VIA Link: https://www.fs.usda.gov/project/?project=63176

September 28, 2023

Gary Blazejewski, Project Leader
Hungry Horse Ranger Station
P.O. Box 190340
Hungry Horse, MT 59919

Dear Gary:

On behalf of the American Forest Resource Council (AFRC) and its members, thank you for the opportunity to provide Draft EA comments on the Dry Riverside 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 Dry Riverside Project is located within the Hungry Horse and Spotted Bear Ranger Districts of the Flathead National Forest. The project area is approximately 54,975 acres and is located southeast of the town of Hungry Horse, within Flathead County. Approximately 19 percent (10,503 acres) of the project area is located within designated Wilderness. There are no wild and scenic river corridors present within the project area. Approximately 17,215 acres of the project area (31%) is designated as inventoried roadless area (IRA). There are 13,537 acres classified as general forest moderate intensity vegetation management and 2,120 acres as low intensity management.

AFRC supports this Project and submitted scoping comments on December 15, 2022, and we looked at part of the Project on September 15, 2023. The need for management became apparent

this year with the Ridge fire burning near the project area in similar circumstances. AFRC believes the project area is on borrowed time and needs to have immediate treatment.

Further pointing out the need for treatment is a description of the current stand conditions which shows that much of the project area is dominated by 50-year-old plus western larch in need of density reduction treatments. Past stand replacement fires or commercial harvesting have created even-aged stands with uniform structures that are also in need of thinning. Finally, stands in some of the higher elevations have not experienced disturbance since the early 1900s and are mature, mixed species stands with understories of Engelmann spruce and subalpine fir. These stands are dense and slow growing with large, western white pine and western larch remnant trees throughout.

Based on these conditions, AFRC supports the Purpose and Need for this Project as outlined in the scoping document:

- Improve the diversity and resilience of terrestrial ecosystems and vegetation.
- Remove, reduce, or rearrange fuels to promote a more fire resilient forest and limit impacts to natural resources, should a wildfire occur.
- Provide a mix of forest products to contribute to economic sustainability, providing jobs and income to local economies.

AFRC supports the Project, and we offer the following suggestions that we believe will enhance and improve the Project as you move towards implementation.

1. AFRC is disappointed that the District chose to reduce the commercial thinning acres from 4,189 acres down to 3,805 acres and the shelterwood treatments from 55 acres down to 28 acres from scoping to the Draft EA. The proposed treatments are listed below:

Table 2. Summary of proposed vegetative treatments

Proposed vegetation treatments	Acres
Commercial thin	3,805
Seed tree	372
Shelterwood	28
Total proposed commercial treatment	**4,205**

As we mentioned in our scoping comments, AFRC is pleased that the provision of a mix of forest products to contribute to economic sustainability, providing jobs and income to local economies is included in the Purpose and Need. We also asked the Forest Service to analyze treatment of as many acres as practical in the EA. The expense of these planning documents is high, and we feel it is important to get as much work done as possible using this document. Treating more acres also adds to the timber volume that will be produced. The National Forests in Montana are very important for providing the raw materials that sawmills within the State need to operate. For those reasons listed above and the fact that the Forest desperately needs treatment, we feel the Forest has lost a great opportunity to treat the full extent of the landscape in need..

The timber products provided by the Forest Service are crucial to the health of our membership. 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. Specifically, studies in Montana have shown that 12-15 direct and indirect jobs are created for every one million board feet of timber harvested. 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 way these products are permitted to be delivered from the forest to the mills.

Additionally, Montana's forest products industry is one of the largest components of manufacturing in the state and employs roughly 7,000 workers earning about $300 million annually. Much of the industry is centered in western Montana, and this Project is crucial to the infrastructure located in and around the Flathead National Forest.

Further, AFRC members depend on a predictable and economical supply of timber products off Forest Service land to run their businesses and to provide useful wood products to the American public. This supply is important for present-day needs but also important for future needs. This future need for timber products hinges on the types of treatments implemented by the Forest Service today. Of importance is how those treatments affect the long-term sustainability of the timber resources on Forest Service managed land. Not managing the maximum number of acres today will impact the ability to produce the timber needed in the future.

2. AFRC questions why the Project is being scaled back when the Draft EA states: *"Currently, most of the project area consists of forests that are greater than 40 percent canopy cover which is considered moderate- to high-density forests with closed forest canopies (table 41). With the absence of vegetation treatment, forest density within the project area would remain moderate to high. Those stands with less than or equal to 40 percent canopy cover would continue to grow, increasing their canopy density over time. With more closed forest canopy, chances of fires reaching the forest canopy and becoming a crown fire type increase, and this can contribute to severe stand-replacing fires."*

   The table below shows the canopy cover across the project area. Note that more than 60% of the acres in the project area are identified as being either moderate or high density. AFRC does not believe the Forest is achieving the second Purpose and Need by scaling back the acres treated.

   - Remove, reduce, or rearrange fuels to promote a more fire resilient forest and limit impacts to natural resources, should a wildfire occur.

Tree canopy cover	Acres	Forest density	Percent of project area[a]
10-25% canopy cover	3503	Very low	6
26-40% canopy cover	5660	Low	10
41-59% canopy cover	13781	Moderate	25
≥ 60% canopy cover	15463	High	28

3. Even though the acres being commercially treated have been reduced, (commercial thinning is planned on 3,805 acres with seed tree harvest planned on 372 acres, and 28 acres of shelterwood) it is still critical to treat those remaining acres effectively to meet the purpose and need and adequately reduce stand densities. AFRC encourages the District to thin up to 40 sq. ft. of basal area in the commercial thinning areas. This would be consistent with the proposed treatments in the scoping document which states: *"leave tree selection would favor western white pine, western larch, ponderosa pine and Douglas-fir. These trees would then have more growing space, light, nutrients, and water increasing their insect, disease, and fire tolerance. Commercial thinning would also achieve fuels reduction objectives by reducing tree densities."*

   Shelterwood and Seed Tree harvests will create a new forest stand of fire-tolerant tree species. AFRC suspects and supports that these methods of harvest will be used in the higher elevation areas where mature and mixed stands of non-fire-resistant species would be found. These acres then would be replanted with fire tolerant species.

4. AFRC is pleased to see that treatments will take place in the riparian zones. *"Vegetation treatments within the riparian management zone would promote desired conditions that maintain or improve ecosystem integrity and promote resilience of vegetation. In many areas, diverse structure in riparian management zones is promoted through natural ecosystem processes such as wildfire, insects, or disease. In lieu of natural disturbance, vegetation management activities can be used to meet desired conditions. These treatments could address not only stand-level conditions but also landscape-level desired conditions, by adding to a pattern of forest conditions and structures across the broader landscape that contribute to altering potential future fire behavior and increasing the diversity of forest age classes, species composition, and forest density."*

   AFRC would like to supplement your riparian work by noting that 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. The Draft EA describes the need for treatments that meet the need of multiple habitat types and we encourage the Hungry Horse 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.

The tradeoffs that the Forest Service will likely be considering 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.

Dry Forests

Messier, Michael S., Shatford, Jeff P.A., and Hibbs, David E. 2011. Fire Exclusion effects riparian forest dynamics in southwestern Oregon. *Forest Ecology and Management*. 264 (2012) 60-71.

Key points of the Messier paper include:

- Fire exclusion has altered the structure, composition, and successional trajectory of riparian forests in fire-prone landscapes.
- Fire exclusion has been associated with increase in tree density and recruitment of shade-tolerate species that may replace large diameter, more decay-resistant Douglas-fir trees.
- A hands-off management regime for these riparian forests will have ecologically undesirable consequences.

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.

5. AFRC would like to see the District accurately describe the impacts of the No Action Alternative over the potential 10 years of the Project. Your data shows that much of the project area is dominated by 50-year-old plus western larch in need of density reduction treatments. Past stand replacement fires or commercial harvesting have created even-aged stands with uniform structures that are also in need of thinning. Finally, stands in some of the higher elevations have not experienced disturbance since the early 1900s and are mature, mixed species stands with understories of Engelmann spruce and subalpine fir. These stands are dense and slow growing with large, western white pine and western larch remnant trees throughout. Fire exclusion combined with natural vegetation development and past management has resulted in changes to the vegetative patterns on the landscape. The picture below was taken while looking at the Ridge fire located nearby and shows the devastation by the fire. The Forest Service should consider these results as a possible outcome of implementation of the no action alternative.

Most of your comments under the No Action Alternative state that this alternative would not result in any additional effects---this also was under the soil resources section. We believe this conclusion is inaccurate—No Action will likely lead to fires that would adversely impact soils, climate change and carbon, and other resources.

6. AFRC believes the Forest adequately analyzed impacts to proposed and threatened species. The discussion consumed a significant portion of the Draft EA from pages 40-67. In those pages you outlined how the Project might impact wolverine, Canada lynx,

Grizzly bear, ungulates, and connectivity. Again, AFRC believes that while these species may see some short-term impacts, the No Action alternative clearly highlights potential effects of not taking action (specifically wolverine in this case: *"Large, severe, stand-replacing fire could remove large amounts of forest cover throughout the project area including within female dispersal wolverine habitat which may result in avoidance of openings created by wildfire."*).

7. AFRC supports the treatments proposed in the IRAs. This would include 2,257 acres of prescribed burning and 714 acres of whitebark pine restoration. The objective of whitebark pine restoration is to increase genetic diversity, increase white pine blister rust resistance and increase proportion of whitebark pine across the landscape. This will be accomplished by either direct seeding or planting of rust resistant whitebark pine seedlings. Seedlings may be transported by stock or helicopter. Prescribed burns will be used in the IRAs to create forage for ungulates and to help regenerate white bark pine. AFRC's only concern is that the window for using prescribed fire is getting more limited and often the Kalispell valley has air quality alerts halting prescribed fires.

8. The Draft EA examines the methods of tree removal for units with commercial products. As outlined, this would be a combination of ground-based (tractor; tracked and or rubber-tired equipment) and skyline mechanized harvest. A combination of whole tree yarding and cut-to-length (CTL) methods are anticipated. Whole tree yarding may be used to remove forest fuels from the stand to a landing pile and excavator piling may be used to pile fuels. Mechanized harvest methods would occur across approximately 4,205 acres.

   We would also like the District to recognize that one of the primary issues affecting the ability of our members to feasibly deliver logs to their mills is 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 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 Flathead market area with a variety of skills and equipment. Developing this EA 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 and cautious use of their equipment. To address this issue, we would like to see flexibility in the Final EA and contracts 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 feller-bunchers 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. Please prepare your NEPA analysis documents in a manner that will facilitate flexibility in the use of various types of equipment. AFRC believes that with some of the lighter touch logging methods as mentioned above, the impacts could even be less than those analyzed.

Finally, AFRC would like the Forest to examine the days that operations and haul are shut down due to hunting seasons and other outdoor recreation. The logging community has limited operating time at best, and further reductions such as these only makes surviving in the logging business that much more difficult.

9. The Road Management Plan calls for approximately 10.4 miles of historical roadbeds and 11.1 miles of existing roadbeds (21.5 miles total) to be reconstructed to the minimum standards necessary for project activities and could then be added to the NFS road system in intermittent stored service condition and **made impassable (as defined in the forest plan) to wheeled motorized vehicles.** In addition, 1.2 miles of new road are proposed to be constructed, utilized for project activities, and made impassable after the project.

   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 Dry Riverside Project area likely represents ***permanent*** removal of these roads and the deferral of management of those forest stands that they provide access to. The land base covered in the Dry Riverside Project area is 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. AFRC believes that a significant factor contributing to increased fire activity in the region is the decreasing road access to our federal lands. This factor is often overshadowed by both climate change and fuels accumulation when the topic of wildfire is discussed in public forums. However, we believe that a deteriorating road

infrastructure has also significantly contributed to recent spikes in wildfires. This deterioration has been a result of both reduced funding for road maintenance and the federal agency's subsequent direction to reduce their overall road networks to align with this reduced funding. The outcome is a forested landscape that is increasingly inaccessible to fire suppression agencies due to road decommissioning and/or road abandonment. This inaccessibility complicates and delays the ability of firefighters to attack nascent fires quickly and directly. On the other hand, an intact and well-maintained road system would facilitate a scenario where firefighters can rapidly access fires and initiate direct attack in a more safe and effective manner.

If the Forest Service proposes to decommission, abandon, or obliterate road segments from the Dry Riverside planning area we would like to see the analysis consider potential adverse impacts to fire suppression efforts due to the reduced access caused by the reduction in the road network. We believe that this road network reduction would decrease access to wildland areas and hamper opportunities for firefighters to quickly respond and suppress fires. On the other hand, additional and improved roads will enable firefighters to have quicker and safer access to suppress any fires that are ignited. Please consider whether all the temporary roads need decommissioning and by what methods this will be accomplished.

10. AFRC also supports removal of conifers from the stands of aspen and other hardwood species. The Plan calls for keeping equipment out of the aspen stands which is understandable, however, there should be flexibility for allowing conifers to be pulled out of those aspen clones.

11. AFRC also supports using Designation by Prescription (DxP) to implement prescribed treatments in the harvests units to reduce sale preparation time and costs. The Flathead National Forest has been one of the leading Forests in utilizing DxP.

12. The Forest has done a pretty good job of explaining the impacts that various treatments could have regarding the carbon cycle, global warming, CO2 sequestration, and those impacts to other resources. 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 Dry Riverside project analysis.**

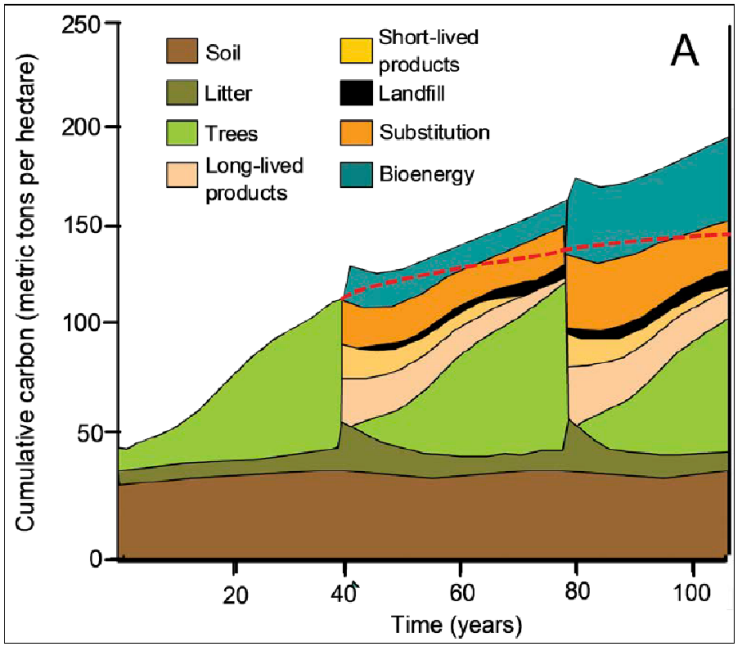

Figure 8.7—Carbon balance from a hypothetical forest management project in which the forest is harvested roughly every 40 years from land that started with low forest carbon stocks. This figure accounts for forest regrowth and carbon stored in wood products in use and landfills as well as the prevented 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 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.
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Thank you for the opportunity to provide comments for the Dry Riverside Project Draft EA. I look forward to following the Project through implementation.

Sincerely,

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