Data Submitted (UTC 11): 7/1/2022 4:00:00 AM
First name: Zack
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Organization: Standing Trees
Title: Executive Director
Comments: Dear Mr. Innes,

Standing Trees submits the following scoping comments regarding the U.S. Forest Service's June 7, 2022, Notice of Proposed Action ("NOPA") for the Sandwich Vegetation Management Project ("Sandwich VMP" or "the proposed action").

Standing Trees is an incorporated nonprofit dedicated to advancing policy and legal solutions that protect and restore New England's native forests. Standing Trees seeks to hold state and federal agencies accountable for their actions that affect forests, and to ensure that land-managers and policymakers follow the latest climate and biodiversity science. After reviewing the NOPA, Standing Trees has concerns regarding the potential impacts of the proposed action on the character and composition of the White Mountain National Forest. Please see the attached letter and supporting exhibits (mailed separately via USPS because of the file size) on the appropriate scope of analysis for the proposed action. We ask that the Forest Service analyze and address the issues described in our letter, and disclose all impacts in a public analysis pursuant to the National Environmental Policy Act ("NEPA") that will be made available to the public for commenting.

Thanks for your careful review and consideration,

Zack Porter

Executive Director

Standing Trees

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At the June 23, 2022 public meeting for the Sandwich VMP, District Ranger James Innes mentioned that, due to

"time constraints," the White Mountain National Forest (WMNF) is planning to skip a customary 30-day comment period when it releases its Environmental Assessment, instead opting to utilize an objections period instead. Standing Trees believes such a decision would be an error in judgment that would lead to a breach of the public's trust, diminishing transparency and accountability in decision-making. As we detail in the following comments, a range of supporting documents were not provided to the public on the Sandwich VMP project webpage at the time that the scoping period was launched, and significant information remains unavailable at the time that these comments were finalized. To suggest that there is a time constraint is disingenuous at best: this project has been under development for at least two years and likely more. A decision to skip a second 30-day comment period upon release of the Environmental Assessment puts an extra burden on the public, and it also increases the responsibility of the WMNF to provide sufficient information up front, especially when much of that information is readily available to WMNF staff. To date, the WMNF has not met this responsibility.

I. The Purpose and Need Statement must be properly defined.

To comply with NEPA, federal agencies must provide a statement explaining the purpose and need for the proposed action. See 40 CFR [sect] 1501.5(c)(2) (2020); [sect] 1502.13 (2020). It is important that this statement accurately reflects the proposed action's purpose and need because this statement in turn informs the range of alternatives the agency will consider as part of its NEPA analysis. See League of Wilderness Defs.-Blue Mountains Biodiversity Proj. v. U.S. Forest Serv., 689 F.3d 1060, 1069 (9th Cir. 2012). The Forest Service should take care to not define the purpose and need so narrowly as to eliminate reasonable alternatives from analysis. City of Carmel-By-The-Sea v. U.S. Dep't of Transp., 123 F.3d 1142, 1155 (9th Cir. 1995); see also Simmons v. U.S. Army Corps of Engineers, 120 F.3d 664, 667 (7th Cir. 1997) (finding the range of alternatives the Corps considered to be inadequate because the agency too narrowly defined the project's purpose, emphasizing that the evaluation of alternatives is intended to be an evaluation of alternative means to accomplish the general goal of the action).

The NOPA appears to advance two purposes: (1) to "advance goals, objectives, and desired conditions of the White Mountain National Forest Land and Management Plan," and (2) to "implement actions to address transportation system needs." See NOPA at 3. These are two very distinct objectives that are proposed to be achieved in distinct ways at different locations across the property. Based on the description of proposed activities in the NOPA, it appears that the silvicultural and fuels treatments to "advance goals" of the Plan will mainly be various logging methods and prescribed fire while transportation needs will be addressed through road reconstruction methods such as aggregate placement and excavation and embankment work. Id. at 8 and 14. Attempting to formulate action alternatives that fit both of these disparate purposes at the same time may unduly narrow the scope of alternatives considered by the Forest Service. The Forest Service should frame the purpose and need in such a manner that it allows the Forest Service to consider an adequate range of alternatives, as discussed in more detail below.

A properly crafted purpose and need statement would integrate purposes of the Forest Plan with current executive orders, see Exhibit 1 (Executive Order 140721 and Executive Order 140082), to identify the best management approaches for current stand conditions. Instead, the 4 NOPA states the purpose of the proposed action is to implement the 17-year old Forest Plan. This inherently structures the NOPA to presuppose that the Forest Plan could only be implemented by the proposed action and fails to explain the management context (i.e., is the management needed and is this the most appropriate management for the subject stands?) to demonstrate the need component of the purpose and need statement. In order to demonstrate the need for the action, the Forest Service must do more than simply state a preference for "highquality timber products[,]" 2022 NOPA at 3, but must actually connect stand conditions, best science, and desired future conditions to this supposed need. Without this, the NOPA's purpose and need statement is inadequate to satisfy the NEPA requirements because it is too narrow and eliminates reasonable alternatives.

A more accurate purpose and need statement would promote and require exploration of other forest

management prescriptions that could better implement the Forest Plan, better avoid significant impacts on scenic and cultural resources and mature forests, and better support wildlife. A more accurate purpose and need statement would also promote detailed evaluations of current natural and cultural resources, which appear to be lacking thus far, which would, in turn, illuminate further reasonable alternatives for the Forest Service and the public to consider.

II. The Forest Service must analyze an adequate range of alternatives.

NEPA mandates that an EA describe the environmental impacts of both the proposed action and alternatives to the proposed action. 40 C.F.R. [sect] 1501.5(c)(2). NEPA similarly requires an alternatives analysis for Environmental Impact Statements ("EIS"). 40 C.F.R. [sect] 1502.14. The alternatives analysis, in which an agency evaluates "reasonable alternatives," is the heart of the environmental assessment. 40 C.F.R. [sect] 1502.14(a). An agency may consider only the proposed action when there are no "unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. [sect] 4332(E); see also 36 C.F.R. [sect] 220.7(b)(2)(i). Unresolved conflicts exist when the agency lacks a consensus about the proposed action based on input from interested parties. National Environmental Policy Act Procedures, 73 Fed. Reg. 43,084, 43,092 (July 24, 2008) (codified at 36 C.F.R. Part 220). Further, agencies "shall not commit resources prejudicing selection of alternatives before making a final decision." 40 CFR [sect] 1502.2(f); [sect] 1506.1.

CEQ regulations mandate that federal agencies shall "inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment." 40 C.F.R. [sect] 1502.1. It is also incumbent upon federal agencies to "[s]tudy, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources." Id. [sect] 1501.2(c); see also 42 U.S.C. [sect] 4332(E). Given the many different facets of the proposed action and the current primary purpose articulated in the NOPA[mdash]"advance Forest Plan goals, objectives, and desired conditions for vegetation, wildlife, and other resources in the Sandwich HMU"[mdash]it is inconceivable that there will be only one way to achieve that purpose. 2022 NOPA at 3. This is especially true for the logging portions of the proposed action. The sheer number of different silviculture prescriptions for the proposed action demonstrates that even if logging is needed[mdash]which Standing Trees asserts it is not[mdash]there is a wide variability in how the logging can achieve desired conditions. This variability necessarily implies several reasonable alternatives exist that the Forest Service should consider in an EIS.

With these considerations in mind, the Forest Service should include and analyze the following reasonable alternatives as part of its NEPA analysis.

A. The Forest Service must consider a No Action Alternative.

A "No Action Alternative" is the bare minimum alternative analysis an agency should undertake for an EA or EIS. 40 CFR [sect] 1502.14(c). One of the most critical purposes of a No Action Alternative is to establish a baseline against which the proposed action can be measured. The Forest Service should consider a No Action Alternative to establish such a baseline for the proposed action. NEPA requires agencies to consider both the detriments and benefits of proposed projects, which would include considering the benefits of reasonable alternatives as well. There are numerous benefits of not moving ahead with the proposed action (i.e., taking No Action), including, but not limited to: climate benefits of retaining older, mature trees; habitat benefits for the Northern Long-eared Bat and other species that rely on mature, old, or interior forests or are sensitive to harvest impacts; avoiding potential detrimental impacts to water quality due to runoff, sedimentation, and potential herbicide contamination; avoiding loss or damage to historic and cultural resources located within the proposed action area; avoiding introduction of invasive species (which were noted to be essentially non-existent at the 6/23/22 public meeting); and avoiding visual and noise impacts, among many others. A No Action alternative should also carefully detail how the full range of habitats required by native species can be facilitated within the project area

by simply allowing natural processes and forest ageing to create habitat diversity and complexity.

B. Additional Alternatives

In addition to a No Action Alternative, the WMNF should prepare additional alternatives that explore a reasonable range of options to meet the Purpose and Need while avoiding or minimizing harmful impacts. Additional alternatives should consider:

[bull] avoiding all roadless area impacts and protecting roadless area values by guiding logging away from Forest Plan Inventoried Roadless Areas that were allocated to Management Area 2.1 in the 2005 Forest Plan. Such an analysis should also consider how roadless area logging and road construction/reconstruction, regardless of whether a roadless area is managed according to the 2001 Roadless Area Conservation Rule, may change the outcome of future Ch 70 wilderness inventories and evaluations and the potential for Congress to include these lands in the National Wilderness Preservation System, especially since the current forest plan has outlived its 15-year lifespan as dictated by the National Forest Management Act;

[bull] increasing the size of the buffer from watercourses and wetlands;

[bull] increasing the size of the buffer from the boundaries of the Sandwich Wilderness and Mt Chocorua Scenic Area. Such an analysis should also consider how logging may degrade scenery management objectives, desired future conditions for WMNF Scenic Areas, the wilderness character of the Sandwich Wilderness, and other values that are emphasized in the Forest Plan or in statute;

[bull] avoiding all mature and old forest as defined in WMNF Forest Plan Appendix D, Age Class Definitions by Habitat Type, to comply with EO 14072 and to reduce risk of harm to Northern Long-eared Bat habitat.

III. The NOPA fails to provide supporting documentation to allow adequate and meaningful public participation.

Public participation is a critical aspect of the NEPA process. See 40 C.F.R. [sect] 1500.1(b) ("The purpose and function of NEPA is satisfied if Federal agencies have considered relevant environmental information, and the public has been informed regarding the decision-making process."); 40 C.F.R. [sect] 1506.6(a) ("Agencies shall . . . [m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures.").

Here, public involvement has been impeded by the unavailability of relevant supporting documents, the failure of the NOPA to clearly identify other supporting documents, and the failure to include sufficient detail in the NOPA to allow the public to engage the necessary substantive analysis underlying the agency's design of the Proposed action and its intended goals. Indeed, at the Forest Service's public meeting on June 23, 2022, Forest Service employees acknowledged that relevant data, including some basic maps, were available that had not been posted on the Sandwich VMP webpage, and they agreed to post it. This raises several questions. First, why wasn't this relevant data already publicly available on the webpage? The fact that the Forest Service said they would post it there in response to questions at the public meeting shows how easy it is to do. However, the public will have less than half of the full comment period to review and analyze the newly available data. Second, it begs the question about what other data the Forest Service has related to the proposed action that it hasn't or won't post on the webpage simply because it was not asked about it. Given how easy it is for the Forest Service to upload to the project's webpage relevant data and analysis on the proposed action to date, it should review its files to ensure all of that information is available so the public can make the most informed comments possible.

A. The Forest Service makes several conclusions that are supported by documents that are not available to the public for review.

Numerous references are made to other unspecified authorities to support conclusions advanced by the Forest

Service in the 2022 NOPA. For example, the NOPA states that "[s]ite assessments and other data indicate that existing conditions in the Sandwich HMU do not meet MA 2.1 habitat composition and age class objectives described in the Forest Plan." 2022 NOPA at 3. It then references a large section of White Mountain National Forest Land and Resource Management Plan ("the Plan") that contains these objectives, but no reference or citation is provided for where the public can review these "site assessments and other data." If an analysis was already conducted it could have been included in the NOPA, or at least cited so that the public could review it. Instead, we are left to wonder if this analysis is contained in one of the other documents provided on the Forest Service proposed action webpage. This does not appear to be the case. On June 16, 2022, Standing Trees' Executive Director requested a stand age class map for the areas proposed for harvest in the NOPA, with overlays of 2001 Roadless Area Conservation Rule Inventoried Roadless Area boundaries and WMNF 2005 Forest Plan Inventoried Roadless Area boundaries; Recreation Opportunity Spectrum and Scenery Management System with the proposed treatments; stand age classes with the proposed treatments. In addition, Standing Trees requested the 2015 Transportation Analysis Process document referenced in the NOPA and to clarify whether age definitions referenced in the NOPA were taken from WMNF 2005 Forest Plan Appendix D. In relation to stand ages, Standing Trees requested clarification on whether there are any stands that qualify as old forest as defined by Appendix D of the WMNF 2005 Forest Plan. See Exhibit 2. While the Forest Service responded to some of Standing Trees' questions, all requested information has still not been provided. See id.

In addition, the NOPA states that the proposed action area is "approximately 24 percent . . . young age class, 76 percent is mature forest, and regeneration-age (0 to 9 years) stands are limited or absent." 2022 NOPA at 3. Similar to the aforementioned references to unspecified authorities to support conclusions, the NOPA does not identify the data that establishes this. Therefore, there is no way for the public to review and assess the accuracy of the data set. Additionally, there is no way to know what year the composition data is based on. Stand age class maps have not been provided to the public to critically assess the age of the forest more carefully. This is especially important because the Plan forbids timber harvest in old growth forest. WMNF Plan at 2-13. These maps should be provided to the public for review as soon as possible, but at a minimum far in advance of the next comment or objection period. Without them, it is impossible for the public to determine whether this standard is being met or that the WMNF Plan's desired conditions are otherwise being achieved. Further, project documents fail to note the current forest-wide age class percentages within WMNF Management Area 2.1, leaving the public to guess whether age class objectives have been met overall, even if they have not been met in the Sandwich VMP project area, as asserted in the NOPA.

Similarly, the NOPA states that transportation management actions were informed by the Forest-wide Transportation Analysis Process (TAP), but "that proposed travel management actions may differ from TAP recommendations for some [hellip] system roads. These differences are the result of a project-specific analysis of transportation needs based on management goals and objectives for the project area." 2022 NOPA at 14. The "project-specific analysis" was not provided to the public. There is no information regarding when this analysis is from, what criteria the analysis was based on, or justifications for why this analysis warrants deviations from the TAP. There is no way for the public to review the analysis to assess the accuracy of the site analysis and the chosen methodologies based on it.

B. The Forest Service fails to address impacts to several uses of the WMNF as required by the WMNF Plan.

The WMNF Plan creates many requirements for the Forest Service for new projects in addition to many programs that all projects must adhere to. The Forest Service is required to assess the impacts on Threatened, Endangered, and Sensitive (TES) species for all projects according to the Plan. WMNF Plan at 2-13. Additionally, the WMNF Plan requires the Forest Service to abide by the Scenery Management System, see WMNF Plan at 3-6 to 3-8; the Recreational Opportunity Spectrum, see WMNF Plan at 3-5 to 3-6; and the Roadless Rule, see Special Areas; Roadless Area Conservation, 66 Fed. Reg. 3,244 (January 12, 2001). The Forest Service must provide analysis or information regarding all of the aforementioned requirements in its EIS for the proposed action. Additionally, the Forest Service should provide more information to support the use of prescribed burns.

All of the aforementioned considerations should be included in the Forest Service's EIS and are discussed in more detail below.

1. The NOPA is void of any discussion of impacts on TES species.

The Plan requires that "[a]ll project sites must be investigated for the presence of TES species and/or habitat prior to beginning any authorized ground-disturbing activity at the site. TES plant surveys must be completed for all new ground-disturbing projects, unless biologists/botanists determine TES species occurrence is unlikely (e.g., no habitat exists)." WMNF Plan at 2-13. However, the NOPA is void of any reference to any TES species in regard to their presence in the proposed action area, whether the proposed action area is suitable habitat for any TES species, or if any analysis has already been done in regard to TES species for the proposed action. The Forest Service should make any analysis it has already done regarding TES species available for public review and comment, and further analysis related to TES species must be a central part of its continuing NEPA evaluation.

Additionally, on March 23, 2022, the U.S. Fish and Wildlife Service ("USFWS") announced a proposed rule to reclassify the northern long-eared bat from threatened to endangered and remove the bat's species-specific 4(d) rule. Endangered Species Status for Northern Long-Eared Bat, 87 Fed. Reg. 16,442 (March 23, 2022). Exhibit 3. Even though the 2022 NOPA was released after the proposed up-listing of the Northern Long-Eared Bat and removal of the 4(d) rule, the NOPA does not address this significant event. The up-listing of the bat, if finalized, will remove its species-specific 4(d) Rule and make all take of the bat unlawful. 87 Fed. Reg. 16,442. While the Forest Service has analyzed impacts of logging on the bat in other projects, it is not clear whether such analysis has been done here. Additionally, in those projects the Forest Service found that at least some bats may be taken, especially under its cumulative impacts analysis, but the Forest Service has never evaluated the impacts of such take on the species in the absence of the 4(d) Rule. The proposed up-listing and removal of the 4(d) rule is thus new information that warrants additional analysis and an EIS, as discussed in more detail below.

The up-listing was, by definition, motivated by an increased likelihood that the Northern Long-eared Bat is in danger of extinction throughout all of its range. See 87 Fed. Reg. 16,449. The bat's abundance "has and will continue to decline substantially under current demographic and stressor conditions;" extant winter colonies have declined range-wide by 81%; and rangewide abundance is projected to decline by 95% from historical conditions by 2030. Id. at 16,446. Further, there has been a 96-100% decline in the number of large hibernacula. Id. Such low population sizes "exacerbate the effects of current and future declines due to continued exposure to [white nose syndrome], mortality from wind turbines, and impacts associated with habitat loss and climate change." Id. at 16,447.

Northern Long-eared Bat habitat requirements are the opposite of the type of habitat that will be generated from the proposed action. According to the USFWS Species Status Assessment Report for the Northern Long-eared Bat ("NLEB Report"), dated March 22, 2022, the bat depends on mature and old forests for roosting and foraging. Exhibit 4. Preferred roosting habitat is large diameter live or dead trees of a variety of species, with exfoliating bark, cavities, or crevices. Bats change roosts approximately every two days. Preferred foraging habitat is old forest with complex vertical structure on hillsides and ridges.

The WMNF, including the Sandwich proposed action area, contains extensive mature forests that are beginning to acquire the characteristics of an old forest, likely providing some of the highest-quality Northern Long-eared Bat habitat in New England. Many of the silviculture treatment prescriptions involve the removal of mature trees. In combination with recently approved projects (including Bowen Brook Integrated Resource Project, Deer Ridge Integrated Resource Project, Wanosha Integrated Resource Project, and others), and anticipated logging projects (including Peabody West Integrated Resource Project and Tarleton Integrated Resource Project), WMNF is set to eliminate or degrade thousands of acres of Northern Long-eared Bat habitat across a large region. As discussed in further detail below, the Forest Service should evaluate the cumulative impact of these

combined and geographically proximate projects.

What's more, logging is commonplace in private lands surrounding the WMNF and across the region, making mature forests a rare element in the New England landscape. Project analysis should assess age classes across the broader landscape to determine how WMNF lands can be best leveraged to restore natural disturbance regimes, native species, and their habitats. In light of this new information that Northern Long-eared Bat populations have become so decimated that the species is now in danger of extinction throughout all of its range and has thus been proposed for up-listing to endangered status, the Forest Service must initiate formal consultation with USFWS. To the extent that such consultation is already ongoing, it must take this new information regarding the potential up-listing of the Northern Long-eared Bat into consideration. The failure to do so would not only be a violation of the ESA, but of NEPA, which holds an independent obligation that agencies continue to take a "hard look" at project impacts.

2. The NOPA does not address the scenery impacts or address the requirements of the Scenery Management System.

The WMNF Plan mandates that "all management activities should meet or exceed Scenic Integrity Objectives established for the Forest through the Scenery Management System ("SMS")[.]" WMNF Plan at 2-26. However, the NOPA makes no reference to the SMS nor the requirements that are imposed upon the Forest Service by the SMS. The SMS is used to address the visible impact created by man-made activities. Within the SMS are Land Use Designations (LUD) and Scenic Integrity Objectives (SIO) that define the areas of land specific to which management direction is applied and the level of scenic quality, respectively. The proposed action is likely to have an impact on the scenery as over 600 acres will experience logging, and many of these acres are along roads and trails.

The Scenery Management portion of the Forest Plan mandates that "[i]n evaluating cumulative effects for viewed landscapes from established concern level 1, open, higher elevation viewpoints affording expansive or large scale views, no more than 9 percent of the acreage within the view should be treated with regeneration vegetation management activities within a 30 year period. Total area affected during any one entry period with new regeneration treatment should not exceed 4 percent of the acreage. Assessment may need to be made from multiple viewpoints (that view a common land base). The assessment will apply to each view separately." WMNF Plan at 3-6. Additionally, "VisualFX or similar computer graphics/simulation software should be used to design and evaluate visibility of proposed regeneration cuts, especially when viewed from higher elevation or superior viewpoints." Id. For areas with a "High" Scenic Integrity Objective, which Forest Service officials stated during the June 23, 2022 public meeting that the project area is, "most of the project area created openings should be minimally evident from trail, road, or use area vantage points. Maximum observed size should not exceed 4-5 acres. If openings occur, they should appear as natural occurrences and be well- distributed in the viewed landscape." Id.

The Forest Service should provide more information explaining the current SIOs and LUDs in the proposed action area and the positive and negative consequences the proposed action will have on those current land/areas with those designated statuses.

3. The NOPA references recreational value but fails to address the proposed action's impacts on recreation or the requirements of the Recreation Opportunity Spectrum.

Although the NOPA makes several references to recreational opportunities and management, and even states that creating a variety of recreational opportunities and managing recreation areas is the purpose of the management area, the NOPA makes no reference to the Recreation Opportunity Spectrum ("ROS"). The purpose of the ROS is to provide information on what the current status of recreational areas within National Forests are to allow the Forest Service to make informed decisions regarding how projects will impact the current

settings of certain recreation areas and how to develop those areas to the desired settings. Additionally, the WMNF Plan requires that projects are developed in accordance with the ROS objectives and goals. For MA 2.1 Forest Management, recreational management "will match the ROS class objectives provided in this management area. Recreational management activities themselves should not derive the ROS Class from a less developed to a more developed class." WMNF Plan at 3-4 to 3-5. It is odd that the Forest Service would develop a proposed action to improve recreational opportunities without explaining which areas specific to the proposed action are not yet at the desired usage, in addition to failing to acknowledge what those areas within the proposed action are currently qualified as.

Such baseline data is critical for the public to understand fully the potential recreational impacts of the proposed action. The Forest Service should provide more information explaining the current settings3 of the recreational opportunities in the proposed action area and the positive and negative consequences the proposed action will have on those recreational opportunities.

4. The NOPA does not address how the proposed action impacts Inventoried Roadless Areas.

Within the NOPA, the Forest Service does not include any information regarding whether sections of the proposed action area are subject to the 2001 Roadless Area Conservation Rule, or whether any Forest Plan Inventoried Roadless Areas overlap with the project. The public is left to guess how the proposed action will impact areas that were previously considered for wilderness designation in WMNF Forest Plan Appendix C, and may be considered again when the Forest Plan is revised. As stated previously, the Environmental Assessment should analyze impacts to roadless area values and propose alternatives that avoid roadless area impacts, regardless of whether those roadless areas are managed according to the 2001 Roadless Area Conservation Rule.

5. The NOPA provides little support for utilizing prescribed burns.

One of the several methods that the NOPA describes to meet the WMNF Plan is prescribed fire for at least portions of the following proposed action areas: 03, 04, 05, 07, 12, 13, 14, and 34. While the NOPA explains that the Forest Service is planning to burn approximately 96 acres of oak-pine communities, it incorrectly asserts that the burning will occur across only three units. 2022 NOPA at 13. Additionally, the NOPA states that the prescribed fire will occur in the planned wildlife opening, proposed action area 02, but does not indicate that prescribed fire will occur in that area according to Map 3 Liberty. Furthermore, the NOPA asserts the benefits of prescribed fire; however, it fails to include supporting evidence that prescribed fire 3 Settings is a word used by the Forest Service to describe the status or designation of areas on the ROS. will work for these proposed action areas. The Forest Service should document the supporting evidence for these assertions for the public to comment on in the EA.

The Plan requires that "[w]hen artificial regeneration is prescribed it should be initiated within two years of the harvest cut. Site preparation for planting may include manual, prescribed fire, chemical, or mechanical methods." WMNF Plan at 3-8.

6. The Forest Service must comply with MA 2.1 standards and guidelines.

The proposed action must comply with all of the standards and guidelines contained in the WMNF for the MA 2.1 ("General Forest Management") designation. There are some standards and guidelines that Standing Trees would like to draw specific attention to, which may be particularly relevant to the proposed action. First, project-related motorized administrative use may be allowed but the Forest Service should "consider potential impacts to social conditions and ecological resources in the area," resulting from such motorized use. WMNF Plan at 3-5. Additionally, regarding general vegetation management, "[h]arvest restrictions, such as time of day, day of the week, or season, should be considered in high-use recreation areas or other sensitive areas, such as private

residences, on a case-by-case basis." WMNF Plan at 3-8. Also, "[s]election cuts should be made on a 15- to 20-year entry interval, depending on individual site conditions." Id. Several of these guidelines are likely to be implicated due to the proposed action design; and therefore, must be considered and analyzed by the Forest Service as part of its NEPA evaluation.

7. The Forest Service must comply with Forest-Wide Management Direction.

Standard S-3 in WMNF Plan Ch 2-Forest-Wide Management Direction states that "Timber harvest is prohibited in old growth forest." WMNF Plan 2-13. Further, Guideline G-1 states that "Outstanding natural communities should be conserved." Id. Old-growth is defined in the WMNF Plan as "Uneven-aged (three or more age classes) forest with an abundance of trees at least 200 years old, multiple canopy layers, large diameter snags and down logs, and a forest floor exhibiting pit-and-mound topography. There should be little or no evidence of past timber harvest or agriculture. Northern hardwood old growth consists primarily of sugar maple and American beech; softwood old growth is largely made up of spruce and hemlock. Stands need to be at least 10 acres in size to be identified as old growth. Anything smaller is a patch of old trees within a younger stand, not a habitat type in its own right." WMNF Plan Abbreviations, Acronyms, and Glossary at 21.

The WMNF Plan goes beyond protections for existing old-growth forest, however, clearly looking to how the WMNF can facilitate recovery of old-growth forest across a larger percentage of the forest in the future. The WMNF Plan defines old forest as beginning at 70 years of age in Aspen-birch habitat types, 90 years of age in Spruce-Fir, 120 years of age in Northern hardwoods, Mixed wood, Oak-Pine, and Hemlock. WMNF Plan Appendix D-2. The WMNF Plan defines Old Forest Habitat as: "Desired habitat conditions start with those for mature forest and can include greater size, decadence, structural complexity, etc. No harvest will occur in stands identified to provide old forest habitat" (emphasis added). WMNF Plan Abbreviations, Acronyms, and Glossary at 21. The Environmental Assessment must analyze whether there are any portions of the project area that provide old forest habitat. The WMNF Plan advises against even-aged management in Mature Forest Habitat, and yet the Sandwich VMP proposes extensive even-aged management in mature stands. The mature age class ranges from 40-89 years for Spruce-Fir habitat types, 60-119 years for Mixed wood and Northern hardwood, 40-69 years for Aspen-birch, and 70-119 years for Oak-Pine and Hemlock. WMNF Plan Appendix D-2. The WMNF Plan further defines Mature Forest as "Stands in which the overstory is in the mature age class. Mature forest habitat is typically made up of trees that are eight inches or more in diameter. Mortality is just beginning in these stands, resulting in a few scattered canopy gaps and a small number of snags and cavities in the overstory. Most snags and down logs are small in diameter and within the intermediate or understory layers. Depending on site conditions, thinning and uneven-aged harvest methods can be used in this habitat without negatively impacting habitat quality. Some uneven-aged harvest may enhance vegetative and structural diversity" (emphasis added). WMNF Plan Abbreviations, Acronyms, and Glossary at 18. The Forest Plan is clearly implying that even-aged management in mature forest negatively impacts habitat quality. Despite this instruction to avoid even-aged management in mature forest habitat, the WMNF offers no explanation for how such negative impacts will be avoided or mitigated in the Sandwich Vegetation Management Project. In fact, if the NOPA is accurate that 76% of the project area is in the mature age class, then the project as currently designed will lead to negative impacts to habitat quality, considering the amount of even-aged management that is currently proposed.

C. The NOPA makes several references to potential alterations in the proposed action without opportunity for public comment.

The NOPA acknowledges several parts of the proposed action that are subject to change dependent upon several conditions. However, the Forest Service does not include an opportunity for the public to participate in the changes in the proposed action and does not explain when such changes would be implemented. The Forest Service allows for "treatment units . . . [to] be reduced or modified to meet visual and water quality objectives[.]" NOPA at 8 (emphasis added). The NOPA does not explain what the visual or water quality objectives are, when there would be a need to reserve patches of uncut trees or protective buffers nor does it provide an opportunity

or process for the public to participate in this determination. This theme continues throughout the NOPA. The Forest Service in the NOPA allows for "[f]inal locations of log landings [to] be modified during project layout subject to applicable forest plan standards and guidelines, best management practices, and other site specific requirements." NOPA at 9 (emphasis added). Additionally, the NOPA allows for "proposed travel management actions [to] differ from TAP recommendations for some National Forest System roads (system roads). These differences are the result of a project-specific analysis of transportation needs based on management goals and objectives for the project area." NOPA at 14.

In order to truly facilitate opportunities for public participation, the Forest Service must include more detail of these instances of deviation from the proposed action in order to allow for sufficient public comment on those deviations. Additionally, the Forest Service should narrow the opportunities to stray from a publicly reviewed proposed action deviation without further opportunity for public participation. If the Transportation Analysis Process (TAP) involved a signed record of decision, then any deviations from the TAP would require an amendment with NEPA review. As it stands, the TAP was unavailable for review on the WMNF website at the time that the NOPA was posted, and to date the WMNF has only provided a TAP map with no supporting analysis.

D. The aforementioned omissions impede public participation in violation of NEPA.

The public is not able to properly scrutinize agency decisions and analysis when relevant documentation is not made available or when available documents do not actually contain the analysis necessary to support the Forest Service's conclusory statements. The overall effect is to impede public participation, in violation of NEPA's clear mandate to "[m]ake diligent efforts to involve the public in preparing and implementing their NEPA procedures." 40 C.F.R. [sect] 1506.6(a). In addition, the failure to provide clear analysis, or sometimes any analysis, violates NEPA's mandate that NEPA documents "shall be written in plain language . . . so that decisionmakers and the public can readily understand them." Id. [sect] 1502.8. The public cannot understand what it is not told.

Without providing actual analysis, it is impossible to gauge the actual anticipated impact to proposed action-area resources, the significance of those impacts, and whether they may violate the Forest Plan standards and guidelines. "[T]he public should not be required to parse the agency's statements to determine how an area will be impacted[.]" League of Wilderness Defs./Blue Mountains Biodiversity Project v. Connaughton, 752 F.3d 755, 761 (9th Cir. 2014). Instances of this persistent defect are identified throughout these comments. Given the gaps in data available for public scrutiny, the Forest Service should reconsider its stance from the June 23, 2022 public meeting that it does not intend to provide another 30-day comment period on its draft EA. Reconsideration of that decision is also good public policy.

IV. The Forest Service's proposed action fails to meet current scientific standards and demands.

Despite the clear scientific evidence for increased amounts of old, wild forest, only 3% of New Hampshire (and a similar amount across New England) is managed to permanently protect or restore old forest conditions, with a primary emphasis on supporting native biodiversity, natural processes, and climate stabilization.4 New Hampshire was historically dominated by old forests, and it remained that way for millennia prior to European arrival.5 Although the Abenaki people and other indigenous communities developed a sophisticated culture and cleared and managed some of the New England landscape with fire, recent science demonstrates that their impacts were highly concentrated, with the majority of historic New England forests primarily impacted by forces such as wind, ice, and beavers.6 Much of New Hampshire's landscape evolved with relatively minor human influence over thousands of years since the last glaciation. With these considerations in mind, the Forest Service should reconsider its stance in regard to the Age Class goals and implementation of Executive Order 14072.

A. The Age Class goals do not match the latest scientific understanding of the ecology of New England forests.

Today, old forests - the forests that once dominated the region - are functionally absent from northern New England.7 Elk, caribou, wolverine, wolves, cougars, pine marten, and salmon, once common in New Hampshire, have either been entirely eliminated or, in the case of salmon, have long since failed to naturally reproduce. By any objective measure of ecosystem health, New Hampshire's ecosystems remain in the intensive care unit ("ICU").

According to the definitive paper on disturbance frequency and intensity in New England, "the proportion of the presettlement landscape in seedling-sapling forest habitat (1-15 years old) ranged from 1 to 3% in northern hardwood forests (Fagus-Betula-Acer-Tsuga) of the interior uplands." "The current estimates of 9-25% [seedling-sapling habitat] for the northern New England states are probably several times higher than presettlement levels." Gap size in Hemlock-Northern Hardwood forests averaged less than .75 acres. Beech was the dominant species among Northern Hardwoods, comprising perhaps 30% of the forest. Stand replacing events occurred, on average, only every 1,000 to 7,500 years.8

A 2008 paper builds on these themes: "Although humans have a long history (about 12,000 years) on the North American continent, the magnitude of change wrought by European settlement has no parallel since the last glaciation... In New England, rates of landscape change have been far greater in the past 300 years than in the previous 1000 years as a result of forest cutting, agricultural conversion, urban development, altered fire regimes and herbivore populations, nonnative species introductions, and atmospheric pollution[hellip] There has been no return to presettlement conditions because of continuing low-level disturbance and perhaps insufficient recovery time."9

We can measure New Hampshire's progress towards forest ecosystem restoration against several large landscape conservation visions that have gained traction in the past fifteen years. In 2006, Wildlands and Woodlands, a program of Harvard Forest and Highstead Foundation, produced a widely supported vision for New England that included a goal for 10% of all regional forestlands to be conserved as wildlands. Fifteen years later, only 3% of New England is in wildlands, and relatively little progress has been made toward the 10% goal, despite excellent progress towards conserving forests for extraction of wood products.

More recently, based on the rapid decline of wildlife populations10 and the rapid degradation of the climate,11 scientists have suggested that much more aggressive measures must be taken to stave off climate and extinction catastrophe. The 2019 Global Deal for Nature (the inspiration for "30x30") calls for 30% of lands and waters to be permanently protected in GAP 1 and 212 protected areas13 by 2030 to maintain and restore biodiversity, with an additional 20% percent conserved to stabilize the climate.14 This vision was partially endorsed by the Biden Administration in Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad." Exhibit 14. To date, the Forest Service, including the White Mountain National Forest, has not revealed how it intends to implement EO 14008.

Large blocks of intact forest minimize harmful vectors for the spread of invasive species and allow natural disturbances to play out across a sufficiently large landscape to ensure that there is a mix of early and late successional habitats required by the full spectrum of New England's forest-dependent species. Although passive management is most often all that's required to restore old forest conditions,15 it takes centuries to develop forest complexity, requiring permanent protection from timber harvest if restoration is to be successful.16,17,18,19,20

The NOPA states that its vegetation management goals include creation of "small and large openings in the forest" to "improve wildlife habitat diversity," as well as "discouraging beech regeneration." 2022 NOPA at 9. Additionally, as explained above, the NOPA suggests that12 The US Geological Survey maintains the nation's protected area database and has created a "GAP Status Code Assignment" to categorize types of conservation across all land ownerships, public and private. "site assessments and other data indicate that existing conditions in the Sandwich [Habitat Management Unit ("HMU")] do not meet MA 2.1 habitat composition and age class

objectives" outlined in the 2005 Forest Plan. 2022 NOPA at 3. However, the NOPA fails to include any description of this purported analysis, and it is unclear that the WMNF has sound information about stand ages classes in the Sandwich HMU. Nor does the NOPA contain an analysis of whether the age class objectives for regeneration and young age classes have already been met, forest-wide, in the 17 years since the signing of the Forest Plan. Indeed, the Forest Plan expects that regeneration age-class objectives will be met by year 10 of the Forest Plan. WMNF Plan at 1-21.

Taking the aforementioned science into account, the public is also left to wonder what science the White Mountain National Forest is grounding forest management decisions in. Which species does the Sandwich VMP stand to benefit most? Why does the Sandwich VMP seem to favor game species, which already exist in abundance elsewhere in New Hampshire? Why are interior and mature forest species devalued in the proposed action area? Why does the NOPA propose to reduce the beech population, despite the fact that it is a critical wildlife food source and that it was historically the dominant species on this site? By removing all beech, how can we identify strains that are resistant to beech bark disease? How should the public reconcile extensive areas of even-age management with the fact that such areas bear little resemblance to the natural disturbance regime of a Northern Hardwood forest?

B. The Forest Service has failed to implement Executive Order 14072.

The NOPA fails to explain how proposed logging will comply with the Forest Plan standards and prohibitions, as well as President Biden's Executive Order 14072, Strengthening the Nation's Forests, Communities, and Local Economies. Exhibit 1. The EO reads:

"Sec. 2. Restoring and Conserving the Nation's Forests, Including Mature and Old- Growth Forests. My Administration will manage forests on Federal lands, which include many mature and old-growth forests, to promote their continued health and resilience; retain and enhance carbon storage; conserve biodiversity; mitigate the risk of wildfires; enhance climate resilience; enable subsistence and cultural uses; provide outdoor recreational opportunities; and promote sustainable local economic development."

Exhibit 1, at 2-3. The EO continues:

"(b) The Secretary of the Interior, with respect to public lands managed by the Bureau of Land Management, and the Secretary of Agriculture, with respect to National Forest System lands, shall, within 1 year of the date of this order, define, identify, and complete an inventory of old-growth and mature forests on Federal lands, accounting for regional and ecological variations, as appropriate, and shall make such inventory publicly available.

(c) Following completion of the inventory, the Secretaries shall:

(i) coordinate conservation and wildfire risk reduction activities, including consideration of climate-smart stewardship of mature and old-growth forests, with other executive departments and agencies (agencies), States, Tribal Nations, and any private landowners who volunteer to participate;

(ii) analyze the threats to mature and old-growth forests on Federal lands, including from wildfires and climate change; and

(iii) develop policies, with robust opportunity for public comment, to institutionalize climate-smart management and conservation strategies that address threats to mature and old growth forests on Federal lands."

See Exhibit 1, at 3-4.

The WMNF Plan gives the forest a distinct advantage in meeting its NFMA and EO obligations by already clearly

defining mature, old, and old-growth forests. The WMNF has identified extensive mature forests in the Sandwich VMP project area, much of which it is planning to log in a clear violation of EO 14072. Until detailed analysis is completed and mature forests are conserved, the Sandwich VMP must not proceed.

The scientific underpinnings of EO 14072 are rooted in recent peer-reviewed studies that investigate climate change mitigation and the intersection of forest ecology and forest carbon. Climate change is driving and exacerbating a range of threats to New Hampshire, the New England region, and the globe. The 2009 New Hampshire Climate Action Plan notes that climate change is already "[i]ncreasing the frequency and severity of heavy, damaging precipitation events and the associated major economic impacts of cleanup, repair, and lost productivity and economic activity." In addition, climate change is "[i]ncreasing the frequency of short-term (i.e., one to three month) summer droughts from every two to three years to annually, resulting in increased water costs, and agricultural and forestry stress." Exhibit 19. Although perhaps not a primary driver of the spread of invasive species, ticks, and disease, climate change can amplify these threats.

The Intergovernmental Panel on Climate Change Report released in February 2022 found, "[s]afeguarding biodiversity and ecosystems is fundamental to climate resilient development [hellip] and to [climate] mitigation and adaptation." Exhibit 20. On November 12th, 2021, the US joined 140 other nations in signing a commitment at the COP 26 UN Climate Change Conference in Glasgow, Scotland. The "Glasgow Leaders' Declaration on Forests and Land Use" promised to "to halt and reverse forest loss and land degradation by 2030" (emphasis added). Exhibit 21.

On the global scale, forest protection represents approximately half or more of the climate change mitigation needed to hold temperature rise to 1.5 degrees Celsius.21 New Hampshire may be a relatively small state, but its temperate deciduous forests are among the planet's most effective carbon sinks. In the US, New England's in-situ carbon storage potential is second only to that of the Pacific Northwest, but carbon storage levels remain artificially low due to timber harvest frequency and intensity. Across the Northeast US and Upper Midwest, timber harvest accounts for 86% of annual forest carbon loss. In comparison only 9% of forest carbon in the same geographic area is lost annually from insect damage, and 3% from conversion to other land uses.22 Other recent studies show that among land uses in New England, timber harvest is the leading cause of tree mortality23 and has the greatest impact on aboveground carbon storage.24

The WMNF is an insurance policy against a changing climate and increasing extinction rates. The WMNF contains many of the oldest and most carbon-dense ecosystems in New England, much less New Hampshire, supporting native biodiversity and protecting critical headwaters. Its management should reflect its unique values in the broader landscape, serving the greatest good for the greatest number by maximizing carbon and water storage, water quality, and habitat for species that require old and unfragmented forests.

The 2018 Vermont Conservation Design Natural Community and Habitat Technical Report, jointly produced by the Vermont Departments of Forests, Parks and Recreation and Fish and Wildlife, puts it this way:

"As a result of the persistent structural and vegetative complexity above ground and the diverse biome belowground and associated complex biotic and abiotic relationships that develop over time, old forests also protect water quality, and sequester and store carbon, provide opportunities for adaptation of species and community relationships to climate and other environmental changes, and an ecological benchmark against which to measure active management of Vermont's forests."25

There is a common misconception that young forests are better than old when it comes to removing carbon in the atmosphere. First of all, old forests store much more carbon than young forests, and they continue to accumulate carbon over time.26,27,28 What's more, the rate of carbon sequestration also increases as trees age.29

Today, despite tree cover across 84% of New Hampshire, the state's forests do not produce high levels of

ecosystem services due to current management practices, including harvest frequency and intensity, and are still recovering from extensive clearing in the eighteenth and nineteenth centuries. A 2019 paper by Harvard Forest researchers found that:

"Among land uses, timber harvesting [has] a larger effect on [aboveground carbon] storage and changes in tree composition than did forest conversion to non-forest uses[hellip] Our results demonstrate a large difference between the landscape's potential to store carbon and the landscape's current trajectory."30

Northeast secondary forests have the potential to increase biological carbon sequestration 2.3-4.2-fold.31 A 2011 paper by UVM Professor Bill Keeton found that:

"[hellip]there is a significant potential to increase total carbon storage in the Northeast's northern hardwood-conifer forests. Young to mature secondary forests in the northeastern United States today have aboveground biomass (live and dead) levels of 107 Mg/ha on average (Turner et al. 1995, Birdsey and Lewis 2003). Thus, assuming a maximum potential aboveground biomass range for old-growth of approximately 250-450 Mg/ha, a range consistent with upper thresholds in our data set and the lower threshold observed at Hubbard Brook, our results suggest a potential to increase in situ forest carbon storage by a factor of 2.3-4.2, depending on site-specific variability. This would sequester an additional 72-172 Mg/ha of carbon."32

Forests in temperate zones such as in the Eastern U.S. have a particularly high untapped capacity for carbon storage and sequestration because of high growth and low decay rates, along with exceptionally long periods between stand replacing disturbance events, similar to the moist coastal forests of the Pacific Northwest. Further, because of recent recovery from an extensive history of timber harvesting and land conversion for agriculture in the 18th, 19th, and early 20th centuries, median forest age is about 75 years,33 which is only about 25-35% of the lifespan of many of the common tree species in these forests.34 Because of our remarkable forest ecosystems here in Northeastern North America, several global studies have highlighted the unique potential of our temperate deciduous forests to contribute on the global stage to climate stabilization and resilience.35,36

Old forests are also the most resilient to changes in the climate, producing the highest outputs of ecosystem services like clean water, and reducing the impacts of droughts and floods. These ecosystem services protect downstream communities from flooding, purify drinking water at low cost, and maintain base flows and low temperatures in rivers during hot summers for the benefit of fish and wildlife.

In New England, frequent flooding and nutrient-driven water quality degradation are two of our most costly environmental crises, and both are compounded by climate change. Mature and old forests naturally mitigate against flooding and drought by slowing, sinking, and storing water that would otherwise rapidly flow into our streams, rivers, and lakes.37 Scientists have also shown that old forests are exceptional at removing nutrients that drive harmful algae blooms, like phosphorus.38

After Tropical Storm Irene ravaged New England in 2011, Vermont's Department of Forests, Parks, and Recreation commissioned a report entitled "Enhancing Flood Resiliency of Vermont State Lands." According to the report:

"There may be a tendency to assume that lands in forest cover are resilient to the effects of flooding simply by virtue of their forested status. However, forest cover does not necessarily equate to forest health and forest flood resilience. Headwater forests of Vermont include a legacy of human modifications that have left certain land areas with a heightened propensity to generate runoff, accelerate soil erosion, and sediment streams. These legacy impacts affect forest lands across the state... The quality of [today's] forests is not the same as the pre-Settlement old growth forests. The legacy of early landscape development and a history of channel and floodplain modifications continue to impact water and sediment routing from the land."39

A 2019 study led by the University of Vermont looked into the climate resilience of older compared to younger forests. The research found that:

"[older forests] simultaneously support high levels of carbon storage, timber growth, and species richness. Older forests also exhibit low climate sensitivity[hellip]compared to younger forests[hellip] Strategies aimed at enhancing the representation of older forest conditions at landscape scales will help sustain [ecosystem services and biodiversity] in a changing world[hellip] Although our analysis suggests that old forests exhibit the highest combined [ecosystem services and biodiversity (ESB)] performance, less than 0.2% of the investigated sites are currently occupied by forests older than 200 years. This suggests a large potential to improve joint ESB outcomes in temperate and boreal forests of eastern North America by enhancing the representation of late-successional and older forest stand structures[hellip]" 40

V. The Forest Service should conduct additional analysis.

In addition, the Environmental Assessment should analyze and minimize:

[bull] Water quality impacts, including from road construction/reconstruction and logging;

[bull] Impacts to historic and cultural resources, including those of the Abenaki community;

[bull] Soil quality impacts, including from road construction/reconstruction and logging.

VI. The Project, as proposed, is "significant" and requires an EIS.

NEPA requires that federal agencies prepare an Environmental Impact Statement ("EIS") for projects that are likely to have significant effects. 40 CFR [sect] 1501.3(a)(3). In determining whether the effects of the proposed action are likely to be significant, agencies are to consider (1) both short- and long-term effects; (2) Both beneficial and adverse effects; (3) Effects on public health and safety, and (4) effects that would violate Federal, State, Tribal, or local law protecting the environment. Id. [sect] 1501.3(b)(2) (emphasis added). In making the significance determination, agencies are also to consider connected actions. Id. [sect] 1501.3(b). Moreover, "significance varies with the setting of the proposed action" and "in the case of a site-specific action, significance would usually depend only upon the effects in the local area." Id. [sect] 1501.3(b)(1).

Standing Trees believes that an EA is not adequate for a proposed action of this size, and requests that the Forest Service prepare an EIS. This is a multi-phase, 5-10 year proposed action that is significantly affecting the environment, regardless of whether those effects are considered beneficial or detrimental. First, the proposed action is likely to have both short- and long-term effects because of its expansive scope and size. Logging will have a severe negative impact on the Northern Long-eared Bat if that species and/or its habitat are found in the proposed action area. Second, the proposed action is likely to contribute to the loss of climate benefits of retaining older, mature trees due to the proposed logging. Third, potential detrimental impacts to water quality due to runoff, sedimentation, and potential herbicide contamination due to the proposed whole tree removal. Fourth, the proposed action is likely to cause loss or damage to historic and cultural resources located within the proposed action area. For the above reasons, the size, scope, and significance of the Forest Service's proposed action indicates the need for the Forest Service to prepare an EIS instead of an EA.

VII. Conclusion

NEPA requires that agencies fully evaluate and understand the potential environmental impacts of proposed actions before committing to a specific course of action. In order to fulfill this duty, Standing Trees asks that the Forest Service thoroughly analyze all concerns and recommendations raised above. Standing Trees supports the NOPA's plans to decommission roads and return them to their natural state. Standing Trees looks forward to the

opportunity to review and comment upon the Forest Service's forthcoming NEPA analysis to ensure that this duty was faithfully performed.

FOOTNOTES

1 See Strengthening the Nation's Forests, Communities, and Local Economies, Executive Order 14072, 87 Fed. Reg. 24,851 (April 22, 2022).

2 See Tackling the Climate Crisis at Home and Abroad, Executive Order 14008, 86 Fed. Reg. 7619 (February 2, 2021).

4 See Moomaw et al., INTACT FORESTS IN THE UNITED STATES: PROFORESTATION MITIGATES CLIMATE CHANGE AND SERVES THE GREATEST GOOD (2019) [Exhibit 5] (hereinafter "Moomaw et al. (2019)").

5 Lorimer and White, SCALE AND FREQUENCY OF NATURAL DISTURBANCES IN THE NORTHEASTERN US: IMPLICATIONS FOR EARLY SUCCESSIONAL FOREST HABITATS AND REGIONAL AGE DISTRIBUTIONS (2003) [Exhibit 6] (hereinafter "Lorimer and White (2003)").

6 Oswald et al., CONSERVATION IMPLICATIONS OF LIMITED NATIVE AMERICAN IMPACTS IN PRE-CONTACT NEW ENGLAND (2020) [Exhibit 7].

7 Zaino et al., VERMONT CONSERVATION DESIGN - NATURAL COMMUNITY AND HABITAT TECHNICAL REPORT (2018) [Exhibit 8] (hereinafter "Zaino et al. (2018)").

8 Exhibit 6 (Lorimer and White (2003)).

9 Nowacki and Abrams, THE DEMISE OF FIRE AND "MESOPHICATION" OF FORESTS IN THE EASTERN UNITED STATES (2008) [Exhibit 9].

10 Ceballos et al., VERTEBRATES ON THE BRINK AS INDICATES OF BIOLOGICAL ANNIHILATION AND THE SIXTH MASS EXTINCTION (2020) [Exhibit 10].

11 "Climate Change 2021: The Physical Science Basis" (Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change) [Exhibit 11].

13 Dreiss and Malcom, GETTING TO 30X30: GUIDELINES FOR DECISION-MAKERS (2020) [Exhibit 12].

14 Dinerstein et al., A GLOBAL DEAL FOR NATURE: GUIDING PRINCIPLES, MILESTONES, AND TARGETS (2019) [Exhibit 13].

15 See Exhibit 8 (Zaino et al. (2018)).

16 Watson et al., THE EXCEPTIONAL VALUE OF INTACT FOREST ECOSYSTEMS (2019) [Exhibit 15].

17 DiMarco et al., WILDERNESS AREAS HALVE THE EXTINCTION RISK OF TERRESTRIAL BIODIVERSITY (2019) [Exhibit 16].

18 Exhibit 13 (Dinerstein et al. (2020)).

19 Miller et al., EASTERN NATIONAL PARKS PROTECT GREATER TREE SPECIES DIVERSITY THAN

UNPROTECTED MATRIX FORESTS (2018) [Exhibit 17].

20 Miller et al., NATIONAL PARKS IN THE EASTERN UNITED STATES HARBOR IMPORTANT OLDER FOREST STRUCTURE COMPARED WITH MATRIX FORESTS (2016) [Exhibit 18].

21 Erb et al., UNEXPECTEDLY LARGE IMPACT OF FOREST MANAGEMENT AND GRAZING ON GLOBAL VEGETATION BIOMASS (2018) [Exhibit 22].

22 Harris et al., ATTRIBUTION OF NET CARBON CHANGE BY DISTURBANCE TYPE ACROSS FOREST LANDS OF THE COTERMINOUS UNITED STATES (2016) [Exhibit 23].

23 Brown et al., TIMBER HARVEST AS THE PREDOMINANT DISTURBANCE REGIME IN NORTHEASTERN U.S. FORESTS: EFFECTS OF HARVEST INTENSIFICATION (2018) [Exhibit 24].

24 Duveneck and Thompson, SOCIAL AND BIOPHYSICAL DETERMINATIONS OF FUTURE FOREST CONDITIONS IN NEW ENGLAND: EFFECTS OF A MODERN LAND-USE REGIME (2019) [Exhibit 25] (hereinafter "Duveneck and Thompson (2019)").

25 Exhibit 8 (Zaino et al. (2018)).

26 Keith et al., RE-EVALUATION OF FOREST BIOMASS CARBON STOCKS AND LESSONS FROM THE WORLD'S MOST CARBON-DENSE FORESTS (2009) [Exhibit 26].

27 Luyssaert et al., OLD-GROWTH FORESTS AS GLOBAL CARBON SINKS (2008) [Exhibit 27].

28 Masino et al., OLDER EASTERN WHITE PINE TREES AND STANDS SEQUESTER CARBON FOR MANY DECADES AND

MAXIMIZE CUMULATIVE CARBON (2021) [Exhibit 28].

29 Stephenson et al., RATE OF TREE CARBON ACCUMULATION INCREASES CONTINUOUSLY WITH TREE SIZE (2014) [Exhibit 29].

30 Exhibit 25 (Duveneck and Thompson (2019)).

31 Keeton et al., Late-successional Biomass Development in Northern Hardwood-Conifer Forests of the Northeastern United States (2011) [Exhibit 30] (hereinafter "Keeton et al. (2011)").

32 Id.

33 Exhibit 5 (Moomaw et al. (2019)).

34 Id.

35 Dinerstein et al., A GLOBAL SAFETY NET TO REVERSE BIODIVERSITY LOSS (2020) [Exhibit 31].

36 Jung et al., AREAS OF GLOBAL IMPORTANCE FOR TERRESTRIAL BIODIVERSITY, CARBON, AND WATER (2020) [Exhibit 32].

37 Underwood and Brynn, ENHANCING FLOOD RESILIENCY OF VERMONT STATE LANDS (2015) [Exhibit 33] (hereinafter "Underwood and Brynn (2015)").

38 Warren et al., FOREST STREAM INTERACTIONS IN EASTERN OLD-GROWTH FORESTS (2018) [Exhibit 34].

39 Exhibit 33 (Underwood and Brynn (2015)).

40 Thom et al., THE CLIMATE SENSITIVITY OF CARBON, TIMBER, AND SPECIES RICHNESS COVARIES WITH FOREST AGE IN BOREAL-TEMPERATE NORTH AMERICA (2019) [Exhibit 35].

Exhibits

Number Exhibit Title

1 Executive Order 14,072 on Strengthening the Nation's Forests, Communities, and Local Economics

2 Email Exchange with USFS re Request for Sandwich Vegetation Management Project Information

3 87 Fed. Reg. 16442, Endangered Species Status for Northern Long-Eared Bat.

4 Species Status Assessment Report for the Northern Long-Eared Bat

5 Moomaw et al., (2019).

6 Lorimer and White (2003).

7 Oswald et al., (2020).

8 Zaino et al., (2018).

9 Nowacki and Abrams (2008).

10 Ceballos et al., (2020).

11 IPCC Climate Change 2021: The Physical Science Basis Summary for Policymakers

12 Dreiss and Malcom (2020).

13 Dinerstein et al., (2019).

14 Executive Order 14,008 on Tackling the Climate Crisis at Home and Abroad

15 Watson et al., (2018).

16 DiMarco et al., (2019).

17 Miller et al., (2018).

18 Miller et al., (2016).

19 The New Hampshire Climate Action Plan (2009)

20 IPCC Climate Change 2022 Impacts, Adaptations, and Vulnerability Summary for Policymakers

21 Glasgow Leaders' Declaration on Forests and Land Use

22 Erb et al., (2018).

23 Harris et al., (2016).

24 Brown et al., (2018).

25 Duveneck and Thompson (2019).

26 Keith et al., (2009).

27 Luyssaert et al., (2008).

28 Masino, Moomaw, and Leverett (2021).

29 Stephenson et al., (2014).

30 Keeton et al., (2011).

31 Dinerstein et al., (2020).

32 Jung et al., (2020).

33 Underwood and Brynn (2015).

34 Warren et al., (2018).

35 Thom et al., (2019).

Furthermore, the NOPA asserts the benefits of prescribed fire; however, it fails to include supporting evidence that prescribed fire will work for these proposed action areas. The Forest Service should document the supporting evidence for these assertions for the public to comment on in the EA.