

Data Submitted (UTC 11): 7/5/2016 7:00:00 AM

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Comments: Draft Colville National Forest Plan and Draft EIS comments.

Attached are comments. Please acknowledge receipt.

July 5, 2016

Colville National Forest Plan Revision Team

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To the Forest Supervisor, Revision Team, and Whomever it May Concern:

This letter is comments on the Draft Colville National Forest Proposed Revised Land and Resource Management Plan (hereinafter "Draft Forest Plan" or "DFP"), and the accompanying Draft Programmatic Environmental Impact Statement (hereinafter "Draft EIS or DEIS"). Those documents have been prepared under the National Forest Management Act (NFMA) requirement that forest plans "be revised ... at least every fifteen years" and National Environmental Policy Act (NEPA) requirements that include "provide full and fair discussion of significant environmental impacts and ...inform decisionmakers and the public of the reasonable alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment." As well as being my own comments, I am also submitting them on behalf of the Alliance for the Wild Rockies, Conservation Congress, and the Upper Columbia River Group of the Sierra Club.

I. FAILURE OF DRAFT FOREST PLAN DIRECTION

The language found in "Consistency with the Plan Components" (Appendix A) results in very weak Draft Forest Plan (DFP) direction. Generally, Plan Components lack strong, binding direction that would compel managers to accomplish measurable outcomes in a specified timetable, and feature little restraint of management discretion and potential mis-prioritization.

To be consistent with a Desired Condition, a project needs to only vaguely "make progress toward" it or even "be neutral" in regards to such progress. It's also okay to make negative progress toward a Desired Condition in the short-term. Generally the DEIS defines "short-term" to be less than 20 years, meaning such negative effects can persist over the entire lifespan of the revised Forest Plan. It's also okay to make negative progress for the long-term if this occurs-also vaguely-"in a negligible way." Clearly, Desired Conditions don't compel management action nor limit management.

Similarly, Objectives ("concise projections of measureable, time-specific intended outcomes") compel management action in a very limited manner. For the vast majority of Objectives, the time frame for achieving the outcome is 15 years-approximately the entire lifespan of the revised Forest Plan. Furthermore, how progress toward Objectives would be measured is not specified, again too discretionary. In terms of management restraint, an authorized activity under the DFP must not "prevent the attainment of any applicable objectives." The meaning of "attainment" is highly subjective and discretionary, and could well be judged by the agency only at the end of this 15 years, rendering such limitations of no practical effect.

Guidelines "provide operational practices and procedures" and would theoretically set limitations on management actions. For the most part unfortunately, the DFP's Guidelines are worded as to be unenforceable, containing the word "should" rather than more definitive "shall." The word, "should", although according to the dictionary imparts duty and obligation, is not the Forest Service's preferred interpretation, as the FS has gotten a court to rule in *Lands Council v. McNair*:

"We cannot conclude that (should) creates a mandatory rule that strictly limits... ." Rather, this Court explained, "[t]he section is cast in suggestive (i.e., "should" and "may") rather than mandatory (e.g., "must" or "only") terms..."

Furthermore, actions are allowed to deviate from the exact wording of a Guideline as long as they are "as effective in meeting the purpose of the guideline to contribute to the maintenance or attainment of the relevant desired conditions and objectives" (emphasis added). Since this defines "purpose" of an Objective in terms of consistency with the vague and discretionary Desired Conditions and Objectives, it can be seen why that allowance is a huge loophole.

Standards set "constraints upon project and activity decision making." Unfortunately, as I discuss in below sections, the FS has not included much in the way of meaningful Standards, to the degree that protections for the various resources is not assured and ecological and economic sustainability is left hanging by the DFP.

The last Plan Component is "Suitability of Areas." Actions are only allowed if the Forest Plan identifies them as "suitable" for the particular location. Unfortunately, in some cases the Draft Forest Plan fails to disclose any objective criteria by which the Forest Service has determined suitability as per NFMA and planning regulations. In some cases suitability determinations are quite logical or determined by other laws, for example commercial use firewood gathering is not allowed in Wilderness. In other cases these determinations seem arbitrary, for example temporary road construction in the Management Area (MA) Special Interest Areas and in the MA Backcountry (non-motorized) is deemed "suitable."

Although Suitability is the Plan Component seemingly most limiting of management activities, the DFP contains another huge loophole allowing unsuitable uses. All the decisionmaker has to do is to claim, no matter how arbitrarily: "The use is appropriate for that location's desired conditions and objectives." Again, see the above critiques of Desired Conditions and Objectives.

Although to the casual or unsuspecting reader the DFP might seem to be more limiting on commercial logging because of areas being classed as unsuitable, the DFP writes the agency a big loophole. All the Forest Service needs to do is claim the commercial logging project is "not for the purpose of timber production"-the logging is merely a "tool" for some other management purpose. The public in general is not aware that 100% of the logging project NEPA documents for at least the past 15 years on the CNF have included Purpose and Need statements that state the logging is needed as a tool to "restore" something or for making the forest "more resilient" or make some similar lame justification. So, for Alternative R, old growth may seem to be conceptually emphasized ("an expanded late forest structure reserve network"). In reality the Forest Service would apply no different management philosophy for this alternative than it would with the Forest Service's Preferred Alternative P, since the DEIS presents no different Alternative R vegetation Desired Conditions, Standards, Objectives, or Guidelines and since Alternative R "retains a (timber) production oriented general forest."

In reality, as applied for this revision process "unsuitability for timber" is a meaningless concept.

Because of the situation described above, the differences between the DFP's revision alternatives are merely superficial, which is in violation of NEPA. Management actions would for all intents and purposes be directed by the political whims reflected in Congressional budget allocations, by local politicians, and by other entities with vested financial interests. Citizens whose legitimate public interests contrast with those of the political and

financially vested would have little recourse, except in rare cases where it can be easily shown that other environmental laws are being violated. Land managers and members of project interdisciplinary teams, who would by far hold the most sway against political and financial interests during Forest Plan design and implementation have, unfortunately, little career incentive to intervene on behalf of other values, and much incentive to go along with resource extraction. And as discussed below, the DEIS reflects this "go along" attitude, reflected by how science is applied selectively and in a very biased manner, and how logic and reason are often left on the wayside in the analyses for the various resources.

Regardless, in many ways and to various degrees in below comments I suspend disbelief, pretending that the various management emphases of the alternatives might actually lead to different management outcomes. I also pretend that the Forest Service might be open to other scientific perspectives and applications of logic and reason. And I also hope-against better judgment-that managers and members of project interdisciplinary teams will buck trends and find ways to influence project design and manage in ways that are truly sustainable and in harmony with the natural world.

II. DRAFT EIS'S PSEUDOSCIENCE ON CLIMATE CHANGE AND CARBON SEQUESTRATION

The Committee of Scientists, 1999 recognize the importance of forests for their contribution to sustainability and contributing to global carbon cycles. And the 2011 draft NFMA regulations recognize that forests provide "Benefits... including... Regulating services, such as long term storage of carbon; climate regulation..."

Some politicians and status quo profiteers pretend that there's nothing to do about climate change because it isn't real. The Forest Service acknowledges it's real, yet focuses only its symptoms and-like those politicians and profiteers-ignores and distracts from causes it enables.

The bias found in the "scientific" discussions presented in the DEIS concerning climate change is far more troubling than the document's bias on other topics, because consequences of unchecked climate change would be disastrous for food production, water supplies, and thus would lead to complete turmoil for all human societies. This is an issue as serious a nuclear annihilation (although at least with the latter we're not already pressing the button).

It is clear that the management of the planet's forest is a nexus for addressing this huge crisis of our times. Yet the DEIS fails to even disclose the amount of agency-fostered CO₂ emissions or consider the best available science on the topic. This is immensely unethical.

The Idaho Panhandle National Forests plan revision draft EIS defines carbon sequestration: "...the process by which atmospheric carbon dioxide is taken up by vegetation through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soils."

The DEIS fails to provide comprehensive estimates of the total amount of carbon dioxide (CO₂) or other greenhouse gas emissions caused by Forest Service management actions and policies-forestwide, regionally, or nationally. Instead, the DEIS makes selective use of science to suggest its agency actions and policies would be net neutral or would even help carbon sequestration, flying in the face of science and common sense. The agency policymakers seem comfortable maintaining a position that they need not take any leadership on this issue, and obfuscate via this DEIS to justify their failure of leadership.

DEIS Figures 9 and 10 and the accompanying discussions of modeling suggest the CNF is a net carbon sink (although as recently as the 1990s the same modeling indicates the Forest was a net source). However, the DEIS fails to properly analyze and disclose how particular management actions cause trends in one direction or another. So for example, the DEIS fails to present any modeling of forest stands under different management

scenarios. The best scientific information strongly suggests that management that involves removal of trees and other biomass is a source of atmospheric CO₂-unsurprisingly the DEIS doesn't state that simple fact. If the Forest Service really believes its carbon modeling can provide meaningful information, it should model the carbon flux over time for all of its proposed stand management scenarios for each of the forest types found on the CNF.

The DEIS also ignores CO₂ and other greenhouse gas emissions from several other common human activities related to forest management and recreational uses. These include emissions associated with machines used for logging and associated activities, vehicle use for administrative actions, recreational motor vehicles, and most emissions associated with livestock grazing. The DEIS does not list these under incomplete or unavailable information, so the Forest Service is simply ignoring the impacts of these management and other authorized activities.

Such greenhouse gas sources can be quantified. Kassari and Spitler (2008) for example, provide an analysis of the carbon footprint of off-road vehicles in California. They determined that: Off-road vehicles in California currently emit more than 230,000 metric tons - or 5000 million pounds - of carbon dioxide into the atmosphere each year. This is equivalent to the emissions created by burning 500,000 barrels of oil. The 26 million gallons of gasoline consumed by off-road vehicles each year in California is equivalent to the amount of gasoline used by 1.5 million car trips from San Francisco to Los Angeles.

. . . Off-road vehicles emit considerably more pollution than automobiles. According to the California Air Resources Board, off-road motorcycles and all-terrain vehicles produce 118 times as much smog-forming pollutants as do modern automobiles on a per-mile basis.

. . . Emissions from current off-road vehicle use statewide are equivalent to the carbon dioxide emissions from 42,000 passenger vehicles driven for an entire year or the electricity used to power 30,500 homes for one year.

Also, Sylvester, 2014 provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate the carbon footprint. The study finds that resident snowmobilers burn 3.3 million gallons of gas in their snowmobiles each year and a similar amount of fuel to transport themselves and their snowmobiles to and from their destination. Non-residents annually burn one million gallons of gas in snowmobiles and about twice that in related transportation. So that adds up to 9.6 million gallons of fuel consumed in the pursuit of snowmobiling each year in Montana alone. Multiply that by 20 pounds of carbon dioxide per gallon of gas (diesel pickups spew 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO₂ per year into the atmosphere.

Nitrous oxide, a by-product generated by the microbial breakdown of nitrogen in manure, is a potent greenhouse gas completely ignored by the DEIS. Also, the digestion of organic materials by livestock is a large source of methane emission. The DEIS only discusses methane in terms of a byproduct of the decomposition of manure, ignoring the greater emissions from digestion. The way methane is discussed is a crystal-clear example of the lack of breadth of scientific discussion and bias in the DEIS:

Free-ranging livestock deposit manure across the landscape, resulting in aerobic decomposition. Aerobic decomposition of manure generates considerably less methane than does decomposition associated with stockpiling strategies used in more concentrated livestock production strategies (Alberta Agriculture and Food Ag-Info Center) (EPA 2005). This "in-effect" land application of manure also results in a buildup of soil carbon that decomposes much more slowly than occurs when composting (NRCS 2007).

The DEIS also ignores the cumulative CO₂ emissions from forest management on other ownerships in the region or beyond. Since (as the DEIS reveals) "Harvested Wood Products" are a net source of CO₂ emissions on national forests in the Pacific Northwest Region, and given the less regulated logging on non-federal ownerships, clearly timber management continues to be a net source of CO₂. Omitting such a cumulative effects analysis

allows the agency to avoid describing the opportunity found on national forests to counterbalance some CO₂ emissions from other forest ownerships, resulting in a range of alternatives where none really address climate change. This is a violation of NEPA, as well as the public trust.

The DEIS misleads the public, distracting from the emerging scientific consensus that removing wood or any biomass from the forest only makes the problem worse. The science on climate change supports the idea that forest policies must shift away from logging if carbon sequestration is genuinely an emphasis. All old-growth forest areas, other unlogged or lightly logged forests, and most others should be preserved indefinitely for their carbon storage value. Forests that have been logged should be allowed to convert to eventual old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions. (Harmon et al., 2002; Harmon, 2001; Harmon et al., 1990; Homan et al., 2005; Solomon et al., 2007; Turner et al., 1995; Turner et al., 1997; Woodbury et al., 2007.)

Beschta et al 2012 review some of the science on livestock exacerbation of climate change:

Livestock production impacts energy and carbon cycles and globally contributes an estimated 18% to the total anthropogenic greenhouse gas (GHG) emissions (Steinfeld and others 2006). How public-land livestock contribute to these effects has received little study. Nevertheless, livestock grazing and trampling can reduce the capacity of rangeland vegetation and soils to sequester carbon and contribute to the loss of above- and below-ground carbon pools (e.g., Lal 2001b; Bowker and others 2012). Lal (2001a) indicated that heavy grazing over the long-term may have adverse impacts on soil organic carbon content, especially for soils of low inherent fertility. Although Gill (2007) found that grazing over 100 years or longer in subalpine areas on the Wasatch Plateau in central Utah had no significant impacts on total soil carbon, results of the study suggest that "if temperatures warm and summer precipitation increases as is anticipated, [soils in grazed areas] may become net sources of CO₂ to the atmosphere" (Gill 2007, p. 88). Furthermore, limited soil aeration in soils compacted by livestock can stimulate production of methane, and emissions of nitrous oxide under shrub canopies may be twice the levels in nearby grasslands (Asner and others 2004). Both of these are potent GHGs.

Kutsch et al., 2010 provide an integrated view of the current and emerging methods and concepts applied in soil carbon research. They use a standardized protocol for measuring soil CO₂ efflux, designed to improve future assessments of regional and global patterns of soil carbon dynamics. The authors state:

Excluding carbonate rocks, soils represent the largest terrestrial stock of carbon, holding approximately 1,500 Pg (10¹⁵ g) C in the top metre. This is approximately twice the amount held in the atmosphere and thrice the amount held in terrestrial vegetation. Soils, and soil organic carbon in particular, currently receive much attention in terms of the role they can play in mitigating the effects of elevated atmospheric carbon dioxide (CO₂) and associated global warming. Protecting soil carbon stocks and the process of soil carbon sequestration, or flux of carbon into the soil, have become integral parts of managing the global carbon balance. This has been mainly because many of the factors affecting the flow of carbon into and out of the soil are affected directly by land-management practices.

(Emphasis added.) That leads to the following scientific discussion of the effect of "land-management practices" (ignored in the DEIS) because the latter are contributing to increased atmospheric CO₂ and thus climate change. Van der Werf, et al. 2009 state:

(T)he maximum reduction in CO₂ emissions from avoiding deforestation and forest degradation is probably about 12% of current total anthropogenic emissions (or 15% if peat degradation is included) - and that is assuming, unrealistically, that emissions from deforestation, forest degradation and peat degradation can be completely eliminated.

...reducing fossil fuel emissions remains the key element for stabilizing atmospheric CO₂ concentrations.

(E)fforts to mitigate emissions from tropical forests and peatlands, and maintain existing terrestrial carbon stocks, remain critical for the negotiation of a post-Kyoto agreement. Even our revised estimates represent substantial

emissions ...

Keith et al., 2009 state:

Both net primary production and net ecosystem production in many old forest stands have been found to be positive; they were lower than the carbon fluxes in young and mature stands, but not significantly different from them. Northern Hemisphere forests up to 800 years old have been found to still function as a carbon sink. Carbon stocks can continue to accumulate in multi-aged and mixed species stands because stem respiration rates decrease with increasing tree size, and continual turnover of leaves, roots, and woody material contribute to stable components of soil organic matter. There is a growing body of evidence that forest ecosystems do not necessarily reach an equilibrium between assimilation and respiration, but can continue to accumulate carbon in living biomass, coarse woody debris, and soils, and therefore may act as net carbon sinks for long periods. Hence, process-based models of forest growth and carbon cycling based on an assumption that stands are even-aged and carbon exchange reaches an equilibrium may underestimate productivity and carbon accumulation in some forest types. Conserving forests with large stocks of biomass from deforestation and degradation avoids significant carbon emissions to the atmosphere. Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration.

Harmon, 2009 reviews how the forest ecosystem stores carbon, the issues that must be addressed when assessing any proposed course of action, and some common misconceptions that need to be avoided. He also reviews and assesses some of the more common proposals as well as his general scientific concerns about the forest system as a place to store carbon.

Hanson, 2010 addresses the false notion, presented in the DEIS, that wildland fires should be managed against: Our forests are functioning as carbon sinks (net sequestration) where logging has been reduced or halted, and wildland fire helps maintain high productivity and carbon storage.

Even large, intense fires consume less than 3% of the biomass in live trees, and carbon emissions from forest fires is only tiny fraction of the amount resulting from fossil fuel consumption (even these emissions are balanced by carbon uptake from forest growth and regeneration).

"Thinning" operations for lumber or biofuels do not increase carbon storage but, rather, reduce it, and thinning designed to curb fires further threatens imperiled wildlife species that depend upon post-fire habitat.

Campbell et al., 2011 also refutes the notion that fuel-reduction treatments increase forest carbon storage in the western US:

It has been suggested that thinning trees and other fuel-reduction practices aimed at reducing the probability of high-severity forest fire are consistent with efforts to keep carbon (C) sequestered in terrestrial pools, and that such practices should therefore be rewarded rather than penalized in C-accounting schemes. By evaluating how fuel treatments, wildfire, and their interactions affect forest C stocks across a wide range of spatial and temporal scales, we conclude that this is extremely unlikely. Our review reveals high C losses associated with fuel treatment, only modest differences in the combustive losses associated with high-severity fire and the low-severity fire that fuel treatment is meant to encourage, and a low likelihood that treated forests will be exposed to fire. Although fuel-reduction treatments may be necessary to restore historical functionality to fire-suppressed ecosystems, we found little credible evidence that such efforts have the added benefit of increasing terrestrial C stocks.

Mitchell et al. (2009) also refutes the assertion that logging to reduce fire hazard helps store carbon, and conclude that although thinning can affect fire, management activities are likely to remove more carbon by logging than will be stored by trying to prevent fire.

III. THE DRAFT FOREST PLAN AND DRAFT EIS FAIL TO ADDRESS THE ROOT CAUSE OF MOST OF THE ONGOING ECOLOGICAL DAMAGE ON THE FOREST-ROADS.

The DEIS admits that the Forest Service "can no longer afford to properly maintain the (CNF) road system at current operational maintenance levels." Unfortunately, the DEIS barely touches on the huge ecological liability of this excessive forest road network. Forest Service scientists Gucinski et al. (2001) identify many of the highly adverse impacts of forest roads. Concerning road density impacts on fish populations, they note:

(I)ncreasing road densities and their attendant effects are associated with declines in the status of four non-anadromous salmonid species. These species are less likely to use highly roaded areas for spawning and rearing and, if found, are less likely to have strong populations. This consistent pattern is based on empirical analysis of 3,327 combinations of known species' status and subwatershed conditions, limited primarily to forested lands administered by the Forest Service and the Bureau of Land Management.

Scientific information from government studies conducted for the Interior Columbia Ecosystem Management Project strongly indicates the high negative correlation between road density and fish habitat conditions. USDA Forest Service & USDI Bureau of Land Management, 1996a state:

High integrity [forests] contain the greatest proportion of high forest, aquatic, and hydrologic integrity of all [] are dominated by wilderness and roadless areas [and] are the least altered by management. [] Low integrity [forests have] likely been altered by past management [] are extensively roaded and have little wilderness. (Pp. 108, 115 and 116).

And USDA Forest Service & USDI Bureau of Land Management (1996) state "Increasing road density is correlated with declining aquatic habitat conditions and aquatic integrity. [] An intensive review of the literature concludes that increases in sedimentation [of streams] are unavoidable even using the most cautious roading methods." (P. 105).

Carnefix and Frissell, 2009 state:

Roads have well-documented, significant and widespread ecological impacts across multiple scales, often far beyond the area of the road "footprint". Such impacts often create large and extensive departures from the natural conditions to which organisms are adapted, which increase with the extent and/or density of the road network.

Likewise, Wisdom, et al. (2000) state:

Our analysis also indicated that >70 percent of the 91 species are affected negatively by one or more factors associated with roads. Moreover, maps of the abundance of source habitats in relation to classes of road density suggested that road-associated factors hypothetically may reduce the potential to support persistent populations of terrestrial carnivores in many subbasins. Management implications of our summarized road effects include the potential to mitigate a diverse set of negative factors associated with roads.

The DEIS discloses that "Road densities in riparian areas are higher than general road densities." Obviously, the Forest Service could address much of the ecological issues on the CNF by significantly reducing the road system, starting in riparian areas. Instead of demonstrating leadership on this issue, however, the DFP includes no direction whatsoever mandating a reduced road network, and little direction to stop its growth. And none of the alternatives address this highly significant environmental issue either, in violation of NEPA. The DEIS admits, "The local population's MIS/focal species status is rated functioning at risk or not properly functioning in most subwatersheds" on the CNF. Also, "in no subbasin, for any MIS/focal species, is there support for the conclusion the populations are currently viable."

So where's the direction to improve the situation? The only nondiscretionary road density standard in the DFP is FW-STD-WR-03, which states, "There shall be no net increase at any time in the mileage of National Forest

System roads in any key watershed." Whereas this standard stems the growth of the excessive road network in many watersheds, it fails to reduce it. What the DFP has instead is highly discretionary direction found in Desired Conditions:

MA-DC-FR-05. Road densities vary considerably across the management area; however, there is no more than one mile per square mile within the focused restoration management areas within each 5th field watershed.

MA-DC-GR-05. This area has National Forest System roads, which may be maintained at maintenance levels 1 through 5 (primitive roads to highways). National Forest System trails also exist. Road densities vary across the management area; however, they are no more than two miles per square mile within the general restoration management areas within each 5th field watershed.

It is concerning that, as the DEIS states, "Since road density desired conditions do not consider closed ML 1 roads, they do not adequately address the potential impacts of the road system on hydrologic and aquatic function and habitat." Nor to these Desired Conditions-or even standard FW-STD-WR-03-limit the use of temporary roads.

How this plays out with revised forest plan implementation with projects will be a lot of excuses why the FS cannot significantly "make progress toward" those DCs or respond to the ecological liabilities of its excessive road network. Case in point: the CNF's June 2016 Environmental Assessment for the North Fork Mill Creek timber sale. It stated:

Many ...comments concerned the extent of roads and their effects on water quality, as well as the construction and decommissioning of roads. Roads were a concern with regard to erosion, sediment delivery to streams, and other hydrologic-process related issues including the effects from peak flows, mass wasting (e.g., landslides), the need for or lack of maintenance, adjacency to streams, problem water crossings, and locating roads on unstable slopes.

Concerns regarding decommissioning of roads reflected a desire to maintain access to National Forest System lands for forest management, dispersed recreation, grazing allotment management, public safety, and future management of the forest. Public safety concerns were expressed that fire suppression would not be possible if the roads are decommissioned and that access should be maintained for public safety reasons, including but not limited to fire suppression and search and rescue needs.

The interdisciplinary team responded to this concern, along with findings of road planning, to remove the proposed decommissioning of closed National Forest System roads from the proposed action. (Emphasis added.)

Whereas the Forest Service had wide discretion to decommission roads in that project area (including those in the project area recommended for removal in the 2014 Forestwide Travel Analysis Report), the agency instead bowed to political pressure and the decision resulted in no net reduction in system roads.

There was reason to be hopeful when, to address its unsustainable and deteriorating road system, the Forest Service promulgated Travel Management Regulations (TMR) at 36 CFR § 212. At CFR § 212.5, Subpart A of the TMR states:

(b) Road system-(1) Identification of road system. For each national forest, national grassland, experimental forest, and any other units of the National Forest System (§ 212.1), the responsible official must identify the minimum road system needed for safe and efficient travel and for administration, utilization, and protection of National Forest System lands. In determining the minimum road system, the responsible official must incorporate a science-based roads analysis at the appropriate scale and, to the degree practicable, involve a broad spectrum of interested and affected citizens, other state and federal agencies, and tribal governments. The minimum system is the road system determined to be needed to meet resource and other management objectives adopted in the relevant land and resource management plan (36 CFR part 219), to meet applicable statutory and

regulatory requirements, to reflect long-term funding expectations, to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.

The "science-based roads analysis" required under Subpart A of the TMR is generally referred to as the "travel analysis process" or TAP. The Forest Service Washington Office, through a series of directive memoranda, instructed forests to use the Subpart A process to "maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns." These memoranda also outline core elements that must be included in each Travel Analysis Report.

The Washington Office memorandum dated March 29, 2012 directed the following:

- * A TAP must analyze all roads (maintenance levels 1 through 5);
- * The Travel Analysis Report must include a map displaying roads that will inform the Minimum Road System pursuant to 36 C.F.R. § 212.5(b), and an explanation of the underlying analysis;
- * The TAP and Watershed Condition Framework process should inform one another so that they can be integrated and updated with new information or where conditions change.

The December 17, 2013 Washington Office memorandum clarifies that each forest must:

- * Produce a Travel Analysis Report summarizing the travel analysis;
- * Produce a list of roads likely not needed for future use; and
- * Synthesize the results in a map displaying roads that are likely needed and likely not needed in the future that conforms to the provided template.

The TAP is intended to account for benefits and risks of each road, and especially to account for affordability. The TAP must account for the cost of maintaining roads to standard, including costs required to comply with Best Management Practices related to road maintenance.

Then in June 2014 the CNF releases its Forest-wide Travel Analysis Report (TAR). It states, "Travel analysis process results will assist the Colville National Forest in addressing issues related to roads. It will be used to inform future analyses, decisions, and specific actions." Unfortunately, the CNF did not properly engage the public during its TAP, the resulting forestwide TAR was not science based, did not arrive at an affordable and ecologically sustainable minimum road system, and basically sanctioned the status quo in terms of roads. The Forest Service has not carried forth anything from the TAR into forest plan revision-its analysis was not at all informed by the CNF's forestwide TAR. Therefore, this forest plan revision process must do the job. From all indications though, the Forest Service is not up to it.

The DEIS states, "As part of the process in determining what an appropriate road system might look like on the Colville National Forest, the Forest developed a Travel Analysis Report pursuant to Subpart A of the 2005 Travel Management Rule." Regarding Subpart A, under "The Roads Policy" the DEIS also states:

In January 2009, new directives (FSM 7700 and FSH 7709) regarding travel management were put into effect to make them consistent with and to facilitate implementation of the agency's final travel management rule. This direction gives managers a scientific analysis process to inform their decision-making. It directs the agency to maintain a safe, environmentally sound road network that is responsive to public needs and affordable to manage but that calls for unneeded roads to be considered for decommissioning or conversion to other uses, such as trails.

These final directives consolidate direction for travel planning for both NFS roads and NFS trails in Forest Service Manual (FSM) 7710 and Forest Service Handbook (FSH) 7709.55. The final directives rename roads analysis "travel analysis" and streamline some of its procedural requirements. In addition, for purposes of designating roads, trails, and areas for motor vehicle use, the final directives expand the scope of travel analysis to encompass trails and areas being considered for designation.

The DEIS states, "Decisions on road decommissioning would be made at the project level based on information provided by resource specialists and recommendations contained in the Forest's most recent Travel Analysis Report pursuant to subpart A of the 2005 Travel Management Rule." As stated above, the Forest Service has already demonstrated total refusal to be informed by its forestwide TAR.

The DEIS indicates, based on expected budget trends, "Roadwork on the forest will average 20 miles per year of reconstruction, construction or decommissioning over the life of the plan."

It's clear the Forest Service fails to take seriously its responsibilities under the Travel Management Regulations at 36 CFR § 2125, Subpart A, because as stated above, the DFP contains no Plan Components that require a significant reduction in the forest road system or identification and implementation of the Minimum Road System, and takes no explicit direction from the Travel Management Regulations at 36 CFR § 2125, Subpart A. The DEIS and DFP are in violation of the Travel Management Regulations.

The science on roads is clear. From the federal government's own Interior Columbia Basin studies, Wisdom, et al. (2000) state:

Comprehensive mitigation of road-associated factors would require a substantial reduction in the density of existing roads as well as effective control of road access in relation to management of livestock, timber, recreation, hunting, trapping, mineral development, and other human activities.

...Efforts to restore habitats without simultaneous efforts to reduce road density and control human disturbances will curtail the effectiveness of habitat restoration, or even contribute to its failure; this is because of the large number of species that are simultaneously affected by decline in habitat as well as by road-associated factors. (Emphases added.)

Carnefix and Frissell, 2009 make a very strong scientific case for including ecologically-based road density standards:

Road density is a useful metric or indicator of human impact at all scales broader than a single local site because it integrates impacts of human disturbance from activities that are associated with roads and their use (e.g., timber harvest, mining, human wildfire ignitions, invasive species introduction and spread, etc.) with direct road impacts. Multiple, convergent lines of empirical evidence summarized herein support two robust conclusions: 1) no truly "safe" threshold road density exists, but rather negative impacts begin to accrue and be expressed with incursion of the very first road segment; and 2) highly significant impacts (e.g., threat of extirpation of sensitive species) are already apparent at road densities on the order of 0.6 km per square km (1 mile per square mile) or less. Therefore, restoration strategies prioritized to reduce road densities in areas of high aquatic resource value from low-to-moderately-low levels to zero-to-low densities (e.g., <1 mile per square mile, lower if attainable) are likely to be most efficient and effective in terms of both economic cost and ecological benefit. By strong inference from these empirical studies of systems and species sensitive to humans' environmental impact, with limited exceptions, investments that only reduce high road density to moderate road density are unlikely to produce any but small incremental improvements in abundance, and will not result in robust populations of sensitive species. (Emphases added.)

So under the revised forest plan as reflected in the DFP, the road system will continue to deteriorate because its extent would continue to be unaffordable. The DEIS fails to analyze or disclose the extent of the impacts from that ongoing situation. The DEIS also fails to present an economics analysis that considers the direct, indirect, and cumulative costs of roads.

The DFP and DEIS fail to consider the best available science in the formulation of alternatives and disclosure of impacts, in violation of NEPA and NFMA.

IV. REVISED FOREST PLAN FAILS TO ASSURE ABUNDANT POPULATIONS OF NATIVE FISH AND WILDLIFE, AND CANNOT EVEN COMMIT TO MAINTAINING MINIMUM VIABLE POPULATIONS.

The Draft Forest Plan relies upon achieving its Vegetation direction as a surrogate for restoring wildlife habitat. However the DEIS fails to acknowledge the controversy of such a position. Years ago, as the FS began a process of revising NFMA regulations, the agency commissioned the Committee of Scientists. The Committee of Scientists (1999), take issue with a management focus that emphasizes manipulation of habitat as the primary management methodology for insuring wildlife viability, "...in recognition that focusing only on composition, structure, and processes may miss some components of biological diversity."

Which raises the issue of monitoring. The Committee of Scientists (1999) state:

Habitat alone cannot be used to predict wildlife populations...The presence of suitable habitat does not ensure that any particular species will be present or will reproduce. Therefore, populations of species must also be assessed and continually monitored.

The Plan Components provide a few token measures for protecting and restoring wildlife and fish habitat, however they fail to address important biological needs or recognize ecological relationships between key habitat components and the natural processes that create and maintain them.

Vegetative conditions simply cannot be used as a substitute or proxy for monitoring populations, as the Forest Service's own science clearly indicates. The complex and subtle interplay between animals and vegetative components, structure, pattern, and processes is not well-understood, Offering Plan Components for Vegetation as wildlife viability assurance is smoke and mirrors, assuring not viable populations of wildlife but perpetual manipulation of vegetation.

The DEIS states at pp. 165-166:

Direction for management of species differs between the 2000/2005/2008 and 1982 planning rules in regards to viability and sustainability of species. Under the 2000, 2005, and 2008 Planning Rules, National Forests were required to assess "the contribution of National Forest System (NFS) lands to the sustainability of ecosystems and species" as opposed to "maintaining viable population of species." ...Given that the 1982 planning rule is again in place, the objective of this evaluation (starting in 2010) was to refine the current "ecological sustainability" model where appropriate to ensure the evaluation approach addresses "species viability" criteria of the 1982 planning, while meeting the intent of the 2012 planning rule.

The above is quite confusing. Since the revised forest plan process is essentially using the 1982 planning rule, one might assume that the following direction, found in the DEIS, is still required:

Under the 1982 planning rule, national forests were required to manage habitat in order to maintain viable populations of existing species in planning areas. The planning rule further defines a viable population as "one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area."

However, based on other analyses in the DEIS it appears that instead of accepting its duty to insure viability, the DFP and DEIS analyze things in terms of their "contribution to" the viability of species. This is reminiscent of DFP Desired Conditions, which never need be achieved. Apparently viable populations of wildlife need not to be reached during the life of the revised forest plan.

The DEIS further dodges and weaves, identifying various categorizations of species. These include Management Indicator Species (MIS), focal species, sensitive species, species at risk, species of concern, surrogate species, and species of (management) interest. The DEIS says that there are scientific problems with the MIS and/or focal species approach, but for aquatic species, the DEIS uses it anyway. The DEIS fully rejects the MIS/focal species

approach in favor of surrogate species for terrestrial wildlife. Again, the DEIS is confusing. The DEIS defines surrogate species using very technical terms that sound similar to the definition of MIS, and is ultimately unsuccessful in discriminating between the two concepts.

There are overlaps between the above categories of species and also species listed under the Endangered Species Act. The overlap often just leads to more confusion or-perhaps it's about obfuscation. So whereas the CNF's June, 2011 Proposed Action for forest plan disclosed that the Pacific fisher has been extirpated from the Forest, this DEIS apparently replaces this "Sensitive" species with four other "surrogate species" (Pileated Woodpecker, American Marten, Northern Goshawk, Woodland Caribou-see Table 152). Since "it is not expected that the population dynamics of a surrogate species would necessarily represent the population dynamics of another species" (DEIS at 379) one might wonder how recovery of a species once found on the Forest-the fisher, now extirpated-can be achieved by managing its habitat as if it were a Pileated Woodpecker, American Marten, Northern Goshawk, or Woodland Caribou. Of course that explanation is not provided.

It appears that, whereas for some categories of species such as Sensitive, of which there is concern about viability, when the dust settles on the revised forest plan those species' viability concerns will evaporate without scientific explanation.

For aquatic species, "MIS/focal species local population condition was evaluated using data on fish distribution, population status and abundance, habitat and genetic connectivity, and impact of non-native species." DEIS at 180. The DEIS doesn't say why MIS/focal/surrogate terrestrial species' local population conditions were not "evaluated using data on ...distribution, population status and abundance, habitat and genetic connectivity, and impact of non-native species." Is this because the data is incomplete and/or unavailable?

The hydrology analysis bases a lot of impacts on water quality (and therefore fish) on the sediment risk from roads, however the impacts of logging due to elevated water yield impacts and compacted soils in units are not evaluated. This underestimates the DEIS's impacts on fish populations.

The DEIS states that "the narrow (Riparian Management Objectives) do not provide the same flexibility for adaptive management as the aquatic and riparian plan components in the proposed action and alternatives R, P, and O." This is actually not a good feature of alternatives R, P, and O, because "adaptive management" actually means increased and widespread logging in riparian areas-the impacts of which are erroneously assumed negligible in the DEIS.

The Draft Forest Plan has no Standard to protect the amount and distribution of old growth to resemble historic conditions. The DFP contains no requirement to manage for the amount and distribution of old growth that has been determined by scientific research to be necessary in order to sustain old-growth associated wildlife species.

The DFP and its alternatives do little or nothing to direct or limit management activities via Plan Components in response to the five key findings (DEIS at 380-381).

Although the DEIS states that road "zone of influence" is a better indicator of habitat condition, zone of influence is not a metric used with any Plan Components.

The DEIS states, "A key assumption of the landscape restoration approach that is represented in two of the alternatives (proposed action and P) is that by strategically locating restoration treatments, landscape fire movement can be altered, and the risk to adjacent late-successional and old forest habitat is reduced." As discussed elsewhere in these comments, this paradigm of providing for wildlife habitats by emphasizing vegetation management is extremely flawed.

The DEIS indicates that the alternatives impacts on viability outcomes was determined by modeling. The

limitations of the models were not disclosed, violating NEPA. Beck and Suring, 2011 "remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities."

Larson et al. 2011 state: "Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be as widely appreciated."

Larson et al. 2011 state:

Habitat models are developed to satisfy a variety of objectives. ...A basic objective of most habitat models is to predict some aspect of a wildlife population (e.g., presence, density, survival), so assessing predictive ability is a critical component of model validation. This requires wildlife-use data that are independent of those from which the model was developed. ...It is informative not only to evaluate model predictions with new observations from the original study site but also to evaluate predictions in new geographic areas.

(Internal citations omitted, emphasis added). A 2000 Northern Region forest plan monitoring and evaluation report provides an example of the agency itself acknowledging the problems of data that was old and incomplete, leading to the limitation of models the FS typically uses for wildlife analyses for old-growth MIS habitats: Habitat modeling based on the timber stand database has its limitations: the data are, on average, 15 years old; canopy closure estimates are inaccurate; and data do not exist for the abundance or distribution of snags or down woody material... .

(USDA Forest Service, 2000c.) In that case, the FS expert believed the data were unreliable, so the usefulness or applicability of the model-its validity-is limited.

Beck and Suring, 2011 state:

Developers of frameworks have consistently attained scientific credibility through published manuscripts describing the development or applications of models developed within their frameworks, but a major weakness for many frameworks continues to be a lack of validation. Model validation is critical so that models developed within any framework can be used with confidence. Therefore, we recommend that models be validated through independent field study or by reserving some data used in model development.

An open, independent peer review process was described twelve years ago by the Committee of Scientists (1999):

To ensure the development of scientifically credible conservation strategies, the Committee recommends a process that includes (1) scientific involvement in the selection of focal species, in the development of measures of species viability and ecological integrity, and in the definition of key elements of conservation strategies; (2) independent scientific review of proposed conservation strategies before plans are published; (3) scientific involvement in designing monitoring protocols and adaptive management; and (4) a national scientific committee to advise the Chief of the Forest Service on scientific issues in assessment and planning.

Schultz (2010) recommends peer review of large-scale assessments and project level management guidelines, and more robust, scientifically sound monitoring, and measurable objectives and thresholds for maintaining viable populations of all native and desirable non-native wildlife species.

Larson et al. 2011 state:

(T)he scale at which land management objectives are most relevant, often the landscape, is also the most relevant scale at which to evaluate model performance. Model validity, however, is currently limited by a lack of information about the spatial components of wildlife habitat (e.g., minimum patch size) and relationships between habitat quality and landscape indices (Li et al. 2000).

Beck and Suring, 2011 developed several criteria for rating modeling frameworks-that is, evaluating their validity. Three of their criteria are especially relevant to this discussion:

The DEIS violates NEPA because the Forest Service has not insured the reliability of data relied upon by the models, and the Forest Service has not validated the models for the way the DEIS utilizes them.

The Ninth Circuit Court of Appeals has ruled that the Forest Service "must both describe the quantity and quality of habitat that is necessary to sustain the viability of the species in question and explain its methodology for measuring this habitat." (Lands Council v. McNair). Assuring viability of most wildlife species is forestwide issue. The cumulative effects of multiple habitat disrupting projects simultaneously across a national forest makes it imperative that population viability be assessed at least at the forestwide scale (Marcot and Murphy, 1992; also see Ruggiero et al., 1994a). Since the Forest Service cannot make strong, science-based commitments to manage the habitat for all these species in its revised forest plan, the agency is obviously not up to the task of complying with NFMA's diversity requirements.

Under the assumption that Alternative R really would reduce logging on the CNF, the DEIS indicates "this alternative would provide greater habitat for snag-dependent surrogate wildlife species than any other alternative, and would improve the viability outcomes for snag-dependent surrogate wildlife species."

The DFP and DEIS fail to consider the best available science in the design of Plan Components, formulation of alternatives and disclosure of impacts, in violation of NEPA and NFMA.

V. VEGETATION MANIPULATION

The DEIS states on p. 5, "In the past 10 to 15 years, fire acres in eastern Washington have increased with amplified severity reflective of higher fuels levels and tree mortality influences, along with longer fire seasons." The DEIS thus sets a pattern of distorting the science, ignoring the overwhelming evidence that prevailing weather conditions are what govern the behavior of the fires that affect the most acreage in any given year. The Forest Service is misleading the public in an attempt to gain acceptance for its timber agenda: "Experimental work has shown that these increasing trends can be reduced through active management when applied at a landscape scale (Schwilk et al. 2009)." (Id.)

Furthering this ruse is the agency's use of the concept "resilience." The vegetation Desired Condition, FW-DC-VEG-04, is the template for DFP direction: "Forest structural classes are resilient and compatible with maintaining characteristic disturbance processes such as wildland fire, insects and diseases." The DEIS defines "resilience" as "The capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks." However, the Forest Service provides absolutely nothing that would allow anybody to actually measure the resilience of the ecosystem as it stands now, or measure the change in resilience following project activities. An essential component of an operational definition is measurement. A simple and accurate definition of measurement is the assignment of numbers to a variable in which one are interested. In this case, that variable is resilience, and how the agency measures it in the ecosystem.

Mostly what is "learned" about resilience from the DEIS is, it's what happens when the forest is "managed" (i.e., mostly logged or prescribe burned), and the more the forest is logged and burned, the more resilient it becomes.

Also "learned" is that nothing that happens naturally, without management, will increase resilience. In other words, from the Forest Service's perspective, resilience can only be manufactured, engineered, or imposed by management. The term "resilience" as used by the DFP is little but a distractor, a word that sounds impressive but has little practical meaning.

The DEIS states:

Vegetation composition for the planning area was classified based on plant association groups (PAGs), which are groups of plant associations with similar moisture and temperature regimes. The PAG data was produced in 2012 and covers the entire Colville National Forest. Forested PAGs were then assigned to a Landfire biophysical setting (BpS), and a subsequent common name vegetation type. Landfire biophysical settings represent vegetation that may have been dominant on the land before European settlement and are based on an approximation of the historical disturbance regime (LANDFIRE 2007). These biophysical settings provide a good description of general vegetation characteristics, along with historical disturbance regimes, successional pathways, and basic spatial information. They also provide a link between the vegetation analysis presented here and the fire/fuels analysis.

The DEIS thus states that the Desired Conditions for vegetation are designed around the Historic Range of Variability (HRV). Since climate change scenarios are expected lead to temperature, weather pattern, and precipitation amounts and patterns that differ from the "historical disturbance regimes" that resulted in the Forest Service's assumed HRV, it makes no sense for the DFP to rely on static Desired Conditions to "increase resilience against climate change." The range of expected forest conditions under climate change are not known.

At pp. 72-73, the DEIS describes the vegetation models and the data sets used by the modeling. The DEIS and DFP do not define "model" but in the Nez Perce-Clearwater National Forest's Clear Creek Integrated Restoration Project Final EIS, the Forest Service defines "Model" as "A theoretical projection in detail of a possible system of natural resource relationships. A simulation based on an empirical calculation to set potential or outputs of a proposed action or actions." (G-14.) From www.thefreedictionary.com "empirical" is defined:

1. a. Relying on or derived from observation or experiment: empirical results that supported the hypothesis. b. Verifiable or provable by means of observation or experiment: empirical laws. 2. Guided by practical experience and not theory, especially in medicine.

So models are "theoretical" in nature and by implication somehow based in observation or experiment that support the hypotheses of the models. This also implies that models describe reality, but to a limited degree. That is why the Ninth Circuit Court of Appeals has declared that an EIS must disclose the limitations of its models in order to comply with NEPA. However, the DEIS does not disclose the limitations of these vegetation models.

Furthermore, data must be accurate and reliable for appropriate use as an input to modeling. Huck, 2000 states: The basic idea of reliability is summed up by the word consistency. Researchers can and do evaluate the reliability of their instruments from different perspectives, but the basic question that cuts across these various perspectives (and techniques) is always the same: "To what extent can we say the data are consistent?" ...(T)he notion of consistency is at the heart of the matter in each case.

...(R)eliability is conceptually and computationally connected to the data produced by the use of a measuring instrument, not to the measuring instrument as it sits on the shelf.

Beck and Suring, 2011 "remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities."

Larson et al. 2011 state: "Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be

as widely appreciated."

But even if FS data input to a model is reliable, that still leaves open the question of model validity. In other words, are the models scientifically appropriate for the uses for which the Forest Service is utilizing them? As Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of these vegetation models utilized in the DEIS's analyses have not been established for how agency utilizes them. No studies are cited which establishes their content validity, and no independent expert peer review process of the models has occurred.

There's also no indication that the vegetation type categories or the structure class definitions are, scientifically speaking, valid for the purposes for which the Forest Service employs them in DEIS analyses.

Since the entire basis of the DFP's Desired Conditions are based upon vegetation modeling that has not been examined for reliability, validity, or limitations, the DFP's set of vegetation management premises are a house of cards facing an imminent windstorm. Further compounding the situation is a joker in the deck, climate change, which the models ignore.

And because the DFP and DEIS assume that making progress toward Desired Conditions is mostly all that's required in order to protect, restore, and maintain terrestrial and aquatic species' populations, it's easy to see how this entire management paradigm is destined to fail.

For alternatives that retain the Eastside Screens 21" rule, the DEIS states, "Once trees within a stand grow larger than 21 inches d.b.h., the number of management options is essentially restricted to fire, and there is little opportunity to reduce densities and create early structure or maintain open structure types." However this is contradicted elsewhere: "If the landscape is above HRV, then large trees could be cut to achieve specific objectives." So which is it?

The DEIS describes Alternative R:

(A)lternative R would maintain the fixed reserves management approach for late-successional and old forest habitat, (and) would include species-specific management direction for surrogate wildlife species that are associated with these late-successional habitat structures through proposed plan components for large trees, retention of snag habitat, and down woody debris."

But as the DEIS indicates, Alternative R would engineer this habitat-there's no place for natural processes to create the habitat outside Wilderness: "timber harvest would be used as a management tool to maintain and improve resiliency of the late and old forest habitat components (e.g., structure such as large and old trees, large snags, and downed wood)." In other words, the timber agenda would dominate, tree farmers would have their way over the vast majority of the Forest. Any apparent difference between this and other alternatives is not real.

There is no analysis of the current landscape pattern of specific forest landscapes, comparing them to the reference conditions, using data gathered in the CNF to describe both reference and current conditions. The CNF has very limited data to describe the reference condition of landscapes. Yet the DFP prescribes mostly mechanical treatments, to reduce tree density to different degrees across the landscape, without adequately demonstrating that the treatment effects would actually mimic the landscape pattern of reference conditions. The CNF does not use any scientifically-validated or peer reviewed metrics to describe the complex landscape pattern created predominantly by fire and therefore reflective of the vegetative HRV. Therefore the CNF cannot make any assurances that its management actions result in habitat conditions for wildlife that actually contribute to viability for wildlife, to adequately compensate for the unavoidable adverse effects of the mechanical treatments.

Frissell and Bayles, 1996 reinforce our skepticism about the heavy emphasis on vegetative HRV the Draft Forest Plan utilizes, providing a scientific perspective like our concerns:

...The concept of range of natural variability also suffers from its failure to provide defensible criteria about which factors ranges should be measured. Proponents of the concept assume that a finite set of variables can be used to define the range of ecosystem behaviors, when ecological science strongly indicates many diverse factors can control and limit biota and natural resource productivity, often in complex, interacting, surprising, and species-specific and time-variant ways. Any simple index for measuring the range of variation will likely exclude some physical and biotic dimensions important for the maintenance of ecological integrity and native species diversity. (Bold emphasis added.)

So by chasing its Desired Conditions for vegetation, the CNF fails to factor in many other factors of the landscape that have highly adverse effects on the landscape. Below is a list of HRVs for other factors which have been heavily impacted by management. These are factors the DFP makes no commitments to significantly improve upon, in contrast to its major emphasis on vegetation (mostly logging):

Road density zero

Noxious weed occurrence zero

Miles of long-term stream channel degradation ("press" disturbance) zero

Culverts zero

Human-induced detrimental soil conditions <1%

Maximum daily decibel level of motorized devices zero

Acres of significantly below HRV snag levels for many decades zero

In his book, *Among Whales* ocean biologist Roger Payne has the following to say about the same kind of hubris represented by the Forest Service's view that it can manipulate and control its way to a restored forest by more intensive management:

One often hears that because humanity's impact has become so great, the rest of life on this planet now relies on us for its succession and that we are going to have to get used to managing natural systems in the future-the idea being that since we now threaten everything on earth we must take responsibility for holding the fate of everything in our hands. This bespeaks a form of unreality that takes my breath away... The cost of just finding out enough about the environment to become proper stewards of it-to say nothing of the costs of acting in such a way as to ameliorate serious problems we already understand, as well as problems about which we haven't a clue-is utterly prohibitive. And the fact that monitoring must proceed indefinitely means that on economic grounds alone the only possible way to proceed is to face the fact that by far the cheapest means of continuing life on earth as we know it is to curb ourselves instead of trying to take on the proper management of the ecosystems we have so entirely disrupted.

(Payne 1995, emphasis added.) Not accompanying all the Forest Service's hypothetical promises of improving nature are any acknowledgments of the potential or degree of unintended side effects that pose risk or present likely damage to some other composition, structure, or function of the ecosystem. Regarding this characteristic agency hubris, Frissell and Bayles (1996) comment:

Most philosophies and approaches for ecosystem management put forward to date are limited (perhaps doomed) by a failure to acknowledge and rationally address the overriding problems of uncertainty and ignorance about the mechanisms by which complex ecosystems respond to human actions. They lack humility and historical perspective about science and about our past failures in management. They still implicitly subscribe to the scientifically discredited illusion that humans are fully in control of an ecosystemic machine and can foresee and manipulate all the possible consequences of particular actions while deliberately altering the ecosystem to produce only predictable, optimized and socially desirable outputs. Moreover, despite our well-demonstrated inability to prescribe and forge institutional arrangements capable of successfully implementing the principles and practice of integrated ecosystem management over a sustained time frame and at sufficiently large spatial scales, would-be ecosystem managers have neglected to acknowledge and critically analyze past institutional and policy failures. They say we need ecosystem management because public opinion has changed, neglecting the obvious point that public opinion has been shaped by the glowing promises of past managers and by their clear

and spectacular failure to deliver on such promises.

The DEIS discloses, "Based on the ...budget trend, this analysis assumes ...The expected amount of acres treated (prescribed fire, mechanical fuels, stand improvement activities, or timber harvest) will remain constant over the life of the forest plan, approximately 6,000 to 12,000 acres per year on average." That means for the expected 15-year life of the revised forest plan, only up to 180,000 acres would be manipulated by active management. The DEIS does not disclose the impacts the Forest Service believes would be ongoing with so little of the Forest meeting Desired Conditions at any given time.

FW-STD-VEG-05. "If individual harvest openings created by even-aged silvicultural practices are proposed that would exceed 40 acres, then NFMA requirements regarding public notification and approval shall be followed. These requirements do not apply to the size of areas harvested because of catastrophes such as, but not limited to, fire, insect and disease attacks, or wind storms." This highlights a problem there is an undefined category of natural processes the Forest Service calls "catastrophe", which defines an economic loss of opportunity as the catastrophe rather than something being ecologically harmful.

VI. WILDLAND FIRE

The wildland fire issue is, in many ways, the most daunting and perplexing one facing management of the CNF. On one hand, the DFP and DEIS implicate it as a looming "catastrophe", a threat to life and property, a natural force to be controlled at all costs-even if those costs bust the agency budgets. On the other hand, it is recognized as a vital creative force that sustains practically all components of the forest ecosystems-wildlife, fish, soil productivity, species composition, landscape pattern and structure. In addressing the issue of wildland fire, the revision of the forest plan is at the crossroads where overall management of the CNF can shift boldly towards sustainably, or lurch onward towards ecological disintegration. Unfortunately, the Forest Service lurches onward instead of shifting boldly.

The pressing unmet need for public education on this issue, coupled with the vested economic interests in carrying on fire suppression (limited only by equipment and firefighter availability), other political forces that prioritize timber over ecology, and the culture of the agency itself (favoring manipulation and control rather than embracing wildness)-all stand as significant barriers to accomplishing the necessary change in fire policy.

The DEIS touts the benefits of most action alternatives because the revised forest plan would direct that wildland fire be less suppressed and more accepted. However, the DFP does not provide solid Plan Components that would effectively reduce the incentives of managers to order as much fire suppression as available resources would allow. So the DEIS fails to provide an analysis what really would happen-perpetual "fuel treatment" via industrial logging to mitigate perpetual fire suppression.

The DEIS claims, "Fire suppression on Federal lands has led to fuels accumulation in some fire types, resulting in wildfires that are uncharacteristic in both fire effects and scale." The DEIS makes similar statements about insect outbreaks ("pests") in the Forest. There are, however, no scientific bases established for such claims. No examples of "uncharacteristic" disturbances are mentioned, probably because with such specifics, any claim of their being "uncharacteristic" could easily be refuted. The Forest Service is using this "uncharacteristic" scare as propaganda to mask its real agenda, perpetual "fuel treatment" via industrial logging to mitigate perpetual fire suppression.

The DEIS's Table 32 "summarizes the change in fire return intervals for each vegetation type." That data does not describe a normal range for fire return intervals, only a single statistic for most vegetation types. The DEIS doesn't even state how abnormal a fire return interval outside of 50-150 years would be for Mesic Mixed Conifer. The validity of this analysis is highly questionable.

Furthermore, the DEIS does not disclose the limitations of its other fire modeling, such as the Fire Regime Condition Class.

For fire, under Environmental Consequences the DEIS states, "This analysis examines how the plan alternatives address the risk of uncharacteristic wildfire and how well they contribute to returning wildfire to a more natural role." The FS thus sends the public on a wild goose chase for uncharacteristic wildfire, distracting from its perpetual "fuel treatment" agenda.

In order to assume that "fire severity, and fire return intervals would closely match actual conditions in the future" the Forest Service must deny the reality of climate change.

Under the Forest Service's preferred Alternative P, "Seventy-four percent of the landscape exhibits a departure from natural fire process and would remain predisposed to losing key ecosystem components, which could threaten late forest structure and timber production. Losing key ecosystem components in late forest structure would impact dependent surrogate wildlife species habitat (Gaines 2015)." This pretty much shreds the rest of the DEIS's and DFP's optimistic "making progress toward" analyses.

Clearly, the Plan Components need much stronger direction and certainty for use of wildland fire for resource benefits.

The DEIS and DFP are not clear as to how the existence of the increasing WUI and the Community Wildfire Protection Plans comprise policy and direction the Forest Service and revised forest plan must follow. Our understanding is that the WUI has been defined, and can be re-defined, without any NEPA process. The Draft Forest Plan does not even show the location of the WUI. Given the uncertain location of the Draft Plan WUI, the DEIS cannot possibly analyze the implication of Plan implementation of WUI management.

Experience shows the countless dangers faced by firefighters, to the degree that public safety ought to be genuinely at risk before decisions are made to risk firefighter safety. And although I disagree about the extent of the WUI, I welcome a dialogue that would result in agreement where firefighting will be understood as a given likelihood (a more reasonably defined WUI) vs. where potential losses to lives would be nonexistent if a fire is allowed to burn and where private property risks are minimal. Because of the importance of dealing with this issue, these two "management area" classifications are more important than most of those in the Draft Forest Plan. As stated above, however, they must be established in the context of NEPA rather than by county governments, and therefore be subject to the test of good science and full and fair analysis, unlike present WUI delineations.

VII. SOIL, THE MOST FUNDAMENTAL FOREST RESOURCE

The Draft Forest Plan's overall lack of Standards is counter to the Regulations. How, for instance, can the Plan conform to the Regulations' requirement to "Conserve soil ... resources and not allow significant or permanent impairment of the productivity of the land" if the Forest Plan does not contain a single forestwide soil standard? There is absolutely no limit to the amount of soil loss or damage that is allowed in livestock grazing allotments or pastures, logging or burning units, temporary roads or landings, etc.

The DEIS does not disclose the impacts on soil productivity due to the DFP's lack of regulation. Losses of soil productivity due to foreseeable increases in noxious weeds is not addressed.

This situation points out the lack of currently existing reasonable regulatory mechanisms for protecting soil productivity on the national forests as discussed by Lacy, 2001.

The DEIS states, "Forest Service Manual (FSM) Chapter 2550 Soil Management directs soil resource management on National Forest System lands." If that is true, the DEIS must disclose this direction, and analyze the impacts implied from this direction. The DEIS vaguely mentions "Region 6 Soil Quality Standards" but again, the DEIS and DFP fail to disclose them.

The DEIS states, "The FSM identifies six soil functions: soil biology, soil hydrology, nutrient cycling, carbon storage, soil stability and support, and filtering and buffering. In order to provide multiple uses and ecosystem services in perpetuity, these six soil functions need to be active and effectively working." Yet the impacts of forest plan implementation from the various alternatives' land management practices is not analyzed or disclosed in the DEIS. This violates NEPA.

Under "Past Management Impacts on Soil Quality and Productivity" the DEIS presents no quantified analyses of past management activities. Further, the DEIS fails to analyze and disclose the impacts of the alternatives on the six soil functions the FSM identified. This violates NEPA.

The decrease in future timber yield due to cumulative soil damage forestwide is not quantified in the DEIS. Even if timber were the only accepted use of the CNF, it would make no sense for the Forest Service to never factor in management-induced decreases in productivity, leading to unanticipated significant reductions over time in timber yields. USDA Forest Service, 2007 stated:

Sustained yield was defined... as "the achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without permanent impairment of the productivity of the land." Sustained yield is based on the lands' ability to produce.

The forestwide extent of soils with permanently impairment or experiencing long-term detrimental impacts must be quantified to address the "sustained yield." The DEIS fails to analyze or disclose these cumulative impacts.

Booth, 1991 explains the relationship between soil quality conditions and hydrology:

Drainage systems consist of all of the elements of the landscape through which or over which water travels. These elements include the soil and the vegetation that grows on it, the geologic materials underlying that soil, the stream channels that carry water on the surface, and the zones where water is held in the soil and moves beneath the surface. Also included are any constructed elements including pipes and culverts, cleared and compacted land surfaces, and pavement and other impervious surfaces that are not able to absorb water at all.

...The collection, movement, and storage of water through drainage basins characterize the hydrology of a region. Related systems, particularly the ever-changing shape of stream channels and the viability of plants and animals that live in those channels, can be very sensitive to the hydrologic processes occurring over these basins. Typically, these systems have evolved over hundreds of thousands of years under the prevailing hydrologic conditions; in turn, their stability often depends on the continued stability of those hydrologic conditions.

Alteration of a natural drainage basin, either by the impact of forestry, agriculture, or urbanization, can impose dramatic changes in the movement and storage of water. ...Flooding, channel erosion, landsliding, and destruction of aquatic habitat are some of the unanticipated changes that ...result from these alterations.

...Human activities accompanying development can have irreversible effects on drainage-basin hydrology, particularly where subsurface flow once predominated. Vegetation is cleared and the soil is stripped and compacted. Roads are installed, collecting surface and shallow subsurface water in continuous channels.

...These changes produce measurable effects in the hydrologic response of a drainage basin.

The DFP is not consistent with NFMA or the regulations and directives, and the DEIS does not conform to NEPA

requirements.

VIII. DRAFT EIS ANALYSIS AND DRAFT FOREST PLAN DIRECTION REGARDING LIVESTOCK GRAZING IS ABYSMAL.

The DEIS states, "The revised plan proposes no changes in the status, location, or boundaries of permitted range allotments or type of livestock." This is perhaps best explained where the DEIS states: Eliminating grazing is inconsistent with Forest Service policy. Opening and closing allotments or changing allotment boundaries are site-specific decisions not made in this forest plan revision process. The proposed revised forest plan and alternatives identify suitability for grazing and the DEIS discloses the effects of grazing on other resources. Alternatives are not designed to change boundaries, end grazing, or make site-specific changes to allotments. The proposed revised forest plan describes management direction, such as desired conditions for the variety of vegetation types within grazing allotments, that may result in future changes to allotment management plans.

The lack of scientific integrity of the DEIS's livestock analysis approaches that of its climate change analysis. For example, the DEIS states, "It has been hypothesized that grazed areas resulting in a lower soil water holding capacity and lower temperature sensitivity of soil respiration might release less CO₂ to the atmosphere through soil respiration under future precipitation and temperature scenarios." There you go-solve the climate crisis by increasing livestock grazing.

The DEIS then trots out "science" in support (p. 529), however nothing it cites actually resulted from direct measures of the claimed or modeled CO₂ benefits. The DEIS fails to address the conclusions of conflicting science, such as "Grazing and trampling reduces the capacity of soils to sequester carbon, and through various processes contributes to greenhouse warming." (Beschta et al., 2012).

The DEIS doesn't analyze or disclose noxious weed spread due to livestock grazing. The DEIS doesn't analyze or disclose soil damage due to livestock grazing. The DEIS doesn't analyze or disclose riparian habitat damage due to livestock grazing. The DEIS doesn't analyze or disclose the interaction between upland vegetation changes due to livestock grazing, fire behavior, and forest composition. The DEIS doesn't analyze or disclose the expected annual infrastructure maintenance and installation costs paid for by taxpayers for the benefit of livestock grazing. The DEIS does not analyze or disclose the costs and impacts of Wildlife Services destruction of wildlife species at the behest of grazing interests.

Beschta et al., 2012 provide a scientific basis for expecting significant environmental damage from livestock grazing that, based on the DEIS, the Forest Service is unaware of:

- * Climate impacts are compounded from heavy use by livestock and other grazing ungulates, which cause soil erosion, compaction, and dust generation; stream degradation; higher water temperatures and pollution; loss of habitat for fish, birds and amphibians; and desertification.
- * Encroachment of woody shrubs at the expense of native grasses and other plants can occur in grazed areas, affecting pollinators, birds, small mammals and other native wildlife.
- * Livestock grazing and trampling degrades soil fertility, stability and hydrology, and makes it vulnerable to wind erosion. This in turn adds sediments, nutrients and pathogens to western streams.
- * Water developments and diversion for livestock can reduce streamflows and increase water temperatures, degrading habitat for fish and aquatic invertebrates.
- * The advent of climate change has significantly added to historic and contemporary problems that result from cattle and sheep ranching.

Beschta et al., 2012 believe the burden of proof should be shifted. Those using public lands for livestock production should have to justify the continuation of ungulate grazing.

Some other key points Beschta et al. 2012, make are:

*If livestock use on public lands continues at current levels, its interaction with anticipated changes in climate will likely worsen soil erosion, dust generation, and stream pollution. Soils whose moisture retention capacity has been reduced will undergo further drying by warming temperatures and/or drought and become even more susceptible to wind erosion (Sankey and others 2009).

*(I)n 1994 the BLM and FS reported that western riparian areas were in their worst condition in history, and livestock use-typically concentrated in these areas-was the chief cause (BLM and FS 1994).

*Ohmart and Anderson (1986) suggested that livestock grazing may be the major factor negatively affecting wildlife in eleven western states. Such effects will compound the problems of adaptation of these ecosystems to the dynamics of climate change (Joyce and others 2008, 2009). Currently, the widespread and ongoing declines of many North American bird populations that use grassland and grass-shrub habitats affected by grazing are "on track to become a prominent wildlife conservation crisis of the 21st century" (Brennan and Kuvlesky 2005, p. 1)

*Climate change and ungulates, singly and in concert, influence ecosystems at the most fundamental levels by affecting soils and hydrologic processes. These effects, in turn, influence many other ecosystem components and processes-nutrient and energy cycles; reproduction, survival, and abundance of terrestrial and aquatic species; and community structure and composition. Moreover, by altering so many factors crucial to ecosystem functioning, the combined effects of a changing climate and ungulate use can affect biodiversity at scales ranging from species to ecosystems (FS 2007) and limit the capability of large areas to supply ecosystem services (Christensen and others 1996; MEA 2005b).

*The site-specific impacts of livestock use vary as a function of many factors (e.g., livestock species and density, periods of rest or non-use, local plant communities, soil conditions). Nevertheless, extensive reviews of published research generally indicate that livestock have had numerous and widespread negative effects to western ecosystems (Love 1959; Blackburn 1984; Fleischner 1994; Belsky and others 1999; Kauffman and Pyke 2001; Asner and others 2004; Steinfeld and others 2006; Thornton and Herrero 2010). Moreover, public-land range conditions have generally worsened in recent decades (CWWR 1996, Donahue 2007), perhaps due to the reduced productivity of these lands caused by past grazing in conjunction with a changing climate (FWS 2010, p. 13,941, citing Knick and Hanser 2011).

*Livestock use effects, exacerbated by climate change, often have severe impacts on upland plant communities. For example, ... areas severely affected include the northern Great Basin and interior Columbia River Basin (Middleton and Thomas 1997).

*Livestock grazing has numerous consequences for hydrologic processes and water resources. Livestock can have profound effects on soils, including their productivity, infiltration, and water storage, and these properties drive many other ecosystem changes. Soil compaction from livestock has been identified as an extensive problem on public lands (CWWR 1996; FS and BLM 1997). Such compaction is inevitable because the hoof of a 450-kg cow exerts more than five times the pressure of heavy earthmoving machinery (Cowley 2002). Soil compaction significantly reduces infiltration rates and the ability of soils to store water, both of which affect runoff processes (Branson and others 1981; Blackburn 1984). Compaction of wet meadow soils by livestock can significantly decrease soil water storage (Kauffman and others 2004), thus contributing to reduced summer base flows. Concomitantly, decreases in infiltration and soil water storage of compacted soils during periods of high-intensity rainfall contribute to increased surface runoff and soil erosion (Branson and others 1981). These fundamental alterations in hydrologic processes from livestock use are likely to be exacerbated by climate change.

*The combined effects of elevated soil loss and compaction caused by grazing reduce soil productivity, further compromising the capability of grazed areas to support native plant communities (CWWR 1996; FS and BLM 1997). Erosion triggered by livestock use continues to represent a major source of sediment, nutrients, and pathogens in western streams (WSWC 1989; EPA 2009).

*Historical and contemporary effects of livestock grazing and trampling along stream channels can destabilize streambanks, thus contributing to widened and/or incised channels (NRC 2002). Accelerated streambank erosion and channel incision are pervasive on western public lands used by livestock (Fig. 4). Stream incision contributes to desiccation of floodplains and wet meadows, loss of floodwater detention storage, and reductions in baseflow

(Ponce and Lindquist 1990; Trimble and Mendel 1995). Grazing and trampling of riparian plant communities also contribute to elevated water temperatures-directly, by reducing stream shading and, indirectly, by damaging streambanks and increasing channel widths (NRC 2002). Livestock use of riparian plant communities can also decrease the availability of food and construction materials for keystone species such as beaver (*Castor canadensis*).

*Livestock production impacts energy and carbon cycles and globally contributes an estimated 18% to the total anthropogenic greenhouse gas (GHG) emissions (Steinfeld and others 2006). How public-land livestock contribute to these effects has received little study. Nevertheless, livestock grazing and trampling can reduce the capacity of rangeland vegetation and soils to sequester carbon and contribute to the loss of above- and below-ground carbon pools (e.g., Lal 2001b; Bowker and others 2012). Lal (2001a) indicated that heavy grazing over the long-term may have adverse impacts on soil organic carbon content, especially for soils of low inherent fertility. Although Gill (2007) found that grazing over 100 years or longer in subalpine areas on the Wasatch Plateau in central Utah had no significant impacts on total soil carbon, results of the study suggest that "if temperatures warm and summer precipitation increases as is anticipated, [soils in grazed areas] may become net sources of CO₂ to the atmosphere" (Gill 2007, p. 88). Furthermore, limited soil aeration in soils compacted by livestock can stimulate production of methane, and emissions of nitrous oxide under shrub canopies may be twice the levels in nearby grasslands (Asner and others 2004). Both of these are potent GHGs.

*Managing livestock on public lands also involves extensive fence systems. Between 1962 and 1997, over 51,000 km of fence were constructed on BLM lands with resident sage-grouse populations (FWS 2010). Such fences can significantly impact this wildlife species. For example, 146 sage-grouse died in less than three years from collisions with fences along a 7.6-km BLM range fence in Wyoming (FWS 2010). Fences can also restrict the movements of wild ungulates and increase the risk of injury and death by entanglement or impalement (Harrington and Conover 2006; FWS 2010). Fences and roads for livestock access can fragment and isolate segments of natural ecological mosaics thus influencing the capability of wildlife to adapt to a changing climate.

*(L)ivestock use (particularly cattle) on these lands exert disturbances without evolutionary parallel (Milchunas and Lauenroth 1993; MEA 2005a). ...The combined effects of ungulates (domestic, wild, and feral) and a changing climate present a pervasive set of stressors on public lands, which are significantly different from those encountered during the evolutionary history of the region's native species. The intersection of these stressors is setting the stage for fundamental and unprecedented changes to forest, arid, and semi-arid landscapes in the western US (Table 1) and increasing the likelihood of alternative states. Thus, public-land management needs to focus on restoring and maintaining structure, function, and integrity of ecosystems to improve their resilience to climate change (Rieman and Isaak 2010).

*Natural floods provide another illustration of how ungulates can alter the ecological role of disturbances. High flows are normally important for maintaining riparian plant communities through the deposition of nutrients, organic matter, and sediment on streambanks and floodplains, and for enhancing habitat diversity of aquatic and riparian ecosystems (CWWR 1996). Ungulate effects on the structure and composition of riparian plant communities (e.g., Platts 1991; Chadde and Kay 1996), however, can drastically alter the outcome of these hydrologic disturbances by diminishing streambank stability and severing linkages between high flows and the maintenance of streamside plant communities. As a result, accelerated erosion of streambanks and floodplains, channel incision, and the occurrence of high instream sediment loads may become increasingly common during periods of high flows (Trimble and Mendel 1995). Similar effects have been found in systems where large predators have been displaced or extirpated (Beschta and Ripple 2012). In general, high levels of ungulate use can essentially uncouple typical ecosystem responses to chronic or acute disturbances, thus greatly limiting the capacity of these systems to provide a full array of ecosystem services during a changing climate.

*(F)ederal grazing fees on BLM and FS lands cover only about one-sixth of the agencies' administration costs (Vincent 2012).

NEPA regulations at 40 CFR § 1502.24 state, under Methodology and scientific accuracy: "Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements." The DEIS violates NEPA in terms of methodology, scientific accuracy, scientific integrity, and failure to properly analyze and disclose cumulative effects.

IX. WEEDS

Nothing even suggest that weeds are being reduced on the Forest, even though the Forest Service has been relying upon measures such as "the Pacific Northwest Region Invasive Plant Program Preventing and Managing Invasive Plants Record of Decision (USDA Forest Service 2005)" which would be "common to all alternatives."

The DEIS admits, "Alternative P would result in an elevated level of risk for invasive plants compared to the no-action alternative and that which has been experienced under the existing 1988 Plan. This is because the amount of suitable forestlands is predicted to increase."

Despite the token measures now being taken, as the DEIS admits the soil disturbing actions would only worsen the problem. The DFP contains no direction to reign in its unsustainable management, including weed spread. The impacts on other key resources from this out-of-control weed spread are not analyzed or disclosed in the DEIS.

What is the purpose for the DEIS presenting Table 43, which predicts that acres of noxious weeds would be reduced from over 20,000 to zero in 15 years? The DEIS says it's unrealistic, and "only being used as an analysis tool." Why use tools that don't work?

X. SCIENTIFIC INTEGRITY

A substantial portion of the DEIS's analysis relies upon the use models. The Forest Service has not determined the reliability of all the data used as input for the models used. Since "an instrument's data must be reliable if they are valid" (Huck, 2000) this means the data that is input to a model must accurately measure that aspect of the world it is claimed to measure, or else the data is invalid for use by that model. Huck, 2000 states:

The basic idea of reliability is summed up by the word consistency. Researchers can and do evaluate the reliability of their instruments from different perspectives, but the basic question that cuts across these various perspectives (and techniques) is always the same: "To what extent can we say the data are consistent?" ...(T)he notion of consistency is at the heart of the matter in each case.

...(R)eliability is conceptually and computationally connected to the data produced by the use of a measuring instrument, not to the measuring instrument as it sits on the shelf.

Beck and Suring, 2011 "remind practitioners that if available data are poor quality or fail to adequately describe variables critical to the habitat requirements of a species, then only poor quality outputs will result. Thus, obtaining quality input data is paramount in modeling activities."

Larson et al. 2011 state: "Although the presence of sampling error in habitat attribute data gathered in the field is well known, the measurement error associated with remotely sensed data and other GIS databases may not be as widely appreciated."

During litigation of a timber sale on the Kootenai NF, the Forest Service criticized a report provided by Plaintiffs, stating "(Its) purported 'statistical analysis' reports no confidence intervals, standard deviations or standard errors in association with its conclusions."

As Huck (2000) states, the issue of "standard deviations or standard errors" that the Forest Service raised in the context of litigation relates to the reliability of the data, which in turn depends upon how well-trained the data-gatherers are with their measuring tools and measuring methodology. In other words, different measurements of

the same phenomenon must result in numbers that are very similar to result in small "standard deviations or standard errors" and thus high reliability coefficients, which in turn provide the public and decisionmakers with an idea of how confident they can be in the conclusions drawn from the data.

The next level of scientific integrity is the notion of "validity." As Huck, (2000) explains, the degree of "content validity," or accuracy of the model or methodology is established by utilizing other experts. This, in turn, demonstrates the necessity for utilizing the peer review process. The validity of the various models utilized in the DEIS analyses have not been established for how agency utilizes them. No studies are cited which establishes their content validity, and no independent expert peer review process of the models has occurred.

So even if FS data input to a model is reliable, that still leaves open the question of model validity. In other words, are the models scientifically appropriate for the uses for which the Forest Service is utilizing them?

Next, best available science is discussed, and the need for independent peer review and objectivity in relation to how science is used by the Forest Service in its planning and decisionmaking.

A scientist from the research arm of the Forest Service, Ruggiero, 2007 stated, "Independence and objectivity are key ingredients of scientific credibility, especially in research organizations that are part of a natural resource management agency like the Forest Service. Credibility, in turn, is essential to the utility of scientific information in socio-political processes."

Ruggiero, 2007 points out that the Forest Service's scientific research branch is distinct from its management branch:

The Forest Service is comprised of three major branches: the National Forest System (managers and policy makers for National Forests and National Grasslands), Research and Development (scientists chartered to address issues in natural resource management for numerous information users, including the public), and State and Private Forestry (responsible for providing assistance to private and state landowners). This article is directed toward the first two branches.

The relationship between the National Forest System and the Forest Service Research and Development (Research) branches is somewhat hampered by confusion over the respective roles of scientists (researchers) and managers (policy makers and those that implement management policy). For example, some managers believe that scientists can enhance a given policy position or management action by advocating for it. This neglects the importance of scientific credibility and the difference between advocating for one's research versus advocating for or against a given policy. Similarly, some scientists believe the best way to increase funding for research is to support management policies or actions. But, as a very astute forest supervisor once told me, "Everyone has a hired gun...they are not credible...and we need you guys [Forest Service Research] to be credible."

The Forest Service Manual (FSM) provides direction on how to implement statutes and related regulations. FSM 4000 - Research and Development Chapter 4030 states: "To achieve its Research and Development (R&D) program objectives, the Forest Service shall ... maintain the R&D function as a separate entity ... with clear accountability through a system that maintains scientific freedom..." (Emphasis added).

Ruggiero, 2007 discusses the risk to scientific integrity if that separation is not maintained, that is, if politics overly influences the use of scientific research:

This separation also serves to keep conducting science separate from formulating policy and the political ramifications of that process. The wisdom here is that science cannot be credible if it is politicized. Science should not be influenced by managers, and scientists should not establish policy. This logic keeps scientific research "independent" while ensuring that policy makers are free to consider factors other than scientific understandings. Thus, science simply informs decision making by land managers. As the new forest planning

regulations clearly state, those responsible for land management decisions must consider the best available science and document how this science was applied (Federal Register 70(3), January 5, 2005; Section 219.11(4); p. 1059).

So with Ruggiero, 2007 the Forest Service itself recognizes there is a fundamental need to demonstrate the proper use of scientific information, in order to overcome issues of decisionmaking integrity that arise from bureaucratic inertia and political influence.

The Forest Service prepared Guldin et al. (2003) which:

...outlines a process called the science consistency review, which can be used to evaluate the use of scientific information in land management decisions. Developed with specific reference to land management decisions in the U.S. Department of Agriculture Forest Service, the process involves assembling a team of reviewers under a review administrator to constructively criticize draft analysis and decision documents. Reviews are then forwarded to the responsible official, whose team of technical experts may revise the draft documents in response to reviewer concerns. The process is designed to proceed iteratively until reviewers are satisfied that key elements are consistent with available scientific information. (Emphases added.)

In other words, the FS can cite all the "best available science" it wants in preparing a NEPA document, but it's another matter entirely whether or not the proposal is consistent with the science cited. The Forest Service should conduct a science consistency review to lend scientific credibility of its DEIS and DFP.

Schultz (2010) provides a critique of FS wildlife analyses, and recommends peer review of large-scale assessments and management guidelines, and more robust, scientifically sound monitoring, and measurable objectives and thresholds for maintaining viable populations of all native and desirable non-native wildlife species.

Next is discussed the various levels of scientific review characteristic of studies the Forest Service typically cites, addressing the issue of what is "best available science."

Sullivan et al. 2006 state that "Peer-reviewed literature ...is considered the most reliable mainly because it has undergone peer review." They explain:

Peer review.-A basic precept of science is that it must be verifiable, and this is what separates science from other methods of understanding and interpreting nature. The most direct method of verification is to redo the study or experiment and get the same results and interpretations, thus validating the findings. Direct verification is not always possible for nonexperimental studies and is often quite expensive and time-consuming. Instead, scientists review the study as a community to assess its validity. This latter approach is the process of peer review, and it is necessary for evaluating and endorsing the products of science. The rigor of the peer review is one way to assess the degree to which a scientific study is adequate for informing management decisions.

Sullivan et al. 2006 contrast peer-reviewed literature with gray literature which:

...does not typically receive an independent peer review but which may be reviewed in-house, that is, within the author's own institution. ...Gray literature, such as some agency or academic technical reports ...commonly contains reports of survey, experimental or long-term historical data along with changes in protocols, meta-data, and the progress and findings of standard monitoring procedures.

As does Ruggiero, 2007, Sullivan et al., 2006 discusses the dangers of the "Politicization of Science":

Many nonscientists and scientists believe that science is being increasingly politicized. Articles in newspapers (e.g., Broad and Glanz 2003) and professional newsletters document frequent instances in which the process and products of science are interfered with for political or ideological reasons. In these cases, the soundness of science, as judged by those interfering, turns on the extent to which the evidence supports a particular policy stance or goal. ...Politicization is especially problematic for scientists supervised by administrators who may not

feel the need to follow the same rules of scientific rigor and transparency that are required of their scientists.

Agency expert opinion and gray literature relied upon in the DEIS is not necessarily the same as "the best scientific information" available. Sullivan et al., 2006 discuss the concept of best available science in the context of politically influenced management:

Often, scientific and political communities differ in their definition of best available science and opposing factions misrepresent the concept to support particular ideological positions. Ideally, each policy decision would include all the relevant facts and all parties would be fully aware of the consequences of a decision. But economic, social, and scientific limitations often force decisions to be based on limited scientific information, leaving policymaking open to uncertainty.

The American Fisheries Society and the Estuarine Research Federation established this committee to consider what determines the best available science and how it might be used to formulate natural resource policies and shape management actions. The report examines how scientists and nonscientists perceive science, what factors affect the quality and use of science, and how changing technology influences the availability of science. Because the issues surrounding the definition of best available science surface when managers and policymakers interpret and use science, this report also will consider the interface between science and policy and explore what scientists, policymakers, and managers should consider when implementing science through decision making.

As part of their implicit contract with society, environmental scientists are obliged to communicate their knowledge widely to facilitate informed decision making (Lubchenco 1998). For nonscientists to use that knowledge effectively and fairly, they must also understand the multifaceted scientific process that produces it.

Science is a dynamic process that adapts to the evolving philosophies of its practitioners and to the shifting demands of the society it serves. Unfortunately, these dynamics are often controversial for both the scientific community and the public. To see how such controversies affect science, note that over the last decade nonscientists have exerted increasing influence on how science is conducted and how it is applied to environmental policy. Many observers find this trend alarming, as evidenced by several expositions titled "science under siege" (e.g., Wilkinson 1998; Trachtman and Perrucci 2000).

To achieve high-quality science, scientists conduct their studies using what is known as the scientific process, which typically includes the following elements:

- *A clear statement of objectives;
- *A conceptual model, which is a framework for characterizing systems, stating assumptions, making predictions, and testing hypotheses;
- *A good experimental design and a standardized method for collecting data;
- *Statistical rigor and sound logic for analysis and interpretation;
- *Clear documentation of methods, results, and conclusions; and
- *Peer review.

The Committee of Scientists (1999) state:

To ensure the development of scientifically credible conservation strategies, the Committee recommends a process that includes (1) scientific involvement in the selection of focal species, in the development of measures of species viability and ecological integrity, and in the definition of key elements of conservation strategies; (2) independent scientific review of proposed conservation strategies before plans are published; (3) scientific involvement in designing monitoring protocols and adaptive management; and (4) a national scientific committee to advise the Chief of the Forest Service on scientific issues in assessment and planning.

NEPA states that "Accurate scientific analysis... (is) essential to implementing NEPA." And the NEPA regulations at 40 CFR § 1502.24 ("Methodology and scientific accuracy") state:

Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements. They shall identify any methodologies used and shall make explicit reference by footnote to the scientific and other sources relied upon for conclusions in the statement. An agency may place discussion of methodology in an appendix.

The DEIS violates NEPA in terms of methodology, scientific accuracy, and scientific integrity.

XI. ECONOMICS

The economics analysis is all about justifying management by expounding upon the benefits to the local economy. On the other hand the costs to U.S. taxpayers for all these local focus benefits are not analyzed or disclosed. The externalized costs of the existing and subsequent environmental damage due to management actions and other human activities are also not considered.

From the DEIS, there is no way to assess the efficiency of alternatives towards the assumed benefits. The costs of units of management activity were not analyzed. One might wonder what the expected costs might be of noxious weed treatments over the life of the revised forest plan, as they vary per alternative. Forget that. What about the taxpayer investment per board feet produced? Nada. What dollar amount per grazed Animal Unit Month or accumulated pound of beef does the taxpayer spend with its subsidies to the ranchers? It isn't in there.

What would it cost to achieve Desired Conditions for road densities for each alternative under the revised forest plan, for the 15 years of expected implementation? Nothing there.

It would be consistent with the DEIS's outlook if the DEIS expressed the benefits of creating more jobs for the local economy by increasing the amount of noxious weed treatments.

Ecosystem services were not analyzed. Check the 2012 Planning Rule for why this is important.

XII. WILDERNESS AND ROADLESS AREAS

"In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness."

-The Wilderness Act of 1964

The process that the Forest Service used to evaluate roadless lands for potential wilderness recommendation is of concern. The criteria were not used properly. The overwhelming public sentiment expressed in public comments on the National Roadless Rule was to maintain the wild character of these areas. There is no rational reason to manage any of the Roadless Areas in any manner that would reduce their Wilderness character and therefore diminish the chances that Congress would designate them under the Wilderness Act.

The DEIS fails to consider the wide body of research revealing that counties adjacent to Wilderness areas and National Parks show better economic sustainability than counties heavily reliant upon resource extraction. This skewed use of science violates NEPA.

The DEIS states that motorized recreation would be "suitable" in Recommended Wilderness "if motorized use occurred prior to identification as recommended wilderness." However, this is directly contradicted elsewhere

where it states this previous motorized use would stop:

(R)ecreation opportunities that would not conform to wilderness management direction (mountain biking, motorized trail use, motorized trail maintenance and reconstruction, historic structure maintenance, and rental cabin management) would not be allowed to continue prior to designation of the recommended wilderness areas as wilderness by Congress.

XIII. COLLABORATION

The proponents of alternative B consider it good balance because it proposes the most CNF acreage as Recommended Wilderness. However, the very small increment of protection via recommended wilderness provided by Alternative B, over and above the existing protections availed by the Roadless Rule, do not justify the increased level of industrialization this alternative promotes. As described in the DEIS:

Implementation of alternative B is expected to contribute the least to MIS/focal species viability compared to all alternatives except the no-action alternative (table 70 in the no-action alternative). The relatively low contribution is due to maintaining the current amount of road mileage on the Forest, a significant amount of the Forest in the Active Management MA and the relatively small number of key watersheds. Alternative B also maintains the INFISH ACS, which after 20 years is showing some slow improvement in stream habitat, but most subwatersheds and stream habitat is, and may be expected to continue to be, in a functioning at risk or not properly functioning state with watershed conditions not generally considered conducive for strong fish populations.

...the pace of watershed restoration is not increased from current levels.

The DEIS also estimates that, for terrestrial ecosystems the intensity of logging under Alternative B would cause the most impact of all alternatives except for No Action.

The DEIS evaluates the other collaborated alternative, O, as being second worst for terrestrial and aquatic ecosystems, except for No Action.

The nature of these two alternatives is not surprising, given the narrow interests represented at the tables of the two collaborative syndicates. The much wider public interest of the owners of this national forest, in general, is not of much concern of narrow vested interests.

XIV. A BETTER ALTERNATIVE

This is to propose, for full analysis in a Supplemental Draft EIS, a Citizen Alternative (C) informed by sound scientific principles and sets a positive future for the Colville National Forest, one which emphasize the outstanding wild, natural and appropriate recreational values for this remarkable place. It would also take advantage of the opportunity to create economic benefits through citizen appreciation of nature while providing genuine restoration work such as road decommissioning.

Each of the alternatives currently featured in the DEIS can be conceptualized as being from the Industrial/Anthropocentric paradigm, as described by Wuerthner, 2006a:

- *Views fire as a threat
- *Thinks in terms of utility (use and exchange value)
- *Takes a narrow/specialist view
- *Considers the short term
- *Promotes the welfare of individuals
- *Has a simplistic understanding of how natural systems function

- *Sees natural processes as mechanical and able to be controlled
- *Ignores extinction
- *Advocates biologically unsustainable solutions
- *Holds human cleverness to be the measure of the appropriateness of any action

In contrast, the philosophy and worldview defining an Alternative C is "Ecological/Biocentric" (Id):

- *Sees fire as an integral part of the ecosystem
- *Thinks in terms of intrinsic worth (existence is valued for its own sake)
- *Takes a wide/holistic view
- *Considers the long term
- *Promotes the public welfare
- *Has a nuanced understanding of the complexity of natural systems
- *Recognizes that nature operates beyond human control
- *Considers species extinction to be a critical issue.
- *Advocates biologically sustainable solutions
- *Holds nature's wisdom to be the measure of the appropriateness of any action

Alternative C does not mean no active management, nor would it institute a total "hands off" approach to management, or end all commercial uses entirely. Instead, it would reduce such uses to levels that are truly sustainable, based upon independently peer-reviewed scientific analyses.

Alternative C would replace the presently proposed Desired Conditions by focusing on natural processes as the creators of Desired Conditions, instead of their being instituted artificially. What the Forest Service has promoted with its DFP is the human control of the forest ecosystem through mechanical means in order to maintain unnatural stasis by eliminating, suppressing or altering natural disturbances such as wildfire, to facilitate the extraction of commercial resources for human use.

Ecological resilience, which the DEIS implies the agency is instituting, is not the absence of natural disturbances like wildfire or beetle kill, rather it is the opposite (DellaSala and Hanson, 2015, Chapter 1, pp. 12-13).

Ultimately the DEIS and DFP reflect an overriding bias favoring resource extraction via "management" needed to "make progress toward" selected Desired Conditions, such as a certain numbers, species, and sizes/ages of trees and snags, along the way neglecting many other structures and compositional features, and especially the ecological processes ("function") driving these ecosystems. Essentially the Forest Service rigs the game, as many Desired Conditions would only be achievable by resource extractive activities. But since Desired Conditions must be maintained through repeated management/manipulation the management paradigm would be at odds with natural processes-the real drivers of the ecosystem. McClelland (undated) criticizes the aim to achieve desired conditions by the use of mitigation measures calling for retention of specific numbers of certain habitat structures:

The snags per acre approach is not a long-term answer because it concentrates on the products of ecosystem processes rather than the processes themselves. It does not address the most critical issue-long-term perpetuation of diverse forest habitats, a mosaic pattern which includes stands of old-growth larch. The processes that produce suitable habitat must be retained or reinstated by managers. Snags are the result of these processes (fire, insects, disease, flooding, lightning, etc.).

(Emphases added.) Wales, et al. 2007 modeled various potential outcomes of fire and fuel management scenarios on the structure of forested habitats in northeast Oregon. They projected that the natural disturbance scenario resulted in the highest amounts of all types of medium and large tree forests combined and best emulated the Natural Range of Variability for medium and large tree forests by potential vegetation type after several decades. Restoring the natural disturbances regimes and processes is the key to restoring forest structure and functionality similar to historical conditions.

There is scientific certainty that climate change has reset the deck for future ecological conditions. For example, Sallabanks, et al., 2001:

(L)ong-term evolutionary potentials can be met only by accounting for potential future changes in conditions. ...Impending changes in regional climates ...have the capacity for causing great shifts in composition of ecological communities.

In other words, the Desired Conditions the DFP relies upon must be evaluated in the context of how realistic-or even "desirable"-achieving them really is in the context of rapidly changing climate.

Hayward, 1994 states:

Despite increased interest in historical ecology, scientific understanding of the historic abundance and distribution of montane conifer forests in the western United States is not sufficient to indicate how current patterns compare to the past. In particular, knowledge of patterns in distribution and abundance of older age classes of these forests is not available. ...Current efforts to put management impacts into a historic context seem to focus almost exclusively on what amounts to a snapshot of vegetation history-a documentation of forest conditions near the time when European settlers first began to impact forest structure. ...The value of the historic information lies in the perspective it can provide on the potential variation... I do not believe that historical ecology, emphasizing static conditions in recent times, say 100 years ago, will provide the complete picture needed to place present conditions in a proper historic context. Conditions immediately prior to industrial development may have been extraordinary compared to the past 1,000 years or more. Using forest conditions in the 1800s as a baseline, then, could provide a false impression if the baseline is considered a goal to strive toward.

Frissell and Bayles (1996) ask:

From the point of view of many aquatic species, the range of natural variability at any one site would doubtless include local extirpation. At the scale of a large river basin, management could remain well within such natural extremes and we would still face severe degradation of natural resource and possible extinction of species (Rhodes et al., 1994). The missing element in this concept is the landscape-scale pattern of occurrence of extreme conditions, and patterns over space and time of recovery from such stressed states. How long did ecosystems spend in extreme states vs. intermediate or mean states? Were extremes chronologically correlated among adjacent basins, or did asynchrony of landscape disturbances provide for large-scale refugia for persistence and recolonization of native species? These are critical questions that are not well addressed under the concept of range of natural variability as it has been framed to date by managers.

...The concept of range of natural variability also suffers from its failure to provide defensible criteria about which factors ranges should be measured. Proponents of the concept assume that a finite set of variables can be used to define the range of ecosystem behaviors, when ecological science strongly indicates many diverse factors can control and limit biota and natural resource productivity, often in complex, interacting, surprising, and species-specific and time-variant ways. Any simple index for measuring the range of variation will likely exclude some physical and biotic dimensions important for the maintenance of ecological integrity and native species diversity. (Bold emphasis added.)

The Forest Service's strategy of "making progress toward" Desired Conditions (e.g., resilience) basically focuses upon static conditions, instead of the natural dynamics of the ecosystem. An abundance of scientific evidence suggests that Desired Conditions conceptually be replaced with desired future dynamics, to align with best available science. Kauffman, 2004 states:

Restoration entails much more than simple structural modifications achieved through mechanical means. Restoration should be undertaken at landscape scales and must allow for the occurrence of dominant ecosystem processes, such as the natural fire regimes achieved through natural and/or prescribed fires at appropriate temporal and spatial scales.

Desired Conditions must be instead written as desired future dynamics in order to be consistent with the best available science. Hessburg and Agee (2003) for example, state:

Patterns of structure and composition within existing late-successional and old forest reserve networks will change as a result of wildfires, insect outbreaks, and other processes. What may be needed is an approach that marries a short-term system of reserves with a long-term strategy to convert to a continuous network of landscapes with dynamic properties. In such a system, late-successional and old forest elements would be continuously recruited, but would shift semi-predictably in landscape position across space and time. Such an approach would represent a planning paradigm shift from NEPA-like desired future conditions, to planning for landscape-scale desired future dynamics.

(Emphasis added.) Likewise, Sallabanks et al., 2001 state:

Given the dynamic nature of ecological communities in Eastside (interior) forests and woodlands, particularly regarding potential effects of fire, perhaps the very concept of defining "desired future conditions" for planning could be replaced with a concept of describing "desired future dynamics."

(Emphasis added.) There is plenty of support in the scientific literature for such an approach. Noss 2001, for example, believes "If the thoughtfully identified critical components and processes of an ecosystem are sustained, there is a high probability that the ecosystem as a whole is sustained." (Emphasis added.) Noss, 2001 describes basic ecosystem components:

Ecosystems have three basic components: composition, structure, and function. Together, they define biodiversity and ecological integrity and provide the foundation on which standards for a sustainable human relationship with the earth might be crafted.

(Emphasis added.) Noss, 2001 goes on to define those basic components:

Composition includes the kinds of species present in an ecosystem and their relative abundances, as well as the composition of plant associations, floras and faunas, and habitats at broader scales. We might describe the composition of a forest, from individual stands to watersheds and regions.

Structure is the architecture of the forest, which includes the vertical layering and shape of vegetation and its horizontal patchiness at several scales, from within stands (e.g., treefall gaps) to landscape patterns at coarser scales. Structure also includes the presence and abundance of such distinct structural elements as snags (standing dead trees) and downed logs in various size and decay classes.

Function refers to the ecological processes that characterize the ecosystem. These processes are both biotic and abiotic, and include decomposition, nutrient cycling, disturbance, succession, seed dispersal, herbivory, predation, parasitism, pollination, and many others. Evolutionary processes, including mutation, gene flow, and natural selection, are also in the functional category.

(Emphasis added.) Hutto, 1995 also addresses natural processes, referring specifically to fire:

Fire is such an important creator of the ecological variety in Rocky Mountain landscapes that the conservation of biological diversity [required by NFMA] is likely to be accomplished only through the conservation of fire as a process...Efforts to meet legal mandates to maintain biodiversity should, therefore, be directed toward maintaining processes like fire, which create the variety of vegetative cover types upon which the great variety of wildlife species depend.

(Emphasis added.) Noss and Cooperrider (1994) state:

Considering process is fundamental to biodiversity conservation because process determines pattern. Six interrelated categories of ecological processes that biologists and managers must understand in order to effectively conserve biodiversity are (1) energy flows, (2) nutrient cycles, (3) hydrologic cycles, (4) disturbance regimes, (5) equilibrium processes, and (6) feedback effects.

(Emphasis added.) The Environmental Protection Agency (1999) recognizes the primacy of natural processes: (E)cological processes such as natural disturbance, hydrology, nutrient cycling, biotic interactions, population dynamics, and evolution determine the species composition, habitat structure, and ecological health of every site and landscape. Only through the conservation of ecological processes will it be possible to (1) represent all native ecosystems within the landscape and (2) maintain complete, unfragmented environmental gradients among ecosystems.

(Emphasis added.) Forest Service researcher Everett (1994) states:

To prevent loss of future options we need to simultaneously reestablish ecosystem processes and disturbance effects that create and maintain desired sustainable ecosystems, while conserving genetic, species, community, and landscape diversity and long-term site productivity.

...We must address restoration of ecosystem processes and disturbance effects that create sustainable forests before we can speak to the restoration of stressed sites; otherwise, we will forever treat the symptom and not the problem. ... One of the most significant management impacts on the sustainability of forest ecosystems has been the disruption of ecosystem processes through actions such as fire suppression (Mutch and others 1993), dewatering of streams for irrigation (Wissmar and others 1993), truncation of stand succession by timber harvest (Walstad 1988), and maintaining numbers of desired wildlife species such as elk in excess of historical levels (Irwin and others 1993). Several ecosystem processes are in an altered state because we have interrupted the cycling of biomass through fire suppression or have created different cycling processes through resource extraction (timber harvest, grazing, fish harvest).

(Emphasis added.) Hessburg and Agee 2003 also emphasize the primacy of natural processes for management purposes:

Ecosystem management planning must acknowledge the central importance of natural processes and pattern-process interactions, the dynamic nature of ecological systems (Attiwill, 1994), the inevitability of uncertainty and variability (Lertzman and Fall, 1998) and cumulative effects (Committee of Scientists, 1999; Dunne et al., 2001).

(Emphasis added.) Further, Collins and Stephens (2007) suggest direction to implement restoring the process of fire by educating the public:

(W)hat may be more important than restoring structure is restoring the process of fire (Stephenson 1999). By allowing fire to resume its natural role in limiting density and reducing surface fuels, competition for growing space would be reduced, along with potential severity in subsequent fires (Fule and Laughlin 2007). As a result, we contend that the forests in Illilouette and Sugarloaf are becoming more resistant to ecosystem perturbations (e.g. insects, disease, drought). This resistance could be important in allowing these forests to cope with projected changes in climate. ... Although it is not ubiquitously applicable, (wildland fire use) could potentially be a cost-effective and ecologically sound tool for "treating" large areas of forested land. Decisions to continue fire suppression are politically safe in the short term, but ecologically detrimental over the long term. Each time the decision to suppress is made, the risk of a fire escaping and causing damage (social and economic) is essentially deferred to the future. Allowing more natural fires to burn under certain conditions will probably mitigate these risks. If the public is encouraged to recognize this and to become more tolerant of the direct, near-term consequences (i.e. smoke production, limited access) managers will be able to more effectively use fire as a tool for restoring forests over the long term.

The Forest Service has recognized that natural processes are vital for achieving ecological integrity. USDA Forest Service, 2009a incorporates "ecological integrity" into its concept of "forest health" thus:

"(E)cological integrity": Angermeier and Karr (1994), and Karr (1991) define this as:

The capacity to support and maintain a balanced, integrated, and adaptive biological system having the full range of elements and processes expected in a region's natural habitat.

"...the ability to support and maintain a balanced, integrated, adaptive community of organisms having a species composition, diversity, and functional organization comparable to that of the natural habitat of the region." That is,

an ecosystem is said to have high integrity if its full complement of native species is present in normal distributions and abundances, and if normal dynamic functions are in place and working properly. In systems with integrity, the "...capacity for self-repair when perturbed is preserved, and minimal external support for management is needed."

That last sentence provides a measure of resilience that the DEIS doesn't acknowledge. In their conclusion, Hessburg and Agee, 2003 state "Desired future conditions will only be realized by planning for and creating the desired ecosystem dynamics represented by ranges of conditions, set initially in strategic locations with minimal risks to species and processes."

Alternative C would reduce carbon emissions and promotes climate stability by emphasizing carbon-storage in trees, down wood, and soils in the forest. Alternative C would reduce the use of motorized vehicles and fossil fuels.

Alternative C would protect all roadless areas so they maintain the characteristics necessary to be designated as Wilderness by Congress in the future.

Alternative C would maintain and/or restore the elements which characterize good native fish habitat and high water quality by including enforceable standards that protect clean and cold water and complex, connected and comprehensive habitats.

Alternative C would protect and restore soils, the building blocks for healthy tree and vegetation growth so vital for wildlife food and shelter by including meaningful and enforceable standards to protect soils as required by law.

Alternative C would curtail domestic livestock grazing so it does not negatively affect watersheds and fish habitat.

Alternative C would allow fire to perform its necessary ecosystem rejuvenating function over much of the forest, saving fire suppression costs markedly.

Alternative C would allow insects and disease to play their ecological functions.

Alternative C would allow natural recovery and restoration in areas damaged by past development practices.

Alternative C would allow protect old-growth forest habitat and allows mature forests to develop old-growth characteristics such as large snags, down woody material and other habitat components so vital for many wildlife and bird species.

Alternative C would curtail clearcutting and other silvicultural prescriptions that leave large openings, which cause edge effects that fragment the landscape.

Alternative C would adopt enforceable standards that are informed by monitoring. Management activities which risk water and soil resources, wildlife habit or other ecological components would only be allowed if monitoring determines that current conditions are meeting standards and the activity won't degrade natural resources.

Alternative C would provide wildlife linkage corridors so that animals can move unimpeded across the landscape, facilitating migration and genetic interchange, and emphasizes connecting old-growth forest habitat.

Alternative C would reduce the roads network to improve wildlife security and watershed integrity, while also providing good paying restoration jobs. Alternative C would use a scientific approach to set the minimum road system necessary to manage the forest within expected budgets. Alternative C would reduce road maintenance

costs to an affordable level by calibrating the road system to these anticipated future budgets. Alternative C would set maximum road density standards to minimize the backlog in road maintenance and meet the biological needs of terrestrial and aquatic species.

Alternative C would provide a diversity of recreational and access opportunities by emphasizing non-motorized access.

Alternative C would include Plan Components reflecting the agency's duty to designate motorized trails and areas to minimize impacts to forest resources and other users as required by Executive Order 11989 and 36 CFR 212.55 and recently affirmed in a federal court decision (see Idaho Conservation League v. Guzman, 2011 WL 447456 (D. Idaho Feb. 4, 2011)).

XV. FOREST PLAN MONITORING

The Draft Forest Plan's management direction is open to so much agency discretion with regards to Desired Conditions, etc. that the Forest Service is unlikely to know if their attainment is being approached. The Monitoring Program and the ideals of "adaptive management" can only be realized with strong Plan Components backed by monitoring elements based upon their achievement and compliance, with scientifically-based monitoring design.

XVI. COMPLIANCE WITH NFMA PLANNING REGULATIONS

The CNF elected to use the provisions of the 1982 planning rule for the plan revisions. Yet a striking feature of the Draft Forest Plan is the relative absence of explicit reference to the 1982 36 CFR 219 planning rule-the guiding NFMA implementing regulations. This makes it difficult to see how the Draft Plan is prepared and meant to be consistent with and grounded in regulations written to fundamentally guide planning under NFMA.

Also, the DEIS makes many references to the 2012 Planning Rule. Neither the DFP nor the DEIS sort out the confusion of exactly what portions of which rules must be taken as legally binding direction.

CONCLUSION

The range of alternatives and analyses in the DFP and DEIS are insufficient to comply with laws, regulations, and policies. A Draft Supplemental Environmental Impact Statement is needed.

I appreciate the opportunity to comment on the revision of the CNF forest plan. A full list of scientific literature and other documents cited is forthcoming.

Sincerely,

...and on behalf of:

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List of cites from my Draft Colville National Forest Plan / Draft EIS comments

As promised, attached is the full list of scientific literature and other documents I cited in my Draft Forest Plan/EIS comments.

My intention is for the Forest Service to include each of those articles in the planning record, since I cited them. Let me know if you need a copy of any of them.

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