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Submitted via CARA: https://cara.fs2c.usda.gov/Public/CommentInput?project=62960

Re: Revision of the Land Management Plan for the Lolo National Forest - Proposed Action (PA) Comments

Dear Revision Team,

On behalf of WildEarth Guardians, the Flathead-Lolo-Bitterroot Citizen Task Force, Friends of the Bitterroot, Friends of the Clearwater, Western Watersheds Project and Wilderness Watch, we respectfully submit the following comment in response to the Forest Service's notice of intent (NOI) to prepare an environmental impact statement to revise the 1986 Lolo National Forest land management plan (Forest Plan). 89 FR 6088. The NOI explained the Forest Service is accepting comments through April 1, 2024 "concerning the preliminary need for change and the proposed action." *Id.* In addition to our comments below, we support and incorporate by reference the comments submitted separately by Wilderness Watch, and those by interested citizen and retired Forest Service official Claudia Narcisco.

As a special note, the Forest Service needs to provide further clarity regarding its March 12, 2024 "Leader's Message" that stated the following:

> We are just past the half-way point of the comment period, which closes April 1, and have already received input that will help us refine our efforts in the next phase of plan revision. For example, we heard concerns that the desired recreation opportunity spectrum maps in the proposed action remove substantial amounts of existing winter motorized recreation opportunities. This was not our intent; the team and I took a closer look and discovered data processing errors. The intent was for the proposed action to approximately reflect the current condition of motorized and non-motorized recreation opportunities.[1]

The message suggests that the Forest Service changed its proposed action as a result of its "errors," which would substantially affect our position on the desired recreation opportunity spectrum maps that included reasonable, but hardly sufficient, allocations for primitive and semi-primitive non-motorized settings. Such a change in the midst of the scoping period would preclude the public from providing meaningful input in violation of the National Environmental Policy Act (NEPA), especially given that the agency failed to provide a side-by-side comparison

[1] See Ex. 1.

displaying any changes resulting from the "errors." To comply with NEPA, the Forest Service must reissue its proposed action for public comments with detailed explanations and illustrations that explain and clearly show where corrections of its "data processing errors" changed the initial desired recreation opportunity spectrum maps.

I. Introduction

We appreciate the Forest Service's recognition that the Lolo National Forest (LNF) "plays a crucial role in providing habitat connectivity across western Montana between ecosystems and habitats for many species," including areas of connectivity "between three of the identified grizzly bear recovery ecosystems; the Northern Continental Divide Ecosystem, the Cabinet Yaak Ecosystem, and the Bitterroot Ecosystem." Preliminary Proposed Action (PA) at 8. The LNF also includes important habitat for a number of at-risk and sensitive species such as Canada lynx, wolverine, whitebark pine, bull trout, westslope cutthroat trout, mountain goat and more. The forest also contains crucial mature and old growth forests storing vast amounts of carbon that serve as part of a broader climate-crisis solution, in addition to providing necessary habitat for a range of species.

Since its formation, the Forest Service has had the unenviable task of managing conflicting interests, and it is generally recognized that the agency's first chief forester, Gifford Pinchot, said that where conflicting interests must be reconciled the question shall always be answered from the standpoint of the greatest good of the greatest number in the long run. In the 21st century, the greatest good and best use of our national forest lands is to provide for non-extractive ecosystem services, in particular:

- Provisioning services, such as clean air and fresh water, **and NOT** energy, fuel, forage, fiber, and minerals;
- Regulating services, such as long term storage of carbon; climate regulation; water filtration, purification, and storage; soil stabilization; flood control; and disease regulation;
- Supporting services, such as pollination, seed dispersal, soil formation, and nutrient cycling; and
- Cultural services, such as educational, aesthetic, spiritual and cultural heritage values, **and NOT high-impact and/or commercial** recreational experiences, and tourism opportunities.

Certainly these services are at risk from the ongoing legacy of Forest Service mismanagement and exploitation that include logging, grazing, mining, high-impact recreation and the disruption of ecological disturbances such as those from wildfire, insects and disease. Exacerbating the environmental consequences of this legacy are the harmful effects of the climate crisis, which cannot be addressed through more mismanagement and exploitation. In fact, forest ecosystems evolved over millennia, often in tandem with traditional Tribal practices that did not exploit

forest resources or result in the severe ecological degradation we see today. As the climate emergency continues to alter forest conditions, it is crucial that the Forest Service adopt a management theme of "Natural Adaptation and Assisted Recovery" that will allow the forest to slowly adapt to climate-altered conditions, and actively heal the scars left from decades of commercial exploitation. Such an approach will better provide for the forest's future ecological integrity than continuing a regime of active management that creates novel, engineered conditions that are experimental at best, and require massive commitments of funding and resources to maintain. Therefore, our comments emphasize the need for the Forest Service to prioritize the protection and restoration of ecological sustainability (36 CFR 219.8), and the diversity of plant and animal communities, (36 CFR 219.9), and the aforementioned ecosystem services (36 CFR 219.10).

The Citizen Plan

In support of the above management direction, we provide (and urge the agency to adopt as part of a reasonable range of alternatives), the geographically applicable portions of "The Lolo-Bitterroot Partnership: A Citizen Plan For Fish, Wildlife & Forests." See Ex. 2, (hereafter, Citizen Plan). The Citizen Plan provides a broad framework for developing a specific alternative, and in some places provides specific management direction in regards to grizzly bear recovery, riparian habitat conservation, and the management of designated areas. In regards to other important issues, the Citizen Plan provides a more general framework that our comments below expand upon by including specific plan components to supplement the Citizen Plan. However, we stand ready to work with the Forest Service and the Plan Revision IDT to refine our suggested plan components if any are found to be unreasonable and cannot be carried forward in the Draft EIS. Where such a determination is made based on funding projections, we request the agency provide supporting budget analysis to demonstrate the cost-constraints.

II. General Comments about the Planning Process

The Forest Service explained that its "proposed action was developed using the findings in the Revised Assessment (September 2023) and the Preliminary Need to Change." PA at 1. We provided detailed comments regarding the Draft Assessment (June, 2023), particularly in regards to the species of conservation concern. See Ex. 3. The Revised Assessment failed to address our comments, which we discuss below and throughout this letter. In addition we provide comments regarding the Need to Change document, and more generally in regards the agency's consideration of best scientific information and plan components.

A. Preliminary Need to Change

We agree with several needs the Forests Service identified for changing its 1986 forest plan, even as we have concerns with others in its Preliminary Need to Change, Jan. 2024, (PNC). We offer

the following observations to help the agency refine its needs for revision and better support a Natural Adaptation and Assisted Recovery theme.

Grizzly Bear

We support the Need to Change where it calls, "[f]or the plan to incorporate the latest grizzly bear management science and policy, and address the role that the Lolo National Forest plays in providing connectivity to the Bitterroot Ecosystem Expansion Area;" PNC at 15. Our groups have provided numerous scientific reports, papers and supporting GIS data that we urge the agency to utilize when determining how the LNF can provide habitat security and species protection within areas of connectivity to the Bitterroot Ecosystem. In addition, the Forest Service recognizes the need "[f]or plan content that reflects the road system impact on federally listed species." The Revised Plan must do much more than "reflect" the road system impacts, and actually ***minimize*** those impacts. Further, there is a need to minimize impacts from all linear features that contribute to wildlife habitat fragmentation, increased erosion, loss of soil function, sedimentation and all the other harmful effects that degrade ecological integrity within the planning area. In other words, there is a need to minimize impacts from system roads and unauthorized roads (those not part of the transportation system such as user-created and any "undetermined" roads). In addition, other linear features include decommissioned roads that were abandoned instead of physically removed, remnants of temporary roads, firelines (which can be as wide as road), powerline corridors, and trails - especially those that receive high levels of use. In other words, the Forest Service must recognize there is a need to minimize the harmful effects of these linear features beyond just system roads.

Infrastructure

We do credit the agency for addressing some aspects of our concerns where it acknowledges that there is a need "[f]or the revised plan to provide guidance that supports a transportation system that provides reasonable access to National Forest lands for all users, minimizes environmental effects, incorporates different types of vehicles and purposes, and is within the fiscal capability of the unit." *Id*. at 18. However, the agency must navigate conflicting interests since providing reasonable access often does not equate to minimizing environmental effects, especially within the agency's fiscal capability. Here we urge the Forest Service to adopt a need that prioritizes minimizing environmental effects, and to establish clear standards, not just "guidance" that will meet this need.

Mature & Old Growth

We appreciate that the Forest Service recognized a need to "[e]nsure the plan supports implementing the emerging policy on mature and old growth forest, per Executive Order 14072, as appropriate." *Id.* at 11. We urge the agency to strengthen this statement and adopt a need to

preserve and recruit old-growth stands as the forest naturally adapts to changing climate conditions, in order to "retain and enhance carbon storage" and "conserve biodiversity." E.O. 14072. This will require adopting a need to establish old growth recruitment and retention objectives, and standards requiring all projects to include a stand-level inventory of mature and old growth trees, and an elevated review to ensure projects are consistent with E.O. 14072. As it stands, the Forest Service has yet to list such a need, rather it states:

> To provide a sustainable conservation and management strategy for old growth and other late-successional forests which incorporate considerations such as wildlife habitat, carbon sequestration, and forest and landscape resilience to disturbances.

PNC at 13. To be clear, there is a need to provide much more than a "strategy" but rather clear objectives, standards and guidelines that go beyond "considerations" and that actually maximize carbon storage and biodiversity.

Soils & Soil Biota

The Forest Service recognizes the importance of soils, including soil function, in several sections of the PNC, including the need:

> To provide plan direction for soil productivity and soil quality that maintains ecosystem functions (including carbon sequestration and nutrient cycling). This plan content should be clear, effective, ecologically based, and independent of management action; and soil monitoring should better capture known issues and conditions such as landslide-prone areas and alluvial fans.

PNC at 15. We encourage the agency to specify that the plan content must include standards and guidelines to meet this need, and provide a specific need to protect and restore soil biota, especially mycorrhizae and common mycorrhizal networks, which we discuss further in these comments.

Wildfire

The wildfire issue is subsuming Forest Service management as reflected in its 10-year strategy called "Confronting the Wildfire Crisis: A Strategy for Protecting Communities and Improving Resilience in America's Forests."[2] We recognize that Congressional direction through funding mandates and national wildfire policy are having an outsized influence on the Plan Revision process. We urge the LNF to resist this influence as much as possible, and adopt a need to allow forests to naturally adapt to changing climate conditions, which often means not resisting change

[2] *See* https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/Confronting-the-Wildfire-Crisis.pdf

through active management such as repeated (often unsustainable) vegetation manipulation. The Forest Service partially recognizes this need where it states:

> For plan direction that provides comprehensive guidance for prescribed fire, unplanned ignitions, and management of wildfire that incorporates fire as a natural disturbance and tool for achieving desired conditions while also recognizing socioeconomic factors, values at risk, the variation in natural fire regimes across different ecosystems, and the departure from natural fire regimes;

Id. at 13. Even with this expansive need, it is unclear if the agency recognizes the value and need for a range of wildfire severities, and that managing with perpetual logging or thinning with intentional burning is at odds with incorporating fire as a natural disturbance. In other words, the Forest Service cannot use active management to mimic fire disturbance, though that is the agency's current emphasis. As it develops "comprehensive guidance," we urge the Forest Service to recognize the highly controversial and uncertain nature reflected in its 10-year strategy for numerous reasons.

First, the agency relies heavily on historic conditions to define departures from natural fire regimes. Yet, when relying on such historic conditions, the Forest Service often fails to account for the fact that climate change is fundamentally altering the agency's assumptions about the efficacy of its vegetation management proposals. ***As such there is a need for the Revised Plan NOT to rely on fire regime departures.*** In fact, recent science calls into question findings that some forested landscapes historically experienced low-severity wildfire and current trends toward higher severities are substantially departed from historic ranges of variability. Specifically, researchers explained,

> The structure and fire regime of pre-industrial (historical) dry forests over ~26 million ha of the western USA is of growing importance because wildfires are increasing and spilling over into communities. Management is guided by current conditions relative to the historical range of variability (HRV). Two models of HRV, with different implications, have been debated since the 1990s in a complex series of papers, replies, and rebuttals. The "low-severity" model is that dry forests were relatively uniform, low in tree density, and dominated by low- to moderate-severity fires; the "mixed-severity" model is that dry forests were heterogeneous, with both low and high tree densities and a mixture of fire severities. Here, we simply rebut evidence in the low-severity model's latest review, including its 37 critiques of the mixed-severity model. A central finding of high-severity fire recently exceeding its historical rates was not supported by evidence in the review itself. A large body of published evidence supporting the mixed-severity model was omitted. These included numerous direct observations by early scientists, early forest atlases, early newspaper accounts, early oblique and aerial photographs, seven paleo-charcoal reconstructions, >18 tree-ring reconstructions, 15 land survey reconstructions, and analysis of forest inventory data. Our rebuttal shows that evidence omitted in the review left a falsification of the scientific record, with significant land

> management implications. The low-severity model is rejected and mixed-severity model is supported by the corrected body of scientific evidence.

Baker et al., 2023. In other words, the Forest Service cannot rely on one interpretation of historic reference conditions to inform its Plan Revision. Rather, the agency must look beyond HRV and inform plan components based on reference sites that reflect current ecological conditions. Such sites would have experienced broadscale disturbances in areas that have a passive management emphasis. In addition, the Forest Service should analyze how those reference conditions may change over the next 50 -100 years based on the best available climate models. It is likely that such analysis will indicate the best management approach is to allow for natural adaptation as a recent study suggests:

> Forests are critical to the planetary operational system and evolved without human management for millions of years in North America. Actively managing forests to help them adapt to a changing climate and disturbance regime has become a major focus in the United States. Aside from a subset of forests wherein wood production, human safety, and experimental research are primary goals, we argue that expensive management interventions are often unnecessary, have uncertain benefits, or are detrimental to many forest attributes such as resilience, carbon accumulation, structural complexity, and genetic and biological diversity. Natural forests (i.e., those protected and largely free from human management) tend to develop greater complexity, carbon storage, and tree diversity over time than forests that are actively managed; and natural forests often become less susceptible to future insect attacks and fire following these disturbances. Natural forest stewardship is therefore a critical and cost effective strategy in forest climate adaptation.

Faison et al. 2023. In fact, Forest Plans should not include direction to resist natural adaptation, especially given that "in a time of pervasive and intensifying change, the implicit assumption that the future will reflect the past is a questionable basis for land management (Falk 2017)." Coop et al., 2020. While it is useful to understand how vegetative conditions have departed from those in the past, the Forest Service cannot rely on those departures to define management direction, or reasonably expect the plan will restore ecological processes.

Given changing climate conditions, the Forest Service should include plan components that emphasize reference conditions based on current and future ranges of variability, and less on historic departures. Further, the agency needs to shift its management approach to incorporate the likelihood that no matter what vegetation treatments it implements, there are going to be future forest wildfire-triggered conversions to other vegetation types. As such, the Forest Service cannot rely on the success of resistance strategies, as Coop 2020 explains:

> Contemporary forest management policies, mandates, and science generally fall within the paradigm of resisting conversion, through on-the-ground tactics such as fuel reduction or tree planting. Given anticipated disturbance trajectories and climate change, science

> syntheses and critical evaluations of such resistance approaches are needed because of their increasing relevance in mitigating future wildfire severity (Stephens et al. 2013, Prichard et al. 2017) and managing for carbon storage (Hurteau et al. 2019b). Managers seeking to wisely invest resources and strategically resist change need to understand the efficacy and durability of these resistance strategies in a changing climate. Managers also require new scientific knowledge to inform alternative approaches including accepting or directing conversion, developing a portfolio of new approaches and conducting experimental adaptation, and to even allow and learn from adaptation failures.

Coop et al., 2020. Further, it is equally important to acknowledge other pertinent scientific findings that show warming and drying trends are having a major impact on forests, resulting in tree die-off even without wildfire or insect infestation. See, e.g., Parmesan, C. 2006; Breshears et al. 2005; Allen et al. 2010, 2015; Anderegg et al. 2012; Williams et al. 2013; Overpeck 2013; Funk et al. 2015; Millar and Stephenson 2015; Gauthier et al. 2015; Ault et al. 2016 ("business-as-usual emissions of greenhouse gasses will drive regional warming and drying, regardless of large precipitation uncertainties"); Vose et al. 2016 ("In essence, a survivable drought of the past can become an intolerable drought under a warming climate").

Given the fallacies of using historic conditions as a reference for desired conditions and the uncertainty that treatments will maintain or restore ecological integrity in the context of climate change and likely forest conversion scenarios, the Forest Service must not adopt plan components that only emphasize resistance strategies.

In fact, many of the agency's assumptions run contrary to the most recent science regarding the impact of logging on wildfire behavior, resilience of the forest to large-scale disturbances, and ability to provide quality wildlife habitat. Many scientific studies we cited call into question the Forest Service's assumption that perpetual active management will meet the PNC. Ultimately, the agency cannot assert that there is broad consensus in the scientific literature that commercial timber harvest or thinning in combination with intentional burning (i.e. prescribed fire) reduces the potential for high severity wildfire to the extent characterized in the proposed action. In fact, such an approach has been broadly questioned within the scientific literature:

> Fire suppression policies and "active management" in response to wildfires are being carried out by land managers globally, including millions of hectares of mixed conifer and dry ponderosa pine (Pinus ponderosa) forests of the western USA that periodically burn in mixed severity fires. Federal managers pour billions of dollars into command-and-control fire suppression and the MegaFire (landscape scale) Active Management Approach (MFAMA) in an attempt to contain wildfires increasingly influenced by top down climate forcings. Wildfire suppression activities aimed at stopping or slowing fires include expansive dozerlines, chemical retardants and igniters, backburns, and cutting trees (live and dead), including within roadless and wilderness areas. MFAMA involves logging of large, fire-resistant live trees and snags; mastication

> of beneficial shrubs; degradation of wildlife habitat, including endangered species habitat; aquatic impacts from an expansive road system; and logging-related carbon emissions. Such impacts are routinely dismissed with minimal environmental review and defiance of the precautionary principle in environmental planning. Placing restrictive bounds on these activities, deemed increasingly ineffective in a change climate, is urgently needed to overcome their contributions to the global biodiversity and climate crises. We urge land managers and decision makers to address the root cause of recent fire increases by reducing greenhouse gas emissions across all sectors, reforming industrial forestry and fire suppression practices, protecting carbon stores in large trees and recently burned forests, working with wildfire for ecosystem benefits using minimum suppression tactics when fire is not threatening towns, and surgical application of thinning and prescribed fire nearest homes.

DellaSala et al., 2022. This article comes in response to an article, Prichard et al. 2021, that we see the Forest Service typically cite to support its proposed actions and assert broad scientific consensus as to their efficacy. Yet, even here the researchers raise several factors that the Forest Service must address in a detailed analysis. For example, they explain:

> Fuel reduction treatments are not appropriate for all conditions or forest types (DellaSala et al. 2004, Reinhardt et al. 2008, Naficy et al. 2016). In some mesic forests, for instance, mechanical treatments may increase the risk of fire by increasing sunlight exposure to the forest floor, drying surface fuels, promoting understory growth, and increasing wind speeds that leave residual trees vulnerable to wind throw (Zald and Dunn 2018, Hanan et al. 2020).

Such conclusions indicate that treatments within areas of mesic site conditions may not be appropriate. In addition, Prichard et al, 2021 explains the following:

> In other forest types such as subalpine, subboreal, and boreal forests, low crown base heights, thin bark, and heavy duff and litter loads make trees vulnerable to fire at any intensity (Agee 1996, Stevens et al 2020). Fire regimes in these forests, along with lodgepole pine, are dominated by moderate- and high-severity fires, and applications of forest thinning and prescribed underburning are generally inappropriate.

The comments we provided regarding the Draft Assessment expand on the scientific uncertainty and controversy regarding the need for and efficacy of broadscale vegetative management to reduce wildfire severity. Ex. 3. Ultimately, we urge the Forest Service to revise its forest plan in a manner that acknowledges the benefits of all types of wildlife, including high severity fires, and does not emphasize perpetual management that creates novel ecosystems with unknown long-term results.

B. Assessment & Species of Conservation Concern

Throughout these comments we note areas where the Forest Service failed to address our comments regarding the Revised Plan Draft Assessment. Ex. 3. In addition to these deficiencies, the following provides specific comments on the Forest Service's list for species of conservation concern.

Species of Conservation Concern (SCC) must be chosen to protect the integrity and diversity of ecosystems. The LNF failed to include an adequate number of SCC including a broad range of species dependent on certain habitat types to ensure ecosystem integrity and diversity across the planning area. The 2012 planning rule states, "Compliance with the ecosystem requirements of paragraph (a) of this section is intended to provide the ecological conditions to both maintain the diversity of plant and animal communities and support the persistence of most native species in the plan area. Compliance with the requirements of paragraph (b) of this section is intended to provide for additional ecological conditions not otherwise provided by compliance with paragraph (a) of this section for individual species as set forth in paragraph (b) of this section." 36 CFR 219.9. The SCC list should include species that are reliant on a specific habitat type and additional ecological conditions to support diversity and integrity.

Instead, the SCC list includes only six animal species, and ten plant species. As we stated in our comments, "Just 2 animals, 1 bird and 8 plants are identified as Species of Conservation Concern out of approximately 170 Species of Concern from the Montana Natural Heritage Program that occur in the Lolo National Forest area. There are also 62 species on the Forest Service List of Sensitive Species in and adjacent to the Lolo National Forest (p 157)." Our comments provide a list (pages 158-167). The criteria used and the explanation for species chosen does not include discussion of their habitat type and how it would support compliance with the 2012 Planning Rule's direction to provide for diversity of plant and animals. For example, there is no explanation as to why the agency selected fisher but not marten or goshawks to ensure the plan is maintaining or restoring habitat for mature and old growth dependent species.

Ultimately, the SCC list must be expanded to provide for the habitat needs that are representative of all native species on the LNF as required in the 2012 planning rule. SCC must include species that are dependent on different habitat types and ecological conditions found throughout the forest to "provide for the persistence of all native species (RA Chap 1, p 7)" in planning including the need for change. We stated, "For example, the Forest Service would not be able to satisfy this requirement by saying we have a few animals of each species in the Wilderness. The Forest must provide for "well-distributed" populations of breeding age individuals for all Species of Conservation Concern across the entire Lolo National Forest (p 157)."

The Revised SCC list completely ignores pollinators essential to the integrity of ecosystems and food sources essential to listed species, "including the huckleberry subspecies dependent on pollinators which are in decline. It must identify the Suckley Cuckoo and Western Bumblebees as Species of Concern. Suckley Cuckoo are an S1 at High Risk species and the Western Bumblebee is on the IUCN Red List of Vulnerable Species (comments, p 157)."

The SCC documents do not list the criteria or explain how the LNF narrowed down the list of 116 animals to a mere "78 that warranted in-depth evaluation (SCC animal p iii)" or the list of 211 plant species to "86 that warranted an in-depth evaluation (SCC plant, p iii)." The criteria used to eliminate these species from evaluation and why each individual species was eliminated from the more comprehensive evaluation process must be disclosed.

SCC list ignores species dependent on specific habitat types that provide for the persistence of a variety of native species and ecosystem diversity. As we stated in our comments, "The Forest Service should include species assemblages that are representative of unique ecosystem types such as the unique assemblage of plants and animals that are largely restricted to recently and severely burned forest conditions as well as species indicative of coastal-disjunct habitats including old growth forest (p 157)."

Why was the black-backed woodpecker not considered to provide for the integrity of Disturbance-Dependent ecosystems? Why weren't Pileated woodpeckers considered to ensure the integrity of snag forests?

The SCC list needs to be greatly expanded, it is especially short on wildlife dependent on old growth that is becoming scarce across the forest. According to the 2021 Lolo National Forest Biennial Monitoring and Evaluation Report (BMER 2021), old growth has been reduced by 18,000 acres across the LNF, "Comparing the most current Forest Inventory and Analysis dataset (Hybrid 2015, with data representing 2006-2015) to the most recent one prior to that (Hybrid 2011, representing 2003-2011) indicates a reduction of approximately 18,000 acres. (p 15)." Again, why Fisher and not Marten and Goshawks?

The LNF must better address our concerns and increase the numbers, types, and spatial distribution of species of conservation concern in order to comply with 2012 planning rules mandate to preserve the integrity and diversity of forest ecosystems.

EIS must analyze and disclose the effects of an inadequate SCC list on habitat and the persistence of all native species on the LNF and the habitat types that support them.

We reminded the Revision Team in our comments page 138-139, "The Forest Service is required, under the National Environmental Policy Act, to insure the professional and scientific integrity of discussions and analyses in environmental impact statements. (40 CFR section 1502.24.) In multiple subsections, the 2012 Planning Rule requires that the Forest Service **identify the best scientific information, use it in preparation of the Assessment, and explain how that science was used**:

> § 219.3 Role of science in planning. The responsible official shall use the best available scientific information to inform the planning process required by this subpart. In doing so, the responsible official shall determine what information is the most accurate, document how the best available scientific information was used to inform the
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> assessment, the plan decision, and the monitoring program as required in §§ 219.6(a)(3) and 219.14(a)(4). Such documentation must: Identify what information was determined to be the best available scientific information, explain the basis for that determination, and explain how the information was applied to the issues considered."

The 1986 Forest Plan included programmatic monitoring concerning wildlife and wildlife habitat to inform a need for change with an amendment or revision. We asked why these results were not included in the information to evaluate SCC. "Most mention of programmatic monitoring in the DA cites the 2021 Biennial Monitoring and Evaluation Report (BMER), which covers very little of the duration of the 1986 forest plan. This ignores the Planning Rule mandate that the Assessment: "Identify and consider relevant existing information contained in governmental or non-governmental assessments, plans, monitoring reports, studies, and other sources of relevant information (pp 4-5)." This information must be included and used to evaluate species for SCC status.

The criteria for evaluating SCC candidates is inadequate and does not comply with the requirement for best available science nor does it provide for ecosystem diversity and integrity. The Executive Summary for SCC (Summary) states that a species can be ruled out if, "Available scientific information was insufficient to conclude if there was a substantial concern about the species' likelihood to persist in the plan area**. Insufficient scientific information included having limited inventory data resulting from low survey effort, lack of effective detection methods, or, in the case of purported population declines, lack of reasonably consistent monitoring methods among trend monitoring periods** (emphasis added p 6)." The LNF has known this Revision process was coming for over a decade, why wasn't more data collected?

According to the SCC Animals document, of the 78 animal species given in-depth evaluation, 47 were disqualified because population information was not available or as repeatedly stated. "There are no known population estimates for the species in Montana or the plan area (pp, 6, 35, 48, 52, 59, 62, 66, 70, 92, 97, 106, 108, 111, 115, 120, 125, 127, 129, 132. 136, 146, 151, 156, 167, 171, 175, 179, 182)." The Fisher (pekania pennanti) is the only animal that made the list without sufficient population data or trends. The Revision must address the reasons why Fisher made it on the list with non-existent population data, but other worthy candidates were rejected.

Lack of information is not a reason to eliminate a species from SCC status. First the LNF omits all programmatic monitoring data since 1986 except the 2021 report. Second, a lack of monitoring and inadequate data on populations is a reflection of the LNF not adequately following the 1986 Forest Plan. The Forest Service should first do no harm. Err on the side of

caution. Without proper data, the forest cannot definitively say the species is not of conservation concern. The forest must include data from monitoring for the last 38 years and rethink disqualifying a candidate for lack of information.

Westslope cutthroat trout must be included as a SCC. The RA disqualified Westslope cutthroat trout even though it is ranked S2 in Montana, "At risk because of **very limited** and/or **potentially declining** population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state (Montana Field Guide)." Montana Fish Wildlife and Parks (FWP) is proposing multiple strategies to prevent the fish from being listed. It must have fallen into the category of, "in the case of purported population declines, lack of reasonably consistent monitoring methods among trend monitoring periods (Summary p 6)." According to BMER 2021, "Despite generally high-quality habitat conditions on the Lolo National Forest, and several million dollars spent on restoration and road remediation projects to improve impaired habitat (see MON-STRM-01,02,03), with a few local exceptions our fisheries monitoring results are not indicating fisheries population improvements where declines exist at a watershed and greater scales (p 48)." And "Focused fish population trend monitoring for westslope cutthroat and other species such as mountain whitefish or sculpin need to occur in Lolo National Forest watersheds to evaluate pre-restoration and post-restoration population densities where fish population data is available. (p 48)."

Declines are purported and more info is needed, but westslope cutthroat trout is not considered a SCC. The RA claims that watershed quality is improving, "Overall, changes in riparian and aquatic ecosystem management practices on national forests have greatly reduced the occurrence of potential threats (Roper et al. 2018), resulting in aquatic and riparian ecosystem conditions that are generally improving (Roper et al. 2019) (p 175)." Yet bull trout is declining and other trout species with it. BMER 2021 states, "More information, context, integration, and prioritization are needed between multi-agency monitoring efforts to more holistically and effectively monitor, understand, and expeditiously target impacts affecting bull trout species, and perhaps **other population declines** (emphasis added p 48)." If the LNF has really improved watershed health due to conservation measures and a decline in timber production, as both the Draft and Revised Assessments claim, why are both bull trout and westslope cutthroat trout in decline? One must also note that the INFISH components that have purportedly improved watershed health will not be included in the Revised Forest Plan and timber production will increase. Westslope cutthroat trout are a key species under INFISH and pure-strain populations are isolated down to about 5%, but it does not qualify under LNF criteria.

One of the criteria for SCC is "Local conservation concern due to **potentially significant threats to populations or habitats**, declining trends in populations or habitat, restricted ranges or habitats, or low population numbers (Emphasis added, Summary p 6)." Rising stream temperatures due to low water levels in streams are a serious threat to westslope cutthroat trout. SCC Animals claims there is "sufficient scientific information available to determine if there is substantial concern for long-term persistence of the species in the plan area (p 184)." But also

states, “There are no known population estimates for the species in Montana or the plan area, and surveys designed to provide reliable abundance estimates for the species (Thompson 2004) are not known to be on-going within the plan area (p 182).” Then on the next page, it states,

> Throughout the species range, threats include impoundments (Schmetterling 2003, Ardren and Bernall 2017), timber harvest (Hicks et al. 1991), roads (Heckel et al. 2020), grazing (Peterson et al. 2010), mining (Mayfield et al. 2019), climate change (Dobos et al. 2016, Isaak et al. 2012, Isaak et al. 2015, Wenger et al. 2011, Yau and Taylore 2013, Kovach, Muhlfeld, Al-Chokhachy, et al. 2015, Young et al. 2018) as well as competition and hybridization with non-native fish (Bell et al. 2021), which is generally considered a significant threat (Allendorf et al. 2003) (p 183).

Not including westslope cutthroat trout on the SCC list makes no sense. Including westslope cutthroat trout would help to ensure integrity and diversity for watershed ecosystems and support the persistence of aquatic species. The LNF chooses pearlshell mussels and the harlequin duck, but does not demonstrate how their inclusion will protect the integrity and diversity of aquatic ecosystems on which westslope cutthroat trout rely.

The SSC list completely ignores mycorrhizal fungi. As we discuss in our comments, “In identifying Needs for Change during the Assessment phase, the Forest Service must evaluate scientific information recognizing the key role of soil ectomycorrhizal networks, and investigate scientific information which suggests management-induced damage to soil ectomycorrhizal networks threatens soil/site productivity, therefore inhibiting ecological processes and functions and negatively impacting sustainability (p 113).” Mycorrhizal fungi play an important role in forest ecosystems and should be included in the SCC list. If it is not, the LNF must explain why they have been omitted. Mycorrhizae in soil habitat is essential to ecosystem processes and function. The RA must explain why these vital fungi have not been considered.

The RA claims, “It is possible that some species may not meet the criteria for a species of conservation concern but may warrant **specific plan components to support their persistence** (emphasis added, Chap 1, p 7).” If a species needs specific plan components to protect their habitat or persistence, and their habitat type is not fully represented with another SCC, then they must be included in the SCC list to ensure diversity. If not, a full explanation as to why the SCC listed provides the ecological conditions necessary to this species must be provided. Compliance with the requirements of paragraph (b) of §219.8 is intended to provide for additional ecological conditions for individual species including Listed, Proposed, and Candidate Species. Furthermore, plan components could be ineffectual to support the persistence of species. BMER 2021 made it clear that the LNF is failing Canada lynx and bull trout even with plan components to protect them. The EIS must explain in detail how the efficacy of the SCC and related plan components be monitored and evaluated and how often?

The 2012 planning rule requires the use of a complementary ecosystem and species specific approach to maintaining diversity of plant and animal communities, the persistence of native

species in the plan area, and ecosystem integrity. To that end, the SCC evaluation should include species that require habitat types that include the following:

(i) Key characteristics associated with terrestrial and aquatic ecosystem types;

(ii) Rare aquatic and terrestrial plant and animal communities; and

(iii) The diversity of native tree species similar to that existing in the plan area.

Please reconsider the following species and the habitat types that would be maintained with their inclusion on the list. Provide a thorough analysis including their habitat type, other animals that provide for that habitat type, programmatic monitoring information from before BMER 2021. If they are not then included on the SCC list, explain the reasons why they were not included, what other species was chosen for that habitat type, and why is that species more suitable to maintain and restore ecosystem integrity regarding their specific ecological conditions.

1. Elk for habitat security, and quality in big game habitats
2. Westslope Cutthroat Trout for water quality, temperature, and connectivity in watersheds and aquatic ecosystems
3. Marten for mature and old growth forests
4. Northern Goshawk for intact, mature and old growth forests
5. North American Porcupine for unfragmented forests
6. Northern Bog Lemming for bog and fenn habitats
7. Pygmy Nuthatch for old growth forests
8. Wolf for predator/prey relationships and their effects on biodiversity
9. Pygmy Whitefish for water quality
10. Coeur d'Alene Salamander for mesic and old growth forests
11. Suckley Cuckoo Bumblebee, a major pollinator for plant diversity
12. Western Bumblebee, a major pollinator for plant diversity
13. Northern Rocky Mountain Refugium Caddisfly for mesic and old growth forests
14. Huckleberry spp. to support grizzly bears
15. Wooly-head Clover to support grizzly bears

The current list of SCC is insufficient to ensure the Revised Plan will contain the necessary components to adequately restore and maintain ecosystem integrity and diversity, nor will they promote habitat types to support the persistence of native species across the forest. We made this clear in our comments and our concerns must be addressed.

B. Assessment and Roads

Our organizations provided detailed comments on the Draft Forest Plan Assessment (June, 2023), much of which the Forest Service failed to address in its Revised Assessment (Sept. 2023), and therefore we raise them again here for analysis in the Revised Plan's Draft EIS. For example, in regards to the issue of road impacts to forest resources we noted the Draft Assessment failed to disclose the total number of roads by maintenance level, and instead provided the total number of roads open to the public. The Revised Assessment (RA) does expand the roads assessment, including disclosing there are over 1,100 miles of closed roads. RA at 312. The agency also provided a summary of the 2015 Travel Analysis Report (TAR) with the acknowledgment there are more than 9,000 miles of roads with over 6,000 miles officially part of the transportation system. *Id.* at 313. This means roughly 3,000 miles are unauthorized roads, but the Forest Service labels them "undetermined." It is unclear how many of these roads were acquired after 2015, but the agency did provide a short summary from a 2023 TAR on roads acquired from 2001-2021 that disclosed there are over 2,000 miles and roughly 1,900 miles remain undetermined. *Id.* at 314. The numbers are useful to be sure, and we appreciate the agency adding this information, however, the Forest Service asserts that the 2015 TAR identified 6,000 miles as likely needed, and "could be considered as an approximation of the minimum road system." *Id.* This, even as it states, "The minimum road system will continue to change as forest needs change." *Id.* With this logic, the minimum road system will never be identified, and further, ignores the fact that while the needs may change the environmental impacts will grow or persist. Minimizing the harmful effects of the road system and unauthorized road network must be paramount in the revision process with commensurate plan components. Further, we asked for an updated Travel Analysis Report, to which the agency responded by stating, "[r]oute-specific travel analysis and planning is outside the scope of the Lolo's revision process; however, this assessment recognizes the need to continue the process of more specific analysis and travel planning for routes on acquired lands." *Id.* at 315. Given this disclosure, it is arbitrary for the Forest Service to assert that a 2015 TAR appropriately identifies a minimum road system in 2024. In fact, by the time the agency completes its Revised Plan, the TAR will be over 10 years old. If the agency is not going to update its 2015 TAR, it must include a plan objective to complete a TAR for each district, and to identify a minimum road system in a NEPA-level decision for each district within 5 years of the plan's adoption. In regards to the assessment, we asked the agency to consider forest access and human wildfire ignitions, but the Revised Assessment was silent on this issue, and overall, it failed to disclose how the overall road network affects forest resources. While the Revised Assessment displayed a chart of road risk categories from its 2023 TAR, it omitted such a chart from its 2015 TAR. Even if such a chart were included, there was no discussion regarding which resources were at risk from the acquired roads and certainly nothing in regards to the overall road network (system and non-system). The Revised Plan Draft EIS must address these shortcomings.

C. Consideration of Best Available Scientific Information

While certainly not exhaustive, we believe the information contained in this letter and its exhibits represents the best available scientific information, which the 2012 planning rule requires the agency to utilize.[3] We ask that you regard it as such, or explain clearly why you disagree while providing the scientific basis for your analysis and conclusions.

D. Need to adopt Standards and Clear Guidelines

We urge the Forest Service to establish enforceable standards in the forest plan because it will ensure accountability and better environmental protection. Martin Nie (2014), a professor of forest policy at the University of Montana and a member of the national FACA committee overseeing implementation of the 2012 planning rule, recommends that the Forest Service utilize standards in second-generation forest plans:

> Not only do law and regulation require standards, but they can also lead to efficiencies in forest planning. They can also be advantageous from a political perspective, as they resonate with a cross section of planning participants, most of whom want a greater degree of certainty, structure, and predictability in forest management.[4]

We agree and encourage the LNF to establish standards in its revised forest plan.

Further, while all plan components are enforceable,[5] several in the PA fail to provide adequate or clear direction which undermines the ability for the Forest Service to ensure project consistency with the Revised Plan.[6] For example, the PA includes a guideline that directs, "[t]o reduce the likelihood of establishing unplanned visitor-use patterns, new fuel breaks, temporary roads, skid trails, and landings should be designed and managed to discourage concentrated use." PA at 59, FW-REC-GDL-03. This guideline is vague because it leaves open to interpretation precisely what would discourage use, or what would constitute "concentrated use." Similarly, how would forest officials design or manage the infrastructure to discourage use? Without more specificity, responsible officials will have to include detailed descriptions and justifications for how it is meeting this guideline, and it lacks any measures that would allow monitoring to determine the

[3] 36 C.F.R. § 219.3 (agency "shall use the best available scientific information to inform the planning process" and "shall document how [that] information was used to inform the assessment").
[4] Nie & Schembra, 2014.
[5] 36 C.F.R. § 219.15(d)
[6] Nie & Brown, 2019 (explaining "In practice, however, enforceability will be difficult if a component is written in an unclear or vague manner.").

success of any design or management direction. We see such problems again where the Forest Service includes the following guideline:

> "To protect natural and cultural resources, projects and other management activities should be designed to prevent the creation and/or use of unauthorized recreation routes, and to rehabilitate existing ones to the extent practicable."

PA at 99, FW-INF-GDL-03. The intent of this guideline is to prevent or reduce unauthorized use, the intent of which we fully support. However, it fails to provide the necessary direction to clarify what is meant by "the extent practicable" or how projects and management activities should be designed, leaving that completely open to interpretation. For example, we would expect such a direction to specify that no linear feature would be established from an open road or motorized trail that leads to or enters an area protected from vehicle use. Absent direction for project or management activities designs, the responsible official must provide detailed explanations to demonstrate consistency with this guideline.

III. Achieving a sustainable minimum road system

A. The forest plan revision must provide direction for achieving a sustainable, minimum road system.

We are disappointed that the PA fails to provide direction for achieving an ecologically and fiscally sustainable minimum road system. As noted above, the Revised Assessment fails to include the necessary information to fully understand the existing condition, particularly the miles of roads that pose high and medium risks. Specifically, the RA fails to disclose road or motorized route densities that are contributing to habitat degradation and watershed impairment. While the Forest Service asserts it need not update its Travel Analysis Report as part of the plan revision process, it must still disclose the harmful environmental consequences of its road network in a manner that can meaningfully inform the revised plan. Ultimately though, we urge the Forest Service to recognize that it must either update its 2015 TAR or address its outdated information and our other related comments in the Revised Plan EIS.

Specifically, it is important to note that the Forest Service explains that "[i]n the 2015 travel analysis report, over 9,000 miles of roads were identified on the Lolo, of which just over 6,000 miles were National Forest System routes, and over 3,000 miles were undetermined routes." RA at 312. Though not included in the Revised Assessment, the 2015 TAR concluded that "[a]pproximately 112 miles of road were identified as "likely not needed for future use by any resource area." 2015 TAR at 18. This represents just 1.9% of all system roads as likely unneeded, or 1.2% of the total road network. Such a paltry amount is unjustifiable to assert that the 2015 TAR identifies the likely minimum road system. In addition, the number of undetermined routes increased with additional land acquisitions considered in a 2023 TAR, where 2,000 miles were added to the system from 2001-2021, of which 1,900 are in an undetermined status. *Id.* at 314.

However, it is unclear how many roads in the 2023 TAR overlap with those in the 2015 TAR, meaning the total road network could be roughly ***11,000 miles of road, an unheard of number.*** The Forest Service does state that since the 2015 TAR, "[t]he miles of undetermined routes has grown since that report due to recent acquisition of lands to just over 4,100 miles." This is an excessive amount of unauthorized roads (even if in an undetermined status), and absent a revised TAR as part of the Plan Revision process, the agency must include a plan component to direct completion of a new TAR(s), that will identify the highest risk roads to prioritize for decommissioning.

1. Regulatory Framework

    a. Road Management under Subpart A of the Travel Rule

To address its unsustainable and deteriorating road system, the Forest Service promulgated the Roads Rule (referred to as "subpart A") in 2001.[7] The rule directs each National Forest to conduct "a science-based roads analysis," generally referred to as a travel analysis report.[8] Based on that analysis, forests must: (1) identify unneeded roads for decommissioning or to be considered for other uses[9]; and (2) identify the minimum road system needed for safe and efficient travel and for the protection, management, and use of National Forest system lands.[10] The Roads Rule defines the minimum road system as:

> the road system determined to be needed [1] to meet resource and other management objectives adopted in the relevant land and resource management plan . . . , [2] to meet applicable statutory and regulatory requirements, [3] to reflect long-term funding expectations, [and 4] to ensure that the identified system minimizes adverse environmental impacts associated with road construction, reconstruction, decommissioning, and maintenance.[11]

While subpart A does not impose a timeline for agency compliance with these mandates, the Forest Service Washington Office, through a series of directive memoranda, ordered forests to

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[7] 36 C.F.R. §§ 212.1-212.21 (Administration of the Forest Transportation System), 66 Fed. Reg. 3206 (Jan. 12, 2001).
[8] 36 C.F.R. § 212.5(b)(1). Forest Service Manual 7712 and Forest Service Handbook 7709.55, Chapter 20 provide detailed guidance on conducting a travel analysis.
[9] 36 C.F.R. § 212.5(b)(2).
[10] *Id.* § 212.5(b)(1).
[11] *Id.* The requirements of subpart A are separate and distinct from those of the 2005 Travel Management Rule, codified at subpart B of 36 C.F.R. part 212, which addresses off-highway vehicle use and corresponding resource damage pursuant to Executive Orders 11644, 37 Fed. Reg. 2877 (Feb. 9, 1972), and 11989, 42 Fed. Reg. 26,959 (May 25, 1977).

produce a travel analysis report by the end of fiscal year 2015.[12] The memoranda articulate an expectation that forests, through the subpart A process, "maintain an appropriately sized and environmentally sustainable road system that is responsive to ecological, economic, and social concerns."[13] The Washington Office memorandum clarifies that travel analysis reports must address *all* system roads—not just the small percentage of roads maintained for passenger vehicles. And it requires travel analysis reports to include a list of roads likely not needed for future use.

The LNF completed its travel analysis report (TAR) in 2015. We reviewed that report, and as we explained in our comments regarding the Draft Assessment, it did not identify a minimum road system (which can only be done through a NEPA-level decision) and it recommended a paltry number of roads for decommissioning. As such, it can hardly be used to actually meet the requirements under subpart A or meaningfully inform the Forest Plan Revision process. One reason is that conditions on the ground have changed since the time it was drafted, especially in regards to the increasing presence of grizzly bears in certain areas and the addition of the Ninemile DCA. Further, the TAR omitted important risks, such as increasing the risk of human-caused wildfire ignitions. The Forest Service must address these, and other, access related risks in its Revised Plan EIS. Such analysis is necessary to truly understand how the PA and other alternatives will move the forest closer to minimizing the road-related impacts.

For this reason, we emphasize the need for the Revised Plan to include components that will ensure compliance with subpart A through its analysis of site-specific projects of the appropriate geographic size under NEPA,[14] actually implement the minimum road system, and to decommission unneeded roads starting with the most problematic. We suggest that the district-scale is the most appropriate geographic size for such a planning effort.

b. Land Management Planning under the 2012 Planning Rule

The 2012 Planning rule[15] guides the development, amendment, and revision of forest plans, with an overarching goal of promoting the ecological integrity and ecological and fiscal sustainability of National Forest lands:

> Plans will guide management of [National Forest System] lands so that they are ecologically sustainable and contribute to social and

[12] Memorandum from Joel Holtrop to Regional Foresters *et al.* re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Nov. 10, 2010); Memorandum from Leslie Weldon to Regional Foresters *et al.* re Travel Management, Implementation of 36 C.F.R., Part 212, Subpart A (Mar. 29, 2012); Memorandum from Leslie Weldon to Regional Foresters re Completion of Travel Management and Next Steps (Sept. 24, 2015).
[13] *Id.*
[14] *See supra,* note 14.
[15] 36 C.F.R. part 219.

> economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.[16]

To accomplish these ecological integrity and sustainability goals, the rule imposes substantive mandates to establish plan components – including standards and guidelines – that maintain or restore healthy aquatic and terrestrial ecosystems, watersheds, and riparian areas, and air, water, and soil quality.[17] The rule also requires that plan components must ensure implementation of the national best management practices for water quality.[18]

The components must be designed "to maintain or restore the structure, function, composition, and connectivity" of terrestrial, riparian, and aquatic ecosystems[19]; must take into account stressors including climate change, and the ability of ecosystems to adapt to change[20]; and must implement national best management practices for water quality.[21] The rule also requires the Forest Service to establish riparian management zones for which plan components "must ensure that no management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment that seriously and adversely affect water conditions or fish habitat shall be permitted."[22] In addition, plans must include plan components for "integrated resource management to provide for ecosystem services and multiple uses," taking into account "[a]ppropriate placement and sustainable management of infrastructure, such as recreational facilities and transportation and utility corridors."[23] Plan components must ensure social and economic sustainability, including sustainable recreation and access.[24] And the Forest Service must "use the best available scientific information" to comply with these substantive mandates.[25]

c. National Best Management Practices Program

The Forest Service, as stated above, must ensure implementation of the National Best

[16] 36 C.F.R. § 219.1(c).
[17] *Id.* § 219.8(a)(1)-(3); *see also id.* § 219.9(a) (corresponding substantive requirement to establish plan components that maintain and restore the diversity of plant and animal communities and support the persistence of native species).
[18] *Id.* § 219.8(a)(1)(4).
[19] *Id.* § 219.8(a)(1) & (a)(3)(i).
[20] *Id.* § 219.8(a)(1)(iv).
[21] *Id.* § 219.8(a)(4).
[22] *Id.* § 219.8(a)(3)(ii)(B).
[23] *Id.* § 219.10(a)(3).
[24] *Id.* § 219.8(b).
[25] *Id.* § 219.3.

Management Practices for Water Quality Management on National Forest System Lands (Volume 1, April 2012) to guide road management in forest planning. The National BMP Program directs the Forest Service to design the transportation system to limit roads to the minimum practicable number, width, and total length consistent with the purpose of specific operations, local topography, geology, and climate to achieve land management plan desired conditions, goals, and objectives for access and water quality management. We recognize that the Forest Service's proposed direction includes a watershed standard that requires project-specific actions incorporate Federal and Montana's BMPs. PA at 34, FW-WTR-STD-01. Certainly this is a necessary requirement under the 2012 Planning Rule, but it is not sufficient to adequately protect watersheds, as we explain below. Still we support the PA's inclusion of this standard.

In regards to monitoring, the Forest Service Washington Office has yet to finalize Volume II, regarding how to monitor BMPs to achieve water quality protections. Proper BMP implementation, followed by thorough monitoring, is an important way to ensure waterways are protected from road-related impacts. For this reason we appreciate that the PA's monitoring program includes direction to measure the "[m]iles of roads and trails where specific water quality BMPs were applied during road maintenance or reconstruction." PA at 168, IND-CWN-04. However, this direction must apply to all projects with road maintenance or reconstruction, and it should be expanded to include road construction in those areas where it is permitted. Only monitoring water quality BMPs within the Conservation Watershed Network is insufficient. Further, the monitoring is specific to implementation, but not effectiveness. The Forest Service cannot assume that just because a BMP is being implemented, that it will be 100 percent effective. The agency must address these deficiencies in any adopted alternative.

2. The proposed Forest Plan direction must address the Lolo National Forest road system.

With forest plans determining the framework for integrated resource management, this plan revision is precisely the place to ensure compliance with the requirements of subpart A and to establish direction for achieving a sustainable minimum road system. Indeed, the substantive ecological integrity and ecological and fiscal sustainability provisions of the 2012 planning rule complement and reinforce the requirements of subpart A. As documented in a literature review by WildEarth Guardians,[26] the adverse environmental and fiscal impacts associated with existing transportation infrastructure (e.g., erosion, compaction, sedimentation and impairment of water quality, fragmentation of wildlife habitat, interference with feeding, breeding, and nesting, spread of invasive species) directly implicate these substantive requirements.

The plan components of the revised forest plan should integrate a variety of approaches to satisfy

[26] *See* Exhibit 4

the substantive mandates of the 2012 Planning Rule and subpart A. The following recommendations are based on the Forest Service's current roads policy framework, relevant legal requirements, and best available science. Where applicable, the recommended plan components also incorporate information from the forest assessment and other relevant sources of information.

a. The Revised Plan must provide direction to remove unneeded roads in order to improve habitat and aquatic connectivity

Connectivity is defined by the Forest Service's 2012 planning rule as "[e]cological conditions that exist at several spatial and temporal scales that provide landscape linkages that permit the exchange of flow, sediments, and nutrients; the daily and seasonal movements of animals within home ranges; the dispersal and genetic interchange between populations; and the long-distance range shifts of species, such as in response to climate change."[27]

Roads are known to be a leading contributor to habitat fragmentation.[28] The forest's assessment identifies a general trend of increasing landscape fragmentation compared to the historic condition.[29] But analysis of the patch metrics of forest openings and multi-storied patches within individual habitat type groups was not provided in the Revised Assessment, an omission that must be corrected in the Revised Plan's environmental impact statement to ensure informed, meaningful public comment. Large predatory species like grizzly bears are particularly vulnerable to habitat fragmentation.[30] Canada lynx are adversely impacted by habitat fragmentation.[31] And wolverine face threats from habitat fragmentation, especially when considering the impacts of climate change on the timing, depth, and duration of snowpack in their montane habitats.[32] In addition, bull trout continue to face a number of threats, including historical habitat loss and fragmentation, interaction with nonnative species, and fish passage. Road crossings over streams are a common migration barrier to threatened bull trout because improper road culverts can reduce or eliminate fish passage.[33]

Yet, the Forest Service is not proposing sufficient plan components that are specifically tied to

[27] 36 C.F.R. § 219.19.
[28] *See* 2020 Literature Review at 7.
[29] RA at 107.
[30] USFWS March 2023 Biological Opinion on the Effects of the Lolo National Forest Plan on Grizzly Bears at 40 ("Negative impacts associated with roads and high road densities influence habitat use patterns of individual grizzly bears as well as the population. Proctor et al. (2019) found that motorized access affects grizzly bears at the individual level by affecting habitat use, home-range selection and the ability to move across the landscape. The same study concluded that effects of motorized access on individual bears also results in effects at the population level due to habitat fragmentation, and decreased survival and reproductive rates.").
[31] *See* Revised Assessment at 160.
[32] 88 FR 83743
[33] *See* Revised Assessment at 175.

alleviating terrestrial habitat connectivity concerns, specifically by including road density standards. It is imperative that the Forest Service incorporates plan direction that will reduce terrestrial and aquatic habitat fragmentation and improve connectivity within and through the forest. Plan components that direct the removal of unneeded roads, seasonal closures, and that limit the construction of roads and motorized trails in areas important for wildlife are critical for addressing habitat fragmentation and improving connectivity.

Moving towards an environmentally and fiscally sustainable minimum road system requires removal of unneeded roads (both system and non-system) to reduce fragmentation and the long-term ecological and maintenance costs of the system. The continued presence of unauthorized routes, temporary roads, and stored roads on the landscape allows for harassment of wildlife, littering, fires, invasive plant distribution, and harm to water quality and aquatic life. It also results in cumulative impacts on the landscape when added to the impacts from system roads. This is especially true when revegetated roads experience a wildfire. The forest plan revision should envision the removal of all unneeded roads, both system and non-system. That is one reason we called for an updated Travel Analysis Report in our comments on the Draft Assessment. Public understanding as to the location and identification of these roads based on the list of likely unneeded roads will be critical to meaningful public comment.

Reconnecting islands of unroaded forestlands is one of the most effective actions land managers can take to enhance forests' ability to adapt to climate change.[34] Removing unneeded roads improves forest resiliency by eliminating conduits for invasive species.[35] Scientifically credible, landscape-scale measures of risk to aquatic integrity include miles of road connected by direct surface flow to streams and the number of road or stream crossings by subwatershed.[36] The revised plan should include plan components focused on restoring aquatic and terrestrial habitats and habitat connections by, in part, reducing stream crossings. The revised plan should prioritize reclamation of unauthorized and unneeded roads in roadless areas (both Inventoried Roadless Areas under the 2001 Roadless Area Conservation Rule and newly inventoried areas under FSH 1909.12, Chapter 70), important watersheds, and other sensitive ecological and conservation areas and corridors.

b. Remove unneeded roads to improve watershed health

In 2011, the Forest Service classified 6th-HUC level watersheds under its Watershed Condition Framework (WCF), and the LNF reassessed its conditions again in 2021, with the following results:

Of the 166 watersheds, 51 were rated as functioning properly, 98 were rated as

[34] 2020 Literature Review at 16-17.
[35] *See, e.g.*, Birdsall J. L. et al. 2012. ("Exotic plan species frequently occur along roadsides; roads can act as conduits for their spread and invasion into neighboring habitats").
[36] *See* USDA Forest Service, 2012.

> functioning at risk, and 17 were rated as impaired. For watersheds that were rated impaired, the most significant drivers of the ratings in the plan area were roads. Across the Plan area, watersheds were most commonly rated as impaired for the indicators: aquatic biota, roads and trails, and aquatic habitat condition.

RA at 184. Given these findings, it is clear the Forest Service must include plan components directing the removal of unneeded roads to improve watershed health during the life of the plan.

i. Conservation Watershed Network

The Forest Service explains that "[t]he conservation watershed network (CWN) is a subset of watersheds where management actions are prioritized for the long-term conservation of native fish and other aquatic species of conservation concern where habitat is expected to persist into the future in the face of climate change." PA at 40. As we explain further below, we strongly suggest strengthening the plan components implementing the CWN to ensure it is useful in achieving the stated desired conditions.

We have several concerns with the Forest Service's current proposed direction for a CWN that we discuss below in the context of bull trout recovery, but overall the PA section addressing the CWN needs more content specific to addressing roads and related impacts. In developing substantive CWN plan components, the forest should consider the Northwest Forest Plan Aquatic Conservation Strategy objectives and supporting plan components. Reeves et al., 2018. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands.

ii. Watershed Condition Framework

In addition to—and separate from—the CWN, the plan should address roads-related impairment of watersheds, as identified by the WCF roads and trails indicator as well as section 303(d) of the Clean Water Act, 33 U.S.C. § 1313(d). The Forest Service's WCF characterizes the health and condition of national forest watersheds as Class 1: Properly Functioning, Class 2: Functioning at Risk, or Class 3: Impaired, based on a set of twelve condition indicators (USDA Forest Service 2011a). Indicator #6 is the condition of forest roads and trails and provides an important measure of the effects of the transportation system on the ecological integrity of aquatic systems. The indicator is based on four roads- and trails-related attributes: open road density; road maintenance; proximity to water; and mass wasting.

As noted above, the LNF contains 115 watersheds that are functioning at risk or have an impaired function, which represents 59% of the total watersheds under the WCF that are not functioning properly. Roads were the most significant factor affecting watershed function. As such we expected the Revised Assessment to include more information regarding the Road &

Trail indicator and its four attributes analyzed to determine its ranking. Ultimately, the Forest Service must disclose the subwatersheds that have fair or poor Road and Trail Indicator scores, and demonstrate how the Revised Plan will effectively move these scores to a better ranking. It should also prioritize removal of unneeded and unauthorized roads in watersheds functioning at risk or in an impaired condition as indicated by Indicator #6, or that contain 303(d) segments impaired by sediment or temperature associated with roads.

c. Adopt road density thresholds to ensure an ecologically sustainable road system

Adopting road density thresholds for particular parts of the landscape or forest matrix is one of the most effective strategies for achieving an ecologically sustainable road system.[37] Road density thresholds are critical to protecting important watersheds, migratory corridors and other key wildlife habitat. There is a direct correlation between road density and various markers for species abundance and viability.[38] Plan components should incorporate road density thresholds, based on the best available science, as a key tool in achieving a sustainable minimum road system that maintains and restores ecological integrity.[39] In doing so, it is critical that the density thresholds apply to all motorized routes, including closed, non-system, and temporary roads, as well as motorized trails.[40]

The Proposed Action omits any road density or motorized route density standards and the Revised Assessment downplays its importance in its discussion about grizzly bear management: "Secure habitat is an important metric because it portrays the impact of the spatial arrangement of motorized routes on the landscape more effectively than a simple road density calculation." RA at 165. We agree secure habitat is an important metric, and one informed by motorized route density calculations. Road or motorized route densities affect a range of species, in particular elk and bull trout. For a time, the Forest Service limited constructing new permanent roads in favor of temporary roads, and though we see that trend reversing, the agency still emphasizes temporary roads, reconstruction of closed or stored roads, and use of unauthorized roads. Omitting road density standards fails to address the need to better manage the harmful consequences of the LNF sprawling road network (both system and non-system), and ignores the Forest Service's increased use of temporary roads, which directly impact the landscape and reduce wildlife security for years following a project.[41]

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[37] *See* 2020 Literature Review at 9-10 (summarizing best available science on road density thresholds for fish and wildlife).
[38] *See* 2020 Literature Review at 9-10; *see also* FSH 1909.12, ch. 10, § 12.13 & Ex. 01 (identifying road density as one of the "key ecosystem characteristics for composition, structure, function, and connectivity" used to assess the "status of ecosystem conditions regarding ecological integrity").
[39] *See* FSH 1909.12, ch. 20, § 23.23l(2)(a) (desired condition for road system may describe desired road density for different areas).
[40] *See* 2020 Literature Review at 9-10 (describing proper methodology for using road density as a metric for ecological function).
[41] *See* 2020 Literature Review at 24.

d. Maintain needed roads to ensure a resilient future forest

A sustainable road system requires maintenance and modification of needed roads and transportation infrastructure to make it more resilient to extreme weather events and other climate stressors.[42] Inadequate road maintenance leads to a host of environmental problems. It increases the fiscal burden of the entire system, since it is much more expensive to fix decayed roads than maintain intact ones. And inadequate road maintenance endangers and impedes access for forest visitors and users due to landslides, potholes, washouts and other failures. For these reasons it is imperative that the Forest Service reduce its road maintenance needs by reducing its road system, and revising its 2015 Travel Analysis Report to update its list of unneeded roads.

The agency explains that "[r]oad maintenance with limited funding available is focused on roads open to public travel that access administrative sites and high use recreation sites." The Forest Service did not disclose the amount of deferred maintenance backlog for its system roads, or how many high-risk roads closed to the public are part of this deferred maintenance. The agency must address these deficiencies in its Revised Plan EIS, and disclose the environmental consequences from its lack of maintenance, and from its prioritization of maintaining only certain roads open to the public.

Plan components should direct the roads identified as likely needed in the travel analysis reports to be upgraded to standards able to withstand more severe storms and flooding by, for example, replacing under-sized culverts and installing additional outflow structures and drivable dips.[43] The Forest Service should also consider plan components directing the forest to move particularly problematic segments of needed roads, if possible, to reduce hazardous conditions, severe failure risk, and to improve fish passage.

e. Create a financially sustainable road system

A sustainable road system must be sized and designed such that it can be adequately maintained under current fiscal limitations. The LNF's current road system is unaffordable by the Forest Service's own admission:

> Current and projected road budgets do not fund road maintenance needs. One possible result will be that more road miles placed in storage (maintenance level 1). Road maintenance emphasis will be placed on promoting safety, aquatic organism movement, and protecting water quality. A road system that is not fully funded may increase the risk of impacts on water quality and aquatic ecosystems. Best Management Practices designed into projects will reduce much of this impact.

[42] *See* Exec. Order 13,653, §§ 1, 3, 5(a), 78 Fed. Reg. 66,819 (Nov. 6, 2013) (agency tasked with enhancing resilience and adaptation to climate change impacts).
[43] 2020 Literature Review at 14. *See also* FSH 1909.12, ch. 20, § 23.23l(2)(b)(1) (plan components may include road improvement objectives for culvert replacement or road stabilization).

RA at 314. The Forest Service did not disclose the amount of funding it would require to bring each road segment into compliance with its road management objectives and meet its regularly scheduled maintenance period. The deferred maintenance backlog is not included in the Revised Assessment, and the Forest Service must disclose this amount in its Revised Plan EIS, along with the environmental consequences from the lack of maintenance. This information is crucial as we often see the Forest Service assert that it cannot afford to decommission unneeded roads, and where roads have medium or low resource value, the agency often recommends long-term storage in place of decommissioning due to funding constraints. However, these same roads may have medium or high risks, and therefore should be decommissioned. In any case, the Forest Service must take a hard look at its funding for road maintenance and decommissioning, and demonstrate why it is more fiscally responsible to keep a deferred maintenance backlog instead of identifying more roads as unneeded and setting a decommissioning objective that will align the LNF road system with its projected road maintenance budget.

3. Recommended plan components to achieve an ecologically and fiscally sustainable road system.

To integrate these approaches and satisfy the substantive mandates of the 2012 Planning Rule and subpart A, we recommend the following plan components and elements—supported by best available science—as the building blocks of a framework for sustainable management of forest roads and transportation infrastructure.

a. Recommended Desired Future Condition

Desired conditions are "specific social, economic, and/or ecological characteristics of the plan area… toward which management of the land and resources should be directed."[44] Include achievement and maintenance of an appropriately sized and environmentally and fiscally sustainable minimum road system as a desired condition. The Forest Service's current roads management policy framework is generally aimed at shrinking the agency's vast and decaying road system and its host of adverse environmental and social impacts. Accordingly, the desired future condition for transportation infrastructure should include a well-maintained system of needed roads that is fiscally and environmentally sustainable and provides for safe and consistent access for the utilization and protection of the forest. We recommend the plan include the following desired condition:

- Identify, implement and maintain an appropriately sized and environmentally and fiscally sustainable minimum road system.

[44] 36 C.F.R. § 219.7(e)(1)(i).

Certainly we recognize the PA includes specific desired conditions that appear to mirror our recommendation, including a DC that states "A safe and cost-effective transportation system including roads, trails, bridges, and culverts provides safe public and administrative access to NFS lands while protecting natural and cultural resources."[45] However, the Forest Service should revise this condition to expressly refer to long-term funding expectations. This makes sense given the forest plan is a long-term planning document. Ways to reduce costs include: remove unneeded roads, including temporary and non-system roads; and make sure to not exceed density standards, based on the best available science, for all motorized routes in important watersheds and wildlife habitat, migratory corridors, and general forest matrix, and for relevant threatened and endangered species and species of conservation concern. Include a guideline that road construction, reconstruction, decommissioning, and maintenance activities shall be designed to minimize adverse environmental impacts.

b. Climate Resilience

Climate change generally intensifies the adverse impacts associated with roads. In particular, the warming climate is expected to lead to more extreme weather events, resulting in increased flood severity, more frequent landslides, altered hydrographs, and changes in erosion and sedimentation rates and delivery processes.[46] Many national forest roads were not designed to current engineering standards (or, in some cases, any engineering standards), making them particularly vulnerable to climate-induced hydrologic shifts. That vulnerability is further exacerbated by the deteriorating physical condition of the system and significant maintenance backlog, as described above. Moreover, even those roads designed to current engineering standards and hydrologic conditions may fail under future weather scenarios, further intensifying adverse ecological impacts, public safety concerns, and maintenance needs. For example, as the warming climate alters species distribution and forces wildlife migration, landscape connectivity becomes even more critical to species survival and ecosystem resilience.[47]

The desired future condition for transportation infrastructure should include a climate resilient forest road system designed and maintained to withstand predicted future storm events. Identifying a resilient future road network is one of the most important endeavors the Forest Service can undertake to restore aquatic systems and wildlife habitat, facilitate adaptation to climate change, ensure reliable recreational access, and operate within budgetary constraints.

c. <u>Objectives to achieve a minimum road system</u>

The planning rules define an objective as "a concise, measureable, and time-specific statement of

[45] See PA at 96, *FW-INF-DC-01*
[46] 2020 Literature Review at 15-16.
[47] 2020 Literature Review at 12-16.

a desired rate of progress toward a desired condition or conditions."[48] We recognize the PA includes a number of road-related Objectives that will improve current road management, but still fall short of identifying and implementing a minimum road system. Therefore we suggest the following Objectives:

- Within 3 years of plan adoption, identify the minimum road system and an implementation strategy for achieving that system.
- Over the life of the plan, decommission all roads identified as likely not needed for future use in the travel analysis report.
- Within 10 years of plan approval, decommission high-priority, unneeded roads with the most benefit in achieving an ecologically and fiscally sustainable transportation network
- Within 10 years of plan approval, address all roads within at-risk or impaired watersheds that have a "poor" ranking under the WCF roads and trails indicator, and within watersheds contributing to sediment or temperature impairment under section 303(d) of the Clean Water Act.
- Within 5 years of plan approval, establish a publicly available system for tracking temporary roads that includes but is not limited to the following information: road location, purpose for road construction, the project-specific plan required below, year of road construction, and projected date by which the road will be decommissioned. Within 10 years of plan approval, all temporary roads will be reflected in the tracking system.
- Over the life of the plan, all identified temporary roads without a project-specific plan will be decommissioned.

d. <u>Standards must ensure that roads do not impair ecological integrity and otherwise satisfy the substantive requirements of the 2012 Planning Rule and subpart A.</u>

A standard is a mandatory constraint on a project and activity decisionmaking, established to help achieve or maintain a desired condition, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.[49] The 2012 planning rule requires that plans provide for the ecological integrity of aquatic and terrestrial ecosystems and watersheds, including maintaining or restoring their structure, function, composition, and connectivity, while taking into account factors such as climate change and other stressors, the broader landscape beyond the plan area, and opportunities for landscape-scale restoration.[50]

Further, though we discuss Riparian Management Zones below, we also include the issue here as it relates to roads. Riparian Management Zones (RMZs) are portions of watersheds where riparian-associated resources receive primary emphasis and management activities are subject to

[48] 36 C.F.R. § 219.7(e)(1)(ii).
[49] 36 C.F.R. § 219.7(e)(1)(iii).
[50] 36 C.F.R. § 219.8(a)(1).

specific standards and guidelines. In addition to the Roads and Trails standards suggested below, the Forest Service must establish standards that better address road activities in RMZs to ensure protection of riparian resources. As it stands, the agency includes the following:

> Newly constructed or reconstructed roads shall not encroach into streams and riparian management zones if this action increases the net long-term negative effect to the aquatic ecosystem, including impacts to the floodplain function and geometry.

PA at 98, FW-INF-STD-03. The standard is vague and permissive as it leaves open to interpretation, and abuse of discretion, what precisely constitutes the "net long-term negative effects," the standard is meant to prevent. Failing to define short-term or long-term effects means a road could be constructed or reconstructed within the RMZ. Further, none of the standards address unauthorized roads found within the RMZ. For these reasons we urge the Forest Service to adopt more protective and clearer road standards for the RMZ:

- No permanent road construction shall occur with the RMZ.
- No temporary road construction or reconstruction shall occur within the RMZ, unless the responsible official demonstrates such activities are unavoidable. Any temporary roads constructed must be physically decommissioned within 3 years of use.
- No unauthorized routes will be added to the transportation system within the RMZ, and any utilized for project-level activities shall be physically decommissioned within 3 years of use.
- For new road construction and reconstruction of existing road segments adjacent to riparian management zones, do not side-cast fill material into the RMZ.

In addition, we provide the following general infrastructure standards:

- In impaired and at-risk watersheds, areas of connectivity, and mature or old growth stands, there shall be no increase to the baseline total motorized route density.
- In habitat needed for the recovery of threatened and endangered species, and the maintenance of viable populations of species of conservation concern, there shall be no increase to the baseline total motorized route density.
- Temporary road plan: No temporary road shall be constructed prior to the development of a project-specific plan that defines how the road shall be managed and constructed.
- Avoid all wetlands and unstable areas when reconstructing existing roads or constructing new roads and landings. Minimize impacts where avoidance is not possible.
- Avoid all wetlands and unstable areas when reconstructing existing roads or constructing new roads and landings. Minimize impacts where avoidance is not possible.
- In fish-bearing streams, construction, reconstruction, or replacement of stream crossings shall provide and maintain passage for all life stages of native aquatic organisms unless barriers are necessary to prevent spread or invasion of nonnative species.

- To reduce the risk to aquatic resources when decommissioning roads, closing roads, or putting roads into intermittent stored service, roads shall be left in a hydrologically stable condition.
    - For decommissioned roads, reclaimed roads, or impassable roads, this means the road must be re-vegetated, no longer function as a road, and all stream-aligned culverts must be removed.
    - For intermittent stored service roads, this means all stream-aligned culverts must be removed.
    - Defining "hydrologically stable condition" is critical to implementation and effect of this plan component, as is distinguishing between decommissioned - reclaimed - impassable roads and intermittent stored service roads.

e. Design guidelines to achieve a sustainable minimum road system.

- For projects with road-related actions, the purpose and need statement should include achieving a sustainable minimum road system and the analysis should consider recommendations from travel analysis reports.
    - To enhance landscape connectivity and ecological integrity, prioritize road decommissioning based on:
    - Effectiveness in reducing habitat fragmentation in areas of connectivity;
    - Increasing habitat security for at-risk and sensitive species;
    - Addressing impaired or at-risk watersheds;
    - Achieving motorized route density standards; and
    - Meeting scenic integrity desired conditions
- To enhance public safety and efficiency of the transportation system, prioritize maintenance of needed routes based on:
    - Storm-proofing needs and opportunities (e.g., relocating roads away from water bodies, resizing or removing culverts, etc.);
    - Restoring aquatic and terrestrial habitats and habitat connections by, in part, reducing or upgrading stream crossings.

4. Establish a monitoring program that ensures progress toward desired conditions.

A thoughtful forest plan monitoring program is critical because it determines the degree to which a forest plan is maintaining or making progress toward achieving desired conditions.[51]

[51] 36 C.F.R. §§ 219.5 (monitoring "provides feedback for the planning cycle by testing relevant assumptions, tracking relevant conditions over time, and measuring management effectiveness"), 219.7 (listing a monitoring program as a required plan component).

Monitoring questions should be based on desired conditions, objectives, or other plan components.[52] We suggest the following annual monitoring questions to address the desired conditions and objectives outlined above:

- Miles of road improved or maintained to meet BMP guidelines?
- Miles of road addressed for all roads within at-risk and impaired watersheds according to the WCF roads and trails indicator, and within watersheds contributing to sediment or temperature impairment under section 303(d) of the Clean Water Act?
- Percentage of road miles decommissioned in a subwatershed with a "poor" WCF roads and trails indicator?
- Miles of roads identified as likely not needed for future use in the travel analysis report decommissioned?
- Miles of road decommissioned for roads identified as high-priority, unneeded and with the most benefit in achieving an ecologically and fiscally sustainable transportation network (e.g., roads posing a high risk to forest resources, roads in inventoried roadless areas and other ecologically sensitive areas, etc.)?
- Percentage of forest with increased habitat fragmentation in important wildlife habitat?
- Percentage of subwatersheds with an identified minimum road system?
- Percentage of subwatersheds with an implemented minimum road system?

IV. Providing for Sustainable Recreation

A. Legal Framework

1. Sustainable Recreation under the 2012 Planning rule

The 2012 planning rule establishes ecological sustainability as the overarching goal of planning, and directs that land management plans should provide people and communities ecosystem services and multiple uses that provide a range of benefits—including recreational, educational, and spiritual—for the present and into the future.[53] To achieve this, the rule requires the Forest Service to provide for "sustainable recreation" and emphasizes the importance of connecting people with nature. As set forth in the rule, sustainable recreation is "the set of recreation settings and opportunities on the National Forest System that is **ecologically**, economically, and socially sustainable to present and future generations."[54] We caution the Forest Service to give careful consideration to determine what recreational uses are ecologically sustainable,[55] and not approach providing recreational opportunities as an exercise of dividing the pie. Rather, the agency must first identify its decision space based on what recreational uses are ecologically

[52] 36 C.F.R. § 219.12(a)(2).
[53] 36 C.F.R. § 219.1(c).
[54] *Id.* at § 219.19. (emphasis added).
[55] *Id.* at § 219.8

sustainable, and then allocate areas of opportunity based on what is socially and economically sustainable. In other words, ***the desires of those with recreational interests must not be met at the expense of an area's ecological integrity***.

In revising a forest plan, the Forest Service must develop plan components, including standards and guidelines, to provide for sustainable recreation, including sustainable settings, opportunities, and access.[56] It must develop plan components, including standards and guidelines, to guide the plan area's contribution to social and economic sustainability, taking into account sustainable recreation, including recreation settings, opportunities, and access, scenic character, and opportunities to connect people with nature.[57] And it must include plan components, including standards and guidelines, for integrated resource management to provide for ecosystem services and multiple uses in the plan area, considering: (1) appropriate placement of infrastructure, such as recreational facilities, (2) opportunities to coordinate with neighboring landowners to link open spaces and take into account joint management objectives where feasible and appropriate, and (3) opportunities to connect people to nature.[58]

In regard to the interface of recreation and protecting environmental resources, the planning rule requires plan components, including standards and guidelines, to ensure achievement of the substantive provisions related to ecological integrity, sustainability, and diversity at 36 C.F.R. §§ 219.8(a) and 219.9. The Forest Service, therefore, needs to develop plan components guiding the management of recreation settings, opportunities, infrastructure, and access that do not impede the achievement of the substantive provisions.

2. Planning Directives

The planning directives add detail to the planning rule's provisions. The Forest Service should review information from the assessment, the need for change, and distinctive roles and contributions related to recreational settings, opportunities, and access in the plan area, as well as public preferences or demand for certain uses.[59] It should consider compatibility of different recreational uses in specific areas.[60]

Drawing on the unit's distinctive role and contributions, the directives urge the forest to be proactive in developing a "coherent system of sustainable and socially compatible recreation opportunities."[61] In doing so, the Forest Service should use the ROS to define recreation settings, and then establish compatible activities (opportunities) within those settings.[62] The Forest

[56] *Id.* at § 219.10(b)(1)(i).
[57] *Id.* at § 219.8(b)(2) & (6).
[58] *Id.* at § 219.10(a)(3), (4) & (10).
[59] FSH 1909.12 § 23.23a(1)(a).
[60] *Id.* § 23.23a(1)(b).
[61] *Id.* § 23.23a(1)(d)(2).
[62] *Id.* § 23.23a(1)(d)(1).

Service can create ROS sub-classes to reflect specific situations on a forest or reflect seasonal variations.[63] Integrated planning should form the basis for sustainable recreation. "At the forest scale, sustainable recreation is derived through the integrated planning process and emerges as the resultant set of desired recreation opportunity spectrum classes."[64]

The desired ROS layer should be the result of a rigorous interdisciplinary process that would, for example, identify where in the landscape recreation is a "stressor" (like climate change) to other resource values (like water quality, aquatic species, meadows, etc.). The identification and allocation of desired recreation settings should not be done after other resource allocations are made. This has happened in the past and resulted in the subordination of recreation settings to other resource allocations.[65] Further, it is crucial that the Revised Plan clarify that area designations under the Travel Management Rule (TMR) and ROS allocations are two separate, albeit related, decisions. Forest planning is a broad-brush process in which general suitability for various activities is determined. The ROS classification system and management area classifications are both useful tools but they do not reach the level of specificity required by travel planning. Backcountry motorized, semi-primitive motorized, and roaded natural ROS settings provide a good starting point for where to designate OSV routes and areas but the Forest Service should not assume that all OSV use should be allowed across the entirety of these areas, or across all management areas where OSV use is allowed. Winter semi-primitive motorized areas, and winter roaded natural areas both provide quality backcountry ski experiences. Many people enjoy Nordic skiing and touring on snow-covered forest roads and having an opportunity to do so without having to contend with motorized activity is a valuable experience that the Lolo NF must recognize and accommodate. Therefore, it is important that the Forest go beyond simply relying on ROS classifications to determine where OSV use will be allowed. As we noted above, it is unclear how the agency is identifying areas suitable for motorized recreation, and should consider developing suitability determinations for various recreational uses, access, infrastructure and facilities.[66] "The identification of suitability or nonsuitability of lands is based on the desired condition for those lands and the inherent capability of the land to support the use."[67] In regards to winter motorized ROS, declining snowpack, shortening of the grizzly bear denning season and the listing of wolverine as a threatened species due, in part, to the climate crisis all indicate that the ROS allocations must be carefully evaluated to ensure they meet the 2012 Planning Rule requirements, and provide an appropriate starting point for reviewing motorized designations, as we discuss next.

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[63] *Id.*
[64] FSH 1909.12, ch. 20, § 23.23(a)(1)(d).
[65] In previous rounds of forest planning, ROS settings were generally by-products of resource allocations. For example, zones where vegetative management or commercial logging were allowed were by default assigned to motorized ROS settings.
[66] FSH 1909.12, § 23.23a(2)(d).
[67] FSH 1909.19, § 22.15.

B. Existing Motorized Designations - Summer & Winter

The Forest Service codified the minimization criteria in subpart B of the 2005 National Travel Management Rule.[68] The 2005 National Travel Management Rule (TMR) requires national forests to designate roads, trails, and areas open to motorized vehicles, and display those designations on a motor vehicle use map (MVUM).[69] It also prohibits motor vehicle use off designated system routes and areas. The Forest Service explains the following:

> The 1986 plan was developed under 1982 planning regulations, which included a requirement to identify where off-road vehicle use would be planned, implemented, and permitted. The travel management regulations at 36 CFR 212.52(a) and 212.81(b) allow for publication of motor vehicle use maps with public notice if a unit has made previous administrative decisions under other authorities restricting motor vehicle use.[70]

In 2013, Winter Wildlands Alliance successfully challenged the 2005 Travel Management Rule's exemption for designating over-snow vehicle (OSV) areas and trails in federal court. As a result, the Forest Service revised its travel rules and in 2015 finalized subpart C. Under this rule, each national forest unit with adequate snowfall must designate and display on a map a system of areas and routes where OSV use is permitted based on protection of resources and other recreational uses. OSV use outside the designated system is prohibited. Ultimately, this means that rather than allowing OSV use largely by default wherever that use is not specifically prohibited, the rule creates a paradigm shift to a "closed unless designated open" management regime. Implemented correctly, the rule presents an important opportunity to enhance quality recreation opportunities for both motorized and non-motorized users, protect wildlife during the vulnerable winter season, prevent avoidable damage to air and water quality, and restore the balance to the winter backcountry on the Lolo National Forest.

The TMR allows the responsible official for each forest to incorporate previous administrative decisions regarding travel management made under other authorities,[71] (grandfathering clause) and the LNF opted to use this provision to comply with the regulations:

> The travel management regulations at 36 CFR 212.52(a) and 212.81(b) allow for publication of motor vehicle use maps with public notice if a unit has made previous administrative decisions under other authorities restricting motor vehicle use. Based on previous decision-making, the Lolo National Forest has been publishing motor vehicle and over-snow motor vehicle use maps since 2014.[72]

We certainly recognize and appreciate the management direction provided under the 1986 Plan

[68] 36 C.F.R. § 212.55.
[69] *Id.* §§ 212.51, 212.56.
[70] RA at 308.
[71] 36 C.F.R. § 212.50(b).
[72] RA at 308.

that helped limit the damage and impacts from cross-country summer motorized travel. Since the publication of the LNF's first summer motor vehicle use map there have been site-specific projects that have altered those maps, including designating new motorized trails and opening roads for public use. We urge the Forest Service to disclose those site-specific decisions and summarize the changes made since the first MVUM was issued under the 2005 Travel Management Rule (TMR). Further, the Forest Service explained that a majority of the LNF has protections from over-snow vehicle (OSV) use where only 21% is in a winter motorized setting.[73] To be clear, this percent still totals more than 472,500 acres where the agency has designated OSV per the TMR's grandfathering clause and perhaps other site-specific project decisions. However, overall the LNF has yet to conduct a forest wide or district level review of its summer or winter motorized designations to verify they meet the TMR's requirements. As noted, there have been site-specific motorized designations for both summer and winter use under certain projects, which is why we're requesting a list of those projects and the designations approved under past decisions. ***Those decisions and the motorized designations carried forward per the current forest plan must undergo review*** to ensure their consistency with NEPA, especially where conditions have changed. This NEPA sufficiency review must demonstrate compliance with the minimization criteria under the TMR. As such, we strongly urge the agency to include an objective to complete a NEPA/TMR sufficiency review for each motorized designation older than 10 years.

C. Plan components must provide for sustainable recreation.

1. Ecological Sustainability

The Forest Service must include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including plan components to maintain or restore structure, function, composition, and connectivity.[74] Based on the Revised Assessment, the existing recreation settings are not ecologically sustainable.[75] In particular, technological advancements have changed the way people can and do use off-highway vehicles on the Forest, both in the summer and winter.[76]

2. Social and Economic Sustainability

[73] *Id.*
[74] 36 C.F.R. § 219.8(a).
[75] *See, e.g.*, RA at 284 ("Recreation opportunities identified as potentially most vulnerable to climate change include water and snow-based activities and those activities where wildlife is an important part of the experience, such as hunting and bird watching.").
[76] *See* RA at 283 ("The use and availability of off-highway vehicles, coupled with the power and advanced technology of over-snow vehicles has provided visitors with greater ability to go places within the plan area than had previously been available to them. The Forest Service has been challenged with the development of travel plans that provide direction for these motorized activities, while balancing the needs of nonmotorized users within the plan area.").

The plan must include plan components, including standards or guidelines, to guide the plan area's contribution to social and economic sustainability.[77] Existing management appears to detract from, rather than contribute to social and economic sustainability.

The 2012 planning rule defines social sustainability as "the capability of society to support the network of relationships, traditions, culture, and activities that connect people to the land and to one another and support vibrant communities."[78] Existing motorized use designations do not appear to support social sustainability. For example, non-motorized activities such as hiking and walking are very popular across the state.[79] Further, while motorized recreational use has increased since 2000, future interest is in decline and among the lowest projected growth in participant numbers with an increase between 29 - 56 percent for summer use and 25 - 61 percent for winter use.[80] While still an increase, visiting primitive areas is projected to increase between 33 - 65 percent, which is still among the lowest growth increase, but still higher than motorized recreation. Importantly, "undeveloped skiing (55 to 106 percent increase)" represents one of the biggest increases in trends of recreational uses.[81] This is an important factor when considering allocating areas for winter non-motorized use, which is why the existing condition for winter motorized use is over-represented across the forest, and why the initial desired ROS allocations for winter non-motorized was reasonable, even while not sufficient to meet the definition of sustainable recreation. Finally, the top ten recreational uses of the LNF do not include motorized recreation: "The top ten reasons people recreate in the plan area are hiking/walking, viewing wildlife, viewing natural features, relaxing, driving for pleasure, fishing, hunting, nature study, downhill skiing, and biking (U.S. Department of Agriculture 2023c)."[82]

The 2012 planning rule defines economic sustainability as "the capability of society to produce and consume or otherwise benefit from goods and services including contributions to jobs and market and nonmarket benefits."[83] The Forest Service "should develop plan components that are within the authority of the Forest Service, inherent capability of the land and the fiscal capability of the unit (36 CFR 219.1(g))."[84] Plan components "must be within the fiscal capability of the planning unit and its partners, . . . and the inherent capability of the plan area."[85] Given this, budget limitations must be a key feature of any analysis supporting allocation of recreational opportunities, and providing for sustainable recreation.

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[77] 36 C.F.R. § 219.8(b).
[78] 36 C.F.R. § 219.19.
[79] RA at 288 ("...the top five activities include: day hiking (50%), nature photography (48%), wildlife watching (45%), and car and RV camping (37%)."
[80] RA at 287.
[81] *Id.*
[82] *Id.* at 282.
[83] 36 C.F.R. § 219.19.
[84] FSH 1909.19, § 23.23a.
[85] FSH 1909.19, § 23.23l(1)(c).

D. Recommended Plan components to achieve sustainable recreation

Desired Conditions

The plan must include plan components, including standards or guidelines, to provide for sustainable recreation. To meet this requirement, the plan must include desired conditions for sustainable recreation using mapped desired ROS classes. While the initial desired ROS allocations for primitive and semi-primitive non-motorized was a step in the right direction, (and one that should not be weakened by correcting so-called "errors"), we urge the agency to consider an alternative that allocates a ROS primitive classification to all Inventoried Roadless Areas recommended for Wilderness in the Citizen Plan. We also urge the agency to extend this classification to all unroaded areas less than 5,000 acres. Should the Forest Service consider this direction as unreasonable, we stand ready to discuss how we can best adapt the Citizen Plan to a reasonable alternative for analysis in the Draft EIS. In any event, the Forest Service must demonstrate in its analysis how the ROS allocations support achieving sustainable recreation across the planning area. As it stands, those listed in the PA still allow motorized use in areas unsuitable for such activities, particularly in habitat for at-risk and sensitive fish and wildlife species.[86]

Absent allocating too many acres for motorized recreation disproportionate to the levels of use occurring across the forest and the projected levels of increase, the desired conditions for both general recreation and for the ROS allocations are well-meaning and we offer the following to help the agency achieve sustainable recreation. For the section listing FW-REC-DC, we urge the agency to add the following:

- The design, management and maintenance of the designated motorized system of roads, trails and areas is climate resilient and able to withstand variable storm events and wide fluctuations in precipitation, including snowfall.
- The design, management and maintenance of the designated motorized system of roads, trails and areas provides landscape and aquatic connectivity necessary for the recovery and viability of fish and wildlife species.
- Infrastructure and development related to sustainable recreation reflects long term funding expectations.

For the desired condition FW-ROS-DC-02, we request all Roadless Areas be placed in a primitive setting, and that the agency revise it to ensure that the settings reflect the ecological capabilities of the area in order to provide for sustainable recreation:

- Outdoor recreation opportunities and experiences are available year-round in a range of settings, as described by the desired distribution of forestwide recreation opportunity spectrum settings (Table 12). These settings reflect the integration of other resource

[86] PA at 60, FW-ROS-DC-02, Table 12.

values with the desired recreation opportunities, access, facilities, and infrastructure provided within those settings. ***These settings are commensurate with the ecological capabilities of the ROS allocated area.*** Locations of desired recreation opportunity spectrum settings are mapped in appendix 1."

Objectives

As we noted, due to the grandfather clause in the Travel Management Rule forests had the option to produce a Motor Vehicle Use Map based on existing authorizations if there were no changes or additions that expanded off-road vehicle use. The LNF has been issuing Motor Vehicle and Over-Snow Vehicle Use Maps based largely on the 1986 Forest Plan, and has been issuing the maps with changes as necessary to reflect new decisions. However, it is likely that some conditions have changed since those decisions were issued and certainly since the agency issued its first motor vehicle use maps. Therefore we strongly recommend the Revised Plan include the following objective:

- Within 5 years of plan approval, each district will complete a NEPA sufficiency review for all summer and winter motorized designations older than 10 years, open to public comment, to verify those designations comply with the Travel Management Rule and all other applicable laws and regulations.
- Within 3 years after a NEPA sufficiency review for all motorized designations, initiate travel management planning for all designations found not to be in compliance with the Travel Management Rule or other applicable laws and regulations.

Standards

We appreciate that the Forest Service included standards to ensure motorized use conforms to the applicable ROS allocations, and we support the direction to protect adjacent non-motorized settings when designating motorized use as reflected in FW-ROS-STD-02. We also support the direction in FW-ROS-STD-03 that "no routes or areas shall be designated for motorized transport." FW-ROS-STD-03. In addition to these standards, we recommend the following to ensure consistency with our proposed objectives and desired conditions:

- Add a general standard - Close roads, trails and areas to public motorized use where the NEPA sufficiency review finds specific motorized designations are not in compliance with the Travel Management Rule or other applicable laws and regulation.
- Add a general standard for OSV use - Designated OSV areas may only open to cross-country motorized use when snow depth measurements at established, representative locations reach at least 24 inches. For groomed OSV trails, snow-depth must reach at least 18 inches.

- Change guideline FW-ROS-GDL-06 to a standard: "To retain quiet recreation character, roads should not be plowed for recreation access in desired winter semi-primitive nonmotorized settings."[87]

Guidelines

The Forest Service proposes a number of guidelines that provide good direction for ensuring consistency with the ROS allocations, however, there is a need to clarify for managers and the public that identifying areas as available for motorized designations does not automatically equate to such use as being compatible with the TMR's minimization criteria. As such, we recommend the following:

- Off-road and over-snow vehicle use within areas that have a ROS motorized setting, must be demonstrated to comply with the Travel Management Rule and other applicable laws and regulations.

Suitability

We strongly recommend that the Forest Service consider fish and wildlife habitat requirements for threatened and endangered species, sensitive species and species of conservation concern. The agency must ensure that any motorized ROS allocations "contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern within the plan area."[88] As such the Forest Service must demonstrate how its findings that areas are suitable for motorized use meet the 2012 Planning Rule direction. At a minimum, the Forest Service should identify winter denning habitat for species such as grizzly bears and wolverine as unsuitable for winter motorized use.

V. Grizzly Bear Management and Connectivity

The PA for Grizzly Bears (Appendix 9) is woefully inadequate and legally deficient. The Standards and Guidelines apply only to the NCDE Primary Conservation Area (Recovery Zone) and Zone 1 and mostly just within the Recovery Zone.

The National Forest Planning Regulations require that species be "well-distributed across the planning area." The planning area is the Lolo National Forest. Thus, standards and guidelines may not be arbitrarily restricted to one part of the planning area. Moreover, grizzly bears within the "occupied" and "may be present" areas cover the entire Lolo National Forest (see Figure 1) further necessitating Forest-wide standards.

[87] PA at 63.
[88] 36 C.F.R. § 219.9(b)(1).

Figure 1. USFWS Grizzly bear species list area map[89]

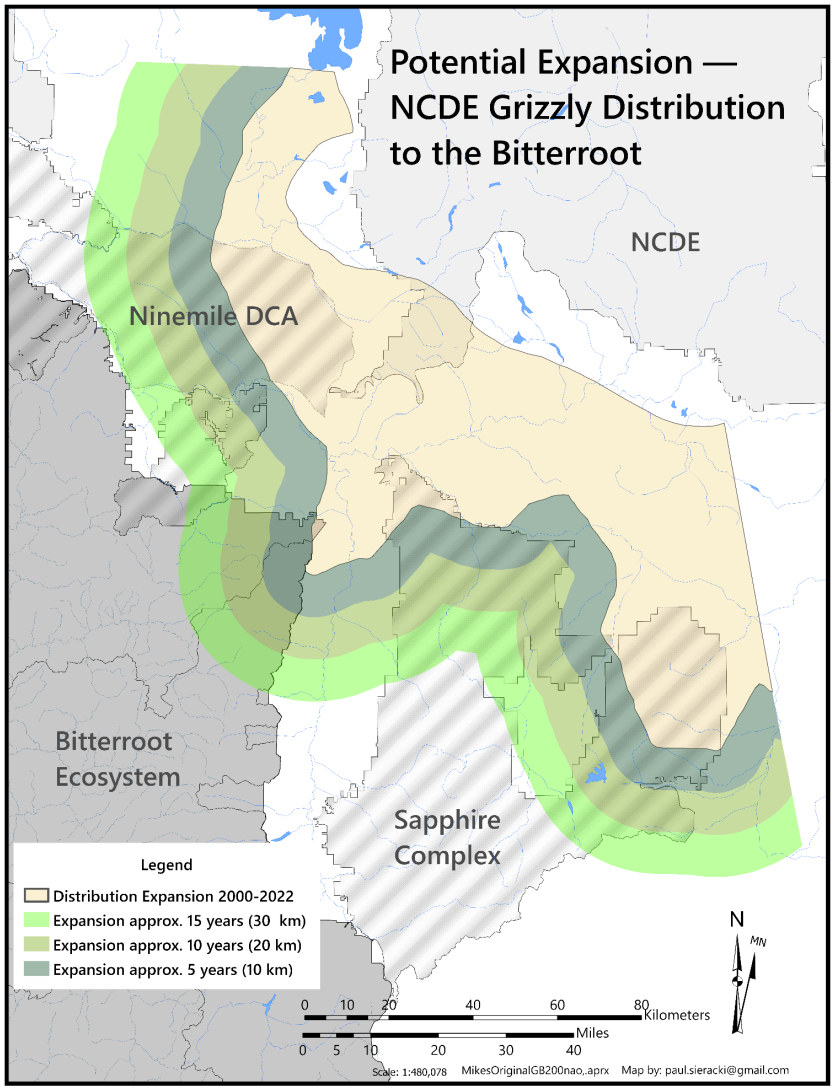
Species List Areas (or "may be present" map) help federal agencies determine where effects to listed species should be considered for consultation from actions they carry out, fund, or permit to meet requirements under Section7(a) of the Endangered Species Act (ESA). As grizzly bears expand their range, the SLA is intended to be spatially inclusive of all areas that meet the "may be present" methodology for grizzly bears. The "may be present" methodology is derived from current distributions and verified location data outside of current distributions; not all areas that are designated as "may be present" meet the criteria to be included in current distributions. Local evaluation is needed by federal Level 1 ESA Streamlining Teams to determine potential effects of agency actions where grizzly bears "may be present." Identifying locations where grizzly bears "may be present" will facilitate project planning activities that promote grizzly bear conservation and recovery. The grizzly bear SLA is updated with any new verified sightings every 90 days. Although we receive sighting infomation throughout the year, there can be a lag between receipt of the information, verification of grizzly bear, and updating the map. To provide the most up-to-date information for Section 7 consultation pending those updates, we will notify the relevant federal agency personnel when any new HUCs are added. We will continue to supply an updated verified map to all partners through PAC.Last updated July 26, 2022 with data from 2012 to July 26, 2022

Assumptions made in other documents from the Lolo National Forest, including the forest-wide biological opinion are bogus. For example, the agency assumes female grizzly bears will not reach the western part of the Forest for 15-20 years. In fact, the USFWS estimates grizzly bear breeding will occur within the Bitterroot Ecosystem in Idaho in as soon as 15 years (USFWS Scoping Notice 2024). One analysis shows female grizzly bears will reach the edge of the BE in 5-10 years (Bader and Sieracki 2024, see Ex. 5).

In fact, residential occupancy of the entire Lolo National Forest is projected to occur in less than the lifetime of the Revised Forest Plan. Therefore, the time to adopt and implement standards is now, otherwise the Revised Plan will be legally deficient. Figure 2 shows a conservative expansion model of how the "occupied" area of the NCDE population is expanding, and Figure 3 displays the likely dispersal routes of females with cubs. Within a few years the "occupied" area will encompass the entire Lolo National Forest.

[89] Grizzly bear species list area map, USFWS, Public Domain, https://www.fws.gov/media/grizzly-bear-species-list-area-map

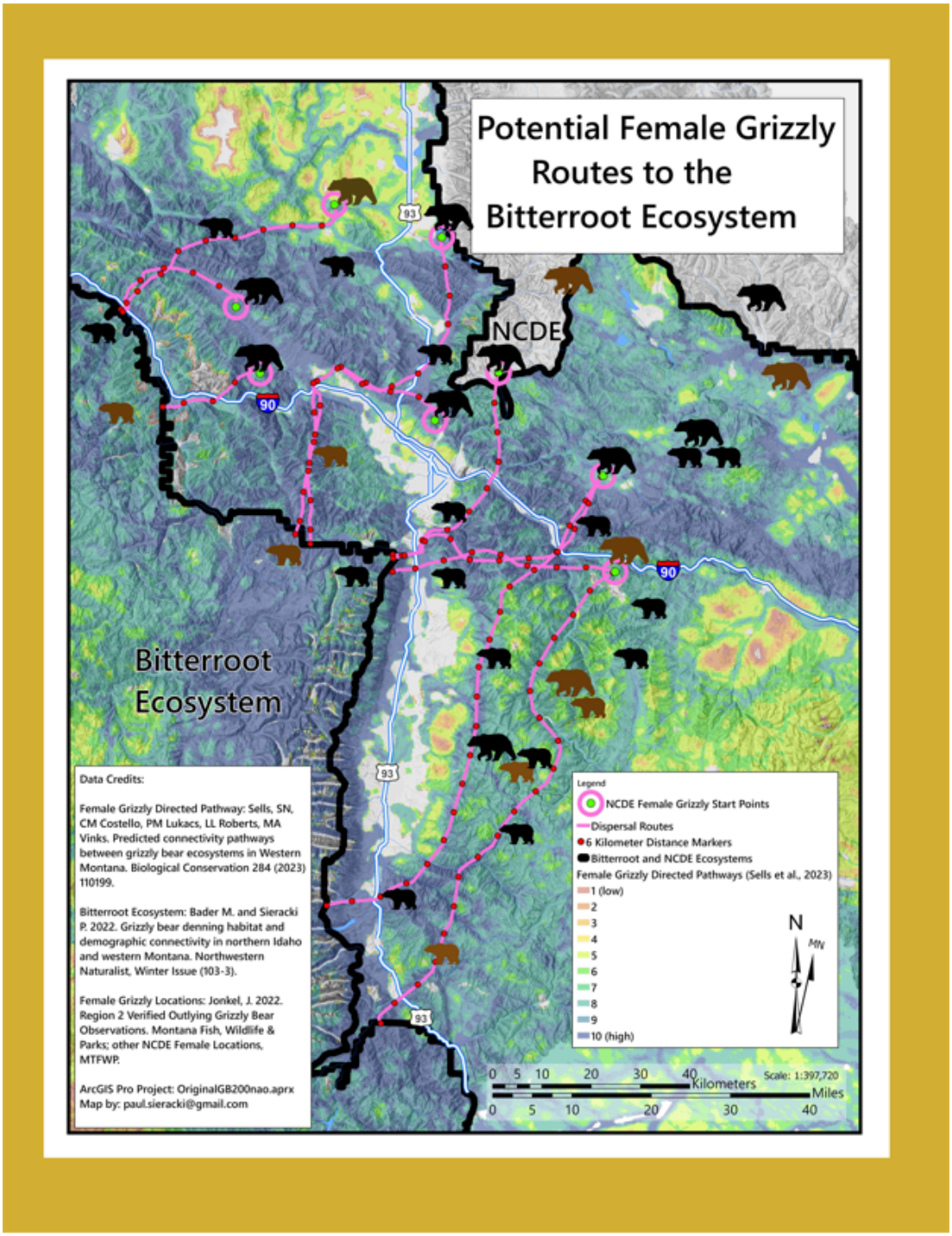
Figure 2. Potential grizzly bear expansion from the NCDE to the BE



In addition, the PA glossary contains grossly inaccurate definitions. For example, the non-denning season for grizzly bears is shown as April 1-November 30 which is outdated in the era of climate change and must be updated to incorporate the best available scientific information. PA at 203. According to Montana Fish, Wildlife & Parks, between 2015- 2022, 53% of collared bears in the Montana portion of the GYE were active in March and as early as January and February and grizzly bears have been documented active in all months of the year throughout Montana. In the NCDE, females with cubs were documented active on December 31st, 2023 and hundreds of grizzly bears were active throughout December 2023 throughout Montana. Grizzly bears were documented active in January, 2024 by the Custer-Gallatin National Forest. The most recent Species Status Assessment for Grizzly Bears (USFWS) finds that grizzly bears "remain at risk of becoming extinct throughout their range in the lower 48 states," and the PA fails to adequately contribute their recovery, namely by omitting any

motorized route density standards outside the Ninemile DCA, and failing to identify or protect or maintain areas of connectivity as we explain next.

Figure 3. Start Points of Verified Observations of Female Grizzly Bears With Cubs.[90]



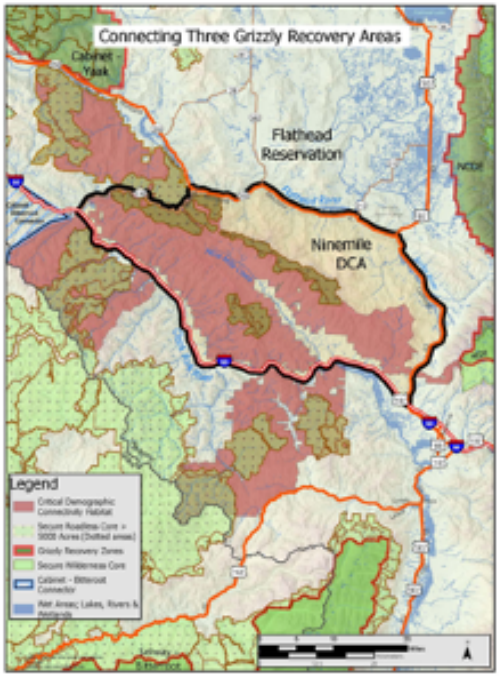
[90] Bader and Sieracki 2024. Ex. 5

A. Connectivity Areas

Ninemile Demographic Connectivity Area-Bitterroot Ecosystem

The Ninemile Demographic Connectivity Area must be expanded to connect all the way to the Bitterroot and Cabinet-Yaak Recovery Areas, as shown in Figure 4. The Ninemile Demographic Connectivity Area for female grizzly bears was established in the Lolo National Forest Plan Amendment and is part of the NCDE Grizzly Bear Conservation Strategy (2018). In recent years the Ninemile DCA has had verified observations of females with cubs in 2018, 2019, 2020 and 2023 which has been counted for the Occupancy requirements under the Conservation Strategy.

Figure 4. Expanding the Ninemile DCA to Connect All the Way to BE and CYE.



Sells, et al. (2023) found this area to have the highest potential for female grizzly bear connectivity and movement including in the area between the DCA and the BE. Bader and Sieracki (2022) identified significant amounts of moderate-high probability denning habitat. The area also has valley bottom riparian habitat and extensive berry fields.

The Ninemile DCA needs to be extended in three areas to connect all the way to the Bitterroot Ecosystem and Cabinet-Yaak Ecosystems which results in a total area of 2,204 km^2. The existing Demographic Connectivity Area is 44.5% federal, 31.0% Flathead Indian Reservation, 5.5% state and 19.0% private lands and 10.1% is within Inventoried Roadless Areas and there is contiguous roadless area on the Flathead Indian Reservation. The DCA additions are 59.7% federal, 16.7% state and 23.5% private lands and 18.4% is within Inventoried Roadless Areas.

Cabinet-Yaak-Bitterroot Connectivity Area

This connectivity area (3,447 km^2) was identified as a possible connectivity habitat by the U.S. Fish and Wildlife Service (1993) warranting further analysis. It is 93.3% federal, 0.2% state and 6.5% private lands and 33.2% is within Inventoried Roadless Areas. Bader and Sieracki (2022) found this connectivity area has suitable denning habitats and secure core habitats capable of supporting resident female grizzly bears. Sells et al. (2023) predicted this connectivity area has high connectivity potential for female and male grizzly bears. Grizzly bears have been documented using this connectivity area including Bear 927, the Kelly Creek bear that was killed, Ethyl and others who have moved south of Highway 200 and I-90. The U.S. Forest Service (2020) stated this area has grizzly bear habitat productivity equal in quality to that in the Grizzly Bear Recovery Areas.

Sapphire-Pintler Connectivity Area

A significant portion of this connectivity area is located within the Lolo National Forest and lands administered by the Lolo National Forest in the Sapphire and John Long Mountains. The Sapphire-Pintler Connectivity Area (7,113 km^2) has the highest potential for occupancy by resident breeding age female grizzly bears and has potential to support a small sub-population of grizzly bears due to nearly three-quarters of a million acres of roadless wildlands and proximity to the NCDE and BE (Bader and Sieracki 2022). It is 87.5% federal, 2.4% state and 10.1% private lands and 40.5% is within Inventoried Roadless Areas and Wilderness/WSA.

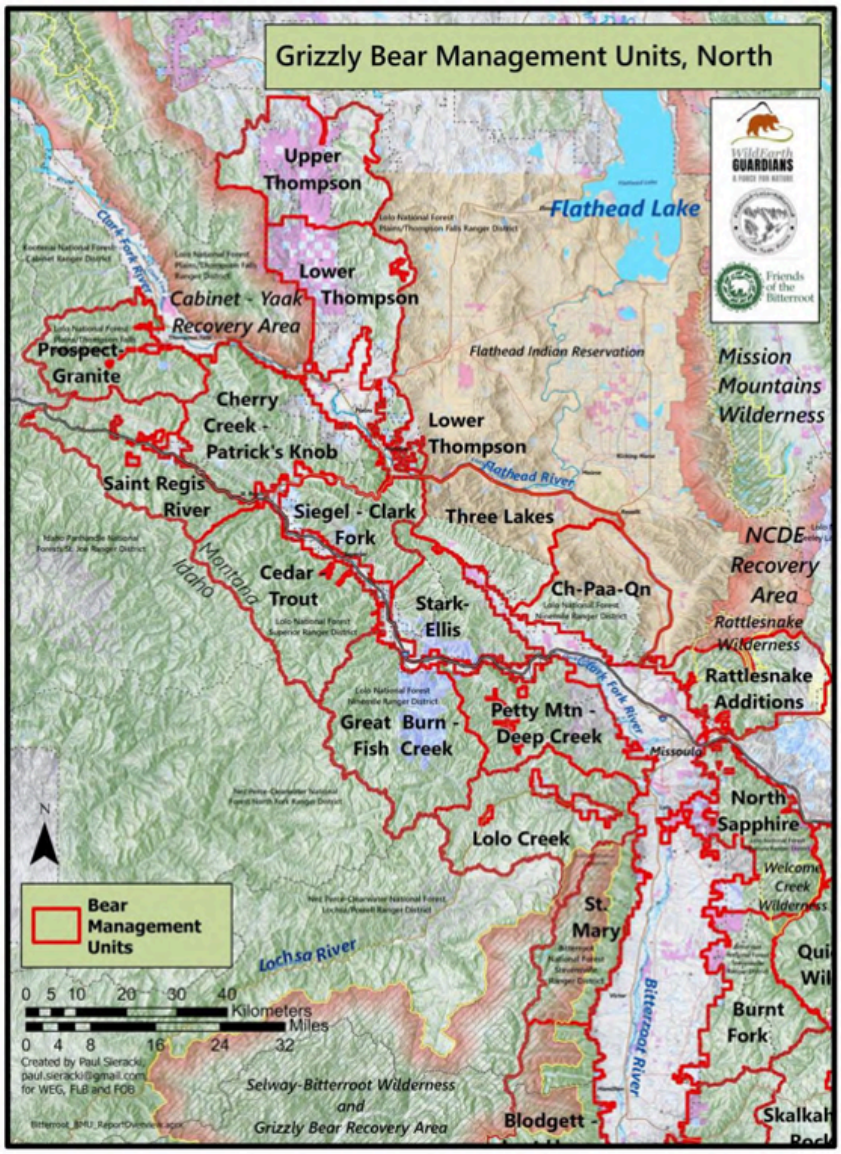
The western edge of the Sapphires is within the highest connectivity category (Sells et al. 2023) and directly adjacent to abundant denning habitat. The Sapphire Mountains were also found to have extensive ground cover by berry-producing species favored by grizzly bears (Hogg et al. 2001) and also has the highest amount of secure core habitat of any connectivity area between the NCDE, Bitterroot and Cabinet-Yaak Recovery Areas (Bader and Sieracki 2022).

There have been numerous verified observations in this area including a female and 3 cubs near Gillespie Creek in the John Long Mountains, a male denned in the northern Sapphires in 2023-24, a male and female pair of siblings, a male near Stevensville, an adult female in 2015, a male around Miller Peak and several others including two males in the East Fork of the Bitterroot. There have also been recent verified observations along both sides of Rock Creek in the northern Sapphires on the Lolo National Forest (Montana Fish, Wildlife & Parks 2024).

As per the recommendations of Proctor, et al. (2019) road densities must be reduced within and adjacent to key connectivity routes. For example, the current standard for Zone 1 of open road density of $2mi/mi^2$ cannot sustain grizzly bears or elk. The non-existent road density standards for much of the western and southern portions of the Lolo National Forest is an unacceptable condition.

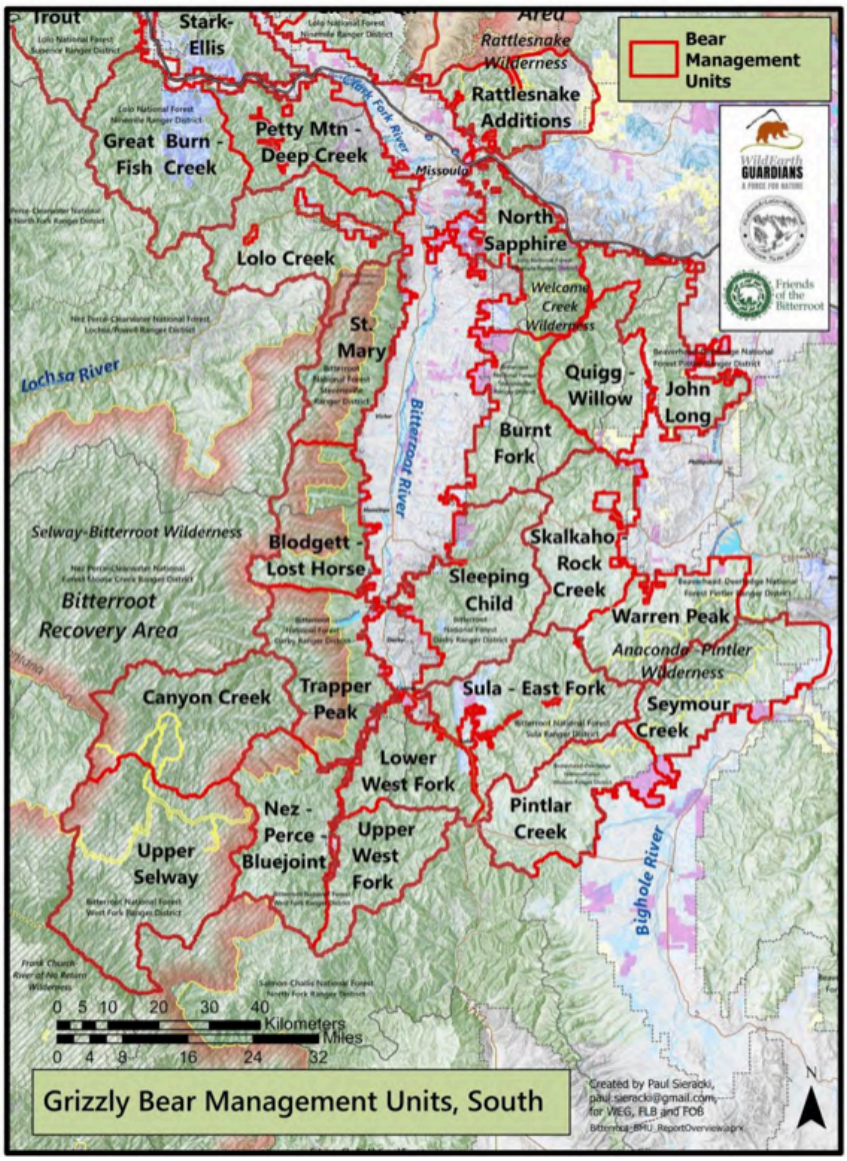
Appropriate Grizzly Bear Management Units must be identified and mapped for the entire Lolo National Forest, as shown below in Figures 5 and 6.[91] This information must be, at a minimum, considered, and ideally adopted in the Revised Plan EIS in order to meet the agency's clearly legal obligations to comply with the Endangered Species Act and the National Forest Management Act.

Figure 5. Proposed Grizzly Bear Management Units (North)



[91] *See* Bader & Sieracki. 2022, Ex. 6.

Figure 6. Proposed Grizzly Bear Management Units (South)



VI. Protection and Restoration of Watersheds and Fisheries - Bull Trout

Bull trout were listed as a threatened species under the Endangered Species Act (ESA) in 1999.[92] Throughout its range, bull trout are threatened by habitat degradation, fragmentation, and alterations associated with dewatering, road construction and maintenance, mining, grazing, blockage of migratory corridors, poor water quality, incidental angler harvest, entrainment, and non-native species. "Despite recent progress in restoring bull trout habitat degradation, several threats to populations remain." RA at 175. The Forest Service explains that some contributing factors are outside its control or cannot be address at the forest planning level, but explains the

[92] 64 Fed. Reg. 58910 (1999).

following:

> However, continuing to reduce the effects of forest system road networks (i.e., undersized culverts and road encroachment into streams and riparian areas) are threats () forest plans can provide components to address. Additional restoration of past mining damage in streams and overall enhancement of bull trout habitat on National Forest System land are also appropriate issues for forest planning.

Id. Given the LNF has over 9,000 miles of roads across the planning area, (RA at 312), we would expect to see more information regarding where both system and non-system roads were affecting bull trout recovery, including road densities within 300 feet slope distance on either side of bull trout occupied streams and within bull trout critical habitat. In our comments on the Draft Assessment, we expressed concern with the omission of site specific, baseline conditions, poor BMP monitoring, and the reliance PIBO MP as a metric for watershed health. This was not addressed in the RA. The lack of such information stems from the agency's abandonment of its INFISH management direction that we strongly oppose.

A. INFISH background and legal framework

In 1995, the Forest Service amended the Land and Resource Management Plans for 22 separate National Forests, including the LNF, to incorporate the Inland Native Fish Strategy ("INFISH").[93] Forests within the inland range of bull trout adopted INFISH as an amendment, and it provided National Forest management direction for native inland fish and fish habitat in accordance with the National Forest Management Act ("NFMA").

INFISH constitutes a broad-reaching aquatic habitat conservation strategy for native trout, outside the range of anadromous fish in the Pacific Northwest, Northern and Intermountain Regions of the United States. INFISH was originally intended to serve as an "interim" management strategy for eighteen months until the agencies completed a more long-term, comprehensive management strategy. However, INFISH has still not been replaced with a more effective conservation strategy twenty-one years later.

INFISH contains standards that guide forest management (i.e. timber harvest and silvicultural treatments), motorized recreation, grazing, mining, fire and fuels management, land exchange and acquisition, and other special uses to provide for sensitive inland fish species like bull trout. Key components of INFISH are Riparian Goals, Riparian Management Objectives (RMOs), and Standards and Guidelines. Standards and Guidelines include Riparian Habitat Conservation Areas (RHCAs), which are the portions of watersheds where agencies place primary emphasis on riparian-dependent resources and where management activities are subject to specific,

[93] U.S. Forest Service for Intermountain, Northern, and Pacific Northwestern Regions, Decision Notice & Finding of No Significant Impact for the Inland Native Fish Strategy (1995) (hereafter INFISH DN)

measurable standards and guidelines.

INFISH does not differentiate between "standards" and "guidelines," and they apply to all RHCAs and to projects and activities outside of RHCAs that are identified in the NEPA process as potentially degrading RHCAs. The management standards and guidelines maintain Riparian Goals in RHCAs in an effort to protect water quality, stream channel integrity, sediment regime and other aquatic characteristics.

The Forest Service adopted INFISH's interim management strategy on the 22 National Forests in a single Decision Notice. Then, in 1998, the U.S. Fish and Wildlife Service ("FWS") completed its INFISH and PACFISH ESA Section 7 consultation with the Forest Service and Bureau of Land Management ("BLM"). This consultation resulted in a Biological Opinion that analyzed the impacts to bull trout that resulted from implementing both INFISH and PACFISH.[94] According to the 1998 Bull Trout Biological Opinion ("BO"), overextending INFISH slows recovery of bull trout and poses serious risks to the survival of the species:

> [i]ndefinite extension of PACFISH and INFISH aquatic conservation strategies delays the recovery of bull trout and increases the risk that key population segments will be irretrievably lost. The PACFISH and INFISH aquatic conservation strategies maintain a fragmented network of habitats in degraded condition, where they presently exist, because they lack a comprehensive management strategy which protects and restores bull trout watersheds. The interim direction does not provide adequate assurance that future actions will not result in adverse effects to listed bull trout DPSs.[95]

In the Biological Opinion, FWS relied on the assumption that **"[t]he species will persist, but most likely not recover under [INFISH's] direction**."[96] Nevertheless, the Bull Trout BO ultimately concluded that continued implementation of the land management plans was not likely to jeopardize the continued existence of bull trout.[97]

In addition to these deficiencies, at the time of the 1998 consultation no critical habitat had been designated for bull trout. Thus, the Bull Trout BO reasoned that because "[n]o critical habitat has been designated for the species . . . . none will be affected."[98] However, the ESA requires the

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[94] U.S. Forest Service & BLM, Biological Opinion for the Effects to Bull Trout from Continued Implementation of PACFISH and INFISH (1998) (hereafter, Bull Trout BO).
[95] Bull Trout BO at 50.
[96] Bull Trout BO at 59 (emphasis added).
[97] In fact, courts have determined that INFISH does not adequately ensure the long-term survival and recovery of bull trout. *See Friends of the Wild Swan, Inc. v. U.S. Forest Serv.*, 966 F. Supp. 1002, 1019 (D. Or. 1997) (determining that long-term application of INFISH is inadequate to fulfill the Forest Service's viability responsibilities to bull trout).
[98] Bull Trout BO at 91.

Forest Service to reinitiate consultation with FWS on the programmatic management plans when critical habitat was designated for bull trout in 2010.[99]

The 2010 rule designating critical habitat for bull trout acknowledged that the federal agencies "may need to reinitiate consultation on existing actions where they have continued discretionary involvement or control if the activity may affect designated critical habitat."[100] To be clear, although the Forest Service consulted with FWS and the National Marine Fisheries Service on the effects of INFISH and PACFISH *on the bull trout themselves* and determined that the programmatic amendments would not jeopardize the continued existence of bull trout, the agencies never reinitiated consultation to determine whether INFISH and PACFISH would destroy or adversely modify *bull trout critical habitat*.

Despite these issues with INFISH, it has continued to be the management benchmark for bull trout for the last twenty-one years. However, instead of addressing these issues by strengthening the insufficiently protective management provisions from INFISH, the Forest's Draft Plan instead further weakens INFISH's protections, exacerbating the threats to both the survival and recovery of bull trout and other native fish.

B. The draft plan ignores and weakens INFISH's management direction.

Despite INFISH's deficiencies, the Proposed Action provides even feebler protections for bull trout and other at-risk aquatic species, which is why we urge that the current management direction and conservation strategies for the protection of bull trout and its designated critical habitat be included in all action alternatives of this forest plan revision. This includes INFISH and the U.S. Forest Service Bull Trout Conservation Strategy. INFISH provided a two-pronged management approach that included both site-specific and broad-scale protections for bull trout. This draft plan uses a weaker, single prong approach that drops broad-scale protections and weakens site-specific standards for bull trout and designated critical habitat. Therefore, the proposed plan components result in a forest plan that is less protective of inland native fish and provides less aquatic and riparian restoration opportunities than the existing forest plans do under INFISH. The proposed components remove many of INFISH's important management elements, selecting certain components and ignoring or diluting others. Chief among these is omitting the INFISH standards and guidelines that were applicable to all Riparian Habitat Conservation Areas ("RHCAs"), which reflected a commitment to ecosystem management. Under the PA, the Forest Service provides a bifurcation of the Riparian Management Zone (RMZ) into inner and outer

[99] 50 C.F.R. § 402.16(d) (reinitiation of consultation required "where discretionary Federal involvement or control over the action has been retained or is authorized by law and … critical habitat [is] designated that may be affected by the [agency] action."); *Cottonwood Envtl. Law Ctr. v. U.S. Forest Serv.,* 789 F.3d 1075, 1087 (9th Cir. 2015) (ongoing implementation of forest plan serves as basis for reinitiation of consultation claim).
[100] 75 Fed. Reg. at 63,903.

areas. Here the PA would allow vegetation management within the inner zone to "to restore or enhance aquatic and riparian-associated resources." PA at 38, FW-RMZ-STD-02. Within the outer zone, such activities would be allowed as long as they were "designed to ensure the ecosystem functions of the inner and outer RMZ are protected (managed within reference conditions)." We appreciate the focus on protecting ecosystem function, however, the PA lacks the requisite specificity to ensure projects meet these standards, which is why the current INFISH standards need to be incorporated into the final Revised Plan.

Further, the Riparian Goals outlined in INFISH establish an "expectation of the characteristics of healthy, functioning watersheds, riparian areas, and associated fish habitats." INFISH DN at A-1. These Riparian Goals are comprehensive and focus on ensuring the integrity of aquatic and riparian habitats to support species that depend on these habitats. Instead of providing specific Riparian Goals, the proposed direction provides primarily discretionary guidelines applicable to all waterways, even those designated as bull trout critical habitat and occupied by threatened bull trout. For RMZs, the PA direction provides no goals and instead lists desired conditions that assume management activities within RMZs.

One reason the INFISH Strategy provides a better approach to contributing to the recovery of bull trout, and other at-risk aquatic species, is not only because of its focus on site-specific measures to protect the whole RMZ, but also because of its broader watershed focus, as we noted above. Here the INFISH Strategy explains, "[s]ince the quality of water and fish habitat in aquatic systems is inseparably related to the integrity of upland and riparian areas within the watersheds, The strategy identifies several goals for watershed, riparian, and stream channel conditions." INFISH DN at A-1. The INFISH Strategy encouraged National Forest managers to establish site-specific Riparian Management Objective (RMOs) through watershed analysis, and provided specific habitat features and objectives to direct management actions. *Id.* at A-3, 4. Under the PA, there appears to be no requirement to perform a watershed analysis to establish site-specific objectives. Rather, the Forest Service provides the following objective:

> Improve soil and watershed function and resiliency on at least 4,000 acres every five years, prioritizing this work within the CWN, Watershed Condition Framework (WCF) priority watersheds or municipal watersheds. Activities lead to measurable levels of improvement to the WCF metrics that are currently rated as 'at risk' or 'not properly functioning.'

PA at 34, FW-WTR-OBJ-02. The objective is weaker than the INFISH Strategy in that it does not list habitat features or RMOs to ensure site specific activities will result in actually improving soil and watershed function or resiliency. Further, the Forest Service must demonstrate improvement activities across 4,000 acres every five years will actually measurably improve watershed function. Further, even if the agency could demonstrate such improvement, the objective is fundamentally flawed because it does not direct that improvement activities will bring the watershed into a status of functioning properly. This means the improvement could be

measurable, but still minimal, and meet this objective. Further, the Forest Service cannot rely on the PA's objective that directs managers to "[c]omplete all essential restoration work, as identified by Watershed Restoration Action Plans, within at least one Watershed Condition Framework (WCF) priority watershed every three to five years." While the WCF provides a uniform approach for ranking watershed conditions, it is not without its flaws. (See Ex. 7 - Watershed Condition Framework Synopsis and Review). One flaw is that it allows managers to bring a watershed into a status of functioning properly upon completion of activities listed in a Watershed Restoration Action Plan, but it does not require monitoring of those activities to ensure they successfully and measurably improve the condition class. Rather, it just assumes success. We see this same flaw in the PA where the Forest Service provides a standard requiring the application of "[p]roject-specific best management practices…for controlling non-point pollution sources to meet soil and watershed desired conditions and to protect beneficial uses." PA at 34, FW-WTR-STD-01. Certainly, the use of BMPs is a necessary condition for any site-specific project, but the agency cannot arbitrarily assert they are, by themselves, the only standard necessary to sufficiently control nonpoint source pollution, let alone restore entire watersheds to a properly functioning condition. That is one major reason why the INFISH Strategy is a better approach than the proposed action.

Another reason to retain INFISH direction is that it better protects and restores watersheds than the Conservation Watershed Network (CWN) that is required under the 2012 Planning Rule. Our comments are meant to supplement the CWN, not replace it, given the regulation's requirements. INFISH required application of numeric RMOs in any and all watersheds occupied by inland native fish and where watershed analysis has not been completed, with the goal of achieving a high level of habitat diversity and complexity through a combination of habitat features, to meet the life-history requirements of the fish community inhabiting a watershed. In contrast, it is unclear if the Forest Service proposes to prioritize conservation and preservation of bull trout and pure westslope cutthroat trout in a similar manner or only a specific subset of watersheds under its current version of the CWN. Specifically, the agency explains the following:

> Designation of a conservation watershed network, which should include watersheds that are already in good condition or could be restored to good condition, are expected to protect native fish and help maintain healthy watersheds and river systems.
>
> ---
>
> Selection criteria for inclusion should help identify those watersheds that have the capability to be more resilient to ecological change and disturbance induced by climate change.
>
> ---
>
> Many watersheds on the Forest that support the healthiest populations of native trout already have their headwaters protected through NFS lands managed as inventoried roadless areas, Congressionally designated wilderness, or as wild and scenic rivers. These special places are the building blocks of a conservation network as naturally functioning headwaters have a large influence on the function of downstream stream reaches.

RA, Appendix A4-6. A close reading of these descriptions suggest that CWNs include already protected watersheds and those that are in good condition or could be brought into good condition, but not those that are impaired. In other words, the CWN approach appears to write off certain watersheds as lost cause. Another flaw with the CWN approach is that it completely discards the numeric RMOs from INFISH.

C. The Revised Plan must include species-specific plan components to meet its requirements under the 2012 Planning Rule.

The 2012 Planning Rule requires plans "include plan components, including standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area . . . ." 36 C.F.R. § 219.8(a)(1). It also states that "If the responsible official determines that the plan components required in paragraph (a) are insufficient to provide such ecological conditions, then additional, site-specific plan components, including standards or guidelines, must be included in the plan to provide such ecological conditions in the plan area." *Id.* § 219.9(b)(1).To be clear, the PA lacks sufficient standards or guidelines to significantly contribute to the recovery of bull trout, or to "maintain a viable population of each species of conservation concern within the plan area." *Id.*

In addition to addressing the deficiencies we described above, and including measurable INFISH management direction, we also provide specific standards listed in the Citizen Plan. See Ex. 2. This includes those necessary to protect the Primary Constituent Elements of bull trout habitat:

- Fine sediments < 6.4 mm in diameter must be limited to less than 20% in spawning habitat (Espinosa 1996) and standards must be developed to maintain groundwater.
- All streams should average ≥ 90% bank stability and that cobble embeddedness in summer rearing habitat should be < 30% and < 25% in winter rearing habitats (Espinosa 1996). Additional indices include channel morphology including large woody debris, pool frequency volume and residual pool volumes.
- Stream temperatures in current and historic spawning, rearing and migratory corridor habitats should not exceed 6-8 C for spawning, with the optimum for incubation from 2-4 C (McPhail & Murray 1979); 10-12 C for rearing habitat, with 7-8 C being optimal (Goetz 1989); migratory stream corridors should be 12 C or less.
- Establish a total and open road density standard that protects and restores native fish habitat by reducing sediment, restoring hydrologic upwelling, eliminating barriers and removing failed culverts.

Climate change is expected to have serious impacts on bull trout (Bell et al. 2021). In the face of climate change, retaining thermal cover in headwaters areas is important to native fish (Kirk et al. 2022) and standards need to be set for thermal cover in Priority Watersheds that extend to the entire watershed (Frissell 1999).

VII. Canada Lynx

In regards to threatened species, as we noted, the Forest Service must provide plan components that will contribute to the recovery of these species, including Canada lynx. 36 CFR 212.9(b). The need for additional and specific standards or guidelines stems from the fact that the agency's focus on maintaining or restoring the ecological integrity of lynx habitat is not sufficient to provide the necessary ecological conditions for their recovery. Practices designed to protect habitat have yet to show success, and as such additional plan components must be included that better protect and restore lynx habitat. For instance, the Summary of BMER 2021 states, "Lynx habitat is not limited on the Forest and management continues to follow practices to aid in the recovery of the lynx, however, lynx do not appear to be expanding their range on the Forest indicating more information is needed (p 3)."[101] Yet the PA supports no more than business as usual with lynx, which is insufficient to contribute to lynx recovery.

A. The Forest Service must address Revised Assessment deficiencies in the Revised Plan EIS

The revised assessment made no changes to its draft regarding lynx nor did it provide road density or connectivity information within lynx and snowshoe habitat. It would be difficult to assess the current conditions of lynx and lynx recovery on the Lolo National Forest (LNF) without this vital information. Saura et al 2014 found "the loss of intermediate and sufficiently large stepping-stone habitat patches can cause a sharp decline in the distance that can be traversed by species (critical spatial thresholds) that cannot be effectively compensated by other factors previously regarded as crucial for long-distance dispersal (p 1)." A thorough analysis of baseline conditions concerning road densities and connectivity of snowshoe hare and lynx habitat must be completed in the EIS. Then, the effects of the proposed plan on road densities and connectivity for lynx must be analyzed and disclosed.

At the very least, the revised assessment could have clarified/corrected this sentence, "the revised plan will include plan components to support provide ecological these species as appropriate (emphasis added, RA chap 1, p 6)." What does this mean? What does "as appropriate" imply? Is it ever inappropriate to support biodiversity and protect listed species?

B. The Forest Service must fully analyze the direct, indirect, and cumulative impacts of forest management on Canada lynx

In addition to addressing the Revised Assessment deficiencies, the Forest Service must take a hard look at how each alternative contributes to Canada lynx recovery. The RA states that lynx

[101] *See* Lolo National Forest 2021 Biennial Monitoring and Evaluation Report, Summary. Feb 2022 https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd1000791.pdf

only occupy the Seeley Lake District and "there is no evidence that lynx are currently expanding from the Seeley Ranger District to permanently occupy other areas of the Forest (chap 2, p160)." However, the agency acknowledges that "recent large fires may be shifting areas of occupancy across the Southwest Crown of the Continent landscape (ibid p 160)" and that collared lynx have been documented in the Missoula Ranger District (ibid p 160). This information supports the need for connected lynx habitat throughout the forest.

The climate is warming, and the agency's overly aggressive vegetation management meant to reduce wildfire risk is likely exacerbating the loss of lynx habitat and their shifting range. Lynx will need refuge and the ability to move through islands of habitat to persist. According to Ruggiero, 1999:

> Dispersal to distant islands from other islands with small populations is unlikely, and even successful dispersal frequently will not result in successful colonization. Population size, distance, and barriers to dispersal between islands are therefore critically important to the stability of the metapopulation, **it is therefore critically important to maintain or increase the carrying capacity of all areas capable of supporting lynx.** (emphasis added, p 452).

The EIS must map, consider, and disclose lynx and snowshoe hare habitat on the LNF and propose actions that would preserve these areas of habitat. In doing so, it must specifically define optimal habitat for lynx.

The EIS must analyze and disclose the historic range of lynx habitat components as compared with current conditions.

Newmark et al., 2023 states, "Many protected areas worldwide increasingly resemble habitat isolates embedded in human-modified landscapes. However, establishing linkages among protected areas could significantly reduce species loss rates (p 1)." The LNF is within Newmark's map of multi-species linkages, Wilderness, and ungulate migratory routes between Yellowstone and Glacier National Parks (see Figure 7).

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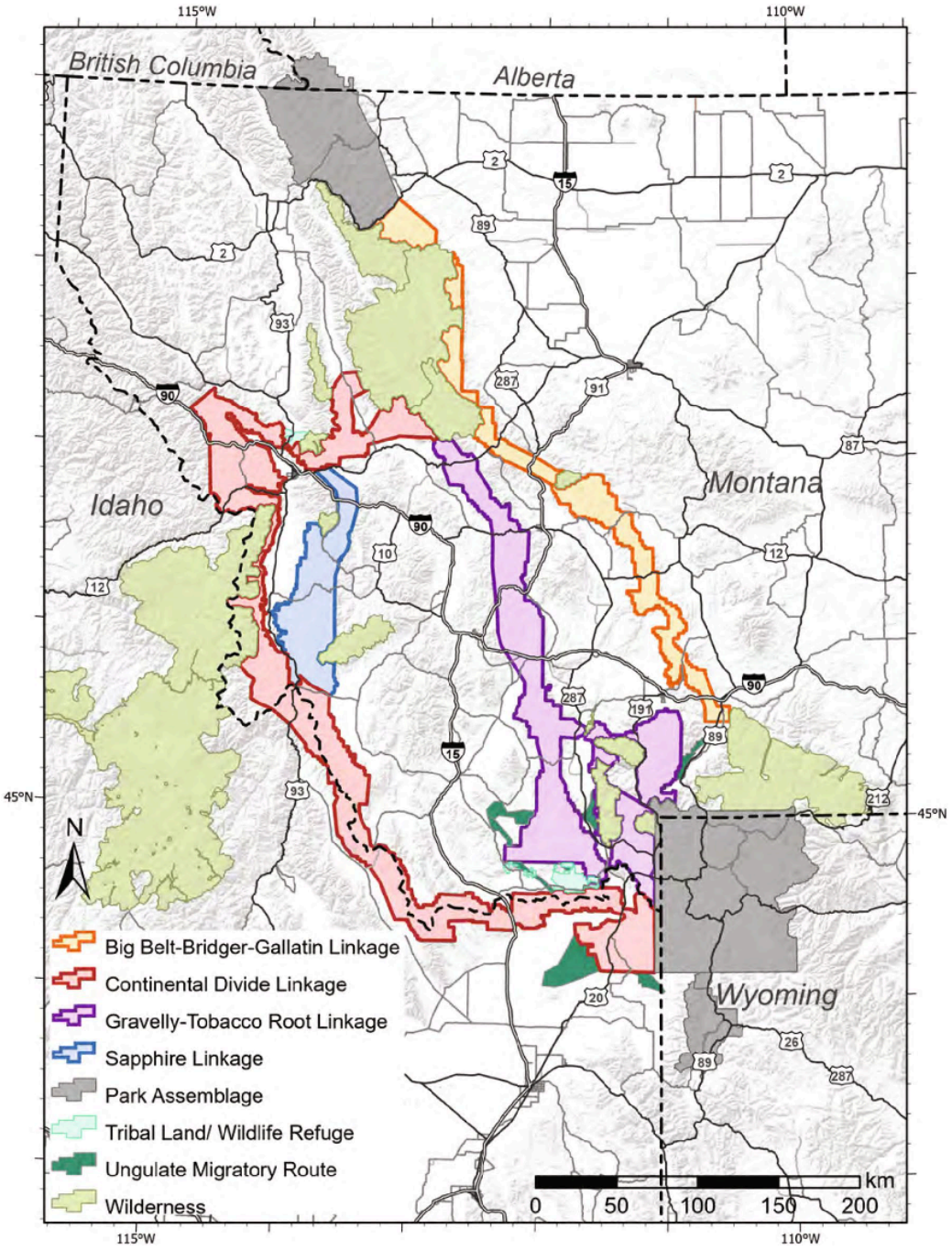
Figure 7. Location of identified multi-species linkages, and wilderness areas and ungulate migratory routes that intersect linkages between Yellowstone and Glacier park assemblages in the northern Rocky Mountains.



The Revised Plan EIS must analyze the role of the LNF within a larger connectivity framework for all species including lynx and create restrictions to protect linkage areas. According to Newmark, 2023:

> Additionally, non-physical anthropogenic barriers that alter or prevent mammal dispersal and movement through identified linkages on public lands would need to be carefully managed. Seasonal closures, user quotas and regulations, and restrictions on mechanized and non-mechanized recreation are approaches that public land-managing agencies are currently implementing to protect wildlife and critical habitat in portions of the identified linkages (p 7).

This would parallel CEQ guidance for connectivity mentioned in our comments when we stated that DA's connectivity analysis is inadequate because it does not consider forest roads and their role in fragmenting habitat and impairing current connectivity. Only 3 areas were suggested for crossing structures on state and federal roads. Many more are necessary.

The RA did an analysis of connectivity for groups of species which helps with overall connectivity and is a start at analyzing the overall connectivity. However, it is inadequate for analysis of specific animals like lynx. It does not consider the specific habitat needs of lynx and how those components are connected or must be connected on the LNF.

Each alternative must include specific and measurable parameters that demonstrate maintaining connectivity for lynx and a definition of what maintaining connectivity means.

There is much work to be done in the EIS to ensure the recovery of lynx in the Lolo National Forest Plan Revision. Efforts must go well beyond the Northern Rocky Mountain Lynx Management Direction (NRLMD) and must include specific, measurable standards to ensure the persistence of this threatened species.

The EIS must fully consider and disclose the strategies for both lynx and wolverine proposed in Wisdom et al 2000 (page 247-248) which include:

- Provide large areas with low road density and minimal human disturbance
- Manage human activities and road access to minimize human disturbance
- Manage lynx and wolverine in a metapopulation context with adequate links among existing populations
- Monitor
- Provide areas of high quality lynx habitat protected from human disturbance
- Develop travel corridors and landscape connectivity to allow populations to interact
- Limit increase in competing predators in occupied areas
- Identify high quality habitat with low road densities and manage them as the "backbone of a metapopulation strategy.

The EIS must analyze the effects of roads both open and closed and illegal use on lynx and lynx recovery. Wisdom et al 2000 stated in their abstract:

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

The EIS must analyze how forest roads facilitate legal and illegal trapping by forest roads. Wisdom et al 2000 states:

> Trapping can be a significant source of mortality for lynx (Bailey and others 1986, Carbyn and Patriquin 1983, Mech 1980, Nellis and others 1972, Parker and others 1983, Ward and Krebs 1985). Trappers are capable of removing from 60 to 80 percent of the individuals in a given lynx population (Bailey and others 1986, Parker and others 1983). Incidental takes of lynx during bobcat and coyote trapping seasons may be cause for concern, especially with low-density lynx populations. p. 246

The EIS must analyze and disclose direct, indirect, and cumulative impacts of recreational activities including winter and summer motorized use on lynx and their recovery. This must include a look at how winter recreation affects competition. Ruggiero et al., 1999 found, "Coyotes appear to be especially effective competitors with lynx in human-dominated landscapes…. Based on research in the North, humans facilitate coyote access into areas occupied by lynx by compacting snow with snowmobiles, snowshoes, or skis (p 450)." They also found that " interactions with coyotes appear to influence lynx more than availability of snowshoe hares (ibid p 91-92)." Guillaumet et al., 2015 also found, "coyotes may limit the numerical tracking of hare by lynx through exploitation or interference competition (p 142)."

The EIS must analyze and disclose the effects of land management activities including increasing timber production and increasing land available for timber production on lynx and lynx recovery. The RA claims the population in the Seeley District is "stable." Stable in not recovery.

The Forest Service states, "Lynx are at additional risk due to large-scale habitat loss associated with changing disturbance regimes and increased fire activity." RA at 160. This does not consider the effects of land management as a disturbance mechanism. On page 162, the RA admits, "The primary stressors to the persistence of Canada lynx in the Northern Rockies are climate change, vegetation management, wildfire and habitat fragmentation (Interagency Lynx Biology Team 2013)."

The Forest Service assumes the NRLMD will mitigate effects of land management activities on lynx. But no evidence is provided in the RA that demonstrates the efficacy of the NRLMD. The population in Seeley has not increased and lynx are not populating other areas since the adoption

of the direction. With an increase in proposed timber production and areas suitable for timber production, will the NRLMD conserve lynx?

Even the USFWS Species Status Assessment (SSA) expressed doubts as to whether the NRLMD is effective. “Although uncertainty remains about the efficacy of this improved regulatory framework (p 231).” It also expresses concerns about the lack of monitoring of population trends. The 2023 Addendum to the SSA also points out uncertainty and assumes that the directives are benefiting lynx, but no evidence is provided. Again, it mentions the lack of effective population monitoring. The RA offers no detailed monitoring of population trends. In fact, the recent changes to biennial forest monitoring focus on distribution rather than population trends.

The NRLMD also assumes that clearcutting/regeneration logging have equivalent temporal effects to a stand replacing fire. But Vanbianchi et al., 2017, who found, “Lynx used burned areas as early as 1 year postfire, which is much earlier than the 2–4 decades postfire previously thought for this predator (p 1).” And Holbrook 2018 found:

> Our analyses indicated that Canada lynx used treatments, but there was a consistent cost in that lynx use was low up to ~10 years after all silvicultural actions. However, cumulative use (in both winter and summer) by lynx reached 50% at ~20 years after a thinning treatment, whereas it took ~34–40 years after a selection or regeneration cut. This indicated that Canada lynx used thinnings at a faster rate post-treatment than selection or regeneration cuts, and that lynx used selection and regeneration cuts in a similar fashion over time (p 114).

Note that Holbrook considers “thinning” as the removal of small diameter trees (10 inches dbh). These reports do not support the idea that land management activities have the same effects as wildfire as far as lynx are concerned. These studies show that land management activities have grave effects and displace lynx for decades.

The Forest Service cannot rely on NRLMD direction to support the recovery of lynx, but that is what it does. There is no recovery plan for lynx and the NRLMD has no specific definition of lynx habitat other than 30% openings in an LAU. But Kosterman et al 2014 found, that 50% of lynx habitat must be mature undisturbed forest for it to be optimal lynx habitat where lynx can have reproductive success and no more than 15% of lynx habitat should be young clearcuts, i.e. trees under 4 in. dbh. Young regenerating forest should occur only on 10-15% of a female lynx home range.

The Forest Service must include a specific and measurable definition of optimal lynx habitat and strategies for maintaining that habitat, and use that definition to compare alternatives in the Revised Plan EIS.

C. The Forest Service must include plan components that effectively contribute to Canada lynx recovery

According to the proposed action, the desired condition for Lynx is, "Forests representing a diversity of seral stages occur at spatial scales and arrangements that support lynx occupancy and dispersal. Essential lynx habitat elements are common and well distributed at spatial scales relevant to supporting the physiological, behavioral, and life history needs of lynx (chap 2, p 45)."

What is the definition of diversity of seral stages, spatial scales, and arrangements that would support lynx occupancy? What percentages are optimum? What are the essential lynx habitat elements, what is the definition of common, what does "well distributed" mean? The Forest Service must define these conditions with specific, measurable criteria. Without specifics, there are no means to adequately assess and monitor effects of the proposed plan and future actions allowed by the plan on lynx recovery.

The plan must include specific and measurable standards to provide for the recovery of lynx and other listed species. The words "as appropriate" should not be used. It is always appropriate to protect listed and sensitive species. It is always appropriate to support biodiversity by protecting species. In fact, the RA states, "The revised plan must provide for the persistence of all native species in the plan area (chap 1, p 7)." The Forest Service must replace vague and general terms with specific, measurable standards. In fact, we asked for road density standards and connecting isolated core habitat for grizzlies:

> Within connectivity areas, Open Motorized Route Density should be limited to 1mi/mi2 which will require targeted road closures and decommissioning. Within the roaded matrix lands, road decommissioning should be focused on increasing secure core area size, to connect isolated secure core areas and to better represent different habitat types and seasonal food sources within secure core.

Ex. 3 at 22. This would also benefit lynx. Yet, no considerations of road densities and connectivity for lynx were considered in the revised assessment or included in the PA. At a minimum, the Forest Service must identify and provide plan components that provide for lynx connectivity, to which the information from Sells et al 2023, and Newmark 2023 may prove useful to inform this effort. In any alternative, the Revised Plan must include standards to provide for and promote connectivity. Further, it must include a detailed monitoring program to measure population trends and the efficacy of conservation efforts.

VIII. Whitebark Pine

A. The Forest Service must fully analyze the direct, indirect, and cumulative impacts of forest management on whitebark pine

In our Draft Assessment comments regarding whitebark pine, we noted numerous areas where the agency must provide additional information and analysis. Here we expand on these comments, which the Forest Service must address in its Revised Plan EIS in order to comply with NEPA and to support the Revised Plan components.

The first step in restoring whitebark pine (Keane et al., 2017) is to: "Assess conditions. Conduct assessments that document the status and trend of whitebark pine forests within regions." Yet, both the Draft and Revised Assessment (RA) of the LNF Land Management Plan give only a general overview of whitebark pine without any discussion of the specific conditions on LNF, oversimplifying the complexity, variability, and heterogeneity of whitebark pine ecosystems. Larson and Kipfmueller (2012) state:

> Generalizations about the decline of this species do little to improve our overall understanding of whitebark pine communities and are difficult to translate into management actions… A more nuanced perspective is critically important for directing management and restoration activities in whitebark pine communities, lest generalizations blur recognition of the mechanisms driving declines of this singular species and lead to more harm than good.

The RA makes a number of assumptions about whitebark pine conditions that may not apply to Lolo National Forest because specific conditions are unknown. There is a wide body of literature on whitebark pine, summarized by the USFWS (87 FR 76882), Keane et al (2017), Larson and Kipfmueller (2012), and USFWS (2023). Further, although the RA Map A1-29 shows occurrences of whitebark pine on LNF, no detailed information is available. How was this inventory conducted—by field surveys or by remote sensing or by modeling? How accurate is the inventory? Are the whitebark pines in pure stands or mixed with other species? What are age distributions in each area? What is the health of each stand? What are the main stressors in **Lolo National Forest**? Are the trees cone-bearing? Where do rust-resistant "plus" trees exist? What is the degree of connectivity between whitebark pine stands? Tomback et al (2022) distinguished two types of WBP communities: Seral stands common in the northern Rockies and climax or self-reproducing stands common in the Pacific Northwest that are not fire-dependent. Which are LNF's WBPs? Do both occur, depending on their specific location? An assessment and EIS that answers these questions is necessary before a land management plan that will preserve and restore whitebark pine can be developed, which is step #2 in Keane et al. (2017).

The Forest Service contradicts much of the recent science in its RA. For example:

- RA states: *Management actions to improve integrity can include the planting or seeding of blister rust-resistant stock to a small degree and thinning to reduce competition.* However, Six et al. (2021) concluded that "in cases where planting is required, care should be used in sourcing seed, as even locations close to one another may not be appropriate for collections"

- RA states*: There are greater restoration opportunities associated with prescribed fire and benefits from wildfire to create suitable sites for regeneration.* However, recent literature is conflicted and uncertain about the effects of fire. Keane et al (2020) reported high WBP mortality in many prescribed burns because WBPs thin bark make it especially susceptible to damage from even a low-intensity surface fire. USFWS (2023) stated "conditions under which the species is most likely to survive such fires remains largely unknown". Six et al. (2021) found "that thinning prescriptions aimed at increasing tree growth in whitebark pine should be applied with considerable caution. In our study, as well as in that of Kichas et al. (2020), faster overall growth was the strongest predictor of mortality due to mountain pine beetle (MPB), indicating that such treatments will not have their intended effect in P. albicaulis and may even be detrimental." Keane et al (2017) recommended avoiding "treatments designed only to reduce disturbance agents, such as fuel treatments. Embrace a holistic wildland fire policy that balances losses with gains in competition-free burned areas". Tomback et al (2022) described two types of WBP communities: Seral stands common in the northern Rockies and climax or self-reproducing stands common in the Pacific Northwest that are not fire-dependent, and seral stands common in the northern Rockies that may be dependent on fire. LNF includes both moist Pacific Northwest climates and drier northern Rockies climates.

- RA states: *The natural selection process for resistance traits is occurring too slowly given the influence of other stressors that cause the loss of viable seed trees.* Six et al. (2021) disagreed, saying "To protect the ability of this tree to adapt to current and future conditions, the maintenance of genetic diversity should be a top priority, and practices that can reduce diversity or that may introduce maladaptive genes or swamp local adaptation should be avoided. Reliance on natural regeneration is best because it involves locally adapted seed sources drawn from the full array of diversity present in the stand and seedlings that establish will have done so under a local climatic selection filter."

- RA states: *A century of fire suppression has allowed shade-tolerant species to outcompete whitebark pine and change the fuel profile. There is an increased fire frequency and shift to higher severities in forests where Engelmann spruce and subalpine fir have become prevalent.* However, Larson and Kipfmueller (2012) concluded "the implication of fire suppression as a widespread cause of declines of whitebark pine communities may be inaccurate for much of the range of the species and could result in misguided restoration efforts". Similarly, the whitebark listing on the Federal Register (2022) states "we do not know at what scale the impacts of fire exclusion and resultant forest succession have affected whitebark pine".

- RA states: *"Bark beetle outbreaks have become widespread due in part to warming temperatures which results in lower winter mortality of beetles and increases reproduction rates. The homogeneity of neighboring lodgepole pine forests in some places has led to outbreaks which can "spill" into whitebark pine forests."* In contrast,

Larson and Kipfmueller (2012) said: "Suggestions that the current mountain pine beetle outbreaks are unnatural must be firmly placed within the context of the extremely short historical record relative to the pace of forest dynamics in whitebark pine communities… beetle outbreaks may play roles equal in importance to fire in creating suitable sites for whitebark pine regeneration." USFWS (2023) suggests that removing other species, such as lodgepole pine, that are preferred by mountain pine beetle, may increase whitebark pine susceptibility to MPB during outbreaks, calling into question the benefits of silvicultural and prescribed burning. Furniss and Renkin (2003) found the assumption that mountain pine beetle outbreaks spread from lower lodgepole forests into higher whitebark forests may be false, and that the opposite might be true.

- RA, p. 124, states: "*Climate change is an overarching stressor that exacerbates the other stressors described and directly impacts whitebark pine whose competitive advantage relies on its ability to survive cold temperatures at treeline."* But the effects of climate change on whitebark pine are still largely unknown, as summarized by Larson and Kipfmueller (2012): "The net effects of climate change may be negative for whitebark pine as a species, yet even here uncertainty and heterogeneity exist. As winter temperatures warm, much of western North America will experience lower snow packs and overall drier conditions, particularly through earlier snowmelt and more intense late season droughts (Barnett et al. 2008). Drier conditions may limit the spread of blister rust spores and result in an overall reduction in the effects of this disease on whitebark pine communities (cf. Boland et al. 2004). Drier conditions are also expected to result in increased fire frequency and severity in subalpine forests (Fagre et al. 2003; Westerling et al. 2006). This may, in effect, counter any effects of fire suppression that do exist and result in a greater abundance of recently burned sites that are amenable to whitebark pine regeneration, depending on the severity of fires and their areal extent." Demonstrating just how little is known about climate change's effects on whitebark pine is a study by Flanary and Keane (2019) that found that whitebark in southwest Montana had expanded to *lower* elevations, with no evidence that it was moving upward as expected from climate change.

- RA, p. 125, states: *The expected trend of this ecosystem is a continued decline, except for areas where active restoration occurs (e.g., prescribed fire and planting of stock that is genetically resistant to white pine blister rust)….Genetic depression increases the need for active restoration activities to increase the population*. However, the benefits of the proposed active restoration activities are still speculative and could do more harm than good. Six et al. (2021) concluded that maintaining genetic diversity is most important, and "in cases where planting is required, care should be used in sourcing seed, as even locations close to one another may not be appropriate for collections". Larson and Kipfmueller (2012) state "the implication of fire suppression as a widespread cause of declines of whitebark pine communities may be inaccurate for much of the range of the species and could result in misguided restoration efforts". Keane et al (2020) reported

high WBP mortality in many prescribed burns because WBP's thin bark make it especially susceptible to damage from even a low-intensity surface fire. USFWS (2023) "conditions under which the species is most likely to survive such fires remains largely unknown". The Proposed LNF Management Plan places WBP pine in fire regime V, with fire return intervals of 200+ years; burning at mostly high severity but can include low and moderate severity (p. 190). This suggests that the Forest Service's focus on reducing severe wildfires in WBP habitat is not only ineffective, but will run counter to the agency's own predicted fire-return intervals.

Overall, the Forest Service must recognize and address that its current management approaches are not only uncertain and scientifically controversial, but that they may actually be increasing the loss of whitebark pine. Specifically, the objective of current silvicultural treatments is to use mechanical cutting, prescribed fire, and daylighting to remove competing, faster-growing conifers in successionally-advanced stands and promote natural regeneration by providing open areas for Clark's nutcracker seed caching. However, daylighting, mechanical thinning, and prescribed burning are largely unproven, and may do more harm than good (Campbell and Antos, 2003; Kichas et al, 2020; Keane et al 2020; Larson and Kipfmueller, 2012; Tomback, 2022; Six et al, 2021; Shoettle et al, 2022; USFWS, 2023). In addition, Lorenz et al (2011) found that Clark's nutcrackers choose locations with minimal snow cover by caching seeds at the lowest available elevations in their home ranges, by caching 85% of seeds cached above ground in trees, and by caching the other 15% in the ground but mostly under tree canopy. The RA fails to properly consider this recent science, which the Forest Service must address in its Revised Plan EIS.

B. The Forest Service must include plan components that effectively contribute to whitebark pine recovery

The Forest Service offers a few desired conditions, objectives and guidelines meant to contribute to the recovery of the species, but they are insufficient to meet this requirement and the agency failed to include any protective standards. The Forest Service proposes ***Objective 02: "****Treat 300 acres per year, measured as an annual average on a decadal basis, for the purpose of sustaining or restoring whitebark pine."* PA at 44. Yet, as we explained above, the vegetation management discussed in the RA are experimental, and the PA lacks sufficient monitoring and adaptive management provisions to test whether treatments are performing as expected and for unintended consequences (Tomback, 2022). How will these treatments be monitored?

Further, the PA includes the following WBP guidelines (p. 44):

- ***Guideline 04:*** *When conducting management activities in whitebark pine stands, project-level design criteria should be designed to support the recovery of whitebark pine.*

The Forest Service must analyze any management activities in WBP using on-the-ground field data and best available science. All WBP management proposals must provide for post-project monitoring and adaptive management.

- ***Guideline 05:*** *To support the recovery of whitebark pine, management in areas with mature trees with rust resistance or in healthy, unsuppressed regenerating stands should only be authorized for the purpose of improving the health and resilience of whitebark pine*.

The agency must direct that any analysis of management activities in WBP use on-the-ground field data and best available science. All WBP management proposals must ensure post-project monitoring and adaptive management.

- ***Guideline 06:*** *To protect at-risk plant species not adapted or resilient to fire, prescribed fire treatments should either avoid occupied habitat or include other design features that reduce potential loss.*

The Forest Service must acknowledge that WBP itself may not be adapted or resilient to prescribed fire (Keane et al, 2020; USFWS, 2023).

Should the Forest Service continue to rely on these plan components, it must demonstrate in the Revised Plan EIS that they will actually contribute to whitebark pine recovery, and also to what extent that contribution will actually support its recovery. Further, the proposed guidelines continue to rely on vague language that lack definitions that can be operationally applied at the project-level. For example, what is the definition of "improving health." To be clear, the Lolo NF is not sick, it is not a patient in a hospital and the medicalized terminology is not applicable to forest lands. Rather, the 2012 Planning Rule appropriately uses terms based in science, such as ecosystem integrity and diversity. The Revised Plan must include clearly defined and operational components that allow for measurable habitat protections and improvements where necessary. To the extent that the agency relies on "design features" to meet its objectives, those need to be clearly defined with evidence that shows they are not only effective, but that the Forest Service has the ability to ensure proper implementation.

In sum, the Forest Service must recognize that the science of whitebark pine ecology and management is complex, geographically variable, and rapidly evolving. The Revised Assessment, EIS and LNF Management Plan must include a detailed assessment and inventory of whitebark pine on LNF. The LNF Management Plan must ensure that management activities in WBP be analyzed using site-specific field surveys and all available science. LNF Management Plan must ensure that all management activities in WBP are monitored and that monitoring results are used in adaptive management. Because knowledge of whitebark pine ecosystems is changing so rapidly, the LNF Management Plan should place LNF's whitebark pine ecosystems in a Management Area (MA) of their own.

IX. Wolverine

A. The revised forest plan must provide for the ecological conditions necessary to "contribute to the recovery" of wolverine

On November 30, 2023 the U.S. Fish and Wildlife Service officially added the species as threatened "for the distinct population segment (DPS) of the North American wolverine (Gulo gulo luscus) occurring in the contiguous United States. This rule adds the contiguous U.S. DPS of the North American wolverine to the Federal List of Endangered and Threatened Wildlife." 88 FR 83726. However, when the Revised Assessment was finalized just one month earlier, wolverines were still considered "proposed" in the agency's analysis. RA at 159, 167. As such, it is unclear if the agency's assessment properly evaluated forest conditions through the lens of wolverine recovery as opposed to conserving a candidate species, a distinction made in the 2012 Planning Rule. 36 C.F.R. § 219.9(b)(1). This disconnect may have contributed to the Proposed Action's lack of specific standards or guidelines that will contribute to the recovery of wolverine. The Forest Service's 2012 planning rule tasks the LNF with the duty to determine whether or not the ecological components included in the revised plan – including whether the proposed standards, objectives, desired conditions, and guidelines – provide the ecological conditions or site-specific components necessary to "contribute to the recovery" of listed species like wolverine. 36 C.F.R. § 219.9 (b). Recovery means providing the ecological components necessary to improve the status of a listed species to the point at which listing under the Endangered Species Act ("ESA") is no longer appropriate. *Id*. Further, "[i]f the responsible official determines that the plan components required in paragraph (a) are insufficient to provide such ecological conditions, then additional, species-specific plan components, including standards or guidelines, must be included in the plan to provide such ecological conditions in the plan area." *Id.*

This duty to contribute to the recovery of wolverine, therefore, must be the focus of the Revised Plan and must drive and inform all management decisions concerning the species. Providing for the persistence and survival of wolverine is insufficient; the Revised Plan must go further and provide ecological conditions necessary to "contribute to the recovery" of the species.

As it stands, the Proposed Action lacks the necessary direction to meet this requirement as it contains just one plan component: "Suitable wolverine material habitat is widely dispersed throughout the forest and includes locations with limited disturbance from winter recreation." PA at 45, FW-WRISK-DC-07. The proposed desired condition is insufficient to ensure the revised plan will contribute to wolverine recovery. At a minimum, it must include both primary and maternal habitat, and separately there must be a desired condition that will ensure wolverines have habitat security in areas of connectivity and to protect food sources. Further, the Revised Plan must have corresponding standards or guidelines, and we strongly recommend including a standard that will protect maternal and primary habitat from winter motorized use. In fact, the Revised Plan should include a determination that these areas are not suitable for OSV designations. It should also include a standard that protects maternal habitat from concentrated

non-motorized winter recreation, such as groomed ski trails. This is especially important given that "[f]or wolverine, the availability of persistent spring snow is an important component of denning ecology, and projections of spring snowpack suggest large-scale reductions over the next 50-100 years." RA at 160.

B. The LNF needs to collect the necessary data on wolverine population (actual and trend), presence, denning, and movement across the forest.

The Forest Service disclosed that "[w]hile anecdotal observations of wolverine on the Lolo National Forest are relatively common, population-level information across the plan area is unavailable. Relying on anecdotal information or other sources such as trapping reports is not sufficient to inform or monitor for wolverine population trends. In order to effectively conserve and manage for wolverine on the LNF, the Forest Service must first acquire and map information on the local population (actual and trend), where wolverine reside and are denning (both maternal and natal), and where they are traveling/moving within the forest. Certainly the Forest Service can use available methods and models to clearly define and map wolverine habitats and range within the forest such as those discussed in Copeland (2010) and Inman (2013), but such the Forest Service must show how these models inform current populations and trends over the life of the Revised Plan while also adjusting the results to account for projected habitat changes due to the climate crisis. In addition, the Revised Plan must include specific monitoring direction that can allow for population trend analysis to demonstrate it is actually contributing to wolverine recovery.

C. The Forest Service must fully analyze the direct, indirect, and cumulative impacts of forest management on wolverine.

The Forest Service must analyze the direct, indirect or cumulative impacts on wolverine denning, primary and dispersal habitat from human disturbance, specifically winter recreational activities. As noted above, the PA lacks the necessary plan components to adequately protect maternal denning and primary habitat from human disturbances, which is a reflection of the cursory evaluation provided in the Revised Assessment that failed to account for the findings in the USFWS's Wolverine Species Status Assessment Addendum, 2023 (2023 SSA).

The best available science reveals that motorized winter recreation poses a threat to wolverine persistence and recovery, especially within the context of the climate crisis. Yet, the Forest Service fails to acknowledge the threat:

> Climate change, the inadequacy of existing regulatory mechanisms to climate change, harvesting, trapping and small population size were identified as the primary and secondary threats to the continuous wolverine distinct population segment per the U.S. Fish and Wildlife Service five factor analyses1 (U.S. Department of the Interior 2013a) (Table 25).

> The U.S. Fish and Wildlife Service also analyzed four categories of human disturbance as part of their rulemaking process. This included: (1) Dispersed recreational activities with primary impacts to wolverines through direct disturbance (e.g., snowmobiling and heli-skiing); (2) disturbance associated with permanent infrastructure such as residential and commercial developments, mines, and campgrounds; (3) disturbance and mortality associated with transportation corridors; and (4) disturbance associated with land management activities such as forestry, or fire/fuels reduction activities. These were not found to be a threat to the wolverine distinct population segment (Table 25).

RA at 168-69. However, upon listing wolverine as a threatened species, the USFWS explained the following:

> In the 2023 wolverine SSA report addendum, we provide an updated assessment of the effects of winter recreation based on new studies. Research indicates winter recreation is negatively associated with North American wolverine habitat use, and that winter recreation is likely to increase and become more concentrated in the future as snow-covered areas decline due to climate change (Heinemeyer et al. 2019, p. 1). A large multi-State analysis of winter recreation impacts in the Northern Rocky Mountains was published in 2019, indicating greater concern for impacts to wolverines than we found in 2018 and showing a negative functional response to the level of recreation exposure within their home ranges (Heinemeyer et al. 2019a, pp. 13–14, 17–18). Additionally, new research found an incremental loss of wolverines in portions of central Idaho where winter recreation impacts are increasing (Mack and Hagan 2022, p. 13). Furthermore, forest roads used by snowmobilers in the Canadian Rockies were found to have a strong negative correlation with wolverine distribution (Kortello et al. 2019, p. 10). Wolverine detection probability in protected and nonprotected habitat of southwestern Canada was found to be strongly and negatively correlated with nonmotorized recreation in summer and winter (Barrueto et al. 2022, p. 5).

88 FR 83729. The Forest Service must provide an analysis that accounts for shrinking wolverine habitat or concentration of uses or adjust the habitat models to include the scarcity of snowpack over the life of the Revised Plan. In particular, the agency explains in performing its wolverine assessment that it that "Mapping of predicted wolverine habitat in the Northern Region of the Forest Service is based on the work of Inman et al. (2013), which used radio-telemetry data collected in the Yellowstone Region of the United States and Resource Selection Function modelling." RA at 168. Certainly, the model provides important information about the likely wolverine habitats at the time of the study, but it does not account for current or projected declines in snowpack due to the climate crisis, and as such, the Forest Service must adjust the model results or provide an alternative method to account for such declines. The Forest Service

need not go far to find an alternative method as the FWS provided snowpack and snow cover projections in its 2023 SSA, explaining:

> Snow projections were performed over five modeling domains in the U.S. Rocky Mountain and Cascades ranges by researchers at the University of Colorado, University of Maryland, and NASA Goddard Space Flight Center (collectively) at the request of the USFWS. These modeling domains were selected to overlap with occupied and potential wolverine habitat in the contiguous U.S. across latitudinal, longitudinal, and elevation gradients.

2023 SSA at 49. The Forest Service must integrate these model results with its analysis on available wolverine habitat in order to better understand how each alternative in the Revised Plan EIS will affect wolverine recovery, the importance of which the FWS explains:

> Wolverine habitat in the contiguous U.S. is projected to decrease in areas that were modeled and become more fragmented because of climate changes that result in increasing temperatures, earlier spring snowmelt, and loss of deep, persistent spring snowpack, primarily at lower elevations (see Climate Change Effects section above). Winter recreation, which has been shown to negatively influence wolverine behavior, in these diminished habitats may increase as human populations increase (U.S. Forest Service 2016, pp. 12–13, 12–14). In addition, snow-dependent recreation that was formerly distributed over a wider elevation gradient will be constrained to that part of the gradient that contains quality snow into the future.

2023 SSA at 64. Given this, it is crucial for the Forest Service to fully analyze the loss of winter wolverine habitat from current or projected OSV use, or the potential impacts to wolverine food availability or cover. This is particularly important in the transition zones where a model utilized in Aubry et al. 2023 found that "wolverines are restricted primarily to the transitional zone between treeline, below which environmental conditions become too warm, and upper elevations of permanent ice and snow where there is insufficient food and cover to support wolverines (Aubry et al. 2023, pp. 13–14)." 2023 SSA at 18. Further, "[t]here is growing evidence that wolverines rely on subnivean space (the environment between snow and terrain) for thermoregulation, to escape predation risk, and/or to cache food (van der Veen et al. 2020, pp. 8–10; Fisher et al. 2022, p. 10)." 88 FR 83748. The Forest Service must account for the loss or shifting of transition zones or subnivean spaces in its analysis, and account for OSV use within these areas.

In fact, essential sources of wolverine prey reside within the subnivean space. Small mammals that remain active during the winter depend on the insulated space between the snowpack and the ground – the subnivean zone – for winter survival. When snow compaction from snowmobiles occurs, subnivean temperatures decrease, which can lead to increased metabolic rates in these small mammal species, such as voles, shrews, and mice. For example, if the subnivean air space is cooled by as little as 3 degrees Celsius, the metabolic demands of small mammals living in the

space would increase by about 25 calories per hour. Neumann and Merriam, 1972. Through controlled experiments, researchers have demonstrated that compaction due to snowmobile use reduced rodent and shrew use of subnivean habitats to near zero – a decline attributed to direct mortality, not outmigration. Jarvinen and Schmid, 1971. Elsewhere, scientists have documented a decline in small mammals following snowmobile activity that compressed the subnivean zone. Sanecki et al., 2006. Because small mammals make up the majority of prey for many species, from raptors to mesocarnivores, habitat changes that affect subnivean populations could cascade through the food chain. Brander, R.B. 1974. The Forest Service must address this important issue in its analysis.

Additionally, the best available science reveals that motorized winter recreation poses a threat to wolverine persistence and recovery, in addition to the threats posed by climate change. As wolverines lose habitat to the effects of climate change, wolverine and motorized winter recreationists will be forced to share smaller and smaller habitat patches. Heinemeyer, et al. 2019. Decreasing areas with sufficient snow will amplify the effect of motorized winter recreation on wolverine due to the fact that motorized winter recreation will be concentrated in smaller areas on the LNF. The Forest Service cannot rely on currently protected areas alone to provide for all of the wolverine's life history requirements.

Further, the Forest Service must account for any take of wolverine as defined in the ESA. Factors affecting the wolverine's continued existence include projected decrease and fragmentation of wolverine habitat and range due to climate change, lack of secure habitat allowing for connectivity, trapping, lack of regulatory mechanisms to address the threats to wolverine habitat from climate change, and loss of genetic diversity due to small population size. A recent study expands on these threats explaining:

> Modeling suggests snow in wolverine range in the USA and southern British Columbia will diminish markedly in the coming century (McKelvey et al., 2011a). Projection models based on climate-change scenarios suggest a marked reduction of persistent spring snow in the lower half of inferred denning elevation bands (Barsugli et al., 2020) and across all elevations in currently occupied states (Peacock, 2011) for the USA population.
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> Wolverine ranges in the USA are restricted to mountain environments and are fragmented by developed private lands in valley bottoms. As snowpack decreases through the 21st century wolverine populations are expected to become more fragmented and isolated, especially in the USA (McKelvey et al., 2011a).
>
> ---
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> In the mountain regions of the USA wolverines' close association to snow interacts with backcountry winter recreation. Using simultaneous GPS monitoring of mountain wolverines and winter recreationists, Heinemeyer et al. (2019) showed wolverines avoided otherwise high-quality habitats in areas with higher recreation levels. The

> strength of avoidance increased with increased recreation, was greater for dispersed off-trail activities, and was greater for motorized than non-motorized recreation (Heinemeyer et al., 2019). As human pressures for recreational space mount, increasing effects on wolverines are expected in protected areas as last bastions of habitat, adding to the list of stressors for future wolverine.

Fisher et al., 2022. This study bolsters past findings that demonstrate wolverines are sensitive to disturbance from motorized winter recreation activities, and may alter their behavior in response to motorized winter recreation activities. Wolverine may avoid areas where motorized winter recreation activities occur. Disturbance from foot and snowmobile traffic have been purported to cause maternal female wolverines to abandon natal dens and relocate kits to maternal dens.[102]

Snowmobile use commonly overlaps with wolverine denning habitat. Dispersed recreational activities like motorized winter recreation have the potential to negatively impact wolverine by disrupting natal denning areas. Krebs *et al.*, 2007; Lofroth and Krebs, 2007. Ruggiero *et al.*, 2007. Wolverines have one of the lowest successful reproductive rates known to mammals, and this is hypothesized as linked to winter energy constraints. Female wolverines select and enter dens and give birth in February to mid-March and the overlap of winter recreation with this energetically taxing period is highly concerning. Magoun *et al.,* 2017. Any disturbance during this important winter period can negatively affect productivity and other vital rates. May et al., 2007; Krebs et al., 2007.

As noted, researchers have reported that female wolverines may be sensitive to human disturbance in the vicinity of natal and maternal dens, and disturbance from foot and snowmobile traffic has been purported to cause maternal females to abandon or move dens. Magoun et al., 1998; Heinemeyer, et al., 2019. One study found that females tended to avoid areas with heli-skiing and backcountry skiing areas. Krebs et al., 2007. Another study found that motorized recreation occurred at higher intensity across a larger footprint than non-motorized recreation in most wolverine home ranges. Heinemeyer, et al., 2019. Female wolverines exhibited stronger avoidance of off-road motorized recreation and experienced higher indirect habitat loss than male wolverines. *Id.* High-cirque snowmobile use, especially cross-country use and "high marking," may present a substantial threat to wolverines and their habitat.

These behavioral changes can negatively affect individuals' physiological stress levels and reproductive capacity in several ways, as evidenced in numerous studies on different species. Creel et al., 2002. It may reduce the amount of time and thus ability of female wolverines to hunt or to utilize food caches. This would result in significant additive energetic effects, reducing foraging success for adult females already stressed by the demands of bearing and raising a litter. In addition, this could reduce kit survival rates by increasing the potential for predation and

[102] 78 Fed. Reg. 7878 (Feb. 4, 2013).

exposure to cold temperatures. These results indicate that winter recreation may impact wolverines in as yet unknown ways.

As snowmobiling and backcountry skiing continue to grow in popularity and as snowpack continues to decline due to climate change, there is increasing concern that wolverine denning habitat may become limiting. Recent warming has already led to substantial reductions in spring snow cover in the mountains of western North America. Mote et al., 2005; Pederson et al., 2010. Numerous recent and sophisticated studies support the conclusion that climate changes caused by global climate change are likely to negatively affect wolverine habitat. Magoun et al., 2017; Johnston et al., 2012; McKelvey et al., 2011; Copeland et al., 2010. Protection of denning habitat is critical for the persistence of the species.

A Special Note On Trapping

The Forest Service must properly account for the threat trapping poses to wolverine recovery. Attached herein we provide our comments prepared by the Western Environmental Law Center on the FWS's interim 4(d) rule for wolverine (Docket No. FWS-R6-ES-2023-0216) that expands on the threat trapping poses to wolverine recovery. See Ex. 8. Included with these comments is the entire administrative record to which we cite in the letter. See Ex. 9.[103] Notably, these comments explain there are a number of recent studies on the impacts of wolverine trapping on population viability in Canada (where targeted trapping is allowed and where incidental trapping occurs). These studies demonstrate that the current rate of wolverine trapping in southern Canada is unsustainable and that trapping disproportionately impacts younger wolverines that are most likely to constitute the dispersers that the FWS relies upon to ensure connectivity with the lower-48 population. *See* FWS-0048770–83 (Mowat (2019)); *see also* FWS-0033542–49 (Kukka (2017)). Although the ultimate cause of the lack of connectivity between wolverines in the contiguous United States and wolverines in Canada is not known with certainty, the FWS previously determined that it may be related to "harvest management in southern Canada." 75 Fed. Reg. at 78,053. These recent findings demonstrate that unsustainable exploitation of wolverines in Canada threatens wolverines in the lower-48 by impeding dispersal of Canadian wolverines across the international border. *Id*. The same is true in the lower 48 States where trapping can undermine wolverine movement and effective migration which is something needed for the long-term viability of the species. An additional concern related to snowmobile use is that motorized access leads to increased trapping pressure (direct or indirect capture) for some furbearers that prefer more mesic habitat conditions generally found at higher elevations or in riparian habitats, such as marten, fisher, lynx, and wolverine. Trapping season for these species is limited to the winter months, and most trappers prefer the relatively easy access to suitable habitat provided by snowmobiles. Wolverine populations in small, isolated mountain ranges can

[103] The Forest Service CARA webportal does not allow uploading zipped or compressed file formats, therefore we provided this exhibit separately to the Forest Service on a flash drive.

be very susceptible to trapping pressure. Squires et al., 2007. Trapping pressure for these species is dramatically reduced if there is less snowmobile access. The Draft EIS and Revised Plan must properly acknowledge, analyze or address the threats trapping pose.

Cumulative Effects

The final EIS must take a hard look at, and carefully consider, the overall cumulative effects to wolverine. Cumulative impacts are "the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions." 40 C.F.R. § 1508.7. Cumulative impacts can result from "individually minor but collectively significant actions taking place over a period of time." 40 C.F.R. § 1508.7.

The proper consideration of cumulative impacts requires "some quantified or detailed information; general statements about possible effects and some risk do not constitute a hard look absent a justification regarding why more definitive information could not be provided." *Great Basin Mine Watch v. Hankins*, 456 F. 3d 955, 971 (9th Cir. 2006). Moreover, the "analysis must be more than perfunctory; it must provide a useful analysis of the cumulative impacts of past, present, and future projects." *Id*. The Forest Service "must do more than just catalog relevant past projects in the area." *Id.* It must give a "sufficiently detailed catalog of past, present, and future projects and provide adequate analysis about how these projects, and the difference between the projects, are thought to have impacted the environment." *Id.* Some "quantified assessment of their combined environmental impact" is required. *Id*. at 972.

As such the Forest Service must fully and properly address in the Draft EIS the combined or cumulative effects to wolverine. In doing so, it is crucial for the Forest Service to not assume that the impacts are minimal because areas of mapped wolverine habitat on the forest are already in wilderness areas, IRAs, or in a non-motorized status. Notably, as wolverines lose habitat to the effects of climate change, wolverine and motorized winter recreationists will be forced to share smaller and smaller habitat patches. Heinemeyer et al., 2019. Decreasing areas with sufficient snow will amplify the effect of motorized winter recreation on wolverine due to the fact that motorized winter recreation will be concentrated in smaller areas on the Lolo NF. Protected areas in the proposed action may not necessarily provide for all of the wolverine's life history requirements.

X. Designated, Management and Geographic Areas

A. Regulatory and Policy Framework Under the 2012 Planning Rule

The planning rule provides three general approaches for administratively protecting important conservation areas in a forest plan. The agency can establish designated areas (for the purposes

of this letter, we are including areas recommended for designation in this category), geographic areas, and management areas.

The first approach is for the Forest Service to establish **designated areas.** The rule defines a designated area as "[a]n area or feature identified and managed to maintain its unique special character or purpose."[104] Specific to designated areas, the planning rule requires the following of the Forest Service:

- Identify areas that may be suitable for inclusion in the National Wilderness Preservation System (NWPS), and determine whether to recommend any such lands for wilderness designation;
- Identify the eligibility of rivers for inclusion in the National Wild and Scenic Rivers System; and
- Identify existing designated areas (e.g., botanical areas, zoological areas, paleontological areas, etc.), and determine whether to recommend any additional areas for designation.[105]

The planning rule requires that the plan must include plan components, including standards or guidelines that will ensure the appropriate management of designated areas or recommended designated areas.[106] The Forest Service Handbook offers direction regarding the development of plan components for designated areas and recommended designated areas:

> The Responsible Official shall include plan components that will provide for appropriate management of designated areas based on the applicable authorities and the specific purposes for which each area was designated or recommended for designation. Uses and management activities are allowed in designated areas to the extent that these uses are in harmony with the purpose for which the area was designated. For recommended designated areas, the uses and activities allowed should be compatible with the basis of the recommendation.[107]

Further management of designated areas, in addition to plan components, is guided by policy in the Forest Service directives at Forest Service Manual 2300.

The second approach for administratively protecting important conservation areas in a forest plan is for the Forest Service to establish **geographic areas**. The planning rule defines geographic area as "a spatially contiguous land area identified within the planning area" for which specific management direction (i.e., a set of plan components) is developed.[108]

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[104] 36 C.F.R. § 219.19
[105] 36 C.F.R. §§ 219.7(c)(2)(vii), 219. 9 (definition of designated areas calls out Research Natural Areas as an example of an administratively designated area).
[106] 36 C.F.R. § 219.10(b)(1)
[107] FSH 1909.12, § 24.2(1)(b)
[108] 36 C.F.R. § 219.19

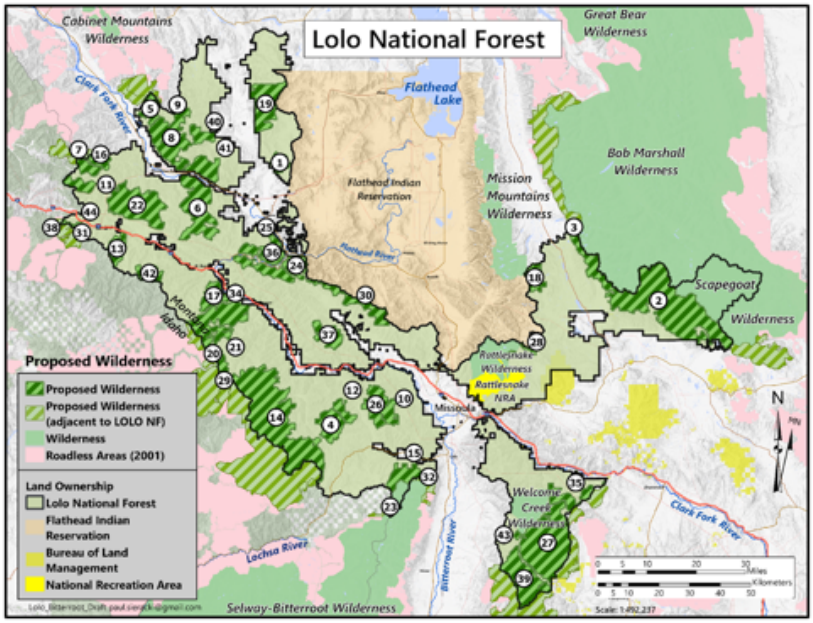
The third approach is for the Forest Service to establish **management areas** that are protective. The rule defines a management area as "a land area identified within the planning area that has the same set of applicable plan components. A management area does not have to be spatially contiguous." *Id.*

Simply put, "geographic areas are based on place, while management areas are based on "purpose." *Id.* Every plan is required to have management areas or geographic areas or both.[109] Forest plans use management areas or geographic areas to describe how plan components apply to specific parcels of land, with locations shown on maps. Note that designated areas, management areas, and geographic areas can overlap.

B. Recommended Wilderness

The Recommended for Wilderness is far too little. The importance of Wilderness and Inventoried Roadless Areas has significantly increased since 1986. The 1986 recommendations are very out of date. For example, scientific research shows Wilderness provides the most secure habitat for grizzly bears, elk, wolverine, lynx, bull trout, westslope cutthroat trout and numerous others.

Figure 7. Citizen Plan - Recommended Wilderness



Wilderness is a place that humans visit but do not remain. It provides opportunities for unequalled solitude, physical challenge, spiritual sustenance and renewal as well as breathtaking scenery and a laboratory for natural processes. Noss et al., 2019 wrote: *Wilderness designation is recognized as the "Gold Standard" for preserving wildlands and ecological values.* DiMarco et al. (2019) wrote: "*Wilderness areas act as a buffer against species loss, as the extinction risk of species within wilderness communities is – on average – less than half of that of species in non-wilderness communities."* Most Bull Trout Strong Populations and Aquatic Strongholds were in wilderness habitat and wilderness provided the most secure habitat

[109] 36 CFR § 219.7(d)

for grizzly bears (Bader 2000). Effective ecosystem protection in the Northern Rockies can be built upon a foundation of Wilderness habitat.

Inventoried Roadless Areas larger than 5,000 acres on the Lolo National Forest are integral components of Landscape Connectivity and protection of the Northern Continental Divide and Bitterroot grizzly bear recovery regions. These are the "demographic stepping stones" of habitat for grizzly bears and they are also vital for other wide-ranging species including elk, lynx and wolverine.

The Recommended Wilderness shall, until Congress determines otherwise, be administered by the Secretary of Agriculture to maintain their presently existing wilderness character and potential for inclusion in the National Wilderness Preservation System. Mechanized and motorized use shall be prohibited.

The Plan Revision DEIS must include an alternative that recommends all eligible roadless lands as Wilderness. The following table corresponds to Figure 7 above.

Area and Number	**Forest**	**Acres**
1-Baldy Mountain	Lolo	6,476
2-Bob/Scapegoat Additions	Lolo	118,469
3-Burdette	Lolo	16,018
4-Cataract	Lolo	9,441
5- Cherry Peak	Lolo	37,885
6- Clear Creek	Lolo	5,538
7- Cube Iron-Silcox	Lolo	36,997
8- Deep Creek	Lolo	7,669
9- Evans Gulch	Lolo	8,055
10- Garden Point	Lolo	6,322
11- Gilt Edge-Silver King	Lolo	10,052
12- Great Burn	Lolo	105,220
13- Lolo Creek	Lolo	14,335
14- Maple Peak	Lolo	6,472
15- Marble Point	Lolo	12,581
16- Marshall Peak	Lolo	9,068
17- McGregor-Thompson	Lolo	27,145
18- Meadow Creek	Lolo	6,928
19- Mt. Bushnell	Lolo	41,798
20- North Siegel	Lolo	9,174
21- Patrick's Knob	Lolo	16,970
22- Petty Mountain	Lolo	16,178
23- Quigg Peak	Lolo	67,265

24- Rattlesnake Addition	Lolo	2,880
25- Rawhide	Lolo	5,833
26- Reservation Divide	Lolo	16,908
27- Rolland Point	Lolo	6,472
28- Selway-Bitterroot Add	Lolo	3,864
29- Sheep Mountain	Lolo	37,836
30- Silver King	Lolo	12,935
31- South Siegel	Lolo	13,473
32- Stark Mountain	Lolo	12,601
33- Stony Mountain	Lolo	32,797
34- Sundance Ridge	Lolo	7,557
35- Teepee-Spring Creek	Lolo	13,901
36- Ward Eagle	Lolo	8,552
37- Welcome Creek Add	Lolo	1,063
38- Wonderful Peak	Lolo	1,321

C. Wild and Scenic Rivers

Water is the lifeblood of the Northern Rockies. The National Wild and Scenic Rivers Act was enacted to protect free-flowing streams on national public lands that have outstanding wild, scenic and conservation values. Designated stream segments are protected from dam construction and depending on category, can limit disturbance and development within a stream side corridor. This is important to the migratory native bull trout and cutthroat trout populations on the Lolo and Bitterroot National Forests.

The Lolo National Forest contains the headwaters of several major rivers and streams including the Blackfoot River, Rock Creek, Rattlesnake Creek, Monture Creek, the Fish Creek drainage and others. The Lolo National Forest, through Forest Plan Amendment 12 (1991) found nine streams eligible. These assessments are outdated and missed several key eligible stream segments.

The Plan Revision DEIS must contain an alternative that recommends all eligible stream segments for Wild & Scenic River designation. Key stream segments are shown below in Figure 8 taken from the Citizen Plan.

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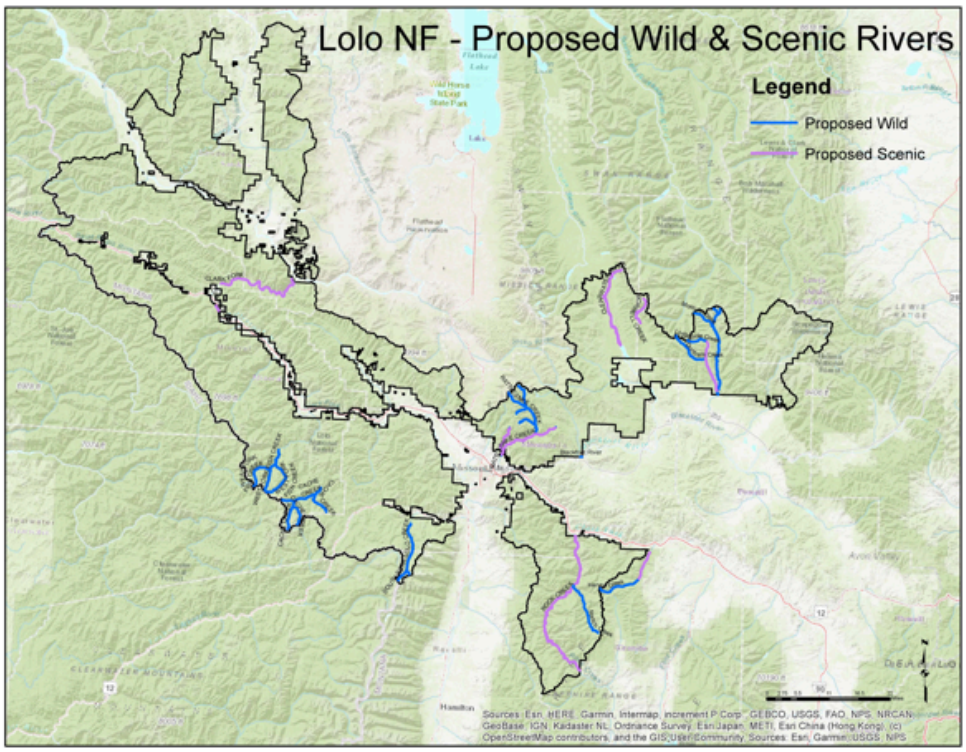
Figure 8. Citizen Plan - Wild and Scenic Rivers



D. Protection and Restoration of Roadless Lands

Undeveloped natural lands provide numerous ecological benefits. They safeguard biodiversity, enhance ecosystem representation (see discussion above), facilitate connectivity (Loucks et al. 2003; USDA 2001; Crist and Wilmer 2005; Strittholt and Dellasala 2001; DeVelice and Martin 2001), and provide high quality or undisturbed water, soil, and air resources (Anderson et al. 2012;[110] DellaSalla et al. 2011). They also serve as ecological baselines to facilitate better understanding of our impacts to other landscapes (Arcese and Sinclari 1997).

National Forest roadless lands, in particular, are heralded for their conservation values. Those values are described at length in the preamble of the Roadless Area Conservation Rule (RACR).[111] and in the Final Environmental Impact Statement (FEIS) for the RACR.[112] They include: high quality or undisturbed soil, water, and air; sources of public drinking water; diverse plant and animal communities; habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; primitive, semi-primitive non-motorized, and semi-‑primitive motorized classes of dispersed recreation; reference landscapes; natural appearing landscapes with high scenic quality;

[110] See Ex. 25.
[111] 66 Fed. Reg. at 3245-‑47.
[112] RACR Final Environmental Impact Statement, Vol. 1, 3–3 to 3–7.

traditional cultural properties and sacred sites; and other locally identified unique characteristics (e.g., uncommon geological formations, plexes, exceptional hunting and fishing opportunities).

Numerous articles in the scientific literature similarly recognize the contribution of roadless and undeveloped lands to biodiversity, connectivity, and conservation reserve networks. For example, Loucks et al. (2003) examined the potential contributions of roadless areas to the conservation of biodiversity, and found that more than 25% of IRAs are located in globally or regionally outstanding ecoregions16 and that 77% of IRAs have the potential to conserve threatened, endangered, or imperiled species. Arcese and Sinclari (1997) highlighted the contribution that IRAs could make toward building a representative network of conservation reserves in the United States, finding that protecting those areas would expand eco‐regional representation, increase the area of reserves at lower elevations, and increase the number of large, relatively undisturbed refugia for species. Crist et al. (2005) looked at the ecological value of roadless lands in the Northern Rockies and found that protection of national forest roadless areas, when added to existing federal conservation lands in the study area, would: 1) increase the representation of virtually all land cover types on conservation lands at both the regional and ecosystem scales, some by more than 100%; 2) help protect rare, species‐rich, and often‐declining vegetation communities; and 3) connect conservation units to create bigger and more cohesive habitat "patches."

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

The 2012 planning rule's substantive ecological sustainability provision sanctions this reserve design and landscape connectivity approach, requiring the Forest Service to formulate "plan components, including standards and guidelines, to maintain or restore [the] structure, function, composition, and connectivity" of terrestrial and aquatic ecosystems and watersheds, taking into account stressors such as climate change.[113] Roadless lands are ideal areas to manage as climate-change refugia, and to maximize their carbon storage potential by preserving old-growth habitat and expanding old-growth forests by protecting mature trees, especially from misguided vegetation management that purports to reduce so-called "uncharacteristic" wildfire. Roadless lands are ideal areas to apply a natural adaptation theme and to assist recovery by officially removing system and non-system roads. The Forest Service must disclose the current above and

[113] 36 C.F.R. § 219.8(a)(1).

below-ground carbon storage capacity of each Inventoried Roadless Area, and set objectives that will maximize their potential.

Further, the Forest Service must analyze in its impacts analysis the extent to which Roadless lands across the Lolo NF, including those identified in the Chapter 70 wilderness inventory, contribute to maintaining or restoring the following per 36 C.F.R. § 219.8(a):

- Air, soil, and water quality;
- Ecological integrity – including structure, function, composition, and connectivity – of terrestrial and aquatic ecosystems and watersheds;
- System drivers, including dominant ecological processes, disturbance regimes, and stressors, such as natural succession, wildland fire, invasive species, and climate change; and the ability of terrestrial and aquatic ecosystems on the plan area to adapt to change;
- Wildland fire and opportunities to restore fire adapted ecosystems;
- Opportunities for landscape scale restoration;
- The diversity of ecosystems and habitat types throughout the plan area;
- Key characteristics associated with terrestrial and aquatic ecosystem types;
- Rare aquatic and terrestrial plant and animal communities; and
- The diversity of native tree species similar to that existing in the plan area.

The Lolo NF must analyze the impacts that each and their associated ecological and social benefits. We also request that the impacts analysis identify key landscapes where roadless lands are providing these ecological and social benefits, and describe the more localized impacts that each alternative will have on the benefits these places provide.

E. The Rattlesnake National Recreation Area (from the Citizen Plan).

The proposed management of the Rattlesnake National Recreation Area is unacceptable. This is an area that was designated for its combination of wildlands and wilderness values close to an urban area. The proposed management is a transparent attempt to change the management direction for this area from special management to protect the wild, scenic and primitive values to general forest which allows roadbuilding, road reconstruction and logging. The existing Forest Plan manages most of this area the same as the Rattlesnake Wilderness. The direction outlined below are far more consistent with the legislative intent in designating this area.

Public Law 96-476 established The Rattlesnake National Recreation Area and Wilderness in 1980. The NRA (25,000 acres) is the only NRA in Region 1 and is designated as Management Area 28 in the Lolo National Forest Plan. The baseline environmental condition in the NRA has changed significantly since the 1986 Forest Plan. For example, the area is now continuously Occupied Grizzly Bear Habitat and is part of the Demographic Monitoring Area for grizzly bears

in the Grizzly Bear Conservation Strategy in the NCDE. A female grizzly bear with cubs has inhabited the area. Also, the 1986 Plan did not foresee the rising recreation use levels including mountain biking that have significant impacts on Forest resources including wildlife and soils. Nor did the Plan consider climate change science.

There are several necessary amendments to the Standards and Guidelines for the NRA.

1. *On page III-145 under C. Standards 3.* Change first sentence to "Tree removal shall be limited to individual trees to eliminate safety hazards to public users."
2. *Standards C. 4.* Remove current language and replace with "Earth disturbing management activities shall be prohibited."
3. *Standards C. 9.* Remove current language and replace with "INFISH standards for riparian area protection shall be applied to streams within the NRA. Rattlesnake Creek is designated as Critical Habitat for the Bull Trout."
4. *Standards C. 12.* Remove the first sentence and replace with "Natural fire plays an important role in shaping the landscape of the NRA and adjacent Wilderness. Wildfire suppression shall be limited to protection of structures on adjacent private lands."
5. *Standards C. 14.* Remove the entire language and replace with "Road construction or reconstruction shall be prohibited within the NRA."
6. *Standards C. 15.* Remove this section entirely.

Additional Recommendations

Mountain bike use is not addressed in the current Forest Plan. The Forest Service must complete an Environmental Impact Statement on recreational use in the NRA which identifies environmental impacts, the current baseline, and alternatives.

Bikes with electric motors ("e-bikes") shall be prohibited within the NRA. Removal of any biomass from the NRA shall be prohibited. Remove the co-designation of Trail 515 as a road while maintaining legal access to the Wilderness dams.

Rattlesnake Wilderness

The Forest Service will support the city of Missoula's efforts to breach dams in the Wilderness in a wilderness-compatible way, and to restore the natural wetlands and ecological function of the wilderness lakes. Remove the co-designation of Trail 515 as a road while maintaining legal access to the Wilderness dams. If the dams are breached or overland access is no longer needed, obliterate the road above the Franklin Bridge and recommend adding the portion of the "cherry stem" above Franklin Bridge to the Rattlesnake Wilderness and designate that portion of Rattlesnake Creek above Franklin Bridge as a Wild River.

F. Factors to Consider in the Environmental Analysis

The National Environmental Policy Act (NEPA) requires federal agencies to assess the direct, indirect and cumulative environmental impacts of proposed actions, taking a "hard look" at environmental consequences and performing an analysis commensurate with the scale of the action at issue. 42 U.S.C. § 4321 *et seq*; 40 C.F.R. § 1508.8; s*ee also Metcalf v. Daley*, 214 F.3d 1135, 1151 (9th Cir. 2000); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). Forest planning affects the entire landscape and can only be thoroughly and properly assessed by considering potential impacts at a comparable level. In this section of our letter, we raise several significant issues pertaining to designated, management, and geographic areas that the Forest Service must analyze in its impacts analysis in order to satisfy NEPA's requisite "hard look" analysis. Further, many of the issues raised pertain to the Forest Service's ability to achieve the rule's substantive requirement to provide for ecological sustainability, integrity and diversity. Therefore, it is necessary for the Lolo NF to utilize this information and analyze the impacts that we raise in its EIS in order to fulfill the rule's substantive mandates.

Overall, while it is important for the Forest Service to provide analysis for its management of designated Wilderness, Recommended Wilderness, Research Natural Areas, Roadless Areas and other relevant designated areas, it is also crucial to consider these areas together. As such the Forest Service must disclose and analyze the value of those special designated areas as a system, particularly in regards to wildlife species, including their ability to move across the landscape, taking into account predicted environmental conditions and trends. Further, the agency must disclose and analyze the impacts of not protecting the wilderness character of lands identified in the wilderness inventory that the agency did not recommend to be included in the National Wilderness Preservation System.

XI. Old growth and mature forests

A. Introduction

The current Forest Plan Final EIS for the Nez Perce National Forest (1987) recognizes the ecological importance of old growth:

> Habitat diversity is a measure of the variety, distribution, and structure of plant communities as the progress through various stages. Each stage supports different wildlife species. **One of the most critical elements of diversity in a managed forest is old growth. If sufficient old growth is retained, all other vegetative stages from grassland through mature forest will be represented in a managed forest.**

(Emphasis added.) The intensive and extensive industrial management paradigm promoted in the PA poses disaster for old growth and by extension, "all other vegetative stages." The remaining natural diversity "represented in a managed forest" including habitats for wildlife and fish on the LNF would

not resemble natural, pre-management conditions. This impression is reinforced by the PA's extreme "sustained yield limit of 144 MMBF (million board feet) per year."

The current Forest Plan Final EIS for the Lolo National Forest (1986) states, "While a diversity of vegetative types and age classes will be provided, old growth forests and dependent wildlife are most sensitive to land management activities."

The PA fails to recognize the full range of old-growth values, as the Forest Service Chief stated in the 1989 Position Statement on National Forest Old Growth Values (found in Green et al., 1992):

> The Forest Service recognizes the many significant values associated with old growth forests, such as biological diversity, wildlife and fisheries habitat, recreation, aesthetics, soil productivity, water quality, and industrial raw material. Old growth on the National Forests will be managed to provide the foregoing values for present and future generations.

The content of the PA indicates public comments on the Draft Assessment comments were ignored. E.g., "FOC presents this discussion to correct and supplement the Assessment record concerning old-growth ecosystems because of the (Draft Assessment's) failure to objectively weigh facts and best available science." This lack of consideration of scientific information installs unacceptable bias into the revision process, as we discuss in our section, "Climate change, carbon storage and carbon sequestration."

Juel, 2021 (Ex. 10) is a report cited in comments on the Draft Assessment. It identifies the challenges of defining old growth, and discusses ways the Forest Service has distorted and/or obfuscated old-growth definitions for purposes inconsistent with ecological sustainability. In many ways, the PA exhibits the negative patterns noted in Juel (2021).

The PA adopts, essentially word-for-word, the forestwide guidelines and other direction from the national forest plan old growth amendment process proposal. For critique of that proposal (Federal Register / Vol. 88, No. 243 / Wednesday, December 20, 2023) please see Exhibits 11, 12, 13, 14.

Leading up to that national forest plan amendment proposal, the federal government issued a Request for Information on Federal Old-growth and Mature Forests (87 FR 42493). See Exhibits 15, 16, 17 and 18 which are letters in response to that solicitation.

B. Definition

The PA provides a confusing definition of old growth, which reflects a gross misunderstanding of the concept within the planning team. The Glossary has entries for "**old-growth associated species**", "**old growth forests**" and "**old growth habitat**" but not for "old growth". Included in the entry for "old

growth habitat" are the words "Old growth habitat may or may not meet the definition for old growth forest" despite the two entries' many similarities. Yet this may be irrelevant because, oddly enough, the term "old growth habitat" does not appear anywhere else in the PA, and isn't even found in the Revised Assessment. Under **old growth forests** the Glossary entry states, "For the purposes of this document, old growth is defined as the minimum criteria established in Old Growth Forest Types of the Northern Region by Pat Green et al. 1992 (errata 2011) …**unless more current scientific information becomes available**." (Emphasis added.)

The fact that the Forest Service has not settled on a definition for old growth at this stage of the revision process renders the PA weak and tentative concerning such a vitally important issue. However for the remainder of our comments, we assume that where the PA refers to old growth, it means forest stands meeting the "minimum criteria established in …Green et al. 1992" as the Glossary states.

Of note, almost two decades preceding the PA, when the Forest Service first began it plan revision process for the LNF, some of the organizations and/or individuals who prepared this PA comment letter submitted to the agency an April, 2004 document entitled, "Citizen reVision: Desired Future Condition of the Bitterroot, Flathead & Lolo National Forests" (Ex. 19). It has a section on old growth, including the following text:

> (Green et al, 1992) is probably the best reference available for these forests and should be used as a guide to determine old-growth forest habitat. We strongly caution though that **the minimum characteristics in Green et al, are not the recommended standards, but merely the starting point by which to determine whether a stand is classified as old growth**. It is NOT to be used to "manage" old growth down to these minimum characteristics. Also, it is important tonote that old-growth attributes such as decadence, large trees, old trees, snags, canopy structure, coarse woody debris, etc. are critical components of old-growth forest habitat. Stands that may not have the minimum number of large trees but contain these other important attributes should be considered "recruitment" or future old-growth and allowed to progress towards meeting the Green et al definition.

(Bold emphasis added.) More recently, our comments on the Draft Assessment (Flathead-Lolo-Bitterroot Citizen Task Force et al. 7/7/2023) cited a 2004 document from the Kootenai National Forest:

> Pages 11 and 12 of Green et al. state the appropriate use of the document. The following are pertinent quotes from the document to aid in that interpretation:
>
> 1. No set of generated numbers can capture all the variation that may occur at any given age or stage in forest development.
> 2. Because of the great variation in old growth stand structures, no set of numbers can be relied upon to correctly classify every stand.
> 3. Do not accept or reject a stand as old growth based on the numbers alone; use the numbers

as a guide.

4. The minimum criteria are used to determine if a stand is potentially old growth. Where these values are clearly exceeded, a stand will usually be old growth. The associated structural characteristics may be useful in decision making in marginal cases, or in comparing relative resource values when making old growth evaluations.

5. The basic concept is that old growth should represent "the late stages of stand development …distinguished by old trees and related structural attributes."

6. A stand's landscape position may be as important, or more important as any stand old growth attribute. The landscape is dynamic. We need to do more than draw lines to manage this dynamic system. Consider the size of old growth blocks (large blocks have special importance), their juxtaposition and connectivity with other old growth stands, their topographic position, their shapes, their edge, and their stand structure compared to neighboring stands. Stands are elements in dynamic landscapes. We need to have representatives of the full range of natural variation, and manage the landscape mosaic as a whole in order to maintain healthy and diverse systems.

The Green et al. document is an aid intended to define, evaluate, and monitor old growth – not to be used as a prescriptive, management guide with minimum attribute values as thresholds. This will not achieve the objective of maintaining old growth.

Another memo from the Forest Supervisor (May 14, 2003) states, "When minimums are used, they are intended to illustrate the beginning of what could be identified as old growth—or late seral, successional development for a specific habitat group within a specific zone—not what is recommended".

(Emphasis in the original.) So the Lolo National Forest was cautioned against using the Green et al. "minimum criteria" as its definition of old growth by the interested public twenty years ago, which echoed a caution stated by Kootenai National Forest officials in the very same time frame, and which was stated once again last year as part of comments on the Draft Assessment. It is long since time the Forest Service **operationally** define "old growth" for application during implementation of the revised forest plan in a manner that uses "minimum criteria" in a properly limited context, which we discuss below. It is also time the Forest Service conceptualizes old growth not as distinct and separate "stands" scattered about the Forest but rather as ecosystems and landscapes, also addressed below.

C. Old-Growth Ecosystems

Stands of trees meeting old-growth criteria are a part of **old-growth ecosystems** as recognized in the above quote from the Forest Plan Final EIS of the Nez Perce National Forest and as stated in Green et al. (1992).

The PA indicates that to the Forest Service, little but the Green et al "minimum criteria" for old-growth stands are of importance. The PA ignores dynamic, temporal and spatially diverse implications for old growth. This topic is discussed extensively in Juel, 2021 and the scientific sources cited therein, e.g.:

> Forest Service management policies have focused mainly on identifying, designating, inventorying and managing at the level of the old-growth "stand"… Kaufmann et al. 2007 identify limitations of this approach: "The term 'stand' may be more useful for management purposes than for describing the ecology of forests."
>
> (From) Franklin and Spies, 1991:
>
> > …Our failure to study old-growth forests as ecosystems is increasingly serious in considerations of old-growth issues. Without adequate basic knowledge of the ecosystem, we risk losing track of its totality in our preoccupation with individual attributes or species. Definitional approaches to old growth based on attributes… predispose us to such myopia. The values and services represented by old-growth ecosystems will be placed at ever greater risk if we perpetuate our current ignorance about these ecosystems. It will also increase doubts about our ability to manage for either old-growth ecosystems.
>
> Green et al., 1992 admits: "Although old growth ecosystems may be distinguished functionally as well as structurally, this definition is restricted primarily to stand-level structural features which are readily measured in forest inventory." Also, "These old growth minimum criteria, associated characteristics, and descriptions were developed to apply to individual stands." (*Id.*)

Yet the Revised Assessment still conflates old-growth ecosystems and stands meeting growth criteria: "Though old-growth **ecosystems** are typically distinguished by old trees**, these stands** are not necessarily in a late successional condition…" (emphases added).

D. Active management cannot create or enhance old growth

The Forest Service has never demonstrated its active management of vegetation has served the wide range of old-growth values (Juel, 2021), since it has largely focused on timber production and fire suppression. The agency's management cannot make old growth "better" in terms of the functions old growth plays in the ecology of forests. And the Forest Service also cannot accelerate its development, since the passage of time—with the changes and successional processes brings to forests—is not replicable using active management in any realistic or ecological sense. Even the application of prescribed fire for such purposes is questionable, since its application is intended for narrowly prescribed conditions not conducive to sustaining the diversity that naturally results from unplanned wildland fire events.

E. Old-growth associated species

This heading is identical to an entry in the PA's glossary, and therein a definition is provided. Oddly enough, neither the PA, the Revised Assessment, nor even the Potential Species of Conservation Concern List identifies species meeting this definition. How can the Forest Service seriously represent the PA as maintaining ecological sustainability if it cannot identify even a single old-growth associated species, and include Plan Components protective of their specific habitat needs? Juel, 2021 includes a discussion of old-growth associated wildlife species.

The LNF's 1986 Final EIS for the Forest Plan identified pileated woodpecker, snowshoe hare, fisher, boreal owl and northern goshawk as vertebrate species associated with old growth. But that list is too narrow. The 1987 Forest Plan for the Kootenai National Forest (USDA Forest Service, 1987a) states:

> Richness in habitat translates into richness in wildlife. Roughly 58 wildlife species on the Kootenai (about 20 percent of the total) find optimum breeding or feeding conditions in the "old" successional stage, while other species select old growth stands to meet specific needs (e.g., thermal cover). Of this total, five species are believed to have a strong preference for old growth and may even be dependent upon it for their long-term survival (see Appendix I[114]).

F. Plan Components

Next we discuss the PA's Plan Components for old growth; also we evaluate the PA's "complementary ecosystem and species-specific approach: ecosystem integrity and species diversity."

The LNF's 1986 Final EIS for the Forest Plan identifies the Forest Service strategy for insuring viable populations of old-growth associated wildlife, which recognized diverse vegetative types and proper distribution of old growth as vital:

> As a strategy for meeting old growth needs, the Forest was segregated into 71 drainages. A minimum of 8 percent old growth was allocated to most of these drainages where wilderness was not available, although this varies to some degree by alternative (Table 11-19). This old growth was then distributed by vegetative type within each drainage recognizing the individual needs of various old growth dependent species. While a diversity of vegetative types and age classes will be provided, old growth forests and dependent wildlife are most sensitive to land management activities.
>
> …Laws and regulations require the maintenance of viable populations of old growth dependent species. Although there are an adequate number of wilderness acres, noncommercial acres and unsuitable commercial acres to support these populations, the acres are not optimally distributed

[114] The Kootenai National Forest's Forest Plan Appendix I wildlife species list is found in Appendix A of Juel (2021).

> spatially or by vegetative type. To rely only on these lands for old growth habitat would create large biological "isolates" and species survival would not be guaranteed. In selecting lands necessary to maintain viable populations, unsuitable lands were selected first and suitable lands selected second. Suitable lands will be managed on a doubled rotation age to provide the necessary over-mature component of old-growth habitat.
>
> …Roadlessness …is important in the maintenance of old-growth timber and its associated wildlife species. Providing adequate acreages of roadless will not by itself meet old growth vegetative conditions. In addition, old growth must be distributed adequately in order to allow for species mobility and the maintenance of gene pools.

We point out that the LNF revision document "Preliminary Need to Change" did not identify any part of the above 1986 Forest Plan old growth strategy as needing to be changed. Yet the Plan Components profoundly change the management approach.

Desired Condition FW-OG-DC-01: "The amount and distribution of old-growth forest conditions are maintained and improved relative to the existing condition over time, recognizing that old-growth forest conditions are dynamic in nature and shift in the landscape over time as a result of succession and disturbance." Typical of PA "Desired Conditions" (DCs) in general, the language is vague and noncommittal, which means managers cannot be held accountable. It also provides no genuine temporal direction.

Whereas this DC sounds good on its face, the Forest Service has not identified "the existing condition" for old growth in any revision documents so there can be no comparison "relative to the existing condition(s)." The fact that such a situation conflicts with Forest Plan direction is not mentioned in any revision documents. The current Forest Plan includes "Additional Data Requirements and Accomplishment Schedule." It identifies "Site Specific Stand Age Class and Condition Inventory on Areas Allocated to MA 21"[115] to be completed by 1992. Furthermore, since that was never done, and because of other forest plan implementation purposes, the Forest Supervisor issued a 1994 "Old Growth Strategy …for consistent implementation of an old growth strategy within the Lolo Forest Plan." It included a section headed "INVENTORY, ANALYSIS, TRACKING OF OLD GROWTH". It committed to creating an old-growth inventory: "During the NFMA analysis of an EMA,[116] stands identified as old stands in excess of the 8% reserved as old growth, will be coded in TSMRS for the purpose of developing **a complete inventory on the Forest**" (emphasis added). Yet despite its "old growth strategy" and the commitments it made, the LNF has no comprehensive old-growth inventory, and no maps showing where the agency has identified old growth, or verified old growth in Management Area 21 during project analyses

[115] Management Area 21 is the current Forest Plan's MA emphasizing designation and maintenance of old growth.
[116] "Ecosystem Management Areas (EMAs) will serve as the analysis area for making old growth allocations." (Id.)

conducted over the past 38 years of Forest Plan implementation. **The Forest Service is effectively hiding old growth from the interested public.** This renders FW-OG-DC-01 meaningless.

Desired Condition FW-OG-DC-02: "**Proactive** stewardship, including for retention and **recruitment**, along with natural succession, **foster** an increasing trend in the amount, representativeness, redundancy, and connectivity of old-growth forest conditions such that future conditions are resilient and adaptable to stressors and likely future environments." (Emphases added.) First, the failure of FW-OG-DC-01 likewise makes the "increasing trend" statement in FW-OG-DC-02 meaningless. But this DC goes further in threatening old growth by identifying the agency's relationship to old growth to be highly manipulative, controlling and mostly about active management. (See words emphasized.) We explain.

The definition of "proactive" (but not found in the PA Glossary) is "serving to prepare for, intervene in, and control an expected occurrence or situation, especially an negative or challenging one." This is not the relationship the public wants the Forest Service has for old growth. Why not preserve existing old growth?

The definition of "recruitment" (but not found in the PA Glossary) is "to gain new supplies of." Why not prioritize preservation of all old growth presently existing?

The definition of "foster" (but not found in the PA Glossary) is "to promote the growth or development of." Old-growth ecosystems and old-growth associated wildlife did just fine over the centuries without the extensive, industrial-style management proposed in the PA. These ecosystems need no fostering—they need protection.

Desired Condition FW-OG-DC-03: "Carbon stored in old-growth conditions contributes to the long-term carbon storage, stability, and resiliency of forest carbon across the National Forest System." That is a statement of fact. Ironically, as we discuss elsewhere, the FS ignores best available science in regards to carbon storage and even actively contradicts best available scientific information on this subject.

Desired Condition FW-OG-DC-04: "The long-term abundance, distribution, and resiliency of old-growth conditions contribute to the overall ecological integrity of ecosystems and watersheds." Although the active verb "contribute" is out of place in this (and in the previous) DC, at least the FS exhibits some of understanding of the values and ecosystem services of old growth.

Standard FW-OG-STD-01: "Vegetation management activities must not degrade or impair the composition, structure, or ecological processes in a manner that prevents the long-term persistence of old-growth forest conditions within the plan area." Although this standard seems to be setting the tone for the right direction, it is too vague to be a **constraint** on management, as forest plan standards are meant to be. In the context it's supposed to effect—which is project implementation—it's spatially

vague ("within the plan area"), temporally vague ("long-term persistence") and sets an extremely high bar ("prevents"). If the Forest Service were to genuinely value old growth as "contribut(ing) to overall ecological integrity of ecosystems and watersheds", the standard would simply say, "Vegetation management activities shall not occur in old growth."

Standard FW-OG-STD-02: "Vegetation management in old-growth forest conditions must be for the purpose of **proactive** stewardship, to **promote** the composition, structure, pattern, or ecological processes necessary for the old-growth forest conditions to be resilient and adaptable to stressors and likely future environments. **Proactive** stewardship activities shall **promote**…" (emphases added.) Again, the emphasized words are skewed in favor of highly manipulative, command-and-control management techniques for which there is no scientific basis to support the premise they can improve old growth or at the very least, have neutral effects. The best available science is incontrovertible in stating that old growth is naturally, and inherently resilient and adaptable to stressors, so there's no need for this standard. Furthermore, if the FS is able to describe even a single vegetation management technique it has implemented on the Lolo NF in the past twenty years that would be constrained by the wording of this standard, we'd be interested in reading about it.

And then there's the second part of this standard that effectively nullifies anything potentially beneficial about the first part: "Exceptions to this standard may be allowed if the responsible official determines that actions are necessary to…" which is then followed by verbiage that echoes the Purpose and Need statements found in every timber sale NEPA document issued by the LNF in the past two decades, which means the first part of the standard will be universally ignored during forest plan implementation.

Standard FW-OG-STD-03: "Vegetation management within old-growth forest conditions may not be for the primary purpose of growing, tending, harvesting, or regeneration of trees for economic reasons. Ecologically appropriate harvest is permitted in accordance with standards 1 and 2." This constrains nothing. The responsible official need merely claim that clearcutting a stand of 300-year old trees is okay because it is, vaguely: "beneficial to a particular forest ecosystem type." The Forest Service is so locked into its command-and-control conceptualization that it cannot see the forest. How can this management paradigm possibly serve genuine ecological sustainability?

Ultimately, the Forest Service must include meaningful and clear standards that will actually preserve old growth ecosystems well distributed across the LNF, and that begins by excluding any commercial exchange of old growth trees, and including plan components that will allow mature stands to develop into old growth habitat.

XII. Climate change, carbon storage and carbon sequestration

In regards to the climate crisis, our groups fully engaged in dialogue with the Forest Service at every opportunity. Commenters responded to the Forest Service's Advance Notice of Proposed Rulemaking (88

Fed. Reg. 24,497, April 21, 2023), requesting public comment on how the agency should protect, conserve, and manage the national forests and grasslands for climate resilience. (E.g., Ex. 20, Ex. 21.)

Our organizations' previous comments on revision examine the implications of global climate change and the likely ecological, social, and economic chaos we face in our collective future. A holistic consideration of these facts is missing from the PA and other revision documents, including the Revised Assessment.

Given the Revised Assessment's narrow view of climate-related issues, it's no surprise the direction in the PA flies in the face of the best scientific information by promoting management actions that increase carbon emissions over the very time frame climate scientists urge humanity to reduce them instead. In these comments, across the various resource issues, our organizations provide concepts, ideas, methods, and tactics that must be assembled into an alternative for full and fair analysis in the upcoming draft EIS—one based on ecosystems' inherent resilience if traditional forest management practices are curtailed to a large extent. Ultimately, we envision the Lolo National Forest as part of our nation's solution to head off the worst impacts of climate change—a vision the Forest Service does not share at this point in time, much to our chagrin.

A. Plan components

Desired Conditions (DCs) FW-CC-DC-01, FW-CC-DC-02 and FW-CARB-DC-01 most correctly identify intact forests and grassland ecosystems as part of our organizations' envisioned climate solution, including providing the extremely important ecosystem services of long-term storage of carbon and climate mitigation. However since these DCs tacitly or explicitly embrace other plan components that suggest or call for intense active management such as extensive command-and-control vegetation manipulations, which head in the wrong direction climate-wise, these DCs have no beneficial effect.

What is missing from these plan components is a **standard**—constraining management as standards alone do most effectively as plan components—stating something to the degree that a management technique is not allowed if it increases greenhouse gas emissions. We understand the need for additional nuances in such a standard for achieving other outcomes our organizations support, such as wide-scale road decommissioning to best achieve landscape connectivity for species such as grizzly bears, so we welcome opportunities to dialogue for facing those challenges. Ultimately there will be trade-offs, but the level of sacrifice the PA now represents is not trade-off, it's extreme, ignores best available science, and is totally unacceptable.

B. LNF's revision process dismisses public input and biases outcomes against alternatives that would be based upon best available science on climate issues.

Before we begin to describe how the Forest Service has done what the heading of this subsection says it has, we must point out that similar failings and intentional distortions by the agency are evident in how the revision process has treated the other issues our comments discuss in much detail, with the apparent intent to unreasonably restrict the range of alternatives to be fully and fairly considered in the NEPA process. In other words, the Forest Service's failings on the climate issue described in the discussion that follows exemplify the agency's active denial and passive omission of best scientific information on other issues.

The NOI states, "The proposed action is to revise the 1986 Lolo National Forest land management plan to address the identified need for change." The NOI continues:

> In response to the preliminary need for change, a preliminary Draft Land Management Plan has been developed that includes desired conditions, goals, objectives, standards, guidelines, suitability of lands for specific multiple uses, lands that could be recommended to Congress for inclusion into the National Wilderness Preservation System, and the identification of rivers eligible for inclusion into the National Wild and Scenic Rivers system. It can be found on the Lolo National Forest Plan Revision website along with the Preliminary Need to Change.

That preliminary Draft Land Management Plan makes up the bulk of the January 2024 "Proposed Action" document ("PA"). The NOI mentions at least two other revision documents that have not been subject to public comment so far, including the Revised Assessment and the Draft Preliminary Need to Change. The PA states, "This proposed action was developed using the findings in the Revised Assessment (September 2023) and the Preliminary Need to Change." It lists two "Additional documents provided for public comment with the proposed action" and one is the "Preliminary Need to Change" but the Revised Assessment is not the other. We are assuming that omission is unintentional because another revision document, "Summary of Public Comments, Draft Assessment and Potential Species of Conservation Concern, August 14, 2023" (or "Summary of Public Comments") states:

> As stated in the planning rule directives, "the public will have further opportunities throughout the plan development or revision phase and NEPA scoping to provide comment on information in the assessment or provide new information as it relates to the proposed action and other possible alternatives." **Accordingly, the planning team continues to receive and consider input related to the assessment.**

(Emphasis added.) In that vein, we now make a second attempt at getting the Forest Service to properly consider scientific information on forest ecosystems relating to climate change for informing revision.

Friends of the Clearwater's (FOC's) July 7, 2023 comments on the draft Assessment describe "misrepresentations of science and facts in a Forest Service document, 'Carbon Storage and

Sequestration in Land Management Plan Revision' (Lolo National Forest, January 2023) distributed at the most recent Roundtable." Therein the Forest Service stated:

> For many forests, harvesting timber on sustainably managed forests may effectively "store" more carbon over time than if the forest is unmanaged. "Store" in this sense refers to carbon in the forest, carbon in harvested wood products, and the avoided carbon emissions in the atmosphere.

That and similar biases exist in the draft Assessment at 2.10.3 Status and Trends. Those FOC comments attempted "to correct and supplement the record by providing the …discussion" which included citing scientific information not represented in or even contradicted by the Assessment. We provide a number of cited articles in support of our Draft Assessment comments and the comments provided herein. We stand ready to provide copies of any articles the Forest Service may need as it develops the Revised Plan Draft EIS.

It is of vital importance that the agency address our Draft Assessment comments, because the Assessment process is meant to be used, in part, "to inform the development of plan components and other plan content" according to the 2012 Planning Rule. Yet none of the above influenced the content of the Revised Assessment. Under "Theme 1" in the Summary of Public Comments the Forest Service lists a whole host of issues about which the public had expressed concerns while commenting on the draft Assessment. The Summary of Public Comments states in response, "These issues are not directly relevant to the assessment or potential species of conservation concern but do present important issues and considerations that the team will consider in later steps in the planning process. … These comments and issues will not be addressed in the revised assessment."

Our concern is, the "preliminary Draft Land Management Plan" (PA) already includes "plan components and other plan content" as described in the NOI, which we feel are based on biases the FS carried forth into the Revised Assessment and now, into the PA which says it "was developed using the findings in the Revised Assessment (September 2023) and the Preliminary Need to Change."

The PA acknowledges "The 2012 Planning Rule requires the responsible official to use the best available scientific information to inform the development of a revised plan." It also states, "Chapters 2 and 3 discuss science contradictions and areas lacking information."

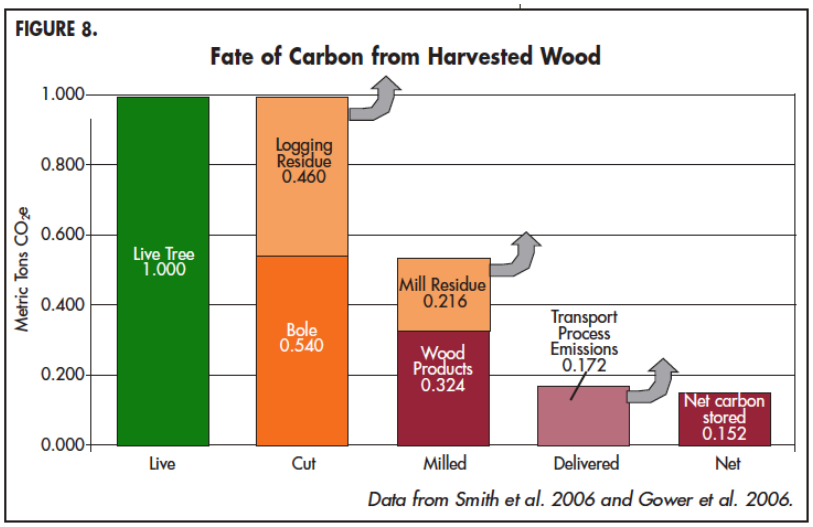
So how do those portions of the PA discuss science contradictions? In Chapter 2, the PA discusses how climate change impacts forests and this is consistent with the best available science our organizations cited in comments on the Assessment. However in Chapter 3 the PA repeats the agency's biased, one-sided consideration of the impacts of forest management on the climate, particularly in regards to alleged benefits of harvested wood products: "Long-lived durable wood products manufactured from Lolo National Forest timber also play an important role in carbon

storage and climate change mitigation (Anderson et al. 2013).” The uninformed reader might get the impression that the more trees are converted to wood products, the better it is for the climate. Yet this is far from the truth. In fact, Anderson et al. 2013 cites Ingerson, 2011 which states in the Abstract:

> As a result of wood waste and decomposition, **the carbon stored long-term in harvested wood products may be a small proportion of that originally stored in the standing trees**—across the United States approximately 1% may remain in products in-use and 13% in landfills at 100 years post-harvest. Related processing and transport emissions may in some cases approach the amount of (carbon-dioxide equivalent) stored in long-lived solid wood products. **Policies that promote wood product carbon storage as a climate mitigation strategy must assess full life-cycle impacts**, address accounting uncertainties, and balance multiple public values derived from forests.”

It is those points we emphasized above in bold that the PA and Revised Assessment fail to consider. Those were points raised in the scientific information cited in comment on the draft Assessment, so the Forest Service has obviously chosen to ignore, distort, and obfuscate science thus far during the Assessment phase including for the writing of its preliminary Draft Land Management Plan. One previous comment cited Talberth, 2023 as an example of a necessarily more complete assessment of carbon emissions associated with implementing a revised forest plan.

Based on the analysis in Ingerson (2007), less than one-fifth of the carbon in trees removed from forests through logging ends up in a wood product like dimensional lumber—the remainder ends up in the atmosphere almost immediately, mostly burned for dirty energy in biomass facilities or as hog fuel at lumber mills (e.g., branches, tree tops, bark, round parts, mill residues). See the chart below from Ingerson, 2007:



We are concerned that in proceeding with the revision process, the Forest Service will reject alternatives for full consideration in the upcoming Draft EIS because they are based upon interpretations of scientific information the agency has already tacitly or explicitly rejected. The

Forest Service has stated that its determination of best available science informing the revision process as per the 2012 Planning Rule will be "prior to the record of decision." (PA at 3.) Since it also states, "The documentation of the ongoing literature review and rationale for responses to literature submitted will be summarized in the draft environmental impact statement" it is clear that the range of alternatives in that draft EIS will only be as wide as the agency is willing to go. That the Forest Service has already failed to write an adequate Assessment after two tries means the Forest Service needs to correct it before going forward in designing alternatives.

We are fully aware that managing the Lolo National Forest with proper consideration of the climate crisis would mean an abrupt about-face from what the agency has traditionally taken as its primary mission—providing timber and livestock forage. It would also be politically complicated, especially given the agency's rhetoric[117] in recent decades on how intensive and extensive industrial management techniques can "restore" forests. But these are not normal times we're living in. The biosphere needs bold leadership, not bureaucrats following marching orders from people wanting to maintain their power via the status quo.

C. Detailed Review of Land Management Plan Revised Assessment Appendix 2: Carbon Assessment

First off, the Revised Assessment Appendix 2 (Carbon Assessment) states, "This assessment was prepared for the Lolo National Forest in April of 2021" so it's not even clear the Forest Service has even revised this at all since the inception of the public portion of the revision process. In any case, it is a study in how to complicate the issue of carbon sequestration in a forest environment.

1. The Issues

In this period of rapid global warming, the central issues are how to minimize human greenhouse gas emissions and how to mitigate the effects of a warming climate by removing CO_2 from the atmosphere (sequestration). Attempts at establishing baseline carbon stocks and flux using computer models (which are inexact and depend upon the accuracy of data) serve no purpose other than to divert attention from the two central issues.

2. Analyzing the Carbon Assessment

Although the details may prove interesting, which past human activities contributed to the current state of the Lolo National Forest matter little other than to inform forest management about what should be avoided.

[117] See also, Ex. 22 printed from:
https://www.counterpunch.org/2024/03/13/forest-management-the-words-matter/print/

The Carbon Assessment asserts, “About 47.3% of carbon stocks … are stored in soil carbon.” And “The aboveground portion of live trees … stores another 32% of the forest carbon stocks. (p. A2-4) However, another statement reveals, “All results in this assessment are estimates that are contingent on models, data inputs, assumptions, and uncertainties.” (p. A2-7)

The Carbon Assessment alleges:

> Although harvest transfers carbon out of the forest ecosystem, most of that carbon is not lost or emitted directly to the atmosphere. Rather, it can be stored in wood products for a variable duration depending on the commodity produced. Wood products can be used in place of other more emission intensive materials, like steel or concrete, and wood-based energy can displace fossil fuel energy, resulting in a substitution effect (Gustavsson et al. 2006, Lippke et al. 2011). Much of the harvested carbon that is initially transferred out of the forest can also be recovered with time as the affected area regrows. (p. A2-8)

The declaration “that most carbon is not lost or emitted” by harvest is simply not true. About 28% of a tree’s carbon is contained in the branches, typically burned shortly after harvest, and another 53% of the tree is discarded as waste during the manufacturing and milling process. That is approximately two-thirds of the tree’s carbon emitted as greenhouse gas (GHG) when a tree is harvested for lumber. (Smith, 2019 - See Ex. 23)

Old, but often repeated claims that “Wood products can be used in place of other more emission intensive materials, …” have been contradicted.

Substitution of wood for more fossil carbon intensive building materials has been projected to result in major climate mitigation benefits often exceeding those of the forests themselves. A reexamination of the fundamental assumptions underlying these projections indicates long-term mitigation benefits related to product substitution may have been overestimated 2- to 100-fold. (Harmon M. , 2019)

The contention that “wood-based energy can displace fossil fuel energy” infers that burning wood emits less GHG than fossil fuels. That has been found to be nonsense. “Because combustion and processing efficiencies for wood are less than coal, the immediate impact of substituting wood for coal is an increase in atmospheric CO2 relative to coal.” (Sterman, 2018)

The Carbon Assessment even admits, “As with the baseline estimates of ecosystem carbon storage, the analysis of carbon storage in harvested wood products also contains uncertainties.” (p. A2-9)

The Forest Service has a history of claiming national forests are at risk of catastrophic wildfires. Although the years covered by this assessment inexplicably end in 2011, it was only between 1990 and 2011 that wildfire was the dominant disturbance type (Figure A2.6, p. A2-10) – no more recent

wildfire evidence is presented. The admission that, "In most years, fire affected less than 0.2% of the total forested area…" (p. A2-10) makes the contention that the Lolo National Forest is at risk of being consumed by wildfire highly questionable.

The Carbon Assessment states that, "timber harvest also affected a relatively small area of the forest during this time. In most years, timber harvest affected less than 0.3 percent of the total forested area of the Lolo National Forest in any single year from 1990 to 2011, …" (pp. A2-10-11)

What is of interest here is that during most years, "fire affected less than 0.2%" while "timber harvest affected less than 0.3%" which would seem to indicate that, at least during some years, logging affected more acreage than wildfire. That conclusion is in line with research conducted by Oregon State University. See Figure 9 below.

An Australian study found:

> Carbon stock losses associated with logging represent a much greater departure from natural disturbance in resprouting forests, because wildfire causes relatively little carbon loss in resprouting forests compared to non-resprouting forests. This analysis highlights the need to consider specific biological responses when assessing forest carbon stock losses associated with disturbance. … Above ground carbon stocks recovered faster after fire than logging. (Wilson, 2021)

The results of Wilson 2021 (and other studies) strongly suggest forests recover more quickly after experiencing wildfire than they do from logging. Thus, the Assessment's Figure A2.8 (p.A2-13) showing that fire was the most disturbing force in the Northern Region, is positive information.

The Carbon Assessment states:

> In some cases, removing carbon from forests for human use can result in lower net contributions of greenhouse gases to the atmosphere than if the forest was not managed, when accounting for the carbon stored in wood products, substitution effects, and forest regrowth (Lippke et al. 2011, McKinley et al. 2011, Skog et al. 2014, Dugan et al. 2018).

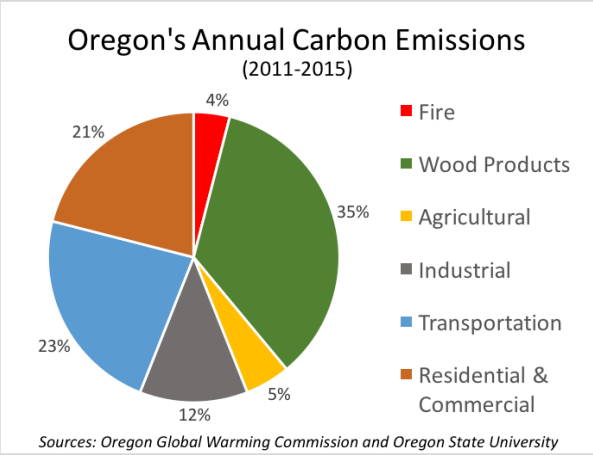
Besides relying on several studies a decade or more old, the Carbon Assessment appears to have misrepresented Dugan et al 2018. That research concludes:

> It is critical to apply a systems approach to comprehensively assess net emissions from forest sector climate change mitigation scenarios. Although some scenarios produced a benefit by displacing emissions from fossil fuel energy or by substituting wood products for other materials, these benefits can be outweighed by increased carbon emissions in the forest or product systems. Maintaining forests as forests, extending rotations, and shifting commodities

to longer-lived products had the strongest mitigation benefits over several decades. Carbon cycle impacts of bioenergy depend on timeframe, feedstocks, and alternative uses of biomass, and cannot be assumed carbon neutral. (Dugan, 2018)

Dugan ***does not*** conclude that, in some circumstances, a managed forest can sequester more carbon than an unmanaged forest as the Carbon Assessment asserts. Figure 9 better illustrates carbon emissions and the Revised Plan EIS should include a similar chart for the Lolo NF:

Figure 9



The Carbon Assessment declares:

> Forests are generally most productive when they are young to middle age, then productivity peaks and declines or stabilizes as the forest canopy closes and as the stand experiences increased respiration and mortality of older trees (Pregitzer and Euskirchen 2004, He et al. 2012), … (p. A2-14)

That statement is contradicted by recent research. Stephenson et al. (2014) state:

> Here we present a global analysis of 403 tropical and temperate tree species, showing that for most species mass growth rate increases continuously with tree size. Thus**, large, old trees do not act simply as senescent carbon reservoirs but actively fix large amounts of carbon compared to smaller trees;** at the extreme, a single big tree can add the same amount of carbon to the forest within a year as is contained in an entire mid-sized tree. The apparent paradoxes of individual tree growth increasing with tree size despite declining leaf-level and stand-level productivity can be explained, respectively, by increases in a tree's total leaf area that outpace declines in productivity per unit of leaf area and, among other factors, age-related reductions in population density**. Our results resolve conflicting assumptions about the nature of tree growth**, inform efforts to understand and model forest carbon dynamics, and have additional implications for theories of resource allocation and plant senescence.

(Emphases added.) And from Mildrexler et al. (2020):

> **Large-diameter trees store disproportionally massive amounts of carbon and are a major driver of carbon cycle dynamics in forests worldwide.** In the temperate forests of the western United States, proposed changes to Forest Plans would significantly weaken protections for a large portion of trees greater than 53 cm (21 inches) in diameter (herein referred to as "large-diameter trees") across 11.5 million acres (~4.7 million ha) of National Forest lands. … We analyzed forest inventory data collected on 3,335 plots and found that large trees play a major role in the accumulated carbon stock of these forests. Tree AGC (kg) increases sharply with tree diameter at breast height (DBH; cm) among five dominant tree species. Large trees accounted for 2.0 to 3.7% of all stems (DBH 1" or 2.54 cm) among five tree species; but held 33 to 46% of the total AGC stored by each species. **Pooled across the five dominant species, large trees accounted for 3% of the 636,520 trees occurring on the inventory plots but stored 42% of the total AGC**. … Given the urgency of keeping additional carbon out of the atmosphere and continuing carbon accumulation from the atmosphere to protect the climate system, it would be prudent to continue protecting ecosystems with large trees for their carbon stores, and also for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.
>
> **Conducting a quantitative assessment using empirical data has determined the large carbon stock that would be lost and the resulting climate consequences if these large trees are harvested**. … Proforestation allows existing forests to continue growing without harvest or other management practices so that more trees can reach the large tree size that accumulates more carbon in the near and long term than do reforestation and afforestation (Moomaw et al., 2019).
>
> No additional land is required as is the case with afforestation, and proforestation is the lowest cost opportunity for reaching the zero net carbon goal by 2050. In fire-prone forests such as in our study area, a diameter limit strikes the balance between protecting the most fire-resistant trees that store the most carbon and allowing fuels reduction with reintroduction of fire in dry biophysical environments. Intact mesic forests are ideal locations for proforestation. Harvesting large trees will add very large amounts of biogenic carbon to the atmosphere (Harris et al., 2016), and make the net zero carbon goal difficult or impossible ... The young trees will never be able to recover and accumulate the amount of carbon that is in the growing and older forests during these next critical decades, and will only equal current levels a century or more from now. (Mildrexler, 2020) (emphasis added)
>
> Protecting large trees to help stabilize climate is critically important for managing forest ecosystems as social-ecological systems.

(Emphases added.) The Carbon Assessment states:

> As with the baseline estimates, there is also uncertainty associated with estimates of the relative effects of disturbances, aging, and environmental factors on forest carbon trends. For example, omission, commission, and attribution errors may exist in the remotely sensed disturbance maps used in the Forest Carbon Management Framework and Integrated Terrestrial Ecosystem Carbon models. However, these errors are not expected to be significant given that the maps were manually verified, rather than solely derived from automated methods. (pp. A2-16-17)

Given the lack of field work the Agency is capable of performing, the claim that "these errors are not expected to be significant given that the maps were manually verified, rather than solely derived from automated methods" is highly suspect. Therefore, it must be assumed that the "uncertainty associated with the estimates" is very high and the conclusions reached are mere speculation.

The Carbon Assessment admits as much when it declares, "However, the relative partitioning of the effects of disturbance and non-disturbance factors as well as uncertainties at finer scales (e.g., national forest scale) are likely to be considerably higher. (p. A2-17)

The Carbon Assessment declares:

> … forest stands on the Lolo National Forest are mostly middle-aged and older (greater than 70 years) with approximately 30% of the stands less than 70 years old, and about 20% greater than 150 years of age (Figure A2.9). If the Forest continues this aging trajectory, more stands will reach a slower growth stage in coming years and decades (Figure A2.9), potentially causing the rate carbon accumulates to decline and the Forest may eventually transition to a steady state in the future. (p. A2-18)

Again, the Agency proclaims that "a slower growth stage … potentially causing the rate of carbon accumulation to decline…" possibly believing that repetition of a falsehood somehow makes it acceptable as truth. See (Stephenson, 2014) (Mildrexler, 2020)

The Carbon Assessment asserts:

> For Resources Planning Act's Rocky Mountain Region …, projections indicate that the rate of carbon sequestration will decline fairly rapidly in the 2020s mostly due to the loss of forestland (land-use transfer), causing the region's forests to shift to a carbon source. (pp. A2-18-19)

That statement is only true if the area converted from forest to other uses is included in the calculations for carbon sequestration. In reality, areas that remain forest (i.e., not converted) will not be carbon sources but will remain carbon sinks.

In fact, the Carbon Assessment admits that by stating:

> Converting forest land to a non-forest use removes a large amount of carbon from the forest and inhibits future carbon sequestration. National forests tend to experience low rates of land-use change, and thus, forest land area is not expected to change substantially within the Lolo National Forest in the future, though planned land acquisitions will continue to occur. (p. A2-19)

In what may be the most truthful statement presented in the document, the Carbon Assessment says:

> Because disturbance regimes are projected to increase with climate change (Vose et al. 2018), understanding past trends is not sufficient to fully understand vegetation carbon dynamics in the future. (p. A2-19)

That statement suggests the question, "Rather than accept that future conditions are theoretical, why does the Agency continue to make decisions based on the past and outdated, contested research?"

The Carbon Assessment proclaims:

> A climate change vulnerability assessment for the Forest Service Northern Rockies Region (Halofsky et al. 2018a), including the Lolo National Forest, indicates that temperature is projected to increase throughout the 21st century. By the 2040s, mean annual monthly temperatures are projected to increase in the Northern Rockies region. In the Western and Central Subregions (which include the Lolo National Forest), maximum annual temperature is projected to increase by 5–11 degrees Fahrenheit by 2100, and minimum annual temperature is projected to increase by 5–12 degrees Fahrenheit by 2100. Minimum and maximum temperatures are projected to increase in all seasons. The frequency of summer days with extreme heat is likely to increase (Halofsky et al. 2018a).

Those statements agree with the most recent, best available scientific research. Unfortunately, recent and current management actions by the Agency seem to disregard scientific consensuses associated with global warming.

Although referencing decade-old work when more recent research is available, the drafters of the Carbon Assessment seem to understand that "Carbon dioxide emissions are projected to increase through 2100 under even the most conservative emission scenarios (Intergovernmental Panel on Climate Change 2014)." (p. A2-21)

But the Carbon Assessment then offers an excuse for not moving forward with care and restraint by declaring that, "Given the complex interactions among forest ecosystem processes, disturbance

regimes, climate, and nutrients, it is difficult to project how forests and carbon trends will respond under novel future conditions." (p. A2-21)

3. Commentary

Most management activities associated with Agency projects contribute to the increasing accumulation of greenhouse gases (GHG) in the atmosphere. For example, logging, thinning, prescribed fire, pile burning, travel to and from project sites, etc. all release GHG.

Issued on August 1, 2016, this directive from Executive Office of the President, Council on Environmental Quality has been re-implemented as national direction. [See 86 Fed Reg. 10252 (Feb. 19, 2021).]

The 2016 CEQ guidance acknowledges, "changes in our climate caused by elevated concentrations of greenhouse gases in the atmosphere are reasonably anticipated to endanger the public health and public welfare of current and future generations." It directs federal agencies to consider the extent to which a proposed action would contribute to climate change. It rejects as inappropriate any notion that any project is of too small a scale for such consideration:

> 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 is 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.[118]

The Forest Service must quantify GHG emissions. The Agency can only use a qualitative method if tools, methodologies, or data inputs are not reasonably available, and if that is the case, there needs to be rationale as to why a quantitative analysis is not warranted. Quantitative tools are available, so the Agency must comply.[119]

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[118] FR 86 10252 - https://www.govinfo.gov/content/pkg/FR-2021-02-19/pdf/2021-03355.pdf
[119] Greenhouse Gas (GHG) Accounting Tools - https://ceq.doe.gov/guidance/ghg-tools-and-resources.html

Given the urgency of preventing additional GHG emissions and continuing carbon sequestration to protect climate ecosystems, it would be best to protect trees for their carbon stores and for their co-benefits of habitat for biodiversity, resilience to drought and fire, and microclimate buffering under future climate extremes.

According to a 2021 article, "Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change." (Law & Moomaw, Keeping trees in the ground where they are already growing is an effective low-tech way to slow climate change, 2021)

From Achat et al. (2015):

> Compared with other terrestrial ecosystems, forests store some of the largest quantities of carbon per surface area of land." Much of the carbon stored is within the soils, with a smaller part in the vegetation. Forest management can modify soil organic carbon stocks. For example, conventional harvests like clearcutting or shelterwood cutting cause soils to lose organic carbon which is not the case for soils in unharvested forests. Not only does it lose the carbon stored in the soils, but cutting trees eliminates the trees' potential to continue to sequester carbon.
>
> Our study showed that, compared with conventional stem-only harvest, removing the stem plus the harvesting residues generally increases nutrient outputs thereby leading to reduced amounts of total and available nutrients in soils and soil acidification, particularly when foliage is harvested along with the branches. Losses of available nutrients in soils could also be explained by reduced microbial activity and mineralization fluxes, which in turn, may be affected by changes in organic matter quality and environmental conditions (soil compaction, temperature, and moisture). Soil fertility losses were shown to have consequences for the subsequent forest ecosystem: tree growth was reduced by 3–7% in the short or medium term (up to 33 years after harvest) in the most intensive harvests (e.g., when branches are exported with foliage). Combining all the results showed that, overall, whole-tree harvesting has negative impacts on soil properties and trees that may have an impact on the functioning of forest ecosystems.

Vegetation management attempts to replicate how the Forest Service theorizes forests looked pre-European influence, ignores the larger pattern of climate, global warming, and disregards natural succession. The Agency seems intent on continuing its attempts to replicate the past which exposes its refusal to accept that global warming has made such an endeavor impossible.

As we discussed above in our comments on the Preliminary Need to Change, the Forest Service relies heavily on assumed departures from historic conditions to support the purpose and need of every project. The agency must address these comments both in regards to the fundamental flaws in its PNC and as it relates to these comments on the Carbon Assessment.

The Forest Service is a federal Agency. So when performing management activities (i.e., future projects) in Montana, it must abide by restrictions contained in Montana's constitution. More plainly, Montana's constitution promises a clean and healthful environment:

> Article IX -- ENVIRONMENT AND NATURAL RESOURCES. Section 1. Protection and improvement. (1) The state and each person shall maintain and improve a clean and healthful environment in Montana for present and future generations.

Thus, the Forest Service must ensure that its management activities do not contribute to the degradation of the future environment. Management actions which release greenhouse gases (GHG) into the atmosphere or lessen the environment's ability to sequester CO2 do just that and run afoul of Montana's constitution. (See *Held v. State of Montana*, CDV-2020-307 – August 14, 2023.)

The Forest Service must acknowledge that mature forests sequester and accumulate massive amounts of atmospheric carbon stored mainly in large trees and soils making an invaluable contribution to climate smart management and international climate commitments. (Stephenson, 2014) (Mildrexler, 2020) Other studies demonstrate that unmanaged forests can be highly effective at capturing and storing carbon. (Luyssaert, 2008) Further, mature, and old-growth forests have received increased global attention in climate fora (IUCN 2021) and in the scientific community as natural climate solutions. (Moomaw, 2019) Notably, Article 5.1 of the Paris Climate Agreement calls on governments to protect and enhance "carbon sinks and reservoirs." Article 38 of the UNFCCC COP26 Glasgow Climate Pact emphasizes "the importance of protecting, conserving and restoring nature and ecosystems, including forests … to achieve the long-term global goal of the Convention by acting as sinks and reservoirs of greenhouse gasses and protecting biodiversity… ." The USA was also one of 140 nations at the COP26 that pledged to end forest degradation and deforestation by 2030. Logging both mature and old-growth forests is a form of forest degradation as it removes important forest structural features.

In addition, several studies demonstrate that maintaining forests rather than cutting them down can help reduce the impacts of climate change. "Stakeholders and policy makers need to recognize that the way to maximize carbon storage and sequestration is to grow intact forest ecosystems where possible." (Moomaw, 2019)

Another report (Hudiburg et al., 2019) concludes:

> Allowing forests to reach their biological potential for growth and sequestration, maintaining large trees (Lutz, 2018), reforesting recently cut lands, and afforestation of suitable areas will remove additional CO2 from the atmosphere. Global vegetation stores of carbon are 50% of their potential including western forests because of harvest activities (Erb, 2018). Clearly, western forests could do more to address climate change through carbon sequestration if allowed to grow longer.

A June 2020 paper from leading experts on forest carbon storage (Law et al., 2020) reported:

> There is absolutely no evidence that thinning forests increases biomass stored. It takes decades to centuries for carbon to accumulate in forest vegetation and soils and it takes decades to centuries for dead wood to decompose. We must preserve medium to high biomass (carbon-dense) forest not only because of their carbon potential but also because they have the greatest biodiversity of forest species. (Internal citations omitted.)

Clearly the role of mature and old-growth forests to store carbon and serve as a natural climate-crisis solution must be part of any detailed project-level analysis. The Forest Service owes a duty to the public to ensure that these forests remain standing so that they can continue to perform their vital function of storing large amounts of carbon. See also *Light v. U.S.*, 220 U.S. 523 (1911) ("the public lands . . . are held in trust for the people of the whole country."); *Juliana v. U.S.*, 217 F.Supp.3d 1224, 1259 (D. Or. 2016) ("[t]he federal government, like the states, holds public assets . . . in trust for the people.") (rev'd on other grounds, *Juliana v. U.S.*, 947 F.3d 1159 (9th Cir. 2020)); *Selkirk-Priest Basin Ass'n Inc. v. State ex rel Andrus*, 899 P.2d 949, 952-54 (Idaho 1995) (public trust doctrine permits challenge to timber sales since increased sedimentation could impact trust resources).

As such, the Forest Service should not be logging any mature or old-growth forests, at least until it has completed the rulemaking that is currently being considered. Therefore, we are calling for a moratorium on mature and old-growth logging considering EO 14072 "calls particular attention to the importance of (MOG) forests on Federal lands for their role in contributing to nature-based climate solutions by storing large amounts of carbon and increasing biodiversity" (77 Fed. Reg. 24497, 24498; see also MOG Report, at 3). Continuing to cut down and remove mature and old-growth trees and forests before the "definitions and inventory are established" and the current rulemaking is completed undermines the administration's focus on "nature-based climate solutions" for "storing large amounts of carbon."

The Forest Service must provide detailed analysis which uses readily available methods and models that represent high quality information and accurate greenhouse gas accounting (Hudiburg T. W., Regional CO2 implications of forest, 2011) (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019) when undertaking environmental reviews of logging projects on federal lands. Research, including studies done by the U.S. government (Merril, 2018) indicates that logging on federal forests is a substantial source of carbon dioxide emissions to the atmosphere. (Harris, 2016) Notably, logging emissions—unlike emissions from natural disturbances—are directly controllable. Models and methods exist that allow agencies to accurately report and quantify logging emissions for avoidance purposes at national, regional, and project-specific scales. As such, the Forest Service has the ability and responsibility to disclose estimates of such greenhouse gas emissions using published accounting methods with the express purpose of avoiding and/or reducing the greenhouse gas associated with logging, and acknowledge

the substantial carbon debt created by logging mature and old-growth trees and forests on federal lands. (Hudiburg T. W., Meeting GHG reduction targets requires accounting for all forest sector emissions, 2019) (Bartowitz, 2022)

4. The Forest Service must provide a detailed carbon analysis

To address the aforementioned fatal flaws in the PA Carbon Assessment and provide the requisite analysis NEPA requires, it must at a minimum must consider the relevant science we cite and provide the following:

- Identify and assess gross emissions from logging, particularly logging mature and old-growth trees and forests on federal lands, including the emissions from logging on site and downstream emissions through the entire chain of custody of milling, manufacturing, and transportation

- Provide a high standard of scientific support for any asserted offsets of gross emissions, including discussion of timing factors that address the carbon debit created from logging vs avoiding logging and allowing stocks to further accrue. (Moomaw, 2019) Storing some carbon in short-lived wood product pools is not compensatory as an offset or avoidance for using other carbon-intensive materials in construction. (Harmon M. , 2019)

<u>The Forest Service must also disclose direct and indirect climate impacts from removing, transporting, and milling wood.</u>

This includes emissions from loss of stored carbon during the removal at the forest (in-boundary) and manufacturing and transport process (out-of-boundary). That is, Guidance should more closely specify the need to disclose the GHG emissions from logging on site through the entire chain of custody of milling, manufacturing, and transportation, including:

- construction, reconstruction, and maintenance of logging access routes;
- all forms of logging operations (clearcut, selective, postfire, commercial thinning, etc.), including any herbicides, insecticides, and related treatments;
- transport of logs to mills;
- milling of the wood; and
- transport of products to other sectors.

These emissions and others are all foreseeable impacts of logging and thinning projects. In some cases, these impacts may be considerable. For example, the South Plateau Project in Montana, would result in at least 40,000 trips by fully loaded logging trucks to remove the 83 million board feet of timber and will involve the construction (and subsequent obliteration) of up to 57 miles of temporary road. We note that in addressing the impacts of coal mine expansions, federal agencies have disclosed the GHG emissions of equipment used to mine coal and to transport it to market. Land management

agencies can and should make similar projections for GHG pollution associated with vegetation removal projects.

As discussed above, the Forest Service routinely asserts that the impacts of logging on carbon stores will be minimal because carbon from logged trees will be stored long-term in forest products. Such assertions are contrary to research indicating that much of the carbon stored in removed trees is lost in the near term, and little carbon is stored long-term in wood products.

For example, Hudiburg et al. (2019) evaluated the quantification of biogenic emissions in the state of Washington, which included GHG emissions from logging, but not decomposition of wood products. The study concluded that the failure to address decomposition losses amounted to as much as a 25% underestimation of carbon emissions.

Losses from decomposition vary over time and depend on the lifetime of the wood product being produced from the timber. Paper and wood chips, for example, have very short lifetimes and will release substantial carbon into the atmosphere within a few months to a few years of production. Bioenergy production and burning has been found to release more emissions than burning coal, including methane. Product disposal in landfills results in anaerobic decomposition which also releases methane. Methane has a global warming potential about 30 times that of carbon dioxide over 100 years, and over 80 times that of carbon dioxide over 20 years, magnifying the impact of disposal of short-term wood products.

Longer term wood products can store carbon for many decades, but this depends on the life of the product. To give a sense of the larger picture, a study modeling carbon stores in Oregon and Washington from 1900-1992 showed that only 23% of carbon from logged trees during this time period was still stored as of 1996. (Harmon M. e., 1996) Similarly, > 80% of carbon removed from the forest in logging operations in West Coast forests was transferred to landfills and the atmosphere within decades. Hudiburg et al. (2019) concludes that state and federal carbon reporting had erroneously excluded some product-related emissions, resulting in a 25-55% underestimation of state total CO_2 emissions from logging. Many of the aforementioned decomposition emissions could be avoided if trees were left standing, especially by protecting carbon stocks from logging of mature and old trees and forests on federal lands.

A NEPA analysis would disclose the trade-off and the importance of maintaining the stock value of mature and old trees. Such an analysis should quantify both the short-term and long-term gross and net impacts of logging projects. That will allow the Forest Service to disclose and assess the trade-offs between increasing GHG emissions via logging now—when decreases are most sorely needed—versus alleged increases in storage later. Detailed NEPA analysis would also avoid ignoring short-term carbon losses due to logging based on the erroneous assumption that the residual forest will have significantly reduced potential to have its carbon stores diminished by high-severity fires. Decades of research, however, call these sorts of blanket assertions into question. Moreover, that is

not a basis for failing to disclose emissions from the logging itself, especially in comparison to fire. Research shows that emissions from logging greatly exceed those from all natural disturbances combined (fire, insects, windstorms). (Harris, 2016)

The CEQ recently issued Guidance clarifying that agencies must address the emissions and storage impacts of project-specific vegetation removal projects, "such as prescribed burning, timber stand improvements, fuel load reductions, and scheduled harvesting."[120] The Forest Service should also assess emissions from pile burning related to forestry operations, as such actions intensify carbon release.

The nature of the global warming emergency is based on multiple points of emission sources, with each contributing to the problem cumulatively. Therefore, analysis is a critical undertaking and one for which land management agencies now have the tools to quantify the contribution of each federal action, including in cumulative effects analyses.

Given the significant climate impact of logging on federal lands, it is critical that agencies estimate and quantify greenhouse gas emissions associated with each individual logging project and provide annual estimates associated with total logging on federal lands.

The Agency must expand its abilities and expectations around accounting for logging emissions as a significant contributor to climate change in tandem with continued progress in fire emissions accounting that more accurately captures actual carbon emissions from forest fires. (Harmon et al., 2022.)

Finally, the need to provide detailed carbon accounting was a central feature in a recent U.S. District Court (Montana) decision (Center *for Biological Diversity et al v. U.S. Forest Service*; CV 22-114-M-DWM, where Judge Molloy states:

> Ultimately, "[greenhouse gas] reduction must happen quickly" and removing carbon from forests in the form of logging, even if the trends are going to grow back, will take decades to centuries to re-sequester. FS-038329. Put more simply, logging causes immediate carbon losses, while re-sequestration happens slowly over time, time that the planet may not have. FS-020739 (I[t] is recognized that global climate research indicates the world's climate is warming and that most of the observed 20th century increase in global average temperatures is very likely due to increased human-caused greenhouse gas emissions.").
>
> …NEPA requires more than a statement of platitudes, it requires appraisal to the public of the actual impacts of an individual project. …(T)he USFS has the responsibility to give the public

[120] CEQ, National Environmental Policy Act Guidance on Consideration of Greenhouse Gas Emissions and Climate Change, 88 Fed Reg. at 1206.

an accurate picture of what impacts a project may have, no matter how "infinitesimal" they believe they may be.

The Forest Service must provide the requisite analysis that acknowledges and addresses the court's opinion.

All future projects must include a thorough, in-depth analysis of its effects on the earth's climate. Management activities associated with projects will require large amounts of fossil fuel. Recent research indicates that, on an annual basis, logging and thinning emit far more carbon than wildfire. (Harris, 2016) Other research shows that logged forests sequester less carbon than untreated forests. (Campbell, 2011) (Wilson, 2021) Any and all management activities which exacerbate climate change should be removed from future projects unless they can be completely offset by including other activities which have been scientifically shown to mitigate global warming.

The earth's climate is warming substantially. Recent research indicates that, no matter what mitigation actions are initiated, human activity has already increased greenhouse gas enough to warm the planet by at least 2 – 2.5 degrees Celsius (3.6 – 4.5 Fahrenheit. Recent research which clearly shows that the total greenhouse gas emissions from logging is at least three times the levels produced during an average wildfire season.[121] (Harris, 2016)

The Forest Service ignores the large body of science on forest management's adverse effects on carbon sequestration. The Forest Service has never analyzed and disclosed the cumulative effects of overall Agency management contributions to the reduction in stored carbon and thus, to climate change.

The Forest Service fails to provide comprehensive estimates of the total amount of CO_2 or other greenhouse gas emissions caused by Agency management actions and policies—forestwide, regionally, or nationally. Instead, flying in the face of science and common sense, the Forest Service makes use of controversial science to suggest its actions and policies would be net neutral or would even help carbon sequestration. Agency policymakers seem comfortable maintaining a position that they need not take any leadership on this issue, and obfuscate to justify their failure of leadership.

The best scientific information strongly suggests that management that involves removal of trees and other biomass is a strong net source of atmospheric CO_2. If the Forest Service really believes its carbon modeling can provide meaningful information, it should model the carbon flux over time for all of its proposed stand management scenarios for each of the forest types on the Lolo National Forest.

[121] Oregon Department of Energy, 2018 Biennial Energy Report - https://energyinfo.oregon.gov/2018-ber

GHG emissions from all common human activities related to forest management and recreational uses must be analyzed. These include emissions associated with machines used for logging and associated activities, vehicle use for administrative actions, recreational motor vehicles, and most emissions associated with livestock grazing. The Forest Service is simply ignoring the impacts of these management and other authorized activities.

Such greenhouse gas sources can be quantified. Kassar and Spitler (2008) for example, provide an analysis of the carbon footprint of off-road vehicles in California. They determined:

> Off-road vehicles in California currently emit more than 230,000 metric tons — or 5000 million pounds — of carbon dioxide into the atmosphere each year. This is equivalent to the emissions created by burning 500,000 barrels of oil. The 26 million gallons of gasoline consumed by off-road vehicles each year in California is equivalent to the amount of gasoline used by 1.5 million car trips from San Francisco to Los Angeles.
>
> Off-road vehicles emit considerably more pollution than automobiles. According to the California Air Resources Board, off-road motorcycles and all-terrain vehicles produce 118 times as much smog-forming pollutants as do modern automobiles on a per-mile basis.
>
> Emissions from current off-road vehicle use statewide are equivalent to the carbon dioxide emissions from 42,000 passenger vehicles driven for an entire year or the electricity used to power 30,500 homes for one year. (Kassar, 2008)

Sylvester, 2014 provides data on the amount of fossil fuel being consumed by snowmobiles in Montana, from which one can calculate the carbon footprint. The study finds that resident snowmobilers burn 3.3 million gallons of gas in their snowmobiles each year and a similar amount of fuel to transport themselves and their snowmobiles to and from their destination. Non-residents annually burn one million gallons of gas in snowmobiles and about twice that in related transportation. That adds up to 9.6 million gallons of fuel consumed in the pursuit of snowmobiling each year in Montana alone. Multiply that by 20 pounds of carbon dioxide per gallon of gas (diesel pickups spew 22 pounds per gallon) and snowmobiling releases 192 million pounds (96 thousand tons) of climate-warming CO_2 per year into the atmosphere. (Sylvester, 2014)

The Agency also ignores the cumulative CO_2 emissions from forest management on other ownerships in the region or beyond. Clearly timber management continues to be a net source of CO_2. Omitting such a cumulative effects analysis allows the Forest Service to avoid describing the opportunity found on national forests to counterbalance some CO_2 emissions from other forest ownerships, resulting in a range of alternatives where none really address climate change. This violates NEPA, as well as the public trust.

The Agency typically does not analyze or disclose the body of science that implicates logging activities as reducing carbon stocks in forests and increasing greenhouse gas (GHG) emissions. The Forest Service misleads the public, distracting from the emerging scientific consensus that removing wood or any biomass from the forest only makes the problem worse. The science on climate change strongly indicates that forest policies must shift away from logging if carbon sequestration is a genuine emphasis. All old-growth forest areas, other unlogged or lightly logged forests, and healthy grasslands must be preserved indefinitely for their carbon storage value. Forests that have been logged should be allowed to eventually revert to old-growth condition. This type of management has the potential to double the current level of carbon storage in some regions. (Harmon M. a., 2002) (Harmon M. E., 2001) (Harmon M. E., (1990) Effects on carbon storage of conversion of old-growth forest to young forests, 1990) (Homann, 2005) (Law B. E., Role of Forest Ecosystems in Climate Change Mitigation, 2014)

Keith et al., 2009 state:

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

Our insights into forest types and forest conditions that result in high biomass carbon density can be used to help identify priority areas for conservation and restoration.

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

> It has been suggested that thinning trees and other fuel-reduction practices aimed at reducing the probability of high-severity forest fire are consistent with efforts to keep carbon (C) sequestered in terrestrial pools, and that such practices should therefore be rewarded rather than penalized in C-accounting schemes. By evaluating how fuel treatments, wildfire, and their interactions affect forest C stocks across a wide range of spatial and temporal scales, we conclude that this is

> extremely unlikely. Our review reveals high C losses associated with fuel treatment, only modest differences in the combustive losses associated with high-severity fire and the low-severity fire that fuel treatment is meant to encourage, and a low likelihood that treated forests will be exposed to fire.
>
> Although fuel-reduction treatments may be necessary to restore historical functionality to fire-suppressed ecosystems, we found little credible evidence that such efforts have the added benefit of increasing terrestrial C stocks. (Campbell, 2011)

The most recent U.S. report of greenhouse gas emissions states that our forests currently "offset" 11 to 13 percent of total U.S. annual emissions. That figure is half that of the global average of 25% and only a fraction of what is needed to avoid climate catastrophe.

And while the U.S. government and industry continue to argue that we need to increase markets for wood, paper, and biofuel as climate solutions, the rate, scale, and methods of logging in the United States are having significant, negative climate impacts, which are largely being ignored in climate policies at the international, national, state, and local levels.

The actual carbon stored long-term in harvested wood products represents less than 10 percent of that originally stored in the standing trees and other forest biomass. If the trees had been left to grow, the amount of carbon stored would have been even greater than it was 100 years prior. Therefore, from a climate perspective, the atmosphere would be better off if the forest had not been harvested at all. In addition, when wood losses and fossil fuels for processing and transportation are accounted for, carbon emissions can actually exceed carbon stored in wood products.

Law and Harmon, 2011 conducted a literature review and concluded: Thinning forests to reduce potential carbon losses due to wildfire is in direct conflict with carbon sequestration goals, and, if implemented, would result in a net emission of CO_2 to the atmosphere because the amount of carbon removed to change fire behavior is often far larger than that saved by changing fire behavior, and more area has to be harvested than will ultimately burn over the period of effectiveness of the thinning treatment. (Law & Harmon, Forest sector carbon management, measurement and verification, and discussion of policy related to mitigation and adaptation of forests to climate change, 2011)

Moomaw and Smith, 2017 state:

> Multiple studies warn that carbon emissions from soil due to logging are significant, yet under-reported. One study found that logging or clear-cutting a forest can cause carbon emissions from soil disturbance for up to fifty years. Ongoing research by an N.C. State University scientist studying soil emissions from logging on Weyerhaeuser land in North

> Carolina suggests that "logging, whether for biofuels or lumber, is eating away at the carbon stored beneath the forest floor."

Moomaw and Smith, 2017 examined the scientific evidence implicating forest biomass removal as contributing to climate change:

> All plant material releases slightly more carbon per unit of heat produced than coal. Because plants produce heat at a lower temperature than coal, wood used to produce electricity produces up to 50 percent more carbon than coal per unit of electricity.
>
> Trees are harvested, dried, and transported using fossil fuels. These emissions add about 20 percent or more to the carbon dioxide emissions associated with combustion.
>
> Protecting and expanding forests is not an "offset" for fossil fuel emissions. To avoid serious climate disruption, it is essential that we simultaneously reduce emissions of carbon dioxide from burning fossil fuels and bioenergy along with other heat trapping gases and accelerate the removal of carbon dioxide from the atmosphere by protecting and expanding forests. It is not one or the other. It is both!

Achieving the scale of forest protection and restoration needed over the coming decades may be a challenging concept to embrace politically; however, forests are the only option that can operate at the necessary scale and within the necessary time frame to keep the world from going over the climate precipice. Unlike the fossil fuel companies, whose industry must be replaced, the wood products industry will still have an important role to play in providing the wood products that we need while working together to keep more forests standing for their climate, water, storm protection, and biodiversity benefits.

It may be asking a lot to "rethink the forest economy" and to "invest in forest stewardship," but tabulating the multiple benefits of doing so will demonstrate that a forest is worth much more standing than logged. Instead of subsidizing the logging of forests for lumber, paper and fuel, society should pay for the multiple benefits of standing forests. It is time to value U.S. forests differently in the twenty-first century. We have a long way to go, but there is not a lot of time to get there.

XIII. Soil Biota - Mycorrhizae

A. The EIS must consider and address our previous comments on the Draft Assessment

In response to the draft Assessment, we provided detailed information regarding soil biota, and in particular the value of mycorrhizae in the context of ecosystem services and overall ecological

sustainability.[122] We included an overview of the general mycorrhizal scientific background, including the fact that many studies report declines in mycorrhizal fungi due to various causes including land use change, invasive species, pollution deposition, and herbicide use (e.g. Meinhardt & Gehring 2012; Swaty et al. 2016; Lilleskov et al. 2019). Climate change also threatens the type of mycorrhizal fungi known to best support carbon sequestration called ectomycorrhizal fungi (EMF)(Baird & Pope 2021). In addition, disturbances such as logging and thinning (Wiensczyk et al. 2002), fragmentation and edge habitat (e.g. Sapford et al. 2020; Tatsumi et al. 2023) the treatment of invasive vegetation with pesticide (Helander et al. 2018), or self-reinforcing soil legacies left after invasion by exotic vegetation (e.g. Meinhardt & Gehring 2012; Anthony et al. 2019), may quietly continue to reduce beneficial fungi, if these impacts are not recognized and specifically addressed as part of land management planning (Davoodian 2015; May et al. 2018; Willis 2018; Markovchick et al. 2023). These effects are not short-term, and ripple throughout the ecosystem, as evidenced by study after study that shows the need for, and effectiveness of, restoring diverse native mycorrhizal communities after various kinds of disturbance. For example, Pankova et al. (2018) found that a single fungicide application left mycorrhizal inoculum and plant outcomes far from reference levels even after five years.

Given our Draft Assessment comments, we hoped to see mychorrizae receive more consideration in the Revised Assessment and specific plan components dedicated to discussing how soil biota and mycorrhizae support ecosystem sustainability and all the ecosystem services we listed in our comments. Unfortunately, the Forest Service failed to acknowledge the role mycorrhizae serve, and even asserted that logging could be beneficial:

> Harvesting timber and addressing fuels reduces the above ground biomass on a site and thus the residual vegetation has high value towards contributing to soil function as both mulch and substrate for soil nutrient cycling.[123]

To be clear, even if residual vegetation (slash) provides some soil benefits, those are likely vastly outweighed by timber harvest impacts and associated activities such as road construction or post-harvest herbicide application. This in addition to the loss of soil moisture from the increased solarization of exposed soils, or the impacts from any intentional post-harvest burning of slash piles and broadcast burns. It is beyond credulity to assert that logging benefits soil biota and the ecosystem services mycorrhizae provide. The Forest Service must better address the comments we provided on this issue in its Revised Plan EIS. In doing so, the agency must pay particular attention to the role of common mycorrhizal networks.

Although the exact function of common mycorrhizal networks (the roots of separate plants linked by a network of fungal strands) is challenging to ascertain under field conditions, even critics recognize their existence in the field and demonstrated functions under controlled conditions (e.g. Karst et al. 2023),

[122] See Draft Assessment comments, Ex. 3. We provide a list of supporting citations for both our Draft Assessment comments and our comments herein in a dedicated cited literature section below.
[123] RA at 196.

and evidence in field is “solid and accumulating” (Klein et al. 2023). For example, these underground networks are known to share resources between trees, shrubs, and other understory plants in the field, with some plants known as mycoheterotrophs being entirely dependent on this setup (e.g. Karst et al. 2023; Selosse et al. 2006). Under laboratory conditions, the use of autoradiography, dye tracers, and air gap treatments provide convincing evidence that resources are shared via the connections between plants provided by mycorrhizal fungi, including carbon (e.g. Finlay et al. 1986; Brownlee et al. 1983; Wu et al. 2001), phosphorus (e.g. Finlay 1989), water (e.g. Warren et al. 2008; Plamboeck et al. 2007; Egerton-Warburton et al. 2007), and defense signals (Babikova et al. 2013). This ability to spread resources (Peay et al. 2016) in the field would reduce risk and increase the inherent stability of ecosystems the way that financial portfolios reduce the risk of investing (Schindler et al. 2015).

While trees communicate chemically all the time through the volatile organic chemicals they produce wafting through the air, research indicating communications and resources are shared through soil, root systems, and common mycorrhizal networks (e.g. Babikova et al. 2013; Bingham & Simard 2011; Simard et al. 2015) poses special new questions for the land and natural resources communities, due to the ability of land management actions to impact the soil community. If the ability of trees to communally send stronger insect control signals or share resources in times of need is impacted by current tree density reduction practices, as suggested by the scientific literature referenced herein, then the government would be liable for ignoring this large body of science, and the impact of its actions. Even the critics of the available current technologies acknowledge that given what we know about plant and fungal biology, these underground linkages, “should be common” (Karst et al. 2023), and the indications of the science are clear - this issue is not constrained to one or a few environments or biomes.

B. The Forest Service must include plan components that maintain or restore soils, particularly soil biota

The 2012 National Forest System Land Management Planning Rule (Planning Rule) requires revised or amended land management plans (i.e. Forest Plans) to provide for ecological sustainability, including ecosystem integrity, which necessitates “standards or guidelines, to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems.” 36 C.F.R. §219.8(a)(1). Further, the Forest Plans must include components, including standards or guidelines, to maintain or restore soils. §219.8(a)(2)(ii). Mycorrhizal fungi, known to be ecological drivers of soil productivity, erosion protection, sedimentation protection, and water quality and resources, receive no standards or guidelines. Further, in order to ensure ecosystem integrity the 2012 Planning Rule directs the agency to include plan components to maintain or restore function. §219.8(a)(1). Function is specifically defined as “Ecological processes that sustain composition and structure, such as energy flow, nutrient cycling and retention, soil development and retention….” (§ 219.19). The 2012 Planning Rule also requires Forest Plans to include standards or guidelines “to maintain or restore the ecological integrity of riparian areas.” §219.8(a)(3). Although mycorrhizal fungi are known to play important roles in riparian

ecosystems, protection against sedimentation, and filtering and protecting water resources, they receive no attention in the riparian-specific portions of the plan or project either. And although this section of the rule requires, "plan components, including standards or guidelines, to guide the plan area's contribution to social and economic sustainability, taking into account:…(4) Ecosystem services….," the Revised Assessment fails to acknowledge the vast scientific literature regarding mycorrhizal-provided ecosystem services, and the Proposed Action lacks sufficient standards or guidelines providing for their protection and restoration. § 219.8(b).

The need for better and additional plan components with supporting analysis in the Revised Plan EIS is further demonstrated by looking at the Forest Service Manual (FSM). It includes a specific objective that "Ecosystems are ecologically or functionally restored so that over the long term they are resilient and can be managed for multiple use and provide ecosystem services, including but not limited to carbon storage and sequestration." (FSM 2020.2). Further, the manual directs that "Responsible soil stewardship [promotes and sustains], biological and hydrologic function, [and that], chemical, physical, and biological soil properties [will all be used to] assess existing soil condition for watershed condition and ecological assessments." (FSM 2550.3). Yet, as a main driver of restoration, resiliency, and ecosystem services including hydraulic lift and water infiltration, retention, and efficient use by vegetation, mycorrhizal fungi are nowhere to be found in the Revised Assessment or the Proposed Action. In fact, no biological aspects of the soil appear to be included in the monitoring section.

In addition, the manual defines biological properties that support "the productive capacity of the land, its ecological processes, such as hydrological function of watersheds, and… ecosystem services" as part of desired soil conditions. (FSM 2550.5). This in fact seems to specifically point to soil biota such as mycorrhizal fungi as something to be monitored and supported.

The Forest Service also directs the following: "Use adaptive management (FSM 1905) to design and implement land management activities in a manner that achieves desired soil conditions and objectives….," monitor soil conditions and trends to ensure that soil and water conservation practices are implemented and effective…, [and] "Determine how changes in soil properties will affect desired soil conditions and objectives related to ecosystem function." (FSM 2551.03). Yet, it is unclear how the agency could possibly meet this direction without the necessary plan components, which appear to be lacking in the PA, especially in regards to monitoring, and the protection and restoration of mycorrhizal fungi. The omission is glaring given the extensive evidence of the roles they play in ensuring ecosystem services, productivity, and unimpaired future functioning of the land in all the ways laid out in the Forest Service Manual. In fact, the manual section on monitoring calls for monitoring sufficient "to determine the soil condition and the cause and effect relationships associated with those conditions…." [and] "Use soil quality monitoring to validate and refine management decisions." (FSM 2551.13) The information collected allows land managers "to determine if land management plan desired conditions are being achieved." *Id.* This section clearly states, "The major objective of soil quality monitoring

is to ensure that ecologically sustainable soil management practices are being applied…. " [and] "Monitoring is conducted to detect changes in physical, chemical, or biological soil properties caused by management activities." *Id.* Since no monitoring of mycorrhizal fungi is included in the PA, clearly the intent of the manual is not being carried out.

The manual also states that "current science and key soil functions and attributes/indicators/soil properties representing those functions" should be considered in developing land management monitoring, standards and guidelines. (FSM 2551.3). Despite this, at least one entire Kingdom which helps to determine soil functioning, and enormous scientific evidence demonstrating the key soil functions that mycorrhizal fungi in particular contribute appears to be entirely ignored.

"The focus of forest plan monitoring is to gauge the progress toward achieving or maintaining the desired conditions and objectives." (FSM 2551.61). When these desired conditions and objectives, as set forward by the FSM, clearly include key biological players in soil function such as mycorrhizal fungi, how can they be resoundingly ignored?

Not only does the FSM clearly state in all the passages above, that key soil biology such as mycorrhizal fungi should be the focus of desired conditions, standards and guidelines, and monitoring. The section of the FSM that deals with invasive vegetation also makes it clear that these key players must be monitored, protected, and restored. The manual also clearly states that objective must be to:

> limit the adverse effects of those infestations on native species, human health, and other National Forest System resources [and] implement restoration, rehabilitation, and/or revegetation activities following invasive species treatments to prevent or reduce the likelihood of the reoccurrence or spread of aquatic or terrestrial invasive species.

(FSM 2902). Based on the overwhelming scientific evidence, this simply cannot be achieved without restoring diverse communities of native mycorrhizal fungi appropriately paired to site conditions and planting materials after most invasions by exotic vegetation. In fact, the Forest Service clearly acknowledges that integrated pest management requires "an ecologically-based holistic strategy that relies on natural mortality factors, such as natural enemies, weather, and environmental management, and seeks control tactics that disrupt these factors as little as possible [specifically including] biological…techniques." (FSM 2902). Based on an overwhelming amount of the best available scientific information, mycorrhizal fungi are key to both managing invasive vegetation, and restoring full function and diversity after invasions. Yet, again, they appear nowhere in this project or forest plan.

In sum, the Proposed Action lacks adequate components to incorporate the Forest Service's own directives, and the Revised Assessment failed to address the issues we raised, including evaluating the ecosystem services mycorrhiza help support. The Forest Service must address these gaps in any alternative considered in the Revised Plan's EIS and its supporting analysis that

must demonstrate how the current Forest Plan provides for ecological sustainability of soils and native mycorrhizal fungi.

XIV. Grazing

The issue of public land livestock grazing is a great concern for our organizations, and the PA provides a number of plan components, including standards and guidelines, meant to achieve the applicable desired conditions, but the PA lacks a specific desired condition that actually states grazing operations will not degrade habitat conditions and will support ecosystem integrity. "At the writing of the proposed action, there are 11 active grazing allotments occupying just over 200,000 acres in the LNF." PA at 102. It is important for the agency to ensure the Revised Plan meets the preliminary need to change (PNC), and here the PA fails. For example, there is a need to clearly provide adequate guidance for vacant allotments, which the PNC describes as "guidance for the management of vacant allotments" (PNC, 18). Yet, the PA lacks sufficient guidance that directly addresses vacant allotments and/or canceled, waived, or relinquished permits. One very effective way to achieve desired conditions in the livestock program is to retire and/or close vacant allotments when the opportunity arises. As the LNF has acknowledged in previous documents associated with this plan revision, livestock grazing activities have and will likely continue to decrease across the forest in the years to come. One of the sure fire ways to reduce the impacts of livestock grazing and achieve a desired condition that supports ecosystem integrity is to reduce this activity through allotment closure when the opportunity arises. There we propose a standard that directs the following:

- Grazing privileges that are lost, waived, relinquished, or canceled, must have the attached AUMs held for watershed protection, predator conflict reduction, and wildlife habitat in perpetuity.

Further, another need from the PNC that does not appear to have been carried over into the PA is the inclusion of components that "minimize intermingling and conflicts between domestic and wild animals" (PNC, 18). The PA should include standards that ensure the implementation and/or incorporation of non-lethal conflict reduction measures into all grazing permits, AMPs, and AOIs. In particular, there needs to be forest-wide management standards that ensure livestock permittees contribute to the recovery of threatened and endangered species, such as grizzly bears. Standards should include specific, enforceable measures to reduce livestock-grizzly conflict. Here is a list of relevant permit provisions that would satisfy this:

- Electric fencing around calving areas;
- Required removal of birthing material;
- Required removal and composting of carcasses;
- Required range riding;
- Hazing carnivores away from livestock;
- Delaying turnout until calves are greater than 200 lbs.;

- Delaying turnout to coincide with native ungulate calving season.

Not only would these provisions facilitate adaptation to the ongoing recolonization of the LNF by grizzly bears, some of these measures (i.e. required range riding) would also help to achieve other plan components, like the improvement of riparian zones and the prevention of grazing-caused degradation. Range riders can monitor livestock and keep them moving before an area is overgrazed or otherwise negatively impacted, while also providing a predator deterrent.

Overall, the PA fails to adequately address the multiple streams on active grazing allotments that Montana DEQ lists as impaired under the Clean Water Act due ***specifically*** to livestock grazing. For example, Sixmile Creek, which runs through the Edith-Sixmile Allotment, is listed as impaired by DEQ due to "Alteration in stream-side or littoral vegetative covers" as a result of "Rangeland Grazing". Similarly, the Little Thompson River, which runs through the Little Thompson Allotment is listed as impaired by DEQ due to "Nitrogen", "Phosphorous", "Alteration in Streamside or Littoral Vegetative Cover", and "Sedimentation/Siltation" all of which are attributed to "Grazing in Riparian or Shoreline Zones." Finally, Henry Creek on the Henry Creek Allotment is listed as impaired due to "Alteration in stream-side or littoral vegetative covers" and "Sedimentation/Siltation" due to "Grazing in Riparian or Shoreline Zones." [124] The Forest Service must disclose and analyze these and other livestock caused impairments in its Revised Plan EIS, and then include standards and guidelines to incorporate explicit measures into AMPs, AOI's and permit terms and conditions that seek to immediately rectify this problem—up to and including full exclusion of livestock from riparian areas. These impairments have existed on these streams for a decade or more, clearly implicating current grazing management on the LNF. The contributions to these impairments by LNF authorized grazing must be quantified, acknowledged, and addressed through substantive changes to the grazing regime on these allotments.

Finally, the PA must include specific provisions to address long-standing deficiencies in how the Forest Service monitors active grazing allotments. What evidence there is of past monitoring on the LNF is sparse and it is clear that this crucial management tool has not been undertaken at the level needed to ensure livestock operations are not causing ecological damage, especially when it comes to riparian areas. These areas are particularly sensitive to livestock impacts and are ecologically crucial for a host of species. Implementation of a required annual monitoring regime for each and every active allotment is the only way to ensure protection of these areas. A biennial Forest Plan monitoring report is insufficient. Consistent, required monitoring is the only way to ensure that permit terms and conditions are being adhered to. As this coalition previously noted in comments provided for the Draft Assessment, the LNF has not implemented an effective and reliable system. The complete lack of monitoring documents in FOIA releases going back

[124] All of this can viewed on the interactive map found on Montana DEQ's Clean Water Act Information Center website: https://gis.mtdeq.us/portal/apps/webappviewer/index.html?id=708aae89f060403db2710378ac4945f0

several years clearly shows that it is simply not occurring on a regular and consistent basis. This plan revision is an opportunity to remedy that by implementing a structured monitoring program.

Conclusion

We appreciate the Forest Service's time and effort carefully considering and addressing our comments. As the agency moves forward developing its range of alternatives and preparing the Draft EIS, our organizations are available to discuss any portion of these comments and provide supporting information, including GIS files.

Cordially,

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Exhibits (enclosed)

1. March 12, 2024 Leader's Message
2. The Lolo-Bitterroot Partnership: A Citizen Plan For Fish, Wildlife & Forests
3. FLBCTF et al. comments on Lolo Assessment and SCC
4. WildEarth Guardians. 2020. The Environmental Consequences of Forest Roads and Achieving a Sustainable Road System .
5. Bader M, P Sieracki. 2024. Natural Grizzly Bear Repopulation in the Greater Bitterroot Ecosystem. Technical Report 01-24. WildEarth Guardians, Flathead-Lolo-Bitterroot Citizen Task Force. Missoula, MT. 22p.

6. Bader & Sieracki. 2022. Proposed Grizzly Bear Management Units on the Lolo, Bitterroot and Select Portions of the Beaverhead-Deerlodge National Forests, Montana, USA.
7. Wildlands CPR. 2011. Policy Primer - Watershed Condition Framework Synopsis and Review.
8. Western Environmental Law Center Comments re: Interim Wolverine 4d Rule January.19.2024.
9. Administrative Record for Docket No. FWS-R6-ES-2023-0216 (provided separately due to CARA limitations).
10. Juel, Jeff. 2021. Management Of Old Growth In The U.S. Northern Rocky Mountains: Debasing the concept and subverting science to plunder national forests.
11. Friends of the Clearwater comments re: "Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System." Federal Register / Vol. 88, No. 243 / Wednesday, December 20, 2023.
12. Multi-organizational comments re: Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System." Federal Register / Vol. 88, No. 243 / Wednesday, December 20, 2023.
13. Wild Heritage comments re: "Land Management Plan Direction for Old-Growth Forest Conditions Across the National Forest System." Federal Register / Vol. 88, No. 243 / Wednesday, December 20, 2023.
14. Coalition Comments Nationwide Old Growth Plan Amendments, Federal Register / Vol. 88, No. 243 / Wednesday, December 20, 2023.
15. Coalition Comments for defining mature & old growth per 87 FR 42493
16. Friends of the Clearwater Comments for defining mature & old growth per 87 FR 42493
17. Friends of the Wild Swan Comments for defining mature & old growth per 87 FR 42493
18. Wild Heritage Comments for defining mature & old growth per 87 FR 42493
19. Citizen reVision: Desired Future Condition of the Bitterroot, Flathead & Lolo National Forests
20. Coalition Comments re: U.S. Forest Service. "Advance Notice of Proposed Rulemaking and Request for Comments." 88 Fed. Reg. 24,497 (April 21, 2023).
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