

Data Submitted (UTC 11): 9/16/2024 4:00:00 AM

First name: Clinton

Last name: Nagel

Organization: Gallatin Wildlife Association

Title: President

Comments: Dear Director Ecosystem Management Coordination:

Please accept the attached comments as those representing the Gallatin Wildlife Association of Bozeman, Montana. We find the current proposal on the National Old Growth Forest Amendment falling far short of the intended goals and mission of Executive Order 14072 and the directive of the Biden Administration to utilize our Nation's forest to mitigate climate change.

Thank you,

Clinton Nagel, President

Gallatin Wildlife Association

September 16, 2024

Director, Ecosystem Management Coordination

201 14th Street SW

Mailstop 1108

Washington, DC 20250-1124

Subject: Old Growth Forest Amendment

Dear Director:

As you know, the long-awaited Draft Environmental Impact Statement (DEIS) for the National Old Growth Forest

Amendment (known as NOGA) was released by the U.S. Forest Service (USFS) and published in the Federal Register on June 21 of this year. This is a result of President Biden's Executive Order 14072 directing the Department of Agriculture to develop policies to mitigate climate change and to instill in place policies to address threats to mature and old-growth forests on Federal lands.

The Gallatin Wildlife Association (GWA) would first like to thank this administration for taking this bold step forward. As far as we know, there has never been a national policy or action to address the management of mature and old-growth forests on public land. This approach is long overdue. The management of said forests until now has been the responsibility of 128 forest land management plans across 193 million acres. Needless to say, this is a tall order, but the importance and timing of this action could not come at a more critical time in our Nation's history. Even so, GWA believes this process should have been in place many, many years ago. First, a little bit of information as to who we are.

Gallatin Wildlife Association (GWA) is a local, all volunteer wildlife conservation organization dedicated to the preservation and restoration of wildlife, fisheries, habitat and migration corridors in Southwest Montana and the Greater Yellowstone Ecosystem, using science-based decision making. We are a nonprofit 501(c)(3) organization founded in 1976. GWA recognizes the intense pressures on our wildlife from habitat loss and climate change, and we advocate for science-based management of public lands for diverse public values, including but not limited to hunting and angling.

In our comments, GWA will provide science and sound reasoning to help justify our position as we firmly believe in utilizing our Nation's Forest to help mitigate the effects of climate change. We will first begin with the introduction of a premise, a new paradigm if you will, one which GWA has adopted over the past several years.

New Paradigm is Necessary for the United States Forest Service:

Before we begin with the details of the DEIS, GWA would like to formally and officially state, that it is past time for the USFS to adopt a new paradigm. It is so much past time that now our planet is facing an existential threat from a warming world. We have discussed this paradigm in many of our previous comments to help guide local and regional USFS forest managers to begin installing a new direction in forest management. But we have done so, without much avail. This is an obvious direction that must be implemented from national headquarters.

This is a premise very relatable to this product (the DEIS) and to future actions of the USFS. The National Old-growth Forest Amendment (NOGA) could become a substantial part of the simple concept of allowing a forest to be a forest. It would restore a basic concept and make a significant contribution to our planet; a concept and contribution that has always been but perhaps long forgotten. We're simply stating that forests should be managed to do what they do best, sequester carbon.

The preservation of our forests for the sake of sequestering carbon has far more value to our society than the traditional way our forests have been managed. The justification for managing forests differently has been completely missing from many forest land management plans. Forests have been taken for granted whereby they have always been seen as a resource to be extracted or exploited rather than a resource that could provide stability to life on earth. Thereby they have become heavily managed, which begets more management, which begets mismanagement over time.

At the very minimum, this new paradigm could be incorporated into and under the Multiple Use and Sustain Yield Act of 1960, an approach that could assist in the fulfillment of many other USFS's multiple-use objectives. The USFS's main mission, the protection of watershed resources and water quality would be enhanced as well as maintaining wildlife habitat. All these goals are the purpose and mission of USFS auspices as well as forest

integrity, biodiversity, and the sequestering of carbon. All are at the main focal point of Executive Order 14072.

To make our case, GWA would like to reference our first scientific article entitled "Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States" by DellaSala, Dominick A1. We want to bring to the attention of USFS officials, the first statement in the report.

"Mature and old-growth forests (MOG) of the conterminous United States collectively support exceptional levels of biodiversity but have declined substantially from logging and development. National-scale proposals to protect 30 and 50% of all lands and waters are useful in assessing MOG conservation targets given the precarious status of these forests."

But the following statement found in the Introduction highlights the relationship between climate and biodiversity, again, the main focal point of Executive Order 14072.

"Old-growth forests (the most structurally advanced stage) generally have exceptional levels of biodiversity compared to logged forests (the least structurally advanced) (Luyssaert et al., 2008; Keith et al., 2009; Lindenmayer et al., 2012, 2014; Cannon et al., 2022). However, because of the timber value of older trees they are declining globally (Lindenmayer et al., 2012, 2014; Mackey et al., 2014). The loss of old-growth forests is coupled with changes to the global climate (Lawrence et al., 2022), reducing opportunities for natural climate solutions (Griscom et al., 2017; Moomaw et al., 2019)."

This is an important emphasis of NOGA, is it not? GWA is asking the USFS to move to a new paradigm, one on a larger scale, to incorporate the value of our forests, to help encapsulate carbon as an answer to a warming world. We need to let our forest be a forest. Let them sequester carbon, provide biodiversity, and let them maintain their forest integrity. Not only are these the main focal points of NOGA, but they very easily could become incorporated into the Multiple Use and Sustained Yield Act. Providing a new and an important emphasis of preserving our forests reinforces the argument as to why we need to maintain our forests intact.

Purpose of and Need for Action:

GWA believes it is safe to say that the purpose and need for action today is the result of inaction of the past. The identification and management of mature and old-growth forests is an action that the National Forest System (NFS) should have undertaken a long time ago. It would have served them well to do so, on so many issues, but they did not. By reading the Summary of the DEIS, one gets the impression they still wouldn't have done so if it weren't for President Biden's Executive Order 14072. Perhaps GWA is wrong in that assumption, but if true, that is unfortunate.

GWA believes one advantage of the President's EO is that it brings attention to the issue, an issue that has been ignored for far too long. However, how we as a society address and take advantage of this opportunity remains to be seen. It is true, the issue of old-growth forest is not an easy issue to address. One reason is the question over the definition of old growth itself. The NFS has never defined the condition on a national scale, at least not one that fully encompasses the satisfaction of many.

Forests are so different in species composition, geography, climate, and other environmental factors; those differences make the issue hard to define and hard to delineate. But for the purposes of this EO, USFS puts forth the effort and defines old growth in this DEIS during their discussion on page 4.

{{PDF highlighting start}} "Old-growth forests are dynamic systems distinguished by old trees and related structural attributes. Old-growth encompasses the later stages of stand development that typically differ from

earlier stages in a variety of characteristics, which may include tree size, accumulations of large dead woody material, number of canopy layers, species composition, and ecosystem function {{PDF highlighting stop}} (USDA Forest Service 1989)."

Further down in the discussion on page 4 there is this clarification concerning the definition of old growth.

{{PDF highlighting start}} "Old-growth forests throughout the National Forest System are defined by the nine Forest Service administrative regions for differing vegetation types, as well as in some individual land management plans. {{PDF highlighting stop}} Regional old-growth criteria rely on structural characteristics and include an attribute that captures the abundance of large trees - specifically, minimum live trees per acre of a minimum size and/or minimum basal area of live trees. Many regional criteria also set a minimum stand age or tree age, and some include standing snags or downed wood. Each region recognizes important ecological variation by defining unique old-growth criteria for different vegetation types."

This paragraph coincides with our statement above.

The Non-inclusion of Mature Forests: An overall weakness in this amendment: In this amendment's attempt to address old growth, there exists a weakness in this DEIS that perpetuates the mistakes of the past. That being, by ignoring "mature" forests, we are ignoring solutions to the future.

The statement below makes the following clarification on page 1.

{{PDF highlighting start}} "Definitions and inventories have been established for forests exhibiting old-growth conditions, but mature forest conditions had not previously been ecologically defined in a consistent manner at a national scale. {{PDF highlighting stop}} This initial inventory resulted in the Forest Service identifying an estimated 24.7 million acres of old-growth forests and 68.1 million acres of mature forest conditions, representing 17 and 47 percent, respectively, of the 144.3 million acres of forested National Forest System lands."

This exercise mandated by the EO is of high value because it addresses an issue long overdue in forest management. But in doing so, it neglects the forest condition of the future, that of mature forests. The DEIS makes the statement, the mature forests of today will be the old-growth forests of tomorrow. While we agree with this true and obvious fact, the DEIS ignores the discussion of corrective steps to help manage that condition, which means the NFS will just perpetuate the continued mismanagement going forward. The old-growth forests of today will not be here tomorrow and so by not taking steps to manage the mature forests of today in a protective and proactive manner, it will leave our future old-growth forests very much in question.

In practical terms, it would be hard to manage the preservation of old-growth forests without the consideration of mature forests. If you don't have knowledge of the distribution or abundance of where these forests are located, it would be nearly impossible to manage them for the future. That is the other purpose and need of this amendment, to inventory these forest conditions. The following statement on page 2 of the DEIS makes an interesting claim.

{{PDF highlighting start}} "The analysis found that mortality from wildfires is currently the leading threat to mature and old-growth forests, followed by insects and disease. {{PDF highlighting stop}} The analysis also found that tree cutting is now a relatively minor threat compared to climate amplified disturbances such as wildfire, insects, and disease. {{PDF highlighting start}} However, past management practices, including timber harvest and fire suppression, contributed to current vulnerabilities in the distribution, abundance, and resilience of old-growth forest characteristics. The amount and distribution of mature forests across the National Forest System suggest that many of these lands have the inherent capability to sustain old-growth forests into the future." {{PDF highlighting stop}}

The threats to old growth are abundant and because of climate change they are amplified. The latter statement above is why USFS officials need to be cognitive and apply the best and wise use of forest-management knowledge and techniques to future forest decisions, meaning "mature" forests.

Actions Undermining the Purpose of this Amendment: It is an issue GWA has raised so many times on many individual Forest Service projects; the likelihood the agency is undermining their own purpose of creating sustainable forests by instilling practices of logging, thinning, and other vegetative treatments. In other words, the USFS could be removing trees with genetic material that could help maintain forests sustainability during the threats of wildfires, disease, pests, and climate change. The issue of thinning and vegetative treatments could very well be releasing untold harm on the very trees necessary for the forest integrity and sustainability needed to exist.

In this context, GWA believes it is critical to discuss an action that is subversive to the subject at hand. These actions undermine the purpose and function of this amendment, and to the ability and purpose of a forest to maintain its own integrity and sustainability. There is a name for the action we are discussing; some call it "genetic erosion". Author Deborah Rogers² states in her scientific paper "Genetic Erosion: No longer just an agricultural issue" the following in her Abstract.

{{PDF highlighting start}} "Genetic erosion is the loss of genetic diversity[mdash]often magnified or accelerated by human activities. In native plant populations, genetic erosion results from habitat loss and fragmentation, but it also can result from a narrow genetic base in the original collections or by practices that reduce genetic diversity."{{PDF highlighting stop}}

Further on in the article there is this statement.

{{PDF highlighting start}} "The term "genetic erosion" is now more generally applied to loss of genetic diversity, including the loss of diversity in native plant species. {{PDF highlighting stop}} But just as the term "climate change" is more commonly understood to represent an accelerated change in climate patterns, which reflects human influences rather than simply natural cycles, {{PDF highlighting start}} "genetic erosion" is more often used in the context of human-driven or -related losses in genetic diversity that are faster in rate or larger in scale than would be expected under natural processes alone." {{PDF highlighting stop}}

We find it strange that on a topic that is so fundamental to the practices and goals of creating a sustainable forest, which is supposedly the rationale by the USFS to manage the forests as they do, the issue of genetic erosion was not discussed. The phrase "genetic erosion" was not even raised once during the DEIS, and neither was the basic term or subject of genetics.

We state this loud and clear because this action is happening upon those native lands where thinning, logging, and vegetative treatments are occurring. Why is the USFS utilizing methods that are counterproductive to the charge at hand, to the ability to sustain our national forests?

In fact, the USFS is even aware of the dangers of genetic erosion as they have published documents on the subject, one of them entitled "What is Genetic Erosion and How Can it be Managed?" In that document published by the National Forest Genetics Laboratory³ at the Pacific Southwest Research Station of the USDA Forest Service there is this statement.

{{PDF highlighting start}} "Influences that could contribute to genetic erosion in native plant species include:

major losses of habitat and the resident plant populations; fragmentation of habitat; management activities such as thinning, harvesting, or nursery selections that target certain features of plants; and planting material from a narrow genetic collection in revegetation efforts." {{PDF highlighting stop}}

This is a major admission that what the USFS has been doing and what they are saying are two different things. They are employing methodologies that could be harmful to the native landscape. This is not the mission of the US Forest Service. The science on such actions needs to be transparent to the American public, but instead, keeping such institutional knowledge in house has led to great misgivings about USFS actions on one hand and complete ignorance by the public on the other. These actions actually exacerbate the need for stricter regulations on mature and old-growth forests just to make sure the methodologies contained within "proactive stewardship" don't come into play. More on that subject below.

The Purpose and Need for the Proposed Action, Alternative 2: On page 7 and 8 of the DEIS, there lies a list of purposes and needs for the Proposed Action, Alternative 2. Many of those will be stated here, but not all, and many will not be stated in their original form within the DEIS. GWA has altered some of those purposes and needs to match the policies and beliefs of our organization.

However, GWA needs to clearly state that we do not favor Alternative 2, the Proposed Action. But we believe many of the reasons for the purpose and need should be part of every alternative. Consequently, we have altered the language of some stated rationales as GWA basically uses science as the determinant factor of our philosophy. Our positioning is based upon the premise of our existence as a nonprofit organization advocating for wildlife. We make these statements basically upon "what is best for wildlife and their respective habitat" not on the behalf of any social function or purpose.

- * "Foster ecologically focused management across the National Forest System by maintaining and developing old-growth forests while improving and expanding their abundance and distribution and protecting them from the increasing threats posed by climate change, wildfire, insects and disease, encroachment pressures from urban development, and other potential stressors, within the context of the National Forest System.

- * Facilitate the development of geographically informed adaptive strategies for old-growth forest conservation to support the effective implementation of this amendment.

- * Establish a national monitoring framework to track trends and distribution patterns of old-growth forests for inventory, evaluation, assessment, and adaptive management purposes."

The need for change is to:

- * Create a consistent framework to manage for the long-term persistence, distribution, and recruitment of old-growth forests across the National Forest System (NFS) in light of the interacting biophysical and social factors that threaten the persistence of older forests on NFS lands across the Nation.

The proposed plan components and direction focus on providing consistency for interrelated topic areas, including:

- * Improving the retention and recruitment of old-growth forests;

- * Improving durability, resilience, and resistance to fire, insects, and disease within old-growth forests across the National Forest System and addressing concerns about future durability, distribution, and redundancy of old-growth forests.

- * Strengthening the capacity of existing and future old-growth forests to adapt to the ongoing effects of climate change and future environments;

- * {{PDF highlighting start}} Recognizing the role of supporting the resilience of old-growth forests and

characteristics over time; {{PDF highlighting stop}}

- * Developing geographically informed adaptive management strategies for the retention of existing and recruitment of future old-growth forests, taking into account relevant local information through consultation with Tribes and collaboration with state, county, and local governments, partners, industry and public stakeholders; and

- * Establishing a national old-growth monitoring framework

As stated, GWA agrees with many statements found for the purposes of need in the proposed action. But we also believe these needs listed above should be part of any serious proposed action to promote the protection and sustainability of old-growth forests.

Let us say one more thing about the purpose and need of NOGA. Even though bullet points above were taken from Alternative 2, our reservation of these bullet points is not in their existence, but in how they are going to be implemented. Therefore, just because we support the purpose of the Proposed Action Alternative, does not mean we support the methodology in how the USFS intends to apply their implementation.

Principles Conflicting with the Mission:

Proactive Stewardship: We want to bring attention to the highlighted yellow bullet point above. In that bullet point found on page S-6 of the DEIS, we removed the phrase {{PDF highlighting start}}"proactive stewardship" {{PDF highlighting stop}}. It is a phrase found 92 times throughout the DEIS and is one that raises a high level of concern. The definition provided on page G-2 in the Glossary defines the term as such.

"Proactive stewardship": {{PDF highlighting start}} Refers to vegetation management that promotes the quality, composition, structure, pattern, or ecological processes necessary for old-growth forests to be resilient and adaptable to stressors and likely future environments." {{PDF highlighting stop}}

In order for us to truly understand the principles in action, we needed to know define the phrase {{PDF highlighting start}} "vegetation management" {{PDF highlighting stop}}. For that, we again refer to the Glossary on page G-3.

"Vegetation management: {{PDF highlighting start}} Includes - but is not limited to - prescribed fire, timber harvest, and other mechanical/non-mechanical treatments {{PDF highlighting stop}} used to achieve specific silviculture or other management objectives (e.g. hazardous fuel reduction, wildlife habitat improvement). (Definition is also included in NOGA-FW-STD-02a)."

These techniques are unacceptable in old-growth conditions, in fact, GWA believes these actions if allowed to be carried out, violate the very definition of old-growth forests and violate the intention and purpose of President Biden's Executive Order. Sadly, vegetation management means what we thought it meant, the actions of logging, thinning, and prescribed fires, the use of mechanical and non-mechanical methods. In other words, there is no difference in how old-growth forests are to be managed versus non-old growth.

These acts are the very threat to old-growth conditions, so what is the point of this exercise if old-growth forest management is not going to change? It has been the past management or lack thereof of old-growth conditions that lands us in the very place we are in today. This is why we removed "proactive stewardship" from our bullet point above. These methodologies are counterproductive to the management of old-growth forests.

On page S-2, the DEIS states this in their description of "proactive stewardship".

{{PDF highlighting start}} "proposed amendment recognizes the importance of proactive stewardship in order to protect oldgrowth forests from threats, including to reduce wildfire risk and allow for the restoration of beneficial fire in fire-adapted ecosystems, consistent with the Forest Service's Wildfire Crisis Strategy." {{PDF highlighting stop}}

Evidently, the USFS believes it must utilize "proactive stewardship" in order to protect old growth. GWA does not. The USFS must come to understand that when reference is made to old-growth forests, we are talking about more than an individual old tree, we're describing the totality of that forest community that contains old growth stands. Perhaps a better definition is found in this reference by Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services⁴.

{{PDF highlighting start}} "From an ecological point of view, old-growth forests are a stage of forest development characterized by large/old trees and structural complexity including live and dead trees, and vertical and horizontal heterogeneity (including a multi-layered canopy). {{PDF highlighting stop}} The structural diversity of old growth forests often supports distinctive/specialist biodiversity; large/old trees are keystone components of the ecosystem (Lindenmayer et al., 2012). {{PDF highlighting start}} In addition, the long-period of forest development without stand replacement disturbance allows many poor-dispersing species to accumulate {{PDF highlighting stop}} (IUFRO, 2018)."

The definition used in the DEIS hints at this when it states the following:

{{PDF highlighting start}} "distinguished by old trees and related structural attributes." {{PDF highlighting stop}}

We're not quite sure what structural attributes actually mean, but obviously old growth has a supporting system, a support system that provides the functionality to old-growth stands. That support system could be and most likely would be severely damaged by actions if taken utilizing the approaches of vegetation management. Practices such as logging, thinning, and mechanical uses harm the natural condition in many ways. Those actions soon to be discussed in this format. Again, GWA believes these actions would be detrimental and undermine the purpose and need of this amendment.

The word "proactive" is found 133 times in the DEIS. When it symbolizes actions taken against or for old-growth forests on behalf of mankind's stewardship, questions arise and rightfully so. The reason? because it signifies that humans are going to manipulate the forest condition in their own image. Historically this has not provided much protection for the resource, in fact, it has done just the opposite. Proactive stewardship and being protective are not synonymous.

Wildfire Crisis Strategy: Perhaps there has been no greater example of our warming world than the notable changes in our forest, changes perhaps no more evident than those forests across the western United States. The changing and warming climate has brought forth an increase in the risk of wildfires. As forests dry out with heat, drought, and winds, it has raised a great deal of political and social concern over forest and wildfire management.

A USFS ancillary planning action called the Wildfire Crisis Implementation Plan⁵ was initiated by the USDA USFS, an action precipitated from recent disastrous wildfires across the Nation, again, mainly those across the western United States. The purpose and scope of this document's existence is briefly stated below as found in Document FS-1187b.

"In response, at the USDA, Forest Service, we have released a 10-year strategy, and are now developing a comprehensive implementation plan for working with partners across jurisdictions to reduce wildfire risk to

people, communities, and natural resources while sustaining and restoring healthy, resilient fire-adapted forests."

Further on in the Wildfire Crisis Implementation Plan, there is this explanation.

"This implementation plan builds on a national strategy for confronting the wildfire crisis facing the Nation. {{PDF highlighting start}} The strategy calls for an unprecedented paradigm shift in land management to increase fuels and forest health treatments across jurisdictions to match the actual scale of wildfire risk to people, communities, and natural resources, {{PDF highlighting stop}} especially in the Western United States."

First GWA finds it interesting that the USFS can make a paradigm shift when it convenient for them or when it coincides with political pressure. We mention this only to reference that GWA is proposing NFS announce a paradigm shift toward managing our forests for the purpose of sequestering carbon. There is no reason why this cannot be done.

The DEIS incorporates this ancillary plan into the amendment under the nomenclature of "Wildfire Crisis Strategy". Within the DEIS, the plan states the following on page 10, section 1.11.2.

{{PDF highlighting start}} "The Forest Service's Wildfire Crisis Strategy calls for reducing wildfire risk through strategic all-lands, all-hands, science-based action that focuses on the most at-risk landscapes. Under this strategy, the agency and partners are increasing the pace and scale of forest restoration treatments to begin to reduce wildfire risk to communities, critical infrastructure, and natural resources." {{PDF highlighting stop}}

We notice on page 16 of the DEIS, it mentions the concern of Alternatives, specifically Alternative 2, in that they should not conflict with the Wildfire Crisis Strategy. This is specifically stated by the following statement.

{{PDF highlighting start}} "There is no intent for these alternatives to contradict or preclude progress on the Wildfire Crisis Strategy." {{PDF highlighting stop}}

GWA believes the intent of this amendment and the Wildfire Crisis Strategy sets NFS resource policy off in two diametrically opposed directions. While the Wildfire Crisis Strategy directs NFS policy in one direction, this amendment and EO sets the direction into another. While not necessarily in direct opposition, the application or implementation of both policies could very well be administered in such a way. We say this because we have already seen such being the case as discussed in the DEIS. The DEIS states that vegetative treatments can be utilized for the purpose of managing wildfires even for the management of old growth on occasion. This is where and when we find these two approaches in conflict.

When conflicts arise, we raise this question, which has priority? This issue is alluded to on page 81 of the DEIS.

"Nationally, based on FIA data, {{PDF highlighting start}} approximately 25 percent of current old-growth occurs in WUI {{PDF highlighting stop}}(Figure 11). {{PDF highlighting start}} While fuel reduction treatments are implemented in the WUI with the primary purpose of aiding fire suppression {{PDF highlighting stop}} and often have secondary purposes of conserving wildlife habitat and restoring historical fire regimes. {{PDF highlighting start}} There may be instances where fuels reduction efforts in the WUI do not necessarily align with maintaining ecological integrity (Stevens et al. 2016)." {{PDF highlighting stop}}

The USFS admits that there could be an occasion where efforts to maintain ecological integrity within old-growth forests will not or may not align with the intent of the Wildfire Crisis Strategy. GWA strongly urges that the National Amendment on Old Growth have precedence over any other ancillary plans or programs in place including the Wildfire Crisis Strategy. We theorize that even old growth can be used as a tool to mitigate wildfire, but to treat old growth as any other generic piece of forest land does a disservice to the intent of the amendment and EO. It also is a disservice to the old-growth stands themselves.

The fact that 25% of old growth occurs within the wildland urban interface (WUI) is problematic. We say that because this highlights the danger of old growth being enveloped by society. A societal statistic from Western Fire Chiefs Association⁶ states that 90% of wildfires are human caused. That should guide us in our wildfire and forest management. But in addition to that, Pacific Biodiversity Institute⁷ states 95% of human-caused wildfires occur within $\frac{1}{12}$ mile of a road. And as we all know, a designation of WUI usually means there are roads to some degree nearby as WUI means some level of accessibility.

We say that to say this, there needs to be greater emphasis on modifying human behavior on human infrastructure, not imposing that behavior on the natural landscape. Landowners and stakeholders who own property containing infrastructure need to shoulder a greater responsibility of fire and weather proofing their property. Modern science and technologies have produced new materials and methodologies to secure greater protection from wildfires, etc. In addition to that approach, there needs to be greater restrictions on developments in proximity to forest landscapes.

On page 97, there is this acknowledgement restating that above, only with some elaboration.

{{PDF highlighting start}} "Modifying fire behavior will remain a priority in the Wildland-Urban Interface (WUI), which is typically, but not always, compatible with stewardship of old-growth ecosystems. Nationally, based on FIA data, approximately 25 percent of old growth is in WUI. {{PDF highlighting stop}} Areas with more frequent fire histories are in greater need of restoration and would benefit more from management actions that reduce vulnerability of old-growth while retaining old-growth forest and concurrently reducing the fire risk in WUI. These frequent-fire ecosystems make up the majority of the WUI. {{PDF highlighting start}} The Forest Service management objectives are to both conserve forest resources, including old-growth forests, and manage the NFS to reduce wildfire risk to natural resources, critical infrastructure and communities. Vegetation management is oftentimes necessary and effective to achieve these objectives (Davis et al. 2024, USDA and USDI 2024b). To that end, by providing direction for the promotion of ecological integrity, the proposed amendment is complementary and consistent with the Wildfire Crisis Strategy and the Forest Service will continue to implement the Wildfire Crisis Strategy and related hazardous fuels reduction activities under all alternatives." {{PDF highlighting stop}}

It is disheartening to learn that the USFS is going to continue with the practice of vegetative treatments even in the vicinity of old-growth forests. The USFS is doubling down on the sentiment that vegetation management is necessary and effective. It is here that we must take exception to this philosophy and practice.

Hazardous fuel reduction activities such as forest thinning, logging, and other mechanical treatments are not the panacea that many land and forest managers have made this practice out to be. Between the costs, the logistics, and the effectiveness, these practices are not only questionable in their effectiveness, but they are also harmful to the ecological integrity of the landscape. GWA would like to familiarize the USFS to a scientific article by Lee, Derik⁸ E., Phd, in the online journal series Phys.org entitled "Proposed forest thinning will sabotage natural forest climate adaptation, resistance to drought, fire, insect outbreaks." The introductory remarks begin this way.

"The USDA Forest Service is proposing widespread forest thinning on our public lands across the West in a misguided attempt to reduce the impact of drought, fire, and insects (see National Forest Restoration Projects, Sierra Nevada National Forest Land Management Plan Revisions, news articles). These logging schemes are the latest in a series of Forest Service attempts to chainsaw their way out of a perceived problem. {{PDF highlighting start}} However, forests in the western United States have evolved to naturally self-thin uncompetitive trees through forest fires, insects, or disease. Forest fires and other disturbances are natural elements of healthy, dynamic forest ecosystems, and have been for millennia. These processes cull the weak and make room for the continued growth and reproduction of stronger, climate-adapted trees. Remaining live trees are genetically adapted to survive the new climate conditions and their offspring are also more climate-adapted, resistant, and

resilient than the trees that perished. Without genetic testing of every tree in the forest, indiscriminate thinning will remove many of the trees that are intrinsically the best-adapted to naturally survive drought, fire, and insects." {{PDF highlighting stop}}

GWA has not seen the USFS address these thoughts and the science. We would like to share more of the scientific paper.

{{PDF highlighting start}} "Recent studies have demonstrated that genetic variation is high within populations of forest trees, with especially high diversity found at the lower latitudes and altitudes that form the edges of a species' distribution. Local genetic and epigenetic variation makes some individuals naturally more likely to survive drought, fire, and insect outbreaks. This is because ecotones, or transitional areas, are where each species experiences the most extreme climate conditions that it can survive, the lowest elevation and latitude boundary. These natural edges are where trees with the most resistant and resilient adaptations are found. It is also where significant mortality is to be expected as part of the process where the distribution of tree species shifts north and uphill in our warming climate." {{PDF highlighting stop}}

GWA believes these scientific passages are self-explanatory, but we would like to summarize one basic thought from this reference. If nothing else, this science highlights that forestry genetics is complex, that there are several factors that genetically make up the forest's integrity, a forest resilience. By applying a "one-fits-all approach", humankind is taking the forest's ability to decide its own fate, denying the forests its own genetic makeup to control self-determination.

While we understand there are scientific journals and articles that seem to conflict our premise here, many of those articles are looking at specific aspects or elements in the science of forestry practices. We are trying to highlight those articles that are more comprehensive in their approach. GWA would like to share one more thought from a paper found in AmericanForests.org⁹. In an article entitled "Forest Thinning: Too Much of a Good Thing?", there is this question proposed.

"To reduce the risk of wildfire, forest managers use a process called "thinning," in which small trees, branches and leaves that are most likely to burn are cut down. {{PDF highlighting start}} Previous research has suggested that thinning helps keep carbon sequestered, or trapped, in trees by helping prevent wildfires. However, this study reveals that thinning might actually contribute to more carbon emissions. For thinning, trees that would normally store carbon are being cut down. In fact, the study found that "for every unit of carbon that is saved by not burning in a fire, as many as 20 units will be removed and potentially not stored when trees are harvested." {{PDF highlighting start}} David Cleaves, climate change advisor at the USDA Forest Service, {{PDF highlighting start}} states that thinning has been used to reduce the risk of wildfire, but carbon has not been considered as a factor in the use of thinning until recently." {{PDF highlighting stop}}

Isn't this the whole purpose of the Amendment and the EO, to curtail, mitigate, or lessen the release of more carbon by actions taken in our forests? Yet, the current NOGA amendment seems to undermine the full potential of actions set before us. This is one of the main faults of this exercise. There are others. Scientific proof will be presented as needed to further the discussion of this amendment's weaknesses.

Silvicultural Directives: The more study we detail in this amendment, the more we understand how complicated it will be to root out bad theory or practices from not just this amendment, but from the NFS. On page 10, there is a paragraph that describes a Forest Service recently published directive called, "Technical Guidance for Standardize Silvicultural Prescriptions for Managing Old-Growth Forests". The DEIS describes the technical guidance this way.

{{PDF highlighting start}} "The guidance provides in-depth direction on silvicultural prescriptions prepared to maintain or restore ecological integrity and resilience of oldgrowth forests on National Forest System lands in the

face of current and future disturbances and climate change. {{PDF highlighting stop}} It includes two appendices:

Appendix A - Best Management Practices for Managing Old-Growth Forests,

Appendix B - Example of Old-Growth Silviculture Prescription

The guidance includes potential questions to help {{PDF highlighting start}} guide the development of effectiveness monitoring and evaluation of old growth treatments {{PDF highlighting stop}} at the project-level, which will support adaptive management of old-growth forests. {{PDF highlighting start}} The guidance complements the National Old Growth Amendment by providing a tool that will be used by field resource managers working at the project level to implement the amendment's objective of fostering resiliency of old-growth forests across national forests." {{PDF highlighting stop}}

Perhaps it is this document that needs review from peers and the public, because if this document is going to be the defining tool or reference to manage old-growth forests, we have a problem. The intent and implementation of this amendment won't reach the desired result. This document is being used as reference for practices that GWA finds objectionable. It represents many of the USFS policies that GWA and others are trying to change within the agency's current paradigm.

A few examples of problematic actions found on page 10 of the Technical Guidance directive, included in Appendix A, are highlighted below:

{{PDF highlighting start}} "Silvicultural practices often include treatments such as thinning, improvement cutting and prescribed burning. When needed, these treatments should reduce vulnerability of old-growth forests and increase resilience to natural disturbances including wildfire, climate change, insects, and diseases. Treatment is considered when current stand conditions make the stand more vulnerable to an existing or future threat and modification of those conditions can reduce those threats."

"Where forest plans mandate diameter cap cutting or an age limit to retain large diameter or old trees, forest plan amendments may be required to apply silvicultural practices essential to achieving or maintaining desired conditions or improving ecological integrity, or both."

"Protect old-growth stands through strategic placement of treatments. Examples include:

[diams] Design treatments near old-growth to reduce fire, wind, and other hazards that may spread to old-growth.

[diams] Consider the spatial location of old growth when designing projects that have a purpose of altering disturbance behavior." {{PDF highlighting stop}}

There are more examples, but these provide insight as to some of the excessive and yes, proactive interference we find in this idea of stewardship of old growth. It doesn't provide any different approaches to managing old-growth forests from non-old growth. We will acknowledge there are several bullet points in this Appendix that are common sense and scientific in their approach. But overall, there seems to be this arrogant mentality that mankind must be involved, that society somehow needs to intervene to manage old growth. We object to this fatal flaw in management.

We could provide countless scientific articles and letters as to why this approach is problematic, but we will highlight only one here as time and length are beginning to be a limiting factor. In a scientific writing published in Ecosphere, "Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States?", Curtis Bradley¹⁰, et al., states the following in their Abstract.

{{PDF highlighting start}} "We investigated the relationship between protected status and fire severity using the Random Forests algorithm applied to 1500 fires affecting 9.5 million hectares between 1984 and 2014 in pine (Pinus ponderosa, Pinus jeffreyi) and mixed-conifer forests of western United States, accounting for key topographic and climate variables. We found forests with higher levels of protection had lower severity values even though they are generally identified as having the highest overall levels of biomass and fuel loading. Our results suggest a need to reconsider current overly simplistic assumptions about the relationship between forest protection and fire severity in fire management and policy." {{PDF highlighting stop}}

Further on in the Conclusion of the article, there are these summations.

{{PDF highlighting start}} "In general, our findings[mdash]that forests with the highest levels of protection from logging tend to burn least severely[mdash]suggest a need for managers and policymakers to rethink current forest and fire management direction, particularly proposals that seek to weaken forest protections or suspend environmental laws ostensibly to facilitate a more extensive and industrial forest-fire management regime. Such approaches would likely achieve the opposite of their intended consequences and would degrade complex early seral forests (DellaSala et al. 2015)."

"Thus, managers wishing to maintain biodiversity in fire-adapted forests should appropriately weigh the benefits of wildfires against the ecological costs of mechanical fuel reduction and fire suppression (Ingalsbee and Raja 2015) and should consider expansion of protected forest areas as a means of maintaining natural ecosystem processes like wildland fire." {{PDF highlighting stop}}

In other words, the NFS needs to change their paradigm. This is the main focal point of our comments here in regard to forest management, but especially in regard to the management of old-growth forests.

Alternatives Considered but Eliminated:

GWA has already stated above that our organization does not support Alternative 2, the Preferred Alternative. Our lack of support is based on some of the reasons already stated and for some reasons yet to come. Yet in quickly reviewing the brief statements describing the Alternatives considered, but eliminated, we do find positive aspects of each that has some merit.

On page 13, section 2.2.1, entitled "Establish Old-Growth Designated Areas", there was this statement.

{{PDF highlighting start}} "There were suggestions to create or manage old-growth areas that would be managed similar to Inventoried Roadless Areas. There was a similar suggestion to not allow management of any kind in old-growth forests." {{PDF highlighting stop}}

GWA believes there is some merit to this position. Given the fact that nothing stays the same and in that, the old-growth forest of today may not be the old-growth forest of tomorrow, land-use designations could still have some value. Perhaps this would be a good time for the NFS to establish a new land-use designation for old growth, acknowledging that mature forests could easily become those forests worth protecting in the future.

This would involve some long-term monitoring, but monitoring should already be part of the NOGA. These suggestions were discounted for as the DEIS states,

{{PDF highlighting start}} "After comparing increases and decreases of mature and old-growth forests within and outside of reserved areas, the results suggest that strictly reserving mature and old-growth forests may not always ensure that it is protected from future losses." {{PDF highlighting stop}}

We don't understand why this is a reasonable rationale not to utilize the concept of protections that can be associated the benefits of designated land use. All entities involved in land-use management realize that there are no guarantees in protection, especially when natural events and conditions are in control.

On page 14, Section 2.2.2 entitled "Extend the Amendment to Include Mature Forest" discusses an issue which GWA was going to bring up in our comments, the value of mature forests. The DEIS in this section states 47% of forested acres are designated as "mature forests". The following statement specifies perhaps the obvious, but GWA would like to have the discussion at any rate as to show how, if any, a change in the NFS paradigm would alter the future of these NFS lands.

{{PDF highlighting start}} "Not all mature forest occurs in areas that will persist as mature forest or that can sustain succession towards old-growth forest." {{PDF highlighting stop}}

We understand the following sentence that acreage will still be managed for multiple uses, but we don't agree with the context that this even precludes the discussion of mature forests from consideration. As stated on page 14.

{{PDF highlighting start}} "Additionally, many of these acres are managed for multiple uses and provide necessary terrestrial habitat features that differ from those found in old-growth forest. For these reasons, mature forest is not being included in conjunction with old-growth forest for all aspects of the amendment; however, emphasis on identifying and prioritizing areas to be managed for future old-growth forest, which includes mature forest, is included in Management Approach 1.b and Guideline 3." {{PDF highlighting stop}}

Must we say the discussion of mature forests was directly included in EO 14072. GWA believes that mature forests and the management of mature forests needs to be incorporated to some extent into this amendment. Since mature forests of today will be the old-growth forests of tomorrow, to not include these landscapes is short sighted and perpetuates the same problem moving into the future.

Comments on Misconceptions:

The discussion on page 16, 17 of the DEIS pertains to misconceptions that relate to Alternative 2, the Proposed Alternative. Of the three bullet points mentioned, we disagree with the second written as follows.

The Modified Proposed Action (Alternative 2) and the Less Restrictive Alternative (Alternative 4) do not contradict the Wildfire Crisis Strategy. As noted, we've already had this discussion, and we must strongly disagree with the conclusion made by the DEIS that there are no contradictions between the Proposed Action and the Wildfire Crisis Strategy. It's interesting that the DEIS believes they must put a disclaimer in the DEIS stating such. This reinforces our opinion that the amendment and the proposed action were written around ancillary guidelines and policies, meaning that the amendment does not have priority, even if necessary to override or take precedence over existing documents.

This is highly unfortunate because what the USFS is saying is this amendment does not have the authority to vacate bad policy, even when that is exactly what is needed. As long as an amendment, any amendment, has a policy or practice that includes vegetative thinning, mechanical treatments, or commercial logging in mature and old-growth forests, there will be a conflict with the intent and purpose of Executive Order 1407211 and purpose of this amendment. Must we remind the NFS, the purpose of the said order is as stated below.

{{PDF highlighting start}} "It is the policy of my Administration, in consultation with State, local, Tribal, and

territorial governments, as well as the private sector, nonprofit organizations, labor unions, and the scientific community, to pursue science-based, sustainable forest and land management; conserve America's mature and old-growth forests on Federal lands; invest in forest health and restoration; support indigenous traditional ecological knowledge and cultural and subsistence practices; honor Tribal treaty rights; and deploy climate-smart forestry practices and other nature-based solutions to improve the resilience of our lands, waters, wildlife, and communities in the face of increasing disturbances and chronic stress arising from climate impacts." {{PDF highlighting stop}}

The Alternatives:

There are four (4) Alternatives under the NOGA DEIS being considered for analysis. The list below includes the names of those four alternatives. Having said that, Alternative 2, the preferred alternative, is the alternative which received most of the detailed discussion and warrants most of that discussion here. GWA has already stated our disagreement with Alternative 2.

Alternative 1: The No Action Alternative

Alternative 2: Modified Proposed Action (Preferred Alternative)

Alternative 3: More Restrictive Standards for Old-Growth

Alternative 4: Less Restrictive Standards for Old-Growth

Obviously, the Preferred Alternative was the only alternative given the most "airtime" within the DEIS occurring on page 17-52. GWA will discuss our misgivings about its preferred status. We have already brought forth enough reasons as to why we object to the Preferred Alternative; some of those will unfortunately be duplicated here as they were used in the Preferred Alternative's reasoning for existence. But our intention is to highlight principles, science, and practices that could make this amendment better, not waste time on the amendment's weaknesses. Having said that, a comparison will have to be made.

Alternative 2: Our strongest objection, one which must be corrected in order to gain support from GWA, is to restore protection for old-growth forests. No matter the implementation chosen, the alternative, any alternative must include protections such as that which appeared in the Federal Register¹², Notice of Intent (NOI) on December 20, 2023. Standard 1 in that NOI states the following.

Standard 1:

{{PDF highlighting start}} "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." {{PDF highlighting stop}}

Yet, in reviewing the DEIS, GWA noticed Standard 1 of the NOI no longer exists in the DEIS. The DEIS on page 28 makes the following in explanation.

{{PDF highlighting start}} "The version of Standard 1 that was originally included in the NOI was removed as it was found to be redundant in stating the intent of Standard 2.a, but in a reverse manner ("must not degrade" versus "may only be for the purpose of")." {{PDF highlighting stop}}

GWA does not believe this explanation to be true. One reason, the phrase - {{PDF highlighting start}}("must not

degrade" versus "may only be for the purpose of"){{PDF highlighting stop}} does not state the same philosophy or have the same definition. Second, there is no protective language included within Standard 2.a as suggested in the DEIS on page 29. GWA finds no redundancy here. So, by removing Standard 1 as it appeared in the NOI, the USFS removed a protective criterion that the Nation needed in order to protect old growth.

Standard 2.a: A second problem with the Preferred Alternative is found in Standard 2.a and it is one on which we have already elaborated, hence we won't devote too much more time to it here. But Standard 2.a provides authority and permission to manage old growth utilizing principles such as proactive stewardship and vegetative management such as prescribed fire, timber harvest, and other mechanical treatments. GWA believes these actions basically treat old-growth forests like any other forest on the landscape. What's the difference if we can log old growth? Where is the protection for old growth? Where are the actions to enhance biological diversity and forest integrity, because these actions referred to as proactive stewardship is just another word for "business as usual".

Standard 2.b: This is a new standard not included in the NOI. The following language of the proposed action and intent are below.

Language of 2.b:

{{PDF highlighting start}} "The cutting or removal of trees in old-growth forest for purposes other than proactive stewardship is permitted when (1) incidental to the implementation of a management activity not otherwise prohibited by the plan, and (2) the area - as defined at an ecologically appropriate scale - continues to meet the definition and associated criteria for old-growth forest after the incidental tree cutting or removal." {{PDF highlighting stop}}

The intent of 2.b:

{{PDF highlighting start}} The purpose of this standard is to provide clarification that cutting or removal of trees can occur in old-growth forest for purposes other than proactive stewardship so long as it occurs within the sideboards specified in (1) and (2). For example, this would allow for trail development or maintenance. {{PDF highlighting stop}}

This Standard just compounds or double downs on the action to cut and remove trees by authorizing actions that are outside the purview of proactive stewardship. In other words, even though the practice of proactive stewardship has allowances for the thinning, cutting and removal of trees in old-growth forests, you don't even need to follow guidelines for that action. You can cut and remove trees in old-growth forests outside of the stipulations and guidelines of proactive stewardship. To which we ask, where is the protection? Even though there are two sideboards that may try to rein in certain acts, they can be easily pushed aside and be considered subjective.

Standard 2.c: This standard has the intention as stated on page 31 to allow for vegetation treatments (such as tree-cutting and removal) in old-growth areas for other multiple-use management considerations. What this implies is the fact there are other functions and uses that may occur within the vicinity of old-growth stands that are of higher importance and consequence than the proper management of old-growth conditions themselves. Whether that is the intent of Standard 2.c may be questioned, but that is the implication.

Without going into detail on all the language for Standard 2.c, this plan component specifically encompasses those situations that may enhance wildfire risk management objectives.

To Summarize Standard 2.a, b, c: All these standard components listed, give permission and authority for man to interfere in the management of old-growth forests. This Standard authorizes or justifies the using of mechanisms

and methods for the USFS to take an active role in standardizing forest management practices across all forests, even old growth. GWA does not see any difference between managing these landscapes with old growth from any other forests under multiple use management. This is unfortunate and unacceptable. All these conditions and standards have the potential to degrade and impair old-growth forests and therefore fall outside the intent of EO 14072 and the supposed purpose and intent of this amendment.

Even Guideline1 found on page 33 of the DEIS, does not provide protection to the standards as they exist. Guideline 1 is as stated.

"In areas that have been identified in the Adaptive Strategy for Old-Growth Forest Conservation as compatible with and prioritized for the development of future old-growth forest, {{PDF highlighting start}} vegetation management projects should be for the purpose of developing those conditions."{{PDF highlighting stop}}

This is a weak guideline that could easily be rationalized away or ignored. We notice the active verb used here is "should", not "shall." The verb "should" has no compelling or mandatory action, therefore has very little relevance in old-growth forest management.

Goals: GWA questions the omission of a goal for biodiversity. Biodiversity, ecological integrity, carbon sequestration and others are listed as Statement of Distinctive Roles and Contributions. These roles or contributions should be stated more as goals or objectives rather than a consequence of conservational action. We say that because these concepts are also mentioned in the justification for the purpose of the EO 14072 and the purpose of this amendment. The Draft of NOGA appears to view these effects more as a consequence, but GWA views them as a desired achievement warranting guidelines and directions in how to achieve these goals.

One reason that GWA does not believe they are included as goals or objectives is because such actions would be in opposition to those methods of proactive stewardship. They could also be seen as in opposition to the purpose and intent of the Wildfire Crisis Strategy Plan. GWA contends that this fundamental reasoning is why improvements to forest management are so hard to achieve. There is an intrinsic desire within the NFS to log or to enact various forms of logging throughout the USFS. It is even incorporated within this document, this DEIS, to the point that it undermines the chances of success.

Alternative 3: More Restrictive Standards for Old-Growth: On page 53, there is a brief description of Alternative 3, an Alternative which was meant to address the recommendations to restrict commercial timber harvest. As stated on page S-9 and on page 53, this Alternative recommended the following limitations when compared to the Preferred Alternative.

{{PDF highlighting start}} "This does not prohibit other vegetation management actions from occurring; however, it is recognized that the removal of commercial timber harvest as a management tool could impact the ability to use other tools. For example, prescribed fire may be precluded if there was not an ability to thin and remove larger vegetation. {{PDF highlighting stop}}

The following refers to the standards as described in Alternative 2. {{PDF highlighting start}} Standard 3 would be updated to read as:

Proactive stewardship in old-growth forests shall not result in commercial timber harvest." {{PDF highlighting stop}}

Yet, the DEIS specifically describes this alternative in the following terms as found on page S-11.

{{PDF highlighting start}} "From an ecological perspective, the anticipated negative effects of reducing the rate of proactive stewardship by limiting vegetation management tools - and thereby accepting avoidable loss of old-

growth - likely outweighs any potential benefits of ensuring that commercial timber harvest does not negatively influence old-growth management decisions. The alternative is likely to be less effective at achieving desired outcomes under the old-growth amendment because it would limit ecologically necessary proactive stewardship activities governed by NOGA-FW-STD-2a. Consequently, the rate of restoration of old-growth will be slowest under this alternative because the agency's ability to restore old-growth resiliency and achieve desired conditions would be more limited with the removal of commercial harvest as a management tool." {{PDF highlighting stop}}

GWA believes this paragraph makes some hard to fathom assumptions. If our understanding is correct, the DEIS is making the premise that ecological gains are going to be dependent upon proactive stewardship. Does the USFS really believe that the lack of commercial harvest is going to restrict the rate of restoration? That is essentially what this paragraph states. GWA is saddened to believe a federal agency of the U.S. government believes in such arrogance. But this is the root of what ails the agency from utilizing the best available science and instead relying on practices that are foreign to the natural landscape.

Perhaps the true reason as to why Alternative 3 was not chosen is because of the truth on page S-13.

{{PDF highlighting start}} "Alternative 3 contributions to social and economic sustainability may be less than the other alternatives because less restoration related economic activity would contribute to rural well-being without funding for restoration through commercial timber sales." {{PDF highlighting stop}}

Perhaps the true reason Alternative 3 was not chosen is the assumption that there would be a loss of economic sustainability from a downturn in commercial timber sales.

Affected Environment and Environmental Consequences:

Ecology Affected Environment: In reviewing Section 3.2.1 of the DEIS, GWA wants to acknowledge a statement concerning ecological integrity found on page 57.

{{PDF highlighting start}} "Compared to historical conditions, the extent of old-growth is clearly in deficit - suggesting ecological integrity is compromised (USDA and USDI 2024b). However, those insights must be supplemented by additional factors including the loss of Indigenous influences on disturbance regimes along with changes in climatic regimes." {{PDF highlighting stop}}

GWA agrees with the statement that ecological integrity is compromised; a belief that GWA has long held. But we are curious as to why the USFS believes this to be the case. The answer to that question would provide a clue as to whether our beliefs diverge. On the other issue, while we do not question whether or not the loss of indigenous influences is one reason for the compromised ecological integrity, we cannot ignore the issue that both; the lack of indigenous influence and the lack of ecological integrity itself, is a result of colonialism to some degree, either directly or indirectly. According to the ICCA Consortium¹³, Kathleen Ciola Evans and Eva Perry state the following.

"A report by the ICCA Consortium estimated {{PDF highlighting start}} that 21% of global land is intact due to the conservation practices of Indigenous Peoples, {{PDF highlighting stop}} compared to fourteen percent protected and conserved by countries."

This means colonialism has had an intensive amount of impact upon the natural landscape, affecting biodiversity, ecological integrity, and climate change.

Further on in the discussion on page 58 under Environmental Consequences, there is a discussion presented on

how "old-growth forests provide a range of critical ecosystem services" to use the phrase on page 58.

{{PDF highlighting start}} "1. Ecological Functions: Old-growth forests contribute to carbon sequestration by storing large amounts of carbon in their biomass and soil, thereby mitigating climate change. They also enhance biodiversity by providing habitat for a wide array of species and maintaining complex ecological interactions that support ecosystem stability and resilience.

2. Regulating Services: These forests play a vital role in regulating water cycles and maintaining watershed health, which includes filtering water, reducing erosion, and stabilizing hydrological regimes. Additionally, they contribute to soil formation and nutrient cycling, ensuring long-term soil fertility and forest health." {{PDF highlighting stop}}

We are going to include a 3rd service because GWA believes it fits into the assignment and that would be "biodiversity," a term later discussed under the subject heading. GWA mentions these subjects because they are indeed benefits to our human-nature connectedness (HNC),¹⁴ a term used in the scientific paper entitled "Human-nature connectedness as a pathway to sustainability: A global meta-analysis".

The Abstract:

{{PDF highlighting start}} "Internationally agreed sustainability goals are being missed. Here, we conduct global meta-analyses to assess how the extent to which humans see themselves as part of nature[mdash]known as human-nature connectedness (HNC)[mdash]can be used as a leverage point to reach sustainability."{{PDF highlighting stop}}

Introduction:

{{PDF highlighting start}} "Anthropogenic climate change and biodiversity loss are major threats not only to nonhuman living beings but also to our own survival {{PDF highlighting stop}} (Brondizio et al., 2019; D[iacute]az et al., 2019; Pachauri & Meyer, 2014; Shukla et al., 2019). There appears to be international consensus {{PDF highlighting start}} to better preserve nature (e.g., the Convention on Biological Diversity; CBD, 2011), to limit global warming {{PDF highlighting stop}} (e.g., the Paris Agreements) and to create a sustainable, equitable world (e.g., the Sustainable Development Goals)."

GWA agrees with these summations and premises and is proud to see the USFS picking up the mantle in understanding these basic principles. But it is not enough to say the right things, but the USFS also must enact upon those things and put those principles and practices in order. It is the application of the knowledge, or lack thereof, as to why and where GWA runs afoul of the USFS management.

Drivers and Stressors: GWA would like to skip forward to page 70 of the DEIS and discuss the subject matter of Drivers and Stressors. It seems obvious that in order to apply the correct steps moving forward; to mitigate those negative forces upon our Nation's Forest, we need to understand those forces at work. Drivers and stressors are natural and manmade, quite complex and intricate in how each affects the natural landscape. This is critical to understand because we need to make sure policies and practices adopted have a likelihood of success. On page 70 of the DEIS, the following explanation of each is provided.

{{PDF highlighting start}} "Stressors are factors that may directly or indirectly degrade or impair ecosystem composition, structure, or ecological processes and negatively affect ecological integrity (36 CFR 219.19). Drivers cause change to ecological system, although they do not necessarily impair ecological integrity. In fact, some drivers are necessary to support ecosystem integrity. Some drivers may become stressors when they

occur outside of their expected frequency, severity, or extent." {{PDF highlighting stop}}

In that same paragraph, the USFS admits that past forestry practices have exacerbated wildfires and helped to decline forest conditions.

{{PDF highlighting start}} "climate change and past forestry practices has amplified the frequency, scale, and severity of disturbance events leading to more extreme wildfire and declining forest conditions." {{PDF highlighting stop}}

Even though the DEIS does not specify the kind of forestry practices being referenced, it does make our organization earnestly question the viability and practicality of carrying on those same forestry practices today when climate change is an existential threat to the world as we know it. In researching the subject of drivers and stressors, it is unclear if there is complete agreement as to the delineation of each as to their classification. Some examples as shown here are thought to be both. An example of that is vegetation management. On page 74, there is this exchange.

{{PDF highlighting start}} "Vegetation management can be a stressor in old-growth forests, but it can also be an important driver of restoration and positive transformation {{PDF highlighting stop}} (USDA and USDI 2024b). {{PDF highlighting start}} Interactions among climate, disturbance, and vegetation have always been complex and can create or worsen threats {{PDF highlighting stop}} (Loehman et al. 2020, Sample et al. 2022)."

But before we get to that discussion, we want to complete our thoughts overall on the subject at hand. Climate change, fire, insects and disease, extreme weather, and vegetation management are some of the examples discussed in the DEIS on pages 70-74. Although the DEIS does not appear to distinguish or provide examples of each, we sought out our own clarification and have those listed here.

According to the Natural Resource Condition Assessment (NRCA) Program, the National Park Service¹⁵ (NPS) has provided this information.

Examples of drivers include:

- * Climate change
- * Energy production and mining
- * Biological resource use
- * Human intrusion and disturbance
- * Invasive and problematic species and pathogens
- * Agriculture

Examples of stressors include:

- * Changes in temperature and precipitation (drought)
- * Air pollution
- * Water contaminants
- * Altered hydrology
- * Resource exploration and extraction
- * Accidentally started fire
- * Forest pests
- * Off-road vehicle use (noise and dust)

GWA wants to be clear, we do not view these examples as being beyond the realm of man's capability to control. Some may be, but not all. All of them are, however, large enough that they have become societal problems,

problems that may be unpopular to solve. And that in and of itself is a problem.

Before we leave this subject, GWA would like to go back and discuss the statement found on page 74.

{{PDF highlighting start}} "Vegetation management can be a stressor in old-growth forests, but it can also be an important driver of restoration and positive transformation (USDA and USDI 2024b). Interactions among climate, disturbance, and vegetation have always been complex and can create or worsen threats (Loehman et al. 2020, Sample et al. 2022)." {{PDF highlighting stop}}

The USFS is calling "vegetation management" a stressor in old-growth forests. GWA believes this to be the case. But that forces us to ask the question, knowing this; why is the USFS applying a management technique that can be harmful or detrimental to old-growth forests? Even given the fact that perhaps under certain conditions, vegetative management can be a positive, transforming method, do we as a society really understand the complexity of forest science enough to make an informed decision? Our fear is that the USFS is using this tool as a blanket mechanism, a tool that we do not understand the complexity of its application.

Carbon: Within this discussion on page 75, the DEIS has included a brief conversation about Carbon. Carbon stewardship as it is called on page 75 is definitely affected by drivers and stressors, but it is not a driving force or stressor in and of itself. GWA is not sure why this subject matter is positioned for discussion among this analysis, but none-the-less there are several statements made where GWA finds fault. We will list those here and respond at the end.

{{PDF highlighting start}} "Many management activities like removing hazardous fuels and reducing live tree density or activities enhancing species, structural, or age-class diversity may have short-term carbon emissions but yield long-term carbon benefits through enhancing forest resiliency and therefore carbon stabilization {{PDF highlighting stop}} (Krofcheck et al. 2019, Puhlick et al. 2020; Crockett et al. 2023)."

{{PDF highlighting start}} "Moving carbon stored in forests to forest products storage may result in lower net greenhouse gas (GHG) emissions relative to unmanaged forests, if carbon stored in harvested wood products (HWP), {{PDF highlighting stop}} substitution effects, and forest regrowth are considered (Lippke et al. 2011; McKinley et al. 2011; Skog et al. 2014; Dugan et al. 2018)."

{{PDF highlighting start}} The Intergovernmental Panel on Climate Change (IPCC) recognizes wood as a renewable resource that when sustainably managed can mitigate climate change (IPCC, 2022b). Assessing impacts of harvest on GHGs thus should include carbon storage estimates from wood products. {{PDF highlighting stop}}

Since carbon and carbon storage has been brought up in this context, we will follow through with our science references in rebuttal. First, in answering this old debate about the best management and most efficient method of storing carbon, GWA would like to refer the USFS to the facts as noted by the Woodwell Climate Research Center¹⁶.

{{PDF highlighting start}} "While all forests sequester carbon as they grow, older and larger trees represent an existing store of carbon in their biomass and soil. Research by Woodwell Climate scientists on carbon stocks in a sample of federally managed U.S. forests found that while larger trees in mature stands constitute a small fraction of all trees, they store between 41 and 84 percent of the total carbon stock of all trees."¹⁷

"An analysis of mature and old growth forests across the country found that approximately 76 percent (20.8 million hectares) of these forests are unprotected from logging. This represents an amount of carbon roughly equivalent to one quarter of the U.S.'s annual fossil fuel emissions."

"Although younger forests grow faster proportionally, they are not adding as much carbon in a single year as older forests with large trees. Additionally, mature forests continue to pack away carbon year over year in their soils, which is largely protected from effects of disturbance. Cutting down a mature forest creates a "carbon debt" that can take decades[mdash]centuries in some cases[mdash]to recoup, and in the meantime those mature trees are no longer sequestering carbon each year." {{PDF highlighting stop}}

Reference 17 above was found in the scientific literature authored by Richard A. Birdsey, et al., entitled "Assessing carbon stocks and accumulation potential of mature forests and larger trees in U.S. federal lands".

{{PDF highlighting start}} "For this study, a new term "Culmination of Net Primary Productivity" (CNPP) is used to describe the age at which NPP reaches a maximum carbon accumulation rate. Physiologically, peak productivity occurs approximately at the age when the growing space in the ecosystem is fully covered by leaf area[mdash]i.e., tree canopy closure reaches 100%. After this age, NPP either stays constant or declines gradually, depending on tree species composition, and other environmental factors such as nutrient availability {{PDF highlighting stop}}(Kutsch et al., 2009; He et al., 2012)."

GWA would like to include one more reference as to the importance of large, old-growth trees. In an online blog managed by Earth Law Center,¹⁸ there is an article entitled "Seeking Rights of Nature for Elliott State Forest", there were these comments.

{{PDF highlighting start}} "Nature, one of the top scientific journals, has found that the rate of tree carbon accumulation increases continuously with tree size. This means that big, mature trees capture the most carbon dioxide (CO₂). Yet selective logging usually removes the bigger trees, {{PDF highlighting stop}} so this new research supports the Greenpeace campaign for zero (gross) deforestation, globally, by 2020.

{{PDF highlighting start}} In the Elliott State forest, old-growth trees provide an unmatched donation to the carbon cycle that can be tributed to the large amount of vegetation preserved. Forests store carbon that would otherwise contribute to climate change. As the trees continue to grow their carbon capture ability grows with age. {{PDF highlighting stop}} Preserving the Elliott State Forest allows for the continued growth of old-growth trees which is beneficial for capturing and storing carbon that would otherwise be released into the atmosphere."

These three references basically refute the DEIS argument that even though there would be a temporary release of stored carbon from logging and thinning, younger forests would make up for that carbon release difference by the growth of younger trees. Science and many others refute that notion by saying the greater efficiency of stored carbon occurs in the largest trees and more mature trees, hence they should not be logged, cut, or thinned. As the Woodwell Climate Research Center scientific article states, it would take decades if not generations before that carbon debt are made up. Needless to say, GWA does not believe our planet has that kind of time.

Social, Economic and Cultural Affected Environment: GWA has noticed a major flaw in the agency's purpose as stated on page 82 under Section 3.2.2.

"National forests and grasslands contribute to communities by providing ecosystem services (ranging from clean water, {{PDF highlighting start}} carbon sequestration,{{PDF highlighting stop}} and {{PDF highlighting start}} biodiversity {{PDF highlighting stop}} to subsistence foods, {{PDF highlighting start}} recreation opportunities, {{PDF highlighting stop}} and inspiration); multiple uses (including timber, rangelands, outdoor recreation, and other land uses); infrastructure (such as utility infrastructure, roads, and {{PDF highlighting start}} developed recreation facilities){{PDF highlighting stop}}; and connections between the operations and employees of the Forest Service and people outside of the plan area (see Forest Service Handbook 1909.12, section 13.1)."

Nowhere in this description does it state anything about wildlife or wildlife habitat. The closest reference made to the forest's biology is using the word biodiversity. But this is a far cry from acknowledging that ecosystem

services also provide a role in the sustainability of wildlife and their habitat. We can also say the same thing about the omission of wildlife and the protection of their habitat pertaining to multiple uses. Why the omission of wildlife?

GWA did notice in their listing of societal, economic and cultural uses, carbon sequestration actually was recognized as an example of a product of ecosystem services; those provided by national forests and grassland management. This is an improvement and perhaps the first time that the USFS acknowledged their role in carbon sequestration. Now, if we can get the agency to manage our Nation's Forest in that way, and continually promote this as part of their multiple use strategy, this would be a huge proactive step forward.

But back to the lack of mentioning wildlife and their respective habitat as a product of ecosystem services. Worse yet, there was not any mention of wildlife being part of the multiple use program. This is a huge disappointment. But this explains the many bad decisions our organization has seen on a project and forest wide national scale within the USFS. GWA also noticed that recreation was mentioned three (3) times in this reference. This explains the other half of bad decisions made by the USFS. The USFS needs to change their perspective in overall policy prioritization.

Wildlife and Wildlife Habitat:

GWA is going to divert from the outline of the DEIS and leave the script as the main text of the amendment (the DEIS) draws to a close. We find the word "wildlife" mentioned 21 times in the main text of the DEIS with the remaining 42 references used in terms of highlighting personal preparers, contributors, and other organizations and definitions. Most of the references within the text were used in conjunction with wildlife habitat; a phrase used in the most general of terms. Wildlife was not used in any specific capacity.

With GWA being a wildlife advocacy organization, we were expecting and hoping to see a more scientific discussion on how important old-growth forests are in their relation to wildlife, even specific species of wildlife, but there was none of that. To be more blunt, we were expecting to see how actions such as vegetation management would affect wildlife during a period of "proactive stewardship" in old growth. With what GWA has learned so far from this DEIS, the general public perhaps has a false sense of security that old-growth forests were immune from disruption other than from natural events. But now we know that is not true.

On page 98, under the section of 3.3.1 Environmental Impacts, there is this statement.

{{PDF highlighting start}} "Common vegetation management objectives and practices will continue under all alternatives, both within and outside of old-growth, as governed by the relevant land management plan. Consistent with the Multiple-Use Sustained-Yield Act of 1960 {{PDF highlighting stop}} (16 U.S.C. 528-531) (MUSYA), {{PDF highlighting start}} the Forest Service manages the National Forest System (NFS) to sustain the multiple use of its renewable resources while maintaining the long-term health and productivity of the land."

"In addition, NFS planning focuses on ecological and social sustainability integrating forest restoration, ecological integrity, climate resilience, watershed protection, wildlife conservation, public engagement, and opportunities to contribute to vibrant local economies into an effective planning process that supports sustainable forests over time. Vegetation management activities that occur on the NFS, including in old-growth forest, are designed to foster ecosystems that are sustainable while also providing for multiple uses." {{PDF highlighting stop}}

The DEIS appears to signify the critical nature of always applying the multiple use program in terms of old-growth forests. Is the NFS saying that even in terms of old-growth forest management, the agency must consider other uses under MUSYA? To this question, we must ask the USFS this question, does the agency consider wildlife or

watershed protections during uses such as timber harvesting or high-use recreation? Is the USFS saying that every square inch of acreage of USFS land must be capable of utilizing every facet of multiple use covered under MUSYA of 1960. This is obviously absurd, but it appears the USFS is trying to incorporate all uses in old-growth forests.

GWA believes that the best application of land-use management is to set aside land acreage for those uses that best support that use. For example, many times such as wilderness, you have many facets of MUSYA being incorporated into that one land-use designation. Aspects such as wildlife, wilderness, watershed protection, clean water, and old-growth forests can all be facilitated under one classification of land use, in this case wilderness. But as we know, this is not always the scenario. Many uses are incompatible with other uses, so you have conflicts. High-use recreation and timber harvesting most likely won't occur on the same acreage as sensitive wildlife habitat. Just the same, old-growth forests should not be forced to endure conflicting uses such as timber harvesting, high-use recreation, and high-use visitation or other incompatible uses.

It should be straight forward that old-growth forests are highly regarded as critical wildlife habitat and should be managed as such. The EO 14072 and this DEIS even state this fact. On page 58 of the DEIS, there is this statement.

{{PDF highlighting start}} "Biodiversity is a critical ecosystem service provided by old-growth forests, which are home to a vast array of plant and animal species, including many that are rare or absent in younger forests. These forests support high levels of biodiversity due to their complex structure, with features like large trees, diverse understory vegetation, and abundant dead wood - creating a wide range of ecological niches and microhabitats (Brockerhoff et al. 2017)." {{PDF highlighting stop}}

Lichens were mentioned 4 times in one paragraph on page 58, but no mention of specific species such as wolves, grizzly bears, Canadian lynx or pine martens. There should have been a greater discussion as to how the decline or destruction of this particular habitat could be an existential threat to them or other species of wildlife. This is a missed opportunity. Even given the fact that all old-growth forests are not the same, and the wildlife that are associated and supported by those old-growth forests are not the same, GWA believes there still could have been some accreditation given as to the critical nature of certain species of wildlife to old-growth forests.

According to the Defenders of Wildlife¹⁹, their online website states the following.

{{PDF highlighting start}} "Old-growth and mature forests are biodiversity strongholds. They are home to thousands of plants and animals, including over 100 threatened and endangered species." {{PDF highlighting stop}}

The same is mentioned in the DEIS on page 59.

{{PDF highlighting start}} "The biodiversity of old-growth forests is essential for maintaining ecosystem functioning and resilience. A diverse array of species contributes to processes like nutrient cycling, carbon sequestration, and water regulation. Old-growth forests also provide habitat for threatened and endangered species, making them biodiversity strongholds. Maintaining a mosaic of old-growth forests and forests of different ages is crucial for preserving the full spectrum of biodiversity an ecological integrity across landscapes." {{PDF highlighting stop}}

With all this being said, GWA believes that the DEIS could have presented a more scientific background as to the close relationship between old-growth forests and wildlife.

Endangered Species, Sensitive Species, and Species of Conservation Concern: As the DEIS stipulates on page S-11, the USFS and the United States Fish and Wildlife Service had technical meetings and determined Section 7 under the ESA did not warrant further investigations.

{{PDF highlighting start}} "During Spring 2024, the Forest Service initiated conversations with U.S. Fish and Wildlife Service and National Marine Fisheries Service concerning ESA compliance for the old-growth amendment. After a series of technical assistance meetings, the three agencies determined Section 7 consultation was not warranted for the old-growth amendment at this time. The agencies determined that reasonable certainty of effects to species does not exist because of the national scale and programmatic nature of the old-growth amendment." {{PDF highlighting stop}}

But conversations would most likely need to take place at the project level. On page S-12, this is reaffirmed.

{{PDF highlighting start}} "Direct impacts stemming from projects implementing the amendment would be analyzed at the project level." {{PDF highlighting stop}}

Having said all this, it is odd and concerning that on page S-12 of the DEIS, the next paragraph makes this statement.

{{PDF highlighting start}} "For these species it was determined that the impact of the old-growth amendment would be "May Impact Individuals or Habitat" (MIIH). {{PDF highlighting stop}} Use of this determination indicates that the proposed amendment will not cause a trend towards federal listing under ESA, nor cause a loss of viability in the planning area. {{PDF highlighting start}} For species that occur in old-growth supportive habitat, impacts of the amendment are likely to be negligible or beneficial. For species occurring outside old-growth supportive habitat, the impacts of the amendment are likely to be negligible as the amendment does not change management of other seral stages." {{PDF highlighting stop}}

It needs to be noted that GWA views this as a double-edged sword. For if we understand this statement correctly, even though the amendment may not and most likely would not be a threat to wildlife in old-growth forests; projects stemming from this amendment, under these auspices, very well could be a threat. This is the reason as to why GWA does not support Alternative 2, the Proposed Amendment.

At Risk Forest Ecosystems and Species: This section and the title are from a scientific article found online at Frontiers in Forests and Global Change. Written by Dominick A. DellaSala²⁰, et al., places the relationship between old-growth forests and wildlife in more relatable terms. This reference provides the connection between the health of ecosystems and the element of biodiversity. Both concepts are at the heart of EO 14072 and the purpose of this amendment. Note the IUCN acronym mentioned below refers to the International Union for Conservation and Nature and "The IUCN Red List of Threatened Species" refers to the world's most comprehensive information source on the global extinction risk status of animal, fungus and plant species."²¹

The IUCN Red List of Ecosystems (RLE) is an emerging global standard that integrates data and knowledge to document the relative risk status of ecosystem types. {{PDF highlighting start}} RLE criteria were used to assess 655 terrestrial ecosystems in temperate and tropical North America, including 182 forest and woodland ecosystem types in the conterminous United States using the U.S. National Vegetation Classification {{PDF highlighting stop}} (Comer et al., 2022). We mapped these ecosystem types nationally using inter-agency LANDFIRE (2016) map products at 30-m pixel resolution with remote sensing data from approximately 2011. {{PDF highlighting start}} The RLE indicators that gauge the probability of range wide ecosystem collapse were measured for each criterion to address: trends in ecosystem extent (A); relative restricted nature of its distribution

(B); extent and relative severity of environmental degradation (C); and extent and relative severity of disruption of biotic processes (D). {{PDF highlighting stop}} Based on these measures, {{PDF highlighting start}} we categorized ecosystems as Collapsed, Critically Endangered, Endangered, Vulnerable, Near Threatened, Least Concern, Data Deficient, or Not Evaluated. Some 119 (65%) of the 182 United States forest ecosystem types were listed as threatened in some form (i.e., either Critically Endangered (CR) [6.5%], Endangered (EN) [24%], Vulnerable (VU) [24%], or Near Threatened (NT) [10%]).

Some of the remaining old-growth forests on national forest land are within Inventoried Roadless Areas (IRAs) that are at least 2,000 ha. Road building and most forms of logging are prohibited within IRAs but only administratively and not by an act of Congress, meaning protections are not inviolate or permanent {{PDF highlighting stop}} (i.e., classified as GAP3 multiple use management). {{PDF highlighting start}} Importantly, significant portions of eastern forests are approaching maturity {{PDF highlighting stop}} (100 + years, Gunn et al., 2013). {{PDF highlighting start}} As mature forests with advanced structure recover from historical logging, they could develop old-growth characteristics within just a few decades. {{PDF highlighting stop}}

GWA wants to highlight this relationship as it showcases the correlation between a healthy ecosystem and a healthy status of biodiversity, ecological integrity, and the importance of old growth in that relationship. Another way of saying this is by acknowledging the fact, as go our old-growth forest, so goes the health of our ecosystem and the biodiversity within. We must preserve our old-growth forests for the endangered and threatened species that inhabit these landscapes.

But what this article does is relay 65% of this country ecosystems need help. Our environment is not robust like it should be. Past forest management policies, climate change, and other threats like fire, insects and pests, and human influences have placed our natural forests on the threatened and endangered list. They need help.

Central and Eastern Hardwood Forests:

Our previous comments were directed toward our western forests, but we want to go on record indicating our concern for the status of old-growth forests is nationwide. Old-growth forests in the eastern half of the United States are not as prevalent, but they are still existent, albeit, in isolated pockets. But that fact makes them more critical for protection, not less. From the Sierra Club's magazine *Sierra*22, this confirmation in a June 2024 edition of that magazine.

{{PDF highlighting start}} "For all the press it's received, old growth composes just a fraction of the landscape. Across the United States, roughly 6 percent of precolonial forests remain; in New England, the figure varies but is generally considered to be less than 1 percent." {{PDF highlighting stop}}

Even though the percentage of old growth in the eastern half of the United States is far less, especially so when including Alaska, the principle and value of old growth remains the same. Perhaps old growth in the central and eastern part of the country is even more critical to the health of ecosystems today than anywhere else. Page 61 of the DEIS provides a more detailed picture as to numbers by Region and Forests.

There are most likely actions and policy options used in the western half of the United States that could be easily transferred over to the forests of the Midwest, Northeast, and Southeast. Yet, it is sensical that different regions of the country will have different threats, different threats that result from a different history. The role of fire, for example, is an interesting one. GWA would like to urge the USFS to familiarize themselves with the scientific journal "The Demise of Fire and "Mesophication" of Forests in the Eastern United States" by Gregory J.

Nowacki²³ and Marc D. Abrams. Here, fire appears to have a different history on landscapes east of the Mississippi River than those in the west.

{{PDF highlighting start}} "A diverse array of fire-adapted plant communities once covered the eastern United States. European settlement greatly altered fire regimes, often increasing fire occurrence (e.g., in northern hardwoods) or substantially decreasing it (e.g., in tallgrass prairies). Notwithstanding these changes, fire suppression policies, beginning around the 1920s, greatly reduced fire throughout the East, with profound ecological consequences. Fire-maintained open lands converted to closed-canopy forests. As a result of shading, shade-tolerant, fire-sensitive plants began to replace heliophytic (sun-loving), fire-tolerant plants. A positive feedback cycle—which we term "mesophication"—ensued, whereby microenvironmental conditions (cool, damp, and shaded conditions; less flammable fuel beds) continually improve for shade-tolerant mesophytic species and deteriorate for shade-intolerant, fire-adapted species. Plant communities are undergoing rapid compositional and structural changes, some with no ecological antecedent. Stand-level species richness is declining, and will decline further, as numerous fire-adapted plants are replaced by a limited set of shade-tolerant, fire-sensitive species. As this process continues, the effort and cost required to restore fire-adapted ecosystems escalate rapidly." {{PDF highlighting stop}}

This Abstract tells a different story than perhaps what we were expecting, not so much that fire existed, but what came from it. Man has altered the natural landscape and by doing so, it raises some interesting questions. Some may wonder, is this situation reversible, and some may wonder, is it worth the effort to change the fire regime now, and if so, for what purpose?

But from what we see with this scientific evidence, past actions have actually established a new course in the ecology of the Central and East coast hardwoods. The forest ecological integrity has changed as well as the biodiversity. This was possible because of different climate, seasonal demands, geography and fire suppression policies. The use of prescribed burns as recommended by the DEIS for the Central and East Coast hardwoods allows GWA to be very skeptical of their planned use in the present as well as the future.

GWA recommends that there needs to be an honest and frank discussion with scientists, governmental officials, and the public about which direction to take moving forward; maintain the status quo or go back to conditions that don't exist anymore. Perhaps there needs to be more verification of the fire history, but for now, GWA recommends there should be a halt in prescribing burns in these forests. Because we ask, for what purpose?

GWA also recommends that the preservation of old-growth forests of the Central and East Coast must be given the highest priority, as in all old-growth forests nationwide. Along with that there needs to be an assessment of the mature forests, an item which GWA has already bemoaned as to the lack of follow through by the USFS. Those mature forests that are highly likely to become our Nations future old growth should not be logged. Just as the saying goes that man cannot manufacture new wilderness, the same holds true for old-growth forests. We must accept what we have and preserve it as it exists at the time we have it.

With the knowledge that definitions and descriptions of old growth may change because of climatic, biologic, and geographic diversity, the long-term impact and critical nature of these forests remains the same.

Climate Change and Carbon Sequestration:

Since the pronouncement of EO 14072, there has been National and major focus mitigating the negative impacts of climate change. As these introductory remarks state, our forests can be a solution to do just that. From the Fact Sheet²⁴ dated December 19, 2023, there is this statement from the White House and the Biden Administration.

{{PDF highlighting start}} "America's forests are a key climate solution, absorbing carbon dioxide equivalent to more than 10% of U.S. annual greenhouse gas emissions.

Old and mature forests are vital to providing clean water, absorbing carbon pollution, and supplying habitat for wildlife." {{PDF highlighting stop}}

Within the amendment itself, this DEIS, there is this statement found on page S-3 under the heading: Why is the USDA Forest Service Proposing this Amendment?

On April 22, 2022, President Biden issued Executive Order 14072 Strengthening the Nation's Forests, Communities, and Local Economies. {{PDF highlighting start}} Section 2 of the Executive Order (EO) recognizes the distinctive role that Federal forest lands play in sustaining ecological, {{PDF highlighting stop}} social, and economic benefits throughout the nation and {{PDF highlighting start}} calls particular attention to the importance of mature and old-growth forests on Federal lands for their role in contributing to nature-based climate solutions by storing large amounts of carbon and increasing biodiversity, {{PDF highlighting stop}} mitigating wildfire risks, {{PDF highlighting start}} enhancing climate resilience, {{PDF highlighting stop}} enabling subsistence and cultural uses, providing outdoor recreational opportunities, and promoting sustainable local economic development.

Our national focus and purpose of this amendment is serious. It is not something we can shrug off; it needs to be adhered to. The Intergovernmental Panel on Climate Change (IPCC) has released their Sixth Assessment Report²⁵ over the years from 2021-2023. They summarize the condition of the world's climate in these terms.

"Under even the most optimistic scenario, one in which the world bands together to slash emissions immediately, the world can avoid the most catastrophic version of the climate crisis, {{PDF highlighting start}} but it will continue to warm until at least mid-century, due to the impact of past emissions. "Some of the changes already set in motion[mdash]such as continued sea level rise[mdash]are irreversible over hundreds to thousands of years," the report says. That means we can expect climate impacts, from storms to sweltering temperatures, to get worse before they get better, {{PDF highlighting stop}} though these interactions are complex and can vary by region.

The panel also makes clear that {{PDF highlighting start}} the world is not doing enough to adapt to current and worsening climate impacts, particularly in vulnerable communities where the climate crisis can exacerbate existing social and economic inequities. Adaptation efforts have so far been "fragmented" and "incremental," the panel says, when instead, governments should be urgently making "transformational" changes to secure food supplies, build more resilient electricity grids, and protect people's health." {{PDF highlighting stop}}

GWA has been trying to raise this issue of concern by urging the USFS to change their paradigm. To fulfill the intent of EO 14072 and this amendment, there needs to be a consensus of utilizing the best available science. Forestry science and wildfire science has changed and has much improved over the years since the mid-20th century. The purpose of this effort is to put in place those programs that can benefit our forest, biodiversity, and sequester carbon. We need to use methods and technologies that have shown the most improvements over the years in doing just that, sequestering carbon.

There is an obvious link between climate change and carbon sequestration. The purpose of this project and amendment is to create carbon sinks whereby forests remove greenhouse gases (GHG) in this case, carbon dioxide (CO₂) from the atmosphere through the natural process of photosynthesis. From the United Nations²⁶, there is this explanation from their website.

{{PDF highlighting start}} "The rate of build-up of carbon dioxide (CO₂) in the atmosphere can be reduced by

taking advantage of the fact that atmospheric CO₂ can accumulate as carbon in vegetation and soils in terrestrial ecosystems. Under the United Nations Framework Convention on Climate Change any process, activity or mechanism which removes a greenhouse gas (GHG) from the atmosphere is referred to as a "sink" {{PDF highlighting stop}}. Human activities impact terrestrial sinks, through land use, land-use change and forestry (LULUCF), consequently, the exchange of CO₂ (carbon cycle) between the terrestrial biosphere and the atmosphere is altered."

Realizing that GWA has already touched upon the topic of carbon earlier, we would like to expound a little more on the importance of using our forests as one solution to mitigating climate change. All done through the process of carbon sequestration. In the scientific article entitled "Degradation and forgone removals increase the carbon impact of intact forest loss by 626%" by Sean L. Maxwell²⁷, et al., there is this disturbing awareness of our planet's status in terms of impact from anthropogenic sources.

{{PDF highlighting start}} "Large tracts of forest that are free from significant anthropogenic influence, which we term "intact" forests, play a unique and important role in the global carbon cycle. Using mapped intact forest landscapes as the best available proxy, only 20% of tropical forests can be considered intact, but these areas store 40% of the aboveground carbon found in all tropical forests. The net biomass increase of intact forests also removes large amounts of atmospheric carbon [mdash]sequestering at least one petagram of carbon per year, or up to 0.9 Mg of carbon per hectare per year [mdash]and thus makes substantial contributions to the residual terrestrial carbon sink phenomenon.

When compared to forests that have been degraded by large-scale human activities, intact forests are often more resistant to pressures such as fire and drought events and usually less accessible to logging and agricultural conversion. {{PDF highlighting stop}} Avoiding the degradation or outright clearance of intact forests (which we collectively term "intact forest loss") is therefore likely to be an important contributor to the Paris Agreement's goal of limiting global warming to well below 2[deg]C above preindustrial levels, alongside other nature-based climate mitigation actions."

Much of the above reference was focused upon tropical forests, but to counter that potential argument from some, we will provide one more reference. The following article from William Moomaw²⁸, et al., entitled "Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good" provides that necessary information.

{{PDF highlighting start}} "Climate change and loss of biodiversity are widely recognized as the foremost environmental challenges of our time. Forests annually sequester large quantities of atmospheric carbon dioxide (CO₂), and store carbon above and below ground for long periods of time. Intact forests[mdash]largely free from human intervention except primarily for trails and hazard removals[mdash]are the most carbon-dense and biodiverse terrestrial ecosystems, with additional benefits to society and the economy. Internationally, focus has been on preventing loss of tropical forests, yet U.S. temperate and boreal forests remove sufficient atmospheric CO₂ to reduce national annual net emissions by 11%. U.S. forests have the potential for much more rapid atmospheric CO₂ removal rates and biological carbon sequestration by intact and/or older forests." {{PDF highlighting stop}}

We bring this to the attention of decision-makers to state that it does not make sense to employ techniques and methods that may increase the storage of carbon in the future when we need to maintain the greatest efficiency of carbon sequestration in the short term to prevent the current condition of carbon impact from getting worse.

The Tongass:

Before we close these comments out, we need to bring up one more issue that has not been discussed in this format, but it is of high interest to those of us who value forest integrity across our country, including Alaska. And that is the Tongass and the Chugach National Forests in Alaska. According to the DEIS, the Tongass contains more than 50% old growth. This seems hard to imagine compared to what remains in the rest of the country. We need not make the same mistake in Alaska that has already been made in the lower 48 contiguous United States.

As stated on page 106 in the DEIS, Alternatives 2 and 3 would effectively halt larger commercial old-growth timber sales on the Tongass National Forest. We want to be clear, GWA's position on this is to halt all timber sales on old growth in the Tongass National Forest. Commercial timber sales need to be halted on all old-growth lands period, whether it is in the Tongass or in the lower 48 contiguous United States.

According to Dominick DellaSala²⁹ in his paper entitled "PROTECTING THE TONGASS RAINFOREST, OLDER FORESTS, AND LARGE TREES NATIONWIDE FOR THE U.S. NATIONALLY DETERMINED CONTRIBUTION TO THE PARIS CLIMATE AGREEMENT", he states the following.

{{PDF highlighting start}} "The 16.8 million-acre Tongass rainforest in southeast Alaska represents 12% of the entire North Pacific Coastal Temperate Rainforest Biome (from coastal Alaska to the California coast redwoods); collectively, the largest expanse of temperate rainforests on Earth. The Tongass also contains the most old-growth forest of any national forest with ~5 million acres remaining (29% of total area; 89% of historic)."

The Tongass is by far the nation's champion in storing carbon long-term² and presents a unique opportunity for the Biden administration to exercise its Nationally Determined Contribution (NDC) to the Paris climate agreement by including the Tongass, along with remaining older (mature and old-growth) forests {{PDF highlighting stop}} and large trees nationwide, in the lead up to the COP26 UNFCCC meetings in Glasgow. The Tongass is especially noteworthy because it by far has more old growth than any national forest.

{{PDF highlighting start}} The Tongass is the national carbon champion representing ~44% of the total ecosystem carbon of the entire national forest system. {{PDF highlighting stop}} Our estimate was based on published values (above ground, below ground, live and dead woody biomass carbon), including new spatial analysis of FIA datasets, and is consistent with other peer-reviewed studies.

GWA believes it is time to establish Climate Sanctuaries in the most prominent locations across the globe, but there should not be any exceptions in that regard in this country either. Dominick DellaSala recommends that the Tongass would be a prime example of such action as stated below.

{{PDF highlighting start}} However, the Tongass is likely to function as a climate sanctuary due to cooler maritime climate, high amounts of old growth and intact roadless areas, relative to interior Alaska and points further south. Carbon stocks are also more stable here given the cooler coastal climate. {{PDF highlighting stop}}

Conclusion:

GWA commends the Biden Administration for acknowledging the role that our Nation's forest can play in the mitigation of climate change. We also laud them for recognizing our Nation's biodiversity, for it too is in crisis with over one-third of our Nation's biodiversity disappearing³⁰. These negative events are based upon the cumulative effect of climate change and anthropogenic sources, all resulting in our present day Sixth Mass Extinction³¹. As we will see, our Nation is not immune from this devastation. Utilizing our prior reference from above,

NatureServe30 News Release dated February 6, 2023, it places our Nation's biodiversity at great risk. This Administration is addressing the concern in the most evidentiary way by the issuance of EO 14072.

{{PDF highlighting start}} "In the first report of its kind, Biodiversity in Focus: United States Edition reveals an alarming conclusion: 34% of plants and 40% of animals are at risk of extinction, and 41% of ecosystems are at risk of range-wide collapse. Because many protected areas prioritize geological features or landscapes of cultural significance instead of targeting threatened biodiversity, most at-risk species and ecosystems are insufficiently protected to prevent further decline." {{PDF highlighting stop}}

But on a downside to this, we also believe the USFS has strategically failed in their response to this existential crisis. We believe two things exist. One, the USFS would not have taken these steps to protect mature and old-growth forests unless the Biden Administration requested them to do so. Second, there is a deep-rooted belief within the USFS that the agency's purpose of management must include some type of a human's proactive management.

There is an arrogance that exists within the agency that prohibits the USFS from instilling new science and methodologies. This is highly unfortunate for the planet, for the natural world; but also, for the agency itself. For until the USFS is released from this bondage of precedence and politics, the agency will never reach their full potential of what they could be.

GWA believes the USFS failed miserably in addressing the concerns laid out in EO 14072. It is not even clear if the USFS had good intentions in their effort to comply with this order because this DEIS is so slanted toward the logging and thinning industry.

To be blunt, GWA believes the USFS fell short adhering to any new science, new technologies, or new methodologies. There is very little difference between USFS management of old-growth forests and forests under their general jurisdiction. Under this proposal old-growth trees and adjoining trees in old-growth forest conditions can still be cut, thinned, and removed. This is counter to the science that we have shown and from much of the science that exists in journals and research.

There is an abundance of science that highlights the important capacity of mature and old-growth forests to store carbon, to have old-growth forests become carbon sinks. Any action that would negate that capacity is unwarranted and unwise as it would immediately release stored carbon. This is exactly the opposite effect of what is necessary to reach the goals of EO 14072. Yet that is exactly what this proposal, Alternative 2 is prescribing. It allows a "proactive stewardship" a major role in this amendment.

This similar action is bolstered by the adherence to the Wildfire Crisis Strategy, a strategy as we stated above, that we believe conflicts with this amendment. The Wildfire Crisis Strategy appears to be the justification for all other proactive steps to exist. Alternative 2 is written in such a way that all USFS programs and policies take precedent over this amendment, an action GWA fundamentally disagrees with. Yet Alternative 2 admits this would be the case in any proposal. GWA believes this amendment should be written in such a way where precedent policies and programs should be interwoven around the amendment, not the other way around. This current approach weakens the amendment and weakens the likelihood of success because the Amendment does not have the strength to stand on its own.

Another major weakness of this amendment is the lack of protection for mature forests. There is an acknowledgement that the mature trees of today could be the old-growth forests of tomorrow. Even the DEIS admits this fact. However, the DEIS admits there are forgoing problems with considering all mature forests as old growth. On page S-5, the DEIS makes the following statement.

{{PDF highlighting start}} "The goal is not to manage all mature forest as future oldgrowth forest. Not all mature

forest occurs in areas that will persist as mature forest or that can sustain succession towards old-growth forest. Past management - such as fire suppression, previous vegetation management, and/or reforestation - and natural succession or regeneration may have created mature forest or species distribution/composition that does not support desired ecological functions and conditions. Additionally, many of these acres are managed for multiple uses and provide necessary terrestrial habitat features that differ from those found in old-growth forests. For these reasons, mature forest is not being included in conjunction with old-growth (e.g. "old-growth and mature forest") for all aspects of the amendment. However, the amendment does place an emphasis on identifying and prioritizing areas of mature forest to be managed for future old-growth forest, particularly in the Modified Proposed Action (Alternative 2). {{PDF highlighting stop}}

GWA can concur that it is likely all mature forests do not occur in landscapes that will persist as old growth as we move into the future. However, GWA thought that was the whole point of this exercise; to identify those sections of forests that would or could lead to succession; to plan accordingly and manage these lands for future old growth. By not following through on this half of EO 14072, the USGS abdicated half of their responsibility. This is highly unfortunate as this information could be highly valuable for forest management as we move into the future. But we suggest it is not too late.

At the root of the problem is the NFS's tendency to keep and maintain its old silvicultural practices. This is how we began this discussion, suggesting that the NFS needs to implement a new paradigm, one that develops the priority and practice of utilizing carbon sequestration in all the agency's management plans. By instilling that practice, the NFS could set and meet goals of management and multiple use by one administrative stroke. For example, if the landscape met the criterion of wilderness, the NFS could meet multiple use standards of wilderness, watershed protection, clean water, carbon sequestration, and biodiversity. The USFS would save money in the long run.

The practice of current logging and thinning and other active approaches basically undercut the problem at hand. It could take decades, if not generations, for young trees to make up for the stored carbon lost by cutting and harvesting mature and old growth trees. There has been plenty of science that showcases that fact. We have told that story here. In fact, GWA has told that story repeatedly among several comment sessions pertaining to USFS projects at the time. For some reason, those facts do not seem to register. It makes no sense to try and grow our way out of the climate crisis through the harvesting of old and mature trees when those trees are already here storing carbon, even as we speak.

Biodiversity is the other half of the problem which EO 14072 tries to address. GWA views this plan actually making the current biodiversity crisis worse not better. Allowing proactive stewardship that justifies the use of logging, thinning, and mechanical devices into old-growth forests opens the Pandora's Box where all kinds of negative impacts may occur. It opens up the canopy to sunlight and wind, weather conditions that would most likely dry out the forest floor. It would most likely increase accessibility to the interior of the forest, providing society more opportunity to wreak havoc upon the sensitive flora and fauna that exists.

Of course, the more people venturing out to the landscapes of old-growth forests, it will be only the matter of time where more equipment is needed for fire protection and that means more roads, which means more habitat fragmentation, which means more susceptible species becoming and going extinct. To support this conclusion, GWA provides another scientific journal by Jonathan Chase³², et al., entitled "Ecosystem decay exacerbates biodiversity loss with habitat loss".

{{PDF highlighting start}} "Although habitat loss is the predominant factor leading to biodiversity loss in the Anthropocene, exactly how this loss manifests—and at which scales—remains a central debate. The 'passive sampling' hypothesis suggests that species are lost in proportion to their abundance and distribution in the natural habitat, whereas the 'ecosystem decay' hypothesis suggests that ecological processes change in smaller and more-isolated habitats such that more species are lost than would have been expected simply

through loss of habitat alone. {{PDF highlighting stop}}

This statement says it all in terms of biodiversity, but the DEIS basically ignores the importance of this subject even though it is a large part of EO 14072. It should have been a large part of this assignment by the NFS, but it appeared to have been only lightly touched upon. Even though the subject matter was mentioned, it was not addressed. This is another abdication of duty by this DEIS and the USFS.

Since wildfire concerns and climate change appear to be the driving force behind this action, GWA suggest that dollars be spent on fireproofing homes and structures within the Wildland Urban Interface (WUI). Instead of spending tax dollars on methods and policies that harm the forest's integrity, spend the money where the problem is, the actual infrastructure itself. After all the DEIS makes the claim that 25% of the old-growth forest occurs within the WUI. Let's not use this as a rationale to proactively manage these lands by cutting and logging our way out of a potential crisis.

The Costs: One issue that GWA has not discussed yet is the dollar amount of this program; how much will it cost to maintain the Wildfire Crisis Strategy program. According to the USFS in a February 2024 announcement³³, Agriculture Secretary Tom Vilsack made this announcement.

{{PDF highlighting start}} Agriculture Secretary Tom Vilsack announced on February 20, 2024 that the United States Department of Agriculture is investing nearly \$500 million to expand work on the USDA Forest Service's Wildfire Crisis Strategy to reduce wildfire risk to communities, critical infrastructure and natural resources from the nation's wildfire crisis. {{PDF highlighting stop}}

According to the National Institute of Standards and Technology³⁴, they claim the following statistic.

{{PDF highlighting start}} The Wildland-Urban Interface (WUI) is defined as the location where structures and communities meet or intermingle with undeveloped wildland. In the U.S., over 46 million homes in over 70,000 communities have been built in the WUI. {{PDF highlighting stop}}

Local and state governments should have had control over the permitting process and foresaw the inherent danger in allowing unregulated and unchecked development to take place on forested lands. At the least, they should have mandated wildfire-resistant codes and standards. But none of that was done or if it was, it was limited in scope.

Headwaters Economics³⁵ puts the costs of fire-resistant homes in proper contrast to that of normal building materials. See below.

{{PDF highlighting start}} We examined costs in four vulnerable components of the home: the roof (including gutters, vents, and eaves), exterior walls (including windows and doors), decks, and near-home landscaping. Overall, the wildfire-resistant construction cost 2% less than the typical construction, with the greatest cost savings resulting from using wildfire-resistant fiber cement siding on exterior walls, in lieu of typical cedar plank siding. While cedar plank siding is typical in the wildland-urban interface of western Montana, fiber cement siding is already a common choice in many regions because of its relative affordability, durability and low maintenance needs. {{PDF highlighting stop}}

As we draw these comments to a close, we do so with a simple admonition. GWA urges the NFS to adopt a new premise, a premise that has been stated and reinstated at least a few times in these comments alone. But GWA has decided to use the closing comments from Dr. Dominick DellaSala²⁹ as the best way to summarize our thoughts and preferences.

{{PDF highlighting start}} In closing, climate change is solvable if we do two things right away to avoid imminent

climate catastrophes: (1) drastically cut emissions across all sectors (including forestry) (i.e., keep fossil fuels in the ground); and (2) protect carbon reservoirs and sinks as nature-based climate solutions (i.e., keep carbon in forests and trees and out of the atmosphere). Other strategies like planting trees, afforestation, and reforestation can provide some benefits; however, by far the most cost-effective nature-based climate solution is to protect existing carbon stocks present at high levels in older forests and large trees nationwide. Doing so, would provide the Biden administration a unique opportunity to assume global leadership on climate change solutions. {{PDF highlighting stop}}

GWA cannot in good conscious accept the Preferred Proposal as it now exists. It needs major changes. Many of those changes are scattered throughout this document, but we tried to summarize here. Even Alternative 3 which would prohibit logging for commercial purposes, still allows logging for "ecological restoration". Once again, it highlights what is wrong with the basic philosophy of the USFS. It just seems to be the means to an end, more logging on public land.

We strongly urge the USFS and NFS to adapt to a new strategy, one based upon a more passive approach than what we see in this DEIS. To be clear, we understand that some proactive approaches may be necessary in the most extreme cases, but that should not be read as an endorsement on a daily action.

We need an amendment that sets aside lands for the protection of mature forests and old-growth forests for the sake of maintaining and sustaining biological diversity, ecological integrity, climate sanctuaries. Only then will we honor the intentions of Executive Order 14072.

We thank you for this opportunity to comment.

Sincerely,

Clinton Nagel, President

Gallatin Wildlife Association

Bozeman, Montana

Cited References:

1. DellaSala, Dominick A, et al., "Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States", *Frontiers in Forests and Global Change*, September 27, 2022.

<https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2022.979528/full>

1. Rogers, Deborah, "Genetic Erosion: No longer just an agricultural issue", USDA Forest Service and Southern Regional Extension Forestry, published in *Reforestation, Nurseries, and Genetic Resources*, Fall 2004.

<https://rngr.net/npn/journal/articles/genetic-erosion-no-longer-just-an-agricultural-issue#:~:text=Genetic%20erosion%20is%20the%20loss,practices%20that%20reduce%20genetic%20diversity>.

1. "What is Genetic Erosion and How Can it be Managed?", National Forest Genetics Laboratory, Pacific Southwest Research Station, USDA Forest Service, 2006.

https://www.fs.usda.gov/wildflowers/Native_Plant_Materials/documents/genetics_Vol_11.pdf

1. Hilbert & Wienscczyk, Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, 2007.

<https://www.ipbes.net/glossary-tag/old-growth-forest>

1. Wildfire Crisis Implementation Plan, USDA, Forest Service, FS-1187b, January 2022.

<https://www.fs.usda.gov/sites/default/files/Wildfire-Crisis-Implementation-Plan.pdf>

1. Western Fire Chiefs Association

<https://wfca.com/wildfire-articles/what-causes-wildfires/#:~:text=Humans%20cause%20nearly%2090%25%20of,lightning%20strikes%20and%20volcanic%20eruptions>.

1. Morrison, Peter, H., Roads and Wildfires, Pacific Biodiversity Institute, May 2007.

https://www.pacificbio.org/publications/wildfire_studies/Roads_And_Wildfires_2007.pdf

1. Lee, Derek E., Proposed forest thinning will sabotage natural forest climate adaptation, resistance to drought, fire, insect outbreaks, Phys.org, January 16, 2017.

<https://phys.org/news/2017-01-forest-thinning-sabotage-natural-climate.html>

1. "Forest Thinning: Too Much of a Good Thing?", American Forests, January 4, 2012.

<https://www.americanforests.org/article/forest-thinning-too-much-of-a-good-thing/>

10. Bradley, Curtis M., Hanson, Chad T., DellaSala, Dominick A., "Does increased forest protection correspond

to higher fire severity in frequent-fire forests of the western United States?", *Ecosphere*, October 16, 2016.

<https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.1492>

11. Strengthening the Nation's Forests, Communities, and Local Economies, Federal Register, April 27, 2022.

<https://www.federalregister.gov/documents/2022/04/27/2022-09138/strengthening-the-nations-forests-communities-and-local-economies>

12. Notice of Intent, Federal Register, page 88043. December 20, 2023.

20231220FederalRegisterNotice.pdf | Powered by Box

13. Evans, Kathleen Ciola, and Perry, Eva, The Role of Indigenous Knowledge and Land Management Practices in Conservation, University of Maryland, Department of Entomology, March 4, 2022.

<https://entomology.umd.edu/news/the-role-of-indigenous-knowledge-and-land-management-practices-in-conservation#:~:text=A%20report%20by%20the%20ICCA,landscapes%20and%20Indigenous%20Peoples'%20lands.>

14. Barragan-Jason, Gladys, et al., "Human-nature connectedness as a pathway to sustainability: A global meta-analysis", *Conservation Letters: A Journal of the Society for Conservation Biology*, November 21, 2021.

<https://conbio.onlinelibrary.wiley.com/doi/full/10.1111/conl.12852>

15. NRCA: Drivers and Stressors, National Park Service,

https://www.nps.gov/subjects/science/nrca_drivers.htm

16. Ruiz, Sarah, What you should know about protecting the United States' old forests, Woodwell Climate Research Center, June 1, 2023.

<https://www.woodwellclimate.org/protect-us-mature-and-old-growth-forests/>

17. Birdsey, Richard A., Assessing carbon stocks and accumulation potential of mature forests and larger trees in U.S. federal lands", *Frontiers for Global Change*, January 5, 2023.

<https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2022.1074508/full>

18. "Seeking Rights of Nature for Elliott State Forest", Earth Law Center, August 22, 2024.

https://www.earthlawcenter.org/blog-entries/2019/8/seeking-rights-of-nature-for-elliott-state-forest?gad_source=1&gclid=CjwKCAjw8rW2BhAgEiwAoRO5rJtWm4ZfmqS2xHPnBPER3L_8Y33Hv4G2LOn7WowLs5FOWhdZsDhFhoChZMQAvD_BwE

19. McCain, Lauren, Cook, Allison, "Returning to Their Roots: The Importance of Old-Growth and Mature Forests", Defenders of Wildlife, January 16, 2024.

<https://defenders.org/blog/2024/01/returning-their-roots-importance-of-old-growth-and-mature-forests#:~:text=Shaina%20Niehans%20FNPS-,Returning%20to%20Their%20Roots%3A%20The%20Importance,Old%20Growth%20and%20Mature%20Forest&text=Old%20Growth%20and%20mature%20forests%20are%20biodiversity%20strongholds.,100%20threatened%20and%20endangered%20species.>

20. DellaSala, Dominick A., et al., "Mature and old-growth forests contribute to large-scale conservation targets in the conterminous United States", *Frontiers in Forests and Global Change*, September 27, 2022.

<https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2022.979528/full>

21. <https://iucn.org/resources/conservation-tool/iucn-red-list-threatened-species>

22. Langlois, Krista, "The Northeast Has Unexpected Old-Growth Forests That Survived Colonial Axes", *Sierra*, Sierra Club, June 10, 2024.

<https://www.sierraclub.org/sierra/2024-2-summer/feature/northeast-has-unexpected-old-growth-forests-survived-colonial-axes>

23. Nowacki, Gregory J., and Abrams, Marc D, "The Demise of Fire and "Mesophication" of Forests in the Eastern United States", *BioScience*, February 2008.

Demise of Fire and "Mesophication" of Forests in the Eastern United States | *BioScience* | Oxford Academic (oup.com)

24. Fact Sheet, White House, December 19, 2023.

<https://www.whitehouse.gov/briefing-room/statements-releases/2023/12/19/fact-sheet-biden-harris-administration-advances-commitment-to-protect-old-growth-forests-on-national-forest-system-lands/>

25. IPCC Climate Change Reports: Why They Matter to Everyone on the Planet, Natural Resource Defense Council, April 14, 2023.

https://www.nrdc.org/stories/ipcc-climate-change-reports-why-they-matter-everyone-planet?gad_source=1&gclid=CjwKCAjw8rW2BhAgEiwAoRO5rE0DG--VaCWEDsh13muALX1VKioifZMIMX7OcqAeZC9ZTKk73gCvihoC1TwQAvD_BwE#sec-target

26. Land Use, Land-Use Change and Forestry, United Nations,

<https://unfccc.int/topics/land-use/workstreams/land-use--land-use-change-and-forestry-lulucf>

27. Maxwell, Sean L., et al., "Degradation and forgone removals increase the carbon impact of intact forest loss by 626%", Science Advances, Oct. 30, 2019.

<https://www.science.org/doi/10.1126/sciadv.aax2546>

28. Moomaw, William R., et al., "Intact Forests in the United States: Proforestation Mitigates Climate Change and Serves the Greatest Good", Frontiers in Forests and Global Change, June 10, 2019.

<https://www.frontiersin.org/journals/forests-and-global-change/articles/10.3389/ffgc.2019.00027/full>

29. DellaSala, Dominick A., Ph. D, "PROTECTING THE TONGASS RAINFOREST, OLDER FORESTS, AND LARGE TREES NATIONWIDE FOR THE U.S. NATIONALLY DETERMINED CONTRIBUTION TO THE PARIS CLIMATE AGREEMENT", Wild Heritage,

<https://wild-heritage.org/wp-content/uploads/2021/03/Tongasssclimaterellevance-dellasala-3-30-21.pdf>

30. Over One-third of Biodiversity in the United States is at Risk of Disappearing, NatureServe, February 6, 2023.

<https://www.natureserve.org/news-releases/over-one-third-biodiversity-united-states-risk-disappearing>

31. "Strong evidence show Sixth Mass Extinction of global biodiversity in progress", Science Daily, January 13, 2022.

<https://www.sciencedaily.com/releases/2022/01/220113194911.htm>

32. Chase, Jonathan, et al., "Ecosystem decay exacerbates biodiversity loss with habitat loss", Nature, July 29, 2020.

<https://www.nature.com/articles/s41586-020-2531-2>

33. "Confronting the Wildfire Crisis", United Forest Service, U.S. Department of Agriculture,

<https://www.fs.usda.gov/managing-land/wildfire-crisis>

34. Improving WUI Community Fire Protection - Fire Resistant Building Design and Materials, National Institute of Standards and Technology, May 4, 2021.

<https://www.nist.gov/programs-projects/improving-wui-community-fire-protection-fire-resistant-building-design-and>

35. Pohl, Kelly, "Building a Wildfire-Resistant Home: Codes and Costs", Headwaters Economics, November 26, 2018.

<https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>

ATTACHMENT: 20240916.Old Growth Forest Amendment.docx.1.docx - this is the same content that is coded in text box; it was originally included as an attachment