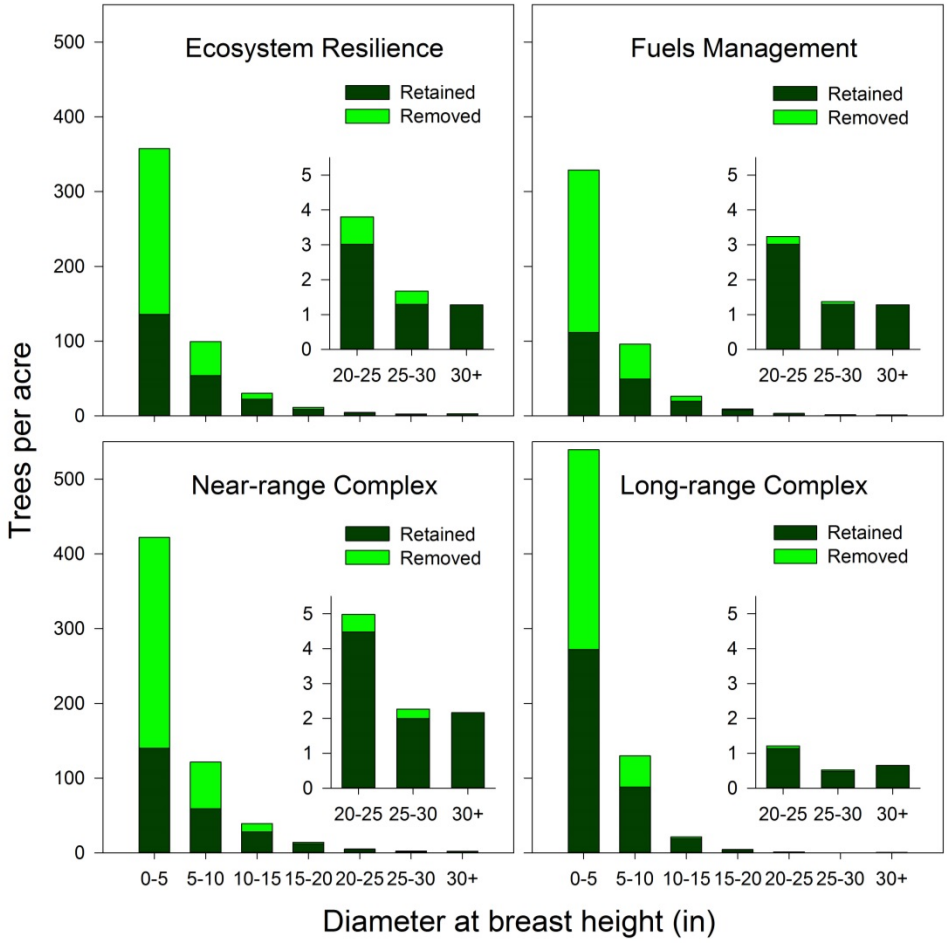


Figure 11: Average existing trees per acre by diameter class (inches) by treatment theme for the available and accessible portions of the analysis area. Application of the SOFRC restoration treatment themes will retain (dark green) or remove (light green) an average number of trees per acre. Inset focuses on trees >20 in. diameter at breast height.

Identifying Treatment Areas

Landscape Treatment Designer (LTD; Ager et al. 2012) was used to identify potential treatment areas optimizing treatment benefit and performance on key indicators. As primary inputs, LTD requires a landscape of polygons to then aggregate into potential treatment areas within specified size and shape constraints. To optimize the tradeoff between analysis resolution and processing time we chose to use an 18 acre fishnet. The program iteratively created aggregations of multiple patches that optimized desired treatment effects based on the five objectives described above 1) mitigating local fire community risk, 2) mitigating large wildfire community risk, 3) promoting resilient landscapes by addressing ecological departure, 4) protecting and promoting Northern Spotted Owl habitat, and 5) promoting landscapes resilient to climate change (Table 6, Figure 9). Patches (treatment areas) were then arrayed in decreasing priority relative to desired outcomes. Once project areas were described, within-project-area boundaries were dissolved and the underlying 30-m resolution raster datasets were queried to report out on performance indicators.

Filters

Treatment placement was constrained by filters to modulate the flow of economically viable byproduct timber volume and conform to land allocation and ecological considerations for no-treatment areas.

<u>Restoration Byproduct Timber</u>

Potential restoration byproduct merchantable volume was calculated as above in the structural restoration needs assessment. To clarify merchantable timber availability and advance the efficiency of restoration projects which include timber harvest, SOFRC generated a logging systems and access tool that takes into account the existing transportation system, topography, and operations awareness to inform potential project scope and design (Table 9). The tool identifies considerations such as fish streams, owl cores, major highways, ridges, and uphill units in order to categorize accessibility by harvest system (i.e., tractor, cable, mixed). It also identifies the part of a landscape with access only by helicopter which require strong markets and logistical fine-tuning. We mapped areas with access limited by the existing system roads, excluding area which would require new road construction for access (Table 9). Economically viable stands were identified based on the predicted restoration byproduct merchantable volume aggregated to 18 acre fishnet and predominant yarding system for that 18 acre cell (Table 10).

Table 9: Accessibility by ownership and vegetation type under the existing road network (acres). Bureau of Land Management (BLM) and US Forest Service (FS) lands are predominately Medford District BLM or Rogue River Siskiyou National Forest, but include 117,000 acres of neighboring agency lands.

Accessibility/Vegetation	BLM	USFS	Other	Total
Accessible	475,003	670,966	1,153,850	2,299,820
Forest	453,253	638,485	936,945	2,028,683
Non-burnable	17,576	27,940	176,127	221,644
Non-Forest, Burnable	4,174	4,541	40,778	49,493
Helicopter accessible	383,480	603,198	483,936	1,470,614
Forest	373,942	593,477	414,914	1,382,333
Non-burnable	4,945	6,253	52,364	63,562
Non-Forest, Burnable	4,593	3,468	16,658	24,720
Limited access	58,880	545,323	197,872	802,075
Forest	56,609	536,311	154,777	747,698
Non-burnable	386	3,541	32,149	36,076
Non-Forest, Burnable	1,885	5,470	10,945	18,300
Total	**917,363**	**1,819,488**	**1,835,658**	**4,572,508**

Table 10: Economic viability of restoration was modeled based on accessibility and predicted restoration byproduct volume (in thousands of board feet /acre; MBF/ac).

Haul system	Definition	Restoration byproduct (MBF/ac)		
		< 2	2-6	>6
Road based	<200 feet of existing roads	Subsidy Required	Economically Viable	Economically Viable
Skidder	Accessible via existing roads with slopes <35%	Subsidy Required	Economically Viable	Economically Viable
Short cable	200-800 downhill of existing roads	Subsidy Required	Economically Viable	Economically Viable
Long cable	800-1600 downhill of existing roads	Subsidy Required	Subsidy Required	Economically Viable
Helicopter	Within ½ mile of existing roads	Subsidy Required	Subsidy Required	Subsidy Required
Limited	Inaccessible via existing road system	Inaccessible	Inaccessible	Inaccessible

No-treatment Filters

Congressionally withdrawn lands were excluded from the analysis. The Federal Land alternative focused on the RRSNF and MBLM. The All-lands alternative treated all ownerships equally. While the All-lands strategy includes minimal acreage of the Klamath, Umpqua, and Fremont-Winema National Forests as well as the Roseburg District BLM, treatment priorities will of-course need to be assessed for those administrative units in their entirety. They are only included here from a neighbor-effects perspective.

No treatment was identified for Northwest Forest Plan riparian reserves, Northern Spotted Owl existing NRF in high RHS locations, and all historical ½ mile NSO cores. Site-specific surveys may alter these no-treatment areas. Riparian reserves were mapped using the National Hydrography Dataset (USGS NHD 2015) with perennial streams buffered by 300 feet and intermittent streams buffered by 150 feet. Northern Spotted Owl nest cores will be evaluated with project level surveys and a hierarchical approach as articulated in RA 10 (U.S. Fish & Wildlife Service 2013).

Table 11: Filters used (acres) to determine where treatments could potentially be placed. The portions of the landscape unavailable for treatment often substantially overlap.

	BLM	USFS	Other	Total	Percent of Grand Total
Accessible	**851,621**	**1,275,468**	**1,637,154**	**3,764,243**	**83**
Developed/unburnable	22,966	34,325	226,810	**284,100**	**6**
Congressionally Reserved	14,839	60,655	440	**75,935**	**2**
Riparian Reserve*	165,524	297,144	301,708	**764,376**	**17**
Northern Spotted Owl**	211,666	334,665	122,551	**668,882**	**15**
Inaccessible* **	**58,279**	**542,408**	**196,164**	**796,851**	**17**
Available	137,360	17,682	135,861	**290,903**	**6**
Developed/unburnable	406	3,559	32,057	**36,022**	**1**
Congressionally Reserved	24,413	319,171	1,127	**344,711**	**8**
Riparian Reserve*	9,982	118,504	17,291	**145,777**	**3**
Northern Spotted Owl**	13,062	86,301	11,969	**111,332**	**2**
Available and Accessible	470,715	640,550	1,034,749	**2,146,014**	**47**
Unavailable and/or Inaccessible	439,186	1,177,326	798,568	**2,415,080**	**53**
Grand Total	**909,901**	**1,817,876**	**1,833,318**	**4,561,094**	

*National Hydrography Dataset perennial streams buffered by 300 feet and intermittent streams buffered by 150 feet

** Existing Northern Spotted Owl nesting roosting and foraging habitat in high relative habitat suitability settings or within historical nest cores

***Otherwise available for treatment, but >1/2 mile from existing system roads

Within the existing framework 47% of the landscape is available for active management and within ½ mile of existing system roads (Table 11). This percentage is much lower for Federal strategy which incorporates significant wilderness and unroaded areas while the All-lands strategy incorporates a higher proportion of heavily roaded forest and woodland adjacent to where people live. Viewed another way, 83% of the total assessment area is potentially accessible for treatment, but only 57% of the accessible area is actually available for treatment, due largely to riparian reserve and NSO habitat filters, parts of which overlap.

Prioritized Project Areas

Across the entire analytical area, the Strategy identifies 2.1 million acres of accessible and available treatment settings of all vegetation types, representing 47% of the landscape. Treatment on these acres would accomplish treatment objectives operating within ½ mile of the existing road system outside of reserved no-treatment areas. We found 1,089,000 acres with commercial byproduct timber on USFS and BLM lands. We parsed that into economically viable and subsidy acres. Application of the treatment themes to the available and accessible federal lands (USFS and BLM) would generate 2.1

billion board feet of restoration byproduct, ~0.9 billion board feet (206,000 acres) of that will be economically viable and 1.2 billion board feet (883,000 acres) will require subsidy. The remaining 1.1 million acres of USFS and BLM lands will require subsidy to maintain resilient conditions and to treat vegetation <10 inches diameter at breast height.

We used LTD to delimit individual projects. To provide an even flow of restoration byproduct volume, we divided the available, accessible, economically viable total volume for the USFS and BLM lands (0.9 billion board feet) by 20 years and by 6 projects per year (120 projects). Planning areas were thus constrained to provide 6 million board feet per project. Additionally projects were constrained to include treatment on 8-12,000 acres.

Interim results are provided here(Figures 12 and 13), in terms of acreage summed by treatment theme, objective function, emphasis, treatment of excess closed-canopy forest, and byproduct volume and economics (Appendices 3-6). For both the Federal and All-lands alternatives, the first 15 projects scaled to roughly 11,700 acres, but the proportions of treatment types varied by alternative. These results reflect an even weighting of the five objective functions and will be further vetted, likely resulting in desirable changes. Similarly, we will generate results for 120 project areas to cover the entire available landscape. We will further sort project areas across BLM resource areas and FS ranger districts to translate our landscape scale priorities as a form of decision support for local land and resource managers.

Federal Lands Alternative

We discuss the results of the of the interim project areas on Forest Service and BLM lands to demonstrate how the selections and data summaries may be used. For example, acreage within the Fuel Management emphasis dominated the first two projects near Grants Pass and Gold Hill and with significant acreage of the Fuel Management treatment theme adjacent to seven other communities also elevated. However, the emphasis varied widely, with the project 5 near Brookings including almost no Fuel Management theme acreage (Appendix 4). The Ecosystem Resilience treatment theme dominated for the remaining thirteen projects, making up the bulk of the treatment overall. The areas treated for NSO predominantly targeted available Near-range stands as a third priority, and treatment to promote the long-range development of habitat amounting to few acres and the least abundant type in nearly all of the top 15 projects.

Another metric for evaluating proposed project areas is to focus on how performance relative to the primary objective functions, as in in Appendix 5. This approach highlights the contribution of each function to the cumulative function for each project. The top 15 projects performed best on Climate Resilience, with moderate level for the highest ranked project and generally increasing to as much as 46% of the objective value. The “Northern Spotted Owl” objective function, which includes thinning to reduce stand closure in appropriate settings, ranks second for its contribution to the project cumulative objective function scores. As such this objective function is fulfilled much more completely than simply tallying the acreage in the Long-range and Near-range treatment themes would suggest.

As with the Fuels Management theme, the contributions of both large and local fire risk are variable across the projects. Treatments to promote resilient landscapes focused on thinning excess closed s-classes, though not all treatments were in closed s-classes (Appendix 6). Among projects, the percentage of the objective value addressing ecological departure averaged 18% and was relatively consistent.

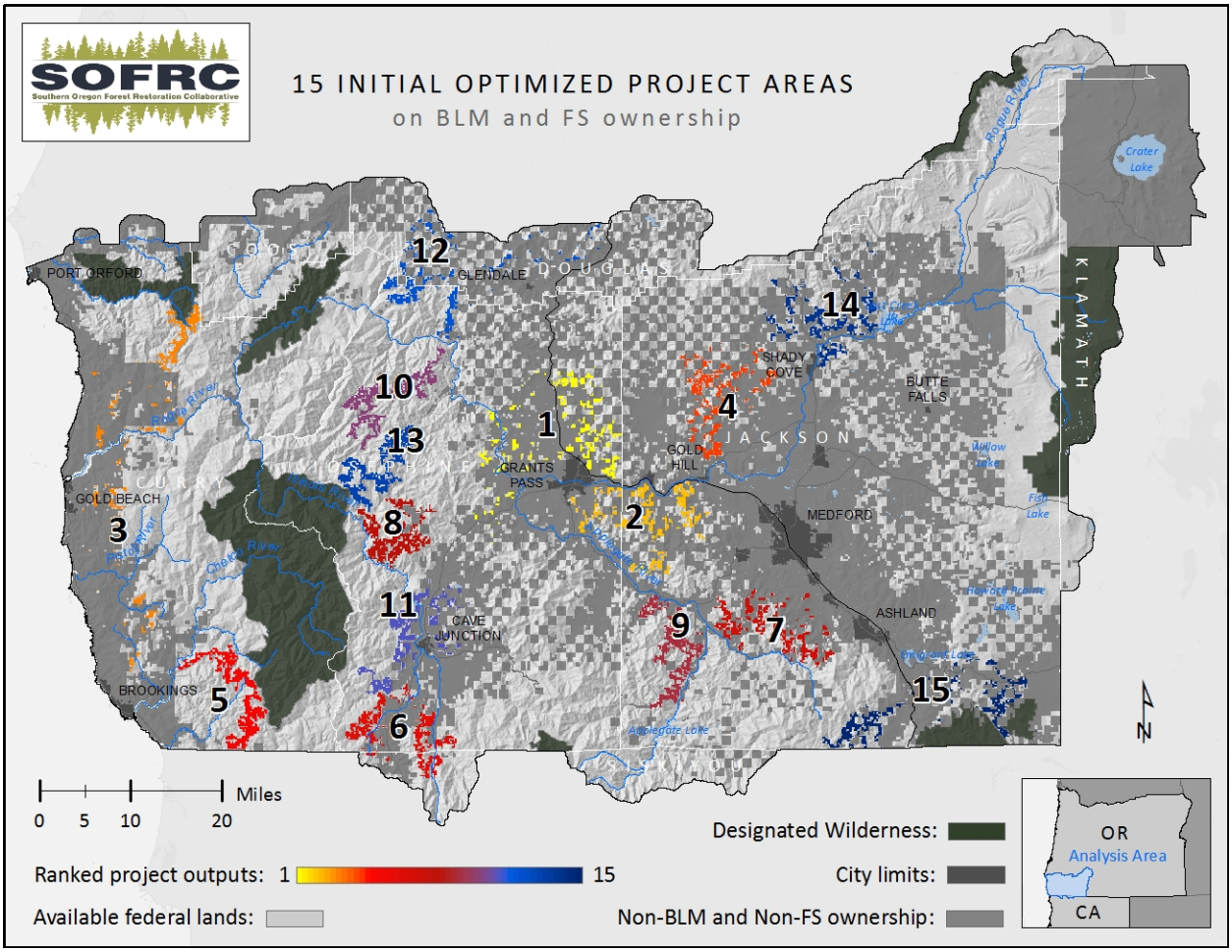


Figure 12: Example results for 15 optimized projects with all five objectives evenly weighted for USDA Forest Service and Bureau of Land Management Lands.

SOFRC did not set volume as an objective function to maximize by project. However, economically viable volume was set as a design constraint in LTD, and each project grew until it provided 6 million board feet of economically viable restoration byproduct volume (Appendix 7). On average, the non-economical acres and volume (requiring subsidy) are roughly double the economically viable acres and volume. The project acres providing economical viable timber ranges widely from 1,746 to nearly 7,000, and these extremes come with the highest and lowest, respectively, cumulative volume requiring subsidy (33 MMBF to as little as 4.3 MMBF). Subsidized treatment which includes only surface and ladder fuels accumulated very little acreage (0 - 3762 acres) in the top priority projects, with a slight tendency toward fewer in the highest priorities. A constraint to spread the cost burden of non-commercial surface and ladder fuel treatment is a factor that could be added.

All-lands scenario

When adding available private forests to the federal lands, the Fuel Management emphasis acreage dominated all the draft 15 projects, with acreage ranging from 40% to 90% of the projects, doubling the result of the Federal Alternative. Treatments targeting the Ecosystem Resilience theme comprised the second most important acreage, followed by acreage tracking the Near-range NSO habitat, and again little acreage accumulated under the theme of Long-range NSO habitat promotion.

Performance on the primary objective functions (Appendix 5) for the All-lands Strategy shows a higher overall objective function score, and, as in the comparison of treatment themes in the Federal Strategy, there is a strong shift to acreage which accomplishes the Local and Large Fire Risk mitigations, with a generally declining contribution from top to the bottom in the list. Here again, an emphasis is placed on treatment accomplishing the Northern Spotted Owl objective function, and that is closely followed by accomplishment of Climate Resilience and then by Ecological Resilience.

In terms of the treatment of excess Closed Forest seral structural states, the All-lands Strategy performed slightly better, adding roughly 13,200 acres, and increasing the average project level treatment by 4%.

In the All-lands Strategy, the public acres treated are reduced dramatically, and the volume constraint was not met in half of the first 15 projects, most of which were ranked in the top half of the priority list (Appendix 7). The All-lands projects pulled in over 2000 acres more economically viable treatment on average, and while the strategy accumulated not quite 75% of the Federal Strategy total restoration byproduct volume, the proportion which required subsidy did not differ (~66%). Subsidized surface and ladder Fuel treatment acres also were quite similar to those in the Federal Strategy.

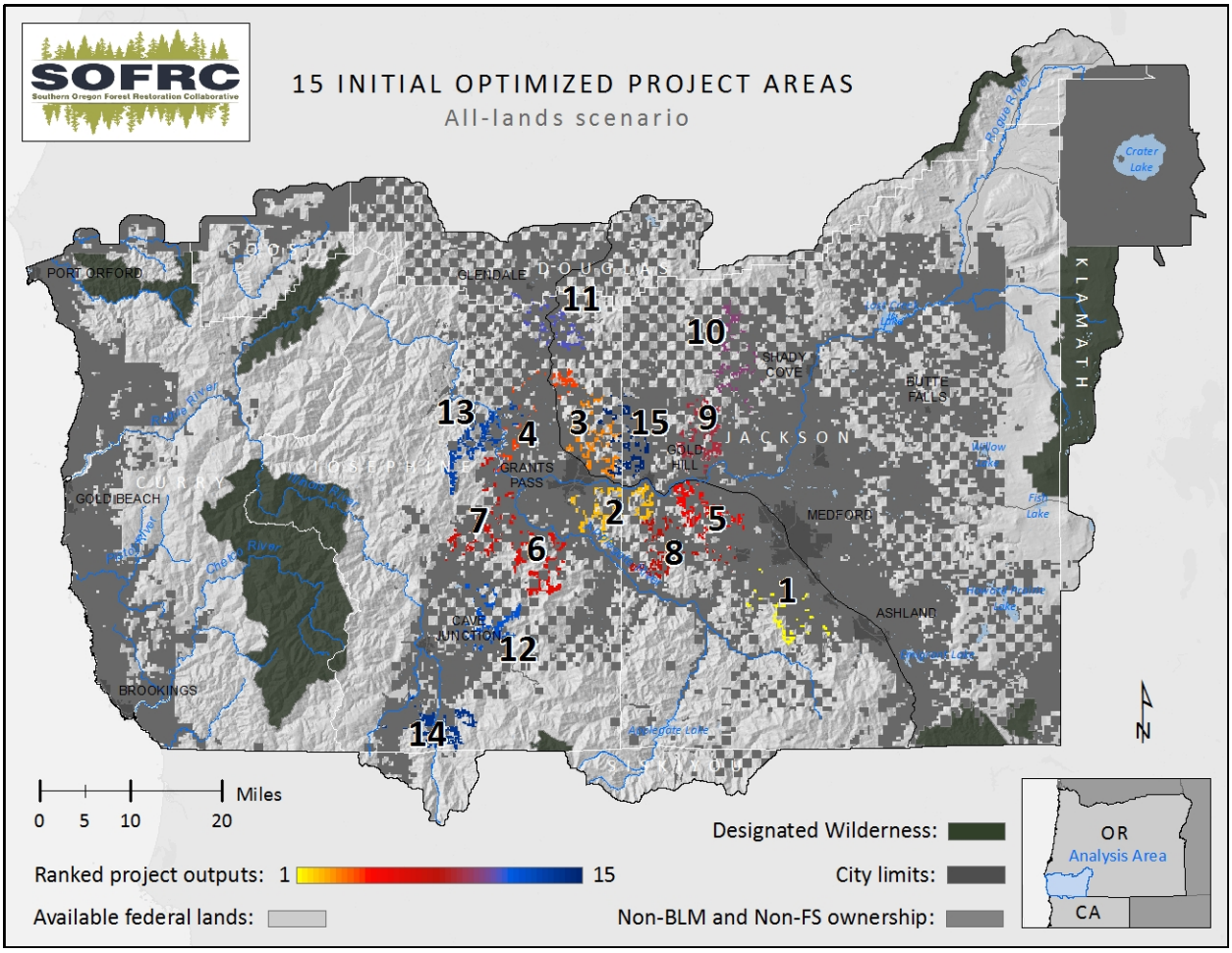


Figure 13: Example results for 15 optimized projects with all five objectives evenly weighted for an All-lands approach.

Comparing Strategy Scenarios

For this version 1 report, the two new Federal and All-lands scenarios are still in development, as the technical team addressed operating limits of the LTD program. The primary two scenarios and the Business-as-Usual comparative scenario will be evaluated on their performance across the entire analysis are relative to key indicators outlined below. Preferably performance of the alternative scenarios will incorporate an estimate of likely wildfire effect. This evaluation of performance on the final outputs will be discussed among the technical team, project advisors, and key stakeholders to provide input on refinements to the assessment and optimization approach for a refined, or "version 2" of this project. While the vetting of the version 1 is ongoing with available resources, SOFRC will also be assembling additional needed resources and a project plan and time frame for completing the refinements for version 2.

Performance Indicators Proposed:

Landscape resilience based in ecological departure

1. Calculated as in Haugo et al. (2015) – proportion of excess closed forest treated as a proportion of available and as a proportion of the whole– account for changes due to wildfire
2. Change in vegetation strata status
3. Change in "risk" to proportions of seral states

Northern Spotted Owl habitat

1. Acres/proportion of acres treated by treatment category (Table 8)
2. Change in risk to NRF and dispersal

Economics

Use the restoration economics calculator (http://ewp.uoregon.edu/economy) to generate economic investment and return expected in local economic activity, primary, secondary, and induced jobs. Results will be aggregated to the planning unit scale. Key available inputs will be:

1. Acres to be treated
2. Trees per acre to be removed by five-inch diameter class
3. Timber volume
    a. Product type
4. Dollars invested in restoration activities
    b. By activity type
5. Firefighting cost – CFLRP calculator

Wildfire risk

Modified modeled fire behavior and risk, overall and by key HVRA's and sub-HVRA's, including critical aggregations such as the community assets.

Proportion of good and bad fire

A key output of the risk assessment

Overall return on investment, near-term and long-term

Next Steps

This Strategy is a major advance in the ongoing dialog about strategic, integrative, and cohesive land management. It provides base data layers, including wildfire hazard and risk to high value resources and assets, consideration of climate adaptation, and an analytical approach to make transparent the Collaborative's principled vision. A number of actions will be needed to fully manifest the Strategy and then to translate planning into action. These steps, listed from near- to long-term are:

1. Generate final LTD potential project areas to evaluate performance of the business as usual, Federal, and All-lands scenarios on indicators as above. Results will be used to:
    a. Modify fuel conditions for fire behavior modeling to recalculate risk across the landscape for each scenario
    b. Parse the results by district and resource area for local project prioritization
    c. Analyze tradeoffs among objectives to identify project areas consistent with collaboratively developed current and long-term needs.
2. Vet the Strategy to build understanding and cohesion, as well as to gain input from a wide range of stakeholders for the continued development of v.2
    a. Local communities
    b. Community fire service
    c. Local and state government
    d. Federal planners
    e. Regulatory agencies
    f. Wildland fire managers
    g. Environmental groups
    h. Industry groups
    i. State and federal policy makers
3. Assess landscape resilience and NSO habitat as affected by ongoing wildfire to refine estimates of restoration need
4. Improve integration of ongoing fire management with further development and analysis using the Wildfire Risk assessment
    a. Identify particularly exposed HVRA's and portions of the landscape for focused fuel management efforts
    b. Inform wildfire management decisions to address fire behavior, smoke, and risk to HVRA's
5. Evaluate long-term (>20-year) impacts of the Strategy in collaboration with Miles Hemstrom and Emily Henderson of the Institute for Natural Resources using STSim, to build that perspective into v.2

Frequent wildfire historically maintained landscape resilience in the Rogue Basin, but fire exclusion has created a backlog of "treatment", which has been termed a "fire deficit" (North et al. 2012). The fire deficit, in concert with other management practices has resulted in a landscape that lacks variability and resilience, a landscape characterized by 2.1 million acres of excess closed forest (Haugo et al. 2015). The Strategy estimates 2.1 million acres on all lands where treatments could occur given existing constraints. However, 1.0 million acres of the total are on private ownership and will be managed by a diverse array of owner objectives. Another 0.6 million acres occur within the Community at Risk, an important footprint where management will reduce fuels and promote fire adapted communities. However, work in the Community at Risk is unlikely to transition stands from closed-to-open, as necessary to achieve landscape resilience. Anticipated annual wildfire effects (26,000 acres annually over the last 20 years) will reduce the needed footprint of mechanical treatments.

Assuming 2.1 million acres of forest were to be treated in 20 years, 180 thousand acres would need to be treated annually working predominantly in appropriate closed conditions to transition to more open mid- and late-seral states. There are 1.1 million accessible and available acres on USFS and BLM lands, the vast majority in appropriate conditions and settings for treatment. Treatment of these available and accessible lands over 20 years would require 55,000 acres to be treated annually. In comparison, the federal agencies currently treat only 9,000 acres/year. Thus, mechanical treatments on federal lands would need to increase dramatically to arrive at resilient landscapes within 20 years, not accounting for ingrowth, maintenance, or the effects of wildfire. Maintenance treatments of either thinning or burning would need to be scheduled on a rotating 10-20 year cycle starting immediately, and assuming an average return interval of 15 years would require 74,000 acres of maintenance treatment, prescribed burning or mechanical treatment annually.

As in North et al. (2012) the magnitude of work needed outstrips the current capacity of the federal agencies to complete the work needed to achieve resilient landscapes. Under the existing framework federal treatments impact 1/3 of the acreage that wildfires impact. This situation elevates the need to incorporate managed wildfire to accomplish societal objectives of reducing wildfire risk and promoting resilient landscapes. This will only be achieved with proactive, strategically placed treatments to promote more favorable fire effects combined with managing wildfire to burn under an appropriate range of fire weather conditions, in the right parts of the landscape. We anticipate working with our federal partners and stakeholders to develop an implementation plan to use SOFRC Cohesive Forest Restoration Strategy to increase forest resilience in the Rogue Basin.

References

Agee, J. K. 1991. Fire history along an elevational gradient in the Siskiyou Mountains, Oregon. Northwest Science **65**:188-199.

Ager, A. A., N. M. Vaillant, D. E. Owens, S. Brittain, and J. Hamann. 2012. Overview and example application of the Landscape Treatment Designer.

Anderson, M. G., and C. E. Ferree. 2010. Conserving the stage: climate change and the geophysical underpinnings of species diversity. PLoS ONE **5**:e11554.

Brown, T. J., B. L. Hall, and A. L. Westerling. 2004. The impact of twenty-first century climate change on wildland fire danger in the western United States: an applications perspective. Climatic change **62**:365-388.

Buttrick, S., K. Popper, M. Schindel, B. McRae, B. Unnasch, A. Jones, and J. Platt. 2015. Conserving Nature's stage: identifying resilient terrestrial landscapes in the Pacific Northwest. The Nature Conservancy, Portland, OR.

Campbell, J. L., and A. A. Ager. 2013. Forest wildfire, fuel reduction treatments, and landscape carbon stocks: A sensitivity analysis. Journal of environmental management **121**:124-132.

Campbell, J. L., M. E. Harmon, and S. R. Mitchell. 2011. Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and the Environment **10**:83-90.

Colombaroli, D., and D. G. Gavin. 2010. Highly episodic fire and erosion regime over the past 2,000 y in the Siskiyou Mountains, Oregon. Proceedings of the National Academy of Sciences **107**:18909–18914.

Covington, W. W., P. Z. Fulé, M. M. Moore, S. C. Hart, T. W. Kolb, J. N. Mast, S. S. Sackett, and M. R. Wagner. 1997. Restoring ecosystem health in ponderosa pine forests of the southwest. Journal of Forestry **95**:23-29.

Dixon, G. E. 2002. Essential FVS: a user's guide to the Forest Vegetation Simulator. Internal Report. USDA Forest Service, Forest Management Service Center.

Franklin, J. F., and K. N. Johnson. 2012. A restoration framework for federal forests in the Pacific Northwest. Journal of Forestry **110**:429-439.

Fried, J. S., M. S. Torn, and E. Mills. 2004. The impact of climate change on wildfire severity: a regional forecast for northern California. Climatic change **64**:169-191.

Fulé, P. Z., J. E. Crouse, J. P. Roccaforte, and E. L. Kalies. 2012. Do thinning and/or burning treatments in western USA ponderosa or Jeffrey pine-dominated forests help restore natural fire behavior? Forest Ecology and Management **269**:68-81.

Halofsky, J. E., D. C. Donato, D. E. Hibbs, J. L. Cambell, M. Donaghy, J. B. Fontaine, J. R. Thompson, R. G. Anthony, B. T. Bormann, L. J. Kayes, B. E. Law, D. L. Peterson, T. A. Spies, and 7. 2011. Mixed-severity fire regimes: lessons and hypotheses from the Klamath-Siskiyou Ecoregion. Ecosphere **2**:1-14.

Haugo, R., C. Zanger, T. DeMeo, C. Ringo, A. Shlisky, K. Blankenship, M. Simpson, K. Mellen-McLean, J. Kertis, and M. Stern. 2015. A new approach to evaluate forest structure restoration needs across Oregon and Washington, USA. Forest Ecology and Management **335**:37-50.

Healthy Forests Restoration Act (HFRA). 2003. One Hundred Eighth Congress of the United States of America, H.R. 1904. Available online: http://www.gpo.gov/fdsys/pkg/BILLS-108hr1904enr/pdf/BILLS-108hr1904enr.pdf.

Hessburg, P. F., D. J. Churchill, A. J. Larson, R. D. Haugo, C. Miller, T. A. Spies, M. P. North, N. A. Povak, R. T. Belote, and P. H. Singleton. 2015. Restoring fire-prone Inland Pacific landscapes: seven core principles. Landscape ecology:1-31.

Hoekstra, J. M., T. M. Boucher, T. H. Ricketts, and C. Roberts. 2005. Confronting a biome crisis: global disparities of habitat loss and protection. Ecology Letters **8**:23-29.

Integrated Landscape Assessment Project. 2014. Gradient Nearest Neighbor (GNN) 2012 vegetation data. Landscape Ecology, Modeling, Mapping, and Analysis (LEMMA), Oregon State University, available online: http://lemma.forestry.oregonstate.edu/data/.

Jewell, S., and T. J. Vilsack. 2014. The National Strategy: The final phase in the development of the National Cohesive Wildland Fire Management Strategy. available online: http://www.forestsandrangelands.gov/strategy/thestrategy.shtml.

Kolb, T., J. Agee, P. Fulé, N. McDowell, K. Pearson, A. Sala, and R. Waring. 2007. Perpetuating old ponderosa pine. Forest Ecology and Management **249**:141-157.

LANDFIRE. 2010. LANDFIRE 1.1.0Existing Vegetation Type layer. U.S. Department of the Interior, Geological Survey, available online: http://landfire.cr.usgs.gov/viewer/

Littell, J. S., D. McKenzie, D. L. Peterson, and A. L. Westerling. 2009. Climate and wildfire area burned in western US ecoprovinces, 1916-2003. Ecological Applications **19**:1003-1021.

Loudermilk, E. L., A. Stanton, R. M. Scheller, T. E. Dilts, P. J. Weisberg, C. Skinner, and J. Yang. 2014. Effectiveness of fuel treatments for mitigating wildfire risk and sequestering forest carbon: A case study in the Lake Tahoe Basin. Forest Ecology and Management **323**:114-125.

Lydersen, J., and M. North. 2012. Topographic variation in structure of mixed-conifer forests under an active-fire regime. Ecosystems **15**:1134-1146.

Martinson, E. J., and P. N. Omi. 2013. Fuel treatments and fire severity: a meta-analysis. USDA Forest Service, Rocky Mountain Research Station **RMRS-RP-103WWW**.

McKinley, D., M. Ryan, R. Birdsey, C. Giardina, M. Harmon, L. Heath, R. Houghton, R. Jackson, J. Morrison, B. Murray, D. E. Pataki, and K. E. Skog. 2011. A synthesis of current knowledge on forests and carbon storage in the United States. Ecological Applications **21**:1902-1924.

McNeil, R. C., and D. B. Zobel. 1980. Vegetation and fire history of a ponderosa pine-white fir forest in Crater Lake National Park. Northwest Science **54**:30-46.

Messier, M. S., J. Shatford, and D. E. Hibbs. 2012. Fire exclusion effects on riparian forest dynamics in southwestern Oregon. Forest Ecology and Management **264**:60-71.

Meyer, G., K. L. Metlen, and K. Wearstler. 2013. Forest assessment.*in* G. Griffith, T. Thaler, A. Perry, T. Crossett, and R. Rasker, editors. The Rogue Basin action plan for resilient watersheds and forests in a changing climate, Model Forest Policy Program in association with the Southern Oregon Forest Restoration Collaborative, the Cumberland River Compact and Headwaters Economics, Sagle, ID.

Mitchell, S., M. Harmon, and K. O'Connell. 2009. Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest ecosystems. Ecological Applications **19**:643-655.

North, M., B. M. Collins, and S. Stephens. 2012. Using fire to increase the scale, benefits, and future maintenance of fuels treatments. Journal of Forestry **110**:392-401.

North, M., M. Hurteau, and J. Innes. 2009. Fire suppression and fuels treatment effects on mixed-conifer carbon stocks and emissions. Ecological Applications **19**:1385-1396.

North, M. P., and M. D. Hurteau. 2011. High-severity wildfire effects on carbon stocks and emissions in fuels treated and untreated forest. Forest Ecology and Management **261**:1115-1120.

Oregon Department of Forestry. 2006. Oregon's *Communities at Risk* Assessment. Oregon Department of Forestry, Salem, OR.

Oregon Department of Forestry, Western Forestry Leadership Coalition, and Council of Western State Foresters. 2013. Westwide Wildfire Risk Assessment. Oregon Department of Forestry, Salem, OR.

Perry, D. A., P. F. Hessburg, C. N. Skinner, T. A. Spies, S. L. Stephens, A. H. Taylor, J. F. Franklin, B. McComb, and G. Riegel. 2011. The ecology of mixed severity fire regimes in Washington, Oregon, and Northern California. Forest Ecology and Management **262**:703-717.

Peterson, D. L., C. I. Millar, L. A. Joyce, M. J. Furniss, J. E. Halofsky, R. P. Neilson, and T. L. Morelli. 2011. Responding to climate change in national forests: a guidebook for developing adaptation options. USDA Forest Service Pacific Northwest Research Station **GTR-855**.

Prichard, S., D. Peterson, and K. Jacobson. 2010. Fuel treatments reduce the severity of wildfire effects in dry mixed conifer forest, Washington, USA. Canadian Journal of Forest Research **40**:1615-1626.

Restaino, J. C., and D. L. Peterson. 2013. Wildfire and fuel treatment effects on forest carbon dynamics in the western United States. Forest Ecology and Management **303**:46-60.

Ritchie, M. W., C. N. Skinner, and T. A. Hamilton. 2007. Probability of tree survival after wildfire in an interior pine forest of northern California: Effects of thinning and prescribed fire. Forest Ecology and Management **247**:200-208.

Safford, H., J. Stevens, K. Merriam, M. Meyer, and A. Latimer. 2012. Fuel treatment effectiveness in California yellow pine and mixed conifer forests. Forest Ecology and Management **274**:17-28.

Scott, J. H. 2014. Summarizing contemporary large-fire occurrence for land and resource management planning. USDA Forest Service, Washington Office.

Scott, J. H., D. J. Helmbrecht, and M. P. Thompson. 2014. Assessing the expected effects of wildfire on vegetation condition on the Bridger-Teton National Forest, Wyoming, USA. USDA Forest Service, Rocky Mountain Research Station **RMRS-RN-71**.

Scott, J. H., M. P. Thompson, and D. E. Calkin. 2013. A wildfire risk assessment framework for land and resource management. USDA Forest Service, Rocky Mountain Research Station **RMRS-GTR-315**.

Sensenig, T., J. D. Bailey, and J. C. Tappeiner. 2013. Stand development, fire and growth of old-growth and young forests in southwestern Oregon, USA. Forest Ecology and Management **291**:96-109.

Stephens, S., J. Agee, P. Fulé, M. North, W. Romme, T. Swetnam, and M. Turner. 2013. Managing forests and fire in changing climates. Science **342**:41-42.

Suh, R. S., and R. Bonnie. 2014. National Action Plan: An implementation framework for the *National Cohesive Wildland Fire Management Strategy*. U.S. Department of the Interior, U.S. Department of Agriculture, Forest Service, National Park Service, Fish and Wildlife Service, Bureau of Land

Management, Bureau of Indian Affairs, U.S. Geological Survey, U.S. Department of Homeland Security/U.S. Fire Administration, Western Governors' Association, National Governors' Association, National Association of Counties, Intertribal Timber Council, National League of Cities, National Association of State Foresters, International Association of Fire Chiefs, available online: http://www.forestsandrangelands.gov/strategy/thestrategy.shtml.

Taylor, A. H., and C. N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. Forest Ecology and Management **111**:285-301.

Taylor, A. H., and C. N. Skinner. 2003. Spatial patterns and controls on historical fire regimes and forest structure in the Klamath Mountains. Ecological Applications **13**:704-719.

U.S. Fish & Wildlife Service. 2011. Revised recovery plan for the northern spotted owl (*Strix occidentalis caurina*). Page xvi + 258US Department of Interior, Portland, Oregon, USA.

U.S. Fish & Wildlife Service. 2012. Endangered and threatened wildlife and plants; designation of revised critical habitat for the Northern Spotted Owl. Medford Bureau of Land Management, Rogue River-Siskiyou National Forest, and USFWS Roseburg Field Office, US Department of Interior, Federal Register.

U.S. Fish & Wildlife Service. 2013. Recovery plan implementation guidance: interim Recovery Action 10. Medford Bureau of Land Management, Rogue River-Siskiyou National Forest, and USFWS Roseburg Field Office, US Department of Interior, Portland, Oregon, USA.

USGS NHD. 2015. National Hydrography Dataset: Watershed Boundary Dataset U.S. Department of Interior, U.S. Geological Survey, available online: http://nhd.usgs.gov/.

Van Mantgem, P. J., J. C. B. Nesmith, M. Keifer, E. E. Knapp, A. Flint, and L. Flint. 2013. Climatic stress increases forest fire severity across the western United States. Ecology Letters:n/a-n/a.

Westerling, A., H. Hidalgo, D. Cayan, and T. Swetnam. 2006. Warming and earlier spring increase western US forest wildfire activity. Science **313**:940.

Whitlock, C., J. Marlon, C. Briles, A. Brunelle, C. Long, and P. Bartlein. 2008. Long-term relations among fire, fuel, and climate in the north-western US based on lake-sediment studies. International Journal of Wildland Fire **17**:72-83.

Wiedinmyer, C., and M. D. Hurteau. 2010. Prescribed fire as a means of reducing forest carbon emissions in the western United States. Environmental science & technology **44**:1926-1932.

Appendices

Appendix 1a: Non-federal participants in the Wildfire Risk Assessment workshops convened by the Southern Oregon Forest Restoration Collaborative in 2015.

Name	Title	Affiliation
Jack Shipley	Executive Director	Applegate Watershed Council
Ken Wienke	Timber Purchaser	Boise Cascade, Inc.
Kendra Smith	Model Watershed Program Director	Bonneville Environmental Foundation
Robert Kentta	Tribal Council	Confederated Tribe of the Siletz Indians
Neil Benson	Fire Plan Coordinator	Fire Plan
Dave Schott	Owner	Forest Glen Lumber
Eugene Wier	Project Manager	The Freshwater Trust
Guy Sparks	Fire Professional	Grayback Forestry, Inc.
Sean Hendricks	Fire Professional	Grayback Forestry, Inc.
Jim Wolf	Wildfire Operations Chief	Intterra Group, Inc.
Karim Naguib	Information Technology	Jackson County
Jenny Hall	Emergency Management Coordinator	Jackson/Josephine County
Simon Hare	County Commissioner	Josephine County
Jaime Stephens	Science Director	Klamath Bird Observatory
Joe Vaile	Executive Director	Klamath-Siskiyou Wildlands Center
Vince Oredson	Wildlife Habitat Specialist	Oregon Department of Fish and Wildlife
Dan Thorpe	District Forester	Oregon Department of Forestry
Greg Alexander	Medford Unit Forester	Oregon Department of Forestry
Herb Johnson	Prevention Specialist	Oregon Department of Forestry
John O'Connor	Cohesive Wildfire Strategy Coordinator	Oregon Department of Forestry
Matt Krunglevich	Prevention Planner	Oregon Department of Forestry
Charley Phoenix	Fire Science Consultant	Phenix Consulting and Education, Inc.
Joe Scott	Wildfire Modeling Specialist	Pyrologix, LLC
Blair Moody	SOFRC Board	Retired BLM/FS
Ed Reilly	Spatial Analyst	Retired BLM/FS
Steve Ziel	Fire Behavior Modeler	Retired Forest Service
Marty Main	Forester	Small Woodland Services, Inc.
Stanley Petrowski	President and Executive Director	South Umpqua Rural Community Partnership
George McKinley	Executive Director	Southern Oregon Forest Restoration Collaborative
Tobin Smail	Fire and Fuels GIS Specialist	Stinger Ghaffarian Technologies, Inc.
Ashley Lara	Fire Adapted Communities Coordinator	The City of Ashland
Chris Chambers	Forest Division Chief	The City of Ashland
Steve Parks	Fire Adapted Communities Coordinator	The City of Ashland
Darren Borgias	Southwest Oregon Program Director	The Nature Conservancy
Derek Olson	Spatial Analyst	The Nature Conservancy
Kerry Metlen	Forest Ecologist	The Nature Conservancy

Appendix 1b: Federal participants in the Wildfire Risk Assessment workshops convened by the Southern Oregon Forest Restoration Collaborative in 2015.

Name	Title	Agency
Al Mason	Fuels Management Specialist	Medford District BLM
Allen Mitchell	Fire and Fuels Management	Medford District BLM
Bryan Wender	District Botany Lead	Medford District BLM
Dayne Barron	Medford District Manager	Medford District BLM
Jena Volpe	Fire Ecologist	Medford District BLM
Jon Larson	Ashland Fuels	Medford District BLM
Kristi Mastrofini	Ashland Supervisor	Medford District BLM
Mark Metevier	District GIS Program Lead	Medford District BLM
Robin Snider	District Wildlife Lead	Medford District BLM
Terry Fairbanks	District Silviculturist	Medford District BLM
Tony Kerwin	District Planner	Medford District BLM
Yanu Gallimore	Fire Management Specialist	Medford District BLM
Peter Winnick	Soil Conservationist	Natural Resources Conservation Service
Amy Amrhein	Staff to Senator Merkley	United States Senate
Cindy Donegan	Fish and Wildlife Biologist	US Fish and Wildlife Service
Charley Martin	Senior Scientist SGT-EROS	US Geological Survey
Bill Schaupp	Entomologist	USFS Forest Health Protection
Josh Bronson	Forest Pathologist	USFS Forest Health Protection
Nikola Smith	Ecosystem Services Specialist	USFS Pacific Northwest Region
Tara Umphries	Sub-regional Fire Planner	USFS/BLM Pacific Northwest Region
Matt Thompson	Research Forester	USFS Rocky Mountain Research Station
Aimee Ross	Botany Technician	USFS Rogue River-Siskiyou National Forest
Allan Hahn	Natural Resources Staff	USFS Rogue River-Siskiyou National Forest
Brian Long	Recreation	USFS Rogue River-Siskiyou National Forest
Clint Emerson	Gold Beach Botanist	USFS Rogue River-Siskiyou National Forest
Craig Trulock	Deputy Forest Supervisor	USFS Rogue River-Siskiyou National Forest
Don Boucher	Environmental Coordinator	USFS Rogue River-Siskiyou National Forest
Donna Mickley	Siskiyou Mountains District Ranger	USFS Rogue River-Siskiyou National Forest
Eric Hensel	Fire and Aviation Staff Officer	USFS Rogue River-Siskiyou National Forest
Jeff von Kienast	Fisheries and Wildlife Biologist	USFS Rogue River-Siskiyou National Forest
Jon Lamb	Fire and Fuels Management	USFS Rogue River-Siskiyou National Forest
Joni Brazier	Hydrology/Soils	USFS Rogue River-Siskiyou National Forest
Mark Hocken	Range Biologist	USFS Rogue River-Siskiyou National Forest
Monty Edwards	Fire Management Officer	USFS Rogue River-Siskiyou National Forest
Patricia Hochhalter	Ecologist	USFS Rogue River-Siskiyou National Forest
Rob Budge	Deputy Fire Staff - Fuels	USFS Rogue River-Siskiyou National Forest
Rob McWhorter	Forest Supervisor	USFS Rogue River-Siskiyou National Forest
Robert Shoemaker	Minerals Specialist	USFS Rogue River-Siskiyou National Forest
Shannon Downey	Environmental Coordinator	USFS Rogue River-Siskiyou National Forest
Donald Helmbrecht	Wildland Fire Analyst	USFS TEAMS Enterprise Unit

Appendix 2: Acreage of Southern Oregon Forest Restoration Collaborative treatment themes available for treatment and accessible via the existing system roads, by potential vegetation type (PVT) and ownership class.

Potential Vegetation Type	Ecosystem Resilience	Fuel Management	Long-range	Near-range	Total	Percent (%)
Douglas-fir - Dry	298,739	254,206	11,265	81,524	645,733	32.8
Douglas-fir – Moist	37,138	3,503	1,984	9,774	52,399	2.7
Jeffrey pine	29,025	8,838	293	2,456	40,612	2.1
Oregon white oak	43,371	71,668	818	2,090	117,947	6.0
Ponderosa pine - Dry	16,097	24,246	252	1,032	41,627	2.1
Shasta red fir - Dry	2,173	100	0	0	2,273	0.1
Shasta red fir - Moist	7,589	16	84	1,976	9,665	0.5
Sitka spruce	4,235	9,353	0	0	13,588	0.7
Tanoak - Douglas-fir - Dry	103,881	17,809	4,411	19,324	145,424	7.4
Tanoak - Douglas-fir - Moist	181,751	46,847	6,660	13,598	248,855	12.6
Ultramafic	35,548	4,961	191	823	41,524	2.1
Western hemlock - Hyperdry	22,446	1,773	752	3,617	28,588	1.4
Western hemlock - Intermediate	49,725	2,590	1,361	3,550	57,226	2.9
Western hemlock - Moist	38,788	2,473	642	2,586	44,489	2.3
White fir – Cool	65,383	3,088	447	7,693	76,611	3.9
White fir - Intermediate	259,234	40,504	8,294	58,430	366,462	18.6
White fir - Moist	3,127	354	340	1,582	5,403	0.3
Other PVT's	92,760	85,079	869	4,880	183,588	8.7
Ownership						
Bureau of Land Management	286,877	102,735	9,226	63,690	462,528	21.8
U.S. Forest Service	505,527	35,640	11,693	74,406	627,266	29.6
Other ownership	497,893	437,903	17,717	76,736	1,030,249	48.6
Total available and accessible	**1,290,297**	**576,278**	**38,636**	**214,832**	**2,120,043**	

Appendix 3: Restoration density targets in for each treatment theme in terms of Relative Density Index (RDI) and Stand Density Index (SDI) scaled by the maximum SDI (Max SDI) of the seral tree species (seral) tailored to potential vegetation type and solar insolation. Excludes PVT's comprising <1% of the treatable landscape.

				Ecosystem Resilience		Fuel Management		Long-range		Near-range	
Potential Vegetation Type	**Insolation**	**Seral***	**Max SDI**	**RDI**	**SDI**	**RDI**	**SDI**	**RDI**	**SDI**	**RDI**	**SDI**
Douglas-fir - Dry	Cool	PIPO	499	0.35	175	0.40	200	0.30	150	0.45	225
Douglas-fir - Dry	Warm	PIPO	499	0.30	150	0.35	175	0.30	150	0.45	225
Douglas-fir – Moist	Cool	PIPO	499	0.40	200	0.45	225	0.30	150	0.45	225
Douglas-fir – Moist	Warm	PIPO	499	0.35	175	0.40	200	0.30	150	0.45	225
Jeffrey pine	Cool	PIJE	264	0.35	92	0.40	106	0.30	79	0.45	119
Jeffrey pine	Warm	PIJE	264	0.25	66	0.35	92	0.30	79	0.45	119
Oregon white oak	Cool	QUGA	200	0.35	70	0.40	80	0.30	60	0.45	90
Oregon white oak	Warm	QUGA	200	0.30	60	0.35	70	0.30	60	0.45	90
Ponderosa pine - Dry	Cool	PIPO	499	0.30	150	0.40	200	0.30	150	0.45	225
Ponderosa pine - Dry	Warm	PIPO	499	0.25	125	0.35	175	0.30	150	0.45	225
Shasta red fir - Dry	Cool	ABMAS	755	0.45	340	0.45	340	0.30	227	0.45	340
Shasta red fir - Dry	Warm	ABMAS	755	0.40	302	0.40	302	0.30	227	0.45	340
Shasta red fir - Moist	Cool	ABMAS	755	0.45	340	0.45	340	0.30	227	0.45	340
Shasta red fir - Moist	Warm	ABMAS	755	0.40	302	0.40	302	0.30	227	0.45	340
Sitka spruce	Cool	PISI	700	0.45	315	0.45	315	0.30	210	0.45	315
Sitka spruce	Warm	PISI	700	0.40	280	0.40	280	0.30	210	0.45	315
Tanoak - Douglas-fir - Dry	Cool	PSME	600	0.35	210	0.40	240	0.30	180	0.45	270
Tanoak - Douglas-fir - Dry	Warm	PSME	600	0.30	180	0.35	210	0.30	180	0.45	270
Tanoak - Douglas-fir - Moist	Cool	PSME	600	0.35	210	0.45	270	0.30	180	0.45	270
Tanoak - Douglas-fir - Moist	Warm	PSME	600	0.30	180	0.40	240	0.30	180	0.45	270
Ultramafic	Cool	PIJE	294	0.30	88	0.40	118	0.30	88	0.45	132
Ultramafic	Warm	PIJE	294	0.25	74	0.35	103	0.30	88	0.45	132
Western hemlock - Hyperdry	Cool	PSME	600	0.35	210	0.45	270	0.30	180	0.45	270
Western hemlock - Hyperdry	Warm	PSME	600	0.30	180	0.40	240	0.30	180	0.45	270
Western hemlock - Intermediate	Cool	PSME	600	0.45	270	0.45	270	0.30	180	0.45	270
Western hemlock - Intermediate	Warm	PSME	600	0.40	240	0.40	240	0.30	180	0.45	270
Western hemlock - Moist	Cool	PSME	600	0.35	210	0.45	270	0.30	180	0.45	270
Western hemlock - Moist	Warm	PSME	600	0.30	180	0.40	240	0.30	180	0.45	270
White fir – Cool	Cool	ABMAS	750	0.40	300	0.45	338	0.30	225	0.45	338
White fir – Cool	Warm	ABMAS	750	0.35	263	0.40	300	0.30	225	0.45	338
White fir - Intermediate	Cool	PSME	530	0.35	186	0.40	212	0.30	159	0.45	239
White fir - Intermediate	Warm	PSME	530	0.30	159	0.35	186	0.30	159	0.45	239

*Seral tree species: ABMAS=Shasta red fir, PIJE=Jeffrey pine, PIPO=ponderosa pine, PISI=Sitka spruce, PSME=Douglas-fir, QUGA=Oregon white oak

Appendix 4: Interim DRAFT results for 15 optimized projects with all five objectives evenly weighted for the Federal (Rogue River-Siskiyou National Forest and Medford District BLM) and All-lands scenarios. Treated area of all projects was ~12,000 acres but varied among mapped treatment themes. Long-range and near-range treatment themes promote complex Northern Spotted Owl habitat. Fuel reduction in and around the Community at Risk is the priority in the fuel management treatment theme. Overall ecosystem resilience is the overriding objective in the ecosystem resilience treatment theme.

	Treatment Theme Acres			
Project	**Long-Range**	**Near-Range**	**Fuel Management**	**Climate Resilience**
		Federal Strategy		
1	19	1,255	7,419	3,086
2	136	2,431	6,456	2,725
3	116	261	1,085	10,349
4	159	1,799	3,739	6,041
5	35	1,456	4	9,810
6	74	1,014	3,415	7,361
7	202	1,307	4,437	5,742
8	46	851	482	10,411
9	139	851	2,067	8,007
10	202	793	629	10,133
11	22	79	3,765	8,078
12	384	1,265	325	8,600
13	71	718	301	10,647
14	234	825	3,665	7,038
15	216	1,774	1,553	8,097
		All-lands Strategy		
1	68	453	10,662	730
2	64	1,822	8,838	1,152
3	29	1,357	9,112	1,325
4	0	341	10,614	982
5	181	698	9,004	2,038
6	121	1,959	5,621	3,800
7	1	92	8,645	3,053
8	147	2,440	6,612	2,530
9	72	768	6,703	4,233
10	49	2,086	5,879	3,823
11	22	1,250	7,303	3,269
12	123	1,246	4,879	5,484
13	81	1,235	7,115	3,284
14	60	1,209	6,378	4,082
15	74	3,504	4,700	3,328

Appendix 5: Interim DRAFT results for 15 optimized projects with all five objectives evenly weighted for the Federal (Rogue River-Siskiyou National Forest and Medford District BLM) and All-lands scenarios. For each project the treated area contributes to achieving the five underling objectives for active treatments. The highest ranked projects (1) have the highest cumulative objective value. However, project areas vary in the relative contribution of each objective to the overall objective value.

Project	Objective Function Contribution to Objective Value					Cumulative Objective Value	Mean Objective Value
	Local Fire Risk	Large Wildfire Risk	Landscape Resilience	Northern Spotted Owl	Climate Resilience		
Federal Strategy							
1	32%	10%	12%	27%	18%	977	1.47
2	26%	10%	12%	28%	23%	972	1.46
3	1%	0%	30%	36%	33%	817	1.23
4	17%	7%	14%	29%	32%	785	1.18
5	0%	0%	26%	37%	37%	767	1.15
6	11%	3%	16%	31%	39%	705	1.06
7	18%	8%	14%	26%	34%	695	1.04
8	1%	3%	18%	34%	45%	657	0.99
9	5%	3%	16%	32%	43%	637	1.01
10	1%	1%	18%	33%	47%	634	0.95
11	15%	5%	13%	27%	40%	630	0.95
12	3%	1%	21%	36%	41%	612	0.98
13	0%	1%	16%	31%	52%	609	0.91
14	8%	1%	15%	33%	42%	594	0.89
15	5%	2%	24%	23%	46%	570	0.86
All-lands Strategy							
1	49%	14%	9%	16%	12%	1102	1.66
2	41%	9%	11%	26%	14%	1040	1.56
3	42%	10%	10%	23%	14%	1035	1.55
4	46%	14%	11%	19%	10%	1003	1.51
5	41%	16%	11%	17%	16%	961	1.44
6	22%	13%	13%	32%	20%	953	1.43
7	36%	6%	14%	28%	16%	931	1.40
8	25%	10%	12%	28%	24%	888	1.33
9	29%	13%	11%	21%	25%	872	1.31
10	28%	1%	13%	32%	25%	869	1.31
11	32%	4%	13%	28%	22%	865	1.30
12	19%	5%	18%	33%	24%	851	1.28
13	25%	6%	15%	30%	24%	842	1.26
14	24%	3%	17%	30%	27%	805	1.21
15	19%	9%	14%	37%	22%	802	1.20

Appendix 6: Interim DRAFT results for 15 optimized projects with all five objectives evenly weighted for the Federal (Rogue River-Siskiyou National Forest and Medford District BLM) and All-lands scenarios. The majority of treatments occur in excess mid-closed or late-closed seral classes. Treatment of excess closed s-classes addresses ecological departure relative to the total 2.1 million acres of excess closed forest.

		Excess Closed Forests	
Project	**Acres**	**Acres Treated**	**% of Total Treated**
		Federal Strategy	
1	11,988	9,585	0.45
2	11,988	10,036	0.47
3	11,988	10,754	0.50
4	11,988	9,545	0.44
5	11,988	10,655	0.50
6	11,988	6,971	0.32
7	11,988	8,030	0.37
8	11,988	6,959	0.32
9	11,340	8,659	0.40
10	11,988	7,361	0.34
11	11,988	5,065	0.24
12	11,268	9,057	0.42
13	11,988	5,989	0.28
14	11,988	7,797	0.36
15	11,988	9,906	0.46
Total	**178,452**	**126,368**	**5.88**
		All-lands Strategy	
1	11,988	9,290	0.43
2	11,988	10,476	0.49
3	11,988	9,669	0.45
4	11,988	9,701	0.45
5	11,988	8,564	0.40
6	11,988	10,056	0.47
7	11,988	9,924	0.46
8	11,988	8,968	0.42
9	11,988	8,352	0.39
10	11,988	9,617	0.45
11	11,988	9,781	0.46
12	11,988	10,022	0.47
13	11,988	7,588	0.35
14	11,988	8,854	0.41
15	11,988	8,684	0.40
Total	**179,820**	**139,546**	**6.49**

Appendix 7: Interim DRAFT results for 15 optimized projects with all five objectives evenly weighted for the Federal (Rogue River-Siskiyou National Forest and Medford District BLM) and All-lands scenarios. Acres to treat were parsed as federal (Forest Service/BLM) or other, economically viable (economic acres), or acres requiring subsidy with restoration byproduct volume or strictly surface and ladder work needing done with insufficient restoration byproduct to support the work. Restoration byproduct volume (in board feet) was classed as economically viable if it met the density and yarding constraints articulated above.

Project	Acres	Federal Acres	Economic Acres	Subsidy Acres		Economic Volume	Volume Requiring Subsidy	Total Volume
				Merchantable	Non-merchantable			
Federal Strategy								
1	11,988	11,988	2,718	8,766	504	5,999,836	19,414,955	25,414,791
2	11,988	11,988	2,988	8,478	522	5,124,886	11,499,581	16,624,468
3	11,988	11,988	1,746	10,152	90	5,999,778	32,767,356	38,767,133
4	11,988	11,988	4,176	7,506	306	5,999,948	8,896,265	14,896,213
5	11,988	11,988	6,840	5,148	0	5,878,468	4,321,618	10,200,087
6	11,988	11,988	4,230	7,254	504	5,999,664	8,444,288	14,443,952
7	11,988	11,988	4,608	6,480	900	5,999,918	8,034,081	14,033,998
8	11,988	11,988	5,058	6,318	612	5,999,502	5,808,442	11,807,943
9	11,340	11,340	3,024	7,794	522	5,999,982	13,373,041	19,373,022
10	11,988	11,988	4,212	7,020	756	5,487,623	7,334,842	12,822,465
11	11,988	11,988	4,212	7,092	684	5,999,665	8,247,021	14,246,686
12	11,268	11,268	4,500	6,588	180	5,999,991	12,747,624	18,747,615
13	11,988	11,988	3,870	6,552	1,566	5,998,946	6,592,033	12,590,980
14	11,988	11,988	2,844	8,262	882	5,999,965	12,476,223	18,476,188
15	11,988	11,988	3,924	4,302	3,762	5,999,913	13,349,326	19,349,239
All-lands Strategy								
1	11,988	2,430	5,886	5,040	1,062	1,908,084	7,717,871	9,625,955
2	11,988	5,364	4,356	6,498	1,134	2,653,032	7,142,871	9,795,903
3	11,988	5,040	6,678	4,320	990	5,818,901	7,819,257	13,638,158
4	11,988	3,330	7,200	3,996	792	2,792,698	7,502,350	10,295,048
5	11,988	5,166	4,392	5,076	2,520	2,778,914	4,731,891	7,510,805
6	11,988	4,878	5,904	6,084	0	5,994,668	14,195,585	20,190,253
7	11,988	3,672	7,362	4,518	108	4,742,368	7,757,686	12,500,054
8	11,988	4,500	3,816	7,326	846	955,538	7,955,219	8,910,757
9	11,988	5,400	4,140	6,426	1,422	1,953,563	5,421,821	7,375,384
10	11,988	4,068	8,082	3,474	432	5,936,490	6,508,500	12,444,990
11	11,988	3,528	5,364	6,534	90	5,605,277	11,460,212	17,065,489
12	11,988	5,256	6,786	5,148	54	5,998,606	15,517,823	21,516,428
13	11,988	6,516	6,066	5,778	144	5,999,449	10,153,087	16,152,536
14	11,988	6,336	6,462	5,310	216	5,998,138	7,645,962	13,644,100
15	11,988	4,806	8,172	3,582	234	5,995,684	6,933,254	12,928,938

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 9:28 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Protect Old Forests and Clean Water in Western Oregon!

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 8:45 AM
Subject: Fwd: Protect Old Forests and Clean Water in Western Oregon!
To: BLM_OR RMPWO_Comments <blm_or_rmpwo_comments@blm.gov>

****

Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **Aaron Nelson** [redacted]
Date: Wed, Aug 19, 2015 at 4:54 PM
Subject: Protect Old Forests and Clean Water in Western Oregon!
To: BLM_OR_RMPs_WesternOregon@blm.gov

Dear BLM Planning Team:

I appreciate the opportunity to share my perspective regarding the management of public lands in western Oregon. Let me start by plainly stating that I believe the forests of western Oregon have been hit too hard by logging in the century and a half since European settlement. In the wake of the heavily destructive force of logging, we now live in an Oregon that is less habitable to innumerable native species like salmon, wolverines, and owls, due both to overall habitat loss as well as fragmentation of the habitat that remains. Also, the Oregon we see today has a far reduced capacity to sequester carbon, which is an increasingly crucial ecosystem service provided by mature forests. Our pace of logging, particularly on public land, has slowed considerably in recent decades, but we need to continue in the direction of focusing on biodiversity and ecosystem services, such as carbon sequestration and water storage, filtration, etc.

I understand that the timber industry feels entitled to logging privileges on our public lands. Let me be clear that I am not against logging on public lands outright. However, the foremost function of harvesting trees on public land should be for restoration of forest health. In other words, logging solely for profit on public lands is completely unacceptable. This type of profit is only redeemed by a few individuals while the rest of the public pays the high price of having an ugly and dysfunctional landscape to live in. Let's not forget that the large timber companies already own 20% of Oregon's forest, and they do a great disservice to us all by routinely clear cutting those places.

I would like you to act to protect stream buffers on these lands. I am disappointed that the BLM slashed stream buffers in half in nearly all the alternatives proposed in the RMP. Stream-side buffers are essential to shade waterways and keep streams cool in the hot summer months—cool, clean water is critical to salmon and for drinking water sources. Additionally, please ensure that the BLM continues to make efforts to restore stream complexity and structure to enhance water storage, given the recent shortages across the West.

The plan would allow further road construction. Instead, the BLM should use the existing road network and remove unnecessary roads. Our public forests don’t need more roads that deliver sediment into our streams, harm salmon and drinking water supplies, and provide avenues for the introduction of invasive species and pathogens such as Port Orford Cedar root rot.

We don’t need more clearcuts, instead we should focus management efforts the thousands of acres that were clearcut in the past and planted with dense young tree plantations. The BLM plan allows clearcutting under most of the alternatives.

The BLM should protect all mature and old-growth trees and forests. There is plenty of forest work that could be done that emphasizes restoration and fuels reduction around homes and communities. We don’t need to cut what little remains of our mature trees and native forests on our public lands.

I urge you to protect the opportunity for people to explore the great outdoors on public land. Recreation on BLM forests is a multi-billion dollar industry and the BLM should elevate hiking, boating, photography, bird-watching and many other forms of quiet outdoor activities.

Finally, there is research that indicates that forests of western Oregon sequester more carbon per acre than any other ecosystem in the world. Are you willing to be responsible for selling off this great resource to highest bidder merely for money? Do you realize how foolish this will appear to your children and grandchildren, who, in the not-too-distant future will undoubtably be utilizing any possible avenue to mitigate the ill-effects of an increasingly disruptive climate? Rather than proposing to log for economic stimulation, why aren't we seriously considering preserving forests and getting paid by carbon-emitters for sequestration services. This would be a win-win: forests are preserved and also produce revenue. That revenue could go towards many

things, including supporting counties who are suffering from the post logging boom depression.

Thank you for your attention to my comments. The forests and rivers managed by the BLM are essential to clean drinking water, native salmon runs and Oregon's growing recreation economy. Please take this opportunity to protect and restore our valuable public lands.

Thank you for thinking big,
Aaron Nelson

Aaron Nelson
[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Friday, August 21, 2015 1:16 PM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Public Comment on BLM Western Oregon RMPs

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 8:34 AM
Subject: Fwd: Public Comment on BLM Western Oregon RMPs
To: BLM_OR RMPWO_Comments <blm_or_rmpwo_comments@blm.gov>

****
Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **Pauline Porter** [redacted]
Date: Mon, Aug 17, 2015 at 4:14 PM
Subject: Public Comment on BLM Western Oregon RMPs
To: BLM_OR_RMPs_WesternOregon@blm.gov

There are many concerns with the draft Resource Management Plans. The agency's preferred alternative provides a sustained harvest level of just 20 percent of the forests' annual growth, while more than doubling the acreage of land set-asides. Less than 30 percent of the land would be open to timber management under the BLM's preferred plan and would result in an unequal distribution of timber and jobs throughout all districts. In addition, alternatives that lock as much as 86 percent of BLM's forests from active management will lead to further declines in forest health, and will provide our communities no relief from severe and catastrophic wildfire.

The Association of O&C Counties (AOCC) commissioned former BLM analyst Chris Cadwell to conduct a thorough analysis of the RMPs. In summary, the analysis finds the BLM has proposed a narrow series of alternatives that all fall far short of meeting the economic needs of our rural communities. Each RMP alternative also fails to comply with the federal O&C Act that requires these forests to be actively and sustainably managed to support local public services and economies. And unless the BLM develops additional alternatives the public will be unable to compare these proposals with those that would honor the O&C Act and/or allow the agency to manage these lands over a larger land base.

Rob Freres, Jr.

R Ps for estern Oregon
rea of and anagement
P.O. ox
Portland, Oregon
mail blm or rm o comments blm.go

Comments

n designation for O se in the imber o ntain area is not a ro riate.

f the ere tr l follo ing the reg lations set forth in exec ti e orders and , the BLM would recognize that "existing conditions" i.e., ma e the area ns itable for de elo ment of O se.

hose conditions incl de

he O C lands ere established ith alternate one s are mile tracts. es ite ario s sales and consolidations of tracts, the imber o ntain O C lands remain a chec er board attern of o nershi , intermixing and ri ate lands. here are er fe contig o s tracts that o ld ro ide ade ate b ffering and isolation of O acti it from ri ate lands, es eciall residential ro erties.

fter decades of st d and mis ste s, the seems rel ctant to ac no ledge the intense negati e im act of O acti it on ad acent residential ro ert . O tres ass and damage to ri ate ro ert are the most ob io s roblems. he noise oll tion of O acti it is the most er asi e roblem. O noise does not sto at the ro ert line. he has failed to ac no ledge the er range of O noise created b modified and o t of s ec e i ment. he also has failed to ac no ledge the lo le el of ambient so nds in r ral residential ro erties. Residents can hear O noise d ring an other ise eacef l ee end afternoon, creating a dissonance that onl ma es the noise oll tion e en more intr si e. he so nd of a bird fl ttering in the b shes can be a leasant ex erience. he er asi e so nd of O noise becomes a grating intr sion.

he imber o ntain area can be an ideal destination for hi ers, e estrians, bird atchers, and other forms of passive recreation. BLM's efforts since 1995 to designate the area for OHV se has recl ded an serio s consideration of enco raging assi e and en ironmentall so nd recreation. Passi e recreationists are dri en a a from O acti it beca se of the noise and safet concerns of interfacing ith O e i ment and riders. he has acknowledged the "unintended consequence" of excluding passive recreation from an OHV area b stating that the passive recreationists "will chose to go elsewhere". Any OHV area designation effecti el excludes passive recreation. BLM's objective of designating 1 , acres in the imber o ntain area for O , effecti el excl des assi e recreation. he designation also ignores the negati e conflicts ith ri ate ro ert and residential areas created b the chec erboard attern of land o nershi and the lac of b ffering and isolation of O im acts.

he sho ld create a set of rioriti ed criteria that o ld ma e an area a ro riate for O acti it . mong that criteria ill be the abilit to isolate and b ffer the O acti it from conflicts ith ad acent land and existing ses. hat one criteria sho ld be high on the list of riorities. he controls o er . million acres of land in estern Oregon. rel there are man alternati es to choose from. he imber o ntain ill be lo on the list of a ro riate areas.

Robert Kingsnorth
Central Point, Oregon

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:44 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Public Comments Draft RMP Western Oregon
Attachments: Final Maxwell Comments BLM RMP Draft 8-20-15.pdf

---------- Forwarded message ----------
From: **Shayne Maxwell** [redacted]
Date: Fri, Aug 21, 2015 at 3:14 PM
Subject: Public Comments Draft RMP Western Oregon
To: blm_or_rmpwo_comments@blm.gov

To:
RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

Please see the attached Public Comment regarding the Resource Management Plan Draft/EIS for Western Oregon.

Best Regards,

Shayne Maxwell
[redacted]

August 20, 2015

Jerome E. Perez, State Director
Washington/Oregon
RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

(also delivered electronically to: blm_or_rmpwo_comments@blm.gov)

RE: Draft RMP/Environmental Impact Statement – Western Oregon (hereinafter DRAFT PLAN)

Summary

My comments are directed to "Recreation Management" included in this BLM Draft Plan specifically the area known as Johns Peak/Timber Mt. in Southern Oregon between Grants Pass and Medford area.

While I understand the importance of having a "Management Plan" for recreation it is equally important that any plan give weight to the thousands of residents and communities, environment and wildlife it impacts. Once that data is known then steps should be taken to adjust the plan to avoid those conflicts. The opposite seems to be happening here.

Since 2003 (12 years) we have been attending meetings, submitting petitions, attending mediation, writing letters and submitting volumes of data as to why this area is not suitable for a BLM Managed Off Highway Vehicle (OHV) Emphasis Area. Every couple of years the BLM brings this ill-conceived idea back and behaves as if the prior letters, meetings, data etc. never existed. This new Draft Resource Management Plan is no different other than it is more confusing and vague than any of its previous versions.

Many in my Foots Creek Community of over 1,000 residents, including myself, have requested to be notified by BLM on any and all matters and meetings related to this subject yet we recently heard there was a recreation planning meeting held in Grants Pass a couple of months ago about this and none of us were notified. The Medford BLM publicizes its "community outreach" on their web site but makes sure not to include any of those that might oppose their agenda. Sadly this has been repeated on numerous occasions. I find it disturbing and not how I would hope my government would operate.

Introduction:

For the last 12 years the amount of prescriptive OHV trails has increased substantially in the Johns Peak/Timber Mt. area in large part due to the Medford BLM directing traffic to this area by listing it as an OHV area when there has been NO record of decision or an OHV Designation. It is listed on the BLM Web site, on their maps and in the hand out booklets at the BLM Medford Office and no doubt in others. At one point the Medford BLM was directing all OHVer's to use Foots Creek Road, Gold Hill to access this area when they knew full well there is No legal access to BLM from Foots Creek Road. This created a host of OHV – Resident conflicts, promoted trespassing over private property, property damage and created numerous illegal OHV trails that had not previously existed.

In the DRAFT Plan Introduction it states "Guidance for Development of All Action Alternatives" contains a bullet point which says, "Designate areas as open, limited, or closed to off-highway vehicle use in accordance with 43 CFR 8342.1. Develop a range of travel management area scenarios in relationship to various land use allocations and management objectives among the alternatives. Defer implementation level travel and transportation management planning until after completion of the RMP revision process. For those areas designated as limited in the RMP, define interim management objectives and clearly identify the process leading from the interim area designation of 'limited to existing roads, primitive roads and trails' to the development of a designated network of roads, primitive roads and trails, consistent with BLM Handbook 8342 – Travel and Transportation Handbook (USDI BLM 2012c)."

So now the BLM wants to connect all these new trails as a network? Does anyone at BLM see a pattern here? Additionally I have yet to get a clear definition from the BLM on what limited to existing roads, primitive roads and trails' actually means.

In the DRAFT BLM refers to significant public interest in Off Highway Vehicles (OHVs) and there are thousands of comments to BLM over the past twelve years documenting increasing conflicts between area residents and OHVs. BLM has done nothing to resolve these conflicts and has promoted OHV activity at the expense of local residents.

Rare Plants and Fungi

Under Off-highway Vehicle Use BLM again admits limits to their ability to analyze impacts from OHV use and again uses the term limited to "existing or designated roads and trails," while failing to provide information for the public as to how that term is defined.

Recreation and Visitor Services

The BLM conducted a recreation demand analysis throughout the planning area in 2013-2014." Neither I nor anyone within my community was aware of this analysis until this DRAFT. Seems odd as we are supposedly on the "BLM Notification List". Table 3-127 shows a significantly higher response rate for "Riding OHVs" than any other form of recreation, seconded by "Mountain Biking." These results differ considerably from the data in both Table 3-126 and both the actual and projected use in Table 3-136. It can be concluded from this conflicting information that BLM's public outreach efforts were targeted toward the OHV community.

BLM lands being "intermingled" with private lands, only access is mentioned, while conflict issues (trespass, noise, etc.) are notably missing. In our community sound testing we average 25-40 decibels and that is only because we could not get the birds to shut up during testing. At the core of minimizing conflicts in recreational areas, greater attention must be paid to the impacts to private, residential land intermingled with BLM lands. Many of these lands have been used for residences since the late 1800's, thus having established precedence regarding neighboring public lands.

BLM's "extrapolating from available trail miles per acre under current conditions allows an approximation for each alternative" puts the entire analysis on shaky ground. Under current conditions there are miles of user-created trails that are not appropriate in their current locations.

The statement that "there are approximately 395 miles of trails on BLM administered lands in western Oregon" indicates that BLM does not recognize these trails. Does that mean the BLM is ignorant of these user-created trails? Unlikely as we have seen BLM maps to the contrary. It also indicates that increasing trail miles in alternatives will incorporate these non-recognized user-created trails. Table 3-138 shows Medford District as having 278 miles of trails though there is no Record of Decision designating any of those that might be user-created.

Table 3-110 shows high to extremely high introduction of invasive species by OHVs in the Medford District. Since invasive species often reduce the overall viability of the landscape, introduction of OHV use fails to fulfill BLM's directive to manage public lands.

Cultural Resources

The DRAFT fails to give any analysis of local culture. In the Medford District the local culture is extremely diverse and value-based. Our community is rich with cultural treasures, one need only read the diaries of the Dragoons based out of Fort Lane to begin to understand. This document fails to take into account local cultural conditions and local residents.

Fire & Fuels

BLM lands comprise more than fifty percent of the lands in both Jackson and Josephine Counties. For the Medford District, this statement is false.

The Foots Creek Basin has one of the most comprehensive and organized fire plans of any community in Jackson County which can be verified by both Jackson and Josephine Emergency Managers and the Medford ODF. We have work diligently for over a decade to educate our residents how to be fire safe and smart, to reduce fuels and to work as a team because what affects one can affect us all. The ODF has worked with us every step of the way as have a bevy of first responder agencies. The Foots Creek and Birdseye Creek areas are designated as "Extreme Fire Hazard Areas" by the ODF and we know only too well how true that is. Opening this area to Motorized use is completely irresponsible and undermines all the hard work and efforts of not only the Foots Creek and Birdseye Communities but all the communities surrounding Johns Peak/Timber Mt.

All the signs in the world don't mean a thing and we know this first hand. Forest Capital Partners (Timber Owners) have had over 200 gates ripped out, the ODF posts no fire signs only to have them torn out and thrown into the fires. Fencing, signs and gates have no impact on these OHVers that BLM has directed to our community. Any motorized use in this area puts numerous communities and thousands of residents at serious risk. It only takes one mistake to start a catastrophic fire and this area is in more risk than most others.

Additionally it should be noted that at each location the BLM has proposed to have an OHV Access point coincidentally coincides with an area they target for fuels reduction. That is actually how we first found out about this proposed OHV agenda over 12 years ago. As pointed out to me by a Timber Harvest Manager, "when you reduce the brush (fuels) you can open yourself up to a lot of OHV users so be mindful".

Fisheries

Foots Creek, Galls Creek and Kane Creek are all listed as sensitive streams. Foots Creek is documented as having Coho Salmon and producing the largest number of Steelhead Redds annually in Jackson County by the ODFW. We are currently in the process of a water and creek improvement project in coordination with Seven Basins Watershed Council. The many feeder streams throughout our hills are vital to the health and vitality of Foots Creek and would be adversely impacted by Motorized OHV use by increasing silt that would damage the main arteries of the creek.

BLM bases analysis on current conditions without objectively analyzing whether or not current conditions are optimum to meet natural resource requirements.

The Riparian Reserve Width is primarily focused on woody debris and temperatures without accounting for wildlife, climate change or other factors. As a future-looking document, this document fails to present a rationale for maintaining current standards in the face of increasing drought cycles in the analysis area.

Hydrology

The outlined Source Water Protection relies singularly on BLM lands and fails to take a complete view that would include consideration of private lands with Source Water.

BLM's analysis and proposed Alternatives presents fixed-width figures for riparian retention, eliminating the more site-specific site tree distances now used. The use of fixed-width figures eliminates the possibility of considering unique characteristics in any harvest unit and restricts the ability to best manage streams.

Given the increasing values of water resources, BLM should also plan to identify and protect independent springs on their lands. Even small springs promise to become valuable sources of water in the future. The DRAFT discusses hydrology and riparian management based on streams and does not mention independent spring resources.

Soil Sources

"Until the BLM completes route designations through implementation level planning, the BLM cannot identify which routes would be designated in any alternative." "In this analysis, the BLM assumed that OHV users would operate vehicles consistent with BLM decisions about OHV use." This analysis fails by referencing future action and making an assumption not supported by current realities. Since the impacts to soil from OHV use are well-documented, this DRAFT fails to incorporate appropriate analysis for this topic.

Trails & Travel Management

"The BLM currently has designated a network of trails and travel management areas within the planning area to address particular concerns…" This is not true in the Medford District. Medford Resource Area Manager John Gerritsma, publicly stated that there are "no designated OHV trails" in the Medford District, despite a two-decade history of conflict concerning OHV use.

All of the alternatives state lands "would be limited to existing OHV use until the BLM completed implementation level travel planning." Thus the entire analysis of Trails and Travel Management with regard to OHV use is a de facto No Action Alternative. This is unacceptable to the public who continue to face conflicts with OHVs and is a failure of the document to present analysis required by NEPA that "a range of alternatives" should be presented.

"…recreational OHV use occurs within the existing Timber Mountain OHV area." This is a false statement. No "Timber Mountain OHV" area exists because analysis of the area has not been completed nor a Record of Decision issued. Medford District BLM continues to promote the area illegally and uses Categorical Exclusions to formalize many trails and staging areas within the proposed area. The only "designation" of a "Timber Mountain OHV area" is 41 characters in the 1995 RMP describing areas "to be managed" for OHV use. No written description was provided in that RMP nor were there any maps showing the 16,880 acres thus "designated." The public never saw a map of the area until 2006 and that map has since changed numerous times. Saying this is an "existing" area is a false statement and renders all discussion therefrom as inaccurate.

Wildlife

The Foots Creek Basin is host to a documented vast array of wildlife some being "endangered species". I found it interesting that the locations of "active nesting sites" for spotted owls as defined by BLM differed greatly in location and in number from data provided to us through a third party wildlife analysis of this area within the last 12 months. I can only conclude that the BLM data is outdated or incomplete.

Motorized recreation (OHVs) will have a direct impact on numerous forms of wildlife in our area and could also substantially increase the number of wildlife/human interaction that would put both at risk for injury or death. Residents here work closely with the Federal Wildlife Service Manager for our area to avoid conflicts and to live peacefully with wildlife whenever possible.

Additionally it will impact nesting sites for certain birds and drive game into more populated areas and ergo the predators that rely on them for food, this is just to name a few.

The 4 Options

The 4 options (A-D) are not only vague but somewhat deceptive. Example: Option A states no "new" trails will be established however it does nothing to remove the illegal trails that have been created in the last 12 years via the BLM's directing of OHV traffic to the area. It also goes a step further limiting or removing Non-motorized recreation which has been done in this basin for generations ie. Equestrian, hiking, hunting, bird watching etc.. It appears like the BLM is saying - if we can't use it for OHVs then nobody can use it.

The BLM needs to specifically show each area and what uses they specifically propose for that area and then address the impacts from that use on the surrounding residents, the creeks and feeder streams, the impacts to the environment overall, the impact to existing wildlife for that area and what sustainable funding is in place to pay for this plan as well as for any litigation costs and detailed "meaningful" enforcement of the plan. You are playing with our hard earned tax dollars and you are required to be accountable and responsible for their highest and best use.

Summary

Off-road motorized recreation areas across the checkerboard pattern of O&C lands directly impact the communities and neighbors of public lands. These impacts must be studied in any BLM planning effort. This DRAFT addresses "conflicts" primarily from the standpoint of other recreational activities. Executive Order 11644 and 43 CFR require "**Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors.**" No analysis of noise and impacts on residential (i.e., populated) lands is included in this DRAFT. The deferral of a TMP for five years and the lack of a definition for "existing roads and trails" means that the documented impact of OHV noise and other issues impacting residential lands will continue unaddressed for half the life of this RMP.

BLM listed 13 areas within the Medford District for off-road machine recreation emphasis, more than twice as many areas as any other district. Can someone please explain to me why this is so disproportionate?

BLM's change from a resource management agency to a multiple-use agency has failed to accommodate societal changes in both information quantity and information delivery systems. This DRAFT fails to analyze public information systems, relying on a formulated list of cooperating agencies. Public workshops held for this DRAFT were the same as past efforts, with small table open Q&A, but no opportunity to publicly address the whole of the issue. If the public does not know the questions being asked, the agendas being pursued, the level of information delivered to the public is so isolated and fragmented as to make any chance of consensus impossible.

BLM constantly creates very segmented information internally and presents it to the public with a strictly defined process for action. BLM fails to set up the big tent that includes and involves their full audience, the citizen-owners of the land BLM is charged with maintaining. BLM's public information record fails to be pro-active and fails to provide useful information, yet this was not addressed in the DRAFT.

For 12 years I have asked for the BLM to direct mail all the residents around the Johns Peak/Timber Mt. area that may be impacted and each time they have refused. They post meeting dates in the Medford Tribune but fail to acknowledge (ever after numerous requests) that they needed to post information in 5 different papers to reach the communities that surround this area. Being included in "Medford BLM's List of people to be informed" has proved equally ineffective. It is abundantly clear to those who live here that the Medford BLM has an agenda and neither facts nor large community opposition makes no difference at all.

I sincerely hope that this will change but that would require "cleaning house" and a new attitude that demonstrates and sincere willingness to be transparent, to listen and to work with those of us who call this area home.

Final Conclusion

We cannot choose any of your options for reasons already stated so instead we make this formal request: Please protect the Foots Creek & Birdseye Creek Basin by designating it as Non-Motorized and removing any and all use from Motorized recreational users both now and for the future and from ridge line to ridge line. We stand to lose everything we hold dear and so we have no choice but to fight to protect our homes, our quality of life and our historic and beautiful watershed. The strong opposition to BLM's OHV Motorized recreation for Johns Peak/Timber Mt. is evidenced by the binder of approx. 1,300 signatures on petitions also being submitted. Sadly, a great many that will be impacted have no idea this is happening.

Please note: we will also be submitting separately a binder that will include the petition from area residents and a map showing all those properties in opposition.

Contact Information

Shayne Maxwell
[redacted]

Sincerely,

Shayne Maxwell

Cc:

Secretary of the Interior Sally Jewell
Senator Jeff Merkley
Senator Ron Wyden
Rep. Peter DeFazio
Rep. Greg Walden

Additional copies were circulated to my community.

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:39 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Resource Management Plan

---------- Forwarded message ----------
From: [redacted]
Date: Fri, Aug 21, 2015 at 1:28 PM
Subject: Resource Management Plan
To: "blm_or_rmpwo_comments@blm.gov" <blm_or_rmpwo_comments@blm.gov>

Mark Brown

RMP Project manager

P. O. Box 2965

Portland, OR 97208

Dear Mr. Brown:

Understanding that the extension period for comments ends today, August 21, 2015, I am contacting you at the email address on the link to BLM: http://www.blm.gov/or/plans/rmpswesternoregon/comments.php.

I will also print and mail a hardcopy of my comments.

I am opposed to including any additional portion of the Rogue River into the National Wild and Scenic Rivers System.

A review of Chapter 3 – AE&EC – Wild and Scenic Rivers, pp 845-891, leads me to believe that all of the alternatives for inclusion of the segment of the Rogue River below Lost Creek Lake/Dam and extending through Jackson County and Josephine County, including the communities of Shady Cove and others to beyond Grants Pass, cannot be justified. By the language of the document itself, most of the area proposed to be included already fails to meet standard for inclusion. It is already a) privately owned, b) does not meet the "no surface occupancy" standard (top of page 846), c) are not "generally inaccessible except by trail. . .

essentially primitive and . . . vestiges of primitive America" (page 847, "**Wild river segments**"), d) are not "free of impoundments. . . [or] largely primitive and undeveloped. . ." " (page 847, "**Scenic river segments**"), e) go beyond the "**Recreational river segments**" (page 847) inasmuch as they are largely quite substantially developed both residentially and commercially.

I have owned an eight-acre parcel with 330 feet of frontage on the Rogue River in Shady Cove for nearly 25 years. On both sides of the river and up-and-down-stream there are residential and commercial properties, and of course, the community of Shady Cove itself.

The proposal under consideration is unlawful. Your process has failed in coordinating with Jackson and Josephine Counties.

Finally, to usurp my/our private property rights by imposing "Wild and Scenic River" designation is just plain unconscionable and untenable on its face. ***Developed*** properties cannot be construed to meet the definition of "Wild and Scenic River".

Thank you,

Robin Lee

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:48 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: RMP Comments
Attachments: RMP Comments 2015.docx

---------- Forwarded message ----------
From: **Erich Reeder** <[redacted]
Date: Fri, Aug 21, 2015 at 4:44 PM
Subject: RMP Comments
To: blm_or_rmpwo_comments@blm.gov

Below and attached as a separate document are my comments. Enjoy.

RMP Comments

1) **The No Action alternative of the Draft RMP/EIS is based on implementation of the original 1995 RMPs "as written," not as currently practiced, which makes comparisons of it to the Action Alternatives bogus and the entire analysis flawed.** For instance, the 1995 RMPs allows for the clearcutting of native old-growth and late-successional forests in Matrix-allocated lands to boost annual board-feet numbers, but changes since then now make such actions socially, politically, ecologically, and legally unrealistic (for example, the BLM is unlikely to be able to clearcut old-growth and late successional forests again, for one, because the 2011 USFWS Revised Recovery Plan for the Northern Spotted Owl, which in Recovery Action 32 calls for maintaining and restoring these older and more structurally complex forests across the owl's range). Therefore, analyzing the effects of a No Action alternative based on the 1995 RMPs "as written" is illogical. Rather, the BLM should responsibly revise the No Action alternative of the Draft RMP/EIS to reflect current constraints and realistic future effects of management practices under the 1995 RMPs as currently implemented.

2) **Concerning the Marbled Murrelet, the fact that "In the first decade, all alternatives would reduce the amount of high-quality nesting habitat" is troubling and inconsistent with the USFWS Marbled Murrelet Recovery Plan (1997)**, which clearly states that "The short-term actions are critical…Short term actions include: (1) maintaining occupied habitat; (2) maintaining large blocks of suitable habitat; (3) maintaining and enhancing buffer habitat; and (4) decreasing risks of loss of nesting habitat due to fire and windthrow."

To this effect, Recovery Action 3.1 of the Recovery Plan states: "Implement short-term actions to stabilize and increase the population." How so? Recovery Action 3.1.1 states: "Maintain/protect

occupied nesting habitat and minimize loss of unoccupied but suitable nesting habitat." Therefore, the RMP/EIS proposal to "reduce the amount of high-quality nesting habitat," in the short-term in all alternatives is directly in conflict with this Recovery Action.

Furthermore, the BLM policy does not currently allow for the destruction of occupied or high-quality nesting habitat, and so the statement that "all alternatives," including the No Action alternative, "would reduce the amount of high-quality nesting habitat" is false (see Comment 1 above).

Moreover, the statement that "there is no basis on which to conclude the temporary loss of 1-4 percent of available nesting habitat crosses a threshold" and that "…it seems unlikely that the loss…would lead to a catastrophic population collapse," suggests that the BLM is less concerned with acting responsibly and in good faith with regard to the Recovery Plan, than it is to avoiding some indefinite threshold that would doom the species to extinction.

3) **Concerning the Marbled Murrelet, the RMP/EIS proposal to eliminate or reduce survey efforts conflicts with Recovery Action 4.1.6 to: "Survey potential breeding habitat to identify potential nesting areas."** The RMP/EIS itself acknowledges that "The loss of future occupied sites through the lack of surveys or cessation of protection on known sites would adversely affect the marbled murrelet," yet it still proposes to reduce or eliminate surveys of nesting habitat in three of the five alternatives.

4) **Concerning the Marbled Murrelet, the proposal to reduce or eliminate surveys leading to the "loss" of up to 20% of future marbled murrelet sites "as a result of timber harvest in the Harvest Land Base…over a 50 year period," is in conflict with Recovery Action 3.2.1.2, to: "Protect 'recruitment' nesting habitat to buffer and enlarge existing stands, reduce fragmentation, and provide replacement habitat for current suitable nesting habitat lost to disturbance events."**

Furthermore, the RMP/EIS states "there is no basis on which to conclude whether the number of occupied sites lost under Alternative A, B, or C crosses a threshold, resulting in substantial changes to the marbled murrelet population." Just so, there is also no basis on which to conclude otherwise, and that the deliberate elimination of 96, 12, or 210 future occupied sites "lost" under the Alternatives A, B, or C does not cross a threshold. Considering that currently "there are 321 known, occupied marbled murrelet nesting sites on BLM-administered land," it is certainly logical to conclude that it will have some adverse effects on the recovery of the marbled murrelet. To this concern, the RMP/EIS offers somewhat wistfully, "…it is unknown if there is a critical threshold number of occupied sites on the landscape necessary to sustain marbled murrelet populations."

5) Despite the scientific consensus affirming ongoing climate change, the vegetation modeling used in the Draft RMP/EIS assumes the climate will remain constant in the future. This assumption undermines the legitimacy of the vegetation modeling analysis.

Sincerely,

Erich Reeder

August 21, 2015

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:53 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: RMP for Western Oregon Comments

---------- Forwarded message ----------
From: **Jerry Malloy** [redacted]
Date: Fri, Aug 21, 2015 at 7:53 PM
Subject: RMP for Western Oregon Comments
To: blm_or_rmpwo_comments@blm.gov

General Comments:

- Need for new RMP is clear, I'm mostly concerned about the priority order hierarchy of the goals. While a sustainable revenue source from resource extraction is required by the O&C Act, more recent laws (ESA, CWA) should override that where there is conflict as they more represent the current public sentiment and values.
    - Habitat protection in support of the ESA should be the top priority as erring here can result in irreversible consequences
    - Next is adhering to the CWA which should also be measured by more than just sediment delivery.
    - Providing a sustained yield of timber revenue to the communities should be last and where possible be generated through processes that are as low impact as practical
        - e.g. minimize clearcutting and prioritize thinning for fire resiliency
        - The ASQ should be determined by what is left after satisfying the needs of the first two priorities.
    - Recreation is important but should be a result of the previous priorities, so long as public access to trails, rivers, etc. is assured.
        - Where there is some chance of an area being eligible for wilderness designation, it should be treated as such by default
    - Old growth is not legislatively protected (yet) but is also a vanishing treasure that deserves protection with conservative definition (i.e. 80 year old threshold not 120)

Some Specific Comments:

- Riparian – I prefer keeping the current RMP standard of 2SPTH on fish bearing streams (1SPTH on non-fish bearing) with a 120 foot inner no-thin zone.
    - I understand the study showed little difference in sediment added under the other alternatives but am of the opinion that the riparian zones support many non-aquatic species and retaining this buffer is valuable.
- Harvest methods – it is important (to me) to not hand over significant public lands to become monocultural tree farms
    - Minimize clear cuts

Thanks for the opportunity to contribute to this planning process.

Jerry Malloy

Jasmine Benjamin

From: fpaulete@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Saturday, August 22, 2015 11:24 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: RMPs for Western Oregon
Attachments: RMP More Alternatives.docx

---------- Forwarded message ----------
From: **RMPs_WesternOregon, BLM_OR** <blm_or_rmps_westernoregon@blm.gov>
Date: Fri, Aug 21, 2015 at 9:06 AM
Subject: Fwd: RMPs for Western Oregon
To: BLM_OR RMPWO_Comments <blm_or_rmpwo_comments@blm.gov>

****
Resource Management Plans for Western Oregon
Bureau of Land Management
web: www.blm.gov/or/plans/rmpswesternoregon

FACEBOOK: www.facebook.com/blmoregon
YOUTUBE: www.youtube.com/user/blmoregon
FLICKR: www.flickr.com/photos/blmoregon
TWITTER: www.twitter.com/blmoregon

Before including address, phone number, email-address, or any other personal identifying information in your comments, be advised that your entire comment, including personal identifying information, may be made publicly available at any time. If you wish us to withhold your personal information you must state this prominently at the beginning of your comment. While individuals may request that the BLM withhold personal identifying information from public view, the BLM cannot guarantee it will be able to do so.

You have received this email because you have previously submitted a request to be on the mailing list, stakeholder list, submitted a comment, feedback or survey response and/or indicated interest in the RMPs for Western Oregon.

---------- Forwarded message ----------
From: **Helen Scott** <[redacted]
Date: Thu, Aug 20, 2015 at 4:42 PM
Subject: RMPs for Western Oregon
To: BLM_OR_RMPs_WesternOregon@blm.gov

Cc: Helen Scott <[redacted]

Attached is my testimony for more Alternatives for the RMP and miscellaneous comments.

Helen Scott

[redacted]

[redacted]

8/20/15

This email has been checked for viruses by Avast antivirus software.
www.avast.com

BLM_OR_RMPs_WesternOregon@blm.gov

RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

From: Helen Scott
[redacted]

This is my testimony in strong support of more land use allocations for timber harvest acreages Alternatives for the RMP. I have included other miscellaneous comments.

The 1937 Oregon and California Act has requirements for sustained yield forestry. You need more Alternatives to take these requirements into account.

In the Summary, pp. xxviii to xxxiii, there is little mention of the O&C Act other than the dollar distribution formula. The BLM is negligent on providing a through discussion and evaluation of the requirements of the Act. On page xxiii the Summary states that the purpose of the RMP revision is to "Provide a sustained yield of timber." Yet, you have not done that, or made it possible in the Alternatives. You need to add Alternatives to make a greater timber volume harvest, not just a small tree harvest acreage. You need to reduce your proposed "locked-up acreages."

The barred owl, an introduced species, is a problem to the spotted owl. Barred owls kill spotted owls. For some years it was not politically correct to kill barred owls. But now, after withdrawing much timbered acreage from logging, and saving acreage and its products for the spotted owls, the BLM has killed a few barred owls, but is still failing in spotted owl recovery. It is interesting on page xxxi that "the BLM has no opportunity through habitat management in the Coast Range to reduce risks to the northern spotted owl during the next 50 years". The BLM needs to spend money and work with diligence on a killing "opportunity" to better manage the barred owl. Then there would be more spotted owls and more timbered acreage available for harvest.

It is interesting to note the small amount of publicity given to the communities in each of the Districts regarding the RMP. The Medford district had a discussion meeting in Medford and a show without a tell meeting in Grants Pass on the

rivers and recreation issues. If you knew enough to ask a question you might or might not get an answer. I was not able to get answers on the location of certain colored areas of maps that had withdrawal of motorcycle use. I still don't know the answer to my question.

In my previous testimony on the non-suitability of the Rogue River for inclusion into the federal Wild and Scenic Rivers System, I initially had difficulty in obtaining the RMP book for SW Oregon Rivers. When I gave my book to a county government I could not get a replacement book in Medford or Grants Pass. I called Portland and a book was found and shipped to me. This lack of sensible publicity and necessary written material to research in order to understand the issues is troubling. Even a city councilor in Grants Pass knew nothing about the River Issues on August 19th, just days before the deadline to comment. Your lack of significant involvement in the communities with riparian properties is not good. I know the BLM has communicated with some individuals such as myself, but the employees were not very knowledgeable about the issues. However, they were very willing to do research on issues where they could.

On page xxxiii it is stated that the BLM has met with individual county commissioners on an ongoing basis to provide updates on progress and key milestones. I don't believe this is necessarily true from conversations I have had with commissioners.

My next comment, regarding the Wild and Scenic Waterway System, is on Public Law 93-279 (May 10, 1974). The section 4(a) was revised to require "all studies to be transmitted to the President and from the President to Congress regardless of the finding." Would not the Wild and Scenic River proposed finding of suitability for inclusion into the System Act be a "study" of suitability? And, therefore would not the suitability be transmitted to the President first and not the Congress first?

In conclusion, please extend your comment period so you can reach more citizens and municipalities with your RMPs.

Thank you for this opportunity to testify,

Helen Scott

United States Department of the Interior
Bureau of Land Management - Oregon & Washington
120 SW 3rd Avenue
Portland, OR 97204
Comments on Draft RMP/EIS Western Oregon

I am enclosing a Paper Prepared for the United States House of Representatives Subcommittee on National Parks, Forests and Public Lands. The enclosed Paper relates to a Proto-Type Stream Restoration Project, located in Ashland Creek, within Lithia Park, Ashland, Oregon, a Tributary of Bear Creek, that then flows into the Rogue River. The Prototype Demonstration Project consists of 355 Restored Stone-Boulder Cascades, a distance of one mile, that I built, restored, and have maintained as a Prototype Stream Restoration Project for that Subcommmittee of the United States House of Representatives.

United States Department of Interior, Bureau of Land Management is Welcome to Accept the Project as your own Prototype Stream Restoration Demonstration Project.

Accepted in its entirety, the Paper would represent Comments, in detail, upon the following Pages of Draft RMP/EIS:
Summary Page XXIII re: "sustained yield capacity of timber" The U.S. Departments of Interior, and Agriculture cannot maintain a sustained yield of timber capacity if you DO NOT RESTORE ALL WATER TABLES OF A REGION. There is not one Page in the 1500 Pages of the 4 Volumes of the Draft RMP/EIS, that even mentions, in passing, any Restoration of Water Tables of the Region. Should you return to your Source Documents, from which you drew up the 4 Volume Draft RMP/EIS, you will discover the SAME Absence. The entire ~~Sujeot~~ Subject has been dropped from Government Literature.

The Source of the Problem lays in the present Teaching of Geology. The meaning of olde English Words was dropped from the Teaching of High School and University Courses around 1910. It is no longer Taught that the Past Tense of Draught of Logs down a Stream, pushing aside all Boulder Cascades, thereby breaking the Water Tables, is Drought.
Therefore, the Meaning of Drought, a Past Tense Verb, Broken Water Tables, Resulting in Declining Water Tables, Has Been Lost.

If the United States Government, through the U.S. Department of the Interior, and the U.S. Department of Agriculture , Returns to the Correct Definition of Drought, Taught during the Administration of President Theodore Roosevelt, Drought: Past Tense Verb, (from the Present Tense Verb, Draught of Logs down a Steam Bed), Meaning: Broken Water Tables and, therefore, Declining Water Tables, the United States Government, through the U.S. Department of Interior, U.S. Department of Agriculture, U.S .Department of Transportation, and, Internationally, through the U.S. Department of State, would be able to eliminate the Verbal Condition of Drought, from any Region of the United States of America, IN ONE YEAR, BY RESTORING THE STONE BOULDER CASCADES OF THE DROUGHT AFFECTED STREAMS OF A REGION.

Your Departments of Government would not be using ANY WOODY DEBRIS. In the event of a Rain Event amounting to 3 inches to 5 inches of Rain in a 24 Hour Period, All Woody Debris located in a Stream Bed, floats and is carried down Stream, Resulting in Flooding. The transported Woody Debris, in the Flood Waters, breaks Stone Boulder Cascades, putting the Region, immediately back into the, By Definition,

Verbal Condition of Drought, broken Water Tables, and therefore, Declining Water Tables.

Flood -Drought -

Flood -Drought -Flood -Drought -Flood -Drought -Flood - Drought Syndrome.

Woody Debris in Streams, always Degrades Anaerobically, Producing Ketones, Aldehydes, and Methanols, all Deadly Chemicals, Toxic to Salmon Juvenile Salmonides.

Salmon feed upon organisms that have as their ultimate food Sources, Water borne, leafy materials, not woody materials. All that feed upon woody debris are Anaerobic Bacteria, violating the intention of the Clean Water Act.

As you are fully aware, the greatest danger of Catastrophic Forest Fires, occurs during times of Very Low Local Humidity. Such Catastrophic Events Destroy the Possibility of Sustained Yield of Timber Harvests. My Prototype Boulder Cascade Stream Restoration

Demonstration Project (enclosed), with zero large woody debris imput, raises the local relative humidity on a daily basis.

Comment on Page 149: Streamflow and Temperature

The Draft RMP/EIS does not even begin to explain the causation cold stream temperatures. At each Restored Boulder Cascade, surrounding air flow is pulled beneath each resulting waterfalls. This Super-Oxygenates the stream waters, and Super-Saturates the immersed air. The captive air then escapes from the stream water, (escape seen as white bubbles coming out of the stream) carrying 585 Calories/Gram of Heat out of the stream waters, Chilling the stream waters at each Restored Cascade. Therefore, the more Cascades that the U.S. Department of the Interior Restores in each stream under their Jurisdiction, the Colder the streams become. ---Comment on Page 232 "cold water protection criteria" ---

---Comment on Page 290 -- "controlling stream temperature' --Since the Draft RMP/EIS does not even mention this essential mechanism of removing 585 Calories/Gram of Heat from streams with every Gram of Super-Saturated Air escaping from the stream water at each Restored Boulder Cascade, it seems obvious ~~the~~ none of the Contributors to the Draft RMP/EIS, including Academic Contributors, have even bothered to think about this Basic Scientific Basis of Stream Water Cooling Mechanisms. This Report: Draft RMP/EIS is coming out of the U.S. Department of the Interior!!

Think about the same Academic Material coming out of the U.S. Department of Agriculture and your Department will begin to discern a very long term trend of Academic Nonsense being served up to your Departments of the U.S. Government by University Sources nationwide.

The moisture saturated air then continuously rises from the Restored Cascades and forms a Nascent Upper Level Low over the local Cascade Mountain Terrain. Because the local Topology is an Extinct Volcano, the Northern Rim of the Pacific Crest, the Cascades sourced Moisture remains in the local region, on a daily basis, flowing continuously Counter-Clockwise, appearing at Dew Point, as locally Sourced Clouds. This locally Sourced Relative Humidity, daily, and weekly, raises the locally Sourced Relative Humidity, thereby reducing the chances for the Occurrance of a Catastrophic Wildfire.

Comment on Page 156: Steamflow and Temperature

The Restored Cascades of the Prototype Stream Restoration Demonstration Project results in 355 pools of chilled, moving water, each storing granitic sourced sands available for spawning beds.

The U.S. Department of the Interior now has available as a Reference, the enclosed Paper, previously submitted to the U.S. House of Representatives, Subcommittee on National Parks, Forests and Public Lands.

For the Purposes of Comments on Draft RMP/EIS, it is intended as Background Material:

concerning the Prototype Stream Restoration Demonstration Project submitted to the U.S. Department of the Interior, Bureau of Land Management, as a Jobs Ready, Prototype Project, that serves as a Working Model/ Comment on Draft RMP/EIS Western Oregon.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

[redacted]

June 24, 2015

Members of the
Subcommittee on National Parks, Forests and Public Lands
1333 Longworth House Office Building
(202) 226-7736 Fax: (202) 226-2301

Mr. Raúl M. Grijalva, Arizona, Chairman
Mr. Rob Bishop, Utah, Ranking Republican Member

Dale E. Kildee, Michigan
Neil Abercrombie, Hawaii
Grace F. Napolitano, California
Rush D. Holt, New Jersey
Madeleine Z. Bordallo, Guam
Dan Boren, Oklahoma
Martin Heinrich, New Mexico
Peter A. DeFazio, Orefgon
Maurice D. Hinchey, New York
Donna M. Christensen, Virgin Islands
Diana DeGette, Colorado
Ron Kind, Wisconsin
Lois Capps, California
Jay Inslee, Washington
Stephanie Herseth Sandlin, South Dakota
John P. Sarbanes, Maryland
Carol Shea-Porter, New Hampshire
Niki Tsongas, Massachusetts
Pedro R. Pierluisi, Puerto Rico
Nick J. Rahall, II, West Virginia (ex officio)

Don Young, Alaska
Elton Gallegly, California
John J. Duncan, Tennessee
Jeff Flake, Arizona
Henry E. Brown, Jr., South Carolina
Louie Gohmert, Texas
Bill Shuster, Pennsylvania
Robert J. Wittman, Virginia
Paul C. Broun, Georgia
Mike Coffman, Colorado
Jason Chaffetz, Utah
Cynthia M. Lummis, Wyoming
Tom McClintock, California
Doc Hastings, Washington (ex officio)

Terrence C. Stenson
[redacted]

U.S. Department of the Interior
U.S. Bureau of Land Management
Field Office Manager
190 March Rd.
Yakima, WA 988091-2058

Sir:

One of your Representatives, W. Scott Willey, of the Bureau of Reclamation made a brief Presentation concerning your intentions, over the next eight years, toward Bear Creek and its tributaries, Jackson County Oregon, to enhance fish passage, lower water temperatures, and reduce stream turbidity, to City of Ashland, Ashland Parks and Recreation Commission, on November, 2012.

With the permission of City of Ashland, City Council, and Parks Commission, beginning in 2003, with completion in 2004, and maintenance from that time, now eight years, I constructed and maintained, a series of 355 stone-boulder Cascades, in Ashland Creek, from the top of Lithia Park, Ashland, Oregon, to Hershey Street, and beyond, a distance of about one mile.

Their purpose was to set in place a Prototype Stream Restoration Demonstration Project for the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands. Some Members of the Subcommittee received the Report Paper in 2007, and all 30 Members of the Subcommittee received the Complete Report Paper, in 2009. I am planning to re-introduce the Report Paper to the same Subcommittee in 2013.

The Demonstration Project, one mile in length, visually shows, by Scientific Definition, what a Mountain Stream, OUT OF DROUGHT, all water tables correctly Restored and Properly Maintained, using the correct materials, insitu, rocks and boulders, looks like.

Drought is a Past-Tense Verb, the Past Tense of Draught (of logs down a stream bed toward a mill), thereby breaking all stone-boulder water tables, also known as Cascades, in the Stream, and leaving the Stream, by definition, with broken water tables (broken Cascades), and therefore, declining water tables, the Definition of Drought.

Olde English has not been spoken, nor studied, since circa 1912, in any high school or University curriculum. That is the time of Theodore Roosevelt, without whom, there would be no National Forests, National Parks, nor Public Lands.

I have a Bachelor of Science in Pure Science, Major Chemistry, and 55 hours beyond, in Geology, and Archeology. Geology, as a field of study, fully split from Chemistry, at the same time that McGuffy's Readers, teaching Olde English, were discarded from Secondary Schools, and from University Curriculum.
Therefore, the correct meaning of DROUGHT, a Past-Tense Verb, meaning broken water tables, and, therefore, declining water tables, has been lost from intelligent Conversation, for appoximately one hundred years.

Ord, Ora are Greek Words meaning Cloud, Clouds. The Steps of the Ord, in a local region , are the Water Tables (Boulder-Cascades) of the local Stream. The Water-Table Steps of the Stream are the Steps of the Ord. Descending from the Greek Civilization, the French Culture referred to Ord, Ora, as Le Ord. Hence, flows the Admonition (from Latin: Admonere: "To be warned"--"Builded up the Steps of Le Ord, Ord, Ora, and Maintain the Steps of Le Ord, or Le Ord will be Displeased and will Lift Up, Drawing away , and the Region will go onto the Fires". So it is not like the current Idiot Civilization has not been warned for a long, long time about the consequences of refusing to maintain the Water-Tables, or Water-Tablets, the Stone Tablets. When the Water Tables of a Region are Broken, by Draught of logs down stream beds, then the Local Clouds will go higher and higher, due to less and less locally sourced moisture, yielding less and less Precipitation upoon local hills and local mountains, until the Region begins to Desertify.

When a Civilization begins to Teach that Drought is a Condition, rather than a Past-Tense Verb, there are Consequences.

Admoneo -"I warn you"; Terre - "Be Afraid, Be Frightened"

The Proto-Type Stream Restoration Demonstration Project accomplishes the following goals:

1) reduces stream turbidity

2) reduces anaerobic Bacteria (re: clearly stated intent of Clean Water Act) by Super-Oxygenation of the Stream waters at each Boulder-Cascade,

3)lowers Water Temperatures by causing air to be introduced into the flowing Stream waters at each Cascade, resulting in localized Super-Saturation, with immediate Water Temperature decline, as the Super-Saturated Air leaves the Stream waters, seen as white bubbles coming to the Stream Surface and bursting,

4) due to the Topology of the Region, the rim of an extinct volcano, the northern rim of the Pacific Crest, with average height above Sea Level of 5555 Feet Elevation, local air saturated at each of the 355 stone-boulder Cascades Restored, Re-Appears at Dew Point Temperatures, as locally sourced Clouds, Before the Locally Rehumidified Air can Attain 5555 Feet Elevation.

That is, Dew-Point Effect Clouds, resulting from the 355 Restored Boulder Cascades, appear almost Daily, before they can leave the Local Region, resulting in increased Localized Precipitation upon the Local Mountains. This results in a Counter-Clockwise Rotation in the Local Atmosphere. This becomes a Localized Weather Phenomena, The Counter-Clockwise Rotation in the Local Atmosphere, due to the appearance of the Dew Point Effect Clouds, slowly leaves the local Region when it reaches approximately 6000 Feet Elevation, becoming, in Effect, and in fact, a Nascent Upper Level Low.

There are 55 miles of Streams and Tributaries in the Bear Creek Watershed. My Prototype Stream Restoration Demonstration Project is the only portion, one mile, of the Bear Creek Watershed, Out of Drought, by Definition.

Since the Proposed entire U.S. House of Representatives Legislative Proposal: $3.5 million/year fior ten years, Stream Restoration Project, would presumably go directly to U.S. Department of the Interior, U.S. Bureau of Reclamation, since your Office seems to be in charge of such Stream Restorations, I trust that your Office will recognize the total Labor involved in causing such a Demonstration Project to exist, and to be properly maintained, and will not be interested in its destruction, through the implantation of logs and large woody debris directly into Ashland Creek, within the Project, nor above the Project, within Ashland Creek.

The Prototype Stream Restoration Demonstration Project is intended to demonstrate to the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands, that, by enacting the Proposed Theodore Roosevelt Memorial Act, $3.5 million/year for ten years, that Drought being a Past-Tense Verb, rather than a Condition, can be Eradicated from any Region of the Nation, in one year, simply by Restoring Stone-Boulder Cascades to every local Stream of a Region, thereby, Restoring All Local Water Tables in such Creeks and Streams. With the first rains following such Restoration Activities, via Backhoes and 3 Person Teams, the Local Drought Conditions would, by Definition, be over.

Your Team will be in Ashland, Oregon, doing your Surveys, in March, 2013.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

[redacted]

December 20, 2012

Western Oregon Bureau of Land Management
BLM State Director
P.O. Box 2965
Portland, Oregon 97208
Attention: New Planning Process
Subject: Initial Public Comments: Riparian Restorations
Sir:

I am enclosing a Copy of a Demonstration Project, Riparian Resources Restoration, which has been at the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands for Five Years, as a Proposal.

The Demonstation Project, Riparian Resources Restoration, includes 355 stone-boulder Cascades (Water Tables) Restored, One Mile of Ashland Creek, within Lithia Park, Ashland, Oregon, Approximately 170 Feet in Vertical Elevation, Total, of Water Table stone boulder Cascades Restored.

Drought is the Past-Tense Verb, of Draught (of logs down a stream bed to mill), the Action of Breaking Water Tables, stone-boulder Cascades, and, therefore, Causing Water Tables to Decline. The Activity of Draught of logs down a stream bed, to a loading area for lumber mills, Causes the Past-Tense Verb, Drought, to Exist. When Water Tables of a Stream in a Region are Broken, Water Tables of the Region Decline, Resulting in All Passing Weather Systems going higher and higher in Altitude, due to the lack of local humidity imput into the System, until passing cloud systems no longer contribute Moisture to the Region, and the Region becomes Desertified.

When Water Tables Decline, Rock Layers Dry Out, and, therefore, loose the ability to Store Electrical Charge. The Result is Cloud Formatiom over the Region Diminishes, since it is based upon Electrical Charge (Pure Chemistry Certainty). No Electrical Charge Stored in Dried Out Rock Layers Results in No Ability for the Local Region to Form Clouds, which are based upon Electrical Charge. You Allow the "Rock Layer Battery" to Dry Out, causing a "Dead Rock Layer Battery", then Clouds can no longer Form over the Region. The Region then Desertifies, begins to turn into a desert.

If you, BLM State Director, have patiently stayed with the Explanation for the Prototype Demonstration Project, Riparian Resources Restoration, then you are in the Rare Position of Pondering Immediate Real Solutions.

The Jobs Ready Proposal would Put 45 Persons, and 15 Backhoes to immediate Use, Restoring 55 Miles of Creek and Stream Water Tables, stone-boulder Cascades, within the Ashland Creek, Bear Creek Watersheds, including the Cascade Siskiyou National Monument, in a Single Year, a Prototype Riparian Resources Restoration Project for the the U.S. Bureau of Land Management.

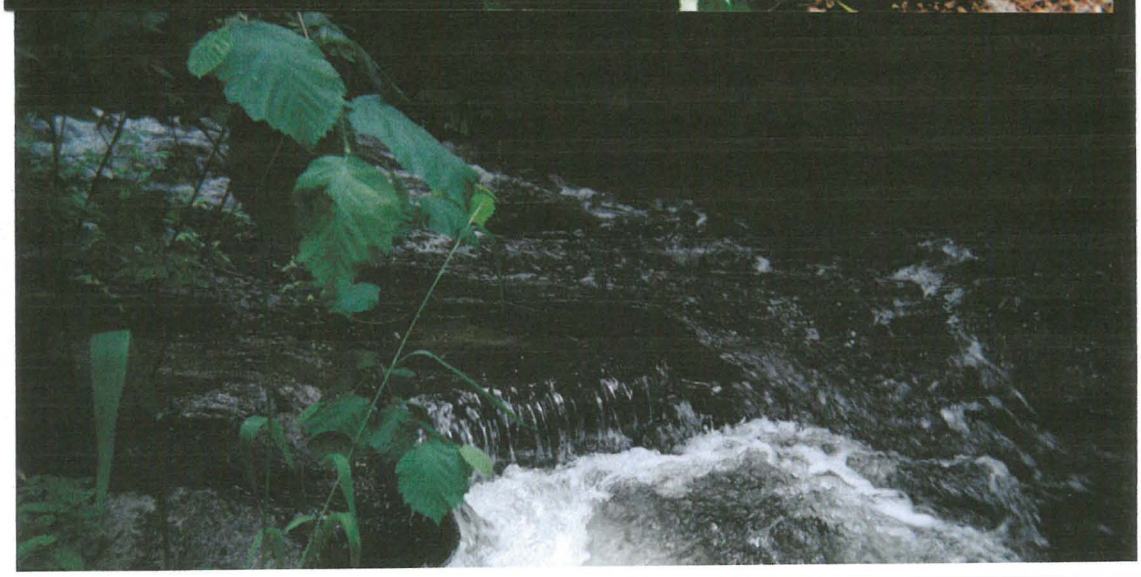
Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

[redacted]

29 June 2012



Notice of Appeal

Appeal Deciding Officer: Regional Forester

Pacific Northwest Region, USDA Forest Service

Attn.: 1570 Appeals

Sir:

The Demonstration Project: Reparian Resources Restoration, 355 Water Table Cascades Restored, One Mile of Ashland Creek, Approximately 170 Feet, Total Vertical Elevation of Water Table Cascades Restored, was disregarded by your Forest Supervisor, Scott Conroy, during the seven years, that I have Restored and Maintained the Demonstration Project, and reported progress on the Project to the USDA Forest Service.

Drought is the Past-Tense Verb, of Draught (of logs down a Steam bed to the mill), the action of Breaking stone boulder Cascades, Water Tables, and, therefore, Causing the Water Tables to Decline, the Definition of Drought.

When you break the stone-boulder Cascades, the Water Tables of a Stream, the Water Tables Decline, Resulting in All Cloud Systems Passing Over the Region going higher and higher, due to lack of local imput of Humidity into the System, until they finally Dissipate and the Region begins to Desertify (turns to Desert). When Water Tables Decline, underlying Rock Layers Dry Out, and Therefore, Loose the Ability to Store Electrical Charge. The Result is Cloud Formation over the Region Diminishes, Since the Cloud Formation is based upon Electrical Charge, Pure Chemistry Certainty. No Electrical Charge Stored in the Dried Out Rock Layers Results in No Ability for the Region to Form Clouds. No Cloud Formation leads to Extremely Low Humidity which Results in the Strong Probability of Catastrophic Wild Fires.

You Allow the Rock Layer Battery to Dry Out, Causing a "Dead Rock Layer Battery", then Clouds can no longer Form over the Region. The Region then begins to Desertify (turns to Desert), Pure Chemistry Certainty. (Any Asian Rice Farmer Knows this Simple Chemical Principal of Cloud Formation. When the Rice is Ripe, they drain their rice paddies, causing the clouds (the cloud dragons) to rise above the Region, bringing on a "dry season" to allow for harvesting the rice and drying the rice.) Wake up, USDA, Wake Up, Forest Service!!! You are Asleep at the Helm, Listening to Endless City-Sourced Academic Drivel and Nonsense about Global Warming caused Directly by U.S. Government Refusal to Maintain any

Water Tables across an entire Continent. President Eisenhower, the Department of Defense, and Academic Sources across the entire USA were concerned that a Nuclear War would lead to Radioactive Ground Waters, therefore, the Government embarked upon a Nationwide Campaign to break all Water Tables of all Streams across the Continent. Rain Water was already up to 200 Millirentgen/hour from Atmospheric Tests (5 rentgens/hour would result in 1/3 Population Decline within 5 years). That generation has passed, leaving a new generation of geniuses in charge. If you are curious about the Symptoms of Radiation Disease, you can research Japanese Literature concerning all of Agricultural Lands from 66 miles Northeast of Tokyo to 33 miles Northeast of Tokyo no longer (ever) being available for food production due to 5 nuclear power plants melting down.

Three Decades of Stratospheric Cloud Dissipation, and Resultant Stratospheric Lightning Dissipation, the true Source of the Stratospheric Ozone Layer has resulted in three Decades of 6% Ozone Layer Depletion, per Decade, 6% + 6% + 6% Ozone Layer Depletion, resulting directly from U.S. Government Policy of Breaking the Water Tables of All Creeks and ALL Streams that may Cause Morning Ground Fog to Occur upon U.S. Federal, and State, and Local Highways (ALL STREAMS MAY CAUSE GROUND FOG TO OCCUR WHEN DUE POINT TEMPERATURES OCCUR), and USDA Policy of Draining all Hillside Areas and Wet Areas to Promote Earlier Planting Schedules, Extending Agricultural Seasons. Apparently, the Chemistry Teaching that Ground Fog disappears and then Reappears as Cumulus Clouds, again disappearing and Reappearing as Stratospheric Clouds, has been lost by the USDA, the U.S. Department of Transportation, and the U.S. Department of the Interior, as well as all those Academics of the University Systems that go on and on, bla bla bla bla, about Global Warming. Orographic Lifting as a Cloud building Mechanism does not rate in importance, compared to all of their hot air updrafts.

Sincerely Yours,

Terrence C. Stenson

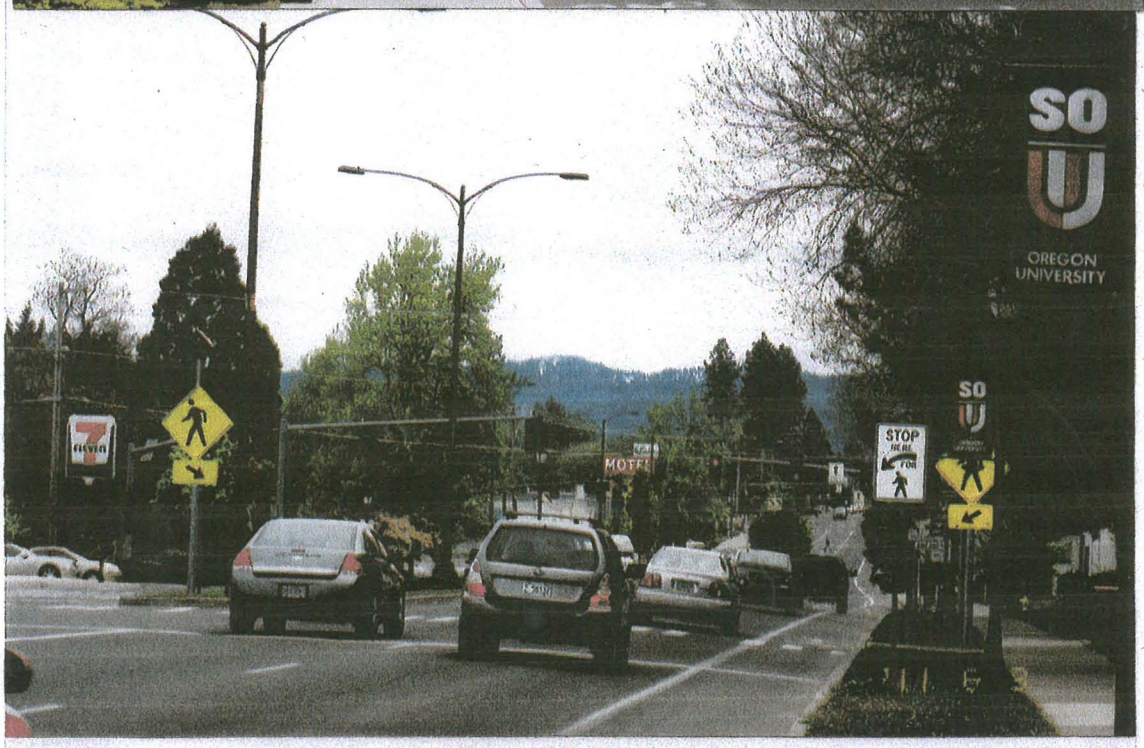
Terrence C. Stenson

[redacted]

July 4, 2011

Direct Result of My Demonstration Project: Reparian Resources Restoration

SNOW LEVEL at 4444 Feet above Sea Level 3 June 2011



Southern Oregon University

Siskiyou Boulevard, Ashland, Oregon

Terrence C. Stenson
[redacted]

Gail Kimbell
U.S. Forest Service
1400 Independence Ave. SW
20250-0003

Dear Gail Kimbell:

The enclosed "jobs ready" -45 persons- Proposal has been with 30 Members of the Subcommittee on National Parks, Forests, and Public Lands (third year of Consideration) since the first week of February 2009.

Should the Subcommittee manage to get the Proposal signed into Law by President Obama, by early July 2009, as the Theodore Roosevelt Memorial Act (26th President 1901-1909), Reparian Resources Restoration, Prototype Demonstation Project, (location: Cascade Siskiyou National Monument and Ashland Creek - Bear Creek Watershed), the 45 persons will be able to start work in July , 2009. They will have completed 60 miles of Stream Restoration by October 2009.

The Forest Service has completed their Final Environmental Impact Statement, 650 pages, with all of their Intended Actions through 2020 A.D Ashland Forest Resiliency, for the Siskiyou Mountains Ranger District, Rogue River - Siskiyou National Forest, Jackson County, Oregon.

NOT ONE SINGLE STREAM RESTORATION PROJECT IS INCLUDED.

The Forest Service States in their final Impact Statement, that although the Enclosed Stream Restoration Project is Valued, the Forest Service IS NOT ALLOWED to Consider, Analyze, NOR PROCEED to the EXPANSION of any Prototype Stream REstoration Project, AS CONGRESS DID NOT ALLOW FOR ANY STREAMS RESTORATION PROJECTS UNDER THE HEALTHY FORESTS RESTORATION ACT OF2003.

Olde English: you have the DRAUGHT of logs down a stream, THEN the stream is in the Condition called DROUGHT. The Definition of Drought is Broken Water Tables in all Streams of a Region, and, THEREFORE, DECLINING WATER TABLES.

The ONLY WAY OUT OF DROUGHT, BY DEFINITION, IS Restoration of ALL Water Tables of all Streams of the Drought-Stricken Region. Once All Water Tables of All Streams of the Drought-Stricken Region are RESTORED, to the Condition existing Prior to the Draught of logs down the Affected Streams, THEN All Localized Dew Point Effect Clouds will begin to reappear over the Region.

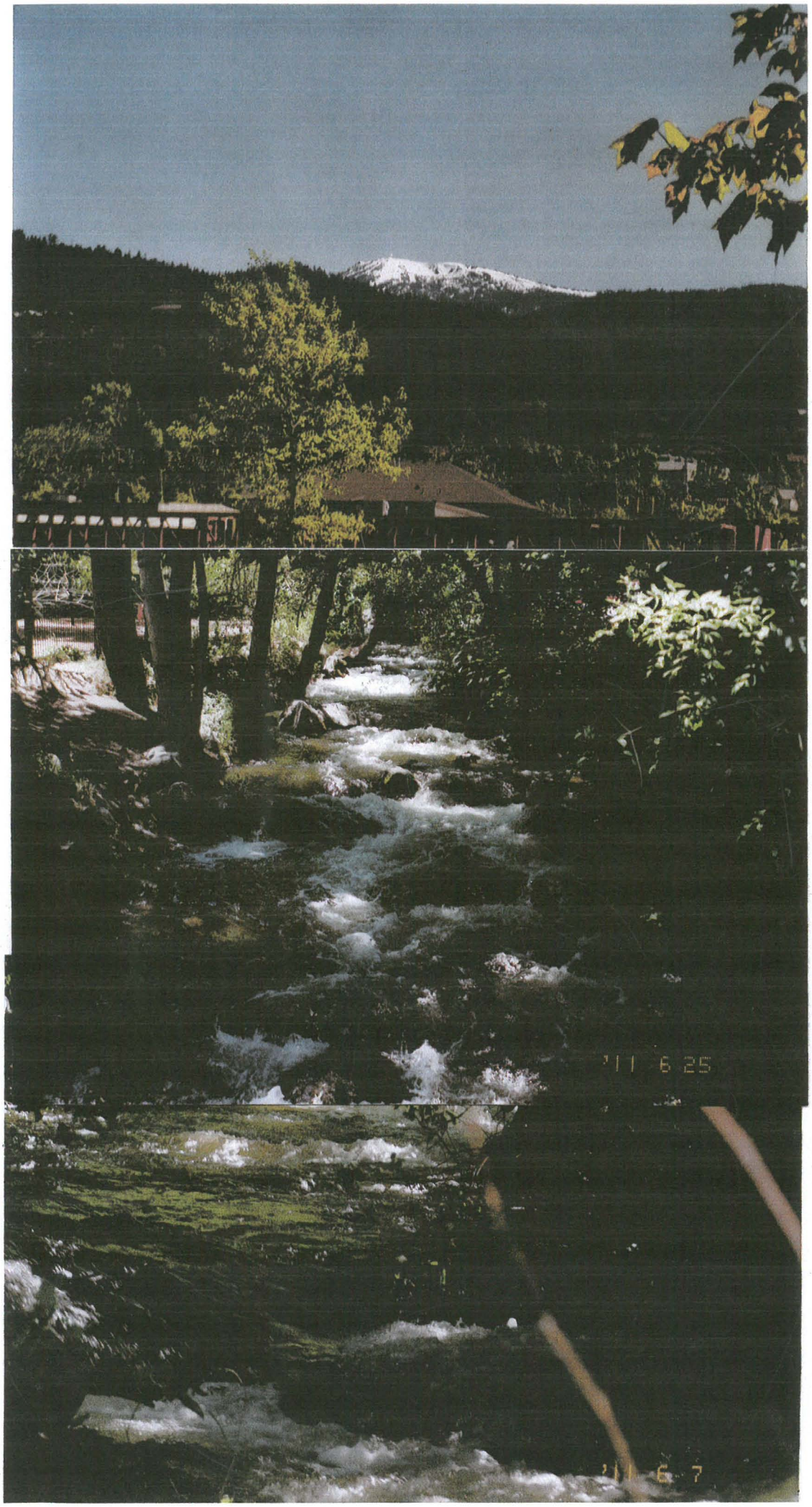
The Result will be the <u>Cloud Base of All Passing Weather Systems will be Lowered, Resulting in Increased Localized Precipitation</u>. BY DEFINITION, the Localized Drought Condition will be over.

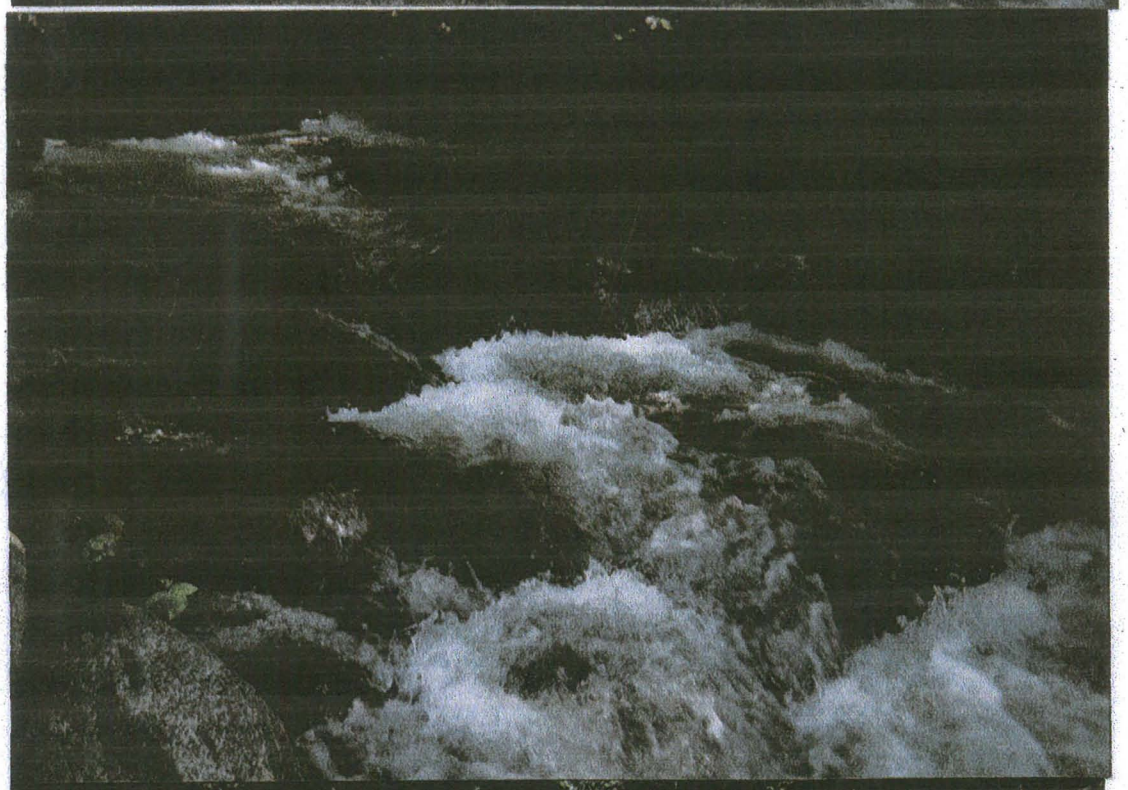
Since the Forest Service intends ZERO Water Tables Stream Restoration in this District through 2020 A.D., BY DEFINITION, THE Siskiyou Mountains Ranger Distict will, by U.S. Forest Service INTENTION, REMAIN IN DROUGHT CONDITION, through 2020 A.D., and, THEREFORE, IN DANGER OF CATASTROPHIC WILDFIRES, through 2020 A.D.

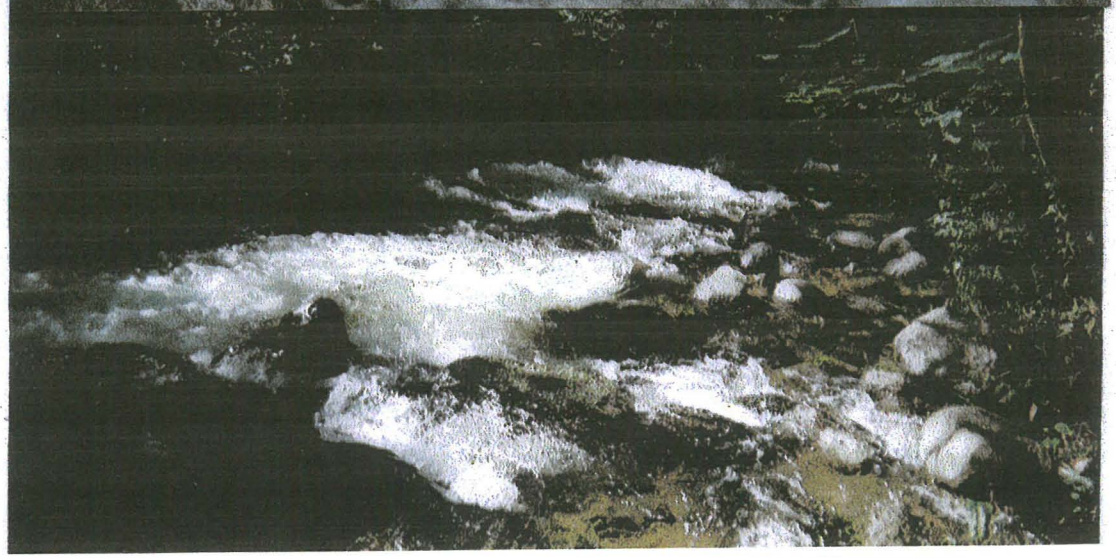
Sincerely Yours,

Terrence C. Stenson

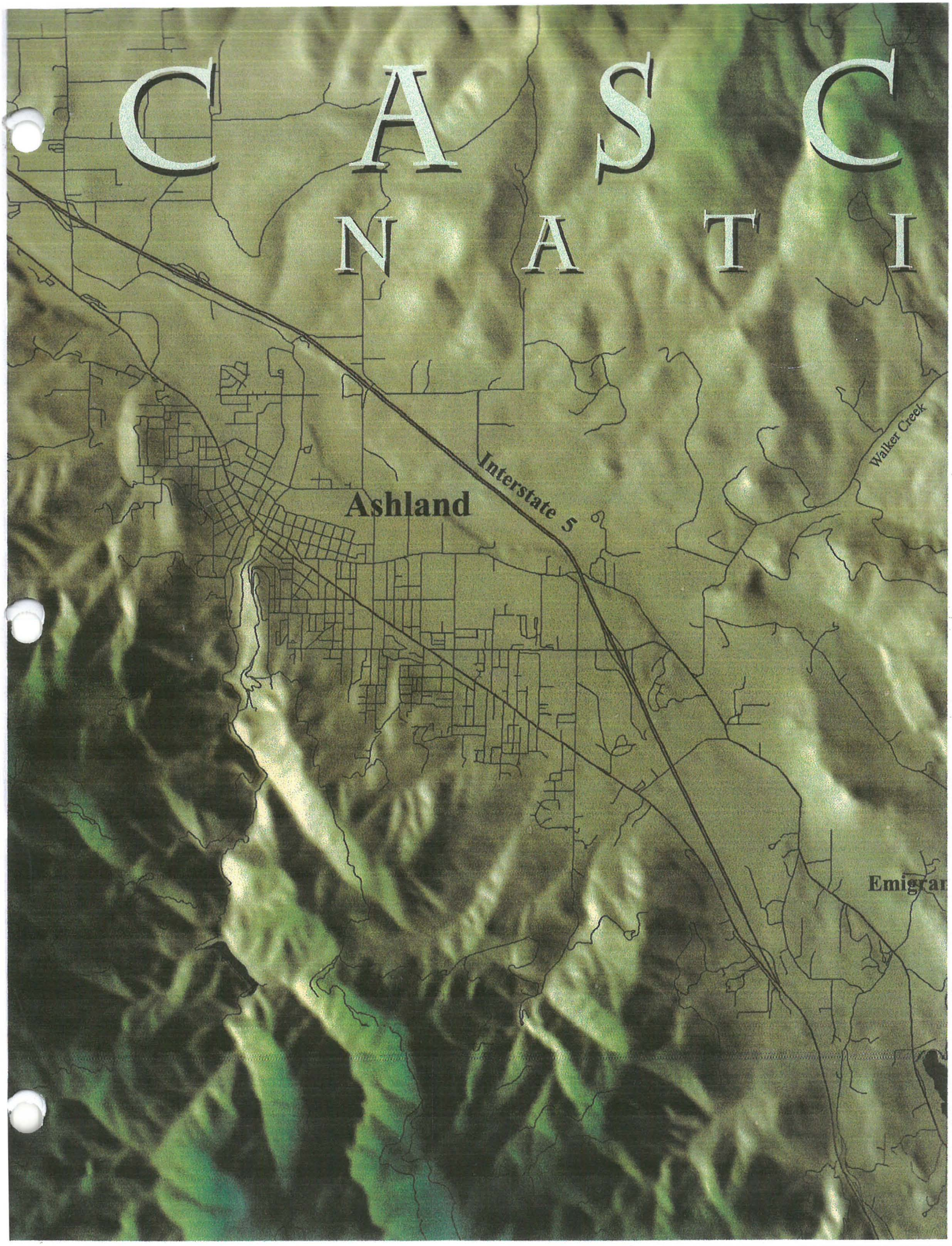
Terrence C. Stenson


'11 6 25
'11 6 7





CASC NATI



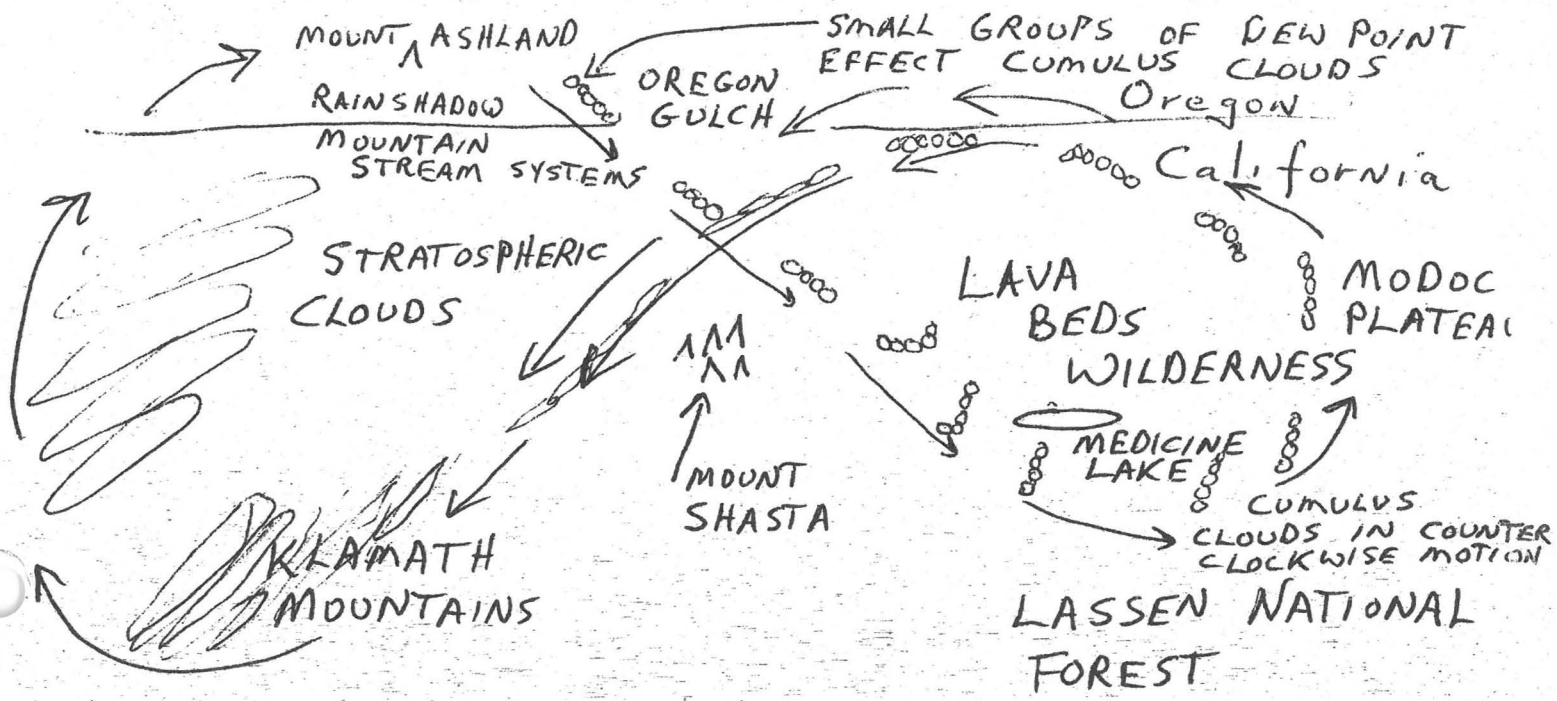
Neil Creek
Mt. Ashland
S
I
K
I
Cottonwood Creek
Fork
East
Mariposa
Preserve
Siskiy
Sum

Congress of the United States
House of Representatives
Subcommittee on National Parks, Forests and Public Lands
1333 Alice B. Longworth House Office Building

I am enclosing a Modest Proposal for Legislation: Reparian Resources Restoration, Act of Congress, 2009, Theodore Roosevelt Memorial Act, Requiring the Rebuilding of all Rock Cascades Waterfalls Water Table Steps (formerly known as Water Cascades), most are less than one foot in height, in all Rainshadow Mountain Streams Systems of Southern Oregon and Northern California, specifically the Cascade Siskiyou National Monument, as Prototype, from in situ, Natural Boulders and Rocks, with ZERO concrete , ZERO rebars, i.e. free stone or free masonry style, using standard Backhoes, and 3 person teams, 45 persons, Total, with 15 working teams, at a cost of $3.5 million, per year, (including Cost of Backhoes), with 60 Linear Miles of streambed restored per year, to Permanently Preserve the Arc#heological Basis of the Restoration, e.g., the Primordial Salmon Culture.

Purpose: To Totally Restore Mountain Water Table Steps to All Rainshadow Mountain Stream Systems of Southern Oregon and Northern California, Thereby Permanently Eliminating the Drought Cycle from the Region, Restoring the Northern Rainforest Effect of the Klamath Siskiyou Mountains of the Cascade Range, and Guaranteeing Proper Annual Maintenance of the Sacramento Valley Watershed Source Waters Aquafer, which supplies needed Water to 8 per cent of the National Food Supply.

Purpose: Restoration of Northern Rainforest Effect, Continental Source for Rapid Growth Cycles in Conifer Forests of the Region:



In 2020 A.D., 1/20 of all Homo Sapiens upon the Planet will have Acquired Immuno Deficiency Disease, 19/20 will be exposed to rapid virus and bacteria mutations; a time of Water-sourced Pandemics. This is not a good time to be Experimenting with Nation-wide Anaerobic Watersheds due to INTENTIONAL Forest Service, Department of Agriculture POLICY of Placing Large Woody Debris ("LOGS") into All Streams and rivers in ALL National Forests under their Jurisdiction, to "improve Aquatic Habitat for Indigenous Fish Populations" (SOURCE: Final Environmental Impact Statement, Ashland Forest Resiliency, Siskiyou Mountains Ranger District, Rogue River Siskiyou National Forest, 650 Pages, with ALL INTENDED ACTIONS THROUGH @#@ 2020 A.D., with ZERO Watertables Cascades Stream Restoration intended through 2020 A.D. Instead, the Forest Service has clearly stated their INTENTION to "IMPUT ALL TRIBUTARY STREAMS of the Bear Creek Watershed (and by direct implication, all tributary streams of all National Forests) with Large Woody Debris".

Aquatic Environments have Low @#$%&# Oxygen, a fraction of 1%. Therefore, All Woody Debris Chemical Brekkdown in Water Environments will be ANAEROBIC, leading to Ketones, Aldehydes, and Methanol, M#&$# Methyl Alcohol ("wood alcohol"), all LETHAL Toxic Chemicals, deadly to nearby Oxygen-based Life, such as Fish. Whab grows upon such Anaerobic Environments are called Anaerobic Life, such as Coliform Bacteria, now growing rampant in all National Forest stream Corridors, due to Intentional Policy of Imputing Large Woody Debris ("LOGS") into all National Forest Reparian Environments.

The Forest Service has Stated in their Final Environmental Impact Statement that although the Prototype Water Tables Cascades Restoration Project is Valued, the Forest Srevice, under the Healthy Forests Restoration Act of 2003, LACKS ANY CONGRESSIONAL AUTHORIZATION TO REVIEW, ANALYZE, OR PROCEED UPON ANY SUCH PROJECT, SINCE THE FOREST SERVICE LEGALLY LACKS ANY AUTHORITY (GRANTED SOLEY BY CONGREES) TO RESTORE THE WATER TABLES (CASCADES) OF ANY STREAM IN ANY NATIONAL PARK, NATIONAL FOREST, NOR PUBLIC LANDS, BECAUSE CONGRESS DID NOT MANDATE ANY SUCH AUTHORITY IN THE ENABLING LEGISLATION OF THE HEALTHY FORESTS RESTORATION ACT OF @### 2003.

Healthy Forest Restoration CANNOT be accomplished without Riparian Resources Restoration, since Restored, sustained water tables are the basis of all Healthy Forests. Any Forest STRESSED by Drought is susceptible to insect predations. Drought is DEFINED by Webster's Dictionary as Broken Water Tables and, therefore, Declining Water Tables. Draught of Logs down Stream Beds, lead, immediately, to Drought, Broken Water Tables. The only way out of Drought, by DEFINITION, is TO RESTORE BROKEN WATER TABLES in all Streams of Affected Watershed.

Congress needs to provide the Forest Service, Department of Agriculture,and Bureau of Land Management, Department of Interior, with Explicit Enabling Legislation, under the Healthy Forests Restoration Act of 2003, to :

1) End all Artificial Drought Conditions in all National Forests by Restoration of Reparian Resources, Water Tables (Cascades) Streams Restoration to all tributary streams of all National Forest Watersheds, National Parks Watersheds, and Public Lands Watersheds; via backhoe and three person crews;

2) Cease Imput of Large Woody Debris Materials into the Tributary Streams of any Watershed of any National Forest, National Park, or Public Lands; to Prevent the onset of Anaerobic Watersheds, Nation-wide.

Congress needs to see Mountain Streams in a different way. Visualize a mountain stream as a Slanted Well, fully exposed to the surface, often many miles long, waiting for Homo Sapiens to Restore the broken, natural stone "well" casements, re-stepping the "well" springs down the mountain slopes, down the valleys, thereby, Re-establishing all of the Local Water Tables of all National Parks, National Forests, and Public Lands, ENDING, by definition, all local Drought Conditions in such regions.

ONce Congress has Legislated the Correct Solution, re-casement of the "slanted wells", mountain streams, the local valley streams, local water tables will begin to be replenished for nine months of each year. Potential flood events of 2" of rain in a 24 hour period, become, instead, welcome opportunities for water tables replenishment, ### as the water table steps , made with boulders and rocks, impede water Velocity and cause the rain event to replenish parched water tables instead of causing flood events.

The Enclosed Prototype Water Tables Cascades Project should answer any Questions Congress needs to have answered in order to write the Correct Enabling Legislation, to accompany the Healthy Forests Restoration Act of 2003, in order to set the Forest Service, Department of Agriculture, and the Bureau of Land Management, Department of INterior upon the CORRECT PATH toward Healthy Forests.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

Background of Author: Terrence Charles Stenson

Bachelor of Science, Major: Chemistry, American Chemical Society Cert.

Le Moyne College, Syracuse, New York 1968

United States Army 1969 1970 Honorable Discharge

1992-1995 University of Kentucky

55 Hours Geology, Archeology, Biology

Subject: Geology of Cascade Mountains and Their Effect on Meteorology

Thesis: Restoration of Cascade Waterfalls to a Single Small Mountain Stream, Ashland Creek, Produces Effect of Changing Entire Weather Pattern of Pacific Northwest Cascade Mountains

Antithesis: Weather Patterns of Cascade Mountains are Resultant of both Oceanic Currents and Surface Geology

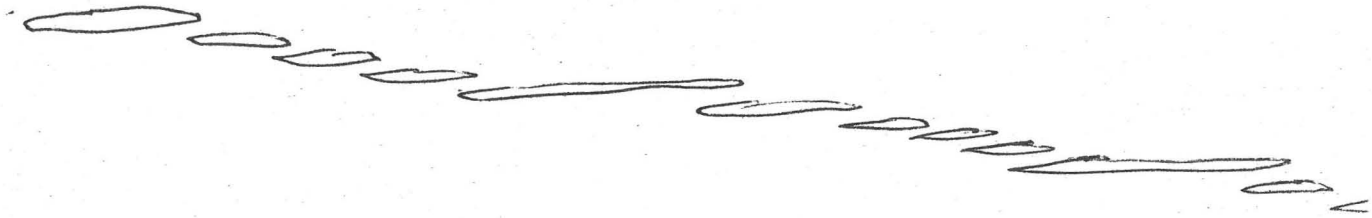
Synthesis: The Fluid Dynamics of Meteorology is both sourced and congruent with Surface Geology

Reference Map: Cascade Siskiyou National Monument

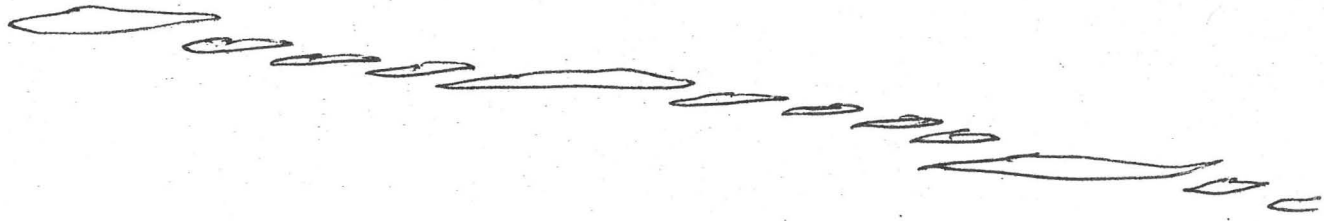
During the Summer of 2004, I completed the two year Restoration of 320 Water Cascades (mini-Waterfalls) to Ashland Creek. The feat was accomplished by moving manually approximately 25 tons of rocks and small boulders into rock dams (often called fish ladders), covering a distance of about one mile.

Result: Restoration of approximately 150 Feet (the collective height of the mini-Cascades restored) of Water Table flowing back into the Mountain Water System directly to the south of Ashland, Oregon. The exact location of the Cascade Stream Restoration Demonstration Project is Lithia Park. This allows observation by interested parties of small section of the Demonstration Project, or, consideration of the entire Demonstration Project via Park maintained pathways. The Project is intended to serve as the permanent Demonstration Model for the proper Restoration of the Ashland Creek - Bear Creek Watershed, as well as, the rest of the Cascade Mountains Watershed. It is, at present, the only extant Restoration in the entire Cascade Mountains Region. Therefore, it is also intended to be the Demonstration Model for proper Management of the Regional National Forest Watersheds.

Cold air descends each night from the steep, eastward facing slopes of the nearby Mountains of the Cascades. The Restored mini-Cascades (mini-waterfalls) cause the cold descending air to become saturated through the churning action of the mini-waterfalls. Each morning, Solar Radiation, 4000 - 8000 angstrom, warms the Ashland Creek Valley and causes the warming, moisture laden Weather Cell to rise above the surrounding terrain. At about 800 feet above ground level, dependent upon barometric pressure, condensation at dew point causes Cumulus Clouds to appear within the nascent weather cell, exactly mimicing the stream water Cascades Restored.



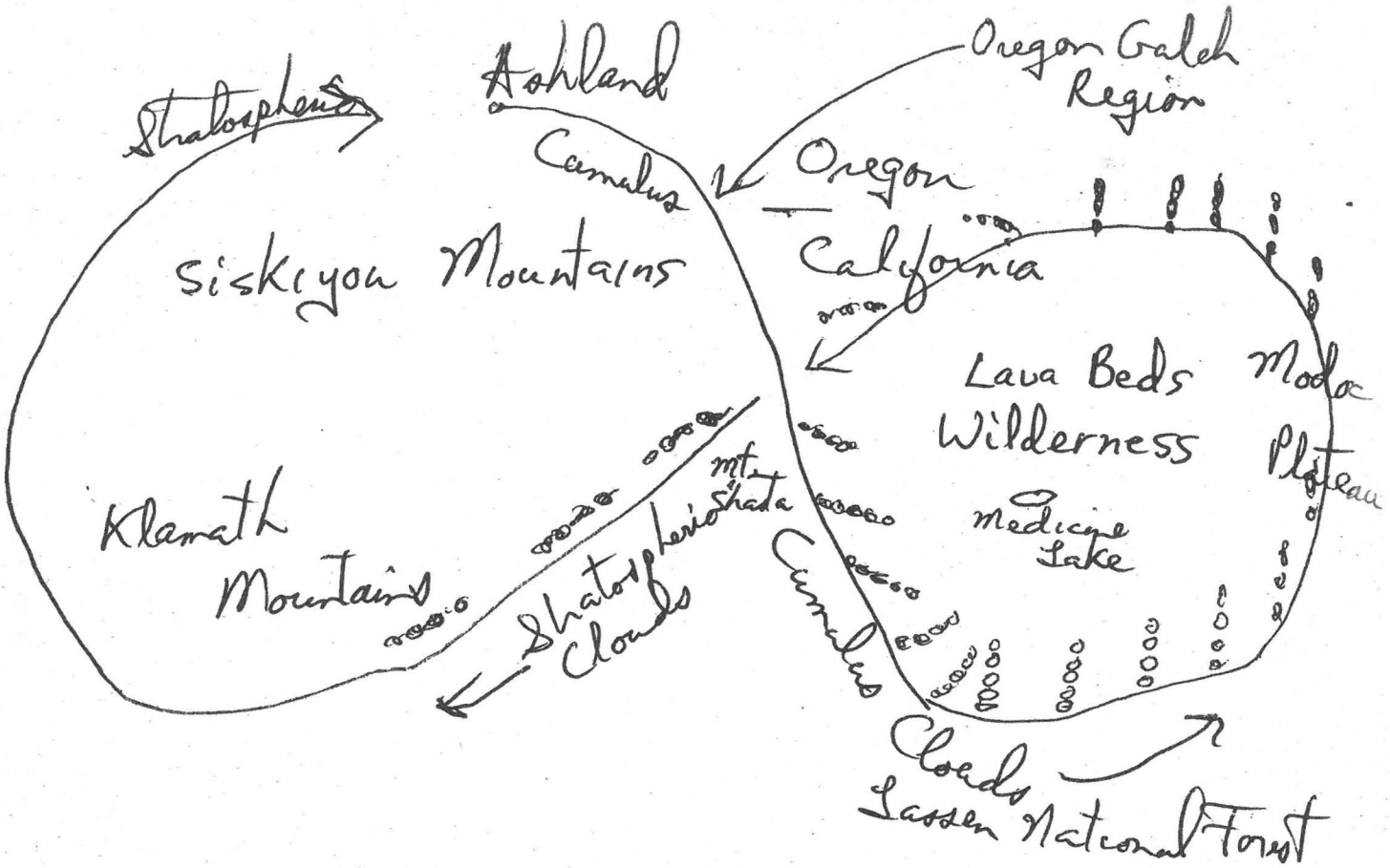
These Cumulus Clouds drift east south-east and are replaced within 20 minutes by a new set of Cumulus Clouds within a new nascent weather cell drifting upward from the same geological template. This Pattern of cumulus cloud formation repeats during the morning until dew point is too high to be visually observed.

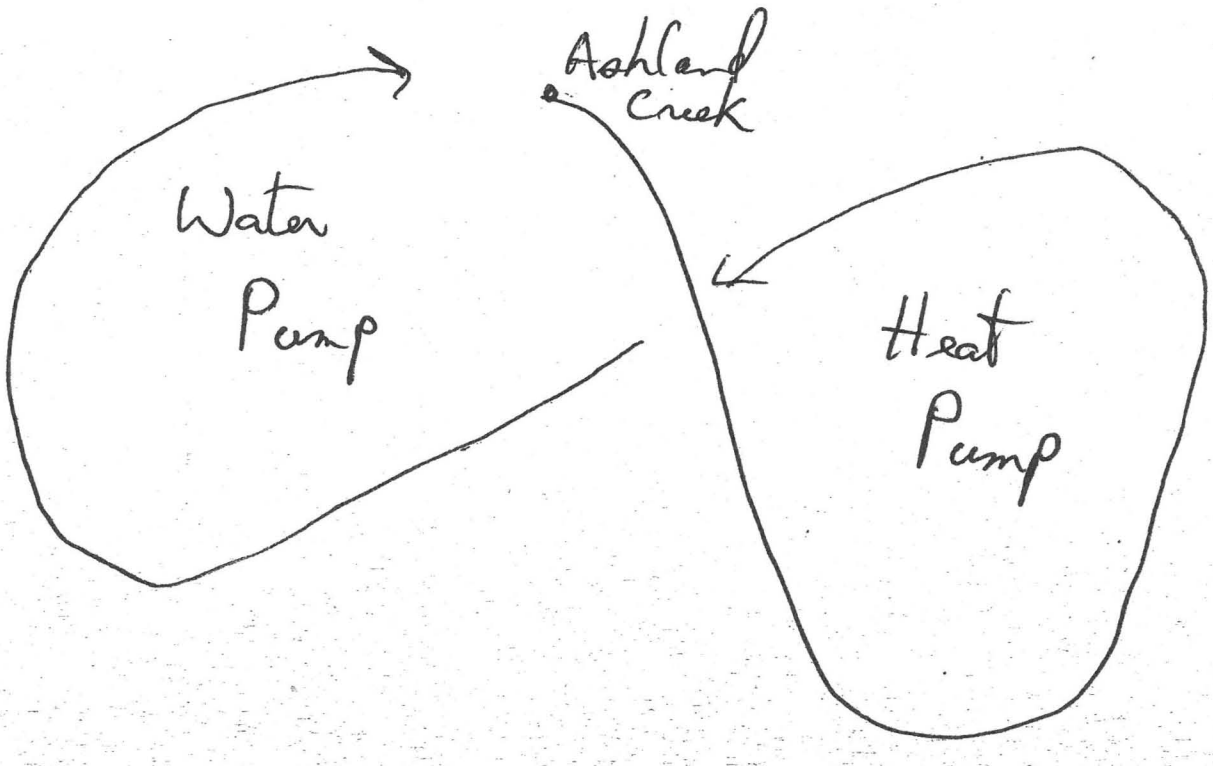


The steps of the cloud patterns, caused by the water steps of the Restored mini-Cascades or min-waterfalls, are the archeological and anthropological Basis for all the Steps in Annual Seasonal Weather Dance Ceremonies of the Primordial Peoples of the Western Mountains of North America. They annually maintained the Steps of their Water Temples, the streams, ponds, and rivers of the Region. They brought the Drama and Teaching of the maintenance activities into the shape of a Totemic Civilization.

These repeat cloud patterns stay within the long geologically based valley patterns, continuing to ascend as they drift east south-east. After passing over a dozen different mountain ridges, they descend as a sequence of moist cold air weather cells into the Oregon Gulch Region. Southeast of the Oregon Gulch Region, are found the geological remains of the largest extinct shield volcano in the entire Western Mountain States region. It is identified as Lava Beds National Monument and Wilderness.. The vast dry black lava beds result in a permanent Meteorological Phenomena, a constant upwelling of HOt Dry Air. Stream degradation caused by logging and surface hydrologic pressure gold mining removed the sources, mini-Cascades or mini-Waterfalls of the regional streams,of the peripheral coating of moisture laden cold air weather cells which were continuously added to the outer rim of the Hot Dry Air Heat Pump by the Salmon Culture. These peripheral weather cells generated by the now extinct Civilization gave the Hot Air Mass a slow counter-clockwise rotation.

As the last of the mini-Waterfalls, maintained annually by the Primordial Peoples, was smashed by loggers, the fixed Heat Pump lost its counter-clockwise rotation, and began to spin Clockwise. The Clockwise rotation of this mighty Heat Pump results in permanent drying winds from the Sacramento-San Joaquin Valley Systems, shifting upward toward Oregon without the balance of a border Low pressure system to turn the Hot Dry Air into beneficial cloud building thermals. The Clockwise Rotation of the Heat Pump presages an end to the perennial rain forest effect of the Coastal Mountains including the Cascades. Hot Dry Air would continue to desiccate the Southern Oregon Border Region and lead to further Catastrophic Cascade Effect Drought and Fire Syndrome. Drought turns the clay sourced soil into Sun dried Adobe, and the desiccation process accelerates.


Shatosphere
Ashland
Oregon Gulch Region
Cumulus
Oregon
California
Siskiyou Mountains
Lava Beds Wilderness
Modoc Plateau
Klamath Mountains
Mt. Shasta
Medicine Lake
Shatosphere Clouds
Cumulus Clouds
Lassen National Forest


Ashland Creek
Water Pump
Heat Pump

Leaving the Oregon Gulch Natural Region, the cloud patterns within the new weather cells commence a journey over the Lava Beds National Monument and Wilderness Region. The old pathway of the Cloud Spirit Dancers has not yet permanently closed, and allows admittance. The cloud weather cells begin the Dance Path as horizontal cascades of cumulus clouds. The Hot Dry Air of the Heat Pump becomes coated on its periphery with the moist weather cells causing the motion of the Heat Pump to return to counter-clockwise. The Cloud Dance takes the weather cells southeast over the Medicine Lake area.

The hot upwelling thermals cause the cumulus clouds to begin to extend vertically and to appear, as they once did for the Salmon Peoples, as standing, Dancing Spirits, performing the Sky Dance that would return the Spirit Dancers to the Ords beyond the Cumulus Ords, where the Pink Salmon Culture Ords Dwell, the stratospheric Ords. The Dance takes the weather cells upon an eastward journey as they pass to the south of the hot dry black lava beds until they approach the Modoc Plateau and slowly change to a pathway leading north. From the center of the Lava Beds Wilderness, the weather cells look like individual vertical cloud formations moving slowly counter-clockwise as they finally embark upon a west and then southwest pathway that carries the weather cells into the stratosphere. Over theKlamath-Siskiyou Mountains, they again become horizontal cloud patterns in the stratosphere.

This is critical to the rainforest effect as it causes a Shadow from the stratosphere to fall on the terrain below, lowering temperatures and causing mists toappear upon the mountain sides. This is the vital ingredient that causes rapid growth of forests and actively sustains the viability of the microclimates that preserve ecological diversity.

When the weather cells return to their source region, the Siskiyou Mountains, they appear as recurrent stratospheric clouds (Ord, Ora: Greek language), and the region begins to re-experience the northern rainforest effect with mountain mists. The Heat Pump of the Lava Beds Wilderness is so powerful as a permanent Meteorological Phenomena that it directly influences the Jet Stream and causes a sinesoidal wave in the path of the jet stream resulting in continental aberations in the weather as the Heat Pump returns to a counter-clockwise rotation.

The Heat Pump provides the permanent Energy to Push the moisture laden weather cells above the incoming cold moist weather cells and upon the long southwest journey into the stratosphere above the Klamath - Siskiyou Mountains. The Energy of the permanent Heat Pump causes the stratospheric cloud formation weather cells to enter the anomalous clockwise flow pattern of the WaterPump Effect Geological Pattern evidenced by the Cascade Stream REstoration Demonstration Project of 320 mini-Cascades (mini-Waterfalls) and 150 Feet of mountain Water Table restored. The 150 Feet of Water Table Hydrology restored, flows back into the semipermeable sandstones of the rock layers immediately south of Ashland, and the Surface Water Table reconnects with the permanent deeper mountain geological Water Table,previously disconnected from the Weather Cell Breeder System Template by destruction of all mini-Cascades (mini- Waterfalls) in the streams of all the Western States National Forest Regions by intentional mismanagement of Riparian Resources by the Department of Agriculture.

Once the Surface Water Table Hydrology is reconnected to the deeper mountain geological Water Table Hydrology, the Weather Cell Breeder System re-primes the Water Pump.

The Water Pump Effect counters incoming High Pressure Air Cells by pushing surface stream water tables downward into the deeper aquifers raising Dew Points of the incoming cool dry air masses by cooling and saturation effects resultant from churning air through the 320 water cascades, and more nascent weather cells arise from the geological cloud template. It takes no great leap of thought to begin to see entire strea and river valley geological formations as natural templates of huge Cloud Formation Weather Cells waiting to be restored by Homo Sapiens.

Result: Permanent Change of Weather System from Catastrophe Theory Drought Forest Fire Syndrome Pattern toward Wet Cloudy Permanently Increasing and Self-Reinforcing Cascade Effect Rainfall Patterns geologically historical to the Cascade Mountains Region with permanently increased Rainfall Patterns. The Restored Cascade Effect Stream Demonstration Project System will not dissipate since it is self-reinforcing. The clouds do not immediately leave the region. They merely drift higher and higher to form a repeat cumulo-stratus cloud formation Pattern that is permanent. The evidence can be seen demonstrated directly over Southern Oregon University each day and every week through the Repetitive Patterns of Cloud Formation.

Because of the uniqueness of the Geology of the Region, with the large extinct shield vocano black lava flows providing the necessary Heat Pump to sustain the System, it is a self-proven Thesis. Years og preliminary Research are avoided since Proof is immediate, ever present and <u>geologically permanent</u>. The Model being overthrown and discarded as a self-defeating Tautology, is the Model that presently directs the management decisions of the Department of Agriculture and through incompetent and false pseudo-science, the National Forest Service. All problems are sourced in El Nino of the Pacific Ocean; the Drought is expected to continue to 2052 without serious interruption to the thoughts of the Department of Agriculture.

Medicine Lake, near the California - Oregon border, is a geologically unique center of thermal upwelling. The surface geological deposits resultant from the deep thermal upward-welling minerals include pink and blue rock formations. These light rocks, both in color and density, form the Spiritual Center of the ancient water-based Civilization of the Region. The Sky blue and Dawn pink rocks, presently endangered by a private geothermal power plant scam based on a taxation avoidance scheme that will scarify the archeological center of the extinct Civilization, were the basis of all the Totemic Painted Ritual Faces of the Weather Dances of the Culture. Medicine Men would make long pilgrimages to Medicine Lake to obtain the colored chalk rocks for the individual communities of the civilization. The lightblue and pink were used as face paint for rain dances, crop festivals, and most other totemic ceremonies. They danced with the pink skies of Dawn and Dusk and the light blues of the Morning Skies, thanking the Great Spirit for bringing Clouds and Rain to their Peoples, and for bringing the Pink Salmon from the Skies to feed their Peoples.

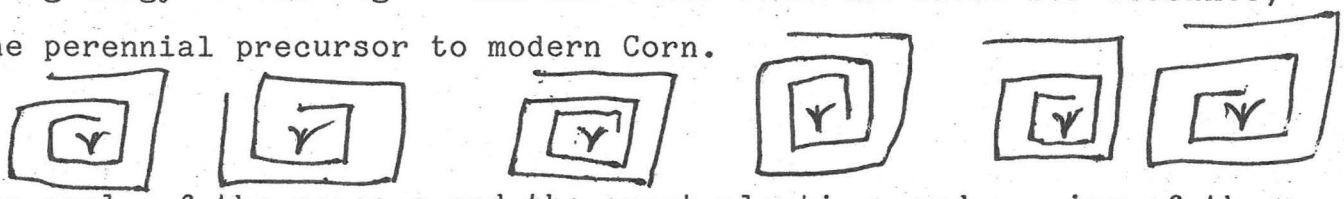
They sought the denser geological pink granitics from pebbles to large boulders to haul great distances to place with the Steps of their Water Temples, the Streams and rivers, to be Spirit Guides to the Returning Salmon. Ashland Creek, alone, within Lithia Park, has over 50 large glyph boulders with Salmon images clearly discernable, a <u>sufficient Number to have the stream declared a National Archeological Site protected by Federal Law</u>. The Peoples rebuilt and maintained the mini-Cascades (mini-Waterfalls) each Summer and were the Water Pump maintenance groups of their civilization.

The Totemic Patterns of the Dance Ceremonies to the Winds, Clouds, Rain and Thunder, exactly mimiced the Water Steps of the individual streams of their village regions, so the Peoples could Dance the resulting Cloud Patterns coming from the cloud templates they seasonally maintained. The Totemic Peoples of the Civilization always remembered that Clouds arose from Mother Earth and formed distinct Patterns in the Skies that exactly mimiced the pattern templates of the Streams,

and rivers of their cloud building civilization. They Danced the Patterns of the Water Steps of the Streams and Rivers and knew they would always dance in the Clouds when they departed their bodies. They would watch over their Peoples from the Clouds and return as Rains with the Salmon Peoples so no one would ever be left behind.

The entire pattern and fabric of the Civilization endured for many thousands of years for the ceremonies of totemic dance showed the exact weather patterns above the Peoples, which were the same patterns of the geologies of the Regions, and allowed the Peoples to look to the Skies and know, in detail, how they were connected together.

The Culture of the Civilization extended to the Dakotas and to the Anasazi of Chaco Canyon Region of Arizona, Colorado, and New Mexico. In that Region, the Ceremonies became those of the Teosinte - Corn Culture. Their Pottery Culture of Chaco Canyon preserved the Medicine Men Culture of the Cascades in their Pottery Patterns. (Original Thesis: no other source 1993 UNiversity of Kentucky, Lexington)/. The Pottery Bowls were the Totemic symbols of Mother Earth. The tops of the pottery showed the Weather Patterns of the American Southwest: Clouds, Clear Skies, and Bolts of Lightning. The lower portion of the pottery bowls showed the geology of the region and the exact PLANTING CYCLE for Teosinte, the perennial precursor to modern Corn.



The cycle of the seasons and the exact planting, and spacing of the Teosinte kernals, along with timing of planting was taught by a series of pottery designs with geometric patterns showing the geology of the region and timing from rainfall at the tops of the Buttes to water arrival via the Water Steps coming down the geological terraces to their planting fields. The Pottery was then used to store the Teosinte Kernals mixed and capped with ashes to prevent insect predation, rot, and spoilage. The ashes were left with the kernals and were ground in flour meal as they interacted with the starch to increase the ~~protein~~ carbohydrate.

The Totemic Civilization recognized that the birds of the skies held upon their wings connection to the winds and clouds of the Salmon Culture. The Earth Bowl produces the Sky Bowl which spins round and round. Water added to the bowl while it spins, gives the sky bowl shape. The water clouds form upon the Sky Bowl from the Earth Bowl Template and repeat their formation from the same geological template. The sky Bowl pours Waters back upon the Earth Bowl to give all Creatures their sustenance. The totemic teaching bowls hold the knowledge of the Peoples that the wisdom never be lost. Fire seals thepottery to give the wisdom long endurance.

Most other water-based and sourced civilizations followed a similar Path to connection with a Cloud Culture. Ord and Ora are Greek words for cloud and clouds. A cloud passed from horizon to horizon in the Mediterranean skies, 24 Ora (hours) in a night and a day. The Ora held the Spirits of all departed spirits of creatures whom had lived and also those great Spirits who watched over the Living. Primordial (from the clouds of beginning)Peoples of Europe considered the Spirit levels of the Ords were a hierarchy of wisdom. Zeus and Hera were the highest Ords beyond all other Ords of the Greek southern European Civilization. They watched over the smaller Ords. The colder Ords of the far Northern European Peoples, the NOrds, were a different heirarchy of wisdom.

French Culture translated the message twelve hundred years later into Le Ords and Le Ords beyond all other Ords who would bring them greenpastures. However, European Civilization was under severe stress from almost 800 years of warfare against Asiatic armies from Chosen China sweeping off the Asian Stepps atempting to enslave or murder all the Peoples between Mongolia and the Atlantic Ocean.

The nightmare of centuries of warfare against Asian armies eventually brought on the despotism of the Spanish Empire with the power of the Inquisition. The Spanish forces took to the seas and attempted to absolutely destroy all civilizations #encountered through torture, inquisition, and complete enslavement of all# Peoples encountered. They totally destroyed all water-based civilizations devoted to continuous Cloud Making, Ord Making, as that lead to the Worship of Strange Ords. Four hundred years of inquisition, torture, and enslavement of the Peoplesof North America and South America has resulted in almost complete annihilation of all remembrances of the water-based civilizations and the Art of the Cloud Builders.

By the above small digression, I have attempted tosummarize the present mindset of Homo Sapiens, and its effort to give the Surface Ecology a permanent case of Subburn through pseudo-science techniques of herbicides, pesticides, and fire applications to Clay-based soils with resultant loss of permeability, through Adobe, sun-baked brick, formation. There is no serious soil scientist who is not aware that Stream # Degradation by loss of water steps, leads immediately to water table destruction, Drought, and fire hazard effect, which turns thousands of years of soil building efforts by weeds, insects, microorganisms, and vertebrates, into Adobe, sun-based bricks. The oxymorons issued by the Department of Agriculture through the Forestry Service are an excellent example: canopy reduction to prevent forest fire.

Nathaniel Hawthorne described the mentality well, writing of the 'evil of departed years shapedinto fallen leaves and dead stalks of lawless and vagrant plants becoming###black rich soil'-House of Seven Gables

This Spring of 2005, based on all complex climate system software and dedicated advance computer systems of the United States Government, Dairy Farmers, Orchardists, and Vineyard owners all over Southern Oregon, were notified that their water allocations were totally cancelled They could take their careers and their properties to their local Courts and file for bankruptcy. The only unnoted change in the entire system, was the singular and unique Project that I completed in the Fall of 2004. Therefore, potential allies for Professors inclined to put together a Grant Proposal for Federal Grant Funds for a new building on Southern Oregon University, dedicated as a ResearchGrade Facility: Geological Meteorology and Allied Sciences - Center for Stratospheric Studies of Cascade Mountains Watershed, are not financial lightweights.

Therefore, the rainfall results can be immediately proven to benefit Forest Service Management of the Forest Service, significantly lowering the cost of Forest Fire Management and Prevention; orchard and vineyard management; as well as endangered species, and habitat preservation of micro-climate niches needed for continued species diversity. The small imput of cost of labor to rebuild the mini-Cascades of Mountain Streams with rock and boulders already present in the streams as vestiges of the extinct water based civilization, with ZERO concrete, would result in extremely large economic benefit to tree growth, old growth, and habitat sustainability for rare and endangered species of plants and fauna, due to demonstrated higher sustained Rainfall Patterns and less need for irrigation waters in plant growth cycles. Geology and Allied Departments of Science, Biology, Ecology, Botany, Forest Management, Mycology, and Genetics, of Southern Oregon University can readily document the Thesis by such simple techniques as computer graphics overlays of daily weather satellite regional meteorological films with Thesis overlays of Heat pump - Water Pump Theory over the affected areas of California - Oregon to Demonstrate Effect.

Background of Author: Terrence Charles Stenson

Bachelor of Science, Major: Chemistry, American Chemical Society Cert.

Le Moyne College, Syracuse, New York 1968

United States Army 1969 1970 Honorable Discharge

1992-1995 University of Kentucky

55 Hours Geology, Archeology, Biology

Terrence C. Stenson
[redacted]

Governor Arnold Schwarzenegger
State Capitol Building
Sacramento, California 95814

Dear Governor:

The Enclosed (next page) Proposed One Line Legislative Ord, " Theodore Roosevelt Memorial Act of Congress, 2009, Reparian Resources Restoration, $3,5 million/year, 10 years", has been before 30Members of the House Subcommittee on National Parks, National Forests, and Public Lands, since February of 2009. as a " Jobs Ready " 45 persons Proposal, third year of Consideration, (re: 2006, 2007), all 30 Members of the Subcommittee receiving the same complete Explanatory Package that your Office is now receiving.

I trust that you will readily comprehend the Expressed Purpose of the Modest Proposal for Legislation, the Permanent Elimination of the Artificial Drought Cycle from Northern California and Southern Oregon, with Legislative Mandate Guaranteeing Proper Annual Maintenance of the Sacramento Valley Watershed Source Waters Aquafer, which Supplies Needed Water to 8 per cent of the Domestic Fruits and Vegetables National Food Supply.

I request that you utilize your Office of Governor of California to encourage the California Congressional Delegation to assure Passage of the One Line Memorial Act (re: Theodore Roosevelt, 26th President of the United States, 1901 - 1909), this year, 2009.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

Terrence C. Stenson
[redacted]

Greg Walden
2D District, Oregon
1210 Longworth House Office Building
Washington, D.c. 20515-3702

Dear Rep. Greg Walden:

The enclosed "jobs Ready" -45 persons- Proposal has been with 30 Members of the Subcommittee on National Parks, Forests and Public lands (third year of Consideration) since the first week of February 2009.

As half of the Prototype Demonstration Project includes your District, I am enclosing a copy for you, and your Office.

Should the Subcommittee manage to get the Proposal signed into Law by President Obama, by 4 July 2009, as the Theodore Roosevelt Memorial Act (26th President, 1901-1909), Reparian Resources Restoration Prototype Demonstration Project, (location: Cascade Siskiyou National Monument and Ashland Creek - Bear Creek Watershed), the 45 Persons will be able to start work, in your District, in July, 2009. They will have completed 60 miles of Stream Restoration by october, 2009.

The Forest Service has completed their Final Environmental Impact Statement, 650 pages, with all of their Intended Actions through 2020 A.D., Ashland Forest Resiliency, for your District.

NOt one single Stream Restoration Project is included.

The Forest Service states in their Final Impact Statement, that although the enclosed Stream Restoration Project is Valued, the Forest Service is is NOT ALLOWED to Consider, Analyze, NOr Proceed to the Expansion of Any Prototype Stream Restoration Project, , AS CONGRESS DID NOT ALLOW FOR ANY STREAMS RESTORATION PROJECTS UNDER THE HEALTHY FORESTS RESTORATION ACT OF 2003, WHICH YOU AUTHORED.

Olde English: you have the Draught of logs down a stream, then the stream is in the Condition called Drought. The definition of Drought is Broken water tables of all streams of a region, and therefore Declining Water Tables.

The Only Way Out of Drought, BY DEFINITION, is Restoration of ALL Water Tables in all Streams of the Drought Stricken Region. Once All water tables of all streams in the Drought Stricken Region are RESTORED, to the Condition existing Prior to the Draught of Logs downthe affected Streams, then all localized Dew Point Effect Clouds willbegin to reappear. The Result will be the cloud base of all passing weather system will be lowered, resulting in increased localized Precipitation.

By DEFINITION, the localized Drought Condition will be over.

Since the Forest Service intends ZERO Water Tables Stream Restoration in your Congressional District, through 2020 A.D., BY DEFINITION, the 2D Congressional District of Oregon, WILL REMAIN IN DROUGHT through 2020 A.D.

Sincerely yours,

Terrence C. Stenson

Terrence C. Stenson

Terrence C. Stenson
[redacted]

Governor Arnold Schwarzenegger
State Capitol Building
Sacramento, California 95814

Dear Governor;

Enclosed are two copies of a Riparian Resources Restoration Proposal to you, your Office, and the State and People of California. It concerns a Completed Demonstration Project, Reparian Resources Restoration, presently before a Subcommittee of the U.S. House of Representatives, Subcommittee on National Parks, Forests, and Public Lands (second year of consideration). It concerns a Requested Legislative Mandate from Congress, to the Forest Service, for Proper Restoration of Reparian Resources of the Source Waters Aquafer for the Sacramento Valley Watershed (including headwaters for the Pit River Riparian System), which supplies Needed Water to 8 Percent of the National Food Supply.

As half of the Requested Prototype Reparian Resources Restoration Project will occur in Northern California, the other Portion being located in Southern Oregon, I wanted you, Personally, to become aware of the Intended Prototype Project. The only other persons in California presently aware of the Intended Prototype Project are Congresspersons: Baca, Miller, and Gallegly.

I look forward to the day when California Rainshadow Effect Streams and Rainshadow Effect River Systems, (including the Big Sur River), FINALLY have their Water Table Step Cascades restored under your Administration, and the Resultant Morning Mists are once again Restored to the Hills and Mountains of Northern and Southern California.

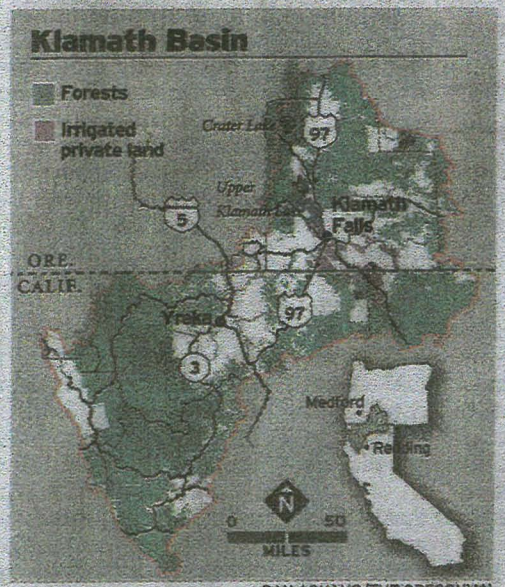
Sincerely Yours,
Terrence C. Stenson
Terrence C. Stenson

P.S.: If you need more copies, please send a letter indicating the requested number of copies.

March 25, 2008

MICHAEL LLOYD/THE OREGONIAN

California Gov. Arnold Schwarzenegger (front) joined Oregon Gov. Ted Kulongoski (right), Interior Secretary Ken Salazar (next to Kulongoski), tribal leaders, Klamath farmers and other groups in Salem to sign two historic Klamath Basin pacts. Failure to end the Klamath water wars "is not an option," Salazar said.



DAN AGUAYO/THE OREGONIAN

The deal is far from certain but could mean historic dam removal and river restoration, granting access to farmers, fishermen and salmon

By SCOTT LEARN
THE OREGONIAN

SALEM — Five years ago, Klamath Basin tribal leaders, longtime farmers, fish-loving environmentalists, PacifiCorp suits and government regulators sat down to take a shot at ending one of the West's grittiest water wars.

"We had people around the table who could barely look at each other, let alone speak to each other," said Thomas O'Rourke Sr., chairman of the Yurok Tribe.

O'Rourke and 29 other representatives from all sides of the Klamath battle gathered in the Capitol rotunda Thursday to sign a peace accord that might double as the United States' biggest dam removal and river restoration compact ever.

Under the two Klamath Basin agreements, four PacifiCorp dams on the Klamath River could fall, salmon could reclaim 350 miles of a legendary salmon run, tribes could see fishing grounds restored and Oregon farmers could get guaranteed water supplies.

The deal is far from certain: Congress must approve $500 million in extra federal expenses over 10 years for river restoration and protecting farmers in dry years. The dams wouldn't come down until 2020, and there are plenty of outs along the way. Critics say the accords give Klamath Basin irrigators too much locked-in

Please see **KLAMATH,** Page A4

Inside: California may be tired of Gov. Arnold Schwarzenegger's "hasta la vista" jokes, but his Terminator schtick got lots of laughs in Oregon | **A4**

Go to **oregonlive.com/politics** to see a video of Schwarzenegger entertaining the Capitol with quips about politics, movies and salmon.

For Klamath dams, it's hasta la vista

A signing ceremony launches the most ambitious river restoration project in U.S. history

Go ahead, get swept up in the river of rhetoric that flowed through the Oregon Capitol when Govs. Ted Kulongoski and Arnold Schwarzenegger, top federal officials, tribal leaders, farmers and hundreds of others gathered Thursday to celebrate the signing of an agreement to restore the Klamath Basin.

It was a historic moment, not just for the shallow, sick river that has been the source of so much pain and controversy, but for every other once-great salmon river reduced to a trawl by dams and insatiable demand for water. "The eyes of the nation, the eyes of the world, are on the Klamath," U.S. Interior Secretary Ken Salazar declared near the end of the hourlong ceremony in the Capitol Rotunda.

What the nation is watching is the culmination of years of negotiations leading to a remarkable agreement calling for the breaching of four dams and a water-sharing agreement meant to end one of the most bitter struggles between irrigators and endangered fish in U.S. history.

The skeptics will note that for now all this is just words, promises and names on paper. The critics will attack the plan for guaranteeing possibly unsustainable levels of water to irrigators, and for permitting the continued farming of tens of thousands of acres of wildlife refuge land in the basin.

Yes, dam breaching is at least a decade away, and still hinges on a determination by the Interior secretary in 2012. Yes, Congress still must consider and approve the Klamath plans, and appropriate more than $1 billion dollars to make them happen. Yes, Klamath plans are a product of negotiations, and they include compromises that make no one entirely happy with the deal. And yes, new problems, lawsuits, water crises are certain to arise.

Oregon Gov. Ted Kulongoski signs the Klamath Basin settlement Thursday in Salem as Secretary of the Interior Ken Salazar (left) and California Gov. Arnold Schwarzenegger (right) look on.

MICHAEL LLOYD
THE OREGONIAN

But, the soaring rhetoric, the Native American songs, the gifts of blankets and pottery, the handshakes and smiles, all the ovations Thursday, were more than justified. Give credit to the governors, the federal officials, the tribes, the irrigators, the PacifiCorp representatives, the conservation groups, all of them, who spent years overcoming the distrust, the suspicion, the hate, that had built up around the Klamath Basin over the decades.

Remember, it was only nine years ago, during a bitter drought, when the federal government shut off irrigation water to protect endangered fish in the Klamath Basin, leaving thousands of acres of crops to wither in the southeast Oregon heat. It was only eight years ago when the Bush administration ordered irrigation deliveries even though another water shortage gripped the region. The result was the largest single salmon kill in U.S. history; an estimated 68,000 salmon rolled up dead in the hot, poisoned lower river.

If you were in Klamath Falls in 2001, feeling the heat, the anger, the potential for violence at the closed irrigation canal head gates, it was impossible to imagine a feel-good moment at the Oregon Capitol only nine years later.

Yet on Thursday there was Gov. Schwarzenegger cracking wise, quoting his movie lines — "Hasta la vista, Klamath dams," and saying of migrating salmon, "I'll be back!" — and mugging for the cameras as he signed the agreement. There were old enemies — irrigators, conservation groups, tribal leaders, the federal government — lining up one after another to put their names on the agreement. It was inspiring, exhilarating, and those are words seldom associated with the Klamath.

We're under no illusions about the challenges that lie ahead. There will be setbacks, and Klamath restoration only gets harder from here. But over the past century there have been precious few occasions to celebrate in the Klamath Basin. Thursday was a day of hope for all the people who live near and love this once-great river.

Terrence C. Stenson
[redacted]

Office of the Governor
Theodore R. Kulongoski, Governor
State Capitol Building
900 Court Street NE.
Salem, Oregon 97301-4047

Dear Governor;

Enclosed are two copies of a Riparian Resources Restoration Proposal for you, your Office, and the State and People of Oregon. It concerns a completed Demonstration Project, Réparian Resources Restoration, presently before a Subcommittee of the U.S. House of Representatives, Subcommittee on National Parks, Forests, and Public Lands (second year under consideration). It concerns a Requested Legislative Mandate from Congress to the Forest Service, for Proper Restoration of Réparian Resources of the Source Waters Aquafer for the Sacramento Valley Watershed (including headwaters for the Pit River Riparian System), which ~~supplies~~ supplies Needed Water to 8 Percent of the National Food Supply.

As half of the Requested Prototype Réparian Resources Restoration Project will occur in Northern California, the other Portion being located in Southern Oregon, I wanted you, Personally, to become aware of the Intended Prototype Project. Governor Arnold Schwarzenegger has also received the Same Material.

I look forward to the day when Rainshadow Effect Streams and Rainshadow Effect River Systems of Southern (and eventually Northern) Oregon, FINALLY have their Water Table Step Cascades restored under your Administration, and its Successors, and Resultant Morning Mists are once again Restored to the Hills and Mountains of Southern Oregon and Northern Califonia.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson
March 25, 2008

P.S.: If you need more copies, please send a letter indicating the requested number of copies.

Terrence C. Stenson
[redacted]

Senator Ron Wyden
700 NE Multnomah #320
Portland, Oregon 97401

Dear Senator Wyden;

I understand that you are Proposing Revision of the Healthy Forests Restoration Act of 2003. PLEASE Read the Enclosed, Scientifically Based, Riparian Resources Restoration Proposal, Presently being considered by the U.S. House of Representatives, Subcommittee on National Parks, Forests, and Public Lands, (second year under consideration), before you press forward with your revised Ord, concerning Hazardous Waste Fuel Reductions, and Forest Harvesting to Prevent Forest Fires.

There exists a large gap in the emphasis of the Present Ord, that has NOT BEEN ADDRESSED BY YOUR EXPERTS, to any extent, whatsoever. It concerns PROPER MAINTENANCE OF WATER TABLES, which is not a difficult concept to mentally grasp: " - - the flat water surface of any stream, lake, pond, swamp, river, etc., - - -". You deal, scientifically, with Drought by Restoring the Underlying Hydrology of local streams, rivers, i.e., Riparian Resources Restoration, NOT by removing CANOPY in Rainshadow Effect Stream Valleys. Such Canopy provides extended Surface Areas Available for Condensation at Dew Point, once the underlying Rainshadow Effect Stream Hydrology is Restored. The more Surface Area Canopy Available, the greater the Condensation, in quantity, without ANY SCIENTIFIC SHADOW OF A DOUBT, Will OCCUR, at Dew Point.

Six members of the House Subcommittee on National Parks, Forests, and Public Lands have considered the Proposal, Congresspersons: Abercrombie, Hawaii, Brown, South Carolina, Cole, Oklahoma, Miller, CA, Baca, California, and Gallegly, California.

P.S.: If you need more copies, please send a letter indicating the requested numbers of copies.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

March 25, 2008

Members of the
Subcommittee on National Parks, Forests and Public Lands
1333 Longworth House Office Building
(202) 226-7736 Fax: (202) 226-2301

Mr. Raúl M. Grijalva, Arizona, Chairman
Mr. Rob Bishop, Utah, Ranking Republican Member

Dale E. Kildee, Michigan
Neil Abercrombie, Hawaii
Grace F. Napolitano, California
Rush D. Holt, New Jersey
Madeleine Z. Bordallo, Guam
Dan Boren, Oklahoma
Martin Heinrich, New Mexico
Peter A. DeFazio, Orefgon
Maurice D. Hinchey, New York
Donna M. Christensen, Virgin Islands
Diana DeGette, Colorado
Ron Kind, Wisconsin
Lois Capps, California
Jay Inslee, Washington
Stephanie Herseth Sandlin, South Dakota
John P. Sarbanes, Maryland
Carol Shea-Porter, New Hampshire
Niki Tsongas, Massachusetts
Pedro R. Pierluisi, Puerto Rico
Nick J. Rahall, II, West Virginia (ex officio)

Don Young, Alaska
Elton Gallegly, California
John J. Duncan, Tennessee
Jeff Flake, Arizona
Henry E. Brown, Jr., South Carolina
Louie Gohmert, Texas
Bill Shuster, Pennsylvania
Robert J. Wittman, Virginia
Paul C. Broun, Georgia
Mike Coffman, Colorado
Jason Chaffetz, Utah
Cynthia M. Lummis, Wyoming
Tom McClintock, California
Doc Hastings, Washington (ex officio)

Your Email Here Submit

» HOME
INSIDE THE COMMITTEE
» CHAIRMAN'S WELCOME
» ABOUT THE COMMITTEE
» 111th CONGRESS AGENDA
» MEMBERS
» SUBCOMMITTEES
» MINORITY SITE
RESOURCE CENTER
» NEWSROOM
» HEARINGS AND MARKUPS
» MULTIMEDIA
» ON THE HOUSE FLOOR
» CONTACT US
VIEW LIVE WebCasts

February 2009

Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Go to Committee Calendar

Members

[Print]

Members of the
Committee on Natural Resources
U.S. House of Representatives
111th Congress

1324 Longworth House Office Building
(202) 225-6065 Fax: (202) 225-1931

MR. NICK J. RAHALL, II, West Virginia, Chairman
MR. DOC HASTINGS, Washington, Ranking Republican Member

(Ratio 29-20)

Dale E. Kildee, Michigan
Eni F.H. Faleomavaega, American Samoa

Neil Abercrombie, Hawaii
Frank Pallone, Jr., New Jersey
Grace F. Napolitano, California
Rush D. Holt, New Jersey
Raúl M. Grijalva, Arizona
Madeleine Z. Bordallo, Guam
Jim Costa, California
Dan Boren, Oklahoma
Gregorio "Kilili" Sablan, Mariana Islands
Martin Heinrich, New Mexio
George Miller, California
Edward J. Markey, Massachusetts
Peter A. DeFazio, Oregon
Maurice D. Hinchey, New York
Donna M. Christensen, Virgin Islands
Diana DeGette, Colorado
Ron Kind, Wisconsin
Lois Capps, California
Jay Inslee, Washington
Joe Baca, California
Stephanie Herseth Sandlin, South Dakota

John Sarbanes, Maryland
Carol Shea Porter, New Hampshire
Niki Tsongas, Massachusetts
Frank Kratovil, Maryland
Pedro Pierluisi, Puerto Rico

Don Young, Alaska
Elton Gallegly, California
John J. Duncan, Jr., Tennessee
Jeff Flake, Arizona
Henry E. Brown, Jr., South Carolina
Cathy McMorris Rodgers, Washington

Louie Gohmert, Texas
Rob Bishop, Utah
Bill Shuster, Pennsylvania
Doug Lamborn, Colorado
Adrian Smith, Nebraska
Robert J. Wittman, Virginia
Paul C. Broun, Georgia
John Fleming, Louisiana
Mike Coffman, Colorado
Jason Chaffetz, Utah
Cynthia M. Lummis, Wyoming
Tom McClintock, California
Bill Cassidy, Louisiana

Members of the
Subcommittee on Energy and Mineral Resources
1626 Longworth House Office Building
(202) 225-9287 Fax: (202) 225-5255

TBA

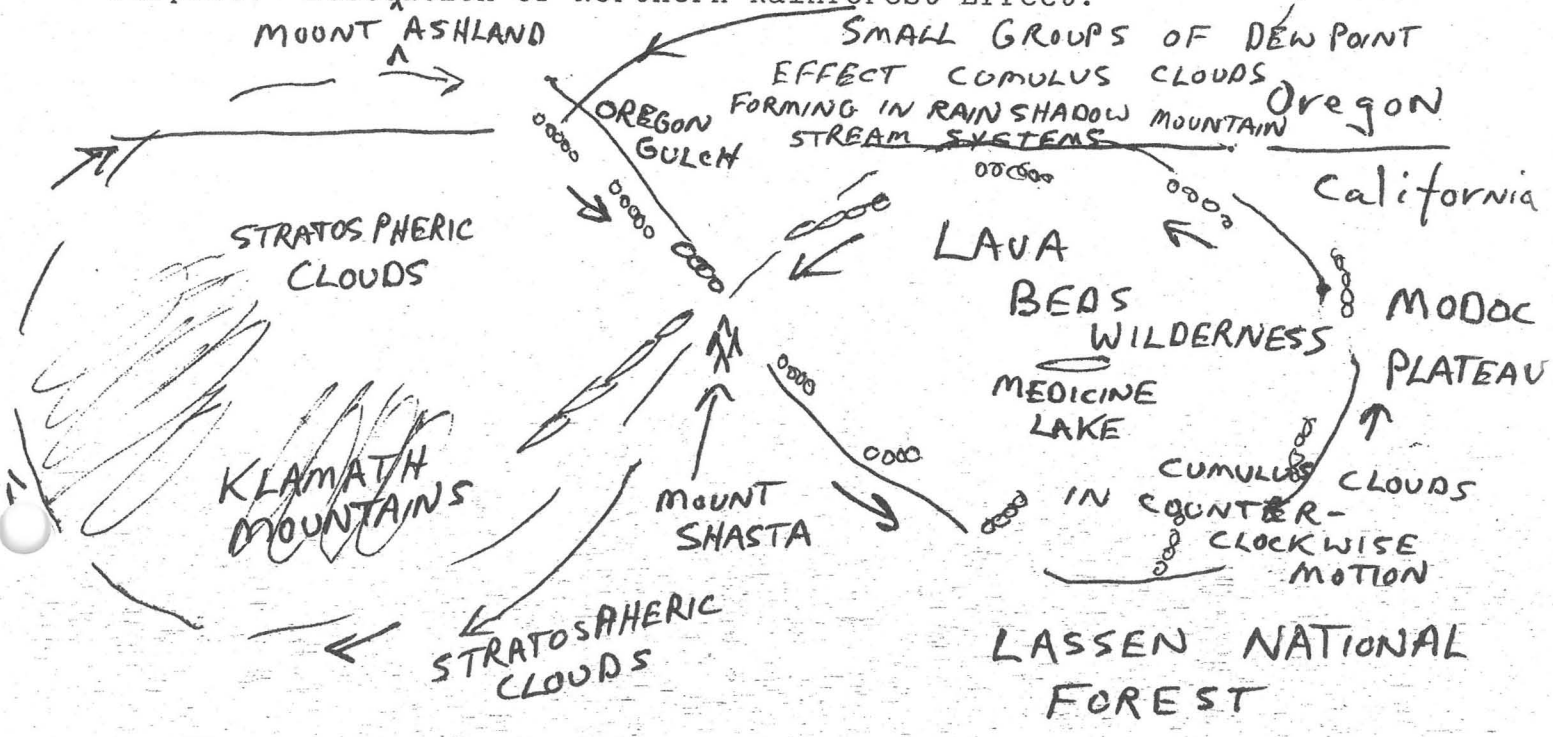
Congress of the United States
House of Representatives
Subcommittee on Ntional Parks, Forests and Public Lands
1333 alice B. Longworth House Office Building

I am enclosing a Modest Proposal for Legislation:

Reparian Resources Restoration - Act of Congress - 2007- Theodore Roosevelt Memorial Act, requiring the rebuilding of all Rock Cascade Waterfalls Water Table Steps (formerly known as Water Cascades), most are less than one foot in height, in all Rainshadow Mountain Stream Systems of Southern Oregon and Northern California, specifically the Cascade Siskiyou National Monument, as Prototype, from in situ, Natural Boulders and Rocks, with ZERO concrete, ZERO rebars, i.e., free stone or free masonry style, using standard Backhoes and 3 man teams, 45 persons, total, with 15 working teams, at a cost of $3.5 Million per year, with 60 linear miles of streambed restored per year, to permanently Preserve the Archeological basis of the Restoration, e.g., the Primordial Salmon Culture.

Purpose: To Totally Restore Mountain Water Table Steps to All Rainshadow Mountain Stream Systems of Southern Oregon and Northern California, thereby Permanently ELIMINATING the Drought Cysle from the Region, Restoring the Northern Rainforest Effect of the Klamath Siskiyou Mountains of the Cascade Range, and Guaranteeing Proper Annual Maintenance of the Sacramento Valley Watershed Source Waters Aquafer.

Purpose: Restoration of Northern Rainforest Effect:



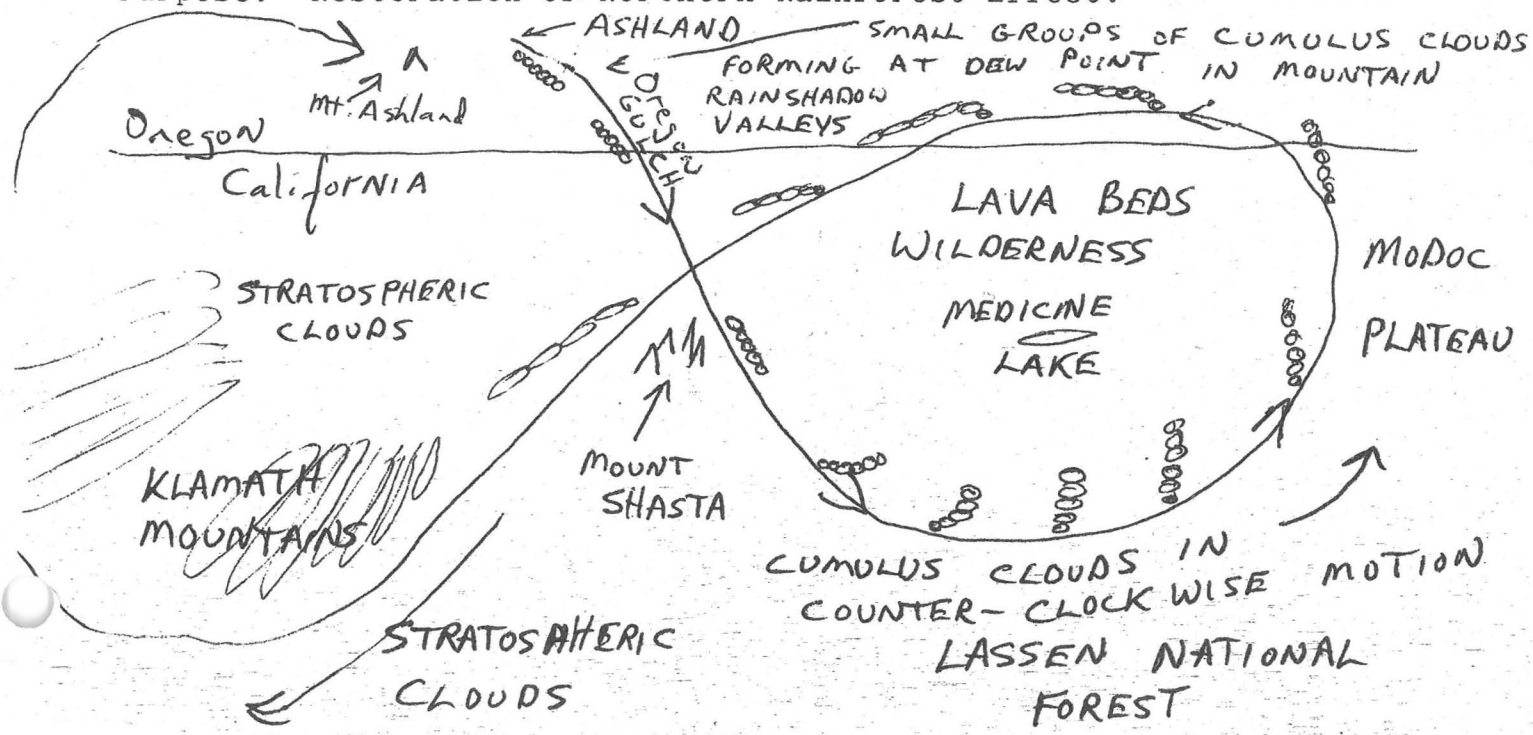
Congress of the United States
House of Representatives
Greg Walden
2D District, Oregon

Dear Congressman,

I am enclosing a Modest Proposal for Legislation: Reparian Resources Restoration - Act of Congress 2006 - Theodore Roosevelt Memorial Act, requiring the rebuilding of all Rock Cascade Waterfalls Water Table Steps (formerly known as Water Cascades),most are less than one foot in height, in all Mountain Rainshadow# Streams of Southern Oregon and Northern California, from in situ, Natural Boulders and Rocks, with ZERO concrete, ZERO rebars, i.e. free stone or free masonry style, to permanently Preserve the ###Archeological basis of the Restoration, e.g., the Primordial Salmon Culture.

Purpose: To Totally Restore Mountain Water Table Steps to all Mountain Streams of Southern Oregon and Northern California, therebyPermanently Eliminating the Drought Cycle from the Region, restoring the Northern Rainforest Effect of the Klamath Siskiyou Mountains of the Cascade Range, and guaranteeing Proper Annual Maintenance of the Sacramento Valley Watershed Source Waters Aquafer.

Purpose: Restoration of Northern Rainforest Effect:



I request that the City of Ashland, Oregon, Planning Commission, insert a single Ord enabling, Paragraph, to the Proposed Reparian Resources Protection Corridors Ord, that you are planning to present to the Ashland City Council, for consideration, and passage.

"" All Streams, intermittant streams, ephemeral streams, and wetlands, within the legal jurisdiction of the City of Ashland, including the City of Ashland Watershed, Shall Have their respective Water Table Step Cascades Properly Maintained, and Restored, by the use of Stream Sourced Boulders and Rocks, with zero concrete, and zero rebars. The Express Purpose is to Preserve, Protect, and Restore Local Water Tables, Thereby Preserving, Protecting, and Restoring a Limited Natural Resource, Water. This substantially Reduces the Threat of Fire in the Ashland Watershed Region"

In the Background Material Provided to the Planning Commission, I have also included a Formal Request that the City of Ashland re-Step the Water Table Cascades of Neil Creek, and Upper Ashland Creek, effectively re-constructing over 500 feet (vertical) of mini-Waterfalls, I,E,, Cascades, during July, August, September, 2008, Completion Date for Project: 30 September 2008. Your City Council will have effectively Doubled the local Snow Pack of Mount Ashland, guaranteeing healthy survival of your City Owned, Snow Pack Based Winter Tourism Industry.

The Estimated Cost for the 3month Project upon Neil Creek, and Upper Ashland Creek, including salaries for the 3 person crew, is $ 50,000. The amount should be successfully billed to the U.S. Forest Service as a Hazardous Waste Fuel Reduction Project, Reparian Resources Restoration, under the Healthy Forests Restoration Act of 2003.

I request that the Ashland City Council, insert a single Ord Enabling, Paragraph,to the Proposed Reparian Resources Corridors Protection Ord, that you are in the process of passing:

" All Streams, intermittant Streams, ephemeral Streams, and Wetlands, within the Legal Jurisdiction of the City of Ashland, Including the the City of Ashland Watershed, Shall have their respective Water Table Step Cascades Properly Maintained, and Restored, by the use of Stream Sourced boulders and rocks, with zero concrete and zero rebars, i.e. free stone or free masonry style, to Preserve the Archeological basis of the Restoration, e.g., the PrimeOrdial Salmon Culture. The express Purpose is to Preserve, Protect, and Restore Local Water Tables, Thereby Preserving, Protecting, and Restoring a Limited Natural Resource, Water. This substantially reduces the Threat of Catastrophic Wildfire to the Ashland Watershed Region. All large and small Woody Debris Materials are to be Removed from All Streams and Tributary Streams of the City of Ashland Watershed, an IMMANENT DANGER TO PUBLIC HEALTH,. Woody Debris chemical breakdown in aquarian environments is, due to Oxygen content of less than 1/5 of 1%, ANAEROBIC, LEADING TO ALDEHYDES, KETONES, AND METNANOL, ALL LETHAL TOXIC POISONS, BECOMING IMMANENT DANGERS TO PUBLIC HEALTH. What grows upon such Micro-Environments are Anaerobic life, such as Coliform Bacteria, causing the Danger of Water-born Pandemic."

Purposes for the Cascade Stream Restoration Demonstration Project:

1) It is the Basis for Grant Proposal for Federal Funds for New Research Grade Science Building at Southern Oregon University - Center for Stratospheric Studies of Cascade Mountains Watershed

2) Permanent Demonstration Model for Proper Restoration of Ashland Creek - Bear Creek Riparian System Watershed

3) Permanent Demonstration Model for Restoration of Primordial Salmon Spawning Beds (now ready for Test Study Stocking) - Ashland nowqualifies for Federal Grant Funds

4) Permanent Demonstration Model for Restoration of Mountain Water Tables to end Drought Fire Syndrome under the Healthy Forests Restoration Act of 2003. Since the Model is Demonstration Project Completed - Stage 5, Ashland and Southern Oregon University both qualify for Federal Grant Funds

5) Archeological Site Restoration with more than fifty Salmon Glyphs Present, qualifying Ashland Creek for listing as National Archeological Site - Ashland qualifies for Federal Grant Funds

6) Following Stream Restoration Project, Ashland, oregon needs only to purchase several small land portions at the top of Lithia Park and to set up land abeyances on the top of Strawberry Lane, beside a dirt road with an iron gate, to qualify Ashland as Entrance to Proposed New National Park with Two Entrances from Ashland with Hiking Trails to Mount Ashland

7) Cascade Stream Restoration Demonstration Project is intended to show Department of Agriculture, Bureau of Land Management, and Department Interior what they have failed to accomplish in current Federal Court Appeal Cases in their Statements that they have exhausted all other Remedies and Possibilities of Fire Prevention in Western National Forests and are left with the Necessity of Preventative Logging

Purposes for Cascade Stream Restoration Demonstration Project:

7) Continued: Since the Death of Theodore Roosevelt, not a single Mountain Stream nor River have ever had their Cascade Step Water Tables restored following logging and mining activities. The Flat Surface of a Stream, Lake, Swamp, or River is the exact Denotative Meaning of the word, Water Table. Ashland Creek, within Lithia Park, is, at present, the only extant restoration of the cascades of a mountain stream in the entire Western Mountains Region.

Since the Department of Agriculture, through its Forest Service, has neglected, for one hundred years, to even begin Riparian Restoration, all of their Legal Arguements, in Federal Courts, concerning Drought Fire Syndromes and the necessity of extensive logging to prevent Forest Fires and crown fires are without legal merit. The Ashland Creek - Cascade Stream Restoration Demonstration Project is, therefore, intended to serve as Permanent Demonstration Model for proper Management of the Regional National Forest Watersheds. The Department of Agriculture needs to visually observe what it must accomplish with all Western Mountain Streams before returning to Federal Courts with more Drought Theory to Justify its Activities.

Acknowledgement of Receipt of Alternative Technical Proposal (Five Copies) to the United States Department of Agriculture, Forest Service, Ashland Ranger District, Rogue River - Siskiyou National Forest, Jackson County, Oregon, as an Authorized Hazardous Fuels Reduction Project, Reparian Resources Restoration, Water Tables (Cascades) Restoration, Permanent Demonstration Model, Ashland Creek - Bear Creek Watershed, under the Healthy Forests Restoration Act of 2003. (First Submitted, with Acknowledgement of Receipt on August 10, 2005)

Received 8/21/08 DON BOUCHER

Acknowledgement of Receipt of Technical Response to Final Environmental Impact Statement, Ashland Forest Resiliency, Siskiyou Mountains Ranger District, Rogue River - Siskiyou National Forest (Six Copies)

Linda W Duff

10.14.2008

Technical Response to Final Environmental Impact Statement,

Ashland Forest Resiliency - Siskiyou Mountains Ranger District,

Rogue River - Siskiyou National Forest

(Statement quoted from your Report are marked by parentheses)

"The NEED for Action is Urgent Reduction of the potential for large-scale, high-severity (Catastrophic) Wildland Fire in the Upper Bear Analysis Area (Bear Creek Watershed)."

"The PURPOSE of the Action is to Protect Values at Risk, reduce hazardous fuels, reduce crown fires potential, and obtain conditions that are more resilient to wildland fires."

" One hundred years of fire exclusion and fuel accumulations in this wildland/urban interface now presents high potential for large-scale, high-severity wildland fire that could significantly interrupt the supply of clean water and late- successional and old-growth forest ecosystems in this analysis Area (within the Range of the Northern Spotted Owl, and therefore, within the Northwest Forest Plan (NWFP) of 20 May 1994)."

The Need for Action is Urgent Reduction of the Potential (Immanent Danger) for Catastrophic Fire in the Bear Creek Watershed DUE TO CHRONIC DROUGHT CONDITIONS IN THE WATERSHED, CAUSED BY BROKEN WATER TABLES CASCADES IN THE TRIBUTARY STREAMS OF THR WATERSHED, due to Forest Service POLICY of throwing Large Woody Debris into the Tributary Streams of the Watershed following Logging Activities in the Watershed, apparently since the 1920's, claiming that large pieces of logs floating down the stream tributaries are good for FISH HABITAT. Your Final Environmental Impact Statement contained over TEN EXPLICIT STATEMENTS of Forest Service Intent to Continue its Explicit Policy of annually Breaking All Boulder and rock sourced Water TablesCascades, by throwing large woody debris ("LOGS") into All Tributary Streams of the Watershed.

DROUGHT (Webster's Dictionary) is prolonged Dry Weather associated with Broken Water Tables and the resulting Declining Water Tables.

The FIRST MANDATORY STEP to End any Drought, and, therefore, by definition, reduce the Danger of Catastrophic Wildfires, ESPECIALLY in a RainShadow Mountain Stream System in the Klamath-Siskiyou Mountains of the Cascade Range, IS TO RESTORE THE WATER TABLE Cascades OF ALL TRIBUTARY STREAMS OF THE BEAR CREEK WATERSHED.

The Submitted Prototype Demonstration Project accomplished a number Goals, all within the Stated Need for Action, and Purpose of the Action, Extensively Laid out in the Final Environmental Impact Statement.

A) Cause Air Nightly Descending from the Rainshadow Effect System of Mouht Ashland to become Saturated through the Churning Effect of 350 Mini-Waterfalls, Cascades, Water-Tables Cascades, Resulting in a Blanket of Saturated Air which Ascends Each Morning from the Ashland Creek - Bear Creek Valley System Resulting in Morning Mists Reappearing upon Grizzly Peak and all of the other surrounding Slopes of the Bear Creek Watershed, a natural huge box canyon, open to the North-West, and, therefore, becoming DE FACTO, a huge Condenser, re-precipitating all locally sourced Humidity that fails to attain 4500 feet before Dew Point Temperature is Attained (Temperature at which clouds, fogs, and Morning Mists begin to form. Morning Mists, Resltant from the Prototype Demonstration Project,are now Weekly Appearances upon All Surrounding Slopes. Raising the Local Morning Humidity via the Churning Action of Air and Water at Each of the Restored Water Tables Cascades Lowers Cloud Levels in All Systems Passing through theRegion. You raise the Localized Dew Point, you Lower the Cloud Base of All Weather Systems Passing through the Region.

Because of the Box-Canyon Effect of the Entire Watershed, the Result is the Re-Establishment of a Gigantic Natural Condenser System that Re-Sources All of the Tributary Streams of the Bear Creek Watershed. This Effect Eliminates the Described 95% Per Centile (occurring at 95 degrees Farenheit, and the 90% Percentile (occurring at 90 degrees Farenheit), the Extreme Danger Zone for Catastrophic Fires in the Watershed, from all but approximately ten days per Year.

Because the Prototype Demonstration Project Raises the Humidity of the Watershed, Combustible Wood Fuels have the Moisture Content of the Woody Materials Raised, therefore, Causing a Direct Reduction in the Amounts of Hazardous Fuel Materials Available , Reducing the the Danger of Catastrophic Fires in the Watershed.
The Monthly Average Moisture Content of All Potential Fuels in the Watershed is, thereby raised.

A Properly Cascades Restored mountain Stream is Best Seen as a Slanted Well, each Portion of the Well Casement Appearing as a Water Tables Cascade, that Step the Springs down the Mountain Side.

Once all of the Tributary Streams of the Bear Creek Watershed, Ashland Creek, Tolman Creek, Neil Creek, Walker Creek, Emigrant Creek, Samson Creek, ##d#W##K have their Water Tables Cascades Restored via Backhoe and 3 person Crews, All Rainshadow Effect Mountain Streams, the Severe Chronic Drought manifesting itself through P0K0K#W##0# Broken Water Tables and Declining Water Tables, Will by Definition, be OVER. Therefore, under the Need for Action, and Purpose of the Action, THE FIRST STEP, Technically, MUST BE to Restore all Water Tables of the Tributary Streams of the Watershed to End the Immanent Danger of Catastrophic Fire in the Watershed, which is ths STATED PURPOSE of the Final Environmental Impact Statement.

With the Water Tables Cascades of the Tributary Streams Restored, ending the Severe Chronic Drought Conditions, All Water Tables of the Watershed will be Replenished for nine months of Each year, Directly Resulting in Doubled Annual Snowpack, the Ultimate Source of the City of Ashland Water Supply.

B) Increased Snow Pack Resulting in Cooler Temperatures in the Watershed and,#K therefore, Increased Moisture Content in Potential Hazardous Fuels. Re: Purpose and Need of Final Environmental ImpacKt Statement: " obtain conditions more resilient to wildland fires".

By Re-Establishing PROPER ##### Historical Moisture Content in the Watershed via Water Tables Cascades Stream Restoration, REparian Resources Restoration, Drought Stress leading to Insect Infestations, will be reduced.

C) The Prototype Demonstration Project, took a Declining Stream, holding approximately 25,000 gallons of non-pumpable water during July, Auguast, September, October, to holding capacity of 100,000 gallons of Pumpable Water in the ##0# Project Parameters of one and one third miles restored. Since the Phenomena is Obviously Repeatable upon all 55 Miles of Tributary Streams of the Bear Creek Watershed, Pumpable, renewable, because of renewed groundwater Sources to the Tributary Streams, stored Pumpable Capacity of 2,000,000 gallons is Easily Attainable, from 20 miles of Stream Restoration, Moisturizing the Potential Hazardous Fuels, Providing Pumpable Water for Portable Pumps Airlifted to Fire Outbreaks, and Providing Safety Zones for Firefighters in the Event their Positions are endangered by rapidly moving Fires and Need Readily Available Pools of Water to temporarily Provide Safe havens.

The CLEAR INTENT of the Healthy Forests Restoration Act of 2003 was to Mandate that the Forest Service, Department of Agriculture, along with the Department of Interior, and Bureau of Land Management, Restore to Healthy Conditions, all National Forests under their Jurisdictions. Healthy Forests Restoration CANNOT BE ACCOMPLISHED without Reparian Resources Restoration, Water Tables Cascades Stream Restorations in all National Forests, since Water Tables are the BASIS of all Healthy Forests.

To Argue in your Final Environmental Impact Statement that you LACK the Legislative Mandate to restore the WaterTables Cascades of Any Stream in Any National Forest, Including the Rogue River- Siskiyou National Forest, that contain both the Range of the Northern Spotted Owl, and the Bear Creek Watershed, is extremely Tedious and Indicative of a Complete Lack of Interest in real Science-based Management of National Forests (Re: "Purpose of the Action is to Protect Values at Risk.")

If your Experts cannot see the Clear and Lucid Intent of the Law, Healthy Forests Restoration Act of 2003, then you are Admitting That a MAJOR FLAW EXISTS IN THE ENABLING LEGISLATION, and you are Required, BY LAW, TO REPORT TO CONGRESS, THAT THE FOREST SERVICE IS IMPEDED FROM PROPER RESPONSE TO THE MANDATE OF THE LAW, by Congress FAILING TO INFORM the Forest Service that Healthy Forests Restoration Necessarily include Restoration of Water Tabes in the Streams of a Drought Stricken Watershed (BY DEFINITION OF DROUGHT).

D) The Prototype Stream Demonstration Project Lowered Temperatures in the Section of the Stream within the Project Parameters.

E) Since each Mini-Waterfalls Cascade kills 10% of all Anaerobic Bacteria, Such as Coliform Bacteria, growing ~~rapant~~ rampant throughout the Watershed due to continued imput into Tributary Streams of large Woody Debris, as the continued Intended Policy of the Forest Service, since Coliform and other anaerobic Bacteria CANNOT SURVIVE Super-Oxygenation due to the Air-Water Churning at each Mini-Waterfalls.

F) Lowered the Danger of Catastrophic Flood by Removal of all Wood Materials that might surge down the stream during a 2" to 4" Rain Event, allowing such events to recharge watertables rather than causing Floods to occur. The Forest Service is through its clear Policy of Tossing Large Woody Debris (Final Environmental Impact Statement, at least ten Clearly Stated Intentions to LOAD the Tributary Streams of the Watershed with Large Woody Debris) Setting the Stage for another Catastrophic Flood to Occur.

Air contains 18% Oxygen, therefore all Woody Materials will degrade through aerobic processes, when allowed to decompose on land. As your District Fish Biologist and Program Manager, Ian S. Reid, Final Environmental Impact Statement, should be FULLY AWARE, CHEMICAL DEGRADATION OF WOODY MATERIALS IN WATER, IN STREAMS, IS FAR DIFFERENT. THE AMOUNT OF OXYGEN AVAILABLE IS FAR LESS, A SMALL FRACTION OF 1%. THEREFORE, ALL WOODY MATERIALS LEFT IN WATER, IN STREAMS, TO DEGRADE, WILL ALWAYS DEGRADE ANAEROBICALLY, FORMING ALDEHYDES, KETONES, AND METHANOL, ALL CHEMICALS THAT ARE DEADLY POISONS, LETHAL TOXICS, KILLING ALL NEARBY OXYGEN-BASED LIFE SUCH AS FISH. What grows in such an anaerobic environment, are called Anaerobic Life, such as COLIFORM BACTERIA, THAT GROWS RAMPANT UPON WOOD LEFT IN WATER,IN STREAMS, TO DEGRADE. To Pursue, as Forest Service Policy, the Practice of Tossing Large Woody Debris, Logs, into Streams Located in National Forests, including Streams of the Bear Creek Watershed, is to Consciously Engage in Policy Decisions Leading to Anaerobic Watersheds. Whatever Fish Biologist formulated the conception that Wood degrading in Water, in Streams, is beneficial to Fish Habitat, Must Have Neglected to Perform the Elemental Experiment of Placing a Single Piece of Wood into an Aquarium to degrade, and then Perform the Count of Resulting DEAD FISH, as the Experiment stretches into weeks and months (always the same results, scientifically)

Perhaps,it is the same group of Scientists that Persist in describing as Himalayan Blackberries, a pernicious weed, to be eradicated from the Bear Creek Watershed, instead of correctly identifying the Blackberry as Sourced from Chatauqua County, New York, Common all over New York State, and Ohio (you may send Plant Samples to Cornell University, New York, to Confirm), and brought to the Region by White Settlers from the East Coast, part of the Chatauqua Movement, a group of Zealots wanting Women to have the Right to Attend Public School, learning to both read and write, (not Russian Fur Traders).

Perhaps, it is the same group of Scientists that identify Scotch Broom as a Pernicious Weed, rather than correctly identifying Scotch Broom as a Nitrogen-Fixing Legume, a Free Bag of Fertilizer per Plant, to Any Forest Environment, and therefore, highly BENEFICIAL.

The Responsible Official, Scott Conroy, Forest Supervisor, Rogue River - Siskiyou National Forest, or one of his Subordinates, Removed the Prototype Demonstration Project for Water Tables Cascades Restoration of a Rainshadow ##### Mountain Stream, Ashland Creek, RPParian Resources Restoration, submitted to the Forest Service, Ashland Ranger District, to Don Boucher, Project Lead, on 8/10/05, with an updated, maintained through August 2008, completed Prototype Demonstration Project, submitted to Ashland Ranger District, Don Boucher, Project Lead, 8/21/08, from all analysis and consideration, stating in your Final Environmental Impact Statement, that the Forest Service, Department of Agriculture, was not allowed to consider a Water Tables Cascades Stream Restoration Project, in the Drought-Stricken Bear Creek Watershed, because such a Prototype Project #### was not allowed to be considered under the Healthy Forests Restoration Act of 2003, nor under the Northwest Forest Plan ROD) of May 1994. Your Agents stated that such a Prototype Demonstration Project did not fall within the required Parameters set forth in 1) "The Need for ACTION""; nor within the 2) "Purpose of the Action".

The Final Environmental Impact Statement lists ALL INTENDED ACTIONS BY THE FOREST SERVICE, DEPARTMENT OF AGRICULTURE, for the NEXT TEN YEARS, 650 Pages of Reasons for Intended Actions, and all Intended Actions, without one single sentence, in 650 Pages, Pertaining to Any Restoration of ## Water Tables Cascades in any Tributary Stream of the Drought Stricken ###### Bear Creek Watershed. By Definition of Drought, The Forest Service, Department of Agriculture, is stating that the Bear Creek Watershed WILL REMAIN (BY DEFINITION OF DROUGHT) in Condition of Chronic ##### THROUGH ### 2020 AD Drought THROUGH 2020 AD. Therefore, the Danger of Catastrophic Fire in # the Bear Creek Watershed, due to Chronic Drought Conditions, will, by the EXPLICITLY STATED INTENTIONS of the Department of Agriculture, Forest Service, Rogue River - Siskiyou National Forest, CONTINUE THROUGH # 2020 A.D., without serious interruption to the THOUGHTS of the Department of Agriculture, Forest Service, Department of Interior, nor to the Thoughts of the Bureau of Land Mangement.

The Forest Service Must Remove from the Final Environmental Impact Statement All Explicitly Stated Intentions to Annually Break all Water Tables Cascades, formed by rocks and boulders, in the Tributary Streams of the Bear Creek Watershed, by imput of large woody debris, logs, into all tributary streams of the Watershed.

If you really want another Catastrophic Flood to occur, your Explicitly stated Intende Policy (repeatedly stated in your Final Environmental Impact Statement) will definitely deliver that Desired Result, by your Stated Intention to Load the Contributing Mountain Streams of the Bear Creek Watershed with large Woody Debris Materials, and then, wait for a Hard Rain Situation of 2" to 4" of Rain over a 24 hour Period.

If you want Ideal Conditions for a Water-Born Epidemiological Vector, i.e., Water-Born Epidemic, you should carry out the Forest Service Policy, clearly Stated, Repeatedly in your Final Environmental Impact Statement, to Load the Tributary Streams of the Bear Creek Watershed, including the City of Ashland Watershed, with Large Woody Debris Materials, that will then break down Anaerobically into Aldehydes, Ketones, and Methanols, a Lethal Toxic Brew, Poison to all Oxygen-Based Life, including Fish, Creating Conditions Ideal for Anaerobic Lifeforms including Coliform Bacteria, that grows rampant upon Wood rottin in Stream Environments.

The result will be Reeder Reservior clogged with rotting wood, fetid water, that you have to treat with Aerating Water Cannons, to kill the Coliform Bacteria, fluorishing in the Watershed due to Explicit Forest Service Policy, laid out in your Final Environmental Impact Statement, of Loading the Tributary Streams of the Watershed with Large Woody Debris, left to Degrade in the Streams, or more Aluminum Sulfate, a chemical toxic to neuronal development and implicated in Alzheimers Disease.

Therefore, by your own Stated intentions, in your Final Environmental Impact Statement, in 2020 A.D., the Tribuary Streams of the Watershed will be filled with rotting large Woody Debris, with rampant Coliform Bacteria growth in an Anaerobic Watershed, zero Water Tables Cascades Stream Restoration. By Coincidence, 2020 A.D. is the expected Date at which time, 1/20 Homo Sapiens will have Acquired Immuno-Deficiency Disease. Such conditions Indicate the Immanent Danger of Global Pandemics, including Water-Born Epidemics, NOT A REALLY GOOD TIME TO BE EXPERIMENTING WITH ANAEROBIC WATERSHEDS BROUGHT ON BY INTENTIONAL ORGANIZED POLICY OF THE FOREST SERVICE, DEPARTMENT OF AGRICULTURE, Department of INTERIOR, AND BUREAU OF LAND MANAGEMENT.

N.B., Responsible Official, Scott Conroy, Forest Supervisor, Rogue River - Siskiyou National Forest, that estimated figure is one out of every twenty Homo Sapiens alive on the Planet in 2020 A.D.

(in case you need your Eye Prescription checked)

Alternate Proposal to the United States Department of Agriculture, Forest Service, Ashland Ranger District Rogue River-Siskiyou National Forest, Jackson County, Oregon, as an Authorized Hazardous Fuels Reduction Project under the Healthy Forests Restoration Act of 2003.

This Alternative Proposal requires the Total Restoration of all MINI-CASCADES, all MINI-waterfalls, to all Lands under the Stewardship of the Department of Agriculture, Forest Service, Bureau of Land Management, and Department of Interior. This includes All National Forest Lands, and specifically, the Rogue River-Siskiyou National Forest, and the Ashland Municipal Watershed.

The express purpose of the Project is to totally Restore Riparian Water Tables to the above mentioned Regions, thereby restoring Morning Mists to Tree Crowns resulting in Total Crown Fire Suppression beyond individual Lightning Strike Occurrances which would be singular events due to Restored Riparian Water Tables.

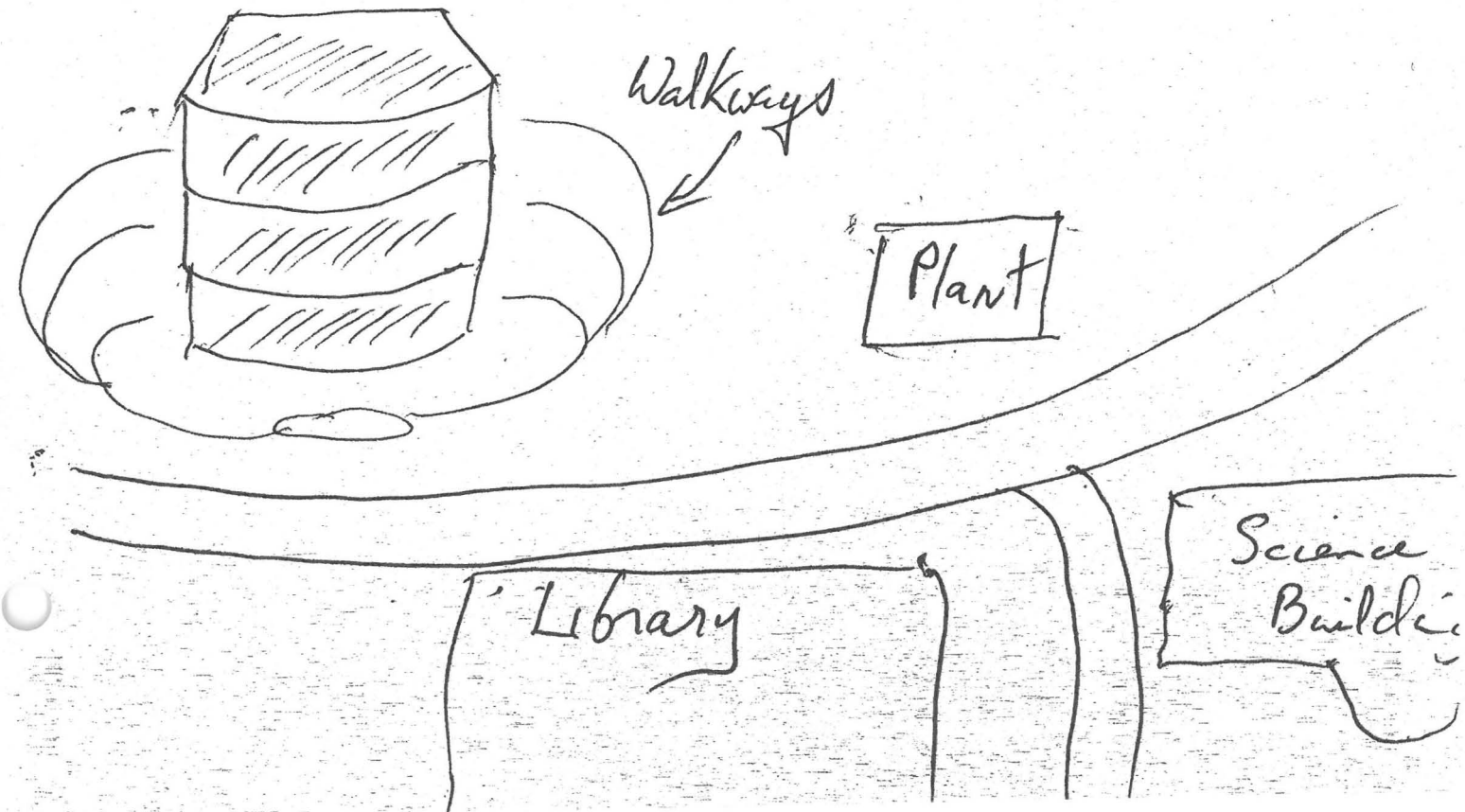
Firefighter Safety is addressed by providing Ubiquitous standing pools of Stream Water as Loci for quick airdrops of portable pumps and hoses for Rapid Fire Fire Suppression. With Focus of the USDA, Forest Service redirected to Restoration of Riparian REsources, Fire Hazard Syndromes will rapidly recede. The RECIDIVISM in the Department of Agriculture and the Department of Interior toward Pyretic Policies laced with Pyromania will finally be permanently Extinguished.

Basis for Preliminary Grant Proposal for Federal Matching Funds for new Research Grade Science Building:

Geological Meteorology and Allied Sciences ------

Center for Stratospheric Studies of Cascade Mountains Watershed at Southern Oregon University

Ideal: Completion of Scientific Depth of Grant Proposal with color photos of regions mentioned including habitats within Study Region



Members of the
Subcommittee on National Parks, Forests and Public Lands
1333 Longworth House Office Building
(202) 226-7736 Fax: (202) 226-2301

Mr. Raúl M. Grijalva, Arizona, Chairman
Mr. Rob Bishop, Utah, Ranking Republican Member

Dale E. Kildee, Michigan
Neil Abercrombie, Hawaii
Donna M. Christensen, Virgin Islands
Rush D. Holt, New Jersey
Dan Boren, Oklahoma
John P. Sarbanes, Maryland
Peter M. DeFazio, Oregon
Maurice D. Hinchey, New York
Ron Kind, Wisconsin
Lois Capps, California
Jay Inslee, Washington
Mark Udall, Colorado
Stephanie Herseth, South Dakota
Heath Shuler, North Carolina
Nick J. Rahall, II, West Virginia *(ex officio)*

John J. Duncan, Jr., Tennessee
Chris Cannon, Utah
Thomas G. Tancredo, Colorado
Jeff Flake, Arizona
Rick Renzi, Arizona
Stevan Pearce, New Mexico
Henry E. Brown, Jr., South Carolina
Louie Gohmert, Texas
Tom Cole, Oklahoma
Dean Heller, Nevada
Bill Sali, Idaho
Doug Lamborn, Colorado
Don Young, Alaska (ex officio)

Members

Members of the
Committee on Natural Resources
U.S. House of Representatives
110th Congress
1329 Longworth House Office Building
(202) 225-6065 Fax: (202) 225-1931

MR. NICK J. RAHALL, II, West Virginia, Chairman
MR. DON YOUNG, Alaska, Ranking Republican Member

(Ratio 27-22)

Dale E. Kildee, Michigan
Eni F.H. Faleomavaega, American Samoa
Neil Abercrombie, Hawaii
Solomon P. Ortiz, Texas
Frank Pallone, Jr., New Jersey
Donna M. Christensen, Virgin Islands
Grace F. Napolitano, California
Rush D. Holt, New Jersey
Raúl M. Grijalva, Arizona
Madeleine Z. Bordallo, Guam
Jim Costa, California
Dan Boren, Oklahoma
John P. Sarbanes, Maryland
George Miller, California
Edward J. Markey, Massachusetts
Peter A. DeFazio, Oregon
Maurice D. Hinchey, New York
Patrick J. Kennedy, Rhode Island
Ron Kind, Wisconsin
Lois Capps, California
Jay Inslee, Washington
Mark Udall, Colorado
Joe Baca, California
Hilda L. Solis, California
Stephanie Herseth, South Dakota
Heath Shuler, North Carolina

Jim Saxton, New Jersey
Elton Gallegly, California
John J. Duncan, Jr., Tennessee
Wayne T. Gilchrest, Maryland
Ken Calvert, California
Chris Cannon, Utah
Thomas G. Tancredo, Colorado
Jeff Flake, Arizona
Rick Renzi, Arizona
Stevan Pearce, New Mexico
Henry E. Brown, Jr., South Carolina
Luis G. Fortuño, Puerto Rico
Cathy McMorris Rodgers, Washington
Bobby Jindal, Louisiana
Louie Gohmert, Texas
Tom Cole, Oklahoma
Rob Bishop, Utah
Bill Shuster, Pennsylvania
Dean Heller, Nevada
Bill Sali, Idaho
Doug Lamborn, Colorado

Congress of the United States
House of Representatives
Subcommittee on National Parks, Forests and Public Lands
1333 Alice B. Longworth House Office Building

Please be aware that a$50 Billion/year Asset Addition to GNP is Presently Lost in your Subcommittee. You need to appropriate a $5 Million/year for 10 years KEY to access this locked away Addition to GNP. Twenty minutes of your time is requested, to read a Technical Science based Proposal for Reparian Resources Restoration on Federal Public Lands under the Management of the Forest Service. The first $50 Billion/year addition to GNP will occur one Calendar Year after the first year of Reparian Resources Restoration.

Light Wavelength is measured in Angstroms (one hundred millionth of a centimeter, 2.54cm.=1 inch). Humans see in the 4000-8000 Angstrom region of the Spectrum (VISIBLE LIGHT). Infrared (HEAT) is in the 7500-8500 Angstrom region of the Spectrum.

The Lava Beds National Monument and Wilderness Region, located in Northern California, is the largest Extinct Shield Volcano System in the continental United States. It presents a huge Surface Area of Black Lava Flows and Sun Baked Adobe. 365 days a year, Sunlight (4000-8000 Angstroms) is Absorbed by the Dark Surface Area of the Lava Beds Wilderness, and re-emitted in the 7500-8500 Angstrom region (INFRARED, HEAT), the Daily Equivalent to the entire Daily Energy Usage of the Los Angeles County Region, 10 million Persons plus industries. This Permanent Meteorological Phenomena Causes a Fixed Heat Pump Energy Source that Daily pushes HOT DRY AIR WEATHER CELLS Continuously into the Stratosphere (HOT AIR RISES), where the Weather Cells then drift across the Continent organizing Weather Patterns in the lower Troposphere beneath them.

If your Subcommittee, via Legislative Directive to the Forest Service, Restore the Water Table Steps of 15 Rainshadow Mountain Stream Systems, Northwest of the Lava Beds Wilderness Region on the Oregon - California Border Region, using nothing more than Standard Backhoes with over-sized Tires and large Buckets, Reparian Resources Restoration - Act of Congress 2007, Theodore Roosevelt Memorial Act (re: Alice B.), you immediately, at a cost of $5 Million/Year, Restore the Most Powerful Beneficial Weather Formation System, in the Continental United States.

Dew Point Effect Clouds willimmediately (within two weeks) begin to reappear above each of the 15 Rainshadow Mountain Stream Systems (as is true whenever the underlying Hydrology, water table steps, cascades, is physically restored, anywhere in the world). The Dew Point Effect Cloud Systems begin as low Cumulus Clouds, dependent on local Barometric Pressure, travel East Southeast through the Oregon Gulch region, and Flow Counter-Clockwise around the Lava Beds Wilderness Heat Pump as they Ascend into the Stratosphere as Exterior Moist Air Coatings around the Daily Upward Pulsations of Hot Dry Air Cells, ACTUALLY CAUSING the Counter-Clock-wise Rotation of the Rising Hot Dry Air Cells (that would otherwise turn Clockwise, producing desicating Upper Level Highs), MAKING THE SYSTEM INTO A CONTINUOUS PRODUCTION OF UPPER LEVEL LOWS, NASCENT OVER THE LAVA BEDS WILDERNESS, GROWING TO MULTI_STATE SIZE AS THEY LEAVE THE REGION.

The first destination of the rising Cumulus Clouds is over the Klamath Mountains of Northern California as an ANOMALOUS Westward Flow of Thin Stratospheric Haze, moving Again Clockwise over the Klamath - Siskiyou Mountains of the Cascade Range of Northern California - Southern Oregon, PRODUCING THE RESTORED NORTHERN RAINFOREST EFFECT, THE PRIME SOURCE FOR RAPID CONIFER GROWTHCYCLES IN THE REGION. It must be annually maintained by the Forest Service (NOT DONE IN 90 YEARS), as the indigenous Salmon Culture Peoples, who used to annually maintain the water step cascades of the discussed Rainshadow Mountain Stream Systems, have not been present in 150 years to perform the needed maintenance.

The Demonstration Project that I began in 2003 and completed in 2004, with maintenance in 2005 and 2006. re-established the Counter-Clockwise Rotation of the Hot Dry Air Upward Pulsations Weather Pattern Formation over the Lava Beds Wilderness: one mile of Rainshadow Mountain Stream System near Mount Ashland, 320 Cascades Restored, 150 verticle feet of Mountain water Tables Restored, 25 tons of boulders repositioned.

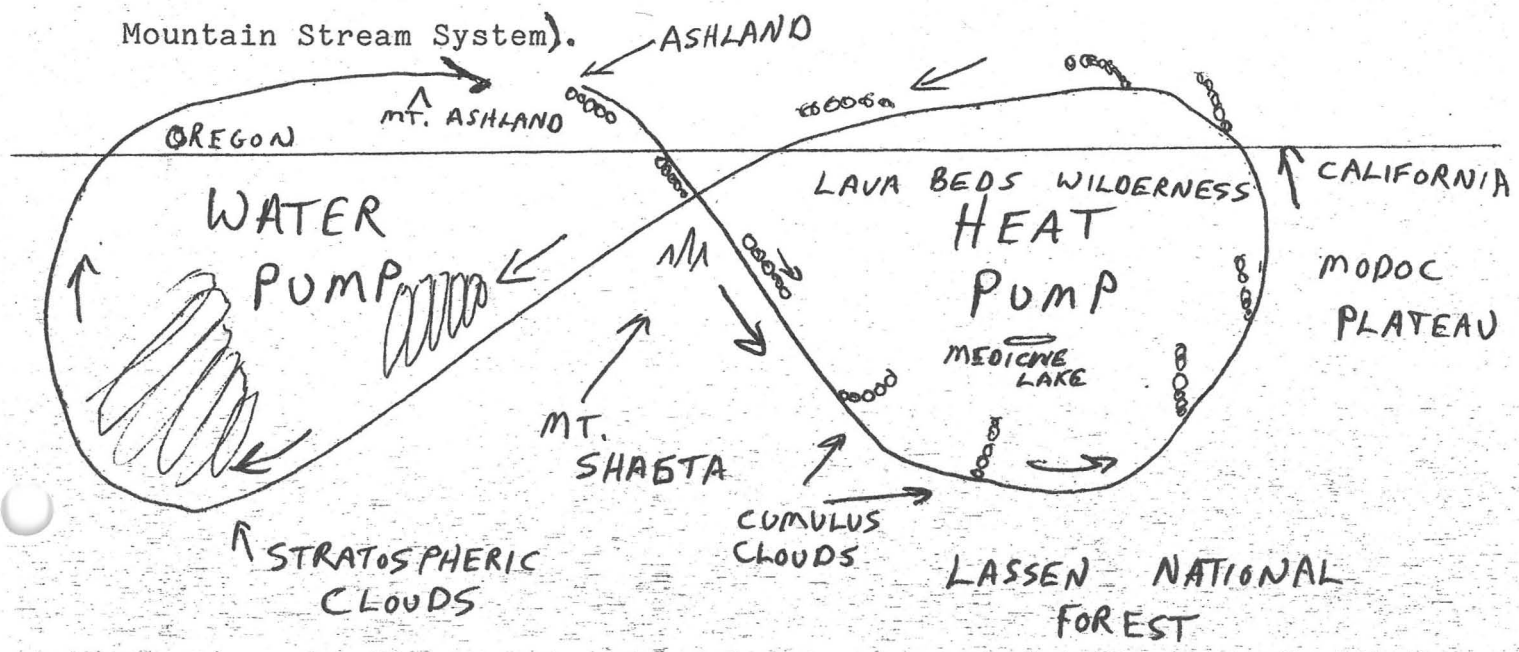
My Working Model Predicted that a minor Reparian Resources Restoration, continuously maintained, sourced in a Critical Rainshadow Mountain Stream System, Ashland Creek, fed by the cold Snow-melt Waters from Mount Ashland, second highest peak in the Region, after Mount Shasta, would End the Regional Drought Syndrome, that had endured for over a Decade, culminating in a 200 Thousand Acre Forest Fire (Ashland Ranger District, U.S.Forest Service), by causing a return to Counter-Clockwise Rotation of the Permanent Meteorological Phenomena, the Hot Dry Air Pulsations into the Stratosphere, over the Lava Beds Wilderness, the Spiritual Center of the Ancient Salmon Culture, which is exactly what has occurred.

That is why Oregon is called Oregon, "Father of Clouds". The Founding Fathers of the United States wore white Whigs until Circa 1835, to Symbolize that they received their Inspiration from the Clouds, Le Ords, including Le Ord beyond other Ords, and hence wrote Divinely Inspired instructions for the rest of the Population, Ords, Laws.

The last time this Source Region for the Northern Rainforest Effect, the Critical Rainshadow Mountain Stream Systems of the Cascade - Siskiyou National Monument was LOGGED OFF (Re: Ashland Ranger District, U.S. Forest Service Report, 2004, 350 Pages, Recomendation of Canopy Reduction (LOG IT OFF) of the Rainshadow Mountain Streams Systems to Prevent Forest Fires), CIRCA 1915, the Dust Bowl followed in two Decades, as the Lava Beds Wilderness Weather Formation System began to spin Clockwise do to Lack of an Exterior Coating of Moist Clouds.

You must NEVER use Concrete to cement the boulders and rocks together, as the Purpose of the Restoration is to produce air churning all the way to the base of the stream with each mini-water table step cascade, causing local air saturation, raising localized Dew Points.

Reparian Restoration of the Rock Cascade Waterfalls Water Table Steps of the Rainshadow Mountain Streams System results in production of almost daily Morning Dewpoint Effect Clouds causing Morning Mists to reappear upon Mountain Slopes. The continuous Cumulus Cloud Formations arising from the Geological Templates of the Rainshadow Valleys feed through the Oregon Gulch Region into the Lava Beds National Monument and Wilderness Region, the massive natural Heat Pump of the Northern Rainforest Effect System. The Core Air within the Heat Pump Region will always be Driven Upward by Solar Radiation Absorption by the Black Lava and Sun-Baked Adobe in the 4000 - 8000 Angstrom Region (LIGHT, Visible) and re-emitted in the 7500-8500 Angstrom Rgion of the Spectrum (Heat). The Moist Cloud Coating is absolutely Necessary on the Outside of the Sky Bowl to give the Sky Bowl a Counter-Clockwise Rotation, Pumping Cumulus Clouds into the Stratosphere above the Klamath Mountains resulting in the Cooling Northern Rainforest Effect of a Stratospheric Haze. Every few days, the Upper Level Low (Sky Bowl) breaks loose from the Permanent Potter's Wheel and Drifts across the Continent of North America as an Upper Level Low (the Center is filled with Hot Dry Air Causing the Air Mass to Rise, but it is Spinning Counter-Clockwise because of the Outside Cloud Coating coming from the Rainshadow Mountain Stream System).



A Two Paragraph Addition to one of your Funding Acts (such as the Refunding of the Forest service for the $1.5 Billion spent putting out Fires in 2006), would be sufficient to state the Act of Congress, RRR, TRMA 2007, Fund it: $5 Million/year, 10 years, and state Explicit Mandated earmarked Intent: 15 Rainshadow Mountain Stream Systems, Location: Southern Oregon - Northern California, Cascade Siskiyou ###### National Monument, Taskforce: 15 purchased Standard Backhoes with Oversized Tires and large Buckets, 3 man Crews, one Pickup Truck per Crew, purchased, 45 person total, Work Window: 1 July - 31 October, full time, at pay rate of $55 Thousand/year, Work Output expected to average 265 linear streambed feet of Rainshadow Mountain stream #System Water Table Steps (formerly known as Cascades), averaging one Cascade Restored per 20 linear streambed feet,including the removal of All Log Materials that might float down the streams at high water if not removed, per backhoe Crew per workday. (That is 80 steps from your office down the hallway per workday, the typical stream being the width of your hallway or less). The 15 backhoe Crews of 3 men each, 45 person total, will have completed 60 MILES of Rainshadow Mountain Stream Systems by 31 October 2007 after 4 months of effort beginning 1 July 2007, at a COST of ### $3.5 million, including the Cost of the Purchase of the Backhoes. In five years, the same number of backhoe Crews, 15, working the same 4 month work window each year, July, August, September, October, 45 men total, will have completed 240 MILES of Rainshadow Mountain Stream System ##### Water Step Mountain Stream Cascades.

The Northern Rain###forest Effect along with the weekly Production of Upper Level Lows Sourced over the Lava Beds Wilderness, will be PERMANENTLY RESTORED, providing a steady supply of Rains to the Nation's Forests, crop Lands, Range Lands, along with Winter Snow pack. The Net Cost (before Hog Trough Bureaucratic Intrusions) will be $17.5 Million over a five year period ($3.5 Million/year).

The suggested concurrent establishment of a Forest Service Funded Research Grade Building located at Southern Oregon University, Center for Stratospheric Studies of the Cascade Mountains Watershed, staffed by the best minds your Subcommittee and the Forest Service can find, to study the Permanent Meteorolggical Phenomena as it Strengthens and Endures with Each Additional Mile of Rainshadow Mountain Stream System Water Table Step Cascades Restored, is intended that your House Subcommittee and the Forest Service Never Again Forget where the Phenomena is Sourced, Why, and what happens if you turn off the System again, as happened in the era ending circa 1915, when the Critical Rainshadow Mountain Stream Systems were Logged Off, resulting in the Clockwise Rotation of the Hot Dry Air Nascent Weather Cells Sourced over the Lava Beds Wilderness (what hot dry air cells do when Lacking an Exterior ## Coating of Moist Air Cells, and being the likely Source of the Dust Bowl two decades later).

When the Jet Stream passes over the Lava Beds Wilderness, the masses of Hot Dry Air continuously Ascend, enter the Transport Mechanism, and are carried wherever the Jet Stream Journeys. As the Hot Dry Air masses are slowly spinning Counter-Clockwise, due to the introduction of a Moist Air Coating upon the exterior surface of the Hot Dry Ascending Air masses, they are called Upper Level Lows. They then organize Weather Patterns beneath the Jet Stream into vast multi-State Weather Systems producing large quantities of Precipitation.

Chemists at SOU engaged in research at the Proposed Center for Stratospheric Studies, would be working on Fluid Dynamics, Condensation Reaction Theory, Heat Pump Driven Systems Analysis, Phase Changes, and the Chemical Basis of Meteorology. When studying monsoonal weather patterns over New Mexico and Arizona caused by Upper Level Lows originating in the Lava Beds Wilderness, they might take time from their basic research, to send suggestive Directives to the Departments of Agriculture and Interior, to send their backhoes into the dry Arroyos to rebuild the ancient Water Table Steps to Effect Permanent Changes in Regional weather Patterns by rock layer storage of Precipitation, to cause reappearance of Dew Point Effect Cloud Patterns.

There are two basic designs of Reservoir Storage. One type uses massive amounts of concrete and rebars, and results in a presentation of a large surface area of exposed Water Table. The water stored is low in oxygen and incapable of sustaining large populations of fish species. Chemicals are used to kill simple plant life which would rot to cause putrescent water.

The second type of Reservoir System stores the same amount of water, via Water Table Step Method, that allows sustained Flora and Fauna, since the mini-waterfalls OXYGENATE the water killing off pathogenic bacteria. Most of the water is stored unseen in layers of semi-permeable rock. Such Reservoirs are extremely inexpensive to build. They must be annually maintained. Reservoir Capacity equivalent to very large Dams can be built from a few minor stream valleys via the Water Table Step Method with ZERO concrete, at low cost.

(Noto Bene, Moneo: The last time this <u>particular</u> region was canopy reduced, circa 1915, causing the Heat Pump to have Clokk-wise rotation, I.E. producing upper level Highs, the Dust Bowl followed in 20 years.)

I am enclosing copies of the Thesis Basis for the Permanent Demonstration Model, located in Lithia Park within Ashland Creek, Ashland, Oregon, for proper Reparian Resources Restoration of Rainshadow Mountain Streams. I have included the Thesis as an integral scientific and archeological basis for my Alternative Proposal to the United States Department of Agriculture, Forest Service, Ashland Ranger District, Rogue River - Siskiyou National Forest, Jackson County, Oregon, as an Authorized Hazardous Fuels Reduction Project, Stage 5, Demonstration Project Model, Completed, under the Healthy Forests Restoration Act of 2003, received by the Forest Service, Ashland, Oregon on 8/10/2005.

Other persons previously receiving copies include:

1) All members of Biology Department at Southern Oregon University
2*) All members of Chemistry Department at Southern Oregon University
2) All members of Geology Department at Southern Oregon University
3) Most members of Anthropology Department at Southern Oregon University
4) President of Southern Oregon University, Elizabeth Zissner
5) Mayor of Ashland, Oregon
6) All members of Parks Commission, Ashland, Oregon
7) Forest Service, Ashland Ranger District, 5 Copies, 8 October 2005
8) Ashland Forest Lands Commission, Ashland Fire Resiliency Community Alternative Technical Committee, July 12, 2005, 8 Copies

ESTIMATED COST: $5,000,000 /Year over a Ten Year Period.

ESTIMATED BENEFIT: Restoration of Northern Rainforest Effect for the Klamath-Siskiyou Mountains of the Cascade Range with Return to Rapid Growth Cycles in Conifer Forests.

ESTIMATED BENEFIT: Guarantee by legislative mandate of proper Annual Maintenance of the Source Waters Aquafer for the Sacramento Valley Watershed, which supplies needed water to 8 per cent of the national Food Supply.

Estimated BENEFIT: Tourism Revenues from Annual increase in SNOWPACK.

Also included in the Proposed Legislation is Funding for a new Research Grade Building at Southern Oregon University, Center For Stratospheric Studies of the Cascade Mountains Watershed (to serve as the academic accomplice to the Forest Service in the Region, and to make sure that the Pure Scientific Basis for the Proposed Legislation as well as the new Reparian Resources Restoration science directed management of the Forest Service does not get lost in extremely expensive Bureaucratic Overthink and Hogwash. This will be the first regional Reparian Resources Restoration based in Pure Science, and upon the Archeological Evidence of the now Extinct Salmon Culture. The Feathers of their Civilization were the Rainshadow Mountain Stream Valleys and the Distinctive Dew Point Cloud Patterns that issued almost every Morning from the Geological Valley Templates resulting from their Annual Maintenance of the Water Cascade Steps of their Stream -Cloud based Culture. Fact: Rebuild the Water Table Steps of the Rainshadow Mountain Stream System and the Cloud Patterns, not seen since Logging and Mining Destroyed the Water Table Steps, will IMMEDIATELY REAPPEAR. The Northern Rainforest Effect of the Klamath-Siskiyou Mountains will be Permanently reestablished by a Single Signature by the President.

This is to be a LOW TECH, LOW COST Reparian Resources Restoration, utilizing standard hydraulic lift equipment, to correctly reposition boulders in Rainshadow Mountain Stream Systems to Effect the Restoration of Mountain Stream Water Tables, causing the Restoration of the DewPoint Based Cloud Systems that will then arise almost Daily from the Restored Geological Templates. In five years, Most of the Rainshadow Mountain Streams System Water Tables Restoration will have been completed. (By then, The Department of Interior will notice, with a RIGOR MORTIS TWITCH, that Drought Stricken Range Lands result directly from broken Water Tables in Streams under their Jurisdiction, and your Legislation will become one of the most Bipartisan politically Popular Acts ever passed by Congress and Signed by a President. You will havebegun to switch City Green Votes toward Theodore Roosevelt Republicans, the natural center of Political Consciousness.

Dew Point Condensation occurs upon all surface areas attaining the proper Dew Point Temperature on a particular day. It is a Scientific fact that the more surface area available for Condensation, at Dew Point, the more, de facto, without any shadow of a doubt,Condensation (in quantity) will occur. When the Forest Service is proposing Canopy Reduction in a Rainshadow Mountain Stream System to reduce chance of Forest Fires (Ashland Watershed, 350 page report,2004), on a surface scientific basis, they are Dead Wrong.

The Forest Service is headed in the absolutely wrong direction in terms of Restoring the Northern Rainforest Effect in Southern Oregon and Northern California over the Klamath-Siskiyou Mountains. In Rainshadow Mountain Stream Valley Systems, they Should be Seeking to Maximize Canopy. Once they have correctly Responded to the HYDROLOGY PROBLEM of Drought by Restoring the underlying Hydrology of the Stream System, by building up the long neglected Water Table Steps of the Rainshadow Mountain Streams System, the maximized canopy surface will receive Maximum Condensation Amounts of Dew, Mountain Mists, and Rain from the Restored Geological Templates of Cloud Formation.

The Restored Water Table Steps of the Stream Systems will begin to regenerate Dew Point Effect Clouds the Same Month the Restoration is completed. The Clouds will feed into the Heat Pump of the Lava Beds National Monument and Wilderness, and the necessary Stratospheric Overcast over the Klamath-Siskiyou Mountains will be Permanently Restored. That ##### will complete the Restoration of the Northern Rainforest Effect, resulting in Return of Rapid Growth Cycles in Conifer Forests of the Region. The renewed Morning Mists uponthe Mountains will once again become a Permanent Reality.

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

May 5, 2006

The churning of air bubbles into the stream waters at each mini-waterfalls kills all anaerobic bacteria, constantly purifying the Mountain Stream waters.

The Meteorological Advisors to your Committee, and Subcommittee, can readily verify the Commencement of the Strong Upper Level Low Weather Phenomena over the Continental United States, including its Sourcing over the Lava Beds Ntional Monument and Wilderness, simply by re-winding theWeather Satellite Scans of the Continental United States back to 2003 and then fast forwarding to 2007 while they study Upper Level Lows continuously originating on the Oregon - California Border Region.

(Or the Meteorology Experts could just dismiss the entire subject with a few well placed chants of " El Nino, El Nino, El Nino", an endless Tautology of Inertia that plays well inthat great Wind Tunnel of Hot Gas, Washington, D.C.)

Sincerely Yours,

Terrence C. Stenson

Terrence C. Stenson

March 2, 2007

COMMITTEES:

ENERGY AND COMMERCE
OVERSIGHT AND INVESTIGATIONS
VICE CHAIRMAN
ENERGY AND AIR QUALITY
TELECOMMUNICATIONS AND THE INTERNET

RESOURCES
FORESTS AND FOREST HEALTH
CHAIRMAN
WATER AND POWER

Congress of the United States
House of Representatives

GREG WALDEN
2D DISTRICT, OREGON
DEPUTY MAJORITY WHIP

WASHINGTON, DC OFFICE:
1210 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-3702
TELEPHONE: (202) 225-6730

DISTRICT OFFICES:
843 EAST MAIN STREET
SUITE 400
MEDFORD, OR 97504
TELEPHONE: (541) 776-4646
TOLL FREE: (800) 533-3303

JAMISON BUILDING
SUITE 201
131 NW HAWTHORNE STREET
BEND, OR 97701
TELEPHONE: (541) 389-4408

WEBSITE:
http://walden.house.gov
(E-MAIL AVAILABLE ON WEBSITE)

February 13, 2005

Terrence C Stenson
297 Garfield St
Ashland, OR 97520-2217

Dear Terrence:

How Congress funds veterans' services is especially important this year as 100,000 new combat veterans from Iraq and Afghanistan are entering the system. In 2007, the Department of Veterans Affairs (VA) expects to treat a record 5.3 million veterans (79 percent of whom are service-connected disabled veterans), while at the same time improving timely access for health care appointments across the system and reducing the processing time for disability claims.

I'm pleased that the President's budget singles out the VA to receive one of the biggest increases in discretionary spending of any government agency. The proposal would increase the medical care budget by a healthy 11.3 percent, the largest increase in discretionary funding for the VA ever requested by a President.

Enacting this proposal would mean that Congress and the administration will have increased the VA budget by 69 percent since 2001. As you know, Congress uses the President's request as a starting point from which the final budget level is ultimately determined. I will continue to engage with veterans' groups, the VA and my colleagues to make sure those who have worn our nation's uniform get the quality care they have earned.

In just the last two years, Congress has increased funding for veterans' medical care by 18 percent while rejecting additional fees for those receiving care. In addition to my efforts to maintain increased funding, I also continue to support legislation to make VA healthcare spending mandatory rather than discretionary to further show our servicemen and women, past and present, that their country cares for them and supports them.

On another initiative, recently I traveled to Vietnam and met with leaders of our country's POW/MIA recovery effort. I accompanied my colleague, Rep. Sam Johnson of Texas, who was held captive for nearly seven years. It was his first trip back to the "Hanoi Hilton" since his release more than 30 years ago. We wanted to both express our nation's appreciation for the level of cooperation that exists today, but also call for increased assistance, especially in recovery efforts in the ocean off Vietnam. America must never forget those who were left behind.

Please stay in touch if I can be of assistance at any time. It's an honor to represent you in Congress.

Best regards,

GREG WALDEN
Member of Congress

P.S. I encourage you to take a moment to visit my website at http://walden.house.gov where you can read about current legislative issues, contact me with your thoughts and sign up for my e-newsletter.

This mailing was prepared, published and mailed at taxpayer expense.

I am providing each member of the Ashland City Council with a copy of material sent to the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands, concerning a completed Demonstration Project, for the Forest Service, under the Healthy Forests Restoration Act of 2003, located in Ashland Creek, within Lithia Park. It involves a re-stepping of the Cascades of Rainshadow Mountain Streams, such as Ashland Creek, to re-establish Water Tables, Regionally, and, therefore, effectively ending Artificial Drought Cycles. The local Demonstration Project includes 320 Cascades restored, 120 feet of water tables restored.

Six members of the House Subcommittee have, so far, accepted the material: Congresspersons: Abercrombie, Hawaii, Baca, California, Cole, Oklahoma, Brown, South Carolina, Gallegly, California, and Miller, California.

By following the Demonstration Model, utilizing a standard Backhoe with 3 person team, and totally re-stepping the Cascades of Neil Creek, and upper Ashland Creek, above Reeder Reservoir, Re-establishing the Water Tables, effectively re-constructing over 500 feet of mini-waterfalls, I.E. Cascades, during July, August, September 2008, Completion Date for Project: 30 September 2008, your City Council will have effectively Doubled the local Snow Pack of Mount Ashland, guaranteeing healthy survival of your Snow Pack Based Winter Tourism Industry.

You may also utilize the Demonstration Model by allowing it to fulfill Stage One, Demonstration Model, Completed, of the State of Oregon Mandate: that the City of Ashland 1) Lower Water Temperatures, 2) Lower Stream Turbidity, and 3) Lower Bacteria Counts in the Ashland Creek - Bear Creek Reparian Zone.

Each mini-Waterfalls, Cascade, effectively kills 10% of all Anaerobic Bacteria, since they cannot survive Super-Oxygenation of the Stream Waters, resulting from air churning at each mini-Waterfalls.

The Other Direct Benefit is Saturation of Local Air Cells, nightly descending to Ashland Creek from the Rainshadow Mountain. The Local Air Cells undergo Air- Water Churning at each mini-Waterfalls resulting in Saturation of Local Air Cells, raising localized Dew Points, and, therefore, causing Morning mists to reappear upon surrounding Mountain Slopes. The Restored Morning Mountain Mists reduce most significant Fire Hazards to local Forest Environments.

The Net Result is an increase in locally based Cumulus Clouds, with corresponding increases in Winter Snow Pack.
That benefits Winter Tourism, regional Ecology, including Old Growth, rare and endangered Species, and the continued prosperity of local Vineyards, and Orchards.

The estimated cost for the 3 month Project upon Neil Creek, and upper Ashland Creek, including salaries for the 3 person crew, is $ 50,000. The amount should be successfully billed to the Forest Service as a Hazardous Waste Fuel Reduction Project, Riparian Restoration, under the Healthy Forests Restoration Act of ~~2002~~ 2003.

Ashland, Oregon
Ashland
~~Ashland~~ City Council

If you really want another Catastrophic Flood to Occur, you should direct the U.S. Forest Service, per your explicit instructions, to Load the contributing mountain streams of the Ashland Creek - Bear Creek Watershed with large Woody Debris Materials, and then, wait for a Hard Rain Situation of 2" to 4" of Rain over a 24 Hour Period.

If you want Ideal Conditions for a Water-Born Epidemiological Vector, i.e. Water-born Epidemic, you should direct the U.S. Forest Service, to Load the Streams of the City of Ashland Watershed, with Large Woody Debris Materials, that then break down Anaerobically into Methanols, Aldehydes, and Ketones, a lethal Toxic Brew, creating Anaerobic Conditions Ideal for Chronic Coliform Bacteria Growth.

The Result will be Reeder Reservior clogged with rotting wood, fetid water, (and a very expensive Water Bill Clean-up Surcharge), that you have to Treat with Aerating Water Cannons, to kill the Coliform Bacteria, or more Aluminum Sulfate, a chemical toxic to neuronal development, and implicated in Alzheimers Disease.

Ashland, Oregon
Ashland City Council

The express purpose of the Ashland Forest Resiliency Community /Alternative (AFRCA) Report was to discuss with the Forest Service " Managing the entire municipal watershed including protection and restoration of aquatic and reparian conditions, to support and allow for continued production of high quality drinking water for the City of Ashland".

The Report, extending through 650 pages, accomplishes ##### an amazing feat. It does not include a single sentence relating Restoration of Water Tables in the Tributary streams of a ## Drought-Stricken Watershed. Broken Water Tables, and Declining Water Tables are part of the Definition of Drought. Therefore, the Restoration of Reparian Water Tables in the Tributary Streams of the Ashland Creek - Bear Creek Watershed, (All Tributary Streams within that Watershed) must be stated # as the Primary Goal of Any City of Ashland- Forest Service Response to the Danger of Catastrophic Fire in the Watershed.

Failure to Place Restoration of ######## Reparian Water Tables as the Primary Goal of the AFRCA Report, and as the Primary Goal of any Forest Service Activities in the # Ashland City # Watershed, severely diminishes the Scientific Quality and Scientific Value of the Report/.

You have to Restore Broken Water Tables in the ######## Tributary Streams of the Watershed, or BY THE DEFINITION OF DROUGHT, the City of Ashland Watershed, STAYS IN DROUGHT. Drought, and broken Water Tables are the Cause of the Danger of Catastrophic Fire in the Watershed.

MINUTES FOR A SPECIAL MEETING OF THE
ASHLAND FOREST LANDS COMMISSION
ASHLAND FIRE RESILENCY COMMUNITY ALTERNATIVE TECHNICAL COMMITTEE
July 12, 2005
Community Development, 51 Winburn Way

A. CALL TO ORDER: 4:40 PM

Marty Main, Consulting Forester and Ashland Forest Lands Commission Liaison to the Forest Service, called the meeting to order. Other attendees included: Keith Woodley, George Badura, Chris Chambers, Nancy Slocum, Darren Borgias, Joan Resnick, Citizen Eric Navickas, Citizen Terry Stenson, SOU Sociology Professor Mark Shibley, SOU Student Ann Taylor, Joseph Vaile and Bob Plain, reporter for the Daily Tidings.

B. NEW BUSINESS

1. Public Comment – Terry Stenson made available a study with associated photos of a Geological Meteorology and Allied Sciences project. He described the geological principle of meteorology and its effect on moisture in the watershed which in turn could effect wildfire suppression.

Mark Shibley, Sociology Professor at SOU, appreciated the work of the Forest Commission and AFRCAT on the City Restoration Project Phase II. He teaches a class called "People and the Forest" and sees this project as an innovative educational opportunity for his students.

Eric Navickas spoke against logging in roadless areas, the construction of helicopter pads to remove trees, compartmentalization and the lack of diameter limits.

Main introduced Joan Resnick, professional facilitator and owner of The Real Life Training Group. She offered to facilitate the meeting with the focus on public process and developing a long term relationship with the Forest Service.

Borgias thought the immediate task for committee members was to read and analyze the DEIS. Questions to answer during review include: How will the Forest Service measure the effects of treatment? How well did the Forest Service interpret the AFRCA? What are the comments on the Forest Service's AFR proposal (e.g. their proposal inadequately addresses long-term soil productivity)? There was also a need for definitions of technical terms.

Navickas commented that the DEIS should have included a clear representation of previous treatments as well as the modeling used for flame models.

Vaile thought an enormous issue unique to this project was that the Forest Service's analysis was based solely on satellite imagery. How do you determine the accuracy of Plant Association Groups (PAG)? On the ground inventory (ground truthing) was

City of Ashland

Ashland Parks Commission / Ashland Forests Commission

Should you dip your feet into Ashland Creek on the 4th of July, 2005, you will notice the water temperatures are back to frigid, a requirement for the restored primordial Salmon spawning beds located in Ashland Creek. Water Quality will be up all Summer as the temperature of the Stream will remain low due to the depths of the restored fish ladder pools. High temperature of water was due to low water levels and consequent exposure of stream rocks and boulders to constant solar heating leading directly to high bacteria counts. The Forest Service left the refrigerator door open and the bacteria multiplied. It had nothing to do with ducks in the stream.

The Department of Agriculture, the Bureau of Land Management, and the Forest Service, have been pulling the wool over the eyes of the Citizens of Oregon, including Dairy Farmers, Orchardists, Vineyard Owners, and all of your State and City Commissions listening to their endless Bureaucratic Deceptions. Since the Death of Theodore Roosevelt, NOT ONE SINGLE STREAM HAS HAD ITS FISH LADDERS RESTORED FOLLOWING LOGGING AND MINING. The Water Tables of the Entire Western Mountain System have been annually DRAINED DOWN without replenishment. Flat water IN ANY STREAM, ANYWHERE IN THE WORLD, IS THE WATER TABLE FOR THAT LOCATION. ThAT IS THE DEFINITION OF WATER TABLE. ANY DAMNED FOOL KNOWS THAT IS TRUE. THIS INTENTIONAL MISMANAGEMENT OF RIPARIAN RESOURCES BY THE Department of Agriculture, should be halted.

What remains for Ashland, are property purchases at the top of Lithia Park to qualify you as an Entrance to a New National Park with hiking trails to Mount Ashland. Your Parking Infrastructure is already complete and adequate. An abatement at the crest of Strawberry Lane, beside an entrance to a private dirt road will complete the Site requirements for the Top Entrance to the Proposed National Park.

At the July, 2009 Meeting of the Ashland Parks Commission, for the Record, I provided a Progress Report on the Prototype Stream Reparian Resources Restoration Demonstration Project located in Ashland Creek within ### Lithia Park, Ashland, Oregon.

For the Record, I also included Proposed Legislation, 3rd year of Consideration, presently before 30 members of the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands; also letters to Congressman## Greg Walden, 2nd District, Oregon, U.S. Senator Wyden, Oregon, and Gail Kimbell, Head of the U.S. Forest Service.

The Demonstration Model concerns how the Ashland Creek - Bear Creek Watershed should be Properly Restored, to, BY DEFINITION, end the Artificial Drought Conditions, by Proper Restoration of ALL Stream Based Water Tables, i.e., Cascades Water Tables Streams Restorations, via backhoes and 3 person crews. The 45 person -Jobs Ready - Proposal would be funded at $3.5 million/year, for 10 years, and would Restore All Mountain Sourced Streams of Southern Oregon and Northern California, at the Rate of 60 Miles OF Mountain Streams Restoration per Year, including the Headwaters of the Sacramento Valley Watershed Source Waters Aquafer, which supplies needed Water to 8 per cent of the National Food Supply.

The Purpose is to Permanently Eliminate the Drought Cycle from the Region, Restoring the Northern Rainforest Effect, Continental Source for Rapid Growth Cycles in Conifer Forests of the Region.

For six years, I have removed all woody debris, including logs and woody brush, from Ashland Creek, ####while Restoring 350 Water Tables Stream Cascades to the condition that would have been seen in the 1901 - 1909 Period, during the Presidency of Theodore Roosevelt, when most National Parks, National Forests, and Public Lands, were first #Established. The Prototype Demonstation Project within Lithia Park extends from the beginning of the Park to upper Lithia Park where the Hiking Trail begins a steep ascent due to privately owned stream corridor. It also extends from Hershey Street to beyond Van Ness Street.

Since 2005, I have kept your City Government completely informed via Parks Commission, Planning Commission, Ashland Forest Resiliency, Ashland City Council; as well as Rep. Walden who received the Proposed Enabling Legislation, to accompany the Healthy Forests Restoration Act, which he Authored. As I stated to Rep. Walden , in writing, the U.S. Forest Service, WILL NOT BE #RESTORING ANY STREAMS IN THE ASHLAND CREEK _ BEAR CREEK WATERSHED THROUGH ##### 2020 A.D. as CONGRESS DID NOT EXPLICITLY MANDATE ANY STREAMS RESTORATIONS IN THE HEALTHY FORESTS RESTORATION ACT OF 2003. Therefore, BY DEFINITION, the Ashland Creek - Bear Creek Watershed will remain in Drought Condition through 2020 A.D., AND, THEREFORE, IN DANGER OF CATASTROPHIC WILDFIRES, THROUGH [redacted] A.D.
2020

Ashland Creek, within Lithia Park, will be the only Stream Section within the City of Ashland Watershed, the Ashland Creek -Bear Creek Watershed, Demonstrating what a mountain Stream looks like when Restored to, by DEFINITION, Non-Drought Condition, through 2020 A.D.
Before 2004, when I completed the Prototype Cascades Stream Restoration Project, Ashland Creek was a Stream consisting of totally Broken Water Tables Cascades, infested with coliform bacteria growing upon rotting logs and rotting brush degrading anaerobically producing aldehydes, ketones, and methanol, all toxic poisons, It was the sole source of the coliform bacteria and resulting fetid smells prevailing in downtown Ashland each summer, until 2005. Once the anaerobically decaying woody debris was removed from the Ashland Creek, the sources of the anaerobic coliform bacteria, the fetid odors prevailing each summer in downtown Ashland totally DISAPPEARED.
Since 2005, you have been able to enjoy shopping and Dining in downtown Ashland, as well as attending Shakespeare Festivals Theatre without any trace of the Coliform Bacteria Smell, that weakened your tourism based summer trade, and lessened the enjoyment of those persons frequenting your downtown Ashland Restaurants.

The situation at the Apartment Residences on Hershey Street was similar. The new residences were subjected to fetid colifomm sourced smells arising from Ashland Creek, to their balcony apartments until I removed all wood from Ashland Creek from their apartments to Ashland Creek Inn, with Restoration of 40 Water Tables Stream Cascades.

This Summer, with temperatures over 90 degrees F. since 1 July 2009, has been an excellent demonstration of how clean downtown Ashland can smell, once all woody debris is removed from Ashland Creek and and the 350 Water Tables Stream Cascades are restored to the status prevailing circa 1901 -1909, during the Presidency of Theodore Roosevelt.

Providing your City Government mandates that all logs and woody debris be promptly removed from Ashland Creek each summer during low water conditions, the Prototype Cascades Water Tables Streams Restoration Project, with mimimal annual summer maintenance, will be a permanent aesthetic benefit to Lithia Park. It will also remain as a permanent lesson to the Citizens of Ashland, what the Ashland Creek - Bear Creek Watershed could look like, providing Coliform -free water to Reeder Reservoir.

REMEMBER; The present intended Policy of the U.S. Forest Service calls for imput of LARGE WOODY DEBRIS into all Stream Tributary Sources of the AShland Creek - Bear Creek Watershed, with ZERO Streams Restorations through 2020 A.D.

To continue blaming the ducks of the Lithia Park Duck Pond, for the coliform bacteria smell in downtown Ashland is intellectually dishonest. Any employee of the Water Department would give you the same answer. You have to maintain a 24 hour strong fountain in the the center of the Duck Pond to recirculate the water to ~~all~~ ### kill all of the anaerobic coliform bacteria, all summer, every summer, with twice monthly water vacuuming of excrement at the bottom of the Duck Pond That maintenance schedule will kill all anaerobic coliform bacteria present in the Duck Pond. The False Waterfalls DOES NOT WORK, because the ##### small boulders are cemented together, rather than using a free - mason style with zero cement, and strong water recycling that would have super-oxygenated the recycling water killing the anaerobic coliform bacteria in the Duck Pond,.

The sole sources of the anaerobic coliform ####### bacteria ### were woody debris, rotting anaerobically in Ashland Creek.

When using U.S, Forest Service as the intellectual source for decisions in Lithia Park, such as removal of Madrone Trees, a winter food source for Robins, and Scotch Broom, a beneficial ## legume, a #free bag of fertilizer to any forest environment, not a pernicious weed, you are dipping low for intellectual support.

The blackberries did not come from the Himalayas, they were brought into the region by pioneer families from the eastern states.

I would like to Report to the Ashland City Council concerning Progress on the Prototype Stream Reparian Resources Restoration Demonstration Project in Lithia Park, Ashland, Oregon.

For the Record, I am including Proposed Legislation, 3rd year of Consideration, Presently before 30 Members of the U.S. House of Representatives, Subcommittee on National Parks, National Forests, and Public Lands, Congressman Greg Walden, 2nd District, Oregon, U.S. Senator Wyden, Oregon, and Gail Kimbell, Head of the U.S. Forest Service. The Demonstration Model concerns how the Ashland Creek - Bear Creek Watershed should be Prperly restored.

For the Record, I am also including the Technical Response to the Final Impact Statement Prepared by the U.S. Forest Service, Ashland Ranger District, Ashland Forest Resiliency, 650 Pages, concerning All ##### Intended Actions through 2020 A.D., with ZERO INTENDED REPARIAN RESOURCES RESTORATIONS, STREAM WATER TABLES CASCADES RESTORATIONS, AS CONGRESS DID NOT MANDATE ANY SUCH RESTORATIONS UNDER THE HEALTHY FORESTS RESTORATIONS ACT OF @### @### 2003. As I described to Congressman Greg Walden, Original Author of the Healthy Forests Restoration Act, the U.S. Forest Service is being Extremely Tedious on the subject, #### since the Words Healthy Forests Restoration Act, Clearly DENOTE STREAMS RESTORATION as any Forests Subjected to Drought, will be Susceptible to Insect Predations, and the Continued Danger of Catastrophic Forest Fires UNTIL the the Artificial Drought Conditions are REMOVED by Water Tables Cascades Stream Restorations to all Tributary Streams of the Watershed, Reparian Resources Restoration, which BY DEFINITION, ENDS DRAUGHT CONDITIONS in the Watershed, Severely Decreasing the Danger of Catastrophic Wildfires in the Watershed,. By Present Forest Service Intentions of Zero Cascades Water Table Streams Restorations through 2020 A.D., # the Ashland Creek - Bear Creek Watershed will, BY DEFINITION REMAIN in Condition of Chronic Drought through 2020 A.D., and therefore, in Danger of Catastrophic Wildfires through 2020 A.D.

By U.S. Forest Service INTENTION to Imput Large Woody Debris into ALL Tributary Streams of the AShland Creek - Bear Creek Watershed, for the# Entire Period from 2009 A.D. through 2020A.D., the Entire WATERSHED will produce Methanol, Ketones, and Aldehydes, i.e. an Anaerobic Watershed, upon which will grow Anaerobic Life such as Coliform Bacteria, which will continue to GROW RAMPANT upon the Watershed constituting an IMMANENT DANGER TO THE PUBLIC HEALTH.

By Restoring the Tradition of Stream Based Exterior Natural Air Conditioner, Tourist Based Lodging Businesses have their Financial Bottom lines heading out of the red, toward the green.
By thinking of Ashland Creek, and all other mountain streams as long slanted Wells, fully exposed to the surface, with their Well Casements waiting to be Restored by Homo sapiens, one realizes that the Stream becomes a Giant Natural Air Conditioner, the Thermostat NO LONGER BROKEN, and is TURNED DOWN LOCALLY TO ASHLAND, from enervating HEAT, to liveably COOL. the Tourist Based Businesses will lower their operating costs.

When the entire Watershed is Restored, Reparian Resources Restoration, following the Prototype Stream Restoration Project Model, 55 miles of Stream Tributaries with Restored Water Tables Cascades, using natural stones and boulders, using backhoes and 3 person crews, the resulting increased Winter Snow Pack will cause the Winter Tourist Based Economy to Prosper.

By Restoration of the Stream Based Summer Air Conditioner, Mount Ashland Ski Season, Based upon Winter Snow Pack, will be longer.

The City of Ashland Water Source, Mount Ashland Snow Pack, moves out of the Danger Zone, with increased Snow Pack Based Water, with resultant increased Water Volume in Reeder Reservoir.

The Demonstration Project destroys all Coliform Bacteria, an Immanent Danger to Public Health, by mixing 18% Oxygen Air into the Stream Flow, maintained by the Restored 100,000 gallon Natural Stream Reservoir, natural to Ashland Creek over the one mile of Demonstration Model Stream Restoration.

The Demonstration Project, naturally killing all Coliform Bacteria, Allows the City of Ashland to have a LEGAL BASIS to Legally Order the U.S. Forest Service NOT to Cause an Immanent Danger to Public Health by Placing Large Woody Debris into All Tributary Streams of theCity of Ashland Watershed, Producing an Anaerobic Watershed with rotting Wood Producing a steady supply of Aldehydes, ketones, and Methanol, all lethal toxic chemicals.

RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

From: Helen Scott
[redacted]

The following is my testimony on the Wild and Scenic Rivers Suitability Report SW Oregon, 2015.

My testimony is specific to the Rogue River based on the suitability study finding by the BLM Medford District that the River is suitable for inclusion into the National Wild and Scenic Rivers System.

I am opposed to the suitability of the proposed inclusion of the Rogue River into the System.

I will be presenting information not covered, i.e. "new information", and, questioning "with a reasoned basis, the accuracy of, methodology for, or assumptions used for the analysis" (page xxi). In some comments I will be focusing on Josephine County, but the same issues may be found in Jackson County also.

NEW INFORMATION

On page 138 the document states: "BLM does not now have the authority to manage or protect ORVs" (outstanding remarkable values). This is true. However, Public Law 90-541, National Wild and Scenic Rivers System, states, in Section 6. (b), that nothing in this section "shall preclude the use of condemnation ... to acquire scenic easements". Scenery can be an ORV. BLM would have the authority to affect "private land use and development" and "maintenance" (page 128) if Congress included the Rogue River in the System. The authority to use condemnation to acquire scenic easements along the proposed segment of the river, with its 2700 private properties, is quite important in the analysis of costs as to whether the river should be listed as suitable for inclusion or not. The expense of having the Rogue River in the System has not been adequately addressed and the assumption it is not a serious issue is wrong.

The financial burden of adding restrictions to the counties and the other riparian owners and the taxpayers, for managing the control, is substantial. Placing this burden on the citizens and governments in Josephine County, where, according to the U.S. Census and the Department of Health and Human Services one-third of its citizens fall below the value for poverty guidelines, is a bad idea. Placing a controlling and financial burden on Josephine County, with its many parks and boat ramps on the river, is undesirable and unwise. Josephine County is already unable to fund its police services around the clock. It can ill-afford the bureaucratic cost of compliance with over-reaching federal controls.

The river runs through several urbanized municipalities, with their lack of wild qualities and attendant sewage treatment plants discharging waste into the river. The administrative costs to cities to have their riparian parks, bridges, and other entities controlled by the BLM would be high.

The proposed river segment runs by about 2700 private properties. Restrictions, such as scenic easements regarding trees, buildings, roads, mining, fences, etc., on these properties would be a burden on the normal rights of homeowners and others. The administration of these BLM managed controls would be expensive.

The river passes by (mostly just one side) such a small number, and less than 3% of the distance, of BLM federally controlled lands, that the studied portion of the river has little to promote it as "outstanding."

The chance of new dams is basically zero for the foreseeable future. The existing dams on the studied section of the river have been removed. So there is substantially no immediate threat of impoundment which would stop the free flow. The problem comes with preventing dams in the future. We may find, if you believe the global warming theory, that our climate may produce increasing drought. If this is the case, we may need to store water behind a modern impoundment with adequate fish ladders. I don't see that you have considered this issue in your dam restrictions.

One consideration that is not mentioned, although examined heavily and publicly by the state, is the problem with earthquakes. Oregon is substantially overdue for a good sized quake (see Goldfinger, OSU study) because of the Cascadia

subduction zone potential for action. Bridges would be major victims. If the Rogue River were to be included in Public Law 90-541 the BLM would control over a dozen bridges on the potential Wild and Scenic Rogue River. This added bureaucracy would be devastating in a time of emergency. These issues are better resolved locally by the state and local municipalities.

QUESTIONING WITH A REASONED BASIS

Importance of the existing Wild and Scenic Rogue River downstream

We already have a Wild and Scenic Rogue River in the System. It is important to note and analyze why we need another designation in an urbanized and developed, section of the river, put into the System. The assumption that the downstream existing Wild and Scenic Wild River classification is not important to this current suitability examination is wrong.

Specific Values of Oregon Land Use and Existing Riparian Laws Not Given Weight

There are assumptions that state and local laws, regulations and rules are not keeping the river banks and inland properties to a standard the BLM would like. Actually, in Oregon, there are many riparian restrictions on the use of lands next to the river, and there are strict zoning restrictions by the state, counties and municipalities. Also, state departments, like forestry, fish and wildlife and others have rules for activities and changes in riparian areas. Oregon is a unique state for its restrictive zoning. It is the only state in the Union with such tough land use laws. Yes, there is already a "demonstrated commitment to protect the river by" non-federal regulations. Therefore, this river does not warrant additional overlays of BLM Wild and Scenic protection. Development has already occurred and the river is flowing free.

Lack of Serious Discussion Regarding very Little BLM Bank Ownership

The assumption that it is O.K. to call a river "suitable" for inclusion in the system, when the BLM manages only 2.1 miles of shoreline, with only one property that crosses the river, and 9 ownerships on one side only, is wrong. The proposed length is 63.24 miles. BLM manages only 3.3 percent of the proposed length, and

only a small part of that is on both sides of the river. A look at the map on page 139 shows nearby, and maybe riparian, BLM ownerships in and amongst the municipalities of Grants Pass, Rogue River and Gold Hill. There are also BLM ownerships, some may be riparian, in the 10 mile stretch between Shady Cove and the upper end of the river proposal. Too scattered and too little to warrant control on 2700 private properties, other federal properties, other state properties and other municipal and district properties.

Assumption that BLM should change Water Rights Laws is Wrong

Page 127 states that "water right status" and future applications may be limited with designation. This is not good. Water rights need to remain managed by the state to take the existing law into account, not be ruled by a future law of the Wild and Scenic River System. Water rights are very complicated and BLM should not try to change or control them.

BLM should not assume that National Defense is inferior to BLM

The BLM needs to pay more attention to the national importance of the U.S. Army Corps of Engineers and make any designation compatible with the Corps. (page 134)

BLM does not have a "Reasoned Basis" for Recommending Oregon Management

The final kicker is the suggestion in Criteria 4 and Criteria 5 (page 128). This suggestion is that the State of Oregon administers the land and resources and river under the Wild and Scenic Rivers law. This would be an enormous burden on the state, which already has expenses growing faster than revenue. The complex of grants and loans and expectations and unintended consequences and strings attached is overwhelming. The BLM has not studied these state issues from the point of view of the state.

If the BLM wants to assign the management of a Wild and Scenic River to the State of Oregon, the river is not worthy, nor appropriate for, inclusion into the System. No state, no matter how much it is paid, or not paid, should be required or recommended to administer and enforce federal laws on the Rogue River.

CONCLUSION

It is interesting to note that the BLM Roseburg District found the S. Umpqua River non-suitable for inclusion because the BLM lands "are fragmented and the overall percentage of federal ownership within the river corridor is extremely low." The Medford District should come to the same conclusion for the Rogue River. The studied section of the Rogue River should be determined to be non-suitable for inclusion into the Wild and Scenic Rivers System.

Thank you for this opportunity to testify,

Helen Scott

Helen Scott

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Thursday, August 20, 2015 8:23 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: BLM Resource Management Plan/EIS Comment 8-18-2015
Attachments: BLM RMP EIS Public Comment 8-18-15.pdf

---------- Forwarded message ----------
From: **L/N Greenwood** [redacted]
Date: Tue, Aug 18, 2015 at 3:29 PM
Subject: BLM Resource Management Plan/EIS Comment 8-18-2015
To: blm_or_rmpwo_comments@blm.gov

BLM,

Attached is my Public Comment for the Forest Management Plan.

Thank you,

Len Greenwood

BLM Draft Resource Management Plan, Environmental Impact Statement Comment
Aug 18, 2015

A New Vision for our Forests & Watershed

In writing a new vision of the use of an existing watershed, I am both humbled and honored to feel I have a voice in the protection of our beautiful Deer Creek Watershed. John Wesley Powell, famous scientist & geographer defined a watershed as: "That area of land, a bounded hydrologic system, within which all living things are inextricably linked by their common water course and where, as humans settled, simple logic demanded that they become part of a community."

As I read his description of a watershed, many words jump off the page, into my mind and heart. "ALL living things, (trees), are "inextricably linked" (inner-connected), and humans must be "part of a community", NOT, the controlling factor!

The Deer Creek Watershed has the distinct presentation of thousands of species and the unique biodiversity not found in many locations. Each tributary and tiny ecosystem presents a wonderful display of life, of flora and fauna, of minute organisms specifically adapted to the special place and time of its life. The Watershed is home to threatened and endangered species, migrating Coho, Chinook, Steelhead, Cutthroat trout, and others. The waters are crystal clear and alive in sound and purity. The community, when untouched and left to be, creates a healthy and natural sanctuary for all life forms, including the humans, who have settled within her soothing arms.

We need the Deer Creek Watershed protected for all time, for all living beings which dwell here.

According to BLM's own Water Quality Restoration Plan for the Deer Creek Watershed, prepared by the Medford District Bureau of Land Management, Grants Pass Resource Area, December, 2011:

Element 2: Goals and Objectives

For BLM-administered lands within the Deer Cree Watershed, the primar goal within the riparian reserves is the maintenance and long-term restoration of riparian ecos stems as identified in the orthwest Forest Plan A uatic Conservation Strateg ACS objectives SDA, SD . 1 4 . Specific project goals include:

1 Manage riparian areas within one to two tree-heights of all streams to benefit riparian health and a uatic habitat. Management includes preserving current conditions protective and silvicultural treatments to increase stand vigor and resilienc proactive .

2 Manage BLM-administered riparian lands to reach their shade potential.

3 Maintain/improve riparian reserve health on BLM-managed lands to maximi e large wood recruitment into the channel and riparian environments. The instream wood will benefit downstream channel stabilit and improve a uatic habitat conditions. Maintenance of late-seral conditions where the currentl exist. n earl , mid-seral, and mature stands that lac structural complexit , treatments would accelerate stand development into late-successional/mature structure i.e. large trees, snags, down wood, species diversit and hardwood retention .

Return stand densit and fuel loads to range of natural variabilit to reduce potential for stand replacement events.

Therefore, the cutting of timber stands within the Deer Creek Watershed would be in complete contradiction to this BLM Restoration and Protection plan. You cannot have a healthy watershed and remove the forest all in the same location.

According to Greenpeace International in its report, "Our Disappearing Forests – April 2, 2007, "Less than 10 percent of the planet's land area remains as intact forest landscapes." A shocking revelation to say the least. Which begs me then to ask the question: With this revelation in mind, how can we continue to cut down and destroy the very life form which give us, in return for just being left alone, our very lives and health? This statement, of our disappearing life-line, truly must awaken the Forestry Service, BLM, and private forest owners and Timber companies to the urgency of maintaining healthy, vibrant forests and watersheds. We are running out of and destroying the lungs of the Earth. And in doing so, we are signing, not only our own death warrant, but the death warrants for most life on this planet. When shall we ever learn?

Attributes of Life of a Forest & Watershed over mere profits by a few:

- Forests sequester carbon (cutting, milling, slash burning and clear cutting releases carbon)
- Forests are deeply rooted. Deep roots reach into rocks and pull up minerals necessary for the entire web of life. Without forests, and this action, the living world would run out of minerals.
- Forests and watersheds filter and clean water, essential for health and life.
- Forests cool the planet through "transpiration", the process by which moisture is carried through roots to small pores in the underside of leaves, which then changes into vapor and is released into the atmosphere, thus, cooling the planet. This is why, on hot days and we walk into the forests, it is much cooler, as the forest is in essence, sweating. If we cut down and eliminate forests, the planet warms, which we are witnessing on a mass scale today.
- Forests & Watersheds are the home of millions of living beings, all inner-connected and interdependent on each other for healthy lives. Remove the forest, health is also cut down, water warms, aquatic life dies, and the natural food chain is altered forever and destroyed.
- Forests are essential in maintaining a healthy and vibrant watershed, which in turn, watersheds are essential to maintaining healthy and vibrant forests. They work in tandem, with one destroyed, the other ceases to exist.
- Forests are a necessary life form to create the conditions that allow rainwater to remain in the watershed. With the removal of forests, the barren land is a plate in which water slips, slides and runs off and away, to flood the watershed, and eventually, merge with the sea to become salt water, unusable to land-based life. Forests retain rainwater, essential especially during periods of drought.
- Forests and watersheds have the intrinsic value of comfort, spirituality and peace. Forests are sanctuaries for the heart and mind, places for all life forms to absorb peace, quiet and serenity away from the poisons and rush of human activities.
- Forests and watersheds can be incredible outdoor classrooms for children and adults alike, opening minds and hearts to the true possibilities of health and life without electronic gadgets, and garish unnatural colors. Forests and watersheds teach us to slow down, to use ALL our senses in a natural way, to see, to listen, to smell, to feel and to experience our true animal nature away from the concrete jungle of humanity.

There are many more wonderful attributes about forests and watersheds but I believe you hopefully get my point. By cutting down forests and destroying watersheds, we lose these wondrous gifts which trees, water, soil and all living beings within give us. And they ask nothing more from us but to be left, alone, untouched, alive.

The Forestry Dept. & BLM pose the argument that they plant 4-5 new trees for every tree removed. The newly planted trees, mostly GMO species, do not constitute being a forest nor resemble in any way the abounding wildlife, flora & fauna or natural watersheds. They become a Tree Farm, defined by Webster's Dictionary as: "U." Hence, never a natural forest again!!! Webster defines forest as: "A large area, chiefly covered by mature trees and undergrowth." I would expand to say, "…and left unmanaged to ensure life and health of all living beings in an uncommercial way."

Lastly, the Deer Creek Watershed supports our home and garden with naturally pure and healthy water. We have no other water source for our domestic use. If logging were allowed upstream from our home, our water would suffer immensely. It has been proven over and over again that streams silt over, domestic water is

harmed and/or poisoned by pesticides used to "weed out" the new understory of re-plants, and aquatic populations dwindle and simply disappear. We will NOT allow this to happen to our community.

Visions and solutions which support both Economy and Ecology and a Healthy Watershed for All living beings.

I fully support the **Natural Selection Alternative** as the primary Resource Management Plan.

BLM Draft Resource Management Plan/Environmental Impact Statement for Western Oregon Natural Selection Alternative

BLM alternatives in the DEIS would not provide a sustained yield of timber; would fail to adequately address climate change and species extinctions; would increase fire hazards instead of restoring fire adapted ecosystems; would degrade water and natural community ecosystems; would harm recreation, tourism and our local economy. They are not supported by best available science. They are not sustainable and would lead western Oregon counties and our rural communities into environmental, economic and social decline.

*The **Natural Selection Alternative**, based on the best available science, offers a solution for long term economic stability and social health. The NSA would achieve BLM stated objectives while minimizing environmental impacts.*

*The community supported **Natural Selection Alternative** resolves conflicts concerning resource uses on BLM lands including, the recovery of threatened and endangered species, providing clean water, restoring fire adapted ecosystems, producing a sustained yield of timber products, and providing for recreation opportunities.*

The NSA will best address: the U.S. Fish and Wildlife Service's recovery plan and proposed critical habitat designations for the Northern Spotted Owl; new scientific information related to forest health and resiliency; carbon sequestration and climate change; and the socio-economic needs of western Oregon communities.

I request the BLM include and fully analyze the NSA in the FEIS (or a revised EIS) for the RMPs for Western Oregon. The NSA meets all environmental protection legal requirements as it places ecosystem health first. This in turn lays the foundation for all forest products and uses at a sustainable level, providing community long term economic stability and social health.

My vision and proposal, in combination with the "Natural Selection Alternative" plan, is to develop the Deer Creek Watershed into a National Recreation and Learning Center, for education in watershed and alternative logging solutions.

We in Josephine Co. are in a unique and valuable natural resource community which could be shared nationally and internationally as a model of protection and true sustainable resource management. I propose leaving the Deer Creek Watershed untouched to logging, but open sections to the public for hiking, camping and educational opportunities. I foresee the Institute for Natural Selection Alternative being the center piece of this unique, job creating venture. Those areas designated for sustainable logging under the Natural Selection Alternative plan would also be open to the public to view, witness, and learn about true sustainable logging practices. Training and implementing loggers as teachers, Josephine County's unemployed workers would be employed in outdoor jobs as rangers, docents, teachers, wilderness guides, trail building, and maintenance. Besides the Oregon Caves and the Rogue River experiences, the new Deer Creek Recreation and Learning Center would attract thousands of tourists who now simply bypass Selma, traveling to the next destination. People from all over the world could be attracted to the Deer Creek Recreation Center, revitalizing the west portion of our county economically, while developing the long range portrait of this area away from the negative image now presented and into a positive image of education and ecological education. EcoTourism is the fastest growing industry in the United States, and we could be at the forefront of both new job creation and a sustainable timber industry.

We can create new visions, we do not and cannot operate in today's world of depleted resources as we did decades ago. It cannot be "business as usual". We MUST be better stewards than the old models performed. We MUST look to the future, a future for a healthy environment for our children and all children of the planet. Trees are living beings, not another commodity for corporate profit. Trees add so much value to our lives and forests multiply that value a million times over. I fully support and advocate for the "Natural Selection Alternative" as the new pathway forward, for a healthy planet and healthy watershed. And I believe, with extended vision and leadership, we can become an international model for a sustainable timber industry and healthy, life giving ecosystems, forests and watersheds.

Sincerely,

Len Greenwood
[redacted]

Jasmine Benjamin

From:	m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent:	Thursday, August 20, 2015 8:23 AM
To:	RMP-Comments@heg-inc.com
Subject:	Fwd: Comments on the 2015 BLM RMP Draft EIS
Attachments:	BLM-RMP-comments-RBaker-8-18-expanded.docx; ACS-Finalreport-35pp-0804.pdf

---------- Forwarded message ----------
From: **Rowan Baker** [redacted]
Date: Tue, Aug 18, 2015 at 4:12 PM
Subject: Comments on the 2015 BLM RMP Draft EIS
To: blm_or_rmpwo_comments@blm.gov
Cc: ChuckW@coastrange.org, SJ@loraxlaw.org, Brenna@bark-out.org

Attn: Mark Brown

Attached are my comments on the Resource Management Planning DEIS.

There are 26 pages including Appendices.

I reference another document (Frissell et al. 2014). It too is attached (as a .pdf).

Please carefully re-consider your approach to scoping, issue identification, and alternative design and selection. These lands and waters are of concern to many members and sectors of the public that BLM appears to be in the process of ignoring.

Furthermore, under the Information Quality Act and related OMB guidance, you must independently peer review all of the influential science assessments and models used in the DEIS. I noted a number of misrepresentations of "best available science" and easily falsifiable assumptions underlying at least two of the models.

As an independent scientist, I would be willing to participate in peer reviews of the models and science assessments. You may contact me at the number listed below.

Sincerely,

Rowan J. Baker
Independent Environmental Consultant
Portland, Oregon

[redacted]

August 18, 2015

erome . Pere
State Director
Washington/Oregon
Bureau of Land Management
P.O. Box 2 65
Portland, Oregon 7208

ATT : Mar Brown
Submitted via mail: <blm_or_rmpwo_comments@blm.gov>

R : Draft 2015 Resource Management Plan/ S for Western Oregon

As a retired federal agenc fisheries biologist and consultant with over 30 ears of experience in ecos stems anal sis, watershed assessment, and PA, feel am professionall ualified to offer the following "fatal flaw" analysis of the Bureau of Land Management BLM Western Oregon Resource Management Plan RMP Draft nvironmental mpact Statement D S :

Major Concerns/Fatal Flaws:

1. The RMP DEIS, despite its length, does not take a "hard look" at the impacts of removing all relevant a uatic standards and guidelines S s lin ing riparian, e watershed, h drologic, ph sical, chemical and biological processes and their management to the nine A uatic Conservation Strateg ACS Objectives and other re uirements of the orthwest Forest Plan WFP . There are over one hundred S s in the WFP Record of Decision ROD appl ing to lands within the range of the northern spotted owl that reference and re uire compliance with the ACS and its Objectives. These, along with the major components of the ACS, including watershed anal sis, designated Ke Watersheds, watershed restoration, riparian reserves RRs , and important contributions from Late Successional Reserves LSRs , were intended to ensure that decades of past a uatic and riparian ecos stem damage would be reversed over the 50-100 ear timeline of the WFP.

2. The RMP D S fails to accuratel describe the o-Action alternative and the full range of protections that the ACS and its standards currentl provide in contrast to all the action alternatives, which remove those protections. In part, this is due to the BLM's current disregard for the actual hierarch of standards and guidelines for the various land allocations see Appendix 1 . The o-Action alternative is the onl alternative in the D S that offers ade uate science-based guidance and re uired standards to promote maintenance of stream and watershed conditions on the ground where the are currentl functional, and to promote restoration where the are not.

3. The RMP D S does not present the complete set of resource concerns and issues that comprise the "Affected Environment" including but not limited to the degraded conditions caused b BLM's own impacts to environmental values and resources over the past several decades. The RMP D S does not contain a separate "Affected Environment" section see Appendix 2 . Dispensing with the "Affected Environment" section in such a complex and controversial S allows BLM to avoid loo ing at currentl degraded conditions on the landscape, and move uic l into modeling future impacts for onl a select set of issues. This approach convenientl ignores man t pes of significant impacts and ecological conse uences of the alternatives especiall in light of past and ongoing impacts of BLM's interpretation of o Action which as stated above in 2. is inaccurate and highl misleading .

Combining the "Affected Environment" and "Environmental Consequences" sections in NEPA is not suitable for highl complex actions with a large number and t pe of wide ranging, significant impacts to the human environment. This flaw is exacerbated b inade uate scoping to determine all significant issues currently "affecting" the human environment. n general, it appears that the "issues" driving the development of this S were contributed mainl b timber interests and the O C Counties.

4. The RMP D S fails to grasp the connected structure and overarching re uirements of the WFP ROD, including the ACS objectives, components, and Riparian Reserve standards, all of which overwrite and enhance provisions of the RMPs, even if the text of the individual RMPs fails to notice or incorporate these re uired WFP elements. 1 5 RMPs are all legall amended b the WFP and must include all aspects of the WFP if an of the NWFP's newer standards are more protective than older, pre-1 5 standards .

5. Because of items 1-4 above, the RMP D S fails two of the ey the "litmus tests" of NEPA: correctl identif ing the o Action alternative and meaningfull evaluating the impacts of each of the action alternatives, when compared to those of the no-action alternative. The comparative weighing of the impacts of alternatives is at the ver heart of PA.

6. The DEIS's authors would have us believe that a region-wide planning effort of this magnitude and significance can have little significant impact. The BLM has a long histor of avoiding critical environmental issues and s irting meaningful anal sis b claiming that there are no impacts of broad, plan-level actions. That claim has been repeatedl struc down in federal courts. Furthermore, a plan level action that removes all meaningful protection from an existing plan can have devastating impacts wherever it applies.

BLM's method of issue avoidance varies, but generall ta es one of two forms: BLM either claims "no significant impact" or states broadl "there is no wa we can determine the impacts at this scale." o significant impact is onl possible to assert if ou s irt the relevant issues, then restrict the anal sis to a few highl mechanistic models of onl one or a few factors of interest. "No way to determine an impact is easil rebutted b the fact that the BLM can and often does model the impacts. owever, even then, the BLM's model constructs maintain the "no significant impact" fiction. BLM's highl mechanistic models are all "parameterized" to show little or no impacts to resources of concern. This also suggests a paradox: if the models are correct that the impacts are not significant, then an S is not re uired.

7. Regional Administrators of the primar federal agencies involved in the WFP have ept silent while the BLM was routinel and s stematicall cutting corners in implementing the ACS Objectives and protective ACS-related standards over the past 20 ears. The impacts of ignoring or not full implementing the ACS provisions of the WFP have not been addressed in the D S, nor were these impacts expected or considered in the Final S for Option , or the previous Federal cos stem Management Team F MAT science s nthesis that led to the design and selection of protective a uatic and riparian provisions in Option . Further, the D S fails to address the legac of adverse impacts of past BLM actions significant landscape damaging actions and projects *prior to 1994-5*, before the adoption and implementation of Option , i.e., the o Action alternative . These past adverse impacts need to be considered along with current impacts of the BLM s misinterpreting and onl partiall following the relevant standards in the ACS. This fails the third major test of an S which is an accurate assessment of the environmental baseline what happens now and into the future under continuation of the o-Action scenario . The baseline is an essential starting point to conduct valid cumulative impacts anal sis, which is another critical PA re uirement.

The past and ongoing impacts of BLM and FS land management program- and project-level actions have been hidden b a number of adverse polic changes. First, the impacts of the Rescissions Act of 1 5 "Salvage Rider" have not been anal ed as part of the environmental baseline in PA. nder the Salvage Rider, acting in conflict with their responsibilities to protect the lands, waters and ecos stems the manage, BLM proceeded to carr out numerous legall enjoined and contested timber sales and road projects. n all cases these projects went forward without an anal sis of their impacts to forest and a uatic ecos stems and due to "sufficiency language" in the rider without PA anal sis or formal SA section 7 consultation for an species.

n addition, both before and after the Rescissions Act, all the agencies charged with implementing the WFP and ACS relied on wea er "transitional" standards and guidelines for a period of two- to-three ears foot dragging b the action agencies resulted in it being closer to four ears . BLM too significant advantage of the "interim guidance period" (from approximately 1 4-1 8 to carr out numerous projects that were either completel inconsistent or not full consistent with the ACS Objectives and standards. Watershed anal ses too several ears to complete with man not being finished until 1 2000-2001 for man non- e watersheds . Soon after that the "Healthy Forests Act" of 2002 further wea ened anal tical re uirements for salvage sales and "fuels reduction" projects These projects were all "categorically excluded" from NEPA essentiall b fiat .

n 2004 BLM was sued successfull for failure to implement protective Surve and Manage re uirements in two projects, but there were man more projects located within the BLM RMP planning areas that were inconsistent with the ACS and its objectives. The "National Fire Plan" projects were, once again, completed with limited or no PA anal sis and routinel underwent onl broad programmatic SA reviews with no teeth adoption of counterpart regulations was threatened if the two regulator agencies bal ed . This was a period of highl "streamlined" ESA section 7 consultations which essentiall meant that the agencies never too a good loo at these projects. The highl collective adverse impacts of these projects on a uatic ecos stems have essentiall never been anal ed, summari ed or s nthesi ed. These projects all affected and helped to determine the actual environmental baseline within the planning area covered b this D S.

Beginning in about 2002, the BLM and all agencies entrusted b the public to implement the ACS protections had essentiall given up the pretense of tr ing to implement the full suite of re uired ACS standards, and the result was a series of ACS-related lawsuits against the SFS, SFWS and OAA-Fisheries in the inth Circuit – nown as the PCFFA *et al*. rulings udge Rothstein and Redden cases . Roughl 160 illegal projects were enjoined b the courts. All the agencies now had reason to thwart further implementation of the ACS, because of the Ninth Circuit Court's repeated and consistent interpretations of existing ACS requirements (aka "legal hooks") that were enforced in these cases.

Subse uentl , the SFS and BLM tried to "re-interpret" the ACS to be consistent with what the and the BLM had, in realit see above , been implementing all along. These efforts failed twice. t is clear that the ACS is not being followed, has never reall been followed, and in most "reasonabl foreseeable futures" (i.e., all current D S "action" alternatives will never be followed. The cumulative impacts of continuing to ignore these legall re uired, fundamental a uatic ecos stem protections must be full evaluated in the F S.

8. The D S inade uatel addresses currentl observable climate trends and the potential for further climate change impacts re uiring greater a uatic and riparian protections when evaluating impacts of the alternatives, including no-action, both currentl and over time.

. The RMP D S in several places portra s existing and planned thinning in riparian reserves as having no limits, when commercial timber harvest within RR boundaries is generall prohibited under the no action alternative on the West Side forests. The BLM and SFS are not allowed to count timber volume taken from RRs toward meeting "timber targets" as part of their "programmed" timber outputs. Said another wa , an such volume has to have an ecological not an economic justification.

10. RMP D S ignores a recent, comprehensive scientific review of the ACS Frissell et al. 2014 . The ACS alone, while a significant improvement over past a uatic s stems management, is insufficient to avoid lasting and irretrievable damage to fisheries and a uatic ecos stems. A recent science s nthesis supports the conclusion that the ACS needs to be strengthened to remain a viable conservation strateg in light of newer scientific evidence regarding climate change, cumulative impacts of timber harvest, thinning, extensive ground disturbance, riparian vegetation removal, and road related impacts on adjacent, non-federal lands. am a co-author of that report. The entire report Frissell et. al 2014 is included in these comments b reference.

Be ond the basic ACS provisions, the NWFP's other protective standards and components for terrestrial resources, also convenientl proposed for removal in all the D S action alternatives, were expected to provide significant benefits to a uatic s stems over time. Late-successional and old-growth management provisions e.g., LSR Objectives, LSO retention standards within watersheds , the limited et important roadless standards i.e., the strict standard re uiring "no new roads in remaining RAR areas if the were located within Ke Watersheds" , and Surve and Manage standards are but a few categories or sets of standards that, along with the ACS, are necessar but not necessaril sufficient to ensure conservation outcomes that were predicted b the F MAT scientists for a wide variet of species.

11. RMP DEIS "management objectives" which would apply to all newly revised RMPs are much wea er than the nine A uatic Conservation Strateg Objectives See Appendix 3 . o anal sis is done in the D S to full explain how the new management objectives and direction would lead to ade uate protection of a uatic and riparian-dependent resources, or how those management objectives are to be achieved other than assumed sufficienc of BMPs . n comparison, the ACS Objectives in the o Action alternative are to be achieved specificall b following the Riparian and Ke Watershed Standards and uidelines of the WFP which lin directl bac to the ACS Objectives as well as to the statement the statement is in WFP ROD, Appendix C, hence part of the o Action S s themselves preceding each of the ACS Objectives that "Lands… will be managed to… meet the objectives " and the related S re uiring managers to support their findings of project level ACS consistenc using watershed anal sis. n the action alternatives, there are lists of BMPs but a these do not have to be explicitl followed b the do not clearl connect to the stripped down management objectives or wea ened management direction and c managers are not re uired to use watershed anal sis, where the findings are scientificall supportable , to determine what are the appropriate practices for the specific watershed to achieve the ACS Objectives over time.

Caveat – Man of the findings and recommendations made in completed watershed anal ses regarding reductions in interim widths of RRs are not supportable from a fisheries, water ualit or ecological standpoint. n the limited cases where a scientific understanding of the full suite of riparian functions was displa ed, the interim reserve widths were generall ept intact or expanded to include greater protection, e.g. for intermittent streams and unstable or potentiall unstable slopes.

The BLM D S has not full anal ed the impacts of these changes in Management Objectives on streams, waterbodies and fisheries. This should be done in the Final S.

Key Finding: There is no scientific basis or justification for the changes in management objectives and direction from those already contained and well justified in the NWFP/ACS (No Action alternative). BLM must provide an explicit scientific basis for the changes in management objectives and management direction in the FEIS.

12. All e functions provided b the Riparian Reserves are not anal ed and the existing S protections for riparian reserves are turned into wea er, more general language with fewer ph sical, h drologic and biotic functions mentioned. This shift toward less holistic treatment of the full suite of functions of RRs needs to be full anal ed in the F S.

The BLM D S limits its anal sis of the numerous functions provided currentl b Riparian Reserves to onl those BLM chooses to model principall shade, sediment, pea flows, and large wood . n doing so, the BLM uses highl uestionable assumptions and in man cases, misinterprets their own cited sources regarding h drologic and ph sical processes and s stem responses. BLM must anal e all the functions represented in the ACS Objectives that would be lost or further degraded under the new set of management objectives and wea ened direction. As stated earlier, in the WFP ROD numerous explicit S s link back to the requirement to "meet" (the NWFP defines as "not retard or prevent attainment of") the nine ACS Objectives and the processes and functions described within them, which are complex and also highl specific. xplicit Riparian Reserve standards that have this interrelationship to the ACS Objectives and functions appl to most if not all individual management activities within the Riparian Reserves, as well as outside them. A comparison of the t pes of functions and processes to be examined is in Appendix 3.

13. nade uate range of alternatives. The D S fails to include an alternative that would increase RR widths from the current, default delineation of 1-2 site potential tree heights fish bearing and perennial streams or 100 minimum intermittent streams each side, with increased widths as part of the delineation depending on floodplain extent, slope steepness, site stabilit , and other factors described in the RR definitions. There is an inade uate range of alternatives in the D S largel as a result of inade uate scoping of issues, narrow interpretation of existing laws and regulations, and also resulting directl from BLM's carefull limited and biased Purpose and eed statement. See comment 14 below .

The BLM has this to sa about wh the did not include an alternative that increases the RR widths:

"This alternative would include Riparian Reserves that would be wider than the Riparian Reserves in the o Action alternative i.e., more than two site-potential tree heights on fish-bearing streams and more than one site-potential tree height on non-fish-bearing streams . **Such an alternative would be substantially similar to the Riparian Reserves in the No Action alternative, because of its effect on the conservation and recovery of listed fish and the protection of clean water.** Based on the results in the interagenc A uatic and Riparian ffectiveness Monitoring Program, which evaluated watershed condition and trend for a fifteen- ear period 1 4-2008 in the orthwest Forest Plan area, the protections provided, in part, b the Riparian Reserves are improving watershed conditions (Lanigan et al. 2012)" (D S Alternatives, p. 80, emphasis added

n the bolded portion of this statement the BLM anal sis is in error. The full implementation of the ACS, including RR widths and protections is in fact necessar , but not sufficient, to conserve listed fish and to protect clean water. This has alread been demonstrated b the fact that salmon species listings continued after the WFP was written and the ACS was implemented in 1 4 part of the re uired

determination that goes into SA listing decisions is the ade uac of existing regulator mechanisms . Furthermore, most streams on BLM lands remain listed as impaired under Section 303 d of the Clean Water Act. Frissell et al. 2014 stated that the ACS is in need of significant improvement to address current inade uacies. mprovements are necessar to update it to address: fish species SA listings and recover plans that have occurred and put in place since 1 4, climate impacts that were not foreseen when the ACS was developed, and heav clearcut harvest, salvage harvest, and road impacts both on federal lands via the histor of abuses outlined under comment 7 above and on adjacent state and private lands particularl in the last 5-10 ears, among other factors Frissell et al. 2014 . Moreover the ACS is being eliminated b the action alternatives, and no improvements are being provided.

AR MP monitoring does show limited improvements in some watershed variables, but it must be clarified in the F S that:

a AR MP uses C mapped h drologic unit boundaries, not true watersheds which in man cases are smaller and not sampled sufficientl . Man small watersheds that were seriousl degraded in 1 4 remain degraded.
b AR MP, as designed, cannot be interpreted as biologicall or ecologicall meaningful for an particular stream reach or true watershed because the overall scale of AR MP inference is the regional WFP area
c AR MP has not undergone one complete "before/after" test sequence and hence the reported results of AR MP are ver preliminar .

On this last point AR MP results currentl cover less than 20 ears of at best partial and lac luster implementation of the ACS. This is less than 1/5th to 1/10th of the time necessar to achieve a uatic and riparian s stem recover from a generall degraded condition, which is roughl one to two centuries.

The DEIS goes on to say: "Additional width of Riparian Reserves would not provide additional protections for fish habitat or water ualit . Furthermore, **the Riparian Reserves in the No Action alternative were designed to meet an array of objectives, including broad ecological objectives and riparian and terrestrial species habitat. In contrast, the Riparian Reserves in the action alternatives are designed to meet narrower objectives:** conservation and recover of listed fish and protection of clean water, consistent with the purpose and need for action. **Because of these narrower objectives, the action alternatives considered in detail do not include widening the Riparian Reserve widths.** D S. Chapter 2, pages 80-81, emphasis added

Additional widths of Riparian Reserves would certainl provide additional protections for fish habitat and water ualit . n the science-based ACS, watershed anal ses are used to determine final RR widths. sing watershed anal sis correctl it was expected that in some cases the initial interim widths of Riparian Reserves would have to be increased. The conditions included such things as landslide ris , slope steepness, underl ing soil/roc t pe, adjacent wetlands, springs/seeps and groundwater connections, floodplain width, inclusion of the inner gorge in steep -notch s stems, potential for channel migration, wetland connectivit , and stream densit .

Climate change impacts will re uire riparian reserves that are sufficientl large to allow for species movements across larger landscapes, including directional movements to the north and upslope for man climate sensitive species, as well as species that must ma e movements from hotter and drier to wetter and cooler environments, particularl amphibians.

The BLM has just admitted that the purpose and need in the D S is too narrow to allow for science-based conservation of wildlife populations See comment 14, below

14. The BLM has established a Purpose and eed statement that is not based on a full evaluation of existing and foreseeable resource needs and conditions. The "Purpose and Need" statement in the DEIS is biased toward timber outputs, ignores the current ecological status and conservation importance of BLM lands and will perpetuate management failure if it does not consider climate impacts and projections as a contributor to current and future impacts to streams, fish, a uatic s stems and water ualit .

The Purpose and eed statement misrepresents the current status and trend of BLM lands within the larger landscape and uses a biased perspective of existing legal re uirements, placing the O C Lands Act of 1 37 on top of the heap of all other environmental laws – particularl the Clean Water Act and the ndangered Species Act. This severel limits the development of alternatives that might address man pervasive pre-existing and evolving "problems" that are critical to identif through ade uate PA scoping and examine in detail: SA listings since 1 4-5, Clean Water Act 303 d listed waterbodies and actual and projected climate impacts for this region which include, among other things, decreased summer low flows, increased nighttime and summer stream temperatures, reduced connectivit of streams and wetlands during longer and more intense periods of drought, and loss of snowpac leading to altered h drologic regimes not onl in current rain-on-snow ones, as BLM asserts see comment 16, below .

The above flaw also applies to the missing "Affected Environment" section of the DEIS, which as stated earlier is how BLM s irts an assessment of what is reall out there and happening now on their lands.

15. "New ESA listings" in some chapters of the DEIS are relegated to the future but in fact there have been "new species listings" since 1994-5.

16. Biased and incomplete h drologic modeling and anal sis:

Using their hydrologic model, the BLM states that "Less than 2 percent of the decision area would susceptible to pea flow increases over time under an alternative. The o Action alternative and Alternatives A and D would result in slight decreases and Alternatives B and C would result in slight increases in the number of sub-watersheds susceptible to pea flow increases." (Chapter 3, Hydrolog , page 286

First, BLM limits the hydrologic analysis to "peak flows." There is no stated basis for this and no explanation of wh an other flow attributes of potential interest are not evaluated. For example the other attributes that BLM currentl must evaluate under the no-action alternative pursuant to ACS Objective number 6 before any major entry into riparian reserves or key watersheds, are the: "...timing, magnitude, duration, and spatial distribution of pea , high, and low flow all of which must be protected." (NWFP ROD page B-11 .

Focusing onl on pea flows appears to be based on a false set of assumptions. The assumptions are that pea flows as opposed to low flows, base flows or the timing and spatial distribution of flows , are the onl flows that affect the stream channel or biota, and that onl the highest of the pea flows e.g., larger 50- or 100- ear recurrence events that are potentiall damaging, either in the short- or longer-

term. These assumptions are incorrect. n fact, man species depend on sufficient flows in late spring and summer, natural pattern and timing of higher flows for attraction and spawning, consistent base flows to maintain habitat extent, and predictable pattern of surface water distribution. These species re uire sufficient summer low flows, base flows, and relativel natural unimpaired temporal and spatial patterns of flows – patterns to which their life histories and movements are often uni uel adapted.

Also, the 1-2 ear recurrence interval pea flow events are considered b basic h drolog texts Leopold et al. 1 64 to be channel maintenance flows the flows principall responsible for creating and maintaining stream channels . These smaller et fre uent pea flows generall increase in some studies b substantial amounts after clearcutting for a period of roughl 7 ears, with the time period of increase var ing on the rate of vegetation regrowth, and the prior condition of watersheds which greatl affects their potential for h drologic recover . See Appendix 4 .

Despite citing rant et al. 2008 its sole source for h drologic information an unpublished .S. Forest Service P W TR Report that has the uni ue and unusual histor of having been initiated and commissioned b BLM , the BLM fails to mention that there can be significant impacts caused b increases in the 1-2 ear pea flows. These fre uent flow events also have the advantage of providing sufficient sample si es to be anal ed separatel with reasonable confidence, which is not true of the largest, least fre uent pea flow events. Also, following an increase in winter or earl spring pea s lasting for roughl 5-8 ears, late summer flows low flows tend to decline for a much longer period up to 30 ears post logging. The destructive combination of earlier and higher channel maintenance flows for a period of 5-8 ears, followed b reductions in late summer alread low flows for up to 30 ears has not been examined b BLM.

n fact the BLM actuall fails to mention an impacts to summer low flows which, combined with increases in drought conditions due to current and projected climate change, is a significant oversight. ncreased pea flows can erode stream ban s and increase the width-to-depth ratios of streams. Wider and shallower streams are noted in man heavil managed watersheds. Dr ing down of streams in summer often results in shallower water, leading to loss of overall habitat extent for fish and warmer stream temperatures. These generall lower summer flows have not been anal ed b BLM in their similarl biased and incomplete stream temperature modeling. The BLM must address the impacts of all alternatives on low flows not just pea s.

The BLM s h drologic model is biased in other wa s as well. First, it onl considers pea flow impacts to be of concern in the Rain-on-Snow ROS transitional one within watersheds this is a misinterpretation of and inconsistent with the findings of rant et al. 2008 and other researchers which show that pea flows can also increase in the rain dominated one and snowmelt ones, and second, the onl watersheds of concern for management-induced pea flows according to BLM are those that are above a fixed threshold of land management activit – a threshold that on careful review is both arbitrar and artificial. Loo ing at rant et al. 2008 , specificall Figures 8 and 10 which BLM misinterprets there are no such thresholds instead, for watersheds both with and without roads there is a relativel linear response relationship for all pea flow responses, as well as for pea flows onl located in the ROS one. There is no threshold of response, i.e., no point of inflection or rapid increase. t appears to be simpl a linear relationship the greater the area harvested and/or roaded, the greater the impact.

n addition to the unpublished agenc s nthesis report rant et al. 2008 there is a wide ranging, published, peer reviewed scientific literature on flows, dating bac to the earl 1 70s. That literature is

replete with studies that have found significant h drologic impacts of timber harvest and roads see Appendix 4 .

BLM's methods are biased toward non-detection of their arbitraril limited factor of interest. For their h drologic model BLM delimits the watersheds that contain "sufficient" amounts of land within the ROS one, removing from further anal sis an watersheds that have less than 60 ROS this screen li el removes most BLM watersheds up front . Then the determine what percentage of the overall planning area might experience "increased peak flows" based on projected i.e., future onl levels of management activities in the remaining few watersheds that passed their first screening criterion. Specificall BLM removes an watershed where less than 1 of the watershed would experience regeneration harvest and roads. This leaves onl a few small sub-watersheds within the planning area or region and a very small percentage of BLM lands "of management concern" for peak flows. The 1 value is not a threshold for response. nstead it is where the roughl interpolated linear relationship in rant et. al. 2008 appears to cross the arbitrar 10 pea flow "detection limit."

There are a number of problems with rel ing on this method. The linear fitting of the relationship that BLM uses borrowed from rant appears to be based on data for all pea flow event t pes – not just ROS but also rain dominated or snow dominated. But the BLM has alread excluded all rain dominated s stems from their model prior to using this relationship and appl ing the 10 detection criterion. This fact alone invalidates the anal sis. Second, the pea s used in the rant et al. 2008 paper rant et al. 2008, figures 8 and 10 include all reported pea flow event magnitudes pea flows of various si es , not onl the more management-sensitive 1-2 ear pea flows see Appendix 4 . nclusion of pea flow recurrence intervals of greater than approximatel 2-6 ears in rant et al. 2013's dataset means that the "detection limit" BLM uses is arbitrar and, for the 1-2 ear pea flows i.e. the most fre uent channel maintenance flows , it is inappropriate. These smaller 1-2 ear pea flow events need to be evaluated separatel to determine what a reasonable, i.e., precautionar , "management limit" might be in man BLM chec erboard watersheds. Third, the BLM uses projected future management levels within watersheds and thus ignores the fact that most BLM mixed ownership watersheds are alread heavil managed and extensivel roaded. When examining h drologic impacts, prior watershed management histor and current condition matters see Appendix 4 .

n addition to the above flaws in their h drologic anal sis, the BLM never loo s at the potential for pea flows of an si e to lead to significant impacts to fish. oode et al. 2013 although wor ing in daho, identif the following issues with pea flow impacts once again, not the onl issue – defined as critical scour events :

-- Critical scour results in movement of bedload and impacts to fish
-- mbr os and oung of fall spawning fish are at greatest ris
-- Ris for all species is reduced when changes in channel morpholog eep pace with climate driven changes in stream flows
-- Refugia habitats ma occur in unconfined portions of streams where scouring events are less li el .
-- Confined valle s will exacerbate climate-driven changes in flow and scour. oode et al. 2013

The BLM's proposed elimination of the "inner gorge" in riparian definitions, lac of management standards to reduce current road mileage and limit future road construction in heavil degraded watersheds, and lac of sufficient protection for intermittent streams, in combination with aggressive timber harvest and soil compaction will li el result in increased fre uenc and magnitude of critical scour events in smaller, steeper watersheds with dense stream networ s and alread high road densities.

The above h drologic impacts will be affected b climate change and subject to additional climate related uncertaint . Climate projections for the region do not full agree on a general trend for precipitation but it appears that the ROS one ma shrin or expand, depending on normal decadal variabilit due to SO/PDO c cles. That means that the snow one in some ears ma become ROS and parts of the rain-dominated one ma become ROS in others. The BLM needs to use a stochastic model that includes climate variabilit to determine where or how much ROS will exist and where and how it ma be affected. owever, again, the BLM must not limit its anal sis to pea flows.

The BLM neglects to full anal e impacts to intermittent streams which are a large proportion of the total stream miles in man watersheds. The BLM also fails to full examine the h drologic impacts that occur now due to ongoing, generall poor identification and appropriate management of intermittent streams. ntermittent streams are b definition ephemeral features of a uatic landscapes. n practice, the agencies and their contractors onl leave trees standing in the correctl defined (minimum 100') riparian buffers if water is seen flowing in them at the time the units are flagged. This practice was alread in full swing bac in 1 5 facilitated in man cases b scientificall deficient watershed anal ses but is now institutionali ed. The loss of relevant geotechnical and h drologic expertise within the BLM district and field offices and at the two consulting agencies, combined with significant increases in contract logging and outsourcing of timber sale planning, allows untrained staff to ma e the call when designing and flagging the units. This flaw applies to all the alternatives, including o Action.

The WFP uses specific language to determine the presence and extent of intermittent streams. t includes all streams even if fully dry) showing "evidence of annual scour or deposition." With climate changing, it is imperative the BLM use this definition when delineating all intermittent streams. All intermittent streams should receive 150' no cut vegetative buffers on either side, measured as slope distance from the outer edge of the floodplain or from the outer edge of the area of visible scour and/or deposition note: not measured from "the ordinary high water mark" as this is inappropriate for intermittent streams , in <u>all</u> alternatives. Anal ses completed since F MAT have determined that full protection of intermittent streams, seeps and areas of high groundwater to surface water interaction i.e., headwaters is even more critical than the F MAT scientists believed bac in 1 4 or were able to incorporate, largel for political reasons. ntermittent stream buffers of only 100' on either side are essentiall inade uate to protect watersheds from cumulative h drologic, thermal and sediment impacts. Persistent or recurrent drought ma es streams dr out starting from the top – reducing stream miles available to fish and freeing up areas for timber harvest, over time. The BLM D S needs to evaluate whether this will reduce intermittent stream detection and riparian buffer protection.

BLM has not evaluated how perenniall flowing streams will shrin , and intermittent streams dr up or disappear, given climate change projections particularl during drier c cles. n fact this is probabl alread happening on BLM lands, exacerbated b BLM forestr practices, state forest practices. and non-federal forestr practices, coupled with interference of natural flow paths via extensive ground disturbance, soil compaction, landings, and roads.

Culverts and road/stream crossings ma e matters decidedl worse, reducing fish passage and habitat area. Road s stem extensions increase water spreading water diversions, road cuts, gullies, roadside ditches, and other runoff channels expand the pattern of flows and reduce in-stream flows particularl in late spring and summer. In fall and winter the roads themselves may become "streams" and alter both flow and sediment regimes. This should be anal ed as an unwelcome change in the timing, magnitude and spatial pattern of flows, but particularl the latter.

A review of BLM watershed anal ses throughout the region would demonstrate that RR widths have uite often been reduced without basis particularl for intermittent streams and non-fish streams. These reductions have h drologic conse uences as well as impacts to sediment regimes, nutrient flows and a uatic food chains. These impact t pes are not addressed in the D S and need to be full anal ed in the F S See Frissell et al. 2014 .

17. Outdated and biased LWD anal sis

The Large Wood Debris LWD Recruitment anal sis relies on 2008 modeling and is inconsistent with best available science and with the actual condition of riparian stands on the ground, particularl in coastal streams and tributaries in central to northern Oregon.

An interagency panel (the "Large Wood Elevation Team") reviewed current models for LWD delivery to streams within wetter, west side forests, and determined that thinning reduces LWD pieces and volumes entering streams for up to 0 ears. Onl after that were remaining trees within the immediate LWD recruitment one appreciabl larger. nder the BLM plan alternatives, the portion of trees not within a limited inner "no cut "zone of less than one tree height would be subject to harvest, so even then LWD recruitment to streams would be lower than natural rates. n the intervening 0 ears LWD amounts in the smaller si e classes were removed, so there is a 0 ear deficit, followed b uncertain benefit. Polloc and Beechie 2014 . Meanwhile the extensive road-related and ph sical disturbance impacts to streams necessar to do wide-spread thinning or regeneration timber harvest in the outer portions of reserves would li el be considerable.

LWD will be reduced b among other things

i alving of the RR boundaries in most cases an exception perhaps is Alternative D for certain stream t pes
ii Removal of the inner gorge from RR definitions for all action alternatives
iii nade uate protection for potentiall unstable landslide prone slopes that can deliver LWD episodicall
iv Inadequate protection and concern for the "channel migration" zone in RR definitions for all action alternatives

n man steep and moderatel steep coastal tributar streams in Oregon, the "inner gorge" is dominated b alder/hardwood stands, with intermittent individual conifers or coniferous patches. Conifer dominated stands in some steeper s stems extend mainl upslope from approximatel the upper third of the inner gorge. All action alternatives eliminate the inner gorge portion of the RR definition i.e., the do not include the whole inner gorge, as does the o Action/ WFP . n alternatives B and C onl the inner half of the one-tree-height RR distance is a "no-thin" one, and in Alt A, fish-bearing streams ma be clearcut to within one site-potential-tree height distance of the stream note: the current o-Action alternative's protection for all fish bearing streams is two site potential tree heights or 300' on each side of the stream, whichever is greatest . This has the effect of leaving primaril the alder and hardwood dominated one standing around streams that are planned for either extensive thinning or clearcutting. Potential large coniferous wood deliver in these s stems large, stable pieces of conifers that form log jams and create and maintain fish habitat would be reduced both from within and outside of the designated stream buffers. n the above situation, which is uite common, the best chance for large, functional "key pieces" of LWD getting into the stream is via debris flows, unstable or potentiall unstable slope failures or larger landslides. n all action alternatives, the RR definition excludes potentiall unstable slopes.

The existing pattern of large coniferous wood sources on the landscape, combined with the loss of the inner gorge portion of the RR definition, and the elimination of the "potentially unstable" portion of the RR definition is not full accounted for in BLM's modeling and anal sis of LWD inputs. The combination of factors described above will reduce or significantl dela essential LWD e piece deliver to stream channels. The li el reduction in total LWD deliver is far greater than is suggested in BLMs modeling.

Other research has shown that it ma not be onl total wood deliver that is important. Reeves et al. 2003 found in Cummins Cree , Western Oregon, that:

> "About 65 of the number of pieces and 46 of the estimated volume of wood were from upslope sources. Streamside sources contributed about 35 of the number of pieces and 54 of the estimated volume of wood. The estimated mean volume of upslope-derived pieces was about one-third that of streamside-derived pieces. pslope-derived pieces were located primaril in the middle stream reaches and in the ones of influence that had the most contact with the low-flow channel. Streamside-derived pieces were more evenl distributed among the examined reaches and were predominatel in the influence ones that had the least contact with the low flow channel."

Thus, LWD deliver from upslope areas outside the 1-tree-height distance ma not be the "rare occurrence" that BLM asserts it to be. Furthermore, the location of the LWD from upslope sources appears to have a higher ecological value that ma exceed its volume.

18. The D S does not ta e a *synthetic* loo at cumulative impacts or climate impacts. Cumulative impacts of current management on adjacent non-federal lands, as well as reasonabl foreseeable future actions of private, state, and all federal actors are not full examined.

Cumulative effects are defined b regulation 40 CFR Section 1508.7 under the ational nvironmental Polic Act as:

> "...the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonabl foreseeable future action regardless of what agenc Federal or non-Federal or person underta es such other actions. Cumulative impacts can result from individuall minor, but collectivel significant actions ta ing place over a period of time." C 1 7

Reasonabl foreseeable impacts of extensive thinning, clearcutting, road construction, post-fire salvage, etc., are not given the "hard look" that NEPA requires in the D S. Furthermore, ongoing climate impacts to streams, fish and riparian- and a uatic-dependent resources are not evaluated as part of cumulative impacts. The D S must contain a s nthetic cumulative impacts and climate impacts anal sis. These two lines of evidence must be integrated, using "best available scientific information" on climate impacts and projections as well as updated baseline and cumulative impacts of past, present and future management actions. This circles bac to the primar defect of the RMP D S which is an inade uate portra al of the current ecological state of affairs. This biased assessment of the status uo also results in a biased Purpose and eed statement, which, in turn, results in an inade uate range of alternatives see Comments 13 and 14

1 . Riparian Reserves vs. “managed” large block reserves – a manufactured controvers

ote: See Appendix 1 for an explanation of how BLM inaccuratel portra s RR vs. LSR provisions of the o Action alternative and current protections on the landscape.

t is apparent that the BLM wishes to pit fish biologists and owl biologists against one another. The o-Action alternative alread provides a balance between later successional forest development in LSRs and ade uate stream and listed fish protection via the ACS. f the balance is compromised, as it will be under an of the several Action alternatives, the end result will li el end up in the courts. This would be a waste of taxpa er dollars. Also it would significantl undercut holistic management of federal forests b the .S. Forest Service SFS and undermine the upcoming SFS plan revisions process. The loss of overall WFP validit will result in more lawsuits, SA petitions, species listings and termination or renegotiation of a large number of abitat Conservation Plans CPs within the region. These are several more wa s to waste taxpa er dollars, not to mention agenc time resources that would be best spent fixing problems on the ground. xtended public controvers , as well as litigation overload will forestall climate savv restoration actions, recover plan implementation, and other necessar conservation efforts. These are all foreseeable impacts and should be presented as such in the RMP F S as an outcome of <u>all</u> the action alternatives.

True Riparian Reserve protections are not inconsistent with functional, climate-informed wildlife migration corridors and interconnected larger bloc reserve development. t is rather distressing that the BLM has constructed the alternatives in the D S to create a false dichotom between a uatic and terrestrial protections. Both are needed.

20. o nvironmentall Preferred Alternative. The BLM must create a new action alternative the “environmentally preferred” alternative) that does not compromise either the ACS or late successional forests – it will resemble the no action alternative, but with improvements to the ACS, as well as improvements in the spatial arrangement and connectivit of later seral forests, to allow for species migrations in light of observed and projected climate changes.

21. BLM D S relies on the 2008 D S for one or more of the models, particularl the large wood model. The 2008 D S has been legall invalidated.

22. BLM uses cites the 20 ear A uatic Resource valuation Monitoring Program AR MP report conclusions which found that the majorit of watersheds improved. see also issue 13 regarding BLM’s rejection of a more protective ACS alternative that would allow for or speed up a uatic s stem recover . Specificall the D S states that “[m]onitoring results conclude that the ecological condition of approximatel two-thirds of the watersheds in the orthwest Forest Plan area have improved in condition in the past two decades.” (DEIS, page 233).

AR MP results can onl ma e broad, coarse scale inferences about the general condition of watersheds Cs or basins where there is > 25 federal ownership. Watersheds primaril at the boundaries of federal ownership and/or where BLM chec erboard lands coexist with mostl non-federal land would be underrepresented or simpl not represented b the AR MP. n an event it is uestionable whether AR MP results, which are FS land-base-centric, appl to all BLM land ownerships within the planning area. Moreover, as all BLM action alternatives remove ACS protections, the BLM cannot claim that an improving trends in watershed conditions, even if real, will continue, as the improving trend depends on full ACS implementation moving forward.

BLM cannot extend the uestionable "improving trend" in AR MP monitoring results because these results represent onl the first twent ears of ACS implementation. nder the WFP, the ACS was expected to continue for another 30-80 ears i.e., be ond the first 20 .

23. n the past, the BLM has repeatedl deviated from the explicit re uirements and essential components of its plans. n particular, the BLM never faithfull integrated or implemented man interrelated aspects of the ACS Standards and uidelines. n all the action alternatives, these features are removed, thus institutionali ing BLM's current lackluster protection of aquatic and riparian protection. All the action alternatives essentiall legali e what BLM is alread doing b removing all so called "legal hooks." The action alternatives, however, would accelerate and multipl the damage that BLM has alread caused in its erratic and incomplete implementation of the WFP ACS.

24. The best available science still indicates that individual watersheds ma var in their conditions, capabilit and functions. The no-action alternative is the onl alternative in the D S that includes watershed anal sis and is the onl one that can address individual watershed conditions, capabilit and functions. The BLM has a poor record of furthering the nine ACS Objectives, which rel on the information contained in completed watershed anal ses. The BLM also repeatedl ignores its own watershed anal sis findings. The o Action alternative is the onl alternative that would include the science-based information contained in watershed anal sis documents and this information is criticall needed to meet all relevant ecological conditions specified in the ACS Objectives. The final selected alternative must include stronger re uirements for managers to incorporate best available science, including but not limited to that contained in completed watershed anal sis documents, prior to conducting land and water management activities particularl in Ke Watersheds and RRs.

25. Overreliance on "Best management Practices" (BMPs)

Chapter 3, Appendix "I" of the BLM DEIS is devoted to roughly 36 pages of BMPs. BMPs are essentiall a form of mitigation for damages, not protection. Furthermore, the BLM DEIS's extensive list of mitigation measures is evidence that the ris s from cumulative mitigation failure are potentiall ver large. Rashin et al. 2006 evaluated similar timber harvest BMPs in Washington State and determined that the effectiveness of BMPs declined as a function of distance from streams. Two of the primar factors influencing BMP effectiveness in their stud were the proximit of ground disturbing activities to streams and the presence or absence of designated stream buffers. The also state another problem with BMP-based approaches is the failure to match or adapt BMPs to actual site conditions such as the densit of small streams at harvest sites and the steepness of inner stream valle slopes. The BLM D S generall has no mechanism to address either of these e factors when implementing or carr ing out BMPs and in fact all BLM action alternatives eliminate the use of watershed anal sis, dramaticall reduce intermittent stream protections and remove language re uiring inclusion of the "inner gorge" within the RR boundary. The BLM action alternatives all shorten the distance between the mitigation measures and all stream classes and t pes, thus, according to Rashin et al 2006 , wea ening the effectiveness of the BMPs.

26. The BLM has chosen to b pass or avoid independent peer review of the scientific information contained in the D S. All models and scientific assessments contained in the D S should undergo independent scientific peer review to identif and remed the following t pes of flaws in BLM's use of science - particularl in their design and parameteri ation or models and interpretation of results.

Flaws in the modeling approaches noted above for h drolog and LWD deliver suggest that **all** of the BLM models used in this D S need to be carefull examined for the following fatal flaws:

- Arbitrar narrowing of the environmental factors of interest
- False or biased modeling assumptions
- mproper parameteri ation of models
- nappropriate use or application of "thresholds"
- mproper interpretation of results
- Misuse or inaccurate use of scientific information
- Selective use of scientific citations, and
- Overreliance on non-peer reviewed "grey literature"

ote: the models for shade, stream temperature, and carbon storage were not full reviewed for these comments due to lac of time however, it appears that all the models suffer from the same inds of flaws detected in the h drologic and LWD models. For example, the carbon storage model neglects to account for the 50-70 loss of carbon in milling wood and manufacturing wood products and also does not account for climate change impacts to soil moisture storage, which can affect carbon storage.

27. AC Cs – Areas of Critical nvironmental Concern.

Concurrent with the comment period for this D S, the BLM is see ing comments and recommendations from the public on "Areas of Critical Environmental Concern" (ACECs). This construct comes from FLPMA and is a regressive non holistic approach to limiting environmental protections to small geographic areas meeting BLM's planning criteria. B removing protections that exist across large landscapes, that are alread based on science, that alread support a variet of critical environmental and human resource needs and b not anal ing these changes in full, the BLM is being disingenuous and dishonest to the public. PA re uires a hard loo at impacts, accurate comparison of alternatives, and full disclosure to the public of an impacts to the human environment. The document fails on all counts. Limited delineation of AC Cs is not helpful or responsible.

All current Ke Watersheds, all LSRs, all interim and designated riparian reserves on all streams and waterbodies in the entire WFP plan area, including BLM lands are in need of *increased* protection relative to o-Action, whether or not the would meet BLM's criteria as "ACECs." Also, all BLM watersheds containing Southern Oregon/ orthern California SO C coho salmon populations, spring chinooo , summer and winter steelhead populations, Pacific Lampre , and bull trout populations, must be protected, whether or not they meet BLM's ACEC criteria.

The ative Fish Societ has submitted comments that include examples of both at ris species and specific streams and rivers of concern for native fish conservation. Those comments are incorporated here b reference however, the are not the onl waterbodies that would be severel degraded b the alternatives in the D S.

Than ou for the opportunit to comment.

Rowan . Ba er
Portland, Oregon
[redacted]

Citations:

Council on nvironmental ualit . 1 7. Considering cumulative effects under the ational nvironmental Polic Act. Council on nvironmental ualit .

 oode, .R., .M. Buffington, D. Tonina, D. . saac, R.F. Thurow, S. Wenger, D. agel. C. Luce, D. Tet laff, and C. Soulsb . 2013. Potential effects of climate change on streambed scour and ris s to salmonid survival in snow-dominated mountain basins. drological Processes 27, 750-765 2013 , Published online b Wile Online Librar .

 rant, . ., S. L. Lewis, F. . Swanson, . . Cissel, and . . McDonnell. 2008. ffects of forest practices on pea flows and conse uent channel response: A state-of-science report for western Oregon and Washington. P W TR Report 760 Ma 2008 .

Frissell, C.A., R. . Ba er, D.A. DellaSala, R.M. ughes, .R. Karr, D.A McCullough, R.K. awa, . Rhodes, M.C. Scurloc , and R.C. Wissmar. 2014. Conservation of a uatic and fisher resources in the Pacific orthwest: mplications of new science for the A uatic Conservation Strateg of the orthwest Forest Plan. The Coast Range Association.

Leopold, L., M. . Wolman, and . P. Miller. 1 64. Fluvial processes in geomorpholog . W. . Freeman and Compan , San Francisco, 522 pp.

Polloc , M.M., and T. . Beechie. 2014. Does riparian forest thinning enhance biodiversit The ecological importance of large wood. ournal of the American Water Resources Association. 50 3 : 543-55

Rashin, .B.. C. . Clishe, A.T. Loch, and .M. Bell. 2006. ffectiveness of timber harvest practices for controlling sediment related water ualit impacts. ournal of the American Water Resources Association, October 2006, pp 1307-1327.

Reeves, . ., K.M. Burnett, and . . Mc arr . 2003. Sources of large wood in the main stem of a fourth order watershed in coastal Oregon. Canadian ournal of Forest Resources 33: 1363-1370.

Appendix 1:

The BLM, in actual practice emplo s the wrong land allocation hierarch of standards and guidelines in the WFP ROD. This has been a tactic both FS and BLM have been using for ears, allowing them to activel manage RR acreage within LSRs as if the other ACS related standards and guidelines for Riparian Reserves did not appl . n realit RR S s as well as LSR S s appl .

The BLM states in Chapter 2 that "[**t]he Riparian Reserves acreage for the No Action alternative presents only the Riparian Reserves within the Matrix [land use allocation] which is how the 1995 RMPs presented the hierarchy of land use allocations. The Late-Successional Reserves acreage for the No Action alternative do not account for Riparian Reserves within the Late-Successional Reserves.**" (Chapter 2, page 32, Emphasis added

The BLM then contradicts itself by saying that ..."[i]n the No Action alternative, the Riparian Reserves would overla the Late-Successional Reserves, and implementation in those overlapping areas would appl the **management objectives and management direction [*]** for both land use allocations." **(USDA/USDI 1994, pp. A-5) [**]"** This is partl correct - both the LSR and RR standards would legall appl however it is not what BLM has actuall been implementing for 20 ears .

[*] but not the numerous ACS related S s - This is actuall terminolog used in the action alternatives and comes not from the WFP ROD but from the O C Lands Act

[**] mapping protocol not the "hierarchy of S&Gs for land allocations" – that s on ROD C-1

The BLM states further that " ...As a result, **the 1995 RMPs only accounted for the Riparian Reserves acreage in the Late-Successional Reserves as Late-Successional Reserves; the only Riparian Reserve acreage calculated were those in the Matrix.** Thus, the acreage of Riparian Reserves and Late-Successional Reserves presented in the 1 5 RMPs cannot be directl compared to the acreages presented in this analysis." (mphasis added, Chapter 2, Alternatives, page 32

Re: "RMPs only accounted for"….The RR acreages would then be treated as LSRs allowing for management within the RR widths to achieve "LSR objectives." This is incorrect.

t appears upon anal sis that the BLM applies the wrong hierarch of Standards and uidelines during implementation of their RMPs i.e., in practice the use the mapping/displa hierarch on ROD page A5, instead of the correct hierarch of S application on ROD page C-1 .

This is consistent with BLM's statements elsewhere in the DEIS analysis that there are "no constraints" on thinning within Riparian Reserves under the 1 5 RMPs no action alternative . This shows that the BLM treats Riparian Reserves as management ones ever where, including within Ke Watersheds.

Contrar to what BLM asserts these are not "no holds barred" management zones. Using the correct hierarch of S s the RR protections **add to** LSR protections, with the RR S s being far more precautionar than LSR Standards with respect to a uatic conservation.

Appendix 2.

The BLM merges the "Affected Environment" section of a typical EIS out of existence which allows BLM to narrowl identif onl those aspects of the environment that the want to anal e generall b using mechanistic models that are reductions or extreme oversimplifications of the full set of existing conditions and resource issues on the landscape :

The D S states up front:

"Although many EISs present the affected environment and environmental consequences in separate chapters, the BLM has combined these two topics into this single chapter to provide all of the relevant information on a resource in a single discussion. This chapter includes sections for each resource that the RMPs are likely to affect… Each section begins with a summary of the methods used to anal e the impacts of the alternatives on this resource." (DEIS, ntroduction

The last sentence of the above is disingenuous, as it allows BLM to move uic l into a discussion of "methods" without framing all the resource issues of concern in the affected environment. The purpose of the "Affected Environment" section in NEPA is to fully describe all issues and resource concerns that occur presentl on the landscape, so as not to miss an t pe of impact as well as to inform cumulative impacts anal sis. The BLM must go bac and describe all the resources that are affected b the RMP revisions in a correctly formulated "Affected Environment" section, before selecting "methods" for analysis. Then the BLM must evaluate all direct, indirect and cumulative impacts to the affected resources.

A perfect example of this is Ke Watersheds. The Affected nvironment includes a s stem of tier 1 and tier 2 e watersheds. All the action alternatives do awa with e watersheds. Currentl , all tier 1 e watersheds are the focus of stream restoration for listed fish and all tier 2 Ke Watersheds are to be managed as critical watersheds for water ualit support to downstream communities. The Affected nvironment section should explain this fact as part of the baseline environmental and resource conditions, and present wh this is so. What caused there to be a need for Ke Watersheds ow are the trending What were the expectations for Ke Watersheds ote: Ke Watersheds were supposed to be the focus of restoration as important refugia or critical water sources and were expected to improve more rapidl than other non- e watersheds but this generall has not happened .

Appendix 3.

Comparison of ACS Objectives o Action with Management Objectives Action alternatives :

"Aquatic Conservation Strategy Objectives:

Forest Service and BLM-administered lands within the range of the northern spotted owl **will be managed to:**

1. Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.

2. Maintain and restore **spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia.** These networ connections must provide chemicall and ph sicall unobstructed routes to areas critical for fulfilling life histor re uirements of a uatic and riparian-dependent species.

3.Maintain and restore the **physical integrity of the aquatic system, including shorelines, banks, and bottom configurations**.

4. Maintain and restore **water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities**.

5. Maintain and restore the **sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

6. Maintain and restore **in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.**

7. Maintain and restore the **timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.**

8. Maintain and restore the species composition and structural diversit of plant communities in riparian areas and wetlands to provide **adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability**.

. Maintain and restore **habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species**"

WFP ROD page B-11, emphasis added

ote: ACS Objectives above lin directl to roughl a hundred activit specific standards and guidelines that must be followed under the no-action alternative. The removal of these e objectives, which are themselves binding standards and guidelines has not been sufficientl anal ed in the D S.

n comparison, the BLM Management Objectives below for Western Oregon Section 3, Appendix B, page 06 et. se . would appl to all the action alternatives and are far more limited in terms of the functions or values they would "protect"– the include compare the wea er language in italics :

<u>West of ighwa 7:</u>

"*Contribute to* the conservation and recover of listed fish species and habitats and *provide for* conservation of special status fish and other special status riparian associated species.

Maintain and restore the proper functioning condition of riparian areas, stream channels and wetlands b *providing forest shade, sediment filtering, wood recruitment, stability of stream banks and channels, water storage and release, vegetation diversity, nutrient cycling and cool and moist microclimate.*

Maintain water ualit and streamflows within the range of natural variabilit , to protect a uatic biodiversit , *provide quality water for contact recreation and drinking water sources*.

Meet OD water ualit targets for 303 d water bodies with approved Total Maximum Dail Loads TMDLs .

Maintain high ualit water and *contribute to the restoration of* degraded water ualit downstream of BLM-administered lands.

Maintain high ualit waters within OD designated Source Water Protection watersheds.

Appendix 4. drologic mpacts

Main point #1: Timber Harvest and Roads affect a wide range of hydrologic impacts, not only "peak" flows:

Timber harvest and roads cause significant h drologic impacts to watersheds, and to do the hard loo that PA re uires, BLM must examine the full range of potential h drologic responses, not just pea flows.

Timber harvest and its associated road construction and site preparation practices can have significant effects on h drologic processes – the amount of infiltration, overland flow, subsurface flow and ground water recharge – affecting the overall water ield and the timing, duration and si e of flow events

Anal sis of the entire suite of flows within a watershed is generall re uired to determine the effect of timber harvest and roads. This includes pea flows of various recurrence intervals or si es , low flows, and especiall the one-two ear events that are associated with channel formation and maintenance. arious landscape, geologic and h drologic factors and watershed pre-conditions form the context for examining the changes in the pattern of sediment, nutrient, and wood routing, and the timing, magnitude, duration, and spatial distribution of pea , high, and low flows resulting from timber harvest activities.

Main point #2: The history and current condition of streams and watersheds matters when evaluating hydrologic impacts.

f the stream is adjusting to changes in h drolog due to past management practices, as evidenced b down-cutting, excessive lateral movement, stream ban erosion, or other signs, it would be critical to decision-ma ing to factor in the impact of additional timber harvest on the overall h drologic function of the s stem. More severe effects can result when channels are unstable at the time flow increases occur Leopold et al. 1 64, see also eede 1 1 .

Main point #3: BLM watersheds with 50% mixed land ownership are already degraded in many cases both physically and hydrologically, so the above observation by Leopold likely applies.

Peak Flows

Pea flows refer to the instantaneous maximum discharge associated with individual storm or snowmelt events McDonald et al. 1 1, Christener and arr 1 83 . n the low-l ing coastal basins in the Pacific orthwest, winter rainfall is the primar cause of pea flows, while in man of the higher elevation and interior areas, pea flows are generated b spring snowmelt. Other possible causes of pea flows events are summer thundershowers and rain-on snow events." (McDonald et al. 1991).

n general several major studies report the following important findings relevant to this region Western Oregon and coastal California where the h drologic mechanisms are largel similar :

1. n the Coast and western Cascade Ranges of Oregon studies have shown that forest management activities can increase fall pea flows up to 200 percent and small winter pea flows up to 50 percent in small watersheds arr et al. 1 7 , Rothacher 1 3, ones and rant 1 6 . Road building and soil compaction associated with timber harvest ma also contribute to damage in small headwater streams as a result of increased si e of larger pea flows arr 1 76 Christner and arr 1 83 .

2. Spence et al. 1 6 conclude from a review of h drologic literature Beschta et al. 1 5, Chamberlin et al. 1 1, arr et al. 1 7 , Rothacher 1 71, MacDonald and Ritland 1 8 , arr 1 86 that most studies in rain-dominated s stems of the Coast Range have indicated increases in pea flows following logging, particularl those pea s occurring in the fall. iemer 1 81 for example, found that earl fall pea s in one low elevation coastal, rain-dominated, watershed in northern California increased about 300 after logging.

3. Forest harvest can increase the si e of the largest pea flows in areas where the largest floods are caused b rain-on-snow events. This increase in the si e of pea flows is due to the combination of increased snowpac caused b a reduction in interception losses and increase in snowmelt due to increased turbulent heat transfer. McDonald et al. 1 1 .

4. iemer and Lisle 1 8 caution that converting subsurface flow to overland flow via soil compaction, whether caused b log s idding, road building, or gra ing, can increase storm flows and runoff velocit .

Research b ones and rant 1 6 shows that the effects of forest management on the largest pea flow events is still an open uestion and that continued research is needed to gain better understanding of pea flow changes in larger basins. The report that:

1. Timber harvest and road building in three small basins created greater changes in small pea flows than in larger flows.

2. Forest harvesting increased large pea discharges b as much as 100 in three large basins over the past 50 ears.

3. Forest harvesting in five paired basins n 375 storm events in the western Cascades of Oregon increased pea discharges b as much as 50 in small basins and 100 in large basins. The addition of roads to clear-cutting in small basins produced a uite different h drologic response than clear-cutting alone, leading to significant increases in all si es of pea discharges in all seasons, and especiall prolonged increases in pea discharges of winter events ones and rant 1 6 .

arr et al. 1 7 in a stud of changes in pea flow in three small headwater watersheds of the South mp ua River, after three t pes of timber harvest clear-cut, shelterwood, small patch cut found that winter increases in pea flows due to logging where largest in absolute terms, but in man ears are smaller in relative terms than the increases found in either fall or summer.

Pea flows that recur on an interval of 1.5 ears e.g., 1-2 ear flows are the dominant channel maintenance flows in a large variet of rivers Wolman and Miller 1 60, in Dunne and Leopold 1 78 . Ban full flows in headwater areas are the major mechanisms that form channels, and steep stream channels are eroded and a uatic habitats damaged during high flows Christner and arr 1 83 . Large e.g., 50 - 200 ear flows are too infre uent to govern stream channel characteristics however these events can cause mar ed long-term changes in channel conditions. Low flows are too small to have an major effect on stream channel form, thus an intermediate flow is implicated as the dominant channel forming flow. Studies that have examined the effects of logging and road building using paired watersheds and which reported results for smaller pea flows have generall found statisticall significant increases in smaller, earl seasonal pea flows in the treated watersheds arr 1 76, Cheng 1 8 , ones and rant 1 6, Thomas and Megahan 1 8 .

Other Flow Issues

Land use can affect several aspects of water ield in addition to pea flows, including winter base flows, summer low flows, total volume, timing and duration, and therefore should be considered in watershed anal sis. The issues mentioned in ACS Objective 6 of flow timing, duration and magnitude see Appendix 2 of these comments ma be applicable to a variet of flow t pes. For example, the timing or magnitude of pea flows, and timing, duration or magnitude of seasonal high or summer low flows ma be appropriate for anal sis. The cumulative effect of roading on variable flow regimes is an additional important consideration.

Summer Low Flows. The effects of harvest and roading on summer low flows have not been as well studied as those of pea flows, although several researchers are currentl conducting such evaluations. Because the removal of trees can reduce the water demand in the summer, summer low flows ma increase Keppeler, 1 8

and even be temporaril beneficial to the stream. ic s et al. 1 1 stud ing the effects of clearcut harvest on pea and low flows reported that an initial eight ear increase in base flows was followed 1 ears of decreased summer low flows. Changes in low flows ma be the result of different mechanisms operating in different geoclimatic settings. For example, if increased erosion also accompanies the harvest and roading, then stream channels can become the sites of increased sedimentation. This channel aggradation can then lead to decreased summer low flows. Conse uentl , the examination of the effects of land management activities on low flow regimes must not onl consider the water budget, but also possible channel changes that would affect how the water is routed through the channel. Another possible mechanism was pointed out b arr 1 82 who attributed the decrease in low flow following logging to reduced canop that lead to decreased fog drip. Basic h drologic anal ses of the watersheds in uestion can assess which flows in a given region are important in maintaining channel form and transporting sediment, and whether increase in low to moderate flows will significantl affect these aspects.

Changes in summer flows can affect salmonid habitat ic s et al. 1 1 b changing water ualit , or available space. For example, increases in summer low flow ma affect the stream temperature regime. An increase in the volume of water in a channel in the summer would ma e a stream less susceptible to water temperature increases. owever, if more water goes subsurface because of channel aggradation, the water flowing through gravel rather on top of gravel will have a different temperature regime.

nfluence of Roads on Spatial Distribution of Flow and Flow Condition. A stud of an extensive logging-road networ in two adjacent 62 and 11 m^2 basins in the western Cascades of Oregon, had three important findings: 1 a large portion 57 percent of the road networ in the basins studied is h drologicall connected to the stream networ 2 a possible explanator mechanism for changes in h drograph shape following road construction is the enhanced routing efficienc due to connecting road segments and stream networ s and 3 the timing of road development and accompan ing h drologic integration of the road networ corresponds to the timing of observed changes in pea flows in the two stud watersheds. This wor supports the h pothesis that road segments that are lin ed to channel networ increase flow routing efficienc and hence provides a plausible mechanism for observed increases in pea flows Wemple et al., 1 6 .

ones and rant 1 6 state that their results support the h pothesis that roads interact positivel with clear-cutting to modif water flow paths and speed the deliver of water to channels during storm events. Mechanisms the describe for altering surface and subsurface flow patterns are include extension of the active channel networ b roads and roadside ditches, increased subsurface flow interception at cutban s, increased overland flow on road surfaces, and alteration of flow routing b ditches and culverts. The cite other studies arr et al. 1 75 Wemple 1 4 Wright et al 1 0 and Reid and Dunne 1 84 which found that road surfaces, cutban s, ditches and culverts all can convert subsurface flow paths to surface flow paths. But few studies have loo ed at how roads ma significantl change the spatial distribution b redirecting flows in other wa s. Forcing or combining of streams into culverts infre uent stream crossing structures, routing of water along roadside ditches) can capture water from microdrainages outside the watershed, and represents a form of "stream piracy" (Megahan 1972). All of these changes in flow paths alteration of surface and subsurface flow paths and moving of water from one stream channel to another are e uivalent to changes in the spatial distribution of flows and can be associated with timber-harvest-related road-building.

Studies have shown that pea flow fre uenc arr 1 76 , duration ac son and averen 1 84 , and timing Rothacher 1 73 arr 1 76 iemer 1 81, arr et al. 1 75 1 7 , arr 1 76 are affected b timber harvest activities. The life-histor characteristics of man a uatic species is influenced b flow regime, therefore forest management activities that can cause changes to the flow regime should be carefull evaluated.

Summary of Flow Regime Studies

The following summar is based on the above review and on broad ranging scientific literature on instream flow changes associated with regeneration harvest summari ed previousl b Spence et. al 1 6, and McDonald and Ritland 1 8 .

1. The effects of forest management on streamflow var b season, b region and b overall h drologic regime.

2. Logging and roading have generall caused statisticall significant increases in 1-2 ear pea flows**. These are channel maintenance flows.**

3. arvest and roading can influence the magnitude and fre uenc of smaller pea flows smaller than a 2- ear return period in 1st to 3rd order watersheds i.e., smaller than 6th field subwatersheds. A pea flow with a return period of one to two ears can be a ban full or over-ban flood.

4. xtensive clearcutting results in short-term increases in summer low flows. owever, after longer periods 5-8 ears this effect ma be followed b a longer period of reduced summer low flows e.g., 30 or more ears ic s et al. 1 1 after clear-cut areas become revegetated.

5. ncreases in pea flows are often associated or related with the cumulative area harvested within a basin, recent rates of clearcutting, and percent of watershed soil surface compacted or seriousl disturbed, which is wh man currentl emplo ed cumulative effects index methodologies attempt to model potential h drologic and other effects using the area or rate of disturbance**.**

6. The influence of harvest and roading on pea flows greater than a 2- ear return period would be most apparent at smaller geographic scales 1st to 3rd order drainages .

Literature Cited:

Beschta, R. L., . R. Bo le, C. C. Chambers, W. P. ibson, S. . regor , . ri el, . C. agar, . L. Li, W. C. McComb, M. L. Reiter, . . Ta lor, and . . Warila. 1 5. Cumulative effects of forest practices in Oregon. Oregon State niversit , Corvallis. Prepared for the Oregon Department of Forestr , Salem, Oregon.

Chamberlin, T. W., R. D. arr, and F. . verest. 1 1. Timber arvesting, Silviculture, and Watershed Processes. American Fisheries Societ Special Publication 1 :181-206.

Cheng, .D. 1 8 . Streamflow changes after clear-cut logging of a pine beetle-infested watershed in southern British Columbia, Canada. Water Resources Research 25 3 :44 -456.

Christner, . and R.D. arr. 1 83. Pea streamflows from the transient snow one, Western Cascades, Oregon. Pages 27-38, in Proceedings, Western Snow Conference, April 20. 1 82, Reno evada, Fort Collins Colorado, Colorado State niversit , Reno, evada, 1 83.

Dunne, L.B., and L.B. Leopold. 1 78. Water in nvironmental Planning. W. . Freeman and Compan , San Francisco, SA. see page 60 regarding channel maintenance flows, and Wolman and Miller 1 60, below

arr, R.D., W. C. arper, .T. Kr gier, and F.S. sieh. 1 75. Changes in storm h drographs after road building and clearcutting in the Oregon Coast Range. Water Resources Research, 11 3 :436-444.

arr, R.D. 1 76. Forest practices and streamflow in Western Oregon. SDA Forest Service eneral Technical Report P W-4 . P W Res. Sta. Portland, OR.

arr, R.D., Fredri sen, R.L., and . Rothacher. 1 7 . Changes in streamflow following timber harvest in Southwestern Oregon. SDA Forest Service Research Report P W-24 . P W Res. Sta. Portland, OR.

arr, R.D. 1 82. Fog drip in the Bull Run municipal watershed, Oregon. Water Resources Bulletin 18 5 : 785-78 .

arr, R.D. 1 86. ffects of clearcutting on rain-on-snow runoff in Western Oregon: a new loo at old studies. Water Resources Research 22 7 : 10 5-1100.

eede, B. . 1 1. Response of a stream in dise uilibrium to timber harvest. nvironmental Management 15 2 :251-255.

ic s, B. ., R.L. Beschta, and R.D. aar 1 1. Long-term changes in streamflow following logging in western Oregon and associated fisheries implications. Water Resources Bulletin 27:217-226. f so, have it

ac son, W.L. and B.P. averen. 1 84. Rainfall-runoff prediction and the effects of logging: the Oregon coast range. SD Bureau of Land Management Denver Service Center, Denver Colorado 80225.

ones, . A., and . . rant. 1 6. Pea flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon. Water Resources Research 32 4 : 5 - 74.

Keppeler, . T. 1 8. The summer flow and water ield response to timber harvest. Pages 35-43 *in* R. R. eimer, editor. Proceedings of the conference on coastal watersheds: The Caspar Cree Stor . SFS eneral Technical Report, PSW- TR-168. Alban , California.

Leopold, L., M. . Wolman, and . P. Miller. 1 64. Fluvial processes in geomorpholog . W. . Freeman and Compan , San Francisco, 522 pp.

McDonald, A., and K. W. Ritland. 1 8 . Sediment D namics in T pe 4 and 5 Waters, a Review and S nthesis. TFW-012-8 -002, Washington Department of atural Resources, Ol mpia Washington.

McDonald, L. ., Smart, A. W., and R. C. Wissmar. 1 1. Monitoring uidelines to valuate ffects of Forestr Activities on Streams in the Pacific orthwest and Alas a. nvironmental Protection Agenc PA/ 10- 1-001 niversit of Washington Center for Streamside Studies, AR-10, niversit of Washington, College of Ocean and Fisheries Sciences, Seattle, WA 81 5.

Reid, L. M., and T. Dunne. 1 84. Sediment production from forest road surfaces. Water Resources Research. 20:1753-1761.

Rotchacher, . 1 71. Regimes of streamflow and their modification b logging. Pages 40-45 in . T. Kr gier and . D. all, editors. A s mposium-forest land uses and stream environment. Continuing ducation Publications, Oregon State niversit , Corvallis, Oregon.

Rothacher, . 1 73. Does harvest in west-slope douglas-fir increase pea flow in small forest streams SDA Forest Service Research Paper P W-163. P W Res. Sta. Portland, OR.

Spence, B.C., .A. Lomnic , R.M. ughes, and R.P. ovit i. 1 6. An cos stem Approach to Salmonid Conservation. TR-4501- 6-6057. ManTech nvironmental Research Services Corp., Corvallis, OR Available from the ational Marine Fisheries Service, Portland, OR .

Thomas, R.B., and W.F. Megahan. 1 8. Pea flow responses to clear-cutting and roads in small and large basins, western Cascades, Oregon: A second opinion. Water Resources Research 34 12 :33 3-3403.

Wemple, B.C., .A. ones, and . . rant. 1 6. Channel networ extension b logging roads in two basins, Western Cascades, Washington. Water Resources Bulletin 32 6 :11 5-1207.

Wolman, M. ., and Miller, .P. 1 60. Magnitude and fre uenc of forces in geomorphic processes. ournal of eolog , 68 1 : 54-74.

Wright, K., K. . Sende , R. . Rice, and R. B. Thomas. 1 0. Logging effects on streamflow: Storm runoff at Caspar Cree in northwestern California. Water Resources Research. 20: 1657-1667.

iemer, R.R. 1 81. Storm flow response to road building and partial cutting in small streams of northern California. Water Resources Research, 17 4 07- 1 .

iemer, R.R. and T. . Lisle. 1 8. drolog . n: aimon, R. ., and R. . Bilb , eds. River ecolog and management -- lessons from the Pacific Coastal ecoregion. : Springer- erlag , : Chapter 3, pp. 43-68.

[Attachments: Frissell et al. 2014]

ResearchGate

See discussions, stats, and author profiles for this publication at: http://www.researchgate.net/publication/264457193

CONSERVATION OF AQUATIC AND FISHERY RESOURCES IN THE PACIFIC NORTHWEST: Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan

TECHNICAL REPORT · AUGUST 2014

DOWNLOADS
97

VIEWS
90

10 AUTHORS, INCLUDING:

Christopher A Frissell
University of Montana
63 PUBLICATIONS **4,595** CITATIONS

SEE PROFILE

Dominick A Dellasala
Geos Institute
70 PUBLICATIONS **1,007** CITATIONS

SEE PROFILE

James R Karr
University of Washington Seattle
159 PUBLICATIONS **15,329** CITATIONS

SEE PROFILE

Dale Mccullough
Columbia River Inter-Tribal Fish Commission
17 PUBLICATIONS **346** CITATIONS

SEE PROFILE

Available from: Christopher A Frissell
Retrieved on: 18 August 2015

CONSERVATION OF AQUATIC AND FISHERY RESOURCES IN THE PACIFIC NORTHWEST:

Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan

Frissell, Christopher A.

Baker, Rowan. J.

DellaSala, Dominick A.

Hughes, Robert M.

Karr, James R.

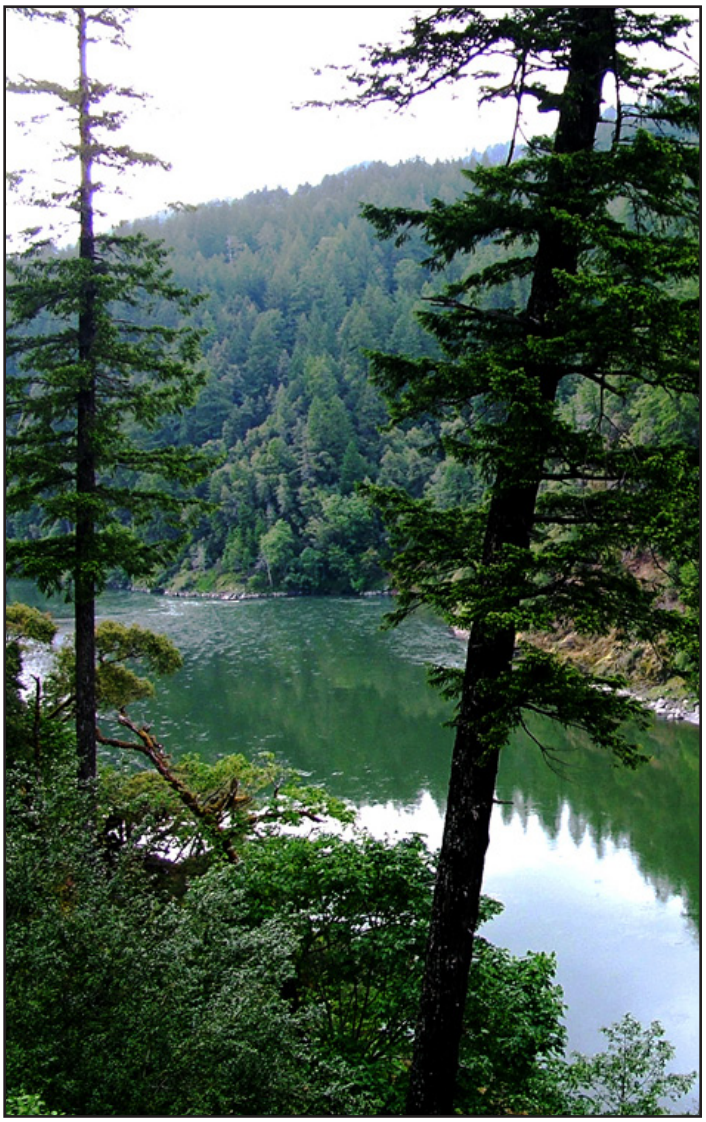
McCullough, Dale A.

Nawa, Richard. K.

Rhodes, Jon

Scurlock, Mary C.

Wissmar, Robert C.



FINAL REPORT
July 30, 2014

Copyright © 2014 Coast Range Association

CONSERVATION OF AQUATIC AND FISHERY RESOURCES IN THE PACIFIC NORTHWEST:

Implications of New Science for the Aquatic Conservation Strategy of the Northwest Forest Plan

ABSTRACT

Twenty years have elapsed since a major science synthesis and planning effort led to adoption of the Aquatic Conservation Strategy (ACS) of the Northwest Forest Plan (NFP) in 1994. Their purpose was to protect and restore riparian and aquatic ecosystems on Pacific Northwest federal forest lands and to ensure that forest management plans achieved legally required and socially desired multiple use objectives, including water quality, aquatic and wildlife resources. In this paper, we review relevant science emerging since 1993 to assess whether proposed changes to the ACS, including reduced riparian reserve protections and a substantially lowered burden of proof for watershed-disturbing activities, are scientifically justified. Observed and anticipated effects of climate change, and of cumulative anthropogenic stressors operating in the nonfederal lands surrounding NFP lands strongly indicate the need to strengthen, not weaken key ACS protections. Roads and ground disturbance associated with mechanical thinning and fuels reduction activities, especially within Riparian Reserves, cause adverse environmental impacts that generally offset or exceed presumed restorative benefits. Headwater streams warrant wider riparian forest buffers than current ACS provisions to ensure effective retention of sediment and nutrients derived from upslope logging, fire, and landslides. Widespread and sustained ecological harm caused by roads is now widely recognized, and ACS measures should be strengthened to more effectively arrest and reduce road impacts in all catchments. Grazing, mining, post-disturbance logging (e.g., fire salvage), water withdrawal, and aerial application of toxic chemicals can cause both acute and chronic harm to aquatic ecosystems. Existing ACS standards and guidelines would need to be strengthened to more effectively control these impacts. A more thorough and current scientific review and synthesis by federal agencies to inform a future ACS is long overdue. Unfortunately, no such review has occurred, while recent agency and legislative proposals would substantially reduce protective provisions of the ACS and NFP by increasing the extent of logging and other mechanized forest management, such as fuels treatments.

Introduction: Origins of the Aquatic Conservation Strategy

In 1994, region-wide social protest over logging old-growth forests, court injunctions on federal forest timber sales, and a rare presidential "roundtable" summit, led to sweeping changes the management of federal forest lands in the U.S. Pacific Northwest. The federal agencies with primary land management responsibilities, the U.S. Department of Agriculture's Forest Service (USFS) and U.S. Department of Interior's Bureau of Land Management (BLM), jointly adopted a new, regional conservation and management framework now known as the Northwest Forest Plan (hereinafter referred to as the NFP, or the "Plan"). The NFP was designed to meet President Clinton's call for an approach that would (1) satisfy federal courts and lift the injunctions, (2) protect the environment, and (3) help stabilize the regional economy (GAO 1999). The Plan's Record of Decision (USDA and USDI 1994) offered a "scientifically sound, ecologically credible, and legally responsible" long-term management strategy for federal lands within the range of the northern spotted owl (*Strix occidentalis cauria*). The NWP region encompasses over 99,000 square km (24.5 million acres) within the highly productive forest zones of western Washington and Oregon and northern California. In addition to spotted owls and other wildlife species dependent on late seral forests, these federal lands also harbor sensitive, declining, and federally listed salmon species (FEMAT 1993; USDA and USDI 1994). Declines in once-abundant salmon and other fish assemblages, amphibians and invertebrates (e.g., river mussels) indicate substantial and persistent loss of aquatic ecosystem integrity (Hughes et al. 2004; Kaufmann and Hughes 2006).

To ensure that the new plan had the sound scientific basis necessary to withstand legal scrutiny, the federal agencies convened an interagency and interdisciplinary panel of scientists (Forest Ecosystem Management Assessment Team, FEMAT 1993) to develop the rationale and options for conservation provisions of the Plan. Recognizing that terrestrial and freshwater species fundamentally share the same landscape, FEMAT scientists developed a system of terrestrial reserves and conservation provisions and a separate but overlapping Aquatic Conservation Strategy ("ACS").

Since the NFP was adopted, social and political pressure have mounted to significantly recast or eliminate the Plan (e.g., Johnson and Franklin 2012), including key elements of its ACS. In late 2013, two bills were introduced in Congress (S.1784 and H.R.1526) that would substantially reshape management on approximately 8000 square km (roughly 2 million acres) managed by the BLM in western Oregon. Separately, the BLM has initiated an administrative planning process intended to result in a decision to replace the NFP policies. These efforts appear principally motivated by the goal of increasing commercial timber production (Blumm and Wigington 2013, DellaSala et al. 2014). Meanwhile, the Forest Service has adopted guidance that would permit substantial alteration of key elements of the ACS in future revisions of its National Forest Management Plans in the Pacific Northwest.

Both agency and congressional proponents of significant alterations of the NFP and its ACS have referred generally to "new science" as a basis for many proposed changes. However, we find that post-1993 scientific findings relevant to the ACS have not been synthesized and addressed in a systematic manner. In this paper we review the key ACS elements, briefly discuss several proposed modifications, and identify concerns about the likely consequences of proposed modifications. Finally we identify needed improvements in the protective measures in the ACS as indicated by new and emerging scientific knowledge, and suggest the form future revisions of ACS provisions might take if they are to be responsive and robust to recent scientific advances.

Core Design Elements of the Aquatic Conservation Strategy

FEMAT (1993) articulated the ACS with two spatial and two programmatic components for managing watersheds and riparian areas: (1) *Key Watersheds*, a land allocation comprising hydrologically discrete areas that putatively contain much of the remaining higher-quality aquatic habitat and offer the greatest potential protection for recovering at-risk fish species. These watersheds are priorities for active restoration, ARE subject to a "no net increase" mandate for road density and watershed analysis mandate for major land use activites.

TABLE 1.
The nine narrative ACS Objectives describing watershed functions and processes and which apply landscape-wide (USDA and USDI. 1994. Record of Decision, p.B-11).

Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to:

1. *Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.*
2. *Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.*
3. *Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.*
4. *Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.*
5. *Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.*
6. *Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.*
7. *Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.*
8. *Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.*
9. *Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.*

(2) Riparian Reserves, a land allocation of varying widths along streams and lakes where aquatic and riparian objectives receive primary emphasis and where management is constrained according to activity-specific standards and guidelines. (3) *Watershed Analysis* is an assessment procedure designed to recommend how to tailor management priorities and actions to the biophysical limitations and perceived restoration needs of individual watersheds. (4) *Watershed Restoration*, a long-term program of somewhat unspecified scope and content, but which may include such wide-ranging provisions as road decommissioning, instream habitat alterations, and other measures (ROD 1994).

Late Successional [forest] Reserves, Congressionally designated reserves, and administratively withdrawn areas are land allocations outside of the specific components of the ACS, but they provide additional protection for portions of watersheds, riparian and aquatic ecosystems, particularly in terms of how they regulate landscape-wide management disturbances. In turn, aspects of the ACS also help provide habitat and connectivity for terrestrial wildlife species (ROD 1994, p.7). Many birds, mammals, amphibians, and invertebrates benefit from roadless areas (Trombulak and Frissell 2000); require large trees or wood debris for nesting or other uses; or rely on riparian forests for refuge, foraging, or dispersal (Pollock and Beechie 2014).

Beyond land allocations, the ACS imposes constraints on habitat-degrading management activities in two other ways: 1) It provides binding *standards and guidelines* that explicitly constrain numerous potential management activities within riparian reserves and key watersheds. 2) It requires all management activities on surrounding federal forestlands to be consistent with maintaining and restoring watershed functions and processes that are described in nine narrative ACS objectives (Table 1). The activity-specific standards and guidelines were intended to "prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of the [ACS] objectives" (USDA and USDI 1994). The precaution that management activities may not retard recovery is a potent requirement. In order to ensure an action does not retard or prevent attainment of recovery, managers must ascertain the net effects of any proposed action on natural recovery processes at site-specific areas and larger spatial scales. This requirement addresses the observation (FEMAT, 1993) that past ecological degradation caused by numerous incremental harms often is not recognized. Cumulative effects across the landscape commonly offset gains from those passive or active management measures claimed to benefit ecological conditions and aquatic resource values.

Although it is beyond the scope of this paper to enumerate the many activity-specific standards and guidelines that comprise the ACS, some specific examples will be discussed because they are conspicuously affected by new or emerging scientific knowledge. The nine over arching ACS objectives also have binding force and constitute forest-wide standards and guidelines themselves (ROD 1994). This approach was explicitly intended to constrain activities in geomorphically, hydrologically, and ecologically sensitive areas and to limit the cumulative impacts of activities throughout a watershed (FEMAT 1993, V-29). The identified goal was to maintain conditions within a broadly conceived "range of variability" across multiple spatial and temporal scales, by evaluating, avoiding, or reversing ecologically harmful management at watershed and site-specific scales. The science of ecological restoration broadly recognizes that avoidance of adverse impacts is far more effective than post-hoc remediation of impacts (Kauffman et al. 1997, Karr et al. 2004, Roni et al. 2008), and this principle is codified in the Plan's Standards and Guidelines for watershed restoration (guideline WR-3 clearly states: "*Do*

not use mitigation or planned restoration as a substitute for preventing habitat degradation.") During the mid-1990s, some federal agencies argued that site-specific failure to meet ACS objectives was broadly acceptable if unacceptable outcomes were not expected to be observed at larger scales. However, courts have validated that the conservation burdens delineated in the ACS apply to both site- or project-specific as well as larger scales, such as a watershed, planning area, or national forest.[1] The guiding language in the nine narrative objectives directs managers to "maintain and restore" specifically identified ecological conditions and functions. Hence management activities that will affect aquatic ecosystems may be pursued only under a reasonable assurance that they are restorative or protective in nature. It is not sufficient that management activities produce acceptably small adverse impacts, or cause harms that might potentially be mitigated by other measures.

Courts have ruled that FEMAT (1994) embodies the best available scientific information pertaining to the impacts of forestry activities on salmon and their habitat in the Pacific Northwest federal forests and that the Plan adequately integrates FEMAT's scientific representations[2]. Several scientific reviews (e.g., Spence et al. 1996, DellaSala and Williams 2006, Reeves et al. 2006a, Everest and Reeves 2006) have broadly concluded that while a great deal of new information has been published, the fundamentals and rationale of FEMAT and the ACS remain consistent with available scientific information. However, no interagency scientific panel comparable to the scope of FEMAT has been reconvened to formally address the broad question of how new scientific information may affect the validity of the ACS and how that might in turn affect Endangered Species Act (ESA) consultations, Clean Water Act (CWA) compliance, or NEPA, NFMA, and other relevant project level planning processes.

Because the ACS is incorporated into agency land use management plans, it is directly enforceable by third parties pursuant to the over arching resource planning statutes of the USFS and BLM. While the majority of distribution of salmon species in the Pacific Northwest lies downstream of federal forest watersheds, the federal lands provide important high-quality refugia for many populations (Burnett et al. 2006), and federal forests confer regional hydrologic benefit to water quality and ecosystem integrity downstream. Implementation of the ACS on federal forests has become a foundational baseline component for attainment of salmonid recovery under the Endangered Species Act and of water quality standards under the Clean Water Act. For example, federal ESA salmon recovery plans in Oregon and California rely heavily on Plan implementation (e.g., NMFS 2007, pp. 402-403, NMFS 2012, pp. 3-48, 49). Furthermore, because of the extent to which ACS implementation is widely assumed to represent the federal contribution to aquatic ecosystem conservation, changes have regulatory implications for nonfederal lands. For example, the underlying analyses of Habitat Conservation Plans granted to nonfederal landowners in the Pacific Northwest under the ESA, with assurances extending 40-50 years, explicitly rest on full ACS implementation on surrounding federal lands. (See e.g. WA DNR 2005). Similar expectations

---

1 See e.g. Pac. Fed'n of Fishermen's Ass'ns et. al. v. Nat'l Marine Fisheries Serv., 71 F. Supp. 2d 1063 (W.D. Wash. 1999) ("PCFFA II")(finding that the Plan requires a determination of consistency with the ACS objectives at the project scale); Pac. Fed'n of Fishermen's Ass'ns et. al. v. Nat'l Marine Fisheries Serv. 265 F.3d 1028 (9th Cir. 2001) ("PCFFA III") (finding NMFS' biological opinions on 23 timber sales affecting then-listed Umpqua cutthroat trout and Oregon Coast coho salmon failed to assess site-level impacts).

2 See e.g. Seattle Audubon Soc'y v. Lyons, 871 F. Supp 1291, 1303 (W.D. Wash. 1994), aff'd sub nom., Seattle Audubon Soc'y v. Moseley, 80 F.3d 1401 9th Cir. 1996) (finding adequate scientific support in the plan's decision record and "unprecedented thoroughness" of the agencies' effort to meet "the legal and scientific needs of forest management").

undergird the state of Oregon's restoration plan for salmon and water quality.[3] In basins where water quality standards are not being met, state and federal regulators routinely consider the ACS to be an adequate implementation plan for BLM and Forest Service managers. Substantive alteration and weakening of the ACS threatens to upset a complicated web of region-wide conservation planning that is explicitly and implicitly dependent on the future habitat quality and recovery rate that the ACS is designed to achieve.

3 http://www.oregon.gov/OPSW/archives/ocsri_mar1997/ocsri_mar1997ex.pdf (identifying NFP implementation as a critical element of Oregon's salmon recovery plan)

Changes to the ACS Proposed by Administrative and Legislative Efforts

ACS Riparian Reserves. Based on the nested set of ecological rationales considered in FEMAT (1993), the ACS specified a set of "default" widths of the Riparian Reserve land allocation to be a) at least two site-potential tree heights (*ca*. 100 m or 330ft) on either side of fish-bearing streams, and b) at least one tree height (*ca*. 50 m or 160 feet) on non-fish bearing streams. Within these reserves, the conservation of aquatic and riparian-dependent terrestrial resources receives primary emphasis. Beyond these default delineations, Riparian Reserves must be drawn to protect areas susceptible to channel erosion and mass wasting. The Riparian Reserve widths were based on ecosystem process considerations (FEMAT 1993, Olson et al. 2007) and broadly specified population viability and habitat considerations for seven groups of salmonids and many terrestrial and avian species. Various sources (e.g., Johnson et al. 2012) have estimated that based on the high stream densities prevailing over much of the region, roughly 40% of total acres within the Plan area are located within the "default" Riparian Reserve system. However, only about 11% of the Plan area lies in Riparian Reserves associated with those areas (often referred to as "Matrix lands") where commercial logging is expected to be concentrated, and where the Riparian Reserve allocation most directly restricts potential logging activity and other management-related disturbances. Very few of the many completed watershed analyses offered a scientific rationale for reducing default Riparian Reserve areas in any location; a larger number identified site-specific reasons to expand Riparian Reserves beyond the specified default widths (Pacific Rivers Council 2008).

Proposed Changes to the ACS and Riparian Reserves. The BLM's 2008 Western Oregon Plan Revisions (WOPR) proposed a new regime of management for the "Oregon and California (O&C) Lands, distributed widely across western Oregon (Blumm and Wigington 2013). The WOPR proposed greatly reducing default Riparian Reserve widths, primarily arguing that ACS default delineations include some upland or "non-riparian" vegetation and that summer stream shade and large wood recruitment to fish-bearing streams could be maintained with narrower reserve widths. Narrative objectives-and standards and guidelines were also reduced or eliminated, allowing commercial timber harvest in Riparian Reserves for pervasive "safety and operational" reasons. The analyses and rationale underlying the WOPR were withdrawn by BLM in 2009 in significant part because they were deemed unlikely to survive consultations with ESA enforcement agencies (the National Marine Fisheries Service and US Fish and Wildlife Service). In a recent regional planning document, BLM (2013) argued again that "Riparian Reserve boundaries extend out beyond the water influence zone and are wider than necessary for water quality protection" but provided few or no specific scientific citations to support these claims. BLM has provided little scientific rationale or empiri-

cal validation for their decision to selectively focus on hydrophilic vegetation, proximate stream shade, and large wood recruitment as the only ecological considerations dictating riparian reserve delineation—in contrast to the much more comprehensive set of biophysical functions considered in FEMAT and the NFP ACS. (Note, as detailed later in this text, we also disagree with BLM's specific simplifying assumptions about effect of Riparian Reserve width on maintenance of shade and wood recruitment, and further conclude that other functions, such as nutrient retention, implicate much wider and less-disturbed reserves.)

A similar extremely constricted perspective on riparian ecological functions appears to underlie two Congressional bills for BLM lands in western Oregon (the "O&C" Lands), one of which (H.R. 1526, http://defazio.house.gov/issues/bipartisan-oc-forests-plan) would reallocate some 675,000 ha (1,667,000 acres) to an "O&C Trust"," the primary purpose of which is timber management (Blumm and Wigington 2013). Areas equivalent to Riparian reserves in the Trust would be designated at about half the width of the current ACS default requirement for steams (with extremely limited buffers for springs, seeps, wetlands, and unstable landscapes). A U.S. Senate bill introduced in 2013 (S.1786) would allocate about 50% of O&C lands to so-called "forestry emphasis areas," cut default Riparian Reserve areas by half across all stream types, with further narrowing if watershed analysis deems them "not ecologically important." The bill would provide for potentially extensive commercial logging in the rubric of thinning riparian areas where stands are younger than 80 years of age; only stands older than 120 years would be protected from logging. These older stands remain in scattered small patches across O&C lands but are important ecologically given high levels of timber cutting on surrounding nonfederal lands (DellaSala et al. 2013). Environmental review at the project level would also be curtailed from current requirements, including but not limited to eliminating the requirement for project-level determinations of consistency with ACS objectives.

Meanwhile the USFS—which manages the majority of federal forestlands in the three state NWP area, has focused on incrementally replacing the ACS with new provisions in upcoming revisions of individual National Forest Plans. In 2008 the Forest Service adopted new regional planning guidance (USDA 2008) that generally mirrors the NFP default riparian area widths and key watersheds allocations, but altered the narrative ACS Objectives, Watershed Analysis, and other NFP direction for management within reserve areas. This guidance stakes a claim for expanded agency discretion to undertake a broader range of vegetation and ground-disturbing management activities within riparian reserves, including but not limited to thinning and other commercial logging and livestock grazing. The 2008 Forest Service regional guidance, if implemented in future revised Forest Plans, would allow actions that alter riparian reserve resources and goals, as long as managers can present a general argument that impacts would be offset by other, beneficial actions or naturally-occurring improvements dispersed or averaged across time or space. The apparent intent of these changes is to reduce the burden for analysis of environmental impacts associated with such projects, which would, for example, streamline approval of more aggressive implementation of mechanized and commercial thinning and other vegetation- and ground-disturbing actions within Riparian Reserves. We are concerned that the 2008 USFS planning guidance has not been subject to rigorous external or scientific review, and if implemented could have harmful consequences for riparian and aquatic resources that have not been adequately evaluated or disclosed.

Weakening of the Northwest Forest Plan ACS will impact numerous listed fish, wildlife and plant species by changing the range of acceptable on-the-ground outcomes from management actions. Across the Pacific Northwest,

reduced protections for listed species and water quality via changes in the ACS would likely necessitate reconsideration of many existing agency programs and initiatives that have been premised on implementation of the 1994 ACS measures.

ACS Watershed Restoration. The ACS intended watershed restoration to be strategically identified and prioritized through *Watershed Analysis*, with particular emphasis on improving ecological conditions in *Key Watersheds*. Protection through passive restoration (Kauffman et al. 1997) of existing high-quality habitat is explicitly prioritized over active instream rehabilitation. To be effective, instream habitat-improvement projects rely on concurrent long-term riparian and catchment-scale protection and rehabilitation measures, and these must be programmatically tiered to management plans affecting each watershed. Hence site-specific active measure, such as instream habitat structures or riparian tree planting, should not be claimed to mitigate for ongoing or future harmful and degrading management actions (Frissell and Nawa 1992, Frissell and Bayles 1996, Roni et al. 2008).

Proposed Changes in Watershed Restoration Policy. In contrast, the current Senate Bill would simply allocate $1 million annually for instream wood placement and $5 million for road removal or "improvement" across the BLM's O&C land area, and apparently exclude such activities from environmental analysis under NEPA. In doing so this bill would decouple active restoration measures from land management decisions. The bill would also alter the programmatic approach to watershed restoration, as discussed in the next section.

Proposed changes to ACS Key Watershed allocations. The Senate and the House bills and the BLM (2013) call for revising Key Watershed allocations in place for the past 20 years under the NFP and ACS. Many current Key Watersheds would apparently be dropped from the allocation under the House bill, with the consequences for conservation planning and species at risk unevaluated; the Senate Bill calls for a revised watershed classification to accommodate new land allocations.

Certain revised Key Watershed delineations might in theory benefit particular populations of species such as ESA-listed coho salmon. However, the concept of prioritizing conservation efforts in Key Watersheds is undermined when watershed-scale priorities are upended and reshuffled on a time frame that is decades shorter than the amount of time expected for significant watershed restoration to occur. Effective watershed restoration requires a sustained commitment to aquatic resource protection and restoration, coupled with appropriately conditioned and scaled land management and effectiveness monitoring extending for decades to centuries (FEMAT 1993). Critical components of the ROD for the ACS include requirements for no road construction within inventoried roadless areas within Key Watersheds, and no net increase in road density within each Key Watershed. These protections for Key Watersheds would apparently be lost under the Congressional proposals, at least for those Key Watersheds that would be de-designated. Although the 2013 Senate bill would retain a process it refers to as "Watershed Analysis" its purpose appears to be inverted: it would not focus on watershed restoration, but on identifying ecological changes due to increase commercial logging over that which might occur under the default prescriptions specified in the bill.

CHANGES IN TERRESTRIAL LAND ALLOCATIONS ALSO AFFECT WATERSHED INTEGRITY

Land allocations within the NFP and other authorities, but outside of the ACS, including Late Successional Reserves, Wilderness, other congressionally designated or "administratively withdrawn" lands, and inventoried roadless areas, can confer additional protection to watersheds. These land allocations can prevent or retard road network expansion, and other disturbances, allowing natural ecosystem maintenance and natural recovery processes to proceed. They limit the spatial extent of disturbances across watershed and stream networks, and reduce the incidence or likelihood of adverse cumulative impacts. Many Key Watersheds are closely associated with such specially designated lands, though unfortunately few are largely or entirely nested such within such conservation delineations (Frissell and Bayles 1996). As a consequence, when new proposals strip away the protection conferred by Late Successional Reserves, roadless areas, or other administrative designations, watersheds are placed at greater risk of impact from forestry activities. Land disturbance from roads, logging, grazing, or other actions can undermine the benefits of restoration and land protection elsewhere in the same watershed (Espinosa et al. 1997), depending on the geography of the watershed in question. The trade-offs of cumulative risk and potential harm to watersheds and sensitive or listed aquatic species from changes in land allocation have not been rigorously assessed in the Congressional and administrative proposals. Such trade-offs amount to a wholesale re-casting of NFP land allocations for the region that includes and surrounds the O&C lands. Each of the 2013 Congressional bills proposes to substantially re-allocate protection of older forests, generally by focusing protection on older stands rather than the more expansive Late Successional Reserves of the present NFP. Moreover the Congressional bills make special provision for thinning under nearly all land allocations, with guidelines allowing for agency-determined findings of need and some minimal requirements for tree retention. Although the NFP did not prohibit thinning or salvage logging in these areas, the legislative bills favor more extensive and intense logging and increasing fragmentation by logging roads than have previously occurred in areas now classified as Late Successional Reserves.

NEW SCIENCE THAT INFORMS AQUATIC CONSERVATION STRATEGY AND PRACTICES

In the following section we discuss some relevant new science published since the convening of FEMAT (1993). We provide selected citations and briefly summarize our view of major implications for the purpose of developing and improving an effective aquatic conservation framework. While our interpretations and recommendations focus on the ACS, many of the citation sources and their implications are derived from studies of other regions and ecosystem types out of necessity because of limited research done in the Pacific Northwest. Just as in FEMAT (1993), relevant scientific information that is critical to define and frame topics of crucial conservation concern sometimes originates from other similar regions, and often spans a variety of disciplines.

In this paper we were not able to comprehensively address all areas of scientific advancement concerning forest management, water quality and aquatic conservation. Some topics await further elaboration. For example, we do

not comprehensively discuss the literature on impacts of logging and roads on streamflow patterns (e.g., Moore and Wondzell 2005), and subsequent effects on stream geomorphology, habitat, and biota. However, we do consider known effects of forest management and climate change on streamflows as a contributing concern under several topic headings. Most importantly, we also do not assess new science pertinent to non-aquatic and amphibian wildlife species in this report. This important work remains to be done.

Management after Wildfire, Disease, and Other Disturbances. Salvage logging of dead or dying trees after fires, insect outbreaks, and other disturbances in Pacific Northwest forests continues to be undertaken in the region, and its effects are a recurring ecological concern (see review by Lindenmayer and Noss 2006). Soon after the NFP was adopted in 1994, the scientific community began to weigh in on the inadvisability of post-disturbance logging. Scientists have catalogued the critical importance of large standing live trees, snags, and downed wood from fallen trees in the post-disturbance recovery of natural forests, including stand successional pathways, watershed processes, and wildlife and fish habitat (e.g., Gresswell 1999, Minshall 2003). Numerous scientific syntheses provided precautionary advice against post-fire logging on a wide range of causal grounds (e.g., Beschta et al. 2004, Karr et al. 2004, Lindenmayer et al. 2004, Lindenmayer and Noss 2006, Donato et al. 2006, Noss et al. 2006). More recent work has identified the potential importance of pulses in trophic energy following high-severity wildfire (Malison and Baxter 2010) for persistence and recovery of aquatic and riparian species. This new information builds on a more longstanding recognition that wildfire, that among its many other effects, plays an important long-term role in the generation of complex wood debris structures in streams (Minshall 2003). Other reviews focused on plant and landscape ecology broadly call into question the effectiveness of salvage logging insect-infested trees to control insect outbreaks (e.g., Black et al. 2013, Six et al. 2014). Similar concerns about the consequences of salvage logging curtailing natural ecosystem recovery processes pertain to salvaging of stands affected by any natural mortality agent, such as windthrow or volcanism.

However, post-disturbance logging was not expressly ruled out in the NFP and ACS, and the political demand for salvage logging remains high, so large post-fire salvage logging projects have been pursued by the USFS and BLM in many areas, including on occasion within Key Watersheds, Riparian Reserves, Late Successional Forest Reserves, and designated critical habitat of listed species (see DellaSala et al. 2014). Scientific consensus on the inadvisability of post-disturbance logging largely emerged in the years just after FEMAT, hence the ACS should be strengthened to reflect such sources as the recommendations in Beschta et al. (2004), Karr et al. (2004), and Black et al. (2013).

We conclude that for maintenance of forest ecosystem integrity, *post-disturbance logging should be prohibited in Riparian Reserves, Key Watersheds, Late Successional Reserves, and other areas where conservation is a dominant emphasis. Post-disturbance actions should prioritize road decommissioning or systemic road drainage improvements, and suspension of livestock grazing to reduce harm under the increased hydrological stresses expected in post-fire forests and their aquatic and riparian habitats and biota.*

Forest Thinning Intended to Reduce Tree Density or Wildfire Fuels. Current ACS language allows the agencies to "apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain…objectives." The agencies carry a project-specific burden to establish

the need for thinning and that outcomes are ecologically restorative. Recently the USFS and BLM have pressed to increase in the average size of thinning projects apparently to reduce the number and cost of site-specific environmental analyses by broadening their scope. Agency initiatives presume extensive use of mechanical harvesting methods in conjunction with commercial timber sales to thin trees in Riparian Reserves and other areas where conservation values are given highest priority. In wetter forest types, the primary claim that thinning is restorative rests on the assumption that the growth rate and vigor of those trees left alive after thinning will likely improve, thereby hastening the future development of larger-sized trees in the stand. In drier forests, the primary rationale is that thinning is needed to promote a generalized reduction in fuel loads, thereby presumably reducing the risk, or severity, or rate of spread, of wildfire and that thinning can increase fire resistance of selected individual trees.

Regardless of silvicultural intent, mechanized treatments in Riparian Reserves can disturb vegetation and soils in close proximity to surface waters, where the risk of sediment delivery and other impacts is demonstrably high (Rashin et al. 2006, Dwire et al. 2010). Logging activity that disturbs soils within riparian buffers can also reduce the buffer's effectiveness to retain sediment and nutrients delivered from upslope sources. Thinning or other disturbance of coniferous or deciduous trees and shrubs within riparian and wetland areas can cause decades of diminished summer low flows (after an initial few years during which low flows may increase), as a consequence of increased water demand by rapidly re-growing vegetation (Hicks et al. 1991, Moore and Wondzell 2005). In addition, thinning and yarding of logs from near-stream areas requires or encourages the construction of roads in close vicinity to streams, where the likelihood of sediment delivery and other impact from roads is increased (Luce et al. 2001). Bryce et al. (2010) found that for sediment-sensitive aquatic vertebrates and macroinvertebrates, minimum-effect levels for percentage fines were 5% and 3%, respectively, meaning that even small increases in fines can adversely affect salmonids and their prey.

Mechanized thinning and fuels operations usually require higher-density road access to be feasibly implemented. Mechanical treatments for fuels reduction are particularly problematic because recurring entries at roughly 10-year intervals are necessary to sustain the desired conditions (Martinson and Omi 2013); such a forest management regime strongly favors, if not requires, a permanent, high-density road network. Many thinning projects involve road and landing construction and reconstruction, as well as elevated haul and other use of existing roads, all of which significantly contribute to watershed and aquatic degradation. Even if constructed roads and landings are deemed "temporary," their consequent impacts to watersheds and water bodies are long lasting or permanent. The hydrological and ecological disruptions of road systems and their use (Jones et al. 2000, Trombulak and Frissell 2000, Gucinski et al. 2001, Black et al. 2013), exacerbated by other effects of vehicle traffic, will likely outweigh any presumed restorative benefit to streams and wetlands accruing from thinning and fuels reduction. In recent years, the prospect of future thinning or fuels reduction projects often has become the basis for the USFS or BLM to avoid or delay decommissioning environmentally harmful roads, even when fiscal resources were available for the work. Prescribed fire without extensive mechanical treatment is of much less concern, as it is more feasible to apply in sparsely-roaded wildlands, entails far less soil disturbance, and if conducted in proper times and places it can more adequately mimic the ecological effects of natural wildfire.

Substantial questions remain about the putative ecological benefits of thinning and

fuels reduction. This is critical because agency proponents commonly argue that the desired ecological benefits outweigh the adverse environmental effects of logging and fuels treatments. Dispute among federal agencies about claimed ecological benefits of thinning in moister, Douglas-fir-dominated forest types (widespread in the Pacific Northwest) led to an interagency scientific review in 2012-2013 (Spies et al. 2013). That panel concluded that increased tree growth might be better obtained from thinning very young, high-density stands--which very seldom produces commercially saleable logs. They further concluded that thinning produces unusually low-stem-density forests and causes long–term depletion of snag and wood recruitment that is likely detrimental in most Riparian Reserves (Spies et al. 2013, and see Pollock et al. 2012, Pollock and Beechie 2013). Further depletion of wood recruitment in headwater streams can adversely affect the behavior of debris flows in Pacific Northwest watersheds in ways that further reduce residual wood debris and its important functions over extensive portions of streams and rivers (May and Gresswell 2002), where present-day wood abundance is decimated compared to historical conditions (Sedell et al. 1988, Pollock and Beechie 2014). Finally, recent reviews also raise compelling, unanswered questions about the effectiveness of thinning forests for attempted control of insect outbreaks (Black et al. 2013, Six et al. 2014).

The effect of thinning on fire behavior and effects within riparian areas has been little studied. For western North American forests in uplands the literature is replete with ambiguous and conflicting results regarding the effects of thinning and other mechanical fuels treatments on fire severity, rate of spread, and recurrence. Moreover, the probability of a fire burning through a treated stand within the limited time window of potential effectiveness of a fuels treatment has been shown to be very small (Lydersen et al. 2014, Rhodes and Baker 2008). Any presumed benefit is even less persistent in Riparian Reserve areas where woody vegetation regrows rapidly after treatment, and where in moister forest types fire tends to recur with lower frequency. Equally important, we question whether managers should be striving to reduce fire severity in riparian areas as a rule, considering that high-severity fire plays a natural and historical role in shaping riparian and stream ecosystems (Gresswell 1999, Minshall 2003, Benda et al. 2003, Malison and Baxter 2010). Other natural forest disturbances, including windthrow, insect outbreaks, and landslides on forested slopes, appear to play a similarly important role in generating pulses of wood debris recruitment to streams, establishing a long-lasting source of ecological and habitat complexity.

Considering the difficult-to-justify costs and recognized inherent risks of adverse impact associated with such operations in sensitive areas, balanced against the uncertainty in intended benefits, we conclude the following: *Thinning and fuels reduction by means of mechanized equipment or for commercial log removal purposes should be generally prohibited in Riparian Reserves and Key Watersheds. Any thinning or fuels treatment that does occur as a restorative treatment in Riparian Reserves (e.g., to remove non-native tree species from a site) should retain all downed wood debris on the ground. Thinning projects that involve road and landing (including those deemed "temporary") construction and/or reconstruction of road segments that have undergone significant recovery through non-use should also be prohibited, due to their long term impacts on critical watershed elements and processes.*

Road Networks and Their Management. Roads are ecologically problematic in any environment because they affect biota, water quality, and a suite of biophysical processes through many physical, chemical, and biological pathways (Trombulak and Frissell 2000, Jones et al. 2000, Al-Chokhachy et al. 2010).

The magnitude of existing road impacts on watersheds and streams in the Plan may equal or exceed the effect of all other activities combined. Firman et al. (2012) reported that density of spawning coho salmon across coastal Oregon streams was negatively associated with road density. Kaufmann and Hughes (2006) found that road density in Coast Range streams was associated negatively with 25-50% of the variability in condition of aquatic vertebrate assemblages. More recently, Meredith et al. (2014) showed that the abundance of habitat-forming wood in Columbia Basin streams declined with proximity to roads, and the effect was roughly the same magnitude as that of natural climate and vegetation differences or long-term livestock grazing.

Roads are necessary to support logging, mining, grazing, and motorized recreation, but the existing federal forest road system far outstrips the extent of those demands. The number and poor condition of USFS and BLM roads, the agencies' inability to prevent current roads from deteriorating and harming streams, and the pervasive effects of roads on the physical and biological environments were recognized in FEMAT (1993). In addition, forest roads have been the subject of high-profile national dialogue and policy reviews since the development of the Plan (Gucinski et al. 2001, Pacific Rivers Council 2008). The ACS's primary means of protecting streams from roads and encouraging effective restoration are twofold: First, ASC objectives discouraged locating roads within Riparian Reserves, and second, roadless areas were to be maintained and overall road density reduced in Key Watersheds. For a small number of Key Watersheds where road network reduction has been pursued, agency monitoring efforts have reported improvements of certain instream habitat conditions, a response not detected elsewhere (Gallo et al. 2005, Reeves et al. 2006a). Often overlooked is that proposals to reduce the size of Riparian Reserves could provide more free rein for the construction of roads and landings in closer proximity to streams, markedly increasing the likelihood of sediment delivery and alteration of near-stream hydrology.

How to substantially reduce road density in critical watersheds and improve road drainage, stream crossings, and other factors that affect streams and aquatic biota, while maintaining sufficient roads for other forest uses, remain central challenges to forest planning and management. The ACS and other operative policies have lacked sufficient means and impetus to accomplish this in the past 20 years. We therefore suggest five policy changes to achieve needed road reductions: 1) *Prohibit the construction of new permanent and "temporary" roads*, except in limited instances were construction of a short segment of new road is coupled with and necessary for the decommissioning of longer and more damaging segments of existing road. 2) *Allow no net increase in road density in any watershed*. New "temporary" roads and landings should be considered to be roads and counted towards road density levels for at least several decades after decommissioning. 3) *Strengthen road density restrictions for Key Watersheds and establish unambiguous standards and metrics for net road density reduction, which include adequate accounting for landings and the impacts of so-called "temporary" and decommissioned roads and landings*. 4) *Improve the system of classification (e.g., road type, use) and inventory (e.g., whether a road is active or decommissioned), and mapping (i.e., update maps to reflect current conditions)* to ensure that agency bookkeeping of road miles corresponds with actual field conditions. This provision is necessary because at present many roads "disappear" when dropped from the inventory, but they in fact remain on the landscape causing watershed impacts. Also, lax road mapping programs and narrow definitions of what constitutes a road can significantly under represent the actual road densities. 5) *Require each proposed forestry and other development project to meet a target of incremental reduction of the road system* in

all watersheds affected by the project. Road density redution should be required until road density in the affected watershed is lower than the target established on the basis of biological response.[4] Finally, 6) *roads for which there are not adequate funds for maintenance and upkeep should be decommissioned*.

Riparian Reserves for Protecting Stream Temperature. Conservation (including restoration) of natural thermal regimes of streams and rivers was but one of many factors considered when ACS default riparian reserve widths were determined in the initial design of the ACS. In recent years the land management agencies and others have commonly assumed shade from riparian vegetation is the predominant proximate control on stream temperature, and some research has suggested that trees within 30 m or so of the stream margin contribute over 90 percent of the effective shade (e.g., Reeves et al. 2013). Furthermore, it has been suggested that headwater streams that do not carry water in summer should presumably not need shade to conserve summer thermal maxima in downstream waters. These two premises have become a primary rationale for proposals by BLM and in congressional bills to reduce default Riparian Reserve widths for some stream types, with the intent of increasing the area of Matrix land or equivalent that is subject to commercial logging. From the perspective of temperature protection, we have four concerns with this rationale for shrinking Riparian Reserves.

First, *redundancy*: most current analyses rest on a static view of riparian stand structure and function—that is, shade is modeled as a nearest single layer function of the existing standing trees only. The tree nearest to the stream margin is attributed as the contributor to shade, even though one or more trees standing behind it, slightly farther from the stream, may contribute shade as well. But when trees fall or die in the so-called "inner zone," then the "outer zone" trees become a replacement source of shade. Obviously, if the outer zone trees have been logged, that functional redundancy is lost and any riparian disturbance, man-made or natural, may lead to incrementally reduced stream surface shade—and an increase in stream temperatures.

Second, *density*: whereas we measure canopy shade with fixed-resolution instruments, little is known about how measurements of shade translate to actual solar penetration. In the coarsest sense, a canopy densiometer is used to visually estimate canopy cover with only 17 sample points that are irrespective of solar path. Even more quantitative instruments, such as the Solar Pathfinder or SunEye have the tendency to overlook the value of small canopy gaps or multiple canopy thickness in reducing light intensity reaching the stream, as does the densiometer. "Redundant" tree canopies create a shade structure that is dense compared to that of a single tree, and this may substantially affect the actual solar energy reaching the water surface in ways that we that we seldom adequately measure.

Third, *groundwater*: thermal response is affected in numerous ways by near-surface groundwater, which affects both surface streamflow rate and the temperature of water at the point of delivery. After initial increases in base flow following logging, summer base flow can decline for many years as a consequence of rapidly re-growing second-growth vegetation and its evapotranspiration demand (Hicks et al. 1991, Moore and Wondzell 2005). Logging in the outer areas of Riparian Reserves or forest-

---

4 E.g., 1 mile per square mile (0.62 km per square km) for watersheds with Pacific salmon, steelhead and cutthroat trout (Lee et al. 1997, Thompson and Lee 2000, Carnefix and Frissell 2009), and 0.5 miles per square mile for watersheds supporting bull trout (USFWS 1999; Baxter et al. 2000, see Fig 5 and Appendix, showing that population growth remained negligible in streams with higher road densities; and Ripley et al. 2005, Fig. 5 showing that probability of bull trout occurrence in Alberta tributary streams dropped by half where road densities exceeded about 0.6 miles per square mile).

ed wetlands can contribute to or conceivably magnify this effect. Accordingly, in some Pacific Northwest watersheds, stream temperature is more strongly associated with catchment-wide logging than with streamside vegetation cover (Pollock et al. 2009). Stream warming in such watersheds (often containing gently sloping or hilly terrain and numerous forested wetlands) could be influenced by reduced canopy shade over large areas of near-surface groundwater. Warming also could be influenced by changes in shallow groundwater flux rates and the level of the water table (Poole et al 2008). Hence, stream temperatures in some circumstances can become warmer at their point of origin (in spring, summer and fall) following watershed logging. Other research has established the importance of the hyporheic flow exchange in determining surface water thermal regime (Poole and Berman 2001, Baxter and Hauer 2001, Poole et al. 2008). The hyporheic zone may include extensive areas of shallow subsurface flow within montane alluvial valleys. In summer this subsurface pool may be dominated by spring snowmelt or cool rain runoff that cools surface streams when it discharges in midsummer (Poole and Berman 2001, Wondzell 2011). The extent of hyporheic storage and exchange bears a somewhat uncertain relationship to surface landforms, and until the decades after FEMAT, land management agencies lacked both the methods and incentive to accurately map these critically important areas (Torgersen et al. 1999, Baxter and Hauer 2001, Ebersole et al. 2003, Poole et al. 2004, Poole et al. 2008, Torgersen et al. 2012). Sediment accumulation in streambeds, or loss of step pools and other structures contributing to channel complexity—often formed by stable large wood—is thought to reduce entrainment of surface flows into, hence flow exchange with, the hyporheic zone (Moore and Wondzell 2005, Poole et al. 2008).

Given these uncertainties, and the increased importance of such groundwater source areas under future climate changes, any management change that increases the areal extent of logging in watersheds poses a risk of contributing to undesired stream warming. Notably, winter and spring stream temperatures can be of comparable importance to summer temperatures in meeting the habitat needs of species. In particular, temperatures of seasonably intermittent streams (even though they may be non-fish-bearing in summer or support salmonids only in early summer) can be important for salmon and other species in winter and spring (Wigington et al. 2006), and are directly and indirectly influenced by riparian canopy shade, thermal insulation, and other forest conditions that mediate water temperature fluctuations.

Fourth, *channel migration*: over time, stream channels migrate and even small streams have secondary channels that may flow only during the rainy season. However, existing side channels and backwaters provide important rearing and refuge habitat for salmonids, and they are commonly unmapped or mapped poorly. In addition, if riparian buffers are narrowed, some of these channels may migrate outside the narrowed buffer and be exposed to direct sunlight and substantially warmed. For instance, the sources of LWD are impaired during channel migration where outer zones have been harvested. Washington state and private forest practices rules have included criteria designed to identify and protect channel migration zones for many years (Brummer et al. 2006); in the ACS, explicit rules for their delineation are left to watershed analysis.

Considering the multiple ecological factors and processes that affect stream temperature and considering that temperature conservation is but one of many significant functional factors influenced by streamside forests, we *find no sufficient scientific support for reducing current ACS Riparian Reserve default widths for any stream type. In many watersheds and stream segments, larger areas of forest protection are warranted to prevent warming of*

shallow groundwater, particularly given likely trends future climate change, and the expectation of increased influence of wildfire and other "unmanaged" forest disturbances (Westerling et al. 2006).

Riparian Reserves and Nutrient Retention. The role of forested riparian buffers in retaining nutrients mobilized by upslope disturbance, or delivered to watersheds in precipitation and fertilization, is globally recognized. Forested buffer zones are commonly prescribed to reduce nutrient delivery to streams in agricultural landscapes (Sweeney and Newbold 2014). Logging and fuels management treatments that disturb green vegetation generate increased nitrogen leaching from forest soils that enters streams and wetlands by both surface and subsurface flow paths (Wenger 1999, Gomi et al. 2002, Kubin et al. 2006). Any ground-disturbing activity or condition (such as a road network) tends to mobilize phosphorus in association with soil erosion. Logging disturbs vegetation and soils over large areas, and scaled over large landscapes or river basins, initial disturbance of forested lands tends to generate larger net increases in nutrient loading than repeat disturbances of already-altered agricultural or urban lands (Wickham et al. 2008; note this observation is from a large population of monitoring sites and remains true even though agricultural lands are commonly more heavily fertilized than forest lands). Over time, nutrient loading to headwater streams transfers downstream, where nutrients accumulate in rivers, lakes, estuaries, and nearshore marine ecosystems (Freeman et al. 2007). For all of these reasons, forestry operations have been identified as a major contributor to nutrient loading, eutrophication, and associated impairment of water quality in Pacific Northwest lakes (Blair 1994, Dagget et al. 1996, Oregon DEQ 2007), rivers and estuaries (Oregon DEQ 2007).

Cumulative nutrient impairment of downstream receiving waters can occur without violation of nutrient standards in headwater streams, simply as a consequence of sustained increases in loading from storm water runoff from forest roads and periodic logging. In effect, logging alters the entire regime of nutrient and sediment export, and nutrient losses to surface waters are endemic and widespread consequences of logging and other disturbance of forested watersheds.

The question of what role Riparian Reserves play in nutrient retention has received insufficient consideration in the Pacific Northwest. Research on the nutrient retention efficiency of various forested buffer widths from the Upper Midwest and other regions (Nieber et al. 2011, Sweeney and Newbold 2014) suggests that average phosphorus and nitrogen retention is around 80% for undisturbed buffer zones of 30 m (100 feet) wide. Extrapolation suggests that buffers of 45 m (150 feet) or greater might be necessary to attain 90-99 percent retention of nutrients mobilized by upslope disturbance. These distances are likely too small for Pacific Northwest forests, where slopes are steeper, soils tend to be more porous, and macropores or channeled flow from uplands are more common than in the Midwest (all factors identified in Nieber et al. [2011] as reducing retention efficiency).

By virtue of their high density of surface channels across most mountainous landscapes, headwater streams with seasonal flow receive a large portion of the nutrients mobilized by up-slope disturbance (Gomi et al. 2002, Freeman et al. 2007). Therefore, full protection of wide Riparian Reserves along even the smallest stream channels (and surface-connected wetlands) is likely necessary for effective nutrient retention when surrounding uplands are disturbed. Channel network expansion from gully erosion (Reid et al. 2010) or roads (Wemple and Jones 2002) and channel simplification through loss of woody debris or sediment increases also reduces retention efficiency of nutrients, sediment, and organ-

ic matter in headwater systems. Moreover, thinning or other disturbance of vegetation or soils within the Riparian Reserve could short-circuit the benefit of riparian forest buffers, by creating a near-stream source of nutrients that is not fully mediated by the retention capacity of the default-width riparian zone.

Although more research is needed in the Pacific Northwest on nutrient retention, current scientific knowledge is sufficient to justify three recommendations. 1) *Continuous, no-cut Riparian Reserves exceeding 50 m (160 feet) along all streams and wetlands are generally needed to mitigate the effects of up-slope logging on nutrient loading to both freshwater ecosystems and downstream marine environments.* 2) *Cessation of livestock grazing in Riparian Reserves, road network reduction, and reconfiguration of remaining roads to reduce their hydrologic connectivity to surface waters are needed to reduce downstream nutrient loading.* 3) *Analysis of the effects of management actions on nutrient loading to immediate downstream receiving waters, including lakes, wetlands, reservoirs, mainstem rivers, estuaries, and the nearshore marine, are needed in environmental assessments, environmental impact statements, watershed analyses, and ESA consultations for aquatic species.*

Livestock Grazing. Whereas forestry predominates in the Northwest Forest Plan area, grazing affects a significant portion of the area as well; for example, 22 percent of BLM lands were subject to livestock grazing in the early 2000s (BLM 2008). A larger area was affected by historic grazing, where soil impacts may persist. Livestock grazing has large impacts on streams (Al-Chokhachy et al. 2010) because livestock tend to concentrate in streams, floodplains and alluvial valleys (see Beschta et al. 2013 for a recent synthesis). Besides direct disruption of wetlands and streambeds, and the suppression of woody vegetation, soil compaction by grazing in both riparian and upland areas degrades runoff quality and adversely alters flow regimes and watershed functions such as soil water storage and nutrient retention.

In addition to these direct impacts, new research shows that managing for livestock can indirectly alter ecosystem trophic cascades. For example, livestock depredation on open range led to programs to extirpate large native carnivores. Reduced numbers of carnivores release native ungulates and other herbivores from predation, leading to declines of riparian vegetation and stream conditions even outside of livestock-grazed areas (Beschta and Ripple 2012). Removing livestock grazing from federal lands has high potential to increase the resilience of watersheds and streams to environmental stresses, including climate change (Beschta et al. 2013, 2014). Measures to reduce the ecological impacts of livestock grazing, primarily by fencing streamside areas and moving cattle frequently from site to site, have met with variable success (Rhodes et al. 1994). Implementation of these methods is limited by the high capital cost of building and maintaining extensive fencing, the wages of field personnel to manage herds, and the cost of necessary environmental review and monitoring. Livestock grazing in forests is a commercial use that is not restorative, and often is marginal economically. We conclude that *livestock grazing should be excluded from Riparian Reserves, Key Watersheds, and other lands where conservation is the primary management objective.*

Chemical Use in Forests. Only very recently has science begun to directly tackle the difficult questions of fate, effects, and toxicity of pesticides and other chemicals associated with forestland uses on stream biota. Toxic contaminants come from various sources, including storm water runoff from roads (particularly those that discharge directly to surface waters pipes and ditches) (McCarthy et al. 2008, Feist et al. 2011). Herbicides are applied to tree plantations and roadsides to

control unwanted vegetation. Until recently these activities were limited by court order on BLM and USFS lands, but now they are increasing in extent and frequency, as well as continuing on adjacent private forest lands. The NMFS is reviewing the science concerning potential harm to listed species of Pacific salmon from application of commonly used pesticides. For example, use following label restrictions of the herbicide 2,4-D was determined to jeopardize Pacific salmon (NMFS 2011). Forest fire retardants that are aerially dropped in large quantities during wildfire suppression operations often reach surface waters, where they may be toxic to salmonids (Buhl and Hamilton 1998, Gaikowski et al. 1996).

While the science on toxic chemicals is certainly advancing, we have five interim recommendations based on existing knowledge: 1) *Minimize application of chemicals for forest management purposes in time and space;* for example, hand-application should be favored over aerial application when there is no feasible alternative to pesticide use. 2) *Weigh the full range of environmental trade-offs between the perceived benefits of chemical use and its possible harms in each case before a decision is made to use chemicals in forest management.* 3) *Implement wide, un-thinned forested buffers in Riparian Reserves to help reduce exposure of fish and aquatic life to toxic chemicals.* Thinned or narrow buffers can allow greatly increased aerosol penetration (chemical) from slopes to streams, and narrower buffers may also allow more transport of toxins in runoff. 4) *Reduce road density and the hydrologic connectivity of roads to surface waters to help control toxins* that originate from road use and maintenance, as well as those that are applied up-slope but find their way to streams via surface runoff. 5) *Analyze the possible effects of management actions in affecting the delivery of toxic chemicals to streams in every NEPA document and ESA consultation.*

Climate Change: Consequences and Adaptation. Anticipated climate change will alter the way we expect ecosystems to respond to forest management actions (Dale et al. 2001, Mote et al. 2003). In general for this region, hydrologic model predictions stepped-down from regional and global circulation models project increased stream and lake warming (varying magnitude across the seasons); more intense winter precipitation events, including flood and wind disturbance of riparian forests; earlier snow pack melting except for the highest elevation watersheds; and likely increased intensity and duration of droughts (Battin et al. 2007, Dalton et al. 2013). In very general terms, most climate change scenarios suggest larger and higher severity wildfires than seen in recent decades, and generally elevated evapotranspiration that could further reduce low summer streamflows. Luce and Holden (2009) documented a widespread pattern of declining summer streamflow over recent decades at gauging stations across the Pacific Northwest.

Climate changes will likely exacerbate existing (ongoing) trends in watershed degradation by affecting key processes or factors (stream thermal regimes, surface flows, groundwater and floodplain connectivity, landslide rates, fuels, fire, invasive species, and post disturbance human responses, to name but a few). Most climate change adaptation strategies call for strategic removal of non-climate stressors, because these will likely be more tractable or remediable than climate stressors (ISAB 2007, Furniss et al. 2010). No formal review of the ACS has apparently been conducted by the USFS or BLM to determine what, if any, science-based changes to the ACS best address future climate scenarios. It seems unlikely, however, that even a cursory review of the climate literature would lend support to proposals to remove or diminish currently protective provisions of the ACS.

The current ACS requirements are integral to assuring streams, wetlands, and other water bodies have the best possible resilience in the face of increasing climate stress. Extensive forested north-facing slopes can moder-

ate some climate influence on watersheds, and localized springs, and extensive shallow alluvial aquifers that store water seasonally can moderate summer streamflows and both summer and winter temperatures (Poole and Berman, 2001, Isaak et al. 2010, Wondzell 2011). Complex natural riparian vegetation communities and natural accumulations of large wood (resulting in concentrations of stored sediment) in and near floodplains are instrumental in creating and maintaining conditions that support hyporheic flow exchange. Wide Riparian Reserves provide not only shade, but essential protection and support for the natural processes that maintain and regenerate the suite of hydrologic and geomorphic elements that help buffer streams against climate forcing.

Intact watersheds are often seen to be less vulnerable to storms, floods, droughts, wildfire, and other extreme events, and are expected to be more resilient to future climate change than highly altered watersheds. Streams and rivers affected by reduced alluvial groundwater storage and diminished hyporheic buffering, fragmentation and loss of biological habitat connectivity, and a less intact native biota, are likely to respond more quickly and with greater volatility to climate change, as are engineered systems such as roads and dams. Watershed resilience in the face of climate change can best be maintained by protecting and restoring the suite of natural processes and conditions that characterize natural forested riparian areas and floodplains (Seavy et al. 2009, Furniss et al., 2010). This is exactly what the ACS was originally designed to accomplish. Whittling away riparian protections on the basis of narrowed, single-factor considerations such as proximate stream shade undermines the comprehensive protection of stream and riparian processes that the ACS was designed to maintain and restore. Finally, under changing climate, some management practices that seemed to produce desirable outcomes in the past may not do so in the future. For example, the putative effectiveness of forest thinning at altering fire behavior could become even more uncertain if weather extremes become more of a top-down driver of fire behavior (see Martinson and Omi 2013) in future climates (Dale et al. 2001, Westerling et al. 2006).

Our overall recommendation is that 1) *ACS protections for Riparian Reserves should be sustained and strengthened to better protect and restore natural ecosystem processes that confer resilience to climate change,* as detailed in our other recommendations. In addition, 2) *an interagency scientific conservation design effort is needed to expand and reconfigure some present Key Watersheds to ensure they better encompass specific areas that are likely to be topographic and hydrologic buffers to future climate change impacts.* Finally, we recommend that 3) *the direct and indirect effects of management actions on the integrity and capacity of stream and watershed ecosystems for resilience to climate change be analyzed in every environmental assessment, environmental impact statement, watershed analysis, and ESA consultation.*

Monitoring and Adaptive Management.

Environmental monitoring data often prove to be useful, but we cannot always anticipate how those data will be useful. Monitoring can be especially valuable when coupled with available data from historical records and time series sampling (such as streamflow gauging and temperature recorder data strings) (Wissmar 1993, Wissmar and Beschta 1988). Substantial progress has been made in the past 20 years on sampling design and methods of data collection for monitoring streams, watersheds and regions of watersheds (Steel et al. 2010). Twenty years after FEMAT, there are greatly expanded technological capabilities for spatially explicit data reporting and analysis, and numerous and increasingly robust methods to integrally evaluate considerations of ecological scale, geographical context, spatial and temporal continuity, and biological connectivity in data design and analysis.

The Northwest Forest Plan designated large

Adaptive Management Areas where alternative means of management and conservation might be implemented and closely monitored. For many reasons this option failed. Public involvement was required, but in most cases the public could not agree on the need for trial and testing of specific management hypotheses (Gray 2000). Managers and scientists also sometimes disagreed on hypotheses to test or what practices should be implemented. Lacking coherent large-scale experimental proposals drawing broad social support, funding never materialized. These failures are by no means endemic to the NFP—they characterize many, if not most aspirational attempts at formalized, large-scale adaptive management (Walters 1997).

We note, however, that ongoing management across multiple ownerships and with a multitude of natural background conditions creates a broad array of natural experiments that already exist on the landscape. Scientists can probably continue to learn much of what we need to know by creative monitoring of extant natural experiments. However imperfect they may be, natural experiments are more beneficial than waiting for planned, large-scale experiments that have proven exceedingly difficult to execute (and are almost always far from ideal themselves in terms of design and resources).

The existing monitoring program for aquatic resources in the Northwest Forest Plan area (Aquatic and Riparian Effectiveness Monitoring Program, AREMP, http://www.reo.gov/monitoring/reports/watershed/aremp/aremp.htm) in our view is constrained by certain design and sampling protocols that limit AREMP's capacity for drawing inferences about changes in habitat condition, living system condition, and biophysical processes over time. Whereas AREMP is intended by design to detect trends in some riparian or stream conditions over large areas, interpreting causal relations for responses requires information about changes in physical conditions and biota at specific locations over time. Further, AREMP design is based on delineated hydrologic units some of which do not represent hydrographically complete watersheds; this confounds identifying linkages between watershed condition and stream biotic and physical responses (Omernik 2003). Considering the scope of natural and man-caused variability in the field, Anlauf et al. (2011) suggested that AREMP incorporates a statistically insufficient number of sites to yield useful confidence intervals needed for reliable assessments of many measures of stream condition. Effectiveness monitoring generally fails when the design or data preclude process or cause-effect inferences, or when assumed fundamental relationships between habitat indices and biological populations and assemblages remain untested. Outside of the specific confines of AREMP, some useful new understanding has emerged from regionally extensive monitoring programs on federal lands in the Pacific Northwest (e.g., Hough-Snee et al. 2014, Meredith et al. 2014). In our view, these studies, far more specifically than AREMP, focus on iterative explicit hypotheses about cause-and-effect relations to inform the query and analysis of field survey data

We recommend three policy shifts in how monitoring is employed under the ACS. First, as a standard management practice, require *some form of effectiveness monitoring and expert review of stream and watershed responses for every forestry, range, mining, recreation development, or active management project.* Every project that could potentially affect watershed and stream conditions should integrally include collection of a field data set that sheds some light on key post-project biophysical conditions influenced by the project. Agency actions should help to increase the certainty of outcomes at particular sites. Agencies should first engage experts that could check collective awareness of the reliability of conventional assumptions about the effects of manage-

ment actions. Expert's perspectives would and increase the likelihood of the agencies identifying unanticipated outcomes that warrant broader study and management consideration. Expert review of project outcomes is needed to discourage the institutional habitat of assuming *a priori* that project outcomes are more certain and unequivocally beneficial than they often are.

Secondly, agencies should review existing programs of comprehensive regional and watershed-scale effectiveness monitoring programs, and develop comprehensive monitoring strategies to optimize return on the capital investment in monitoring. *We call for an interagency scientific panel to review the status and effectiveness of trend monitoring efforts, and identify data sets that could be useful in drawing inferences for improved monitoring programs.* New monitoring programs should be capable of assessing the effects of management actions and climate change on aquatic ecosystems and biological resources associated with BLM and USFS lands. They should be robust to both anticipated and unanticipated environmental changes.

Third, agency-driven improvements in monitoring programs should include *increased emphasis on tracking ecological conditions, including explicit biological condition measures, and the ability to establish with some certainty that trends in Key Watersheds result from specific management actions or choices (which may include deferral of active management).* Key Watersheds are especially critical for the medium- and long-term conservation success of the ACS, and may be disproportionately important to the survival and recovery of ESA-listed and other sensitive species. The special need to focus sustained time-trend effectiveness monitoring in Key Watersheds again raises the concern that re-delineation of Key Watersheds with each new piece of legislation or management planning cycle could disrupt long-term monitoring efforts. Pursuant to our third recommendation, we also recommend that agencies retain some degree of flexibility in allocation of monitoring resources to allow for occasional more directed and intensive investigation where assessments indicate that surprising and ecologically important outcomes have occurred.

CONCLUSIONS

In this report we examine selected new and emerging science that is relevant to the future of the ACS, and touch on concepts that should be integral to whatever might replace the ACS in the future. We believe more exhaustive consideration of the topics we raised--and a broadened consideration of others, including the functions of riparian and watershed reserves for conservation of terrestrial wildlife species--will only strengthen our conclusion that the founding rationale, basic architecture, and core conservation elements of the ACS remain sound. We also maintain that some specific improvements in ACS protection and conservation provisions are warranted.

New science raises many concerns about the adequacy of implementation of the ACS by the federal agencies. These issues include including post-fire and other logging after disturbances, logging and fuels treatments in riparian areas, the degree of riparian protection for headwater streams, the adequacy of past efforts for road system downsizing and remediation, the adequacy of conservation priorities for and delineations of Key Watersheds, the effectiveness of grazing management, and whether current monitoring is as useful as it should be.

This report raises concerns about anticipated climate change. While climate change does not fundamentally alter the basic facts of good conservation and responsible management, it both theoretically and materially raises the level of concern about many specific management issues, including the potential effective-

ness of restoration actions, the effectiveness of riparian areas as stream buffers, and implications for the burden of proof for management actions that balance known environmental problems against presumed restorative benefits. Most watersheds in the region are of mixed federal and other ownership. Because progress in protection and restoration on private lands has been limited (Stout et al. 2012), federal lands will likely continue to be the focus of watershed protection and aquatic habitat conservation, and related climate change initiatives for the foreseeable future.

Finally, an improved monitoring program will be necessary to ascertain that conservation of aquatic ecosystems and resources is in fact occurring, especially in the face of increasing physical and biotic stresses imposed by changing climate and human population growth. It will be of continued or increasing importance to evaluate the degree to which Riparian Reserves can serve as effective buffers against the cumulative effects of logging, roads, and other disturbances on forest lands catchment-wide. This question has assumed greater importance as research in disturbed ecosystems worldwide has demonstrated that watershed condition can sometimes affect fish assemblages more strongly than does riparian condition (Roth et al. 1996; Wang et al. 2003; 2006; Sály et al. 2011; Marzin et al. 2012).

We conclude that attempts to reduce protections to watershed, riparian, and freshwater ecosystems by weakening major components of the ACS and other related conservation elements of the Northwest Forest Plan are not justified by new and emerging science. Improved ecosystem protections--and better monitoring of outcomes--are warranted across all land ownerships, including federal forest lands, if freshwater ecosystems and their biota, including salmon and other sensitive species are to be effectively conserved in an era of increased ecological stress and changing climate.

LITERATURE CITED

Al-Chokhachy, R., B.B. Roper, and E.K. Archer. 2010. Evaluating the status and trends of physical stream habitat in headwater streams within the interior Columbia River and upper Missouri River Basins using an index approach. *Transactions of the American Fisheries Society* 139:1041-1059.

Anlauf, K.J., W. Gaeuman, and K.K. Jones. 2011. Detection of regional trends in salmonid habitat in coastal streams, Oregon. *Transactions of the American Fisheries Society* 140:52-66.

Battin, J., M.W. Wiley, M.H. Ruckelshaus, R.N. Palmer, E. Korb, K.K. Bartz, and H. Imaki. 2007. Projected impacts of climate change on salmon habitat restoration. *Proceedings of the National Academy of Sciences of the United States of America* 104:6720–6725.

Baxter, C.V. and F.R. Hauer. 2000. Geomorphology, hyporheic exchange, and selection of spawning habitat by bull trout (Salvelinus confluentus). *Canadian Journal of Fisheries and Aquatic Sciences* 57: 1470-1481.

Benda, L., D. Miller,., P. Bigelow, , and K. Andras, 2003. Effects of post-wildfire erosion on channel environments, Boise River, Idaho. *Forest Ecology and Management*, 178(1):105-119.

Beschta, R.L., J.J. Rhodes, J.B. Kauffman, R.E. Gresswell, G.W. Minshall, J.R. Karr, D.A. Perry, F.R. Hauer, and C.A. Frissell. 2004. Postfire management on forested public lands of the Western United States. *Conservation Biology* 18: 957–967.

Beschta, R.L., D.L. Donahue, D.A. DellaSala, J.J. Rhodes, J.R. Karr, M.H. O'Brien, T.L. Fleischer, and C. Deacon-Williams. 2013. Adapting to climate change on western public lands: Addressing the ecological effects of domestic, wild, and feral ungulates. *Environmental Management* 51:474–491.

Beschta, R.L., D.L. Donahue, D.A. DellaSala, J.J. Rhodes, J.R. Karr, M.H. O'Brien, T.L. Fleischer, and C. Deacon-Williams. 2014. Reducing livestock effects on public lands in the western United States as climate changes: A reply to Svejcar et al. *Environmental Management*, in press.

Beschta, R.L. and W.J. Ripple. 2012 The role of large predators in maintaining riparian plant communities and river morphology. *Geomorphology* 157-158: 88-98.

Black, S.H., D. Kulakowski, B.R. Noon, and D. DellaSala. 2013. Do bark beetle outbreaks increase wildfire risks in the Central U.S. Rocky Mountains: Implications from recent research? *Natural Areas Journal* 33:59-65.

Blair, M.S. 1994. Oregon coastal lake study: Phosphorus loading and water quality implications. M.S. Thesis, Oregon State University, Corvallis, OR. 114 pp.

BLM (Bureau of Land Management). 2008. Final Environmental Impact Statement for the Revision of the Resource Management Plans of the Western Oregon Bureau of Land Management Districts. Portland, OR. Available online at http://www.blm.gov/or/plans/wopr/final_eis/

Blumm, M.C., and T. Wigington. 2013. The Oregon and California Railroad Grant Lands' sordid past, contentious present, and uncertain future: a century of conflict. *40 Boston College Envvironmental Affairs Law Review* 40:1 (2013). http://lawdigitalcommons.bc.edu/ealr/vol40/iss1/2/

Brummer, C.J., T.B. Abbe, , J.R. Sampson, , and D.R. Montgomery, 2006. Influence of vertical channel change associated with wood accumulations on delineating channel migration zones, Washington, USA. *Geomorphology* 803:295-309.

Bryce, S.A., G.A. Lomnicky, and P.R. Kaufmann. 2010. Protecting sediment-sensitive aquatic species in mountain streams through the application of biologically based streambed sediment criteria. *Journal of the North American Benthological Society* 29:657-672.

Buhl, K.J. and S.J. Hamilton. 1998. Acute toxicity of fire-retardant and foam-suppressant chemicals to early life stages of Chinook salmon (*Oncorhynchus tshawytscha*). Environmental Toxicology and Chemistry 17(8):1589-1599.

Burnett, K. M., G.H. Reeves, D.J. Miller, S. Clarke, K. Vance-Borland, and K. Christiansen. 2007. Distribution of salmon-habitat potential relative to landscape characteristics and implications for conservation. *Ecological Applications* 17(1), 66-80.

Carnefix, G. and C. A. Frissell. 2009. Aquatic and other environmental impacts of roads: The case for road density as indicator of human disturbance and road-density reduction as restoration target, a concise review. Pacific Rivers Council Science Publication 09-001. Pacific Rivers Council, Portland, OR and Polson, MT. http://pacificrivers.org/science-research/resources-publications/road-density-as-indicator/download

Carpenter, S.R., N.F. Caraco, D.L. Correll, R.W. Howarth, A.N. Sharpley, and V.H. Smith. 1998. Nonpoint pollution of surface waters with phosphorus and nitrogen. *Ecological Applications* 8:559–568. http://dx.doi.org/10.1890/1051-0761(1998)008[0559:NPOSWW]2.0.CO;2

Cover, M.R., C.L. May, W.E. Dietrich, and V.H. Resh. 2008. Quantitative linkages among sediment supply, streambed fine sediment, and benthic macroinvertebrates in northern California streams. *Journal of the North American Benthological Society* 27(1):35-149. http://csmres.jmu.edu/geollab/May/Web/Research/Reprints/cover%20et%20al%202008%20jnabs.pdf

Daggett, S.G., A.H. Vogel, and R.R. Petersen. 1996. Eutrophication of Mercer, Munsel, and Woahink Lakes, Oregon. *Northwest Science* 70 (Special Issue 2):28-38.

Dale, V.H., L.A. Joyce, , S. McNulty, , R.P. Neilson, , M.P. Ayres, , M.D. Flannigan, , ... and M.B. . Wotton. 2001. Climate Change and Forest Disturbances: Climate change can affect forests by altering the frequency, intensity, duration, and timing of fire, drought, introduced species, insect and pathogen outbreaks, hurricanes, windstorms, ice storms, or landslides. *BioScience* 51(9):723-734.

Dalton, M.M., P.W. Mote, and A.K. Snover. 2013. *Climate Change in the Northwest Implications for Our Landscapes, Waters, and Communities*. Island Press, Washington DC. 271 pp.

DellaSala, D.A. 2013. Ecological Importance of Bureau of Land Management O&C and Coos Bay Wagon Road Holdings in Western Oregon with Special Attention to Surface Water Source Areas. Geos Institute, Ashland, OR, 19 pp.

DellaSala, D. A., R.G. Anthony, M.L. Bond, Monica, E.S. Fernandez, C.A. Frissell, Chris, C.T. Hanson, and R. Spivak. 2014. Alternative Views of a Restoration Framework for Federal Forests in the Pacific Northwest. *Journal of Forestry* 111(6):420-429.

DellaSala, D.A. and J. Williams. 2006. Northwest Forest Plan ten years later – how far have we come and where are we going. *Conservation Biology* 20:274-276.

DellaSala, D.A., J.R. Karr, and D.M. Olson. 2011. Roadless areas and clean water. *Journal of Soil and Water Conservation* 66:78A-84A.

Donato, D.C., J.B. Fontaine, J.L. Campbell, W.D. Robinson, J.B. Kauffman, and B.E. Law. 2006. Post-wildfire logging hinders regeneration and increases fire risk. Science 311: 352.

Dwire, K.A, C.C. Rhoades, and M.K. Young. 2010. Potential effects of fuel management activities on riparian areas. pp. 175–205 In W.J. Elliot et al., (eds.), Cumulative watershed effects of fuel management in the western United States. USDA Forest Service General Technical Report RMRS-GTR-231, Rocky Mountain Research Station, Ft. Collins, CO. ftp://frap.fire.ca.gov/pub/incoming/TAC/Contractor%20final%20lit%20review%20docs/lit%20review_water/Dwire%202006.pdf

Ebersole, J.L., W.J. Liss, and C.A. Frissell. 2003. Cold water patches in warm streams: Physicochemical characteristics and the influence of shading. *Journal of the American Water Resources Association* 39:355-368. (Published online 8 June 2007).

Espinosa, Jr., F.A., J.J. Rhodes, and D.A. McCullough. 1997. The failure of existing plans to protect salmon habitat in the Clearwater National Forest in Idaho. *Journal of Environmental Management* 49(2): 205-230.

Estes, J.A. 2011. Trophic downgrading of planet Earth. *Science* 333. 15 July 2011

Everest, F.H. and G.H. Reeves. 2006. Riparian and aquatic habitats of the Pacific Northwest and southeast Alaska: ecology, management history, and potential management strategies. Gen. Tech. Rep. PNW-GTR-692. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 130 p.

Fausch, K.D., C.E. Torgersen, C.V. Baxter, and H.W. Li. 2000. Landscapes to riverscapes: bridging the gap between research and conservation of stream fishes. *BioScience* 52(6):1-16.

Feist, B.E., E.R. Buhle, P. Arnold, J.W. Davis, and N.L. Scholz. 2011. Landscape ecotoxicology of coho salmon spawner mortality in urban streams. *PLoS ONE* 6(8): e23424. doi:10.1371/journal.pone.0023424. http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0023424

FEMAT (Forest Ecosystem Management and Assessment Team). 1993. Forest Ecosystem Management: An ecological, economic and social assessment. USDA Forest Service, BLM, USFWS, NOAA, EPA and National Park Service, Portland, Oregon. 1039 p.

Firman, J.C., E.A. Steel, D.W. Jensen, K.M. Burnett, K. Christiansen, B.E. Feist, Blake E., D.P. Larsen, and K. Anlauf. 2011. Landscape models of adult coho salmon density examined at four spatial extents. *Transactions of the American Fisheries Society* 140:440-455.

Freeman, M.C., C.M. Pringle, and C.R. Jackson. 2007. Hydrologic connectivity and the contribution of stream headwaters to ecological integrity and regional scales. *Journal of the American Water Resources Association* 43(1):5-14. DOI: 10.1111/j.1752-1688.2007.00002.x. http://www.energy.vt.edu/ncepstudy/pub/nature/regionalscaleinfluence.pdf

Frissell, C.A. and D. Bayles. 1996. Ecosystem management and the conservation of aquatic biodiversity and ecological integrity. *Water Resources Bulletin* 32:229-240.

Furniss, M.J., B.P. Stabb, S. Hazelhurst, C.F. Clifton, K.B. Roby, B.L. Ilhadrt, E.B. Larry, A.H. Todd, L.M. Reid, S.J. Hines, K.A. Bennett, C.H. Luce, and P.J. Edwards. 2010. Water, climate change, and forests: watershed stewardship for a changing climate. USDA Forest Service General Technical Report PNW-GTR-812, Portland, Oregon, 75pp. http://www.fs.fed.us/pnw/pubs/pnw_gtr812.pdf

Franklin, J.F. and K.N. Johnson. 2012. A restoration framework for federal forests in the Pacific Northwest. *Journal of Forestry* 110: 429-439.

Frissell, C.A. and R.K. Nawa. 1992. Incidence and causes of failure of artificial habitat structures in streams of western Oregon and Washington. *North American Journal of Fisheries Management* 12:182-197.

Gaikowski, M.P., S.J. Hamilton, K.J. Buhl, S.F. McDonald, and C.H Summers. 1996. Acute toxicity of three fire-retardant and two fire-suppressant foam formulations to the early life stages of rainbow trout (*Oncorhynchus mykiss*). *Environmental Toxicology and Chemistry* 15(8):1365-1374.

Gallo, K., S.H. Lanigan, P. Eldred, S.N. Gordon, and C. Moyer. 2005. Northwest Forest Plan—the first 10 years (1994–2003): Preliminary assessment of the condition of watersheds. Gen. Tech. Rep. PNW-GTR-647. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 133 p.

GAO (Government Accountability Office). 1999. Ecosystem Planning: Northwest Forest and Interior Columbia River Basin Plans Demonstrate Improvements in Land-Use Planning (Letter Report, 05/26/99, GAO/RCED-99-64). http://www.gpo.gov/fdsys/pkg/GAOREPORTS-RCED-99-64/html/GAOREPORTS-RCED-99-64.htm

Gomi, T., R.C. Sidel, and J.S. Richardson. 2002. Understanding processes and downstream linkages of headwater streams. *BioScience*52:905-916.

Gray, A.N. 2000. Adaptive ecosystem management in the Pacific Northwest: a case study from coastal Oregon. *Conservation Ecology* 4(2):6. [online] http://www.consecol.org/vol4/iss2/art6/

Gresswell, R.E. 1999. Fire and aquatic ecosystems in forested biomes of North America. *Transactions of the American Fisheries Association* 128:193–221.

Gucinski, H., M.J. Furniss, R.R. Ziemer, and M.H. Brookes. 2001. Forest roads: a synthesis of scientific information. Gen. Tech. Rep. PNWGTR-509. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR. http://www.fs.fed.us/pnw/pubs/gtr509.pdf

Hicks B.J., R.L. Beschta, and R.D. Harr. 1991. Long-term changes in streamflow following logging in western Oregon and associated fisheries implications. *Water Resources Bulletin* 27(2): 217- 226.

Hough-Snee, N., A. Kasprak, B.B. Roper, and C.S. Meredith. 2014. Direct and indirect drivers of instream wood in the interior Pacific Northwest, USA: decoupling climate, vegetation, disturbance, and geomorphic setting. *Riparian Ecology and Conservation* 2(1): 2299-1042. DOI: 10.2478/remc-2014-0002

Houlahan, J.E. and C.S. Findlay. 2003. The effects of adjacent land use on wetland amphibian species richness and community composition. *Canadian Journal of Fisheries and Aquatic Sciences* 60: 1078–1094

Hughes, R.M, S. Howlin, and P.R. Kaufmann. 2004. A biointegrity index for coldwater streams of western Oregon and Washington. *Transactions of the American Fisheries Society* 133:1497-1515.

ISAB. (Independent Scientific Advisory Board). 2007. Climate change impacts on Columbia River basin fish and wildlife. Northwest Power and Conservation council, Portland, OR. 136 pp. http://www.nwcouncil.org/media/31247/isab2007_2.pdf

Issak, D.J., C.H. Luce, B.E. Rieman, D.E. Nagel, E.E. Peterson, D.L. Horan, S. Parkes, and G.L. Chandler. 2010. Effects of climate change and wildfire on stream temperatures and salmonid thermal habitat in a mountain river network. *Ecological Applications* 20:1350–1371.

Johnson, K.N. 2010. Water, climate change, and forests: watershed stewardship for a changing climate. USDA Forest Service General Technical Report PNW-GTR-812. Portland, Oregon, 75pp. http://www.fs.fed.us/pnw/pubs/pnw_gtr812.pdf

Johnson, K.N. and J.F. Franklin. 2012. Increasing Timber Harvest Levels on the BLM O&C Lands While Maintaining Environmental Values (Revised). Testimony before the Senate Committee on Energy and Natural Resources , June 25, 2013. Department of Forest Ecosystems and Society, Oregon State University, Corvallis, OR. Online at http://fes.forestry.oregonstate.edu/sites/fes.forestry.oregonstate.edu/files/PDFs/Johnson_June%202013.pdf

Jones, J.A., F. J. Swanson, B.C. Wemple, and K.U. Snyder. 2000. Effects of roads on hydrology, geomorphology, and disturbance patches in stream networks. *Conservation Biology* 14:76-85.

Karr, J.R., J.J. Rhodes, G.W. Minshall, F.R. Hauer, R.L. Beschta, C.A. Frissell, and D.A. Perry. 2004. The effects of postfire salvage logging on aquatic ecosystems in the American West. *BioScience*54:1029-1033.

Kauffman, J.B., R.L. Beschta, N. Otting, and D. Lytje. 1997. An ecological perspective of riparian and stream restoration in the western United States. *Fisheries* 22(5):12-24.

Kaufmann, P.R. and R.M. Hughes. 2006. Geomorphic and anthropogenic influences on fish and amphibians in Pacific Northwest coastal streams. pp. 429-455. In R.M. Hughes, L. Wang, and P.W. Seelbach (eds.). *Landscape influences on stream habitat and biological assemblages*. American Fisheries Society, Symposium 48.

Klein, R.D., J. Lewis, and M.S. Bufflben. 2012. Logging and turbidity in the coastal watersheds of northern California. *Geomorphology* 139-140:136-144. http://www.sciencedirect.com/science/article/pii/S0169555X11005277

Kubin, E. 2006. Leaching of nitrogen from upland forest-regeneration sites into wetland areas. Pp. 87-94 In Krecek, J. and M. Haigh (eds.) *Environmental Role of Wetlands in Headwaters*. Springer, The Netherlands.

Labbe T.R. and K.D. Fausch. 2000. Dynamics of intermittent stream habitat regulate persistence of a threatened fish at multiple scales. *Ecological Applications* 10: 1774–1791.

Lee, D.C., J.R. Sedell, B.E. Rieman, R.F. Thurow, J.E. Williams, and others. 1997. Broadscale assessment of aquatic species and habitats. Pp. 1057-1496 in S.J. Arbelbide (editor). An assessment of ecosystem components in the Interior Columbia Basin and portions of the Klamath and Great Basins: Vol. III. USDA Forest Service General Technical Report PNW-GTR-405.

Lindenmayer, D.B., D.R. Foster, , J.F. Franklin, , M.L Hunter,., R.F. Noss,., F.A. Schmiegelow, , and D. Perry, 2004. Salvage harvesting policies after natural disturbance. *Science (Washington)* 303(5662):303.

Lindenmayer, D.B. and R.F. Noss. 2006. Salvage logging, ecosystem processes, and biodiversity conservation. *Conservation Biology* 20(4): 949–958.

Lowe, W.H. and G.E. Likens. 2005. Moving headwater streams to the head of the class. *BioScience* 55:196-197.

Luce, C.H., B.E. Rieman, J.L. Dunham, J.G. King, & T.A. Black, 2001. Incorporating aquatic ecology into decisions on prioritization of road decommissioning. Water Resources Impact 3(3):8-14.

Luce, C.H. and Z.A. Holden. 2009. Declining annual streamflow distributions in the Pacific Northwest United States, 1948–2006. *Geophysical Research Letters* 36, L16401, doi:10.1029/2009GL039407, 2009.

Lydersen, J.M., M.P. North, and B.M. Collins. 2014. Severity of an uncharacteristically large wildfire, the Rim Fire, in forests with relatively restored frequent fire regimes. Forest Ecology and Management 328:326-334. DOI:10.1016/j. Foreco.2014.06.005.

Malison, R.L. and C.V. Baxter. 2010. The "fire pulse:" wildfire stimulates flux of aquatic prey to terrestrial habitats driving increases in riparian consumers. *Canadian Journal of Fisheries and Aquatic Sciences* 67(3):570-579.

Martinson, E.J. and P.N. Omi. 2013. Fuels treatments and fire severity: A meta-analysis. Research Paper RMRS-RP-103WWW. USDA Forest Service, Fort Collins, CO. 38 pp. http://www.fs.fed.us/rm/pubs/rmrs_rp103.pdf

Marzin, A.P., P. Verdonschot, and D. Pont. 2012. The relative influence of catchment, riparian corridor and local anthropogenic pressures on fish and macroinvertebrate assemblages in French rivers. *Hydrobiologia* 704: 375–388.

McCarthy S.G., J.P. Incardona, and N.L. Scholz. 2008. Coastal storms, toxic runoff, and the sustainable conservation of fish and fisheries. American Fisheries Society Symposium 64:1-21.

McCullough, D.A. 1999. A review and synthesis of effects of alterations to the water temperature regime on freshwater life stages of salmonids, with special reference to Chinook salmon. EPA 910-R-99-010. Prepared for the United States Environmental Protection Agency, Region 10, Seattle, Washington. 279 p.

Meredith, C., B. Roper, and E. Archer. 2014. Reductions in instream wood in streams near roads in the interior Columbia River Basin. *North American Journal of Fisheries Management* 34(3):493-506.

Minshall, W. 2003. Responses of stream benthic macroinvertebrates to fire. *Forest Ecology and Management* 178:155-161.

Minshall, G.W., C.T. Robinson, and D.E. Lawrence. 1997. Postfire response of lotic ecosystems in Yellowstone National Park U.S.A. *Canadian Journal of Fisheries and Aquatic Sciences* 54:2509-2525.

Montgomery, D.R. 1995. Input- and output-oriented approaches to implementing ecosystem management. *Environmental Management* 19(2): 183-188.

Montgomery, D.R., G.E. Grant, and K. Sullivan. 1995. Watershed analysis as a framework for implementing ecosystem management. *Water Resources Bulletin* 31(9):369-386.

Moore, R.D. and S.M. Wondzell. 2005. Physical hydrology and the effects of forest harvesting in the Pacific Northwest: A review. *Journal of the American Water Resources Association* 41(4):763-784. DOI: 10.1111/j.1752-1688.2005.tb03770.x

Mote, P.W., E.A. Parson, A.F. Hamlet, W.S. Keeton, D. Lettenmaier, N. Mantua, E.L. Miles, D.W. Peterson, D.L. Peterson, R. Slaughter, and A.K. Snover. 2003. Preparing for climatic change: the water, salmon, and forests of the Pacific Northwest. *Climatic Change* 61: 45–88.

Newcombe, C.P. and J.O.T. Jensen. 1996. Channel suspended sediment and fisheries: a synthesis for quantitative assessment of risk and impact. *North American Journal of Fisheries Management* 16(4):693-719

NMFS (National Marine Fisheries Service). 2007. Puget Sound Salmon Recovery Plan. Pacific Northwest Region, Seattle, WA. 472 pp. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/puget_sound/chinook/pugetsoundchinookrecoveryplan.pdf

NMFS (National Marine Fisheries Service). 2011. Biological Opinion: Environmental Protection Agency Registration of Pesticides 2,4-D, Triclopyr BEE, Diuron, Linuron, Captan, and Chlorothalonil. June 30, 2011. 970 pp. + appendices. http://www.nmfs.noaa.gov/pr/pdfs/consultations/pesticide_opinion4.pdf

NMFS (National Marine Fisheries Service). 2012. Recovery Plan Volume 1 for the Southern Oregon Northern California Coast Evolutionarily Significant Unit of coho salmon (*Oncorhynchus kisutch*). Southwest Regional Office, Arcata, CA. http://www.westcoast.fisheries.noaa.gov/publications/recovery_planning/salmon_steelhead/domains/southern_oregon_northern_california/soncc_plan_draft_2012_entire.pdf

NOAA-NMFS and USFWS (National Marine Fisheries Service and US Fish and Widllife Service). 2006a. Final Environmental Impact Statement for the Proposed Issuance of Multiple Species Incidental Take Permits or 4(d) Rules for the Washington State Forests Habitat Conservation Plan (January 2006).

NOAA-NMFS and USFWS (National Marine Fisheries Service and US Fish and Widllife Service). 2006b. Endangered Species Act Section 7 Consultation Biological Opinion and Section 10 Statement of Findings And Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation (June 5, 2006). 337 pp.

Noss, R.F., J.F. Franklin, W.L. Baker, T. Schoennagel, and P.B. Moyle. 2006. Managing fire-prone forests in the western United States. Frontiers in Ecology and the Environment 4:481-487.

Olson, D.H., P.D. Anderson, C.A. Frissell, H.H. Welsh, Jr., and D.F. Bradford. 2007. Biodiversity management approaches for stream-riparian areas: perspectives for Pacific Northwest headwater forests, microclimates, and amphibians. *Forest Ecology and Management* 246(1):81-107.

Omernik, J.M. 2003. The misuse of hydrologic unit maps for extrapolation, reporting and ecosystem management. *Journal of the American Water Resources Association* 39:563–573.

Oregon DEQ. 1994. Coquille River and estuary water quality report, Total Maximum Daily Load program. Oregon Department of Environmental Quality. Portland, OR. 48pp. http://www.deq.state.or.us/wq/tmdls/docs/southcoastbasin/coquille/CoquilleRiverTMDL.pdf

Oregon DEQ. 2007. Tenmile Lakes Watershed Total Maximum Daily Load (TMDL). Oregon Department of Environmental Quality. Portland, OR. 167 pp. http://www.deq.state.or.us/wq/tmdls/docs/southcoastbasin/tenmile/tmdl.pdf

Pacific Rivers Council. 2008. Comments on BLM WOPR DEIS. Portland, Oregon. [Jan. 11, 2008]. http://pacificrivers.org/conservation-priorities/land-management/federal-forest-planning/western-oregon-plan-revisions/prcs-comprehensive-comments-on-the-draft-eis

Pacific Rivers Council (Wright, B. and C. Frissell). 2010. Roads and rivers II: An assessment of national forest roads analyses. Report for the Pacific Rivers Council, Portland, OR. [online] http://pacificrivers.org/science-research/resources-publications/roads-and-rivers-ii/download

Pollock, M.M. and T.J. Beechie. 2014. Does riparian forest thinning enhance biodiversity? The ecological importance of large wood. *Journal of the American Water Resources Association* 50(3):543-559. DOI: 10.1111/jawr.12206

Pollock, M.M., T.J. Beechie, M. Liermann, and R.E. Bigley. 2009. Stream temperature relationships to forest harvest in western Washington. *Journal of the American Water Resources Association* 45(1):141-156.

Pollock, M.M., T.J. Beechie, and H. Imaki. 2012. Using reference conditions in ecosystem restoration: an example for riparian conifer forests in the Pacific Northwest. *Ecosphere* 3(11) Article 98: 1-23. http://dx.doi.org/10.1890/ES12-00175.1

Poole, G.C. and C.H. Berman. 2001. An ecological perspective on in-stream temperature: natural heat dynamics and mechanisms of human-caused thermal degradation. *Environmental Management* 27(6):787–802.

Poole, G.C., S.J. O'Daniel, K.L. Jones, W.W. Woessner, E.S. Bernhardt, A.M. Helton, J.A. Stanford, B.R. Boer, and T.J. Beechie. 2008. Hydrologic spiralling: the role of multiple interactive flow paths in stream ecosystems. *River Research and Applications* 24(7):1018-1031.

Rashin, E.B., C.J. Clishe, A.T. Loch, and J.M. Bell. 2006. Effectiveness of timber harvest practices for controlling sediment. *Journal of the American Water Resources Association* 42:1307-1347.

Reeves, G.H., L.E. Benda, K.M. Burnett, P.A. Bisson, and J.R. Sedell. 1995. A disturbance-based ecosystem approach to maintaining and restoring freshwater habitats of evolutionarily significant units of anadromous salmonids in the Pacific Northwest. *In* J. Nielsen (editor), Proceedings of the American Fisheries Society Symposium on Evolution and the Aquatic Ecosystem, Bethesda, Maryland. Pp. 334–349.

Reeves, G.H., J.E. Williams, K. Gallo, and K.M. Burnett. 2006a. The aquatic conservation strategy of the Northwest Forest Plan. *Conservation Biology* 20: 319-329.

Reeves, G.H, P.A. Bisson, B.E. Reiman, and L.E. Benda. 2006b. Postfire logging in riparian areas. *Conservation Biology* 20:994-1004.

Reeves, G.H., B.R. Pickard, and K.N. Johnson. 2013. Alternative Riparian Buffer Strategies for Matrix Lands of BLM Western Oregon Forests that Maintain Aquatic Ecosystem Values. REVIEW DRAFT. January 23, 2013.

Reid, L.M., N.J. Dewey, T.E. Lisle, and S. Hilton. 2010. The incidence and role of gullies after logging in a coastal redwood forest. *Geomorphology* 117: 155-169. [online] http://naldc.nal.usda.gov/download/40745/PDF

Reid, L.M. and S. Hilton. 1998. Buffering the buffer. In: Proceedings of the Conference on Coastal Watersheds: The Caspar Creek Story. U.S.D.A. Forest Service, Pacific Southwest Forest and Range Experiment Station, Redwood Sciences Lab, Arcata, CA. http://www.fs.fed.us/psw/publications/documents/gtr-168/08reid.pdf

Rhodes, J.J. and W.L. Baker. 2008. Fire probability, fuel treatment effectiveness and ecological trade-offs in western U.S. public forests. *The Open Forest Science Journal* 1:1-7.

Rhodes, J.J., D.A. McCullough, and F.A. Espinosa. 1994. A coarse screening process for evaluation of the effects of land management activities on salmon spawning and rearing habitat in ESA consultations. Columbia River Inter-Tribal Fish Commission, Technical Report 94-4. Portland, OR. 245pp.

Roni, P., K. Hanson, and T. Beechie, 2008. Global review of the physical and biological effectiveness of stream habitat rehabilitation techniques. *North American Journal of Fisheries Management*, 28(3):856-890.

Roth, N.E., J.D. Allan, and D.L. Erickson. 1996. Landscape influences on stream biotic integrity assessed at multiple spatial scales. *Landscape Ecology* 11:141–156.

Sály, P., P. Takács, I. Kiss, P. Bíró and T. Erós. 2011. The relative influence of spatial context and catchment- and site-scale environmental factors on stream fish assemblages in a human-modified landscape. *Ecology of Freshwater Fish* 20: 251–262.

Seavy, N.E., T. Gardali, G.H. Golet, F.T. Griggs, C.A. Howell, R. Kelsey, S.L. Small, J.H. Viers, J. F. Weigand. 2009. Why climate change makes riparian restoration more important than ever: recommendations for practice and research. *Ecological Restoration* 27(3): 330-338. http://er.uwpress.org/content/27/3/330.full.pdf+html

Sedell, J.R., P.A. Bisson, , F.J. Swanson, , and S.V. Gregory, (1988).What we know about large trees that fall into streams and rivers. Pp. 83-112 In *From the forest to the sea, a story of fallen trees*, Maser, C., Tarrant, R.F., Trappe, J.M., and Franklin, J.F., tech eds. USDA Forest Service General Technical Report GTR-PNW-229, Pacific Northwest Res. Sta., Portland, OR. http://andrewsforest.oregonstate.edu/pubs/pdf/pub871.pdf

Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An ecosystem approach to salmonid conservation. Funded jointly by the U.S. EPA, U.S. Fish and Wildlife Service and National Marine Fisheries Service. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR.

Spies, T., M. Pollock, G. Reeves, and T. Beechie. 2013. Effects of riparian thinning on wood recruitment: A scientific synthesis. Science Review Team, Wood Recruitment Subgroup, Forestry Sciences Laboratory, Corvallis, OR, and Northwest Fisheries Science Center, Seattle, WA. 28 January 2013. 46pp. http://www.mediate.com/DSConsulting/docs/FINAL%20wood%20recruitment%20document.pdf

Steel, E.A., R.M. Hughes, A.H. Fullerton, S. Schmutz, J.A. Young, M. Fukushima, S. Muhar, M. Poppe, B.E. Feist, and C. Trautwein. 2010. Are we meeting the challenges of landscape-scale riverine research? A review. *Living Reviews in Landscape Research* 4(2010):1. http://www.livingreviews.org/lrlr-2010-1.

Stout, H.A., P.W. Lawson, D.L. Bottom, T.D. Cooney, M.J. Ford, C.E. Jordan, R.G. Kope, L.M. Kruzic, G.R. Pess, G.H. Reeves, M.D. Scheuerell, T.C. Wainwright, R.S. Waples, E. Ward, L.A. Weitkamp, J.G. Williams, and T.H. Williams. 2012. Scientific conclusions of the status review for Oregon coast coho salmon (*Oncorhynchus kisutch*). U.S. Dept. Commerce, NOAA Tech. Memo.NMFS-NWFSC-118, 242 p.

Sweeney, B.W. and J.D. Newbold, 2014. Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review. *Journal of the American Water Resources Association* (JAWRA):560-584.

Thompson, W.L. and D.C. Lee. 2000. Modeling relationships between landscape-level attributes and snorkel counts of chinook salmon and steelhead parr in Idaho. *Canadian Journal of Fisheries and Aquatic Sciences* 57:1834–1842. doi:10.1139/cjfas-57-9-1834

Torgersen, C.E., Price, D.M., Li, H.W., and McIntosh, B.A. 1999. Multiscale thermal refugia and stream habitat associations of chinook salmon in northeastern Oregon. *Ecological Applications*, 9(1):301-319.

Torgersen, C.E., J.L. Ebersole, and D.M. Keenan. 2012. Primer for Identifying Cold-Water Refuges to Protect and Restore Thermal Diversity in Riverine Landscapes. EPA 910-C-12-001, U.S. Environmental Protection Agency, Seattle, Washington. p. 91.

Trombulak, S.C. and C.A. Frissell. 2000. Review of ecological effects of roads on terrestrial and aquatic communities. *Conservation Biology* 14:18-30.

USDA/USDI 1994. ROD (Northwest Forest Plan Record of Decision). FSEIS and ROD for the Amendment of Planning Documents and Management of Habitat for Late-Successional Old-growth Forest Related Species within the Range of the Northern Spotted Owl. Portland, OR. http://www.blm.gov/or/plans/NFPnepa/FSEIS-1994/NFPTitl.htm

USDA Forest Service Pacific Northwest Region. 2008. Aquatic and Riparian Conservation Strategy (ARCS), August 13, 2008. 31 pp.

USFWS (USDI Fish and Wildlife Service). 1999. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Bull Trout in the Conterminous United States. Final Rule. Federal Register 64:58909-58933.

Walters, C. 1997. Challenges in adaptive management of riparian and coastal ecosystems. *Conservation Ecology* 1(2):1. [online] http://www.consecol.org/vol1/iss2/art1/

Wang, L.Z., J. Lyons, P. Rasmussen, P. Seelbach, T. Simon, M. Wiley, P. Kanehl, E. Baker, S. Niemela, and P.M. Stewart. 2003. Watershed, reach, and riparian influences on stream fish assemblages in the Northern Lakes and Forest Ecoregion, USA. Canadian Journal of Fisheries and Aquatic Sciences 60: 491–505.

Wang, L., P.W. Seelbach, and J. Lyons. 2006. Effects of levels of human disturbance on the influence of catchment, riparian, and reach-scale factors on fish assemblages. Pages 199–219 In R.M. Hughes, L. Wang, and P.W. Seelbach, editors. Landscape influences on stream habitats and biological assemblages. American Fisheries Society Symposium 48, Bethesda, Maryland.

WDNR (Washington Department of Natural Resources). 2005. Forest Practices Habitat Conservation Plan. Olympia, WA. http://www.dnr.wa.gov/businesspermits/topics/forestpracticeshcp/pages/fp_hcp.aspx

Wemple, B.C. and J.A. Jones. 2003. Runoff production on forest roads in a steep, mountain catchment. *Water Resources Research* 39(8):1220, doi:10.1029/2002WR001744.

Wenger, S. 1999. A review of the scientific literature on riparian buffer width, extent, and vegetation. Office of Public Service and Outreach, Institute of Ecology, University of Georgia, Athens, Georgia, USA. http://www.cc.utexas.edu/law/centers/cppdr/services/Improving%20Streams%20web/Work%20Groups/Public%20Lands/Wegner_1999_Review_of_buffer_width.pdf

Westerling, A.L., H.G. Hidalgo, , D.R. Cayan, , and T.W. Swetnam, 2006. Warming and earlier spring increase western US forest wildfire activity. *Science*, 313(5789):940-943.

Wickham, J.D., T.G. Wade, and K.H. Ritters. 2008. Detecting temporal change in watershed nutrient yields. *Environmental Management* 42:3223-231.

Wigington, P.J., J.L. Ebersole, M.E. Colvin, S.G. Leibowitz, B. Miller, B. Hansen, H. Lavigne, D. White, J.P. Baker, M.R. Church, J.R. Brooks, M.A. Cairns, and J.E. Compton. 2006. Coho salmon dependence on intermittent streams. *Frontiers in Ecology and the Environment* 4(10):514-519.

Wissmar, R.C. 1993. Long-term monitoring in stream ecosystems. *Environmental Monitoring and Assessment* 26: 219-234.

Wissmar, R.C. and R. Beschta. 1998. Restoration and the management of riparian ecosystems. *Freshwater Biology* 40(3): 571-585.

Wondzell, S.M. 2011. The role of the hyporheic zone across stream networks. *Hydrologic Processes* 25(22):3525-2532. DOI: 10.1002/hyp.8119

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Thursday, August 20, 2015 8:40 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: Draft RMP/EIS for Western Oregon

---------- Forwarded message ----------
From: **Jack Caufield** [redacted]
Date: Wed, Aug 19, 2015 at 8:44 PM
Subject: Draft RMP/EIS for Western Oregon
To: blm_or_rmpwo_comments@blm.gov

Thank you for the opportunity to comment on the Draft RMP/EIS.

We have reviewed the draft document and find several areas deficient. While we would normally refer to specific areas of the RMP/EIS in our comments, we find that isn't possible. See the following comments:

1. The document ignores the needs of those with disabilities and senior citizens. Data is available for 2012 for instate population numbers of those 65 and over, no estimate is made of those with disabilities. We found no estimates of the number of visitors to Oregon from out of state many of whom are senior citizens and/or have disabilities. We need the maximum number of OHV roads for motorized use.

2. While we did find a few Tables with Rockhounding listed, we found that it was not addressed in the analysis. Many out of state visitors arrive in the dry season to rockhound and attend the many Gem and Mineral Shows in Oregon each year. Many of these shows include rockhounding trips for large groups. Alternate B drastically reduces the number of possible rockhounding sites. They're found all over Western Oregon, not just near the large population centers. We also use the OHV roads to access our collection sites. We also use the OHV roads for sight seeing.

3. The data used in the alternatives is very confusing for OHV. Only miles of road should be evaluated not acres. Even if alternate B is chosen, the number of OHV miles needs to be increased.

4.Table 3-126 What is the basis for these numbers? Do they include out of state visitors? All socioeconomic data needs to include visitors, not just the 12 larger population areas.

5. Table 3-127 is based on only 2,265 responses from 12 larger communities in the RMP area. This doesn't represent the population using the BLM areas. Many of these BLM areas get high out of state visitor usage. This table should be eliminated or a better source of data used.

6. We are a good example. We come to Charleston to clam and crab each year while also rockhounding. We go elsewhere in Oregon to go rockhounding other times of the year along with many friends. We both are senior citizens and disabled and can't walk long distances. We spend a considerable amount of money each year in Oregon.

7. While we understand the importance of timberland in the RMP and support it. Recreation is done by the public and that whole section needs to be rewritten and enlarged with more detail, so we can understand what each alternative does. We know that you can use measures from the other alternatives then the chosen one to improve the recreation opportunities. Please do it and include rockhounding. We also fish too.

Jack and Diane Caufield
[redacted]

[redacted]

Jasmine Benjamin

From: m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent: Thursday, August 20, 2015 8:23 AM
To: RMP-Comments@heg-inc.com
Subject: Fwd: public comment on Draft RMPWO
Attachments: Nelson comments to BLM on the Draft RMP 8-2015.docx

---------- Forwarded message ----------
From: **Kim Nelson** [redacted]
Date: Tue, Aug 18, 2015 at 3:45 PM
Subject: public comment on Draft RMPWO
To: blm_or_rmpwo_comments@blm.gov

Please find attached my comments on the Draft BLM RMPWO.

Thanks, Kim

18 August 2015

RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208
blm_or_rmpwo_comments@blm.gov
BLM_OR_RMPs_WesternOregon@blm.gov

RE: Comments on the Draft BLM Resource Management Plan for western Oregon

To Whom it May Concern:

Following are my comments on BLM's Draft Resource Management Plan for western Oregon.

I have been conducting research specific to the Marbled Murrelet (*Brachyramphus marmoratus*) along the Pacific Coast of North America since 1988. My research on murrelets has focused on their behavior, nest-site characteristics, breeding biology, inland habitat associations, and at-sea distribution. I have published more than 40 papers on the behavior, ecology, and at-sea and inland habitat associations of murrelets.

No single alternative in the Draft BLM Resource Management Plan includes all the conservation measures necessary to provide for the survival and recovery of the Marbled Murrelet. All of the alternatives increase logging to levels that do not consider the needs of the murrelet, let alone climate change and the need to protect special places for other wildlife and recreation.

Marbled Murrelet populations have declined over much of their range due primarily to current and historic loss and fragmentation of older-aged forest breeding habitat (McShane et al. 2004, Piatt et al. 2006, Lynch et al. 2009). Despite being listed as threatened in California, Oregon, and Washington in 1992 (USFWS 1992, 1997) and implementation of the Northwest Forest Plan (NWFP; USDA and USDI 1994), populations have continued to decline by 1.4-3.7% per year (Miller et al. 2012, Falxa and Raphael in press). While issues at sea, such as changes in prey populations, are likely also impacting murrelet populations, the primary reason for declines continues to be sustained low recruitment from the loss and fragmentation of quality nesting sites and increases in predation in nesting habitat (McShane et al. 2004, Lynch et al. 2009, USFWS 2012).

In order to provide for the survival and recovery of the murrelet, all current occupied sites on federal land need to be protected and the current NWFP maintained (McShane et al. 2004, USFWS 2012). I urge the BLM to consider the science on this species (which seems to have been ignored) and go back to the drawing board to develop a plan that builds on the current LSR reserve design. Given population declines with the current protections, it is obvious that additional protections, not fewer, are warranted to reverse this trend. This species is not likely to make it through the proposed significant decreases in the amount and distribution of nesting

habitat. Increasing the amount of murrelet nesting habitat in the long-term will not mitigate for significant short-term loses. As stated in the 5-year review of the species, the population is not likely to make it through the bottleneck of the next 50 years without significant short and long-term increases in the amount and distribution of suitable nesting habitat (McShane et al. 2004).

In addition, corrections need to be made throughout the document including:

(1) Any mention of population increases in Oregon. The murrelet population is not increasing, in fact the latest documents (Falxa and Raphael in press) state that the Oregon population currently has no significant trend. If the 2014 data were added to the analysis, the population would show a downward trend. Indications are that the 2015 data demonstrate continued declines.
(2) Murrelet surveys. If murrelet surveys are not going to be conducted in suitable habitat, then suitable habitat needs to be considered as occupied and the appropriate take analysis performed. This includes all short-term loses. Long-term gains do not immediately mitigate for short-term loses.
(3) All murrelet habitat within 55 miles (88 km) of the coast is important to murrelets. Limiting distance inland for surveys or protecting habitat is arbitrary except in the Siskiyou Mountains of SW Oregon based on intensive, published surveys (Dillingham et al. 1995). Any other truncating of the murrelets range would need to be based on intensive, scientifically reviewed surveys.

I appreciate the opportunity to comment.
Sincerely,

S. Kim Nelson
Corvallis, OR

Literature Cited

Dillingham, C.P., R.C. Miller and L.O. Webb. 1995. Marbled Murrelet distribution in the Siskiyou National Forest of southwestern Oregon. Northwestern Naturalist 76:33-39.

Falxa, G.A. and M.G. Raphael, technical editors. In press. Northwest Forest Plan—The first 20 years (1994-2013): status and trend of Marbled Murrelet populations and nesting habitat. Gen. Tech. Rep. PNW-GTR-XXX. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. xx p.

Lynch, D., L. Roberts, G. Falxa, R. Brown, B. Tuerler, and J. D'Elia. 2009. Evaluation report for the 5-year status review of the Marbled Murrelet in Washington, Oregon, and California. Unpublished report. Lacey, WA: U.S. Fish and Wildlife Service, Region 1.

McShane, C., T. Hamer, H. Carter, G. Swartzman, V. Friesen, D. Ainley, R. Tressler, K. Nelson, A. Burger, L. Spear, T. Mohagen, R. Martin, L. Henkel, K. Prindle, C. Strong, and J. Keany. 2004. Evaluation report for the 5-year status review for the Marbled Murelet in

Washington, Oregon, and California. Prepared by EDAW Inc., Seattle, Washington for the U.S. Fish and Wildlife Service.

Miller, S.L., M.G. Raphael, G.A. Falxa, C. Strong, J. Baldwin, T. Bloxton, B.M. Galleher, M. Lance, D. Lynch, S.F. Pearson, C.J. Ralph, and R.D. Young. 2012. Recent population decline of the marbled murrelet in the Pacific Northwest. Condor 114: 771-781.

Piatt, J.F., K.J. Kuletz, A.E. Burger, S.A. Hatch, V.L. Friesen, T.P. Birt, M.L. Arimitsu, G.S. Drew, A.M.A. Harding, and K.S. Bixler. 2006. Status Review of the Marbled Murrelet (*Brachyramphus marmoratus*) in Alaska and British Columbia. U.S. Geological Survey, Open-File Report 2006-1387: 630pp.

U.S. Department of Agriculture, Forest Service and U.S. Department of Interior, Bureau of Land Management. 1994. Record of decision for amendments to Forest Service and Bureau of Land Management planning documents within the range of the Northern Spotted Owl. 74pp.

U.S. Fish and Wildlife Service. 1992. Endangered and threatened wildlife and plants: determination of threatened status for the Washington, Oregon, and California population of the Marbled Murrelet. Federal Register 57: 45328-45337.

U.S. Fish and Wildlife Service (USFWS). 1997. Recovery plan for the threatened Marbled Murrelet (*Brachyramphus marmoratus*) in Washington, Oregon, and California. U.S. Fish and Wildlife Service, Portland, Oregon. 286pp.

U.S. Fish and Wildlife Service. 2012. Report on Marbled Murrelet Recovery Implementation Team Meeting and Stakeholder Workshop, Recovery Implementation Team, Lacy, WA: Washington Field Office: **http://www.fws.gov/wafwo/pdf/FinalReporMarbledMurrelerRITandStakeholderWorkshop.pdf**

Jasmine Benjamin

From:	m1allen@blm.gov on behalf of RMPWO_Comments, BLM_OR <blm_or_rmpwo_comments@blm.gov>
Sent:	Thursday, August 20, 2015 1:51 PM
To:	RMP-Comments@heg-inc.com
Subject:	Fwd: Comments on Draft Resource Management Plan for Western Oregon
Attachments:	RMP Coalition Comments Final.pdf; SUTA-Hope-comments2015_08_13onBLMRMP.pdf

---------- Forwarded message ----------
From: **Wayne Slawson** [redacted]
Date: Thu, Aug 20, 2015 at 12:25 PM
Subject: Comments on Draft Resource Management Plan for Western Oregon
To: blm_or_rmpwo_comments@blm.gov

[redacted]

Jerome E. Perez, State Director
Washington/Oregon
Bureau of Land Management
P.O. Box 2965
Portland OR 97208
(sent by e-mail to <blm_or_rmpwo_comments@blm.gov>)

Dear Director Perez:

This letter is in response to the BLM's "Draft Resource Management Plans for Western Oregon (DRMP).

As a federal agency, the BLM's clear duty is to act in support of long-term benefits for all Americans and, in the present case, residents of, and visitors to, Western Oregon. The BLM should resist calls from cash-strapped counties in western Oregon for accelerated harvesting of timber in BLM lands in order to pay for regular services that other counties pay for through taxation. Rather it should uphold the on-going development of best practices in timber harvesting and provide for recreation, healthy forests, and, in general, protection of the wild country of western Oregon for for the benefit and enjoyment of our generation and those to come. This the Northwest Forest Plan (NWFP) of 1994/95 has done---not perfectly, but remarkably well---for about two decades. The NWFP has been attacked, unsuccessfully, by prior RMPs from the BLM; the 2015 DRMP represents an unbalanced, confusingly organized, needlessly lengthy effort that is still another such attack. As written, it, too, will be unsuccessful.

I strongly endorse two extended analyses of the 2015 DRMP---one drafted by Joseph Vaile and others at the Klamath Siskiyou Wildlands Center and supported by a long list of individuals and organizations (KSWild), and a second by

Hope Robertson of the Siskiyou Uplands Trails Association (SUTA). The two analyses (attached) mount devastating challenges to 2015 DRMP. They lay out--in extended detail--the weaknesses in 2015 DRMP. They suggest that a new DRMP be devised that is in the form of revisions of the 1994/95 NWFP. The new DRMP should focus on long-term preservation of the forests, controlled harvesting of timber, development of a wide range of recreational activities, protection of riparian lands (actually reduced in 2015 DRMP), and other measures. The necessary revisions of the 2015 DRMP should start by meeting in detail the criticisms of KSWild and SUTA.

For example:

As pointed out in the KSWild critique, ``clear cutting"--proposed in each alternative of the 2015 DRMP (including, in somewhat disguised form, the favored Alternative B)--is incompatible with the concept of "regeneration". Among the many problems presented by the "Harvest Land Base" procedures in 2015 DRMP, is the likelyhood that recovery in such areas will yield a population of equal-aged trees that are particularly susceptible to fire.

Among the revisions proposed in the SUTA critique, I particularly favor interim treatment of ``Areas of Critical Enviromental Concern" and ``Lands with Wilderness Characteristics" as if they were already wilderness. Otherwise they will inevitably deteriorate over the years in ways that will undermine their wild characteristics.

As emphasized in the SUTA critique, recreation should be the highest priority of BLM management. Special attention should be paid to the tension between non-motorized recreation and recreation involving motorized vehicles. An important step in this direction would be designation of all trails for non-motorized travel as Special Recreation Management Areas.

The SUTA critique includes a call for the BLM to enforce present regulations regarding off-highway vehicle (OHV) use, the use of firearms, etc.
As important are SUTA suggestions for the development of separate trail systems for non-motorized and OHV recreation. Providing rich, appropriate, well-administered recreational opportunities could well have as a byproduct a sustainable level of timber harvest (see for example the Little Applegate description, below.)

The form of the 2015 DRMP itself militates against wide-spread public input. Readers from the general public will be discouraged by the sheer size of the document, whereas businesses that may be affected by the DRMP can deduct, as business expenses, the cost of hiring experts to read and evaluate the proposal from that business's point of view. Confusing, also, is the DRMP's division into multiple "Alternatives". Are concerned citizens to separately discuss each Alternative? Just how are comments on the various alternatives to be dealt with? These issues could be addressed if the DRMP included an indication of how comments on the "Alternatives" are to be treated by the BLM. Some hints in the DRMP suggest that provisions from multiple "Alternatives" could be adopted. How are readers (and the BLM, for that matter) to evaluate combinations of provisions from multiple "Alternatives"? The general effect

of these complications seriously undermines attempts by the public to respond to the DRMP.

I've been influenced by an experience during an outing some distance up the south-facing side of the Little Applegate valley. A retired BLM employee pointed out a forest across the valley (on the north-facing slope) and told me that it had been lumbered quite recently. But there were no visible signs of that lumbering operation! The Little Applegate Valley, with all its beauty and support for recreation, provided a timber harvest and, in the process, left an environment ideal for hikers, bicycle riders, equestrians, and other recreational uses. A somewhat more expensive harvesting method resulted in saving an area that would otherwise be a fifty-year eyesore like the one (on private land, I believe) toward the top of our own Yank Gulch Road in Talent. The clearcut there is readily visible from the Bear Creek valley and I-5. The Little Applegate case should be a model for all timber harvesting in Western Oregon.

Yours sincerely,

Wayne Slawson

[redacted]

July 12, 2015/August 20, 2015

RMPs for Western Oregon
Bureau of Land Management
P.O. Box 2965
Portland, Oregon 97208

(also delivered electronically to: BLM OR RMPs WesternOregon@blm.gov)

RE: Draft Resource Management Plan/Environmental Impact Statement – Western Oregon (hereinafter DRAFT)

Summary

This reviewer appreciates the time and energy of BLM in presenting to the public BLM's proposals for managing public resources over the next decade. The numerous citations, references and analysis give the public an opportunity to have direct involvement in the management of their resources.

The four volumes, comprising over 1600 pages (including separately numbered indexes, appendices and glossaries) contain a great deal of information. The presentation of that information, however, lacks a cohesiveness that would allow the public to fully understand what will happen on public lands over the next ten years. Numerous references to limits by the "scope of analysis" and deference to future actions (e.g., TMP), limit this document to an overview lacking the specifics necessary for a truly informed public.

None of the alternatives presented are acceptable as written. While some components of the alternatives may form the basis for a truly transparent and workable plan, the aforementioned limits must be addressed before an acceptable alternative may be developed.

This reviewer is disappointed that BLM continues to limit public access to information about the management of public resources. Citizens with significant expertise will comment on this plan, myself included, but the information in this DRAFT will remain obscure to the majority of the public. The bottom line is that BLM has failed to deliver a clear and understandable document for public review.

These comments, however, are intended to provide direction to BLM in revising the DRAFT and to address some of the aforementioned issues. This reviewer's knowledge base is considerably higher for Southwest Oregon and the Medford District BLM than for other O&C lands, so much of the foreseeable impacts of BLM's plans are primarily based on that knowledge.

Table of Contents

Summary 1
Introduction 2
Purpose and Need 3
Issues by Subject Matter 5
Response to Scoping Comments 16
Conclusions 19
Substantive Comments 19
Qualifications 19
Contact Information 20

Introduction

The Planning Process steps include "3. Analyze management situation" but BLM has failed to present a clear picture of the current state of public lands for public review.

"Guidance for Development of All Action Alternatives" contains a bullet point which says, "Designate areas as open, limited, or closed to off-highway vehicle use in accordance with 43 CFR 8342.1. Develop a range of travel management area scenarios in relationship to various land use allocations and management objectives among the alternatives. Defer implementation level travel and transportation management planning until after completion of the RMP revision process. For those areas designated as limited in the RMP, define interim management objectives and clearly identify the process leading from the interim area designation of 'limited to existing roads, primitive roads and trails' to the development of a designated network of roads, primitive roads and trails, consistent with BLM Handbook 8342 – Travel and Transportation Handbook (USDI BLM 2012c)." (Underline emphasis by reviewer.)

As an active participant in the RMP process, this reviewer attended several BLM workshops. A clear definition of what is meant by "limited to existing roads and trails" was not available. Specialists and Managers both referred to a future Travel Management Plan (TMP) and this DRAFT sets a timeline of five years to complete a TMP. Thus this one statement makes every reference to a future TMP a de facto No Action Alternative. In the DRAFT BLM refers to significant public interest in Off Highway Vehicles (OHVs) and there are thousands of comments to BLM over the past fifteen years documenting increasing conflicts between area residents and OHVs. BLM has done little to nothing to resolve these conflicts and has promoted OHV activity at the expense of local residents. The status quo is therefore completely unacceptable and BLM should address the problems more deliberately in their planning document.

Purpose and Need

"The purpose of this proposed action is to make land use plan decisions to guide the management of BLM administered lands." This DRAFT goes far beyond making land use decisions, setting management protocols for the next decade, many of them specious in nature and unclear to the public. If BLM were presenting only a plan for land use decisions, it would be unlikely to run to 1600 pages.

A footnote (p4) states: 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.' These terms are not synonymous in silviculture nor by any dictionary definition and certainly not as commonly understood by the public.

"Annual productive capacity" of land is the entirety of productive results, including non-merchantable species, water impacts, wildlife capacity, woody biomass as separate from timber sales and other attributes contributing to the full production of the landscape over time. "Annual productive capacity" is science-based.

"Annual sustained yield capacity," within the context of the O&C Act, means that volume of merchantable timber that can be removed from the landscape without negatively impacting the ability of the forests to produce a similar capacity on an annual basis. Sustained yield capacity in this context does not apply to non-merchantable species and only includes other attributes as detailed in the O&C Act. As noted in the DRAFT, environmental considerations for set-asides and other uses will render the "sustained yield capacity" as considerably less than "annual productive capacity." "Annual sustained yield capacity" is science-based.

"Allowable sale quantity" may be based on sustained yield capacity but current forest conditions preclude this association since BLM lands are not now on a sustained yield basis. Allowable sale quantity must be calculated on the basis of complete forest management, including expenses for pre- and post-harvest management. (Note: The failure of federal agencies to properly perform silviculturally prescribed post-harvest management is a major contributing factor to current heavy fuel loads and fire danger.) Therefore allowable sale quantity will be below sustained yield capacity until such time as the landscape has recovered to a true sustained yield basis. "Allowable sale quantity" is economics-based.

Distinction between these terms is noted in the original O&C Act. BLM's use of the terms as synonymous creates confusion in the minds of the public and does a dis-service to the scientific expectations of a government agency.

If BLM plans "to deliver a predictable supply of timber" from lands under their management, a longer view is required. Ten year plans may set guidelines, but the full range of management history should aid BLM in dealing with the mis-steps of the past and restoring the landscape to its true purpose. To that end, BLM must recognize the distinction between the terms above and apply the appropriate principles to a full historical review.

Use of the Purpose and Need to re-define basic terms takes away from an otherwise valuable recitation of requirements for the plan. While the Need to develop realistic plans for our public lands is inarguable, the Purpose stated in this document is unfulfilled and provides no clear picture to the public. Laws are meant to provide guidance, but truly engaging the public requires more than just abiding by the law.

BLM cites compliance with a wide variety of laws, again compartmentalizing issues that should be integrated. Compliance with laws may or may not result in a truly balanced and sustainable forest management plan. An applied view is missing in this document.

Issues by subject matter

Air Quality

BLM admits that air quality will decrease under all action alternatives. The document is very detailed about air quality, the charts and maps and graphs of particulate matter. Though the RMP is a future-looking document, there no discussion of reducing impacts to air quality with emerging techniques, like biodigestion. The failure to present future options and an over-reliance on historical statistics will not lead this government agency to reduce impacts to air quality. The content is similarly lacking in the discussion of Climate Change.

Throughout the Affected Environment and Environmental Consequences BLM provides a worthy education in how these areas and impacts are measured for specific data. This chapter suffers from the same fragmented qualities as previously mentioned. The areas described are done so in isolation from other areas, often by type (e.g., forests) or species.

Lands with Wilderness Characteristics

Only Alternative A would protect these areas from non-compatible use, particularly OHV use. Table 3-91 shows the Wellington unit in the Medford District, an unroaded natural area (not harvested) only a few miles from this reviewer's home. Reductions under all alternatives would, in essence, eliminate the wilderness characteristics of this area and thus fails to provide the protection required under BLM's management directives.

Minerals

The reviewer is required to compare Tables 3-124 and 3-125 to determine actual sales of minerals to permits in the decision area, yet they are not a like comparison. Table 3-124 lumps mineral sales with permits while Table 3-125 shows mineral production. The reader is thus not informed as to the actual comparison.

The discussion of mineral entry is limited to areas withdrawn by designation, yet no discussion is presented of areas that might be withdrawn for other reasons.

Rare Plants and Fungi

Under Off-highway Vehicle Use BLM again admits limits to their ability to analyze impacts from OHV use and again uses the term limited to "existing or designated roads and trails," while failing to provide information for the public as to how that term is defined.

This analysis relies primarily on identified species without regard to those plants or flora that are unique but not listed. As in Visual Resources, BLM fails to recognize that many small, unique areas exist across the landscape and should be preserved for their rarity and scenic values.

Recreation and Visitor Services

It is good to note that BLM has recognized "changed circumstances and new information," particularly the conclusion that "changes are particularly indicated for….off-highway vehicle (sic)……" This reviewer has a forty-year history of contact with the off-highway vehicle situation in southern Oregon. Given the deference of a TMP for five years and an undefined limit to "existing roads and trails," this DRAFT fails to address the changes noted above.

BLM is again confusing the public in that pictures in Figure 3-135 fail to correspond to the descriptions in Table 3-125.

"The BLM conducted a recreation demand analysis throughout the planning area in 2013-2014." Despite being an engaged and active member of the public, particularly with regard to recreation issues, this reviewer was unaware of this research until this DRAFT. Table 3-127 shows a significantly higher response rate for "Riding OHVs" than any other form of recreation, seconded by "Mountain Biking." These results differ considerably from the data in both Table 3-126 and both the actual and projected use in Table 3-136. It can be concluded from this conflicting information that BLM's public outreach efforts were more focused on the OHV community

In discussing BLM lands being "intermingled" with private lands, only access is covered, while conflict issues (trespass, noise, etc.) are missing. At the core of minimizing conflicts in recreational areas, greater attention must be paid to the unique issues of private, residential land intermingled with BLM lands. Many of these lands have been used for residence since the late 1800's, thus having established precedence regarding neighboring public lands.

BLM's "extrapolating from available trail miles per acre under current conditions allows an approximation" for each alternative puts the entire analysis on a false foundation. Under current conditions there are miles of user-created trails that may or may not be appropriate in their current locations. The statement that "there are approximately 395 miles of trails on BLM administered lands in western Oregon" indicates that BLM does not recognize these trails. That conclusion, however, means BLM is ignorant of these user-created trails. It also indicates that increasing trail miles in alternatives that do so will incorporate these non-recognized user-created trails. Table 3-138 shows Medford District as having 278 miles of trails though there is no Record of Decision designating any of those that might be user-created.

Table 3-110 shows high to extremely high introduction of invasive species by OHVs in the Medford District. Since invasive species often reduce the overall viability of the landscape, introduction of OHV use fails to fulfill BLM's directive to manage public lands.

SocioEconomics

The Key Points focus on social capacity and resiliency relative to economics. Cultural impacts are not included in the analysis, making it incomplete.

Cultural Resources

Cultural Resources are based on archaeological sites and cultural artifacts and a United Nations definition of cultural meaning. Archaeology and artifacts should be separately addressed as unique, while cultural considerations are local as well as national. The DRAFT fails to give any analysis of local culture. In the Medford District the local culture is extremely diverse and value-based. This is an overall failure to take into account local cultural conditions and local residents.

Fire and Fuels

"The BLM-administered lands constitute only a small portion of the entire interior/south dry forest landscape." BLM lands comprise more than fifty percent of the lands in both Jackson and Josephine Counties. For the Medford District, this statement is false.

"Currently, many of the dry forest stands are overly dense." The following discussion focuses primarily on fire suppression, growth in wildfire size and intensity and projected fire regimes. Little discussion is provided for mechanical removal of density (e.g., fuel reduction, pre-harvest thinning, post-harvest thinning." Yet BLM says, "In the absence of natural fire as a disturbance agent, management activities, including prescribed fire and mechanical management of vegetation, can serve as a partial surrogate for natural disturbance, and promote and maintain desired structural and compositional changes." While BLM acknowledges "….less departure from reference conditions represents greater fire resiliency," the analysis describes changing conditions only in relation to timber harvest with no information provided on other approaches to restoring "reference conditions." Only in a brief discussion of wildfire in developed areas does BLM mention mitigation, but the analysis following focuses on incidents of human-caused fire in these areas. BLM later states, "All of the alternatives have similar management objectives and management direction regarding noncommercial natural hazardous fuel reduction treatments. Therefore, the BLM assumed in this analysis that similar types and amounts of treatments that have occurred over the past decade would continue in the future under any of the alternatives…" In essence this is a statement of no change from current policies, making it a "No Action Alternative" that omits any other alternative for this activity. Current policies have failed to restore BLM lands to a sustainable basis and therefore must be changed.

"A spatial delineation of both current and future forest vegetation structure using BLM structural stages cross-walked to seral stages and gradient nearest neighbor (GNN) imputation datasets derived from inventory field plots, environmental gradients and Landsat imagery (Ohmann and Gregory 2002) classified into seral stages (Haugo et al. 2015)." This statement fails, *prima facie*, to meet federal standards for the use of clear and unambiguous language.

Fisheries

Again, BLM bases analysis on current conditions without objectively analyzing whether or not current conditions are optimum to meet natural resource requirements.

The discussion of Riparian Reserve Width is primarily focused on woody debris and temperatures without accounting for wildlife, climate change or other factors. As a future-looking document, this document fails to present a rationale for maintaining current standards in the face of increasing drought cycles in the analysis area.

Forest Management

In discussing Conservation of Species the BLM distinguishes "Large, Contiguous Blocks of Late-Successional Forest" and "Older and More Structurally-Complex Multi-Layered Conifer Forests." While these are valuable assessments, they set the stage for managing for forest types without placing them in a landscape view. The ability of a plan to be flexible to local circumstances is constricted by this method of typing.

"Even-aged systems with clear-cutting would produce more uniform stands in a mix of age classes without structural legacies." This statement is oxymoronic in that "even-aged systems" cannot, by definition, produce "a mix of age classes."

Table 3-58 presents a clear picture of excessive (unsustainable) harvest during the three decades from 1960-1990. Table 3-55 shows the results of high harvest and failure to conduct adequate post-harvest management with little natural restocking. Age classes in Table 3-55 indicate a sustainable harvest age of 80-110 years, which would produce more open space forests, greater natural restocking and greater predictability in timber supply. These goals cannot be accomplished with clearcutting. All of the alternatives (Figure 3-61) show a decrease in this harvest base with the exception of Alternative C, which places the 80-110 year age class in reserves.

Table 3-56 presents percentages of land base subject to different classifications. Alternatives A, C and Sub-C indicate large percentages of the land base would be classified High Intensity management areas, which includes clearcutting. While there may be BLM lands within Oregon that are suitable for clearcutting, most of the BLM lands in the Medford District (excepting some lands in the Butte Falls Resource Area), are unsuitable for clearcutting for a variety of reasons. The steep slopes, thin soils, biodiversity and climate of the southern Oregon region are severely negatively impacted by clearcutting. Monocultures crated by current clearcutting post-harvest planting are highly susceptible to high intensity fire.

To illustrate:

This photo, taken at the 5-mile marker on Forest Creek Road, shows private, non-industrial land that was heavily logged in 2012 after being purchased by an investment partnership, industrial forestland owned by a Real Estate Investment Trust and clearcut in 2013, and BLM land, including Mount Isabelle, in the background. Reviewer's family trust land is at extreme center right in photo.

This 2013 photo shows the North face of Mount Isabelle, BLM land clearcut in 1986. Despite re-planting, nearly 30 years later the site is poorly re-stocked and prone to high-intensity fire. A smaller clearcut to the left of the highlighted area shows similar results.

Figure 3-63 makes the same communication error as in much of this analysis, suggesting that various forest types exist in distinct blocks and thus not delivering a matrix, landscape view. The Inventory of Merchantable Timber does nothing to inform the reader of the complexity of timber inventory nor how potential harvest methods would utilize that inventory and impact future inventory.

In discussing annual productive capacity (Issue 2, Forest Management), BLM again makes the error in footnote 47 that 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.' As noted above, these terms are not synonymous by definition and are based on different standards (i.e., science v. economics). The discussion that follows notes variability in the ASQ based on non-merchantable factors that are not a part of annual productive capacity.

Table 3-58 and Figure 3-73 show conflicting figures for standing timber volumes and harvest levels over time. If Figure 3-73 is accurate, then only the figures from 1999 and 2001 show harvest below inventory. Similarly, Table 3-64 shows harvest levels that exceed the inventory figures presented in Table 3-58.

The discussion of harvest types and silvicultural methods (Issue 5) once again includes clearcutting, a practice that must be very limited in the O&C lands for reasons discussed above.

While Table 3-68 shows historical accomplishments for non-harvest silvicultural treatments, BLM admits "The 1995 RMPs estimated levels of silvicultural treatments that would occur because of implementation of the plan, but the BLM has generally not achieved these levels of treatments." The succeeding analysis is thus based on statistics reflecting a failure to fulfill management requirements.

In presenting the impacts of timber harvest by alternative, the DRAFT suggests various methods of reforestation under regeneration (i.e., clearcut) harvest, referencing "standard practices." See the illustrations above as to the effectiveness of "standard practices." Again, the document refers to the Harvest Land Base as a whole and fails to differentiate to accommodate the complexity of various landscapes.

Restrictions to Timber Harvest highlights the weakness of the analysis by repeated citing of "potential" impacts that would change the ASQ.

The overall emphasis on timber harvest within the analysis of Forest Management fails to give the reader a clear view of overall impacts across the landscape. This RMP was

prepared for the entirety of O&C lands in Western Oregon, yet a truly informative presentation would be better served by presenting RMPs for each District.

Hydrology

Having been caretaker of the headwaters of a mountain creek for forty years, this reviewer found the discussion of Hydrology as lacking in scope and the type descriptions never presented an integrated view of water management across our public lands. A future-looking document that does not consider all sources of water makes the DRAFT again a failure. According to a United Nations report our government should be doing everything possible to protect every drop of public water.

"The United Nations reports that we have 15 years to avert a full-blown water crisis and that, by 2030, demand for water will outstrip supply by 40 percent. Five hundred renowned scientists brought together by UN Secretary-General Ban Ki-moon said that our collective abuse of water has caused the earth to enter a "new geologic age," a "planetary transformation" akin to the retreat of the glaciers more than 11,000 years ago. Already, they reported, a majority of the world's population lives within a 30-mile radius of water sources that are badly stressed or running out."

The discussion of Source Water Protection relies solely on BLM lands and fails to take a landscape view that would include consideration of private lands with Source Water.

BLM's analysis and proposed Alternatives presents fixed-width figures for riparian retention, eliminating the more site-specific site tree distances now used. The use of fixed-width figures eliminates the possibility of considering unique characteristics in any harvest unit and restricts the ability to best manage streams.

The discussion of slope stability and road impacts leads this reviewer to conclude that, lacking a Transportation Management Plan, the analysis assumptions are hypothetical at best.

Scenic Amenities

BLM recognizes "Scenic amenities are important to….those who live or work near BLM-administered lands" but concludes this section by considering only increased property values. No analysis of other values is presented.

Cultural Meaning

Limiting the aforementioned amenities to economic value is in conflict with 'The Millennium Ecosystem Assessment defines cultural services as including "nonmaterial benefits people obtain through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" (Sarukán and White 2005).' These values are not applied to Scenic Amenities though BLM admits "it is not possible to characterize all aspects of cultural meaning in the monetary language of economics." The DRAFT again shows the limits of its analysis in value by stating "Cultural meaning is perhaps more valuable from an economic perspective than other resources because the resources that have cultural importance are irreplaceable." Non-economic values from "spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences" are equally irreplaceable.

Contributions by BLM to Local Economies

A great deal of background information and extrapolated analysis shows the failure of making "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" synonymous. The first dictate of the O&C Act is to manage public lands sustainably for a predictable and stable supply of resources. Only in the second section of the Act is distribution of funds addressed. Much of this analysis assumes that managing resources for money takes precedence, subordinating and failing to address the first mandate of the Act.

SocioEconomic Conclusions for Timber

"With respect to the BLM's impacts, the way the BLM manages timber is by far the number one issue of concern among the communities. The primary concern is economic. The community representatives share a common view that the BLM is party to a worldview that no longer allows for economic use of a (timber) resource that is abundant and renewable." In essence, people feel that BLM should be delivering more money into local coffers while providing more jobs. This was not the view of the 1950's, '60's, '70's or '80's. The yield from BLM lands was rich during those decades and people understandably expected it to remain the same. New information about the total value(s) of forest resources and a failure to maintain sustainability contribute significantly to BLM's inability to meet community expectations. The community views are unlikely to change in the short term and will only change in the near future if BLM clearly explains how they intend to return to economic stability so that the long-term community view of BLM management can again be positive.

Soil Resources

"Until the BLM completes route designations through implementation level planning, the BLM cannot identify which routes would be designated in any alternative." "In this analysis, the BLM assumed that OHV users would operate vehicles consistent with BLM decisions about OHV use." This analysis fails by referencing future action and making an assumption not supported by current realities. Since the impacts to soil from OHV use are well-documented, this DRAFT fails to incorporate appropriate analysis for this topic.

Sustainable Energy

This analysis looks only at biomass as fuel and wind sites for energy generation. Geothermal development is mentioned as having potential but is not fully addressed. Once again the document fails to be future-looking. Failure to consider new and emerging technology shows BLM is not planning for a future of alternative energies (e.g., biodigestion, energy storage), a requisite to address climate change. A singular focus on biomass and leasing sites shows BLM has considered only one form of sustainable energy.

Trails and Travel Management

"The BLM currently has designated a network of trails and travel management areas within the planning area to address particular concerns…" This is not true in the Medford District. Medford Resource Area Manager John Gerritsma, in response to a question from this reviewer, publicly stated that there are "no designated OHV trails" in the Medford District, despite a two-decade history of conflict concerning OHV use.

All of the alternatives state lands "would be limited to existing OHV use until the BLM completed implementation level travel planning." Thus the entire analysis of Trails and Travel Management with regard to OHV use is a de facto No Action Alternative. This is unacceptable to the public who continue to face conflicts with OHVs and is a failure of the document to present analysis required by NEPA that "a range of alternatives" should be presented.

"…recreational OHV use occurs within the existing Timber Mountain OHV area." This is a false statement. No "Timber Mountain OHV" area exists because analysis of the area has not been completed nor a Record of Decision issued. Medford District BLM

continues to promote the area illegally and uses Categorical Exclusions to formalize many trails and staging areas within the proposed area. The only "designation" of a "Timber Mountain OHV area" is 41 characters in the 1995 RMP describing areas "to be managed" for OHV use. No written description was provided in that RMP nor were there any maps showing the 16,880 acres thus "designated." The public never saw a map of the area until 2006 and that map has since changed numerous times. Saying this is an "existing" area is a false statement and renders all discussion therefrom as inaccurate.

The "average road ratios" are unbelievable and biased toward "regeneration harvest" (clearcuts). These unattributed ratios would suggest significant differences in management practices for different types of harvest. If management practices are consistent across the landscape, such differences should not exist.

BLM has, in the past two decades, made permanent many of their forest roads and also some of their harvest roads. Some forest roads contribute to driving for pleasure on public lands while some are blocked by gates. Harvest roads, however, should be temporary in nature and will take from the growing stock if made permanent or not re-planted. The standard in the 1950's and when this reviewer studied forestry in the 1970's was to "rip and re-plant" harvest roads that would provide additional harvest when re-opened. Harvest roads should be designed to both produce timber and be the best choice for future management practices.

Tribal Interests

Treaties made with tribes by the U.S. Government make them independent nations. As landholders within their nations, we must abide by their laws.

Visual Resources Management

The BLM provides no criteria for how Visual Resource Inventory classes are determined. For Visual Resource Management, BLM provides descriptions lacking in detail and emphasizing what activities can take place in these areas. No consideration is given to those visual resources which may exist in small plots (e.g., groves) and/or isolated natural scenic attributes (e.g., waterfall, exceptional trees, shrubs or flowers).

Wildlife

Separating this discussion by species fails to present a unified picture. The Middle Applegate region is the last mid-elevation wildlife corridor in the Medford District, yet little discussion of migratory corridors is contained in this analysis. What discussion does occur is limited to the analysis for a single species and a range of impacts with little discussion of the value of the species to the overall ecosystem or efforts to encourage desired species.

Response to Scoping Comments

This reviewer submitted Scoping Comments for this RMP on July 5, 2012. These comments were accepted without challenge by BLM and must therefore be addressed or an explanation provided as to why they were not addressed in the DRAFT. This DRAFT fails to do so in the following particulars:

"BLM's new RMP should reflect the flexibility to manage for site-specific conditions." This DRAFT categorizes public land into distinct classifications without allowing the flexibility requested.

"Small sales to local loggers for more complete use of timber resources would provide a more stable economic benefit while increasing forest health." While the DRAFT provides information on harvest prescriptions, it is silent on small-scale harvest methods.

"BLM's RMP revisions should contain a clear definition of, and planning for, true sustainability." This DRAFT fails to define inventory appropriately to address the differences between "nondeclining even flow" and "total fiber content." While the draft does provide figures and tables for harvest volume, the information is confused by BLM presumption that 'The terms "annual productive capacity," "annual sustained yield capacity," and "allowable sale quantity" are synonymous.'

"BLM must make every effort to coordinate their forestry management plans with neighboring landowners." Reference to activities on neighboring lands in this DRAFT are speculative and do not represent "coordination."

"Maintaining a truly viable landscape across southern Oregon cannot be achieved by creating different types of forests, but by integrating natural biodiversity

across the district." The segmentation of forestry types in the DRAFT fails to provide an integrated view of BLM's management plans.

"Given the increasing values of water resources, BLM should also plan to identify and protect independent springs on their lands. Even small springs promise to become valuable sources of water in the future." The DRAFT discusses hydrology and riparian management based on streams and does not mention independent spring resources.

"Citizens want to know how much a government program will cost. BLM must therefore develop and analyze data showing the cost of implementing programs contained in their RMP, including potential litigation costs. BLM has, in the past, developed planning documents that agency personnel admit will be subject to litigation; such costs should be unacceptable to the agency and to all interested publics. An example of such cost analysis would be to consider the costs of law enforcement necessary to adequately manage recreational activities." Harvest income projections alone are insufficient to address this comment.

"The interests of society must be evaluated separately from purely economic issues." The DRAFT analysis addresses social impacts based on community resiliency in limited studies, but even that is primarily economic based.

"Data such as Values and Lifestyles (VALS) surveys and other social indicators should be developed and evaluated in BLM's planning process." As noted above, the socioeconomic analysis fails to include such data, nor is any reason presented for not doing so.

"Off-road machine recreation areas across the checkerboard pattern of O&C lands directly impact the neighbors of public lands. These impacts must be studied in any BLM planning effort." This DRAFT addresses "conflicts" primarily from the standpoint of other recreational activities. Executive Order 11644 and 43 CFR require "Areas and trails shall be located to minimize conflicts between off-road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands, and to ensure the compatibility of such uses with existing conditions in populated areas, taking into account noise and other factors." No analysis of noise and impacts on residential (i.e., populated) lands is included in this DRAFT. The deferral of a TMP for five years and the lack of a definition for "existing roads and trails" means that the documented impact of OHV noise and other issues impacting residential lands will continue unaddressed for half the life of this RMP.

"BLM listed 13 areas within the Medford District for off-road machine recreation emphasis, more than twice as many areas as any other district. Because these areas are located primarily in rural settings, the issue of environmental justice arises." BLM analyzes environmental justice solely from the standpoint of economics without analyzing the value of place. As noted above, the current situation presents an urgent need to conduct additional analysis and move quickly to restore equity to the issue.

"BLM's change from a resource management agency to a multiple-use agency has failed to accommodate societal changes in both information quantity and information delivery systems." This DRAFT fails to analyze public information systems, relying on a formulated list of cooperating agencies. Public workshops held for this DRAFT were the same as past efforts, with small table open Q&A, but no opportunity to publicly address the whole of the issue. If the public does not know the questions being asked, the agendas being pursued, the level of information delivered to the public is so isolated and fragmented as to make any chance of consensus impossible. BLM constantly creates very segmented information internally and presents it to the public with a strictly defined process for action. BLM fails to set up the big tent that includes and involves their full audience, the citizen-owners of the land BLM is charged with maintaining. Extremely large files limit electronic information to a small segment of society. The lack of a citizen review platform eliminates the critical inclusion of full discussion. BLM's public information record fails to be pro-active and fails to provide useful information, yet this was not addressed in the DRAFT.

"BLM's review and analysis for planning purposes should show integrated relationships between the various disciplines (e.g., wildlife, botany, timber management, et al) applied in developing a comprehensive planning document. Failure to show integrated relationships fails to provide the public with complete information necessary to commenting on any DRAFT plans." This is the most obvious failure of the DRAFT.

"BLM should therefore incorporate previous public comments on RMP processes, as applicable, to the current planning process." BLM refers to analysis done for previous RMPs, but does not acknowledge public input from those same RMPs.

"BLM, particularly in the Medford District, has an unfortunate history over the past few decades that reflects an inability to present planning and project proposals to the public in a complete, comprehensive and fully informative manner. " This DRAFT does not qualify as "complete, comprehensive and fully informative".

Conclusions

The only reasonable conclusion to this review is to find that BLM does not have a clear and cohesive plan for managing our public lands. This DRAFT fails to conform to the requirements of the O&C Act by failing to show how BLM will restore these lands to the truly sustainable basis that was lost during the 1960's into the 1990's. The DRAFT fails to show how BLM's management will lead to a stable and predictable supply of resources.

It is disappointing and frustrating that the well-paid public servants who put so many hours into this work have seen it come together in such an uncoordinated way. This reviewer has put in well over 100 hours reading the DRAFT and preparing comments. This DRAFT does a dis-service to both BLM employees and the public they serve.

Substantive Comments

BLM has a policy of not considering testimony it determines is not "substantive." The definition of "substantive" appears arbitrary and capricious and often fails to consider valid considerations from a social or integrated perspective. These Comments to the DRAFT are considered by this reviewer to be substantive in their entirety and in each individual part and any determination by BLM to the contrary must be explained to me in writing. (40 CFR)

[redacted]

'

Contact Information

John Francis (cka Jack) Duggan
[redacted]

Respectfully submitted,

John F. (cka Jack) Duggan

Copies

Secretary of the Interior Sally Jewell
Senator Jeff Merkley
Senator Ron Wyden
Rep. Peter DeFazio
Rep. Greg Walden

Additional copies of these comments have been circulated to a private list held by the reviewer.