OREGON WILD

19 Sept 2022

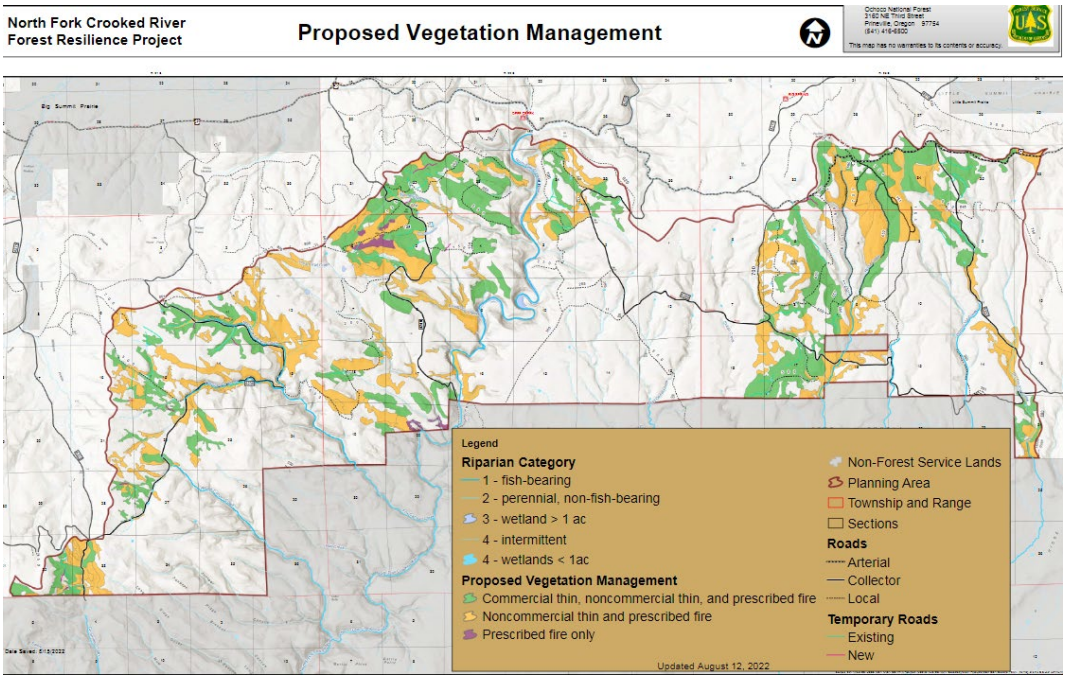
TO: Johanna Kovarik, District Ranger, Ochoco National Forest
VIA: Brianna.Goehring@usda.gov

Subject: North Fork Crooked River Forest Resilience Project — scoping comments

Please accept the following scoping comments from Oregon Wild concerning the North Fork Crooked River Forest Resilience Project, https://www.fs.usda.gov/project/?project=61651. Oregon Wild represents 20,000 members and supporters who share our mission to protect and restore Oregon's wildlands, wildlife, and water as an enduring legacy. Our goal is to protect areas that remain intact while striving to restore areas that have been degraded. This can be accomplished by moving over-represented ecosystem elements (such as logged and roaded areas) toward characteristics that are currently under-represented (such as roadless areas and complex old forest).

The proposed action includes:

- 4800 acres commercial logging
- 5000 acres non-commercial thinning and prescribed fire
- Various transportation management changes including some road closures and decommissioning



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The focus on commercial thinning for fuel reduction is misplaced in this landscape. Fuels are already heterogeneous with extensive grasslands separating forested areas.

The climate change emphasis is lopsidedly focused on density reduction instead of carbon storage, avoiding cumulative stress from compound disturbances, protecting cool/moist microclimate, shade, and undisturbed soil, etc.

The alternatives should include modified grazing practices that advance the purpose and need. Focusing heavily on mechanical vegetation management while ignoring livestock that cause inter-related impacts on the same resources is misguided.

Thinning should be spatially variable and mimic natural patterns. Retain clumps. Use ICO or similar methods.

Avoid road construction which has serious adverse effects on soil, water, carbon, and fish & wildlife. Building roads would be counter to the climate change preparation purposes of this project.

The NEPA analysis should provide a quantitative analysis of logging related carbon emissions and the social cost of carbon dioxide emissions as a proxy to compare with the allege economic benefits of logging.

The FS should retain all large (>21" dbh) trees because they help contribute to the purposes and needs of forest resiliency and climate change preparation.

Commercial logging in riparian reserves should be avoided. Commercial tree removal will retard attainment of aquatic objectives related to wood recruitment and water quality (temperature and turbidity).

The NEPA analysis should carefully explain the trade-offs related to commercial logging in the Wild and Scenic River corridor. Logging will likely cause complex effects on the outstandingly remarkable values, including some negative and some potentially positive. Don't tell us half the story.

Retain mortality processes in the stand, including a high enough basal area to promote some tree mortality. If there are too few trees, and if every tree is healthy, there won't be enough snag recruitment. Think like an ecosystem, not a tree farmer.

Protect and restore roadless and unroaded values. This is an important part of the historic range of variability (and the evolutionary anvil upon which wildlife evolved) and this landscape feature is very out of whack, and the FS can make concreate steps to address it by avoiding logging in unroaded areas >1,000 acres and by strategically closing roads to grow roadless areas.

The NEPA analysis should consider a range of different mixes of commercial and non-commercial thinning and the analysis should distinguish the effects of commercial logging from non-commercial thinning, because they have very different trade-offs. Commercial logging entails more heavy equipment impacts and road impacts on soil and watersheds, and commercial logging removes ecologically valuable habitat structures and carbon. Non-commercial thinning does not have these trade-offs and provides many of the same ecological benefits from density reduction.

Avoiding the spread of weeds should be a priority. The NEPA analysis should disclose the risk that logging will spread terrible weeds such as ventenata grass.

A lot of this project is in winter range. Please avoid adverse effects on big game cover values. Follow the forest plan.

Eastside Screens

The FS should use a scientific definition of large trees which is 20" dbh. And the NEPA analysis should clearly disclose the effects of removal large trees 20-30" dbh under the Trump Screens Amendment, as well as large trees removed for safety and operational purposes.

The National Forest Management Act and it's implementing regulations require the Forest Service to follow the requirements of the LRMP, as amended. The Eastside Screens adopted in 1994 and 1995 are a valid amendments of the LRMP. The Jan 2021 Amendment of the Screens was not adopted pursuant to proper NFMA and NEPA and ESA procedures and so the Forest Service cannot rely on that amendment to authorize the removal of large trees >21" dbh.

In the event the Forest Service may rely on the Trump administration's last-minute decision to approve the regional Screens Amendment allowing removal of large trees, we object. The Trump Screens Amendment is unlawful for a variety of reason, including but not limited to:

1. The Screens Amendment was a public involvement nightmare. The FS failed to provide a scoping period and failed to provide an objection period even though one was promised from the beginning. The FS failed to meaningfully respond to public comment. The decision was approved at the last minute by a corrupt, lame duck administration.
2. The decision to amend the Screens and allow removal of large numbers of large trees across a large region is likely to have significant effects on the environment and therefore requires preparation of an Environmental Impact Statement.

3. The Screens EA violated NEPA in numerous ways, including an inadequate analysis of cumulative effects, failed to take a hard look at effects on carbon and climate, habitat for viable populations of species that depend on large and old trees, dense/unmanaged forest, snags and dead wood, riparian and aquatic habitats, etc.
4. The Screens EA failed to consider reasonable alternatives to meet the purpose and need such as retaining old trees regardless of size, and allowing the large-young trees within the dripline of legacy trees to be converted to snags, using prescribed fire to control encroachment of shade-tolerant tree species, and adopting a quantitative, science-based standard for conservation and restoration of large snags and green recruitment trees to meet population goals for snag-associated species.
5. The Screens Amendment also adopted a standardless approach to managing snags and green replacement trees, calling for the provision of *some* snags and green trees to meet the needs of *some* species, but without any assurances that logging will maintain population viability for the species which are most sensitive to the absence of abundant snags.
6. Approval of the Screens amendment violates the procedural and substantive requirements of the NFMA and its implementing regulations.
7. The FS failed to consult with NMFS and FWS regarding ESA-listed species.

We incorporate by reference our scoping comments and comments on the Large Tree Amendment EA and preserve all legal claims related to the issues raised in our NEPA comments. https://cara.fs2c.usda.gov/Public//ReadingRoom?Project=58050

Regardless of which version of the Screens the Forest Service is relying on, trees over 21" dbh may not be removed from *inside* LOS stands.

First, the Screens were interpreted to prohibit large tree removal both inside and outside LOS. A 1995 interpretive memo from the Regional Forester says: "… the intent of the screens is to maintain, in the short-term, all features of late and old structure, whether the stand is actually LOS or not. … For additional clarification, the screen direction under Scenario A of the wildlife standard is intended to maintain all live trees >21 inches regardless of tree species and regardless of whether a stand is LOS or not. The existing wording in Scenario A could be erroneously interpreted to mean that large trees ≥21 inches "could" be cut in LOS in some instances. We regret the ambiguous wording used in writing Amendment #2. The intent of Scenario A is as stated above." John Lowe, Nov 14, 1995 implementation memo from the Regional Forester to all eastside forest supervisors following a field trip on the Umatilla NF (emphasis added)
https://drive.google.com/file/d/11krMlEE5UcHJcln5eyjWLyiRaJAFRm_M/view?usp=sharing.

Second, the Jan. 2021 Trump Screens Amendment explicitly applies only "outside of LOS." In fact, those three words - *outside of LOS* – are the first words of the amended guideline and clearly condition the entire paragraph regarding management o large trees, including the definition of large trees. (2021 Screens Amendment DN/FONSI page 4). The Screens Amendment did NOT amend the requirement of the Eastside Screens to protect large trees ≥21" *within* LOS. The Forest Service does not get to rely on "ambiguous wording" excuse twice. If

the Forest Service intended to change the requirement to conserve large trees within LOS and allow cutting of large trees >21" dbh inside LOS, the plan amendment should have made that explicit, rather than starting with the words "Outside of LOS…"

Furthermore, the EA supporting the 2021 Screens Amendment did not clearly and accurately disclose the direct, indirect, and cumulative impacts of removing large trees both inside and outside LOS, and the Finding of No Significant Impact was not properly informed by the full scope of the proposal to remove large trees both inside and outside LOS, and suffered for the lack of documentation of the full environmental effects of that proposal.

The NEPA analysis must disclose how the project will comply with all the requirements of the Eastside Screens.

Connectivity Requirements of the Eastside Screens

The explicit intent of the Screens which is "to insure that blocks of habitat maintain a high degree of connectivity between them,..." 1995 Eastside Screens, Scenario A, INTENT STATEMENT for connectivity (emphasis added).

The connectivity requirements of the screens are detailed and mandatory. Connectivity corridors:

- Must link all late old structure stands in at least 2 directions;
- Must be at least 400 feet wide at their narrowest spot;
- Must be maintained as dense as possible with medium and large trees, or in the top third of site-potential and at least 50% canopy cover;

The Eastside Screens provide ...

> ... it is important to insure that blocks of habitat maintain a high degree of connectivity between them, and that blocks of habitat do not become fragmented in the short-term.
>
> a) Maintain or enhance the current level of connectivity between LOS stands and between all Forest Plan designated "old growth/MR" habitats by maintaining stands between them that serve the purpose of connection as described below:
>
> (1) Network pattern – LOS stands and MR/Old Growth habitats need to be connected with each other inside the watershed as well as to like stands in adjacent watersheds in a contiguous network pattern by at least 2 different directions.
>
> (2) Connectivity Corridor Stand Description – Stands in which medium diameter or larger trees are common, and canopy closures are within the top one-third of site potential. Stand widths should be at least 400 ft. wide at their narrowest point. The only exception to stand width is when it is impossible to meet 400 ft with current vegetative structure, AND these "narrower stands" are the only connections available (use them as last resorts). In the case of lodgepole pine, consider medium to large trees as appropriate diameters for this stand type.

If stands meeting this description are not available in order to provide at least 2 different connections for a particular LOS stand or MR/Old Growth habitat, leave the next best stands for connections. Again, each LOS and MR/Old Growth habitat must be connected at least 2 different ways.

(3) Length of Connection Corridors – The length of corridors between LOS stands and MR habitats depends on the distance between such stands. Length of corridors should be as short as possible.

(4) Harvesting within connectivity corridors is permitted if all the criteria in (2) above can be met, and if some amount of understory (if any occurs) is left in patches or scattered to assist in supporting stand density and cover. Some understory removal, stocking control, or salvage may be possible activities, depending on the site.

We would like to emphasize that the screens anticipated the possibility of logging in connectivity areas, but there are minimum requirements for that. The screens provide: "Harvesting within connectivity corridors is permitted if all the criteria in (2) above can be met ..." and some patches of understory are retained.

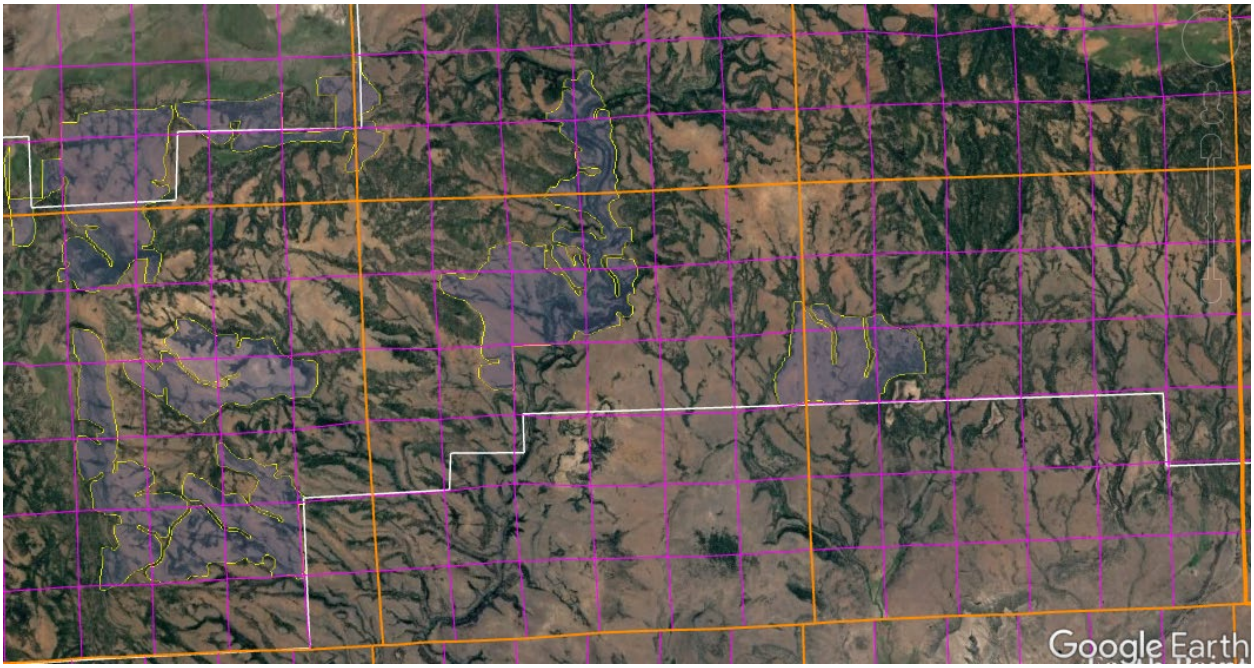
The 1995 EA for the Eastside Screens identifies the following process for analyzing connectivity:

c) To insure connectivity as described above is maintained, use the following process:
(l) Do suitable network linkages between old and late structural stands and MR-designated habitats occur, according to the previous description? If so, will the proposed project isolate any area or group of areas by reducing any one of the parameters below acceptable levels? If not, the project can continue. If so, the project must be deferred or re-designed to meet connectivity parameters described above.
(2) Do suitable network linkages between old and late structural stands and MR-designated habitats NOT OCCUR under current conditions, as described above? If areas are already isolated, or partially isolated by not meeting the connectivity description above, will the proposed prescription promote linkage sooner than if left alone? If so, the project should continue. If the project is designed in a manner that would further increase isolation, the project must be deferred or re-designed to enhance connectivity parameters.

The NEPA analysis must disclose how much of the project area will maintain >50% canopy closure (or in the top third of site potential) after this project is implemented. The 1995 EA supporting the Eastside Screens says "The intent is to maintain canopy closure as dense as possible." The Response to Comment asks "where the >50% canopy closure number came from." The >50% canopy closure number comes from the 1995 EA for the Eastside Screens which included some clarifying text about connectivity on page 17 of Appendix C. Violation of the Eastside Screens, is a violation of NFMA which requires compliance with the LRMP as amended by the Screens.

Protect the Values of Inventoried and Uninventoried Roadless and Low-Road-Density Areas. New information on Unroaded Areas >1,000 acres.

The FS should consider alternatives that conserve and restore large blocks of habitat without commercial logging. Roadlessness is an important and under-represented landscape feature that wildlife evolved within and the FS should conserve and restore. The map below shows existing unroaded areas in pale purple polygons.



Large intact expanses of habitat were once quite common but are now rare. Species evolved in the context of the large habitat patches that result from the natural disturbance regime. As just one important example, big game need large patches of security cover which is best provided by large unroaded areas. New science confirms that roads and logging tend to be contagious on the landscape (managed areas beget more management until little remains unmanaged), so to conserve the habitat values associated with wild places we have to prevent the first intrusions. The purpose and need for this project should include protecting and restoring large unroaded areas consistent with the natural range of variability.

Boakes et al (2009) explained why it is important to retain large unroaded areas.

> **Abstract:** Habitat clearance remains the major cause of biodiversity loss, with consequences for ecosystem services and for people. In response to this, many global conservation schemes direct funds to regions with high rates of recent habitat destruction, though some also **emphasize the conservation of remaining large tracts of intact habitat**. If the pattern of **habitat clearance is highly contagious**, the latter approach will help **prevent destructive processes gaining a foothold** in areas of contiguous intact

habitat. Here, we test the strength of spatial contagion in the pattern of habitat clearance. Using a global dataset of land-cover change at 50x50 km resolution, we discover that intact habitat areas in grid cells are refractory to clearance only when all neighbouring cells are also intact. The **likelihood of loss increases dramatically as soon as habitat is cleared in just one neighbouring cell**, and remains high thereafter. **This effect is consistent for forests and grassland, across biogeographic realms and over centuries, constituting a coherent global pattern**. Our results show that landscapes become vulnerable to wholesale clearance as soon as **threatening processes begin to penetrate**, so actions to prevent any incursions into large, intact blocks of natural habitat are key to their long-term persistence.

Elizabeth H. Boakes, Georgina M. Mace, Philip J. K. McGowan and Richard A. Fuller 2009. Extreme contagion in global habitat clearance. Proceedings of the Royal Society B: Biological Sciences. November 25, 2009. doi: 10.1098/rspb.2009.1771.
http://rspb.royalsocietypublishing.org/content/royprsb/early/2009/11/25/rspb.2009.1771.full.pdf

Ibisch et al (2016) said

> The planet's remaining large and ecologically important tracts of roadless areas sustain key refugia for biodiversity and provide globally relevant ecosystem services. … Global protection of ecologically valuable roadless areas is inadequate. International recognition and protection of roadless areas is urgently needed to halt their continued loss.
>
> …
>
> The impact of roads on the surrounding landscape extends far beyond the roads themselves. Direct and indirect environmental impacts include deforestation and fragmentation, chemical pollution, noise disturbance, increased wildlife mortality due to car collisions, changes in population gene flow, and facilitation of biological invasions (1–4). In addition, roads facilitate "contagious development," in that they provide access to previously remote areas, thus opening them up for more roads, land-use changes, associated resource extraction, and human-caused disturbances of biodiversity (3, 4). With the length of roads projected to increase by >60% globally from 2010 to 2050 (5), there is an urgent need for the development of a comprehensive global strategy for road development if continued biodiversity loss is to be abated (6). To help mitigate the detrimental effects of roads, their construction should be concentrated as much as possible in areas of relatively low "environmental values" (7). Likewise, prioritizing the protection of remaining roadless areas that are regarded as important for biodiversity and ecosystem functionality requires an assessment of their extent, distribution, and ecological quality.
>
> …
>
> There is an urgent need for a global strategy for the effective conservation, restoration, and monitoring of roadless areas and the ecosystems that they encompass. Governments should be encouraged to incorporate the protection of extensive roadless areas into

> relevant policies and other legal mechanisms, reexamine where road development conflicts with the protection of roadless areas, and avoid unnecessary and ecologically disastrous roads entirely. In addition, governments should consider road closure where doing so can promote the restoration of wildlife habitats and ecosystem functionality (4).
> …
> To achieve global biodiversity targets, policies must explicitly acknowledge the factors underlying prior failures (13). Despite increasing scientific evidence for the negative impacts of roads on ecosystems, the current global conservation policy framework has largely ignored road impacts and road expansion.
> …
> In the much wider context of the United Nations' Sustainable Development Goals, conflicting interests can be seen between goals intended to safeguard biodiversity and those promoting economic development (14).
> …
> Enshrined in the protection of roadless areas should be the objective to seek and develop alternative socioeconomic models that do not rely so heavily on road infrastructure. … Although we acknowledge that access to transportation is a fundamental element of human well-being, impacts of road infrastructure require a fully integrated environmental and social cost benefits approach (15). Still, under current conditions and policies, limiting road expansion into roadless areas may prove to be the most cost effective and straightforward way of achieving strategically important global biodiversity and sustainability goals.

Pierre L. Ibisch, Monika T. Hoffmann, Stefan Kreft, Guy Pe'er, Vassiliki Kati, Lisa Biber-Freudenberger, Dominick A. Dellasala, Mariana M. Vale, Peter R. Hobson, Nuria Selva. 2016. A global map of roadless areas and their conservation status. SCIENCE 16 DEC 2016 : 1423-1427. http://science.sciencemag.org/content/354/6318/1423

Our planet is in the midst of a significant extinction event caused by habitat destruction and climate change. Protecting existing wilderness-quality lands will pay huge dividends for biodiversity.

> ... we model the persistence probability of biodiversity, combining habitat condition with spatial variation in species composition, to show that retaining these remaining wilderness areas is essential for the international conservation agenda. Wilderness areas act as a buffer against species loss, as the extinction risk for species within wilderness communities is—on average—less than half that of species in non-wilderness communities.

Di Marco, M., Ferrier, S., Harwood, T.D. et al. Wilderness areas halve the extinction risk of terrestrial biodiversity. Nature 573, 582–585 (2019) doi:10.1038/s41586-019-1567-7. https://www.nature.com/articles/s41586-019-1567-7. See also, Keim, B. 2019. Wilderness areas

could reduce extinction risks by more than half. Anthropocene Magazine. October 23, 2019 http://www.anthropocenemagazine.org/2019/10/importance-of-wilderness/

Roadless and unroaded areas also play a significant role in both climate change mitigation (through carbon storage) and climate change adaptation (by facilitating connectivity and resilience to disturbance).

Transportation infrastructure and carbon sequestration

The topic of the relationship of road restoration and carbon has only recently been explored. [and there are presumably similar carbon benefits from conserving unroaded areas and not building roads in the first place.] There is the potential for large amounts of carbon (C) to be sequestered by reclaiming roads.When roads are decompacted during reclamation, vegetation and soils can develop more rapidly and sequester large amounts of carbon. A recent study estimated total soil C storage increased 6 fold to 6.5 x 107g C/km (to 25 cm depth) in the northwestern US compared to untreated abandoned roads (Lloyd et al. 2013). Another recent study concluded that reclaiming 425 km of logging roads over the last 30 years in Redwood National Park in Northern California resulted in net carbon savings of 49,000 Mg carbon to date (Madej et al. 2013, Table 5).

...

Benefits of roadless areas and roadless area networks to climate change adaptation

Undeveloped natural lands provide numerous ecological benefits. They contribute to biodiversity, enhance ecosystem representation, and facilitate connectivity (Loucks et al. 2003; Crist and Wilmer 2002, Wilcove 1990, The Wilderness Society 2004, Strittholt and Dellasala 2001, DeVelice and Martin 2001), and provide high quality or undisturbed water, soil and air (Anderson et al. 2012, Dellasalla et al. 2011). They also can serve as ecological baselines to help us better understand our impacts to other landscapes, and contribute to landscape resilience to climate change.

Forest Service roadless lands, in particular, are heralded for the conservation values they provide. These are described at length in the preamble of the Roadless Area Conservation Rule (RACR)4 as well as in the Final Environmental Impact Statement (FEIS) for the RACR5 , and include: high quality or undisturbed soil, water, and air; sources of public drinking water; diversity of plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non- motorized, and semi-primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality; traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., include uncommon geological formations, unique wetland complexes, exceptional hunting and fishing opportunities).

The Forest Service, National Park Service, and US Fish and Wildlife Service recognize that protecting and connecting roadless or lightly roaded areas is an important action

agencies can take to enhance climate change adaptation. For example, the Forest Service National Roadmap for Responding to Climate Change (USDA Forest Service 2011b) establishes that increasing connectivity and reducing fragmentation are short and long term actions the Forest Service should take to facilitate adaptation to climate change.6 The National Park Service also identifies connectivity as a key factor for climate change adaptation along with establishing "blocks of natural landscape large enough to be resilient to large-scale disturbances and long-term changes" and other factors. The agency states that: "The success of adaptation strategies will be enhanced by taking a broad approach that identifies connections and barriers across the landscape. Networks of protected areas within a larger mixed landscape can provide the highest level of resilience to climate change."7 Similarly, the National Fish, Wildlife and Plants Climate Adaptation Partnership's Adaptation Strategy (2012) calls for creating an ecologically-connected network of conservation areas.8

Crist and Wilmer (2002) looked at the ecological value of roadless lands in the Northern Rockies and found that protection of national forest roadless areas, when added to existing federal conservation lands in the study area, would 1) increase the representation of virtually all land cover types on conservation lands at both the regional and ecosystem scales, some by more than 100%; 2) help protect rare, species-rich, and often-declining vegetation communities; and 3) connect conservation units to create bigger and more cohesive habitat "patches."

Roadless lands also are responsible for higher quality water and watersheds. Anderson et al. (2012) assessed the relationship of watershed condition and land management status and found a strong spatial association between watershed health and protective designations. Dellasalla et al. (2011) found that undeveloped and roadless watersheds are important for supplying downstream users with high-quality drinking water, and developing these watersheds comes at significant costs associated with declining water quality and availability. The authors recommend a light-touch ecological footprint to sustain the many values that derive from roadless areas including healthy watersheds.

The Wilderness Society. 2014. Transportation Infrastructure and Access on National Forests and Grasslands - A Literature Review. May 2014. https://www.fs.usda.gov/nfs/11558/www/nepa/96158_FSPLT3_3989888.pdf, https://www.sierraforestlegacy.org/Resources/Conservation/ProjectsPlans/ForestPlanRevisions/SFL%20et%20al.%20FPR%20comments%20part%205%20of%205.pdf

The agency cannot limit its analysis of roadless areas to inventoried areas >5,000 acres, because smaller roadless areas that were not inventoried are ecologically relevant and potentially significant. The NEPA analysis must reflect the growing scientific evidence (cited below) indicating the significant value of roadless areas smaller than 5,000 acres and larger than 1,000 acres. Recent scientific literature emphasizes the importance of unroaded areas greater than 1,000 acres as strongholds for the production of fish and other aquatic and terrestrial species, as

well as sources of high quality water. Commercial logging and/or road building within large unroaded areas threatens these significant ecological values.

First, it is important to recognize that about 30% of inventoried roadless areas (IRA) nationwide are smaller than 5,000 acres. It is therefore likely that the diverse and significant values of IRAs can be found within many other unroaded areas between 1,000 and 5,000 acres that were simply not inventoried. NEPA requires that these values be recognized and the effects of logging and roads be carefully disclosed and considered. Martin, DeVelice, Brown. 2001. Landscape Analysis and Biodiversity Specialist Report. Forest Service Roadless Area Conservation FEIS. November 2000. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_035781.pdf

> Small areas are important for conserving biodiversity of species with small home ranges, species with special habitat needs, or for providing linkages between larger areas. … Of the more than 2,800 named inventoried roadless areas, about 70% of these areas are larger than 5,000 acres (USDA Forest Service 2000a).

Large unroaded areas are important simply due to the fact that they better represent the historic condition that species evolved with but they are now rare on the landscape due to human activities that have degraded and fragmented the majority of the landscape. The Northwest Forest Plan LSOG Effectiveness Monitoring Plan says that "perhaps 80 percent or more [of the historic late-successional old-growth forest] would probably have occurred as relatively large (greater than 1,000 acres) areas of connected forest." Miles Hemstrom, Thomas Spies, Craig Palmer, Ross Kiester, John Teply, Phil McDonald, and Ralph Warbington; Late-Successional and Old-Growth Forest Effectiveness Monitoring Plan for the Northwest Forest Plan, USFS General Technical Report PNW-GTR-438; December 1998; http://www.fs.fed.us/pnw/pubs/gtr_438.pdf. Currently, these 1,000 acre and larger patches are rare on the landscape.

World Wildlife Fund and the Conservation Biology Institute summarized the important attributes of small roadless areas (1,000-5,000 acres).

> Small roadless areas share many of attributes in common with larger ones, including:
> • Essential habitat for species key to the recovery of forests following disturbance such as herbaceous plants, lichens, and mycorrhizal fungi
> • Habitat refugia for threatened species and those with restricted distributions (endemics)
> • Aquatic strongholds for salmonids
> • Undisturbed habitats for mollusks and amphibians
> • Remaining pockets of old-growth forests
> • Overwintering habitat for resident birds and ungulates
> • Dispersal "stepping stones" for wildlife movement across fragmented landscapes

DellaSala, Dominick and James Strittholt. 2002. Scientific Basis For Roadless Area Conservation. World Wildlife Fund. Ashland, OR; Conservation Biology Institute. (June 2002 - Updated October 2003)

https://d2k78bk4kdhbpr.cloudfront.net/media/reports/files/Scientific_Basis_For_Roadless_Area_Conservation.pdf.

In a 1997 letter to President Clinton, 136 scientists said:

> There is a growing consensus among academic and agency scientists that existing roadless areas–irrespective of size–contribute substantially to maintaining biodiversity and ecological integrity on the national forests. The Eastside Forests Scientific Societies Panel, including representatives from the American Fisheries Society, American Ornithologists' Union, Ecological Society of America, Society for Conservation Biology, and The Wildlife Society, recommended a prohibition on the construction of new roads and logging within existing (1) roadless regions larger than 1,000 acres, and (2) roadless regions smaller than 1,000 acres that are biologically significant…. Other scientists have also recommended protection of all roadless areas greater than 1,000 acres, at least until landscapes degraded by past management have recovered…. As you have acknowledged, a national policy prohibiting road building and other forms of development in roadless areas represents a major step towards balancing sustainable forest management with conserving environmental values on federal lands. In our view, a scientifically based policy for roadless areas on public lands should, at a minimum, protect from development all roadless areas larger than 1,000 acres and those smaller areas that have special ecological significance because of their contributions to regional landscapes.

Letter to President Clinton from 136 scientists (Dec. 10, 1997). https://drive.google.com/file/d/0B4L_-RD-MJwrRzhFcm5QcFR0MHM/view?usp=sharing&resourcekey=0-2-sbGMN3bOUBQGGMDBQM1Q

To the list of special values found within unroaded areas must be added carbon storage. European policy leaders consider roadless areas effective for carbon storage and climate mitigation:

> [T]he European Parliament has agreed to raise the issue of roadbuilding in intact forests at the UN Climate Change Conference to be held next month in Warsaw (Poland); it calls on parties to use the existence of roads in forest areas as an early negative performance indicator of REDD+ projects, and to prioritise the allocation of REDD+ funds towards road free forests.

Oct 24, 2013 Press release: EUROPEAN PARLIAMENT BACKS THE PROTECTION OF ROADFREE AREAS. http://kritonarsenis.gr/eng/actions/view/european-parliament-backs-the-protection. Federal land managers should recognize the tremendous carbon values in unroaded/unmanaged forests and avoid actions that would threaten these values. See also, William R. Moomaw, Susan A. Masino, and Edward K. Faison. 2019. Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good Front. For. Glob. Change, 11 June 2019 | https://doi.org/10.3389/ffgc.2019.00027; https://www.frontiersin.org/articles/10.3389/ffgc.2019.00027/full. See also, Kun, Z., DellaSala,

D., Keith, H., Kormos, C., Mercer, B., Moomaw, W.R. and Wiezik, M. (2020), Recognising the importance of unmanaged forests to mitigate climate change. GCB Bioenergy. Accepted Author Manuscript. doi:10.1111/gcbb.12714 https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/gcbb.12714. ("The most effective means for keeping carbon out of the atmosphere to meet climate goals is to protect primary forests (Mackey et al. 2020) and continue growing secondary forests to accumulate additional carbon (proforestation) (Moomaw et al. 2019) while reducing emissions from all sources including bioenergy. … The importance of primary (unlogged) forests lies in the magnitude and longevity of their carbon stock. In order to reverse the decreasing forest carbon stocks in Europe (EEA, 2019), the largest forest carbon stores must be protected and additional forests must be allowed to continue accumulating carbon (proforestation).").

Consider the Effects of Livestock Grazing on Forest Health

Livestock grazing has a direct influence on the vegetation structure that this project is designed to address. The agency must analyze the effect of past and future grazing which will tend to reduce palatable fine fuels like grasses and shift the plant community toward less palatable shrubs and trees which are more hazardous as ladder fuels. Livestock grazing probably contributed to the development of plant communities where grass and forbs are underrepresented and small conifers are over-represented. Grazing also likely contributes to the spread of juniper. Future livestock grazing will tend to cause these same trends, so the NEPA analysis must consider the connected and cumulative impacts of livestock grazing.

This project should take steps to address the threat that livestock grazing causes to forest health. There is little point in the agency's efforts to mechanically reduce tree density unless other underlying causes of overstocking are dealt with, e.g. livestock grazing. The NEPA document describes the effects "on" range resources (e.g., fences and transitory range) but fails to disclose or analyze the effects "of" livestock on forest health and the desired future condition of vegetation composition. The Council on Environmental Quality directs agencies to analyze actions together when the actions are similar in timing or geography, when doing so is the best way to assess the combined impacts of the actions (40 CFR §1508.25). As recognized by BLM, "Evaluating both actions in the same EA allows BLM to better assess the combined effects and to consider complementary design features to reduce potential conflicts among potentially competing uses." Thurston Hills Trails and Forest Management EA, https://eplanning.blm.gov/epl-front-office/projects/nepa/75350/142227/174633/2018_04_23_THills_EA_Final_Print.pdf

Grazing reduces the density and vigor of grasses which usually outcompete tree seedlings, leading to dense stands of fire-prone small trees. Cows also decrease the abundance of fine fuels which are necessary to carry periodic, low intensity surface fires. This reduces the frequency of fires, but increases their severity. See Belsky, A.J., Blumenthal, D.M., "Effects of Livestock

Grazing on Stand Dynamics and Soils in Upland Forest of the Interior West," Conservation Biology, 11(2), April 1997. http://web.archive.org/web/20030409094020/http://www.onda.org/library/papers/standdynamics.pdf. See also Wuerthner, George. Livestock Grazing and Fire. January, 2003. http://web.archive.org/web/20040107135236/http://www.onda.org/library/papers/Livestock_Grazing_and_Fire.pdf.

The NEPA document needs to address these issues and consider alternative ways of avoiding these impacts by not grazing. The combination of fire suppression, past high-grading, and livestock grazing together caused the overstocked condition of the stands in the analysis area. Logging and prescribed fire will only partially address the problem. To be effective, livestock grazing must also be eliminated. Grazing and logging cause cumulative effects that must be considered together in one NEPA document.

The court's decision in League of Wilderness Defenders v. USFS, Civil No. 04--488—HA. 2004 U.S. Dist. LEXIS 24413. November 19, 2004, makes clear that the agency has a duty to take a hard look at the effects of grazing in the context of making timber sale decisions. The agency must disclose cumulative impacts and cannot compartmentalize.

Further evidence of the adverse forest health effects of livestock are presented in Madany et al (1983):

> Abstract. Major differences were found between the vegetation structure of ponderosa pine-dominated communities on the Horse Pasture Plateau and those on the nearby but isolated Church and Greatheart Mesas in Zion National Park. The Horse Pasture Plateau was heavily grazed by livestock in the late 19th and early 20th centuries, while the mesas were never grazed. Conditions on the mesas now approximate the pre-European situation of the region as described in the earliest written accounts. Pine, oak, and juniper sapling density and cover were much higher on the formerly grazed plateau than on the relict mesas. Herbaceous species dominated the groundlayer in mesa ponderosa pine savanna stands, while grass and forb cover was low on analogous sites of the plateau. Age-class distributions of major tree species further substantiated that major physiognomic changes have occurred on the plateau since the arrival of European man. Analysis of fire scars showed that prior to 1881, the mean fire-free interval for ponderosa pine stands on the plateau was 4 to 7 yr, while the interval for Church Mesa was 69 yr. Since there were no recorded fires on Church Mesa between 1892 and 1964, and yet no corresponding increase in sapling density, the increased understory density of plateau stands should not be attributed primarily to cessation of fires. Instead, heavy grazing by livestock and associated reduction of the herbaceous groundlayer promoted the establishment of less palatable tree and shrub seedlings, Fire, however, played an important secondary role in maintaining savanna and woodland communities.

Michael H. Madany, and Niel E. West. 1983. Livestock Grazing-Fire Regime Interactions within Montane Forests of Zion National Park, Utah. Ecology: Vol. 64, No. 4, pp. 661-667.

Grazing is also known to have significant adverse impacts on ground nesting birds. Cattle Grazing in a National Forest Greatly Reduces Nesting Success in a Ground-nesting Sparrow. Glenn E. Walsberg. The Condor. Volume 107, No. 3. August, 2005.

The agency often erroneously concludes that livestock grazing will not affect upland vegetation of fuel profiles because fire suppressed stands are too dense to allow livestock access, but this is a gross oversimplification. The agency is conducting so-called "restoration" projects to reduce fuels and vegetation density which has and will allow livestock use. The NEPA document must disclose how livestock grazing interacts with the so-called forest restoration projects. The goal of restoration is a more open stand, and the agency wants more grass and forbs and fewer conifers, but grazing in those "restored" stands will cause the opposite effect – more conifers and less grass and forbs – thereby conflicting with the restoration objectives.

The Purpose and Need Should Address The Unmet Need for Carbon Storage

The agency typically says one of the purposes of this project is to provide a supply of wood products to the public. The agency should reconsider timber targets in light of the fact that the public *needs* carbon storage to reduce global climate change much more than they *need* wood products. The NEPA analysis also needs to account for the fact that managing forests for water quality, water quantity, quality of life, and carbon storage for a stable climate will contribute far more to community stability than propping up the timber boom-bust industry with subsidized logging.

The agency must recognize that wood products are already under-priced and over-supplied due to "externalities" (costs that are not included in the price of wood, so those costs are shifted from wood product producers and consumers to the general public who suffer the consequences of climate change without compensation from those who profit from logging related externalities). Ecosystem carbon storage on the other hand is under-supplied because there is not a functioning market for carbon storage and climate services. The agency is in a position to address these market imperfections by focusing on unmet demand for carbon storage instead of offering wood products that are already oversupplied.

> Land protection, both public and private, provides substantial ecological benefits by avoiding conversion of natural systems to intensive, developed uses. These benefits include carbon sequestration, watershed functioning, soil conservation, and the preservation of diverse habitat types (e.g., Daily 1997, Brauman et al. 2007, Kumar 2012, Watson et al. 2014). Land protection also solves a key market failure: private markets tend to underprovide socially beneficial land uses such as natural forests, agricultural

> lands, or managed timberlands. The reason for this failure is that many of the benefits of these lands go to the public in general, not individual landowners. When private values and market transactions determine land uses, less land will be devoted to socially beneficial uses than if citizens could collectively determine use on the basis of social values (e.g., Angelsen 2010, Tietenberg and Lewis 2016).

Katharine R.E. Sims, Jonathan R. Thompson, Spencer R. Meyer, Christoph Nolte, Joshua S. Plisinski. 2019. Assessing the local economic impacts of land protection. Conservation Biology. 26 March 2019 https://doi.org/10.1111/cobi.13318, https://harvardforest.fas.harvard.edu/sites/default/files/Sims_et_al-2019-Conservation_Biology.pdf.

Maintaining and increasing carbon storage in ecosystems on public lands is also required to meet LRMP desired future conditions and standards & guidelines. Carbon emissions from logging and other land management activities exacerbate global climate change and drive ecosystem changes that diverge from desired future conditions, such as uncharacteristic drought, fire, insect outbreaks, vegetation and wildlife mortality, species range shifts, low summer stream flows, unfavorable stream temperatures, extreme precipitation and peak flows and erosion, uncertainty related to vegetation recovery post-disturbance, uncertainty about the ability to provide a predictable, sustainable supply of forest products, etc. The agency should identify a purpose and need that recognizes the necessity of avoiding carbon emissions from logging and optimizing carbon storage to fulfill the promises in the LRMP.

Harmonize climate change mitigation and adaptation

The scoping package raises the issue of global climate change as an added stress on forests. The Forest Service must also address the fact that more logging will make global climate change worse and make climate stresses worse, not better. The FS need to design this project (and consider a range of alternatives) to harmonize climate change mitigation and adaptation.

Sometimes climate change mitigation and adaptation are in complete harmony, such as protecting riparian forests that both store carbon and buffer streams from hydrological extremes caused by climate change. See Justice et al. 2017. Can stream and riparian restoration offset climate change impacts to salmon populations? Journal of Environmental Management 188 (2017) 212e227 https://www.critfc.org/wp-content/uploads/2017/01/JournalPost_Justice_etal2017.pdf. However, there are also times when efforts directed at climate change adaptation conflict with climate change mitigation goals. For instance, some people argue that we should reduce the density of federal forests so they are more resilient to soil-water stress caused by global warming. However, forest density reduction will accelerate the transfer of carbon from the forest to the atmosphere where it will contribute to global climate change.

Federal agencies must strive to harmonize climate change mitigation (carbon storage or avoided emissions) and climate change adaptation (making ecosystems more resilient to climate change). For example, if the agency uses climate change adaptation as a rationale for forest thinning, they must not only fully disclose the increased GHG emissions caused by their proposal, they must also consider alternatives that harmonize these competing goals, such as by thinning very lightly and retaining all of the medium and large trees that store most of the carbon.

There may be climate benefits from thinning but there will also be climate trade-offs in the form of carbon emissions, unless thinning is done very early in stand development. Schaedel et al (2017) said --

> Thinning in second growth forests is often suggested as a climate change adaptation strategy (Bradford and D'Amato, 2012; Churchill et al., 2013), because thinning can be used to promote the development of complex stand structures resilient to disturbances and drought. However, these climate change adaptation outcomes attainable with thinning generally require a tradeoff with climate change mitigation objectives: most studies have shown decreased forest C storage in thinned stands (Bradford and D'Amato, 2012).
>
> ...
>
> We found that: (1) fifty-four years after PCT total aboveground C is similar across treatments, due primarily to the increase in mean tree C of trees grown at lower stand densities; (2) deadwood legacies from the pre-disturbance forest still play an important role in long-term C storage 62 years after current stand initiation, accounting for approximately 20–25% of aboveground C stores; and (3) given enough time since early thinning, there is no trade-off between managing stands to promote individual tree growth and development of understory vegetation, and maximizing stand level accumulation of aboveground C over the long term. We infer that early PCT can be used to simultaneously achieve climate change mitigation and adaptation objectives, provided treatments are implemented early in stand development before canopy closure and the onset of intense intertree competition.

Michael S. Schaedel, Andrew J. Larson, David L.R. Affleck, R. Travis Belote, John M. Goodburn, Deborah S. Page-Dumroese. 2017. Early forest thinning changes aboveground carbon distribution among pools, but not total amount. Forest Ecology and Management 389 (2017) 187–198. https://www.fs.fed.us/rm/pubs_journals/2017/rmrs_2017_schaedel_m001.pdf. There are actually conflicting results on pre-commercial thinning ...

> ... precommercial thinning (PCT) when the thinned trees have no commercial value, show inconsistent results. Some PCT studies of this type found that decreasing stand density decreased total forest C stores (Skovsgaard et al., 2006; Jiménez et al., 2011), while others noted that the increased growth rate of trees grown at lower densities can maintain or increase live tree C (Hoover and Stout, 2007; Dwyer et al., 2010), especially in the case of longer-term responses to thinning (Horner et al., 2010). Short-term studies of PCT

> effects on aboveground C have shown consistent decreases in aboveground C (Campbell et al., 2009; De las Heras et al., 2013; Jiménez et al., 2011; Dwyer et al., 2010), indicating that low densities of small trees do not fully occupy the site (Turner et al., 2016). Given these conflicting results, it is still unclear whether PCT is compatible with the climate change mitigation goal of forest C storage (Jiménez et al., 2011).

This is important because, even if thinning provides climate benefits in future decades, short-term carbon emissions conflict with climate policy priorities. The next few decades are critical to achieving goals related to decarbonizing our economy. Delayed climate benefits should be strongly discounted because we should have decarbonized our economy by then, so future effects are not nearly as important as near-term effects. If thinning causes a short-term pulse of GHG emissions, that's a problem.

> "It is, therefore, the policy of [the Biden] Administration to listen to the science; to improve public health and protect our environment; to ensure access to clean air and water; … to reduce greenhouse gas emissions; to bolster resilience to the impacts of climate change; … To that end, this order directs all executive departments and agencies (agencies) to immediately review and, as appropriate and consistent with applicable law, take action to address the promulgation of Federal regulations and other actions during the last 4 years that conflict with these important national objectives, and to immediately commence work to confront the climate crisis."

Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis. JANUARY 20, 2021 https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-protecting-public-health-and-environment-and-restoring-science-to-tackle-climate-crisis/.

President Obama established a clear policy mandate to minimize and mitigate impacts of federal land use:

> Section 1. Policy. It shall be the policy of the Departments of Defense, the Interior, and Agriculture; the Environmental Protection Agency; and the National Oceanic and Atmospheric Administration; and all bureaus or agencies within them (agencies); to avoid and then minimize harmful effects to land, water, wildlife, and other ecological resources (natural resources) caused by land- or water-disturbing activities, and to ensure that any remaining harmful effects are effectively addressed, consistent with existing mission and legal authorities. Agencies shall each adopt a clear and consistent approach for avoidance and minimization of, and compensatory mitigation for, the impacts of their activities and the projects they approve.
>
> … Sec 2. Definitions … (f) "Mitigation" means avoiding, minimizing, rectifying, reducing over time, and compensating for impacts on natural resources. As a practical matter, all of these actions are captured in the terms avoidance, minimization, and compensation. These three actions are generally applied sequentially, and therefore

> compensatory measures should normally not be considered until after all appropriate and practicable avoidance and minimization measures have been considered.
> …
> Sec. 3. Establishing Federal Principles for Mitigation. … (b) Agencies' mitigation policies should establish a net benefit goal or, at a minimum, a no net loss goal for natural resources the agency manages that are important, scarce, or sensitive, or wherever doing so is consistent with agency mission and established natural resource objectives. When a resource's value is determined to be irreplaceable, the preferred means of achieving either of these goals is through avoidance, consistent with applicable legal authorities. Agencies should explicitly consider the extent to which the beneficial environmental outcomes that will be achieved are demonstrably new and would not have occurred in the absence of mitigation (i.e. additionality) when determining whether those measures adequately address impacts to natural resources.

Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment. Nov 3, 2015. https://www.whitehouse.gov/the-press-office/2015/11/03/mitigating-impacts-natural-resources-development-and-encouraging-related In the context of climate change this means that greenhouse gas emissions should be avoided and that the climate forcing effects of any emissions that do occur must be mitigated.

> Climate change adaptation is the discipline that focuses on addressing these impacts. In contrast, climate change mitigation addresses the underlying causes of climate change, through a focus on reductions in greenhouse gas concentrations in the atmosphere. Confronting the climate crisis requires that we both address the underlying causes of climate change and simultaneously prepare for and adapt to current and future impacts. Accordingly, adaptation and mitigation must be viewed as essential complements, rather than as alternative approaches. Because greenhouse gas emissions and concentrations will dictate the type and magnitude of impacts to which we will need to adapt, the ability to successfully accomplish adaptation over the long term will be linked to the success of climate mitigation efforts (Warren et al. 2013).
> …
> Climate-smart conservation strategies must also take climate mitigation considerations into account. Although adaptation is about addressing the impacts of rapid climate change, adaptation actions should not aggravate the underlying problem of global warming. Indeed, minimizing the carbon footprint of adaptation actions can help society avoid the “worst-case” scenarios for climate change, which would make successful adaptation in human and natural systems difficult, if not impossible, to achieve. Ideally, adaptation efforts should contribute to meeting climate mitigation goals both by minimizing or reducing the greenhouse gas emissions from project operations, including from any construction and ongoing maintenance, as well as by managing natural systems in ways that sustain or enhance their ability to cycle, sequester, and store carbon.

> …
> Some of the most obvious synergies between adaptation and mitigation are those aimed at enhancing carbon stocks in natural forests, … Strategies for increasing the capture and storage of forest carbon include: avoiding deforestation; afforestation (i.e., establishment of trees in areas have not been forests or where forests have not been present for some time); decreasing forest harvest; and increasing forest growth (McKinley et al. 2011). Managing natural systems to provide carbon benefits must be carefully balanced, however, with other conservation and adaptation goals. … Recent research, however, indicates that old trees "do not act simply as senescent carbon reservoirs" but actively fix larger amounts of carbon than smaller trees (Stephensen et al. 2014). This recognition highlights the important role that biodiversity-rich old-growth forests can play in sequestering carbon.
> …
> It is not always obvious, however, when conservation and climate mitigation efforts might be in alignment or in conflict. … Although there are clear synergies between adaptation and mitigation focused activities, managers will also need to carefully consider any trade-offs.

Stein, B.A., P. Glick, N. Edelson, and A. Staudt (eds.). 2014. Climate-Smart Conservation: Putting Adaptation Principles into Practice. National Wildlife Federation, Washington, D.C. https://www.nwf.org/~/media/PDFs/Global-Warming/2014/Climate-Smart-Conservation-Final_06-06-2014.pdf.

Do not rely on the flawed boilerplate climate analyses

As explained below, the Forest Service's standardized NEPA language regarding carbon and climate change fails to take a hard look that NEPA requires. The analysis makes several highly misleading statements about managing forests for carbon storage, climate resilience, and the effects on climate change. The analysis inappropriately mischaracterizes the role of individual logging projects in the cumulative problem of global GHG emissions. The analysis misstates the effects of logging related carbon emissions that are not related to "deforestation." The analysis grossly misstates the climate effects of logging intended to reduce disturbance. The analysis misleadingly implies that logging benefits the climate by increasing forest productivity.

The NEPA analysis should consider the adverse climate consequences of GHG emissions caused directly and indirectly by logging. The NEPA analysis should estimate the quantity of GHG emitted by logging and associated activities throughout the wood products supply chain, and describe the contribution of this project to cumulative impacts of excess GHG in the atmosphere. The NEPA analysis should use a proxy such as the social cost of carbon dioxide emissions to describe effects.

The Forest Service should not rely on the boilerplate NEPA language from the regional office which is flawed in many ways. Instead the Forest Service:

- Must recognize the cumulative nature of the GHG emissions and climate problems. It does not matter that this project is small in the global scheme because all emissions matter when the causation is global and cumulative;

- Cannot credibly assert that this project is harmless because it's not causing deforestation. This is immaterial. All GHG emissions, regardless of the source or how it is labelled, are part of the problem and cause the same climate impacts.

- Cannot credibly assert that thinning for forest health justifies or mitigates emissions from logging. Logging does not increase the capacity for growing trees. To the contrary, logging harms soil and reduces site productivity. Storing carbon in wood products is not preferable to storing carbon in forests. Evidence shows that forests are a more secure way of storing carbon. If this forest is not logged, or if more green tree are retained *in situ*, the agency cannot conclude that natural mortality will be greater than logging mortality. In fact, it is quite easy to predict that logging causes significantly more mortality than natural processes.

- Must not compare carbon *before and after* logging. That is an improper framework for NEPA analysis. The proper NEPA framework is to compare the effects of different alternatives (over time), so the agency must describe the carbon emissions and carbon storage in the forest over time *with* logging and *without* logging.

- Logging to reduce fire effects does not result in a net increase in forest carbon storage. The agency cannot predict the location, timing, or severity of future wildfires, so most fuel treatments will cause carbon emissions without any offsetting benefits from modified fire behavior. Studies clearly show that the total carbon emissions from logging (plus unavoidable wildfire) are greater than carbon emissions from wildfire alone.

- Cannot credibly assert that carbon storage in wood products is a useful climate strategy. Logging kills trees, stops photosynthesis, and initiates decay and combustion, with the end result being a significant transfer of carbon from the forest to the atmosphere. In stark contrast, an unlogged forest continues to grow and transfer more carbon from the atmosphere to the forest. Carbon emissions caused by logging far exceed the small fraction of carbon transferred to wood products. Carbon accounting methods that attempt to account for *substitution* of wood for other high-carbon building materials are fraught with uncertainty and too often represent maximum potential substitution effects rather than lower realistic estimates.

Each substantive issue discussed in these comments should be (i) incorporated into the purpose and need for the project, (ii) used to develop NEPA alternatives that balance tradeoffs in different ways, (iii) carefully analyzed and documented as part of the effects analysis, and (iv) considered for mitigation.

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Sincerely,

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