October 25, 2021

Sent via mail and email: appeals-northern-regional-office@usda.gov

Attention: Objection Reviewing Officer
Mid-Swan Landscape Restoration and Wildland Urban Interface Project Objection
USDA Forest Service, Northern Region
26 Fort Missoula Road
Missoula, MT 59804

Objection Reviewing Officer:

Pursuant to 36 CFR Part 218, Friends of the Clearwater (FOC) files this objection to the Mid-Swan Landscape Restoration and Wildland Urban Interface Project (hereafter MSP or Project) draft Record of Decision (ROD) and Final Environmental Impact Statement (FEIS) The MSP Project (also called the MSP timber sale in this Objection) is proposed for the Swan Lake Ranger District of the Flathead National Forest. The Responsible Official is Forest Supervisor Kurt Steele.

Objectors submitted two comment letters on the Draft EIS, one undated and one dated October 8, 2020. Since the FEIS and ROD do not address or affirmatively respond to our previous comments, we incorporate into this objection all our previous comments. This current objection does not include and re-state all of the text and issues from those incorporated comment letters, which would unnecessarily clutter up and increase complexity of this document. Those issues and concerns still stand as expressed therein. Below we include additional discussions on selected topics.

The MSP timber sale would implement the 2018 Revised Forest Plan. Our October 8, 2020 DEIS comments incorporated the Alliance for the Wild Rockies (AWR) submissions to the FS during the forest plan revision process. AWR participated fully in the public process as the FS developed its Revised Forest Plan (RFP), including commenting at every stage and submitting a formal objection dated February 12, 2018. Because the FS provided essentially no relief in response to AWR's formal objection, FOC incorporates the documentation of AWR's participation in the RFP process within this Objection. By implementing the RFP with this proposal, the FS would violate laws and regulations.

We also incorporate Swan View Coalition's October 22, 2021 MSP objection and AWR's October 25, 2021 MSP objection within this Objection.

Attachments, references, and other incorporated documents are included on the data disk(s) sent to the Forest Service via US mail, postmarked this date.

INTRODUCTION

The selected alternative, is described in the ROD:

Table 1. Summary of actions by selected alternative and alternatives B and C as analyzed in the FEIS.

Action	FEIS Alternative B[1]	Record of Decision Selected Alternative[1]	FEIS Alternative C
Commercial harvest	37,792 acres	17,858 acres	20,124 acres
Other mechanized treatments with activity fuel treatments	10,643 acres	3,446 acres	6,722 acres
Non-Mechanized treatments with non-activity fuel treatments	49,420 acres	31,874 acres	21,587 acres
Commercial harvest in ORMZ	6,977 acres (footprint)	3,630 acres (footprint)	0 acres
Total new road construction	31.9 mi. perm 9.4 mi. temp	10.7 mi. perm 6.0 mi. temp	7 mi. perm 0 mi. temp
Mileage of FS roads improved to meet BMPs	491 mi.	225 mi.	429 mi.
Number of culverts removed2	285 (71 are on roads not used for com or mech treatment)	132	285 (71 are on roads not used for com or mech treatment)
Mileage of Roads decommission	44.9 (11 of these miles are not used for com or mech treat)	23.5	44.9 (11 of these miles are not used for com or mech treat)
Actions in designated wilderness (Mission Mountains)	8,638 acres of prescribed fire 1,987 acres of direct seeding whitebark pine	5,887 acres of prescribed fire 1,860 acres of direct seeding whitebark pine	0 acres of prescribed fire 0 acres of direct seeding whitebark pine
Actions in recommended wilderness (Swan Front)	7,788 acres prescribed fire and whitebark pine restoration	7,788 acres prescribed fire and whitebark pine restoration	5,800 acres prescribed fire and whitebark pine restoration

[1]Project specific amendments are needed to address vegetation treatments in Lynx habitat as well as motorized use (helicopter transport and use of chainsaws) in recommended wilderness.

[2]Actual parameter is road/stream crossings hydrologically disconnected. Many existing crossings will not have a culvert, either removed already, or crossing of minor intermittent/ephemeral stream. 236 of the crossings are over intermittent streams.

“In addition, …this DROD authorizes 1,280 acres of beaver habitat restoration, and fish barrier removal on four existing barriers.” (ROD).

The ROD makes some notable statements:

> This decision responds to concerns regarding additional opportunities to provide formal comments and consultation needs if the Forest Service elects to implement the remaining portions of actions evaluated in the FEIS. I still consider full implementation of Alternative B to be the best option for meeting the purpose and need for this project area, especially to achieve the landscape scale objectives as evaluated in the FEIS. However, I recognize the concerns regarding implementing the extent of these actions and am committed to engaging with the interested stakeholders through a subsequent decision and objection process as well as an additional consultation process with USFWS on any future decisions not authorized in this record of decision. Therefore, actions authorized in this decision only span implementation units scheduled to start implementation through 2029.

Clearly the FNF Supervisor intends to implement the full Alternative B as outlined in the FEIS, and believes the FEIS as it is written supports that course of action. He commits only to a subsequent objection process as the public's sole opportunity to engage, prior to implementing what this ROD declines to implement of the full Alternative B. The Supervisor does not—as he also claims, "respond to concerns regarding additional **opportunities to provide formal comments.**" (Emphasis added.)

In addition, the Supervisor claims he is "committed to …an additional consultation process with USFWS on any future decisions not authorized in this record of decision". This statement is not credible, because with this ROD he is already ignoring the requirement to re-consult on the Forest Plan following the June 2021 U.S. District Court opinion that found parts of the Forest Plan, its Biological Opinion and the Incidental Take Statement unlawful.

CLIMATE CHANGE AND CARBON SEQUESTRATION

Our DEIS comments discuss climate change in multiple locations, e.g. our October 8, 2020 letter at pp. 1-2 and p. 13.

We are concerned because logging will contribute to climate change, which will feed back into an even greater impact on the ecosystem. We are also concerned with climate change effects on wildlife, fisheries, and landslide risk. The MSP analysis ignores the fact that timber extraction and wood product manufacturing contributes to an increase in carbon emissions and is adding to the potential that climate change will outpace the ecosystem's ability to adapt.

<u>Existing conditions</u>

Human activities have unequivocally warmed the atmosphere, ocean, and land. There is extremely urgent scientific concern expressed over the imminent effects of climate change on the earth's ecosystems, and therefore on civilization itself. Two anthropogenic causes of climate change are burning fossil fuels and deforestation. Logging will contribute to global warming. And while logging in places such as the Amazon are contributing to climate change, the U.S. has incredibly high amounts of logging and deforestation. John Muir Project (2018); Prestemon et al.

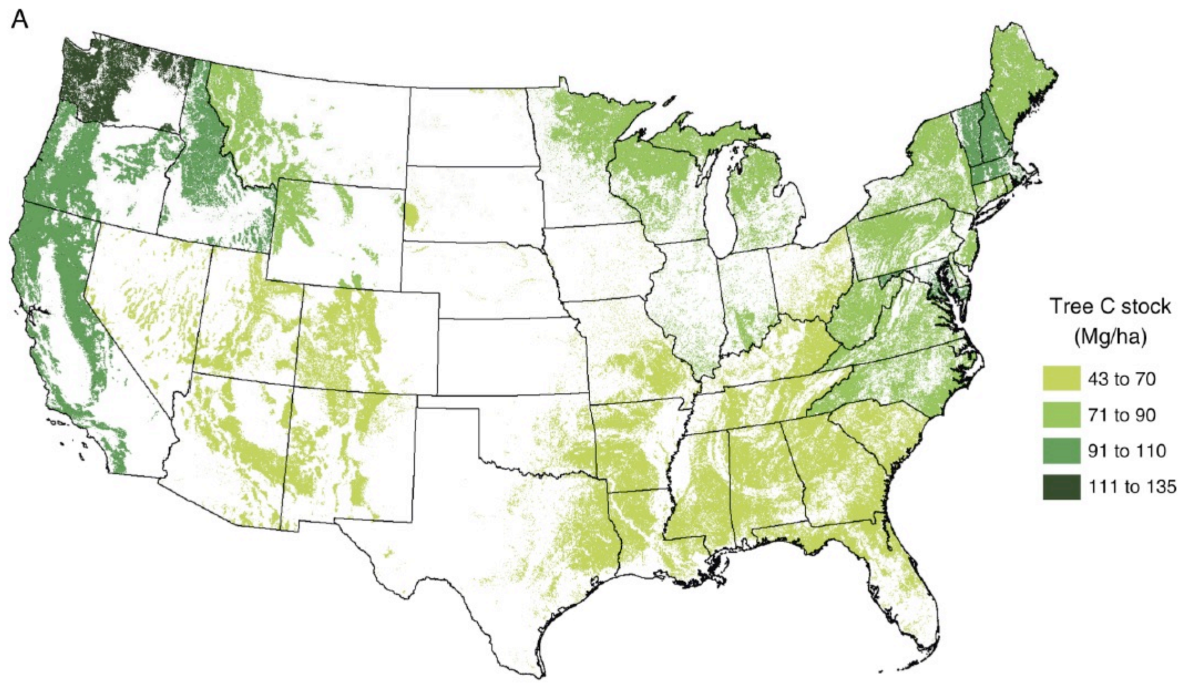
2015; Hansen et al. 2013. We can't ask the rest of the world to save forests without doing our part to protect these resources in our own country.

Since the publication of the DEIS, the Intergovernmental Panel on Climate Change released a new report. We have included it for your review. If greenhouse gas emissions continue at the current rate, there will be more droughts, food shortages, wildfires, mass die-off of coral reefs, and we are seeing these impacts now. The forests cut with the MSP timber sale wouldn't recover under normal conditions within the lifetime of those who wrote this objection and those who are reading it.

"Nations have delayed curbing their fossil-fuel emissions for so long that they can no longer stop global warming from intensifying over the next 30 years, though there is still a short window to prevent the most harrowing future, a major new United Nations scientific report has concluded." Plumer and Fountain. *A Hotter Future is Certain, Climate Panel Warns. But How Hot is Up to Us.* New York Times (Aug. 11, 2021). "Even if nations started sharply cutting emissions today, total global warming is likely to rise around 1.5 degrees Celsius within the next two decades, a hotter future that is now essentially locked in." We are locked in to a future with extreme heat waves and more frequent die-offs. But, we can prevent an even hotter future from moving away from fossil fuels and "removing vast amounts of carbon from the air." Plumer and Fountain 2021. Our collective action to prevent an even hotter future depends on decisions now. If the Forest Service isn't going to think about how it is dooming wildlife to a hotter future, we implore you to think of your children, your nieces and nephews, and future generations whom you could impact by leaving forests intact so they can continue removing carbon from the air. Minimally, under NEPA, this agency needs to fully and honestly grapple with its carbon-emitting actions.

Forests are carbon sinks

Trees sequester carbon continually throughout their lives. While live trees store that carbon they continually remove from the air, dead trees continue to store this. This carbon storage exists throughout forested areas in the United States.



Above: McKinley et al. 2011. "Average statewide forest carbon stocks [in Megagrams of Carbon per hectare] in live and dead trees in the conterminous United States." While the dark green represents the greatest carbon stocks and gain, note how much carbon storage and carbon stocks of forests in the entire United States, when added together, can contribute. All forest lands have the potential to mitigate for global warming in various regions across the United States in both the soils and the vegetation.

While forested lands are carbon sinks, more intact forests[1] are more efficient carbon sinks. For example, larger trees more efficiently store carbon. All parts of the tree—the trunk, the bark, the branches, the leaves or needles, and the roots, is biomass. And scientists have found that the largest one percent of trees in mature and older forests comprised 50 percent of forest biomass worldwide. Lutz, J.A. et al. 2018. This carbon-storage impresses: the Tongass National Forest, for example, still has approximately 90 percent of its original old growth, and stores approximately 44 percent of the carbon stored in the entire National Forest System. DellaSala et al. 2021. The carbon-storage potential extends beyond the Tongass, however, in the Lower 48 states as well: in eastern Oregon, scientists found that large trees that amounted to only three percent of the trees inventoried they stored forty-two percent of the above-ground carbon. Mildrexler et al. 2020. The Pacific Northwest forests can hold live tree biomass equivalent to or larger than tropical forests. Law and Waring 2015. However, large trees do not just store more carbon.

Larger trees can sequester more carbon at a greater rate. In one year, a large tree can accumulate carbon equal to its mid-sized counterpart. Stephenson, N.L. et al. 2014. Large-diameter trees store comparatively outsized amounts of above-ground carbon: "Once trees attain large stature, each additional [diameter at breast height] increment results in a significant addition to the tree's total carbon stores, whereas small-diameter trees must effectively ramp up to size before the

[1] An "intact forest" means current intrusions for activities like restructuring vegetation to place the area in a different successional stage is minimal. "Intact" means where mature trees exist and where soils are relatively undisturbed and where the area is governed by ecosystem processes.

relationship between [diameter at breast height] and [above-ground carbon] results in significant gains." Mildrexler et al. 2020.

Living trees and above-ground vegetation are not the only carbon storage in forests. Dead trees that remain in a forest also store carbon, McKinley et al. 2011, emitting carbon through decay, on a more favorable time-delay than the immediate release caused by active management (discussed below). And forest soils are another remarkable carbon sink. Pan et al. 2011. Unlike above-ground vegetation, soils are more insulated from the weather extremes that can impact carbon stored above-ground. Achat et al. 2015.

Finally, even mountain meadows have potential to be a carbon sink. Researchers at the University of Nevada-Reno found that wet montane meadows, particularly the plants that grow in wetlands and the dense roots that accompany those plants, removed carbon from the atmosphere at a rate comparable to tropical rainforests. They stored carbon in the ground, which again can be less vulnerable to natural ecosystem disturbances. *See* Reed et al. 2020; Wharton 2020.

Active forest management is a carbon source

Climate science suggests that active management[2] is a carbon source. Cutting trees and manipulating vegetation by removing it decreases the carbon sequestered, reduces the carbon stored, and increases carbon emitted. Likewise, livestock grazing facilitates carbon emissions from public lands.

Active management from cutting and removing vegetation

Logging contributes to higher atmospheric carbon levels in several ways. First, it reduces a forest's potential to sequester carbon from the atmosphere. Killing and removing each tree ends that tree's sequestration service, resulting in a net reduction in carbon sequestration. Planting new trees cannot fully replace the lost service because mature forests with larger trees sequester more carbon than newly replanted seedlings: "[I]f the starting point is a mature forest with large carbon stocks, then harvesting this forest and converting it to a young forest will reduce carbon stocks and result in a net increase in atmospheric [carbon dioxide] for some time." McKinley et al. 2011 (internal citations omitted). Removing living vegetation not only arrests an individual organism's sequestration processes, but actively emits carbon by simultaneously reducing carbon stored in biomass while emitting carbon through powering removing and processing biomass. Converting mature forests to any other "desired condition" will loose carbon to the atmosphere. Harmon and Marks 2002.

Wood products store a fraction of the carbon that trees in forests store. Even dead trees store carbon; they release small amounts of carbon into the atmosphere on a slow delay as they decay. *See* Harris et al. 2016. By comparison, carbon storage in forest products, such as lumber or paper,

[2] "Active management," on the other hand, means areas where human activities have attempted to influence the ecosystem and its processes by manipulating vegetation. This includes removing both living and dead vegetation such as trees or shrubs. Active management includes the activities allowed on National Forest System land, including grazing livestock.

is highly inefficient once accounting for the cradle-to-grave activities that emit carbon. Cradle-to-grave activities must be considered when accounting carbon stored versus carbon emitted because such activities exist exclusively for creating the final forest product; soil disturbance, logging and milling residue, and transporting raw and final forest products are all activities that simply would not exist for the alternative of leaving trees undisturbed in a forest. That accounting illustrates that carbon emissions from these activities far outweighs the carbon ultimately stored in any final forest product, and outweighs the carbon emitted from undisturbed trees burned by wildfire and slowly decaying in the forest.

Soil disturbance is the first and continual carbon source during logging operations. For example, the road in picture (*below right*) was cut into a roadless area in 2017 for the single purpose of

Road-building equipment. *FOC file photo.*

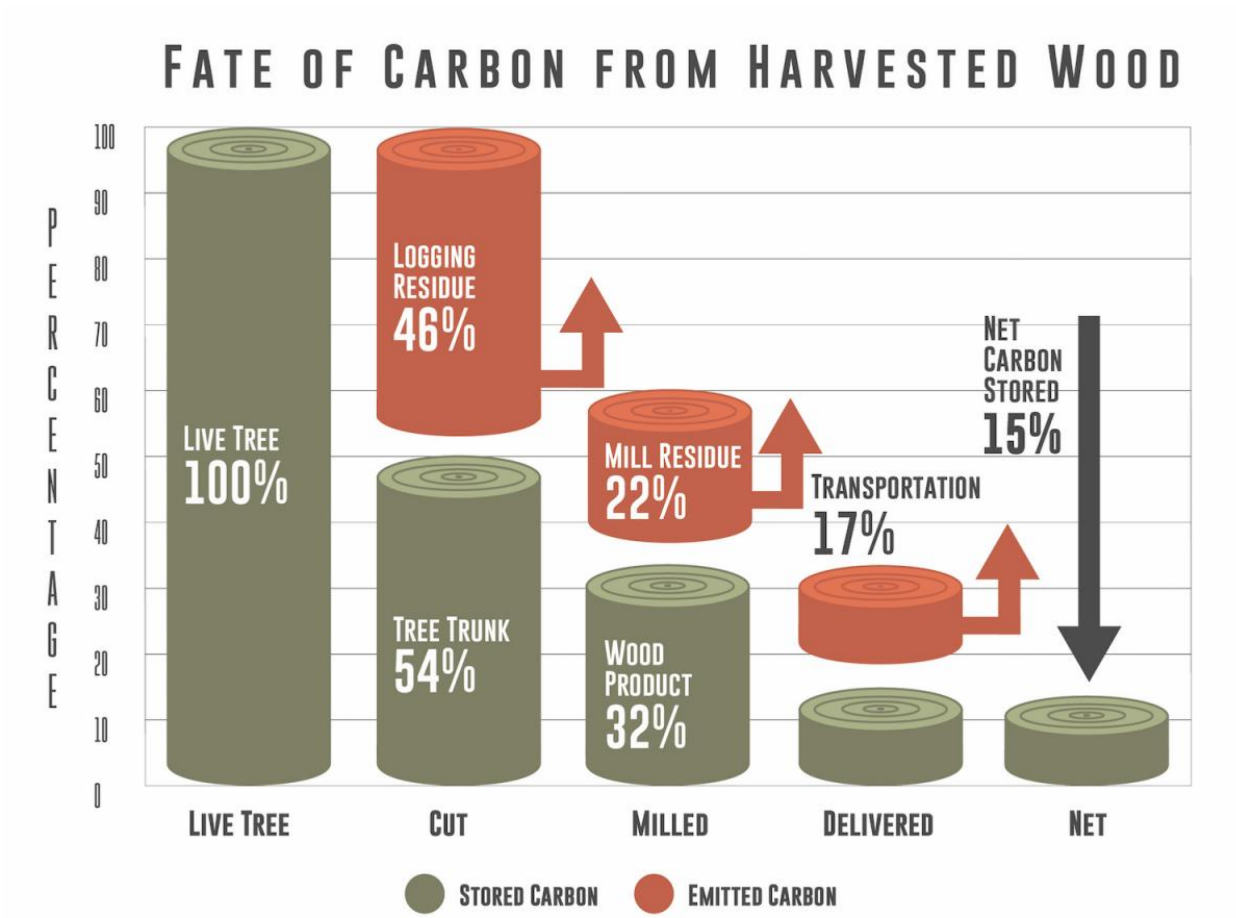
Entirely new temporary road, cut into previously undisturbed forest, Nez Perce National Forest. *FOC file photo.*

accessing a logging unit. Felled trees are dragged along the ground to where machines can load them. These activities disturb soil, releasing carbon stored by soil into the atmosphere. *See* Pan et al. 2011; Achat et al. 2015. The Forest Service allows what it calls "temporary roads" to be bulldozed to access logging units. Like building any road, building a temporary road includes using machinery to rip into the forest floor (*below left*); in the picture (*below right*), the road plowed into a previously undisturbed forest floor, transforming the area disturbed from a carbon sink to a carbon source.

Beyond activities that disturb soils, residue from logging activities becomes an immediate source of carbon emissions. For example, when trees are cut, loggers strip away branches and needles—all biomass that stores carbon—from the trunk so a branchless log can be loaded onto a truck. The branches and needles stripped away become onsite logging residue. This residue is disposed of by piling onsite and burning after logging is complete. Thus, tree branches that had stored carbon in a standing or downed tree, or added as a layer to the forest floor become an immediate source of carbon emissions from logging activities.

Logging residue to be burned, Nez Perce National Forest. *FOC file photo.*

Onsite logging residue is not the only biomass disposed of on the path from tree to lumber. Sawmills further process logs by cutting the usable parts of the log to lumber dimensions, which generates more biomass residue that would have otherwise been stored carbon in the forest. The below graphic, based on data from Gower 2003 and Smith et al. 2006, illuminates the carbon emitted from biomass as living trees that store 100 percent carbon are whittled into final wood products that store a fraction of that amount.



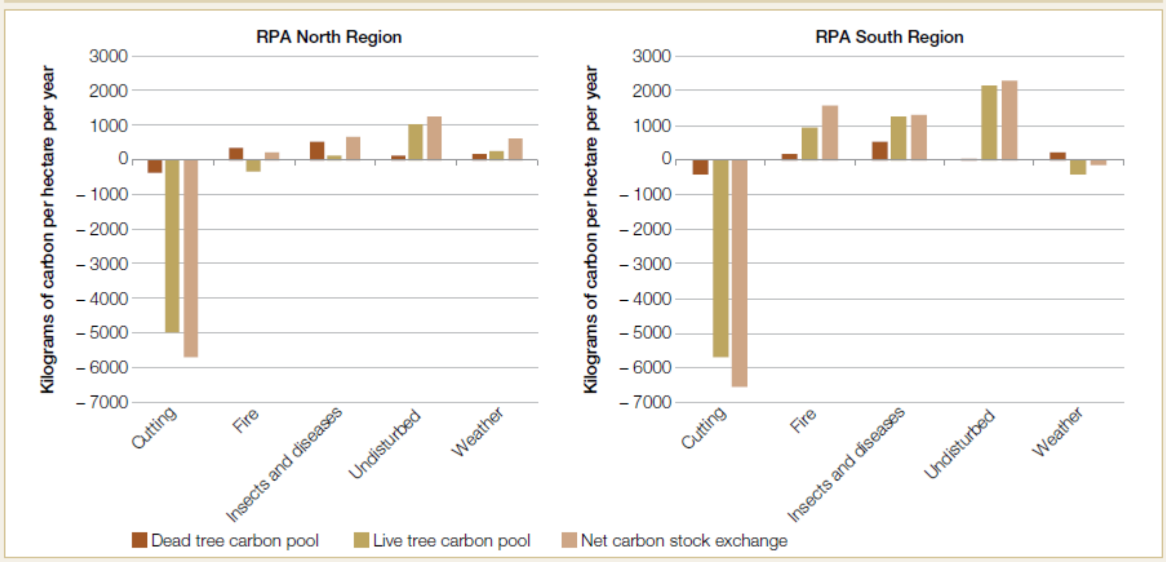
Above: Josephine County Democrats, "Forest Defense is Climate Defense," at https://josephinedemocrats.org/forest-defense-is-climate-defense/ (last visited Apr. 5, 2021)

Harris et al. 2016 estimated roughly similar carbon losses from tree parts stripped away in logging and milling activities: "The highest fractional contribution of C loss in all states was from harvest, and 64% of these losses were from logging residues [both above (19%) and below-ground (23%)] and mill residues (22%)." Accounting for carbon emissions from logging and milling residue, Harris et al. found that the most carbon lost in the public's forests is from logging. And the true emissions associated with logging are sometimes underestimated or not accurately considered. *See* Hudiburg et al. 2019. Harris et al. 2016 used mill surveys, so the above percentages do not appear to account for the fossil fuels burned to cut and harvest the wood before transporting logs to mills. Other scientists, however, have concluded even lesser amounts of long-term carbon storage in the final forest product. "The actual carbon stored long-term in harvested wood products represents less than 10 percent of that originally stored in standing trees or biomass." Moomaw and Smith 2017.

Despite underestimating the true amount of carbon-storage lost from forests on account of logging, the most stored carbon lost from forests is still from logging. For example, below is a USDA Forest Service 2016 update to a 2010 report on carbon accumulation in the Eastern United States. The negative numbers in the chart represent carbon removed from forests' carbon-storage.

Logging also doesn't increase carbon storage by reducing future fire emissions. Research has found high carbon losses associated with "fuel treatment" and only modest differences associated with the high-severity fire and low severity fire that fuel treatment is meant to encourage. Campbell et al. 2012. And where some disturbances like insects, disease, and fire kill trees and lower carbon sequestration, timber harvest is a disturbance with a greater impact. *See* Harris et al. 2016. The FEIS fails to recognize this. Logging to purportedly "reduce fuel" (a strategy largely debunked by science) can emit more carbon than what logging purports to save by altering fire behavior. Harris et a. 2016.

Figure 8-4. Carbon accumulation rates (kilogram per hectare per year) resulting from disturbances in the Eastern United States, based on the most recent remeasured Forest Inventory and Analysis data (about a 6-year time step).



Above: USDA Forest Service 2016. Future of America's Forests and Rangelands. Update to the Forest Service 2010 Resources Planning Act Assessment. "Figure 8-4. Carbon accumulation rates (kilogram per hectare per year) resulting from disturbances in the Eastern United States, based on the most recent remeasured Forest Inventory and Analysis data (about a 6-year time step)."

In addition to carbon-storage eliminated from removing biomass, logging activities themselves burn fossil fuels. Machines cut trees, swingers load trees, and trucks haul logs to mills. These machines burn fossil fuels, and must be transported to remote logging sites, which also burns fossil fuels.

Feller-buncher, Nez Perce National Forest. *FOC file photo*

Swing machine, Nez Perce National Forest. *FOC file photo*

Transporting logs from remote parts of national forests to mills are another carbon source from logging operations. Logging trucks can haul approximately 5,000 board feet of timber per load. The aggregate fossil fuels burned solely from transporting trees logged would be considerable. Accordingly, with Alternative C and Alternative B estimated to yield from 165 mmbf to 202 mmbf respectively, it would take between 33,000 and 40,400 truckloads to haul MSP timber.

Logging truck, Photo credit *US Forest Service*

<u>Warming temperature's impact on forests, and forests' natural ability to respond</u>

Global warming will impact forests because the climate will dictate abiotic surroundings, which will affect what organisms can grow and thrive. The increasing temperature and changing precipitation can dramatically affect our national forests. *See* Malmsheimer et al. 2008. Scientists are already measuring changes in an altered timing of snowmelt and run off in streamflow. Mote et al. 2014. This might mean a species more appropriate to the new temperatures or precipitation patterns replaces a species that can no longer thrive there. Kirilenko and Sedjo 2007.

Intact forests can best mitigate the impacts of global warming. Forest canopies provide climate refugia by promoting cooler microclimates for organisms, buffering warming environments under closed canopies. Scientific studies have found evidence that intact forests—even old growth—are less likely to burn at high severity than managed forests. Zald and Dunn 2018; Bradley et al. 2016; Lesmeister et al. 2019. Intact forests also contain fire refugia—areas where fires miss—where animals find refuge during and after fire, and from where seeds spread for vegetative regrowth after fire. Meddens et al. 2018. Older forests, including old growth, which is the product of hundreds of years of ecosystem work, are among those cooler microclimates. *See* Davis et al. 2019; Frey et al. 2016.

In general, roadless areas and older forests are more resilient to climate change than logged areas, and they provide a sanctuary for climate-sensitive species (DellaSala); Watson, et al. 2013. Mapping vulnerability and conservation adaptation strategies under climate change. Nature Climate Change 3:989-994.

Pacific Northwest forests are especially significant. They hold live tree biomass equivalent or larger than tropical forests. Law and Waring 2015. "Alterations in forest management can contribute to increasing the land sink and decreasing emissions by keeping carbon in high biomass forests, extending harvest cycles, reforestation, and afforestation." Law et al. 2018. The MSP FEIS is missing an honest carbon accounting of the carbon outputs of this project.

McKinley et al. 2011 recognizes, "Generally, harvesting forests with high biomass and planting a new forest will reduce overall carbon stocks more than if the forest were retained, *even counting the carbon storage in harvested wood products*." Avoiding deforestation, afforestation, and reducing harvest are the first three strategies that McKinley et al. 2011 list. *See also* Harmon et al. 1990.

The Forest Service does not recognize logging as a disturbance that causes carbon losses in the soil and that eliminates what would otherwise be ongoing carbon sequestration by intact forests. The agency must account for all carbon emissions—the whole picture. Hudiburg et al. 2019. Here, there is no analysis as to how much emissions the MSP would cause, and how much carbon sequestration will be lost as a result. The FEIS avoids any discussion of CO_2 budgets and how the forest plan and this timber sale will increase emissions.

Likewise, the Forest Service does not recognize that forest preservation, i.e., reducing timber harvest or eliminating it in select areas, is an action the agency has the autority to implement and that this action can mitigate climate change. *See* Harmon 2001. Preservation of forests is a legitimate alternative to mitigate global warming. Law et al. 2018. "Forest preservation offers a cost-effective strategy to avoid and mitigate CO_2 emissions by increasing the magnitude of terrestrial carbon sink in trees and soil, preserve biodiversity, and sustain additional ecosystem services." Buotte et al. 2019. Recently, researchers prioritized forest lands for preservation based on "carbon priority ranking with measures of biodiversity." The "high carbon priority forests in the western US exhibit features of older, intact forest with high structural diveristy[], including carbon density and tree species richness." Buotte et al. 2019. Here is the map from that article:

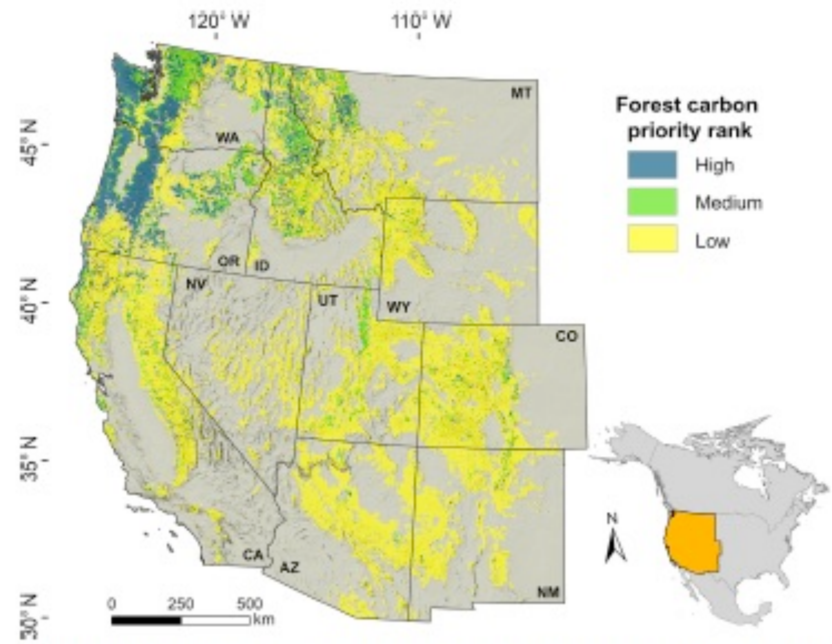


Figure 1, Buotte et al. 2019. While this figure ranks carbon priority, we point out that all of these forests are carbon sinks. Also, this map does not include Alaska forests.

This forest is worth preserving—it has an incredible ability to sequester carbon. Profita (Jan. 1, 2020) *Pacific Northwest forests fit trifecta for curbing climate change—if we stop logging them*, Oregon Public Broadcasting. Yet, the paradigm under which the Forest Service developed this project is that the Forest Service needs to log and replace trees to achieve some arbitrarily static composition of trees that the Forest Service is choosing with no evidence this works. *See* Johnson 2016.

The FS (in USDA Forest Service, 2017b) discusses some effects of climate change on forests, including the following statement: "In many areas, it will no longer be possible to maintain vegetation within the historical range of variability. Land management approaches based on current or historical conditions will need to be adjusted." There is no scientific support for the assumption that "treatments" will result in sustainable vegetation conditions under increasing temperatures. Browne et. al. 2019 discussed that adaptational lag to temperature in valley oak (*Quercus lobata*) can be mitigated by genome-informed assisted gene flow. Even using seed source from local species may not hold for management practices because trees can lag in adapting to temperature. This has not been accounted for.

The FEIS fails to consider that the effects of climate change on the project area, including that the target "historical" or desired vegetation conditions will likely not be achievable or sustainable. The FEIS fails to provide any credible analysis as to how realistic and achievable its objectives are in the context of a rapidly changing climate, along an unpredictable but definitely changing trajectory.

The FEIS fails to analyze and disclose how climate change is already, and is expected to be even more in the future, influence forest ecology. This has vast ramifications as to whether or not the forest in the project area will respond as the FS assumes.

The FEIS fails to acknowledge the likelihood that "…high seedling and sapling mortality rates due to water stress, competing vegetation, and repeat fires that burn young stands," which will likely lead to a dramatic increase in non-forest land acres. (Johnson, et al., 2016.)

In the recent revised Forest Plan Draft EIS for the Custer-Gallatin National Forest, the FS states, "Climate change is expected to continue and have profound effects on the Earth's ecosystems in the coming decades (IPCC 2007)." As alarming as that might sound, the most recent report from the Intergovernmental Panel on Climate Change makes that 2007 report seem optimistic. *See* IPCC 2021.

Any efforts that aimed at trying to replicate how the Forest Service thinks things looked pre-European influence ignores the larger pattern of climate, ignores climate change, and ignores natural succession. *See* Millar and Wolfenden 1999 for a discussion on why patterns within the context of climate change are important.

We incorporate the following article from the *Missoulian* ("Fire study shows landscapes such as Bitterroot's Sapphire Range too hot, dry to restore trees") written by Rob Chaney (March 11, 2019):

> Burned landscapes like this drainage in the Sapphire Mountains hasn't been able to grow new trees since the Valley Complex fire of 2000, due to lack of soil moisture, humidity and seed trees, as well as excess heat during the growing season. University of Montana students Erika Berglund and Lacey Hankin helped gather samples for a study showing tree stands are getting replaced by grass and shrubs after fire across the western United States due to climate change.
>
> Fire-scarred forests like the Sapphire Range of the Bitterroot Valley may become grasslands because the growing seasons have become too hot and dry, according to new research from the University of Montana.
>
> "The drier aspects aren't coming back, especially on north-facing slopes," said Kim Davis, a UM landscape ecologist and lead investigator on the study. "It's not soil sterilization. Other vegetation like grasses are re-sprouting. It's too warm. There's not enough moisture for the trees."
>
> Davis worked with landscape ecologist Solomon Dobrowski, fire paleoecologist Philip Higuera, biologist Anna Sala and geoscientist Marco Maneta at UM along with colleagues at the U.S. Forest Service and University of Colorado-Boulder to produce the study, which was released Monday in the Proceedings of the National Academy of Sciences journal.
>
> "What's striking is if you asked scientists two decades ago how climate warming would play out, this is what they expected we'd see," Higuera said. "And now we're starting to see those predictions on the impact to ecosystems play out."

The study concentrated on regrowth of Ponderosa pine and Douglas fir seedlings in Montana, Idaho, Colorado, New Mexico, Arizona and northern California. Field workers collected trees from 90 sites, including 40 in the northern Rocky Mountains, scattered within 33 wildfires that had occurred within the past 20 years.

“We did over 4,000 miles of road-tripping across the West, as well as lots of miles hiking and backpacking,” Davis said. The survey crews brought back everything from dead seedlings to 4-inch-diameter tree rings; nearly 3,000 samples in total. Then they analyzed how long each tree had been growing and what conditions had been when it sprouted. Before the 1990s, the test sites had enough soil moisture, humidity and other factors to recruit new seedlings after forest fires, Dobrowski said.

“There used to be enough variability in seasonal conditions that seedlings could make it across these fixed thresholds,” Dobrowski said. “After the mid-‘90s, those windows have been closing more often. We’re worried we’ll lose these low-elevation forests to shrubs or grasslands. That’s what the evidence points to.”

After a fire, all kinds of grasses, shrubs and trees have a blank slate to recover. But trees, especially low-elevation species, need more soil moisture and humidity than their smaller plant cousins. Before the mid-90s, those good growing seasons rolled around every three to five years. The study shows such conditions have evaporated on virtually all sites since 2000.

“The six sites we looked at in the Bitterroots haven’t been above the summer humidity threshold since 1997,” Higuera said. “Soil moisture hasn’t crossed the threshold since 2009.”

The study overturns some common assumptions of post-fire recovery. Many historic analyses of mountain forests show the hillsides used to hold far fewer trees a century ago, and have become overstocked due to the efforts humans put at controlling fire in the woods. Higuera explained that some higher elevation forests are returning to their more sparse historical look due to increased fires.

“But at the lower fringes, those burn areas may transition to non-forest types,” Higuera said, “especially where climate conditions at the end of this century are different than what we had in the early 20th Century.”

The study also found that soil sterilization wasn’t a factor in tree regrowth, even in the most severely burned areas. For example, the 2000 Sula Complex of fires stripped forest cover in the southern end of the Bitterroot Valley. While the lodgepole pine stands near Lost Trail Pass have recovered, the lower- elevation Ponderosa pine and Douglas firs haven’t.

Another factor driving regeneration is the availability of surviving seed trees that can repopulate a burn zone. If one remains within 100 meters of the burned landscape, the area can at least start the process of reseeding. Unfortunately, the trend toward high-

> severity fires has reduced the once-common mosaic patterns that left some undamaged groves mixed into the burned areas.
>
> Higuera said he hoped land managers could use small or prescribed fires to make landscapes more resilient, as well as restructure tree-planting efforts to boost the chances of heavily burned places.

We've provided the scientific publication as well: *see* Davis et al. 2019. The Resources Planning Act of 1974 (RPA) and National Forest Management Act of 1976 (NFMA) mandate long-range planning which impose numerous limitations on timber extraction practices and the amount of timber sold annually. These long-range plans are based on assumptions, which are based on data, expert opinion, public participation and other factors which mostly view from a historical perspective. So it's time to peer into the future to examine closely (NEPA: "take a hard look at") those assumptions. The FEIS fails to assess and disclose all risks associated with vegetative-manipulation as proposed.

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.

NEPA requires a "hard look" at the best available science relating to future concentrations of greenhouse gases and gathering climate risk as we move forward into an increasingly uncertain and uncharted climate future. This has not been done. The MSP logging project does not include a legitimate climate-risk analysis, much less one based on the best available science.

No amount of logging, thinning and prescribes burning will cure the cumulative effects (irretrievable loss) already baked into the foreseeably impending climate chaos. "Treatments" must be acknowledged for what they are: adverse cumulative environmental effects. Logging can neither mitigate, nor prevent, the effects of wildfire or logging. Both cause disturbance to forests that cannot be restored or retrieved—the assumed resilience has already been compromised to some degree. It is way too late in the game to ignore the elephant in the room.

The FS ignores best available science indicating prescribed fire, thinning and logging are actually cumulative with the dominant forces of increased heat, drought, and wildfire.

NEPA requires analysis of an alternative that reflects our common understanding of climate risk. A considerable amount of data and scientific research repeatedly confirms that we may be looking in the wrong direction (back into history, e.g., "historic conditions") for answers to better understand our forest future.

The FS fails to analyze an alternative projecting climate science into the FNF's future. It fails to adequately consider that the effects of climate risk represent a significant and eminent loss of forest resilience already, and growing risk into the "foreseeable future."

Davis et al., 2019 state: "At dry sites across our study region, seasonal to annual climate conditions over the past 20 years have crossed these thresholds, such that conditions have become increasingly unsuitable for regeneration. High fire severity and low seed availability further reduced the probability of postfire regeneration. Together, our results demonstrate that climate change combined with high severity fire is leading to increasingly fewer opportunities for seedlings to establish after wildfires and may lead to ecosystem transitions in low-elevation ponderosa pine and Douglas-fir forests across the western United States."

Forests are already experiencing emissions-driven deforestation, on both the post-fire and post-logging acreage.

The FEIS does not disclose restocking monitoring data and analysis.

The Forest Service has not considered changing risks with landslides, as more precipitation will come in the form of rain and can destabilize slopes that might have been stable in colder weather.

The FEIS ignores the impact that wood production plays in contributing to greenhouse gases and eliminating the mitigation mechanisms (carbon sequestration) that trees would have otherwise conducted. The Forest Service's general position that it has a miniscule impact is not acceptable under CEQ guidelines (CEQ Guidance, 2016).

The Forest Service has utterly failed to even attempt to cumulatively examine the effects, which is significant as the Northern Region has been approving many supersized clearcuts across the national forests of Montana and Northern Idaho. *See* Bilodeau and Juel 2021. This region has allowed over 93,000 acres of supersized clearcuts just in the last seven years. That clearing of land—how much carbon sequestration has that eliminated? How much fossil fuel was burned in the clearing of that acreage?

It is odd that this project purports to reduce fuels, which, if even possible, is a secondary driver of fires, while global warming is the primary driver of fires, and this project will contribute to global warming in the manners described above. The Forest Service could actually combat the primary driver of fires by not logging. The CEQ Guidance, 2016 at pp. 10-11 states:

> Climate change results from the incremental addition of GHG emissions from millions of individual sources, which collectively have a large impact on a global scale. CEQ recognizes that the totality of climate change impacts is not attributable to any single action, but are exacerbated by a series of actions including actions taken pursuant to decisions of the Federal Government. Therefore, a statement that emissions from a proposed Federal action represent only a small fraction of global emissions is essentially a statement about the nature of the climate change challenge, and is not an appropriate basis for deciding whether or to what extent to consider climate change impacts under NEPA. Moreover, these comparisons are also not an appropriate method for characterizing the potential impacts associated with a proposed action and its alternatives and mitigations because this approach does not reveal anything beyond the nature of the climate change challenge itself: the fact that diverse individual sources of emissions each

make a relatively small addition to global atmospheric GHG concentrations that collectively have a large impact.

Despite CEQ Guidance, 2016 which requires “federal agencies [to] consider the extent to which a proposed action and its reasonable alternatives would contribute to climate change, through GHG emissions” and account for the ways global warming will, with the proposed action, change the action’s environmental effects, there is no such analysis for the MSP. This agency is going to reduce carbon sequestration, contribute to carbon emissions, proposes to do the same in projects forest-wide, and the FEIS does not recognize such impacts at all. As a result, the agency has violated NEPA by failing to take a hard look at its timber program (minimally forest-wide over 21st century).

We incorporate Oregon Wild, 2020, which identifies many of the fallacies found in Forest Service timber sale NEPA analyses of climate change.

Remedies:
1) Select the no-action alternative
2) Withdraw the project
3) Conduct an analysis that accounts for greenhouse gas emissions and the reduced ability to sequester carbon on a cumulative effects scale for the NPCNF and this region.

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OLD GROWTH

Our DEIS comments discuss old growth (e.g. October 8, 2020 letter at p. 11 where the section "TERRESTRIAL SPECIES DIVERSITY AND VIABILITY, TERRESTRIAL WILDLIFE HABITAT" incorporates AWR'S February 12, 2018 Objection to the Revised Forest Plan—which was incorporated into our DEIS comments.) Since the Revised Forest Plan (RFP) Record of Decision did not provide requested relief regarding old growth, and since the MSP FEIS and ROD go no further, this issue remains ripe for objection.

We incorporate Juel, 2021 which discusses the FS mismanagement of old growth and old-growth landscapes. This mismanagement is fully on display with the MSP.

The FEIS states, "Verification of old growth status following Green et al. (2011) would happen during the implementation of this project." Green et al. is a flawed old-growth definition. (Juel, 2021.) And as discussed in our DEIS comments, NEPA is being violated with the FS lacking data—and therefore leaving the public and decisionmaker uninformed on the presence and extent of old growth.

The FEIS states, "Alternative B proposes to reduce the loss of old growth to stand replacing wildfires or insect activity by decreasing tree density, reducing understory fuels, and burning with prescribed fire." Such treatments are not supported by best available science, and would result in damage to old growth, old-growth associated wildlife, and old-growth landscapes. (Juel, 2021.)

The FS lacks any established way of maintaining a publicly accessible inventory of old growth, or forest identified as being managed for future old growth.

Remedy:
1. Ultimately, the FNF must amend its forest plan, incorporating the ecological principles of old-growth landscapes discussed in Juel, 2010 and in the Friends of the Wild Swan/Swan View Coalition "Back to the Future of Old Growth" alternative submitted for the Amendment 21 Final EIS (*see* USDA Forest Service, 1998).

2. Prepare a Supplemental EIS to design and implement the ecological principles of old-growth landscapes discussed in Juel, 2010 and in the Friends of the Wild Swan/Swan View Coalition "Back to the Future of Old Growth" Amendment 21 alternative at the scale of the MSP landscape.

3. Maintain a fully transparent, publicly accessible forestwide inventory of old growth which facilitates complete, independent forestwide mapping of all categories of old growth including

existing old growth and forest designated for management to attain old growth status within 200 years.

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