September 20, 2024

Ms. Linda Walker, Director, Ecosystem Management Coordination
United States Forest Service
201 14th Street SW, Mailstop 1108
Washington, DC 20250–1124
Submitted via email

Dear Ms. Walker:

Please accept the following comments from Vermont Natural Resources Council, Audubon Vermont, and Dr. William Keeton regarding the Amendments to Land Management Plans to Address Old-Growth Forests Across the National Forest System and the Draft Environmental Impact Statement (DEIS). We commend the United States Forest Service's ("USFS") desire to recruit and protect old-growth forests through the implementation of an amendment to forest land management plans across the National Forest System ("NFS"). This amendment is necessary to provide a consistent framework for the policy and management of this vitally significant and underrepresented forest type and we appreciate the opportunity to comment on the NOGA and Draft Environmental Impact Statement ("DEIS").

Vermont Natural Resources Council ("VNRC") is a nonprofit organization working to protect and enhance Vermont's natural environment, biodiversity, vibrant communities, working landscapes, and rural character. Audubon Vermont ("Audubon") is a state program of the National Audubon Society, a nonprofit organization with a mission to protect birds and the places they need today and tomorrow; the primary goal of Audubon Vermont's Healthy Forests program is to preserve intact forests and promote forest management that ensures forests are healthy and resilient for birds, wildlife, and people. Dr. William Keeton is a Professor of Forest Ecology and Forestry at the University of Vermont, specializing in the study of old-growth forests, carbon forestry, ecological silviculture, and sustainable forest management policy and practice in the United States and internationally.

VNRC, Audubon, and Dr. Keeton's interests in the National Old Growth Amendment ("NOGA") are to promote strong conservation approaches to old-growth forests and, at a high level, to support both passive stewardship management and ecological forestry principles to maximize the benefits of mature forests, including biodiversity, wildlife habitat, climate resilience, carbon storage, flood control, natural resource and water quality protection, as well as enhancing public access and enjoyment of national forests across the United States. Because we are based in Vermont, we are especially interested in how the NOGA will influence forest

management practices and old-growth protections within our region of the northeastern United States (Region 9: Eastern Forests).

High Level Comments on the NOGA and Draft DEIS

In general, we support the concept in Alternative 3 that existing old-growth forests should not be commercially harvested, but we also understand that Alternative 2 of the DEIS touches on several practical approaches for proactive stewardship (or restorative) forest management that are important to consider.

At a high level, we would like to express support for the comments submitted by Silvix Resources, and specifically highlight the following points:

- The preference of passive stewardship management in certain forest types, particularly mesic temperate forests characterized by infrequent fire regimes, and the need to be clear that active management is not necessary or beneficial for all forest types;

- The need for clarity that existing old-growth conditions must not be degraded through proactive stewardship, however well intended, which is a point particularly relevant to forests in our region where fire risk reduction (e.g. fuels treatment and prescribed burning) is germane only in somewhat rare natural community types (Kosiba et al. 2018), although becoming more relevant in some central-Appalachian oak systems and long-needle pine forests of the Southeast;

- The need for the effective recruitment of old-growth forests from mature forest age classes. This must include a systematic approach, such as the Decision Support Tool recommended in the Silvix Resources' letter, to identify high priority mature stands to be managed for old-growth recruitment;

- That passive management should be identified as a specific management option, both for existing old-growth and for mature stands allocated to old forest recruitment; and,

- A strategic curtailment of the extensive list of exceptions that would allow for vegetation management of old-growth outlined in Standards 2.a-c. We share the concern, that without tighter guardrails limiting incidental clearing associated with large-scale infrastructure projects–such as roads, powerlines, and ski area expansion, and *de minimis* cutting of old-growth trees except in the case of Indigenous cultural uses–these exemptions and loopholes have the potential to significantly undermine old-growth protections and the intent of the NOGA.

General Background/Considerations Related to the NOGA

We believe existing old-growth forest conditions must be protected where they functionally exist and should not be degraded. Where they do not exist, we see value in both passive and proactive stewardship approaches (restoration silviculture) in mature stands to recruit additional old-growth structures over time to sustain dynamic old-growth systems and provide associated

ecosystem services (Thom et al. 2019). A mixed approach will be critical to recruiting additional old-growth conditions within the timeframe needed to address the urgent challenges that we face, including the climate crisis.

For example, in Vermont and our region, where forests are still recovering from 19th-century deforestation, which left only half a percent of current forests untouched (Lapin 2005), most of the landscape consists of even-aged forests. These forests, including lands on our National Forest, largely lack the structural characteristics that provide optimal habitat for avian diversity and overall forest health, making them vulnerable to a rapidly changing climate. Science tells us that old-growth conditions—characterized by multi-age structures, large-diameter trees, species diversity, and abundant snags and down woody material (Lapin 2005, McGee et al. 1999)—are essential for supporting bird diversity (Hagenbuch et al. 2013, Thom and Keeton 2020) and climate resilience (McGarvey et al. 2015; Thom et al. 2019). However, science suggests that forests in the eastern United States do not have enough time, relative to the pace and projection of a rapidly changing climate, to naturally develop these old-growth features through natural disturbances alone. Therefore, ecologically based management that mimics natural disturbance regimes native to these systems is an option - in appropriate locations - to accelerate the development of old-growth conditions where they are currently lacking or unlikely to develop soon enough to withstand the climate crisis.

It is crucial to consistently discern where human intervention is necessary to preserve both current and future old-growth conditions, and where passive and proactive stewardship management can accelerate their development. This calls for a clear decision framework that identifies what functional old growth conditions are for each forest type/system, how we measure those conditions, and what appropriate management options exist to preserve, restore or enhance these conditions.

We concur with the comment letter submitted by Silvix Resources that passive stewardship should be identified as a specific management option, both for existing old-growth and for mature stands allocated to old forest recruitment. However, we also see value in identifying examples of specific proactive stewardship practices that could be employed for old forests in our region. As mentioned above, for existing old-growth stands these should be limited to practices like invasive species control and prescribed burning, evaluated on a case-by-case basis to determine if the benefits of intervention outweigh any risk to old-growth integrity.

For mature stands allocated to old-growth recruitment, a variety of silvicultural practices could be applied. These include multi-cohort management through the irregular shelterwood method, variable density thinning or harvest tree selection, crown release of dominant and co-dominant trees, variably-sized gap creation including within-gap structural retention, large woody debris enhancement, tree girdling to create snags, and even pulling/pushing trees over to form tip-up mounds on suitable sites (Keeton 2006, Raymond et al. 2009, Fassnacht et al. 2015, Kern et al, Keeton et al. 2018).

It is also important to recognize that forest conditions, particularly old growth conditions, vary greatly in their form and function across the nation relative to ecoregional forest developmental dynamics, land use history, and current and future stressors impacting and threatening those systems. We understand the important role of proactive stewardship in frequent-fire forests,

however, this type of management is not always appropriate within old-growth stands for most mesic (moderate to high precipitation) forest types in the northeastern United States. In fact, there are only limited scenarios in which proactive stewardship within existing old-growth is necessary for the conservation of northeastern old-growth forests, such as invasive species control and prescribed burning in rarer fire-dependent forest types, such as dry oak woodlands and some pine systems (Palik and Zasada 2003; various in Barton and Keeton 2018).

In the Northeast, proactive management can be beneficial to stand developmental trajectories in young to mature forests leading to old-growth structure and function over time (Ford and Keeton 2017, Keeton et al. 2018). We see value in identifying examples of specific proactive practices that could be employed to conserve, sustain, and recruit complex old forests in our region. The NOGA should recognize that restorative silvicultural options are not limited to fuels treatment in fire-suppressed western forests. Rather, they include a range of practices that have been experimentally tested and validated in eastern deciduous and mixed hardwood-conifer systems (Barton and Keeton 2018). We believe that the NOGA can lay out a clear process for the recruitment of old-growth forests, acknowledging that passive and active management approaches are appropriate. This is an exciting opportunity for the USFS to provide clear management direction for the recruitment of old-growth forests.

Comments on Management Approaches for Identification and Recruitment of Old-Growth Forests

The USFS should implement a Management Approach and Decision Support Tool as articulated in the Silvix Resources comments, and support Adaptive Strategies and model approaches that are rooted in strong scientific and ecological principles. For example, with President Biden's Executive Order 14702 in mind, VNRC, Audubon, and Professor Keeton have worked through the NEPA process over the last year with the Green Mountain National Forest (GMNF) on the Telephone Gap Integrated Resource Management Project to develop an alternative strategy that would protect old growth forests, and enhance and retain structurally and biologically diverse forests that support late successional forest characteristics that are resilient to climate change. More specifically, we advocated for a strategy that would promote diverse age-class management while enhancing protection and recruitment potential for late-successional and old-growth forests. Our suggested approach would utilize site productivity and stand structure/composition criteria to evaluate the developmental condition and potential of mature stands. Based on this evaluation, as well as tradeoff analysis of timber production and habitat diversity goals, mature stands would be allocated to either commercial timber management (e.g., regeneration harvesting, commercial thinning), light silvicultural interventions that promote development of old-forest characteristics, or fully-protected reserve inclusions for old-growth recruitment and protection.

Our recommendations resulted in the GMNF's consideration of a "Triad" approach to conserving and restoring late-successional/old-growth forests (LSOG) while meeting other multiple-use objectives. The three "legs" of the Triad approach consist of a) careful protection of all existing old-growth stands identified through fine resolution inventory and field validation; b) identifying high-priority mature stands for either passive or active OG recruitment using a modified version of the LSOG index developed by Whitman and Hagan (2007) and calculated from USFS stand

inventory data; and c) distinguishing mature stands with less OG potential that are better suited for multiple use management, including commercial timber harvest. A similar approach – using appropriate forest-type specific LSOG definitions, criteria, and indexes – could form the foundation for active and passive approaches for NOGA implementation and old-growth recruitment.

As part of any management approach, it is of paramount importance that we can clearly measure and identify old growth conditions by forest type/system and the degree of resiliency and adaptability of these systems; in doing so, we must account for the fact that, ecologically, to achieve end goals of resiliency, adaptability, and ecological richness of forest is a matter of the *ecologically functional condition* of forests, as opposed to solely the historical aspect of those forests (i.e. whether or not a forest has ever experienced management intervention). It is for this reason that developing system-specific metrics and benchmarks for quantifying and characterizing functioning old forest conditions is vital. Only then, can managers adequately evaluate and identify distance between current forest conditions and target forest conditions.

For example, based on the USFS definition of old growth for the Eastern Region, the criteria provided (FS1215a pg.52 Table 19; tree age, size, and density) appear broad and, on their own, are not necessarily adequate to capture the true characteristics of old-growth forests of the region, which typically feature older, larger trees and complex structures that include elements that extend beyond measures of live timber and stand age alone. We raised this issue in our comment letter to the GMNF regarding the Telephone Gap Integrated Resource Project, suggesting the use of methods described in Keeton et al. (2018) and Catanzaro and D'Amato (2022) to better differentiate conditions of mature and old growth northern hardwood stands, both quantitatively and qualitatively, to align with our suggested Triad approach for forest management.

Conclusion:

Thank you for the opportunity to provide comments in response to the NOGA and accompanying DEIS. We encourage you to incorporate our above suggestions in your final decision to ensure that the NOGA most effectively accomplishes its goal to protect and recruit old-growth forests throughout the United States.

Sincerely,

Jamey Fidel
General Counsel and Forest and Wildlife Program Director
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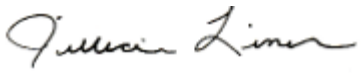

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References:

Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests. Island Press, Washington, D.C. 340 pp.

Catanzaro, P. and A. D'Amato. 2022.. Restoring Old-Growth Characteristics to New England's and New York's Forests. DOI: 10.13140/RG.2.2.22226.84163.

Fassnacht, K. S., D. R. Bronson, B. J. Palik, A. W. D'Amato, C. Lorimer, G., and K. J. Martin. 2015. "Accelerating the development of old-growth characteristics in second-growth northern hardwoods." General Technical Report NRS-144. Northern Research Station. Newtown Square, PA: USDA Forest Service.

Ford, S.E. and W.S. Keeton. 2017. Enhanced carbon storage through management for old-growth characteristics in northern hardwoods. Ecosphere 8:1-20.

Hagenbuch, S., K. Manaras, N. Patch, J. Shallow, K. Sharpless, M. Snyder, and K. Thompson 2013. Managing Your Woods with Birds in Mind: A Vermont Landowner's Guide. Huntington and Waterbury, VT: Audubon Vermont and Vermont Department of Forests, Parks, and Recreation.

Keeton, W.S. 2006. Managing for late-successional/old-growth characteristics in northern hardwood-conifer forests. Forest Ecology and Management 235: 129-142.

Keeton, W.S., C. Lorimer, B. Palik, and F. Doyon. 2018. Silviculture for old-growth in the context of global change. *Pages 237-265 in:* Barton, A. and W.S. Keeton (eds.). Ecology and Recovery of Eastern Old-Growth Forests. Island Press, Washington, D.C. 340 pp.

Kern, C. C., J. Burton, P. Raymond, A. D'Amato, W.S. Keeton, A.A. Royo, M.B. Walters, C.R. Webster, and J.L. Willis. 2016. Challenges facing gap-based silviculture and possible solutions for mesic northern forests in North America. Forestry 90: 4-17.

Kosiba, A., J. Duncan, J. Pontius, G. Meigs, W.S. Keeton, and E.R. Tait. 2018. Spatiotemporal patterns of forest disturbance in the Northeastern United States: 2000-2016. Forest Ecology and Management 430: 94-104.

Lapin, M. 2005. Old growth forests: A literature review of the characteristics of eastern North American forests. Vermont Natural Resources Council.

McGee, G. G., D. J. Leopold, and R. D. Nyland. 1999. "Structural characteristics of old-growth, maturing, and partially cut northern hardwood forests." Ecological Applications 9: 1316–1329.

McGarvey, J. C., J. R. Thompson, H. E. Epstein, and H. H. Shugart, Jr. 2015. "Carbon storage in old-growth forests of the Mid-Atlantic: toward better understanding the eastern forest carbon sink." Ecology 96: 311–317.

Palik, B. J., and J. Zasada. 2003. "An ecological context for regenerating multi-cohort, mixed species red pine forests." Research Note NC-382. North Central Research Station. St. Paul, MN: USDA Forest Service

Raymond, P., S. Bédard, V. Roy, C. Larouche, and S. Tremblay. 2009. "The irregular shelterwood system: review, classification, and potential application to forests affected by partial disturbances." Journal of Forestry 107: 405–413.

Thom, D., M. Golivets, L. Edling, G.W. Meigs, J.D. Gourevitch, L.J. Sonter, G.L. Galford, and W.S. Keeton. Climate sensitivity of carbon, timber, and species richness in the boreal-temperate ecotone co-varies with forest development. 2019. Global Change Biology 25:2446–2458.

Thom, D. and W.S. Keeton. 2020. Disturbance-based silviculture for habitat diversification: effects on forest structure, dynamics, and carbon storage. Forest Ecology and Management. 469: 118132.

Whitman, A. and J. Hagan, John. 2007. An index to identify late-successional forest in temperate and boreal zones. Forest Ecology and Management. 246: 144-154. DOI: 10.1016/j.foreco.2007.03.004.