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Comments: Attached are the comments of Rocky Smith et al on the request for information concerning old forests. Thanks for the opportunity to comment.

Rocky Smith

Via web portal: [https:// cara.fs2c.usda.gov/Public/CommentInput?project=NP-3239](https://cara.fs2c.usda.gov/Public/CommentInput?project=NP-3239)

August 19, 2022

Dear Forest Service and Bureau of Land Management:

The following are comments from the undersigned on the Request for Information (RFI) vis a vis Executive Order 14072 concerning mature and old growth forests in the July 15, 2022 Federal Register (87 Fed Reg 42493 et seq.).

I. INTRODUCTION

We are glad to see the Forest Service and Bureau of Land Management (BLM) propose actions to fulfill Executive Order (EO) 14072. However, the agencies seem focused on developing criteria for old growth and mature forest definitions, when much of this already exists. The existing definitions and descriptions of old growth could be quickly updated using the best available science, and definitions/descriptions of mature forests could be developed. This would allow the agencies to complete the inventories within one year as required by section 2 of the EO.

This would also advance the time that the agencies could begin to "analyze the threats to mature and old growth forests" and "develop policies [hellip] to institutionalize climate-smart management and conservation strategies that address threats to mature and old-growth forests on Federal lands", per EO sections 2(c)(ii) and (iii).

In any case, the agencies should begin conserving and protecting at least the higher quality old growth forests immediately.

II. THE IMPORTANCE OF OLD GROWTH

The importance of older forests cannot be overstated. They are a reservoir of biological diversity, as they provide essential habitat for many animal and plant species that are not found, or at least don't survive well, in younger forests or in non-forested areas. These forests anchor watersheds, providing high-quality sources for much of the water used for agriculture and domestic needs in at least the western United States. They help develop rich soils high in organic matter. And they often provide outstanding opportunities for scientific research, recreation, and appreciation of nature.

Of prime importance, older forests with their larger trees will be absolutely critical in implementing any strategy to reduce the impacts from climate change. Large trees store much more carbon than smaller ones. See Mildrexler et al, 2020. Even if the world were to reform its ways and stop emitting so much carbon pollution, an unlikely reversal of the existing situation in the foreseeable future, large trees would be still needed to absorb the carbon already in our atmosphere.

The Forest Service and Bureau of Land Management (BLM) should be managing older forests to retain their critically important values. However, this is not always the case, as some older forests are at least partially cut down in commercial timber sales and fuel reduction projects. With the President's Executive Order, the agencies have a golden opportunity to identify and protect these ecological treasures; indeed, they now have absolutely no excuse for failing to do so.

II. DEFINING OR DESCRIBING OLD GROWTH FORESTS

In the late 1980s, the Forest Service, feeling pressure from a public concerned about the loss of older forests, especially in the Pacific Northwest, but not limited to that region, realized it needed to devote more attention to old growth forests. At least some Forest Service regions developed definitions or descriptions^[1] of old growth by vegetation type. See: <https://www.fs.fed.us/projects/hfi/field-guide/web/page24.php>

It seems the agencies could, fairly quickly, review and update the previous work and produce draft updated definitions/descriptions for public review. If the agencies take too long in developing at least interim old growth definitions, they will be unable to complete the inventories within one year (i. e., by April 22, 2023), as required by E. O. 14072, section 2(b). Also, analysis of threats to older forests and development of strategies for their conservation, required by EO at section 2(c)(ii) would be further delayed. In any case, the existing definitions should be considered, and then updated or modified as appropriate using the best available science, rather than starting from scratch.

The Forest Service and BLM should not rely solely on a generic or universal definition of old growth. Such a definition would hide the complexities in old growth ecosystems, which vary by latitude, elevation, vegetation type, disturbance history and regime, and precipitation regime. What constitutes old growth may also vary by aspect and elevation, as growth rates for trees and other vegetation, and decay rates for down dead material, differ with these factors. For this reason, age alone should not be used to delineate old growth.

It is important to recognize that old growth is an ecosystem, not just stands of old trees. Each area of old growth exists in a certain context within its respective landscape. The Forest Service's website for the RFI (<https://www.fs.usda.gov/managing-land/old-growth-forests>) has the following statement:

Even within a specific geographic area, no one definition represents the full diversity of old-growth ecosystems - definitions are specific to the vegetation type.

The president's Executive Order 14072 states that old growth and mature forests are to be defined, identified, and inventoried "accounting for regional and ecological variations, as appropriate". Id. at 2(b).

Therefore, it will be important to develop old growth definitions or descriptions for each major vegetation type for each Forest Service region.

Moir, 1992, stated:

Exact definitions of old-growth forest of the Southwest and southern and central Rocky Mountains cannot be given because of the great variation in forest environments and old-growth conditions. However, certain ecological principles may be applied to help conceptualize old growth.

Developing precise definitions for when a given stand in its respective vegetation type and ecosystem becomes old growth would be impossible, as there is much variation by site, i. e., elevation, precipitation regime, disturbance history and regime, soils, and other factors. For example, definitions for high-elevation vegetation types with very infrequent (but usually high-intensity) fire, such as Englemann spruce-subalpine fir would need to be much different than for types that historically had fairly frequent, low-intensity fire, such as northern Front

Rage (Colorado) montane ponderosa pine.

Also, it would be impossible to identify a precise point in time (such as age) or in the appearance of identified ecological characteristics when a mature forest becomes an old growth one, even for vegetation types with similar disturbance regimes. It might thus be better to develop old growth descriptions, rather than definitions. Indeed, this was done in 1992 for Forest Service Region 2. See Mehl, 1992. The introduction to these descriptions states:

These old-growth descriptions are not precise definitions. There is a certain amount of subjectivity in defining old growth. Old growth is conceptual and difficult to define precisely. For that reason the term "description" was chosen instead of "definition."

While definitions or descriptions of old growth for the various vegetation types on national forest land are being developed, the agency could use a generic, universal definition as an interim measure for deciding which late successional forests to protect, i. e., manage for retention of old growth character. Such a universal definition should be broad enough to include all stands that could be considered old growth, even if they are only marginally in the old growth condition. In other words, it should not allow exclusion of stands that may be, or will soon become, old growth. Designations of old growth can later be adjusted as needed after the definition/descriptions for specific vegetation types are developed.

General old growth characteristics include, but are not necessarily limited to, the following (in no order of priority):

- large and old trees for the species and location;
- variation in tree sizes and ages;
- variation in tree spacing;
- signs of decay in standing live trees, such as broken tops, stem and root rots, and cavities;
- standing dead trees, known as snags;
- down dead logs in various stages of decay;
- presence of wildlife and plant species that only exist or thrive best in ecosystems with mature/old growth forest character (see Moir, 1992); and
- in some vegetation types, distinctive features such as deep bark, branch patterns, flattened crown tops, etc. that appear in later ecological stages.

Identify high quality old growth areas. Not all old growth stands are equal in displaying old growth character. Some stands display old growth characteristics much more so than others. Any definitions/descriptions of old growth must allow determination of the quality of old growth in each location. Otherwise, marginal old growth stands might be conserved and higher quality ones would be cut, but the overall inventory for a national forest unit might show that sufficient old growth remained.

To help determine quality of old growth stands, a scorecard format can be used. Such a format was developed on the Medicine Bow National Forest in the late 1980s. This allows surveyors to inventory more than just presence or absence of old growth characteristics, as quality or intensity of at least some of the characteristics can be noted.

III. INVENTORIES

The agencies can begin to assess how much old growth and mature forest exists and where each exists on each management unit using existing information. This will help the agencies decide what areas need to be protected now while they analyze threats to older forests and develop the strategies for conservation of older forests required by the EO at the earliest possible time, consistent with applying best available science.[2] As soon as updated definitions/descriptions of old growth and mature forests are available, the agencies should complete the inventories.

Inventories of old growth and mature forests will be based on data, such as from aerial photos, that is not necessarily 100 percent accurate in determining which forested areas are in older stages. Thus as time, personnel, and funding allow, areas of old growth and mature forests should be field checked whenever possible, and the inventories adjusted as needed.

IV. EXCLUSIONS FROM OLD GROWTH DEFINITIONS/DESCRIPTIONS

Do not have a minimum area size for old growth. In some areas, old trees and old growth ecosystems may exist only in small areas due to recent or persistent logging and/or recent high-intensity fires or other disturbances. In such circumstances, patches of old growth would still be worth saving, especially if the surrounding areas could, with proper management, become part of a connected older forest landscape.

Though old growth forests of almost any size should be conserved, the agencies should issue strong direction for keeping the largest areas of old growth intact. These areas provide the best and most secure habitat for resident wildlife and fish species. The forests surrounding small (less than 100 acres or so) patches of old growth should, to the extent practicable, be managed to increase the size of older forest patches.

Do not automatically remove stands that have received human treatment (logging, mining, leasable mineral development, etc.) from consideration as old growth. Depending on the history and intensity of treatments, stands can recover to display old growth characteristics. This will particularly be true of eastern national forests and some lower-elevation national forests in the west, where the growing season is long enough and the sites are sufficiently productive to allow relatively rapid recovery.

V. OLD GROWTH RECRUITMENT

Old growth is not static on the landscape. Some old growth forests will become young forests (or for awhile, even non-forest) after a major disturbance such as fire or insect attack. Some existing forests will gradually become old growth.

Before forests can become old growth, they must first be in younger stages, then grow to a mature stage and old growth. But not all forests make it into the latter ecological stages. Thus direction for inventorying and protecting mature and old growth forests must include recognizing what forest areas could develop into old growth and protect them to ensure they have the best chance to become old growth.

VI. DEFINING/DESCRIBING MATURE FORESTS

As Moir, 1992, put it: "Old growth differs from mature forest in the complexity of its ecological interrelationships." The difference can be subtle.

To be able to protect potential future old growth stands and ensure they will have a chance to become old growth, definitions of mature forests will be needed for the various vegetation types found on each national forest. One characteristic that can be used to denote mature forests in culmination of mean annual increment of

growth, or CMAI. Simply stated, the age of CMAI is the peak of growth for each respective stand. Once a forest stand has reached this point, it can be considered mature. Size criteria could also be used to help identify which stands are mature, but they would have to be tailored to specific stands or groups of them, considering soils, aspect, elevation, precipitation regime, and other factors, just as for identifying old growth.

CMAI is widely used and understood by forestry professionals. It is likely determined in stand exams, since the National Forest Management Act (NFMA) generally prohibits, with some exceptions, cutting stands until they have reached CMAI. 16 U.S.C. 1604(m). Thus it could very easily be used in any procedure designed to identify and inventory mature forests. For vegetation types that are not normally sold commercially, such as pinon-juniper, other parameters will have to be used.

VII. ANALYZING AND ADDRESSING THREATS TO OLD GROWTH

The EO requires the Forest Service to analyze threats to old growth and mature forests, and to develop "conservation strategies" to conserve the older forests. EO at 2(c)(ii) and (iii). We believe the agencies should begin fulfilling this requirement as soon as possible.

It is commonly assumed that fire is a big threat to old growth, and that fuel reduction is thus necessary to ensure protection of old growth. However, logging remains the biggest threat to old growth. There is always the temptation for the agencies to include large trees in any timber sale or service contract for reducing fuels, in order to make the offering more attractive to industry.

Fire can indeed change or eliminate old growth. But stand-replacement fires are natural occurrences in most vegetation types in the U. S., though they are very infrequent in some types. Also, large trees are the last to ignite in a wildfire, as it takes much more heat to ignite, say, a tree 18 inches in diameter than it does for a tree one a third that size.

The Forest Service needs to have strong policies or even regulations that generally prohibit logging in old growth forests, especially the highest quality old growth forests, with narrow exceptions, such as for removal of hazard trees. Another exception could be for forests which have become denser than they were historically because of fire suppression and/or other human actions. This is, e. g., the case in lower elevation forests (generally below 7200 feet elevation) in the northern Front Range of Colorado. See Sherriff and Veblen, 2006. For these areas, responding to a possible fire threat with any form of vegetation management must require a site-specific determination that the area in question has been substantially altered from the historic condition, and that any proposed treatment would help restore the natural, older forest stage.

In forests that have not been substantially altered by fire exclusion or other human actions, any thinning, say to reduce ladder fuels, would thwart the development of old growth or the replacement thereof, as the trees that might eventually become large and old would instead be removed. Broad-scale thinning would also result in an increase in atmospheric carbon, as the numerous trees cut would no longer store carbon. See Law et al, 2022, at 6-7.

Any thinning would only be effective in reducing fuels for 10-20 years, as new trees would likely grow in the spaces where the previously thinned trees were. Thus such areas would have to be treated regularly. Roads would likely be needed to access areas for treatment. All of this would interrupt, if not degrade or destroy, the development of old growth forest characteristics and the wildlife habitat they provide.

Old growth forests can certainly burn, but when they do, most of the carbon stays in the forest^[3] and slowly decomposes, renewing the soil. Law et al, 2022, concluded that "overall harvest-related emissions were about 5 times fire emissions" in the west coast states they examined. Id. at 7.

Therefore, the potential for fire to hit old growth forests that have long fire return intervals is no excuse for logging them.

The use of fire, both wildlife and prescribed burning, may be appropriate in vegetation types that have or historically had a frequent, low intensity fire regime. Application of such fire could help maintain old growth in such forests.

The Forest Service and BLM should provide guidance for units to conserve old growth. This should include development of desired conditions, standards, and guidelines for forest plans. All old growth must be unsuitable for timber production. Units should be directed to save all of their highest quality old growth in each vegetation type, and also save sufficient old growth recruitment stands to replace existing old growth. Sufficient old growth and replacement old growth must be retained in each major vegetation type on each management unit to support the wildlife and fish species that commonly reside in forests in the older ecological stages.

We recommend the agencies issue draft direction and guidance as soon as possible. The goal should be to have final direction, consistent with best available science and public review, ready when the inventories are complete, i. e., in April, 2023.

CONCLUSION

The Forest Service and BLM should begin to identify the areas of old growth and mature forest on each management unit using existing definitions/descriptions and data. The former should be updated, using the best available science, for each major forested vegetation type found on federal lands. Then the agencies should complete the inventories when the updated definitions/descriptions are finalized. The agencies should immediately begin developing policies to conserve older forests, even while definitions/descriptions and inventories are being updated.

Sincerely,

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FOOTNOTES:

[1] As is further discussed below, we believe "descriptions" is a better and more accurate term for lists of characteristics denoting old growth forests.

[2] At the July 21 webinar, the Forest Service indicated it would finalize the definitions by April, 2023, and only then analyze threats and develop conservation strategies. This is not acceptable - the agencies need to start analyzing threats and developing conservation strategies while the definition/descriptions and inventories are being completed.

[3] One can easily observe this, even in a forest that has had a high-intensity burn. The needles or leaves, small branches, and some of the bark may have burned up, but the tree boles remain.