VIA Link: https://www.fs.usda.gov/project/?project=64924

December 13, 2023

U.S. Forest Service, Swan Lake Ranger District
Attn: Christopher Dowling (Rumbling Owl)
200 Ranger Station Road
Bigfork, MT 59911

Dear Christopher:

On behalf of the American Forest Resource Council (AFRC) and its members, thank you for the opportunity to comment on the Rumbling Owl Project.

AFRC is a regional trade association whose purpose is to advocate for sustained yield timber harvests on public timberlands throughout the West to enhance forest health and resistance to fire, insects, and disease. We do this by promoting active management to attain productive public forests, protect adjoining private forests, and assure community stability. We work to improve federal and state laws, regulations, policies, and decisions regarding access to and management of public forest lands and protection of all forest lands. Many of our members have their operations in communities within and adjacent to the Flathead National Forest and management on these lands ultimately dictates not only the viability of their businesses, but also the economic health of the communities themselves.

The project area is in Missoula County, and National Forest System lands surround private land along the US Highway 83 corridor that extends from Swan Lake south to the boundary of the Flathead National Forest with the Lolo National Forest. The Project area is bounded on the east side by the Bob Marshall Wilderness. The private lands in this area are populated in rural and semi-rural developments within a forested environment.

In a letter dated July 9, 2023, Chief of the Forest Service Randy Moore identified "an emergency situation on National Forest System lands within 250 high risk firesheds across the West" and directed the Forests to use "emergency authorities as their default way of conducting environmental reviews and before consideration of our normal practices." The Condon fireshed encompasses the entire Rumbling Owl Project Area and is identified as one of 19 high risk firesheds in Montana. Western Firesheds Emergency Action Determination, Section 40807 of

the Infrastructure Investment and Jobs Act (Public Law 117-58; 2021), authorizes emergency vegetation treatment actions on National Forest System lands within 250 identified High Risk Firesheds. Emergency actions are taken to achieve relief from threats to public health and safety, critical infrastructure, and/or to mitigate threats to natural resources. The Forest will be asking for the emergency authority to move this Project forward to mitigate the harm to life and property adjacent to National Forest lands.

AFRC supports the Purpose and Need for the Project which includes:

- Reduce wildfire risk to loss of life, property damage, and ecosystem function within the wildland-urban interface.
- Improve the diverse forest composition which contributes to resistant1 forest conditions at both the stand and landscape level.

While AFRC supports the Project and the Purpose and Need, we offer the following comments to support and supplement the record.

1. First, we are very pleased to see the Forest requesting expedited procedures to quickly treat these lands in the Condon Fireshed and support this request as it aligns with the Chief's direction discussed above. The wildfire that burned along Highway 83 earlier this summer is a reminder that this area is in a high risk area to future wildfires.

2. AFRC supports the District's plan to treat 4,441 acres commercially as listed in the table below. As you know, the timber harvested from National Forest Lands in Montana is very important for supporting the local milling infrastructure.

Commercial Tree Harvest	Acres
Regeneration Tree Harvest	988
Intermediate Tree Harvest	3453
Total Commercial Treatment Area	**4441**

Montana's forest products industry is one of the largest components of manufacturing in the state and employs roughly 7,700 workers earning about $335 million annually. There are several sawmills, post and pole, and smaller wood operations where the Project is located. The timber products provided by the Forest Service are crucial to the health of our membership and the counties and communities where they are present. Without the raw material sold by the Forest Service these mills would be unable to produce the amount of wood products that the citizens of this country demand. Without this material, our members would also be unable to run their mills at capacities that keep their employees working, which is crucial to the health of the communities that they operate in. These benefits can only be realized if the Forest Service sells their timber products through sales that are economically viable. This viability is tied to both the volume and type of timber products sold and the manner in which these products are permitted to be delivered from the forest to the mills. Studies from the University of Montana's Bureau of Business and Economic Research has shown that for every million board feet of timber harvested there are 15-18 direct or indirect jobs created.

3. Commercial treatments include several different silvicultural prescriptions including shelterwood, group selection, intermediate treatments, and commercial thinnings. While all of these treatments take a different approach to stand improvement, AFRC suggests that the main goal for all is to reduce stand density and promote fire resistant species across the landscape. We believe in most cases to accomplish this; the basal area of leave trees need to be reduced to about 40 sq. ft. per acre to both reduce fuel loadings and tree competition and to promote tree vigor on the residual trees.

4. Since the District is planning to analyze an Action and No Action Alternative, AFRC would like to see the District more accurately and acutely describe the impacts of the No Action Alternative. We do not believe you are appropriately describing the impact to wildfire risk that is exacerbated by taking no action. Increase levels of insects and disease, accumulating fuels, a warming climate, and expanding development in the wildland-urban interface have made fire threat increasingly inevitable. The risk has reached crisis proportions in the West, calling for decisive action to reduce risk to communities as well as improve forest health and resilience to future wildfire events. Further, increased tree density and tree succession has resulted in a higher susceptibility to insects, disease, and drought as trees compete for sunlight, water, and nutrients. Past and on-going tree mortality is evident, which subsequently has resulted in an increase of hazardous fuels and higher risk of wildfire. Therefore, we request that you supplement the information in your No Action Alternative for all resources.

5. AFRC is pleased to see the broad range of equipment that may be suitable for use during harvest*: "All commercial harvest activities would be implemented using mechanized equipment. Mechanized equipment includes traditional tracked and rubber-tired logging equipment. This may include, but is not limited to, harvesters, forwarders, skidders, feller-bunchers, processors, masticators, chippers, and dozers."*

   AFRC would like to remind the Forest that the benefits of conducting a project can only be realized if the Forest Service sells their timber products through sales that are economically viable. This viability is tied to both the volume and type of timber products sold and the manner in which these products are permitted to be delivered from the forest to the mills. There are many ways to design a timber sale that allows a purchaser the ability to deliver logs to their mill in an efficient manner while also adhering to the necessary practices that are designed to protect the environmental resources present on Forest Service forestland.

   The primary issues affecting the ability of our members to feasibly deliver logs to their mills are firm operating restrictions. As stated above, we understand that the Forest Service must take necessary precautions to protect their resources; however, we believe that in many cases there are conditions that exist on the ground that are not in step with many of the restrictions described in Forest Service EA's and contracts (i.e. dry conditions during wet season, wet conditions during dry season). We would like the Forest Service to shift their methods for protecting resources from that of firm prescriptive restrictions to one that focuses on descriptive end-results; in other words,

describe what you would like the end result to be rather than prescribing how to get there. There are a variety of operators that work in the Montana market area with a variety of skills and equipment. Developing an EA and contract that firmly describes how any given unit shall be logged may inherently limit the abilities of certain operators. For example, restricting certain types of ground-based equipment rather than describing what condition the soils should be at the end of the contract period unnecessarily limits the ability of certain operators to complete a sale in an appropriate manner with the proper use of their equipment. To address this issue, we would like to see flexibility in the EA and contract to allow a variety of equipment to the sale areas. We feel that there are several ways to properly harvest any piece of ground, and certain restrictive language can limit some potential operators. Though some of the proposal area is planned for cable harvest, there are opportunities to use certain ground equipment such as fellerbunchers and processors in the units to make cable yarding more efficient. Allowing the use of processors and fellerbunchers throughout these units can greatly increase its economic viability, and in some cases decrease disturbance by decreasing the amount of cable corridors, reduce damage to the residual stand and provide a more even distribution of woody debris following harvest. Tethered-assist equipment is also becoming a more safe, viable, and available option for felling and yarding on steep slopes. This equipment has shown to contribute little additional ground disturbance when compared to traditional cable systems. Please prepare your NEPA analysis documents in a manner that will facilitate this type of equipment.

6. AFRC supports your travel management plan with some additional suggestions. The plan is listed below.

Table 3. Summary of proposed motorized management activities.

Proposed Motorized Recreation Management Designation[a]	Miles
Temporary Roads	4
Road Decommissioning	3

Since the Forest is planning to decommission 3 miles of road, AFRC would like to remind the Forest that an intact road system is critical to the management of Forest Service land, particularly for the provision of timber products. Without an adequate road system, the Forest Service will be unable to offer and sell timber products to the local industry in an economical manner. The decommissioning of roads in the Rumbling Owl Project likely represents ***permanent*** removal of these roads and likely the deferral of management of those forest stands that they provide access to.

We understand that because of wildlife concerns some roads need to be blocked and decommissioned. At the same time, we want the Forest to understand the land base covered in the Rumbling Owl Project area are to be managed for a variety of forest management objectives. Removal of adequate access to these lands compromises the agency's ability to achieve these objectives and is very concerning to us.

We would like the District to carefully consider the following three factors when deciding to decommission any road in the project area:

a. Determination of any potential resource risk related to a road segment.
b. Determination of the access value provided by a road segment.
c. Determination of whether the resource risk outweighs the access value (for timber management and other resource needs).

We believe that only those road segments where resource risk outweighs access value should be considered for decommissioning. AFRC is generally supportive of BMP upgrades to existing roads, however we encourage the use of hydrologically self-maintaining structures like rolling drain dips rather than structures that require periodic maintenance or are subject to breakage such as flappers or open top box culverts.

7. The Forest recently planned some shaded fuel breaks. AFRC supports the concept of shaded fuel breaks along strategic roads within the project area. These fuel breaks should be wide enough to stop or slow down a fast-moving wildfire. At a minimum, these breaks should be wide enough on either side of those roads to enable effective fire suppression. The stands within those fuel breaks should be thinned to a wide spacing and low basal area to reduce the threat of a crown fire going through the area. The purpose of the fuel breaks is to get the fire to lay down on the ground for suppression purposes.

8. AFRC believes that the Forest has done a good job of explaining how and why forest management work should be done where threatened or endangered species are known to exist. The Healthy Forests Restoration Act authorizes hazardous fuels reduction projects on Federal land that contain threatened and endangered species habitat if (A) natural fire regimes on that land are identified as being important for, or wildfire is identified as a threat to, an endangered species, a threatened species, or habitat of an endangered species or threatened species in a species recovery plan; (B) the authorized hazardous fuel reduction project will provide enhanced protection from catastrophic wildfire for the endangered species, threatened species, or habitat of the endangered species or threatened species; and (C) the Secretary complies with any applicable guidelines specified in any management or recovery plan (16 USC 5512(a)(5)).

9. The scoping document states that *"No harvest activity would occur within the inner Riparian Management Zones (FW-STD-RMZ-06)."* AFRC believes that managing in the greater riparian areas can help to achieve forest restoration goals. It has been well documented that thinning in riparian areas accelerates the stand's trajectory to produce large conifer trees and has minimal effect on stream temperature with adequate buffers. Removal of suppressed trees has an insignificant short-term effect on down wood, and ultimately a positive effect on long-term creation of large down woody debris and large in stream wood, which is what provides the real benefit to wildlife and stream health. We encourage the Forest Service to focus their riparian reserve treatments on a variety of native habitats. There is a need for treatments that meet the need of multiple habitat types, and we encourage the District to look for ways to incorporate treatments that meet those needs. Utilization of gap cuts to promote early seral habitat in the reserves, treatments to diversify all areas of the reserve, and prescriptions that account for the full range of objectives that the Project mandates should be considered.

The tradeoffs that the Forest Service will likely be considering through the ensuing environmental analysis will be between achieving these forest health benefits and potentially having adverse impacts to streams. These impacts to streams typically include stream temperature, wood recruitment, and sedimentation associated with active management. We would like the Forest Service to review the literature cited below and incorporate its findings into your environmental analysis that will shape the level of management permitted to occur in riparian reserves.

Stream temperature

Janisch, Jack E, Wondzell, Steven M., Ehinger, William J. 2012. Headwater stream temperature: Interpreting response after logging, with and without riparian buffers, Washington, USA. *Forest Ecology and Management,* 270, 302-313.

Key points of the Janisch paper include:

- The amount of canopy cover retained in the riparian buffer was not a strong explanatory variable to stream temperature.
- Very small headwater streams may be fundamentally different than many larger streams because factors other than shade from the overstory tree canopy can have sufficient influence on stream temperature.

Anderson P.D., Larson D.J., Chan, S.S. 2007 Riparian Buffer and Density Management Influences on Microclimate of Young Headwater Forests of Western Oregon. *Forest Science,* 53(2):254-269.

Key points of the Anderson paper include:

- With no-harvest buffers of 15 meters (49 feet), maximum air temperature above stream centers was less than one-degree Celsius greater than for unthinned stands.

Riparian reserve gaps

Warren, Dana R., Keeton, William S., Bechtold, Heather A., Rosi-Marshall, Emma J. 2013. Comparing streambed light availability and canopy cover in streams with old-growth versus early-mature riparian forests in western Oregon. *Aquatic Sciences* 75:547-558.

Key points of the Warren paper include:

- Canopy gaps were particularly important in creating variable light within and between reaches.
- Reaches with complex old growth riparian forests had frequent canopy gaps which led to greater stream light availability compared to adjacent reaches with simpler second-growth riparian forests.

Wood Recruitment

Burton, Julia I., Olson, Deanna H., and Puettmann, Klaus J. 2016. Effects of riparian buffer width on wood loading in headwater streams after repeated forest thinning. *Forest Ecology and Management*. 372 (2016) 247-257.

Key points of the Burton paper include:

- Wood volume in early stages of decay was higher in stream reaches with a narrow 6-meter buffer than in stream reaches with larger 15- and 70-meter buffers and in unthinned reference units.
- 82% of sourced wood in early stages of decay originated from within 15 meters of streams.

Sedimentation

Rashin, E., C. Clishe, A. Loch and J. Bell. 2006. Effectiveness of timber harvest practices for controlling sediment related water quality impacts. *Journal of the American Water Resources Association*. Paper No. 01162

Key points of the Rashin paper include:

- Vegetated buffers that are greater than 33 feet in width have been shown to be effective at trapping and storing sediment.

Collectively, we believe that this literature suggests that there exists a declining rate of returns for "protective" measures such as no-cut buffers beyond 30-40 feet. Resource values such as thermal regulation and coarse wood recruitment begin to diminish in scale as no-cut buffers become much larger. We believe that the benefits in forest health achieved through density management will greatly outweigh the potential minor tradeoffs in stream temperature and wood recruitment, based on this scientific literature. We urge the Forest Service to establish no-cut buffers along streams no larger than 40 feet and maximize forest health outcomes beyond this buffer.

In addition to the benefits of managing in the riparian areas listed above, AFRC believes that this Project will have beneficial impacts to fisheries resources as indicated in the scoping document. Culverts need to be replaced to help with fish passage, thinning is needed to increase water yield, and density reduction is needed to mitigate wildfire risk that will lessen the chances for mass soil movements into streams following fires.

10. AFRC supports the District's plan to manage old growth areas. Some proposed fuels treatments will occur in old growth and potential old growth stands. Prescribed burning, and in some instances, tree harvesting would occur in the warm dry and warm moist old growth and recruitment potential old growth stands. The treatment designs include retaining the large old trees, decreasing the number of smaller trees and reintroducing fire into those stands. All harvest treatments in old growth would be intermediate treatments. Treatments in the drier forest types would allow the ability to improve resiliency, resulting in stands more able to withstand bark beetle mortality and stand-replacing fire.

11. The Forest briefly discusses climate change in the following statement: *"Vegetation management and wildlife habitat direction in the Forest Plan addresses future uncertainties, such as climate change, by focusing on the development of landscapes and forest conditions that are resilient and resistant to disturbances and stressors*."

AFRC strongly believes the record needs to be improved for Rumbling Owl as to how this Project could improve carbon sequestration and reduce the risk of greenhouse gas emissions from large catastrophic wildfires if the Project is implemented.

AFRC would like the District to further supplement the carbon cycling and storage with some of the information below. While you have Forest wide information on carbon cycling and storage information, AFRC encourages the Forest to conduct a detailed analysis on the Project's impacts to climate change, carbon sequestration, and greenhouse gas emissions. Interim CEQ regulations pertaining to the analysis of this resource have recently been updated and the Forest Service must conduct its analysis on this Project accordingly. Specifically, those regulations require that greenhouse gas emissions be analyzed for all federal actions. Those regulations also encourage federal agencies to consider the context of short-term emissions as a result of actions that will improve long term sequestration and storage. We strongly believe that the minor, short-term emissions associated with timber harvest and other associated treatments are dwarfed by the long-term benefits associated with such treatments.

We urge the District to clearly outline how the proposed treatments, while possibly emitting carbon in the near term, would ultimately benefit climate change mitigation goals by 1) reducing the likelihood of carbon emissions through wildfire; 2) increasing the rate of carbon sequestration by reducing competition to residual trees; and 3) storing carbon in long lasting wood products that would otherwise be at risk of loss through wildfire. Carbon loss through high intensity wildfire has become a leading cause of our national forests transitioning from carbon sinks to carbon sources. Active management to reduce such a transition would not only reduce carbon loss but accelerate carbon sequestration. And ultimately, any timber products harvested to further these two objectives has been shown to have long lasting carbon storage potential.

Our comments below should help inform this analysis.

AFRC would like the Forest to bolster your information by conducting a detailed analysis on the Project's impacts to climate change and carbon sequestration. Our comments below should help inform this analysis.

Please consider the points below from a technical report by the Climate Change Vulnerability Assessment and Adaptation Project (SWOAP) in Southwest Oregon.

- Wood harvested from the forest, especially timber used for durable structures, can be reservoirs of long-term carbon storage (Bergman et al. 2014).
- Forests and their products embody a closed-loop system in which emissions associated with harvests and product use are eventually recovered as forests regrow.
- Although products may be retired in solid waste disposal sites, they decompose quite slowly, causing carbon to continue to be stored for many decades.
- Products derived from the harvest of timber from national forests reduce carbon emissions by substituting for more energy-intensive materials including concrete, steel, and plastics.

There is scientific support for the practice of regular harvests at an age where tree growth begins to slow, storage of that tree carbon in long-lasting wood products, and proactive reforestation. A failure to do so would hamper that acre's ability to maximize carbon sequestration through the replacement of slow growing large trees with fast growing small trees and the storage of those large trees in long-lasting wood products. Not storing that carbon in wood products also poses the risk of losing the carbon in standing trees from high intensity wildfire, which is becoming increasingly prevalent on public lands in western states. A 2022 study estimated that wildfires in California in 2020 emitted 127 million metric tons of carbon into the atmosphere, making the greenhouse gas (GHG) emissions from wildfires the second most important source in the state, after transportation. For context, the U.S. Forest Service recently disclosed that the agency only "commercially harvests one tenth of one percent of acres within the National Forest System each year. Harvests are designed to improve stand health and resilience by reducing forest density or removing trees damaged by insects or disease that make up 86 percent of those acres. The remainder are final regeneration harvests that are designed to be followed by reforestation." There is an extraordinary opportunity to increase the practice of sustainable forest management on federal lands as an effective tool to sequester carbon.

Harvesting trees and transferring the stored carbon to wood products allows a land manager to "stack" the sequestration potential of that land. For example, assume an objective to maximize carbon sequestration on 100 acres over a 150-year period starting at year zero. Without active management and timber harvest, those trees would grow to 150 years and represent the only carbon sequestered on those 100 acres at the end of the 150-year cycle (assuming they don't burn in a wildfire). Alternatively, the trees could be harvested on a 50-year rotation and stored in wood products. After 150 years, there would be carbon stored in an existing 50-year-old stand, plus carbon stored in wood products from an additional two 50-year-old stands previously harvested. The figure below from the IPCC (2007) illustrates the concept of stacking. **Please consider adopting this graph into the Rumbling Owl project analysis.**

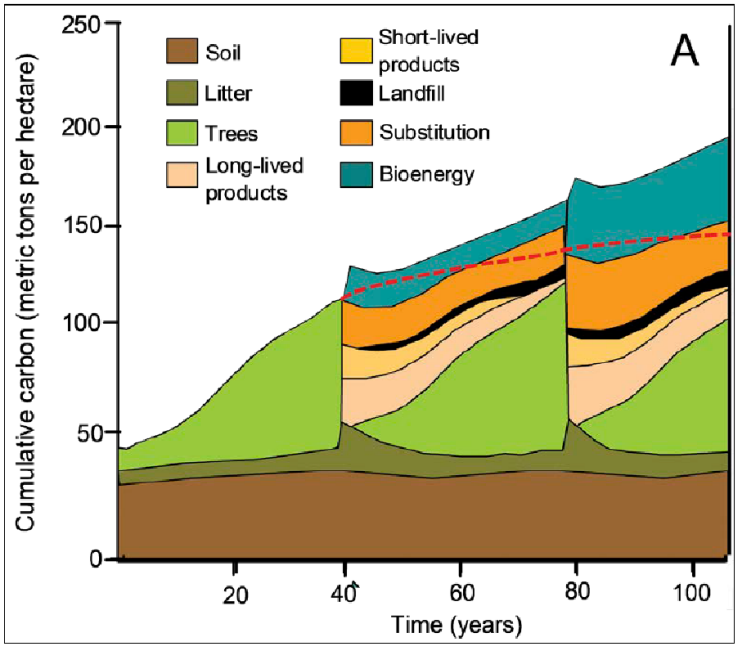

Figure 8.7—Carbon balance from a hypothetical forest management project in which the forest is harvested roughly every 40 years from land that started with low forest carbon stocks. This figure accounts for forest regrowth and carbon stored in wood products in use and landfills as well as the prevented release of fossil fuel carbon (also counted as stored carbon) via product substitution and biomass energy. It illustrates how forests can continue to accrue carbon over time with forest management. Figure is from McKinley et al. (2011) and adapted from IPCC (2007).

We believe that this graph encapsulates the forest management paradigm that would be most effective at maximizing carbon sequestration on a per-acre basis by "stacking" storage in wood products and regrowth of newly planted trees. A 2013 study from the Journal of Sustainable Forestry summarized these concepts well: *More CO2 can be sequestered synergistically in the products or wood energy and landscape together than in the unharvested landscape. Harvesting sustainably at an optimum stand age will sequester more carbon in the combined products, wood energy, and forest than harvesting sustainably at other ages*.

We would like to encourage the Flathead National Forest to consider several additional documents related to carbon sequestration related to forest management.

McCauley, Lisa A., Robles, Marcos D., Wooley, Travis, Marshall, Robert M., Kretchun, Alec, Gori, David F. 2019. Large-scale forest restoration stabilizes carbon under climate change in Southwest United States. *Ecological Applications*, 0(0), 2019, e01979.

Key points of the McCauley paper include:

- Modeling scenarios showed early decreases in ecosystem carbon due to initial thinning/prescribed fire treatments, but total ecosystem carbon increased by 9–18% when compared to no harvest by the end of the simulation.
- This modeled scenario of increased carbon storage equated to the removal of carbon emissions from 55,000 to 110,000 passenger vehicles per year until the end of the century.
- Results demonstrated that large-scale forest restoration can increase the potential for carbon storage and stability and those benefits could increase as the pace of restoration accelerates.

We believe that this study supports the notion that timber harvest and fuels reduction practices collectively increase the overall carbon sequestration capability of any given acre of forest land and, in the long term, generate net benefits toward climate change mitigation.

Gray, A. N., T. R. Whittier, and M. E. Harmon. 2016. Carbon stocks and accumulation rates in Pacific Northwest forests: role of stand age, plant community, and productivity. Ecosphere 7(1):e01224. 10.1002/ecs2.1224

Key points of the Gray paper include:

- Although large trees accumulated C at a faster rate than small trees on an individual basis, their contribution to C accumulation rates was smaller on an area basis, and their importance relative to small trees declined in older stands compared to younger stands.
- Old-growth and large trees are important C stocks, but they play a minor role in additional C accumulation.

We believe that this study supports the notion that, if the role of forests in the fight against climate change is to reduce global greenhouse gasses through maximizing the sequestration of carbon from atmospheric CO2, then increasing the acreage of young, fast growing small trees is the most prudent management approach.

U.S. Department of Agriculture, Forest Service. 2023. Future of America's Forest and Rangelands: Forest Service 2020 Resources Planning Act Assessment. Gen. Tech. Rep. WO-102. Washington, DC. 348 p. https://doi.org/10.2737/WO-GTR-102.

To further support the concepts validated by Gray et al., the USDA recently published a Technical Report on the future of America's forests and rangelands.

Key points of the report include:

- The projected decrease in young forests and increase in older forests will result in overall decreases in growth rates and carbon sequestration.
- The amount of carbon sequestered by forests is projected to decline between 2020 and 2070 under all scenarios, with the forest ecosystem projected to be a net source of carbon in 2070.
- Without active management, significant disturbance, and land use change, forests approach a steady state in terms of C stock change over time.
- Annual carbon sequestration is projected to decrease, indicating carbon saturation of U.S. forests, due in part to forest aging and senescence.

Gustavsson, L., Madlener, R., Hoen, H.-F., Jungmeier, G., Karjalainen, T., KlÖhn, S., … Spelter, H. (2006). The Role of Wood Material for Greenhouse Gas Mitigation. Mitigation and Adaptation Strategies for Global Change, 11(5–6), 1097–1127.

Lippke, B., Oneil, E., Harrison, R., Skog, K., Gustavsson, L., Sathre, R. 2011 Life cycle impacts of forest management and wood utilization on carbon mitigation: knowns and unknowns, Carbon Management, 2:3, 303-333.

McKinley, D.C., Ryan, M.G., Birdsey, R.A., Giardina, C.P., Harmon, M.E., Heath, L.S., Houghton, R.A., Jackson, R.B., Morrison, J.F., Murray, B.C., Pataki, D.E., Skog, K.E. 2011. A synthesis of current knowledge on forests and carbon storage in the United States. Ecological Applications. 21(6): 1902-1924.

Skog, K.E., McKinley, D.C., Birdsey, R.A., Hines, S.J., Woodall, C.W., Reinhardt, E.D., Vose, J.M. 2014. Chapter 7: Managing Carbon. In: Climate Change and United States Forests, Advances in Global Change Research 57 2014; pp. 151-182.

In the absence of commercial thinning, the forest where this proposed action would take place would thin naturally from mortality-inducing natural disturbances and other processes resulting in dead trees that would decay over time, emitting carbon to the atmosphere. Conversely, the wood and fiber removed from the forest in this proposed action would be transferred to the wood products sector for a variety of uses, each of which has different effects on carbon (Skog et al. 2014). Carbon can be stored in wood products for a variable length of time, depending on the commodity produced. It can also be burned to produce heat or electrical energy or converted to liquid transportation fuels and chemicals that would otherwise come from fossil fuels. In addition, a substitution effect occurs when wood products are used in place of other products that emit more GHGs in manufacturing, such as concrete and steel (Gustavasson et al. 2006, Lippke et al. 2011, and McKinley et al. 2011). In fact, removing carbon from forests for human use can result in a lower net contribution of GHGs to the atmosphere than if the forest were not managed (McKinley et al. 2011, Bergman et al. 2014, and Skog et al. 2014). The IPCC recognizes wood and fiber as a renewable resource that can provide lasting climate-related mitigation benefits that can increase over time with active management (IPCC 2000). Furthermore, by reducing stand density, the proposed action may also reduce the risk of more severe disturbances, such as insect and disease outbreak and severe wildfires, which may result in lower forest carbon stocks and greater GHG emissions.

In addition to this study, a recent report by the Forest Service titled: USDA: Forests Converting to Carbon Emitters finds American forests may convert from being carbon absorbers to significant carbon emitters. Researchers say the shift is due to the increasing destruction from natural disasters and the aging of forests, which is reducing their carbon-absorbing capabilities.

Our forests currently absorb 11 percent of U.S carbon emissions, or 150 million metric tons of carbon a year, equivalent to the combined emissions from 40 coal power plants. However, starting in 2025, their ability to hold carbon may start plummeting and could emit up to 100 million metric tons of carbon a year as their emissions from decaying trees exceed their carbon absorption.

Below are several links that show the value of managing the Forest for the benefit of carbon and sequestration of wood into forest products.

- Carbon Sequestration in Wood and Paper Products
  Kenneth E. Skog, USDA Forest Service, Forest Products laboratory
  Sequestration of carbon in harvested wood products for the United States (usda.gov)

- An Assessment of Carbon Pools, Storage, and wood Projects Market Substitution Using Life-cycle Analysis Results
  John Perez Garcis, Bruce Lippke
  840-Article Text-840-1-10-20141206.pdf
- Investments in Fuel Removals to Avoid Forest Fires Result in Substantial Benefits
  C. Larry Mason, Bruce R. Lippke, et. al
  Investments in Fuel Removals to Avoid Forest Fires Result in Substantial Benefits | Journal of Forestry | Oxford Academic (oup.com)
- Using Wood Products to Reduce Greenhouse Gases
  Jim Wilson, Corrim Inc.
  Using Wood Products to Reduce Global Warming (corrim.org)
- To Manage or not to Manage: The Role of Silviculture in Sequestering Carbon in the Specter of Climate Change
  Jianwei Zhang*, Robert F. Powers, and Carl N. Skinner
  Integrated management of carbon sequestration and biomass utilization opportunities in a changing climate: Proceedings of the 2009 National Silviculture Workshop; 2009 June 15-18; Boise, ID (usda.gov)
- Managing Forests because Carbon Matters: Integrating Energy, Products, and Land Management Policy
  Robert W. Malmsheimer, James L. Bowyer et. al.
  Managing forests because carbon matters: integrating energy, products, and land management policy | US Forest Service Research and Development (usda.gov)
- Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests
  Chadwick Oliver, Brice R. Lippke et.al.
  Full article: Carbon, Fossil Fuel, and Biodiversity Mitigation With Wood and Forests (tandfonline.com)
- Science Supporting Harvested Wood Products as a Carbon Negative Technology.
  Dr. Arijit Sinha, et. al.
  CORRIM-scientists-letter-all-recipients-Dec-9-2020.pdf (healthyforests.org)

Thank you for the opportunity to provide scoping comments on the Rumbling Owl Project. The Forest has done a good job of planning restoration needs for many of the resources in the area. I look forward to following the implementation of this project as it moves forward.

Sincerely,

Tom Partin
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Portland, Oregon 97239