October 28, 2024

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(Transmitted electronically to
https://cara.fs2c.usda.gov/Public/CommentInput?project=Directives-4178)

Subject: Forest Service Manual 2470, Silvicultural Practices RDCC Project No. 86233

Thank you for the opportunity to provide comments on the proposed revision of the Forest Service Manual Chapter Number 2470—Silvicultural Practices (https://cara.fs2c.usda.gov/Public/ReadingRoom?project=Directives-4178). According to the Forest Service's introduction, "The proposed directive would update the manual to focus on managing forests for climate change, old growth, use of Indigenous Knowledge, and additional information specific to REPLANT Act and the streamlined silviculture certification process." The deadline for submission was originally October 15, 2024 but was moved to October 28, 2024 per 89 FR 70,163 dated August 29, 2024 available at: https://www.federalregister.gov/documents/2024/08/29/2024-18797/forest-service-manual-2470-silvicultural-practices.

While The Wilderness Society appreciates the Forest Service's objectives in updating the silvicultural practices directive, we are concerned that the draft does not provide adequate guidance to conserve old growth, incorporate Indigenous Knowledge, or achieve climate-resilient forests. More generally, we are extremely disappointed by the outdated nature of this proposed revision. Except for a couple of paragraphs on assisted migration and a sprinkling of references to climate, resilience, etc., this directive could have been written in the 1960s, during the height of timber primacy on the national forests. It lacks any consideration of wildlife habitat, ecosystem management, forest ecosystem health, the role of natural disturbance, adaptive management, or any evidence of the evolution from timber to ecosystem stewardship that has dominated discourse over management of the national forests for the past half-century. It also sends an unfortunate signal to agency employees about what really matters; that all the talk about stewardship is just that: talk – what's really important is to grow timber for harvest.

But there is another, more practical, reason why the silviculture directive needs to be overhauled and brought into the 21st century. In our experience working on forest landscape restoration, it is often limitations embedded in the silviculture manual that present the greatest obstacle to

innovative restoration and stewardship. Because all vegetation treatment must be approved by a certified silviculturist, and because silviculture is so narrowly circumscribed (as evinced by this proposed revision), all restoration prescriptions must be squeezed into the restricting language of timber management, or they will not be approved. Sometimes, a clever and motivated district silviculturist is able to write a prescription that facilitates ecological forestry using the agency's outdated directives, but other restoration projects are foiled before they start because the language of restoration does not neatly fit the restrictions of mid-twentieth century silviculture. If opaque silvicultural treatments are really to live up to the definition of "a forest management activity ... that is designed to alter the establishment, growth, composition, structure, health, and quality of forest and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis," the language of the silviculture manual must be lifted out of the constraints of even- and uneven-aged timber management. Silviculturists must be given the freedom to apply diverse knowledge systems to the accomplishment of diverse goals, including, but not limited to, old-growth restoration, the creation of culturally valued elements of the landscape ecosystem (meadows, shrublands, etc.), and the conservation of biodiversity in the face of a changing climate.

We believe that this manual update represents, at best, a huge missed opportunity to "walk the talk" of stewardship and climate adaptation and, at worst, evidence that the Forest Service has not really changed, despite its soaring rhetoric of late, including the visionary direction in the 2012 Planning Rule to achieve ecological integrity and sustainability. To square the silviculture manual with the needs of national forest management in the 21st century, it must either be completely revised to modernize its approach to vegetation, genetics, and nursery management, the incorporation of Indigenous Knowledge, and climate change, or the requirement that certified silviculturists approve every vegetation treatment must be dropped. To be clear, silviculturists can be an important contributor to the kinds of management practices necessitated by the conditions of the 21st century, but the Forest Service institutional policies need to change to facilitate this role. To this end, the Forest Service should seriously consider an overhaul of this manual section to help bring the agency's mentality around forest management into the 21st century rather than proceeding with shockingly narrow changes offered in its proposal. We offer the following suggestions for ways to improve and strengthen the agency's proposed directive.

I. Old-growth Forest Conservation

The digest of the proposed directive (p. 1) indicates that proposed manual update to Chapter 2470 "adds considerations for… old-growth forests." Specifically, the proposed directive defines thinning in part as an intermediate treatment undertaken for multiple objectives including to "promote stand development toward or conserve characteristic old-growth conditions" (p. 20). The proposed directive also suggests considering "stewardship of old-growth forests" in the context of silvicultural examinations, prescriptions, and evaluations (p. 22). However, there is no other mention in the proposed directive of old-growth forests or use of silviculture to accomplish old-growth conservation. The Forest Service should adopt the following additional provisions with respect to old-growth protection and stewardship:

- Add protection and conservation of old growth as a formal policy for prescribing, implementing, and monitoring silvicultural practices (Section 2470.03).

- Make old-growth conservation an explicit objective of stand improvement (Section 2476.02 beginning on p. 58). Existing stand improvement objectives include "maintain or increase the growth rate" and "improve the quality of stands for resource use," which suggest that capturing future economic value is the primary purpose for stand improvement. But there are many stand improvement activities including but not limited to thinning, control of invasive species, and treatment of uncharacteristic fuel loading that are necessary and desirable to accomplish old growth conservation that should be included as objectives.
- Incorporate direction from the Forest Service's "Technical Guidance for Standardized Silvicultural Prescriptions for Managing Old-Growth Forests" (hereafter, "Old Growth Technical Guidance", available from https://www.fs.usda.gov/sites/default/files/tech-guideance-standardized-silvicultural-prescriptions-managing-ogf.pdf, that provides helpful guidance for characterizing goals, objectives, and methods for silvicultural treatment relevant to old-growth forests -- for instance (at p. 1 of the Old Growth Technical Guidance):

  > "Silviculture prescriptions are a planned series of treatments designed to change current stand structure and composition to meet land management goals and objectives such as conserving and stewarding existing old-growth forest conditions and recruiting future old-growth forest conditions. Prescriptions are critical for reducing threats to old-growth forests by describing needed treatments such as mechanical thinning, harvest, prescribed fire, and improvement cutting to help reduce competition among individual trees, change fuel conditions, or alter species composition, thereby reducing the vulnerability of old-growth forests to disturbances. The primary purpose of silviculture treatments in old-growth forests should be to move the stand toward desired conditions or improve ecological integrity, or both, not be to grow, tend, harvest, or regenerate trees for economic reasons. The preference is to only use management actions when the stand is not moving toward desired conditions."

- Incorporate direction from the Old Growth Technical Guidance that provides guidance for silvicultural diagnoses -- for instance (at p. 4 of the Old Growth Technical Guidance):

  > "For old-growth forest, the diagnosis should consider the durability (ability to exist for a long time without significant deterioration in quality or value), resilience, and resistance to fire, insects, and diseases. Additionally, the management direction should be informed by the relationship between the stand characteristics and the specific values of old growth."

- Incorporate direction from the Old Growth Technical Guidance that provides guidance for silvicultural strategies -- for instance (at p. 5 of the Old Growth Technical Guidance):

  > "If stand modifications can move the stand toward desired conditions and/or improve ecological integrity, consideration is given to treatments to modify stand conditions consistent with the land management plan. Considerations for

modification of the stand should use less intensive treatments such as stand tending treatments (prescribed fire, understory thinning, etc.), intermediate treatments (improvement, salvage, sanitation, etc.), and uneven-aged methods (single tree selection). More intensive treatments such as even-aged methods (seed tree cutting and clearcutting) should be considered as the last resort. They should be used when they are the only option left to move the stand toward desired conditions and/or improve ecological integrity."

- Incorporate direction from the Old Growth Technical Guidance that provides guidance for incorporation of Indigenous Knowledge and the rights of Indigenous communities -- for instance (at p. 10 of the Old Growth Technical Guidance):

  "Dialogue with stakeholders and Tribal Nations is critical in identifying and stewarding old-growth forests. Local and Indigenous Knowledge should be integrated with scientific understanding in old-growth management. Include, when applicable, place-based meanings tied to cultural identity and heritage; local economies and ways of life; traditional and subsistence uses; aesthetic, spiritual, and recreational experiences; and Tribal and Indigenous histories, cultures, and practices."

- Review and incorporate appropriate elements of the Best Management Practices contained in Appendix A of the Old Growth Technical Guidance. The full list of BMPs is appended to these comments.

In bringing the Old Growth Technical Guidance into the manual, the Forest Service should make clear that the "Old Growth Working Definitions" found in Appendix 1 of "Mature and Old-Growth Forests: Definition, Identification, and Initial Inventory on Lands Managed by the Forest Service and Bureau of Land Management" (2023) are not the "Desired Conditions" to be achieved through the practice of silviculture. These definitions are the minimum criteria for identification of old growth, not the central concept. In all cases, old growth will exceed these criteria. It is inappropriate to view large trees above the minimum to be in "excess." Instead of "thinning to the minimum," silviculturists should consider how treatments can improve the quality of old-growth and mature forests.

II. Indigenous Knowledge

The digest (p. 1) indicates that proposed revision of Chapter 2470 "adds considerations for Indigenous Knowledge." The proposed directive provides a robust and practical definition of Indigenous Knowledge (p. 14), and it suggests considering Indigenous Knowledge in the context of silvicultural examinations, prescriptions, and evaluations (p. 22) as well as revision of seed collection zones and bands (p. 52). However, there is no other mention in the proposed amendment of Indigenous Knowledge or means to integrate Indigenous Knowledge in silvicultural strategies or methods. The Forest Service should develop the silvicultural prescription directive based on government-to-government consultation with Tribes and other Tribal input. Related, we encourage the Forest Service to reach out to the Intertribal Timber

Council to seek input. Additional guidance with respect to Indigenous Knowledge and Tribal sovereignty could include:

- Add protection of treaty, reserved, and other rights of Indigenous communities as a formal policy for prescribing, implementing, and monitoring silvicultural practices (Section 2470.03).
- Add Indigenous Knowledge as a source of information for "climate-informed restoration" (Section 2470.05, p. 13).
- Add protection of treaty, reserved, and other rights of Indigenous communities and engagement with Tribal members around Tribal needs as a component of diagnosis of treatment needs (Section 2471.2, p. 23).
- Reconsider the requirement that all types of burning on national forest land require a silvicultural diagnosis and prescription prepared or reviewed by a certified silviculturist prior to implementing the project or treatment (Section 2471.03, p. 21). Cultural burning by Indigenous communities provides a wide range of ecological and cultural benefits that are generally well aligned with forest restoration objectives but may not fit neatly into existing Forest Service planning frameworks (see Long et al. 2021, Clark et al. 2024). Revisit language that prescribed fire is a silvicultural treatment and requires field review and approval by a certified silviculturist (2471.04B, p. 22).
- Create specific mechanisms for involvement of Indigenous communities in monitoring the effects of silviculture (2471.4, p. 23-24).
- Make accomplishing federal trust and treaty responsibilities and provision of culturally significant food and products an explicit objective of stand improvement (Section 2476.02 beginning on p. 58). This change would acknowledge that Tribal use of national forest land is an important and coequal resource use.
- Include training in cultural burning, Indigenous Knowledge, and Tribal relations as part of required Forest Service silviculture training and certification (Section 2471.5; p. 24).

III. Reforestation, Climate Change Adaptation, and Forest Resilience

Ensuring that continued forest cover contributes to desired forest conditions is an essential component of Forest Service silviculture. But much of the language of Section 2472.02 reflects timber production goals that are out of step with important climate change adaptation and forest resilience goals. Although TWS strongly supports conservation and protection of forest ecosystems, we believe the Forest Service silviculture manual should explicitly provide for the restoration of meadows, wetlands, woodlands, and shrublands that have been degraded by forest encroachment in the absence of fire and other natural disturbances (see Halpern and Antos 2021, Lubetkin et al. 2017, Moore and Huffman 2004). In addition, future increases in aridity as well as increasing frequency and/or severity of fire may contract the extent of forest cover or result in long periods of dominance by shrubs or other non-forest vegetation prior to re-establishment of forest cover (Miller et al. 2019, Shive et al. 2018). These non-forest habitats are an important source of landscape-scale biodiversity and resilience to changing disturbance regimes (Prichard et al. 2018, Tepley et al. 2018, Hutto et al. 2016, Swanson et al. 2011).

Adaptation to climate change may mean accepting conversion of forest to non-forest or less than fully stocked stands. Proposed changes to the manual appear to contemplate restoration of forest

conditions following loss of forest in all cases consistent with improving the "quality and yield of new timber stands" (Section 2472.02; p. 25).

The manual states, "When harvest or an unplanned event reduces forest cover to an unstocked or understocked condition, make an initial assessment and diagnosis to identify the acres in need of reforestation treatment or natural recovery to meet management objectives. Report planned, accomplished, and completed reforestation treatments, seed source information and natural recovery in the standard database of record" (Section 2472.03; p. 26). Forest Service silviculturists should first determine if reforestation is appropriate given forest resilience and climate change adaptation considerations. Temporary or permanent conversion to shrubland, woodland, or other non-forest conditions may be an acceptable outcome of Forest Service silvicultural operations provided these operations serve important ecological purposes.

TWS generally supports "reasonable assurance of adequate restocking within five years of harvest" (Section 2472.1; p. 28), although some harvest may be explicitly designed to restore meadows, wetlands, woodlands or other areas with high biodiversity value in which case prompt reforestation may not be appropriate. The proposed manual revision appears to contemplate cases where reforestation may not occur, but only in "low-productivity areas… if an economic analysis indicates a negative present net value" (Section 2472.21; pp. 28-29). The manual makes it clear that "when harvest is applied or if in an area that is considered suitable for timber production, natural recovery is not an appropriate prescription. These areas should receive a prescription that calls for planting, direct seeding, or natural regeneration treatments" (Section 2472.6; p. 32). This would seem to foreclose opportunities to restore critical sources of non-forest biodiversity by removing trees.

Ecological as well as economic considerations should be weighed in decisions about reforestation. The proposed amendment considers "reforestation objectives relative to climate change" only in the context of ensuring that reforestation occurs in all cases ("young trees are vulnerable to microsite and macroclimatic conditions, and these should be incorporated into objectives and treatment methods" (Section 2472.3; p. 29)). The silviculture manual appears to require control of shrub, herb and grass communities that may be an important component of native biodiversity in all cases. The manual requires the Forest Service to "Treat competing vegetation, which threatens the establishment of reforestation projects, by the appropriate method. Vegetation control conducted prior to certification of adequate stocking is considered part of the reforestation process" (Section 2472.33; pp. 30-31). We recommend revisiting the reforestation section of the manual to make it clear that woodland, shrub, herb, forb, wetland and other non-forest communities serve important ecological purposes and that prompt creation of forest cover is not appropriate in all cases.

The Southwest Ecological Restoration Institutes (SWERIs), particularly at Colorado State University's Forest Restoration Institute, have been thinking about climate-informed reforestation of burn scars. We encourage you to reach out to the SWERIs for their insight as you update the silviculture manual section.

IV. USFS Silviculture for the 21st Century

Forest Service silviculturists have a critical role to play in improving forest resilience, adapting forests to future change, and pioneering innovative silvicultural strategies for ensuring a broad range of ecosystem services from national forest land. The silvicultural manual relies heavily on an anachronistic view of stand improvement and timber harvest. We believe there are important opportunities to use the manual to update Forest Service silviculture for the 21st century. The Forest Service currently recognizes only a half dozen fairly limited categories of stand improvement: release and weeding (primarily to ensure reforestation, but see Section III of these comments above), precommercial thinning, pruning, fertilization, control of understory vegetation, and animal damage control (Section 2476.3; p. 60-61). At a minimum, we recommend adding provision of culturally significant food and products (see Section II of these comments), prescribed fire, and other fuel reduction treatments in the context of stand improvement. These activities are of particular relevance for management of surface fuels in seasonally dry, fire-prone forests where fire has been excluded. We also recommend that stand improvement be more specific and intentional about control of invasive species.

The Harvest Cutting section (Section 2477) appropriately identifies improving the health and resilience of forests to disturbances and climate change, reducing fuels, and improving wildlife habitat as objectives of cutting. But the manual relies on static and anachronistic silvicultural methods to achieve these aims. Specifically, the manual only contemplates management of even-aged stands by clearcutting, coppice, seed tree, and shelterwood treatments; management of two-aged stands by clearcutting, coppice, seed tree with reserves, or shelterwood with reserves; management of uneven aged stands by single-tree selection and group selection; and intermediate cutting by improvement cutting, liberation cutting, commercial thinning, salvage, and sanitation. We believe the manual should take a broader view of uneven-aged management to encompass commercial and non-commercial variable density thinning, and small patch cutting as appropriate to increase forest resilience, reduce fuels, steward old growth, and adapt stands to future change. The proposed manual revision is missing an opportunity to take a holistic view of silviculture that integrates a wide range of commercial and non-commercial tree removal, range management, aquatic habitat restoration, and burning to accomplish fire risk mitigation, fuel reduction, forest resilience, and old-growth stewardship objectives (see e.g., Aplet 1994). The manual should explicitly acknowledge the participation of partners including tribal, state, private, and non-governmental actors in the planning and implementation of silviculture on federal lands and create broad and flexible categories of silviculture that accommodate the diverse objectives, perspectives, and expertise of partners.

Section 2476.8 (p. 62) describes monitoring primarily in the context of resource use ("validate predicted yield estimations and provide a method to make local adjustments to yield models"). But monitoring is also critical to validate treatments undertaken to improve forest resilience, adapt stands to climate change, and protect and steward old-growth forests. This section should emphasize monitoring of the effects of silviculture on accomplishment of these and other ecological outcomes. There are also important opportunities to engage partners in monitoring activities.

V. Other Comments

It is unclear why "the database of record" replaces "Forest Service Activity Tracking System (FACTS)" in Section 2470. The Forest Service should ensure that silvicultural activities are tracked within a single, publicly accessible database.

We are also unclear as to the intent of this statement: "Administrative use permits can also be used to accomplish stand improvement. Stand improvement funds can be used to mark or administer the use, subject to FSM 6513. The cost of accomplishing stand improvement through administrative use permits must not exceed the total anticipated costs associated with similar, but otherwise funded stand improvement projects" (Section 2476.5; p. 61). The Forest Service should not foreclose a wide variety of contracting mechanisms to ensure needed work occurs on national forest land.

In conclusion, we are deeply concerned that this proposed revision of the silvicultural prescription directive is largely divorced from the key themes of ecosystem management and sustainability that the Forest Service has long recognized and officially embraced to guide management of the national forests. The agency needs to provide directives that help its silviculturists design treatments to facilitate ecosystem restoration, achieve ecological integrity, and prepare the national forests for climate change.

Thank you for considering The Wilderness Society's comments.

Sincerely,

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APPENDIX: Best Management Practices for Silvicultural Treatments in Old Growth (from USFS Technical Guidance for Standardized Silvicultural Prescriptions for Managing Old-Growth Forests)

- The primary purpose of silviculture treatments in old-growth forests should not be to grow, tend, harvest, or regenerate trees for economic reasons but should be to move the stand toward desired conditions and/or improve ecological integrity.
- Evaluation of potential threats based on current stand condition and stand trajectory provide information necessary to determine if silvicultural practices are needed. Silvicultural practices may be needed to promote and sustain ecological values of old-growth forests. 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.
- Dialogue with stakeholders and Tribal Nations is critical in identifying and stewarding old-growth forests. Local and Indigenous knowledge should be integrated with scientific understanding in old-growth forest management. Include, when applicable, place-based meanings tied to cultural identity and heritage; local economies and ways of life; traditional and subsistence uses; aesthetic, spiritual, and recreational experiences; and Tribal and Indigenous histories, cultures, and practices.
- 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.
- When designing silviculture treatments, the following considerations should be noted:
    - Consider the stand as it pertains to the broader landscape context and how it may contribute to old-growth forest conditions (as defined by region or national forest).
    - Old-growth forests have substantial heterogeneity in the spatial arrangement of old trees, snags, large coarse woody debris, and varying patch sizes of structural diversity.
    - Large trees may be common but large size does not necessarily mean they are old trees.
    - Old-growth forest definitions vary according to forest dynamics, composition, structure, and disturbance regimes along a spectrum between forest types characterized by frequent small-scale disturbances, intermediate types of mixed-severity, and infrequent-types shaped by major disturbances (wildfire, insects, wind, drought) over large areas creating different successional stages. Forests are dynamic, and over time, a single stand will likely cycle through many age classes and successional stages due to disturbances, natural processes, and changing conditions. In some places, changing conditions (climate, human development, shifting communities of plants and animals caused by factors in addition to climate) may make older forests more sustainable in some places than in others, so any single stand should be considered in its broader landscape.

    - When large tree densities meet or exceed desired conditions, thinning to increase heterogeneity and resilience should emphasize retention of the oldest and largest trees. Prescription for a treatment will be based on evaluation of threats under existing conditions and conditions following a silviculture treatment.
- Strive to retain habitat characteristics and refugia such as large trees with deformities, broken tops, large branches, and cavities whenever possible as well as downed wood and snags for wildlife habitat when treating in old-growth forests consistent with desired conditions and ecological integrity.
- Protect old-growth stands through strategic placement of treatments. Examples include:
    - Design treatments near old-growth stands to reduce fire, wind, and other hazards that may spread to old-growth forests.
    - Consider the spatial location of old-growth forests when designing projects that have a purpose of altering disturbance behavior.
- Maintaining resilient old-growth forests requires an understanding of how disturbance regimes have shaped landscape composition, structure, and function.
- Understanding of climate change and the interaction of climate with disturbance regimes may require silviculture prescriptions to be adapted.
- Stewardship of old-growth forests at the stand scale, with larger stands or contiguous patches being more valuable than small, fragmented stands.
- Where disturbance has severely altered old-growth forests and the forest is no longer old-growth, consider planting as necessary and when appropriate for the site or ensure timely stand establishment, development, and a progression toward old-growth forest conditions.
- Map old-growth stands located during project design to promote consistent management of those areas. Old-growth forests are dynamic and require periodic map updates.
- Evaluate trends in species composition and structure to identify pending mesophication (process by which fire removal from fire-dependent forests changes the species composition of the forest) uncharacteristic tree density and potential threats to frequent-disturbance forests. Remove encroaching species in old-growth forests to reduce their vulnerability or to increase their quality.
- To perpetuate old-growth forest components, encourage the development of old-growth forest conditions in areas where old-growth forest is lacking using site specific and forest level analysis.
- Consider maintaining old-growth forest refugia for climate adaptation.
- Consider that old-growth forests are dynamic and will not remain in fixed locations but will instead shift across the landscape over time.