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Comments: Please accept the attached comments from the Society of American Foresters. Thank you for your time and consideration.
The Society of American Foresters (SAF) appreciates the opportunity to submit the following comments to the USDA Forest Service and the DOI Bureau of Land Management regarding the definition of federal mature and old-growth forests; Request for Information (RFI) on Federal Old-growth and Mature Forests, 87 Fed. Reg. 42493 (July 15, 2022) FR Doc. 2022-15185. In addition to the information provided below, SAF has signed and fully endorses the information provided in joint comments from the National Association of Forest Service Retirees and the Public Lands Foundation.SAF is the national scientific and educational organization representing over 9,000 forestry and related natural resources professionals across the United States. Founded in 1900 by Gifford Pinchot, SAF promotes science-based, sustainable management and stewardship of the nation's public and private forests. Forestry and related natural resources professionals are key allies in tackling climate change and improving the overall health and resilience of ecosystems across public and private lands. Our members provide a direct connection to solving the complex conservation challenges facing our forests.Science-based management is a central and indispensable tenet of SAF's philosophy. We also recognize the recreational, psychological, and spiritual values associated with all forests, especially those deemed old-growth. Their protection is critical, which means we must understand the greatest challenges to their long-term conservation. Pursuant to EO 14072, the proposed exercise in defining, inventorying, and mapping mature and old-growth forests provides an opportunity to better plan and implement adaptive management strategies to protect against threats like wildfire, drought, insects, disease, and climate change. SAF provides the following information in support of climate-smart, professional management that will provide for a mutually beneficial relationship between people and forests.Science does not support a universal framework definition of old-growth or mature forests that can apply to all forest types. If a universal framework definition must be developed, it should avoid using national-scale prescriptive criteria but rather dictate a process for developing ecological definitions for mature and old-growth forest types at a regional scale.a. Defining Old-GrowthIn decades of attempts to define old-growth, no universal definition has gained consensus.i In 1989, each Forest Service Region was tasked with developing "Guidance for Conserving and Restoring Old-Growth Forest Communities on National Forests." The Forest Service efforts to define old-growth on a regional basis emphasized the inapplicability of one region's definition of old-growth to other regions with different climates, geological history and soil development, disturbance regimes, insect pathogens, and other physical determinants of a forested environment.ii Notably, many forest types may never attain old-growth qualities due to disturbances and site conditions. The Forest Service's then-chief Dale Robertson issued a national position statement on old-growth forests, providing a generic and still-accurate definition:"Old growth forests encompass the late stages of stand development and are distinguished by old trees and related structural attributes. These attributes, such as tree size, canopy layers, snags, and down trees, generally define forests that are in an old growth condition. The specific attributes vary by forest type. Old growth definitions are to be developed by forest type or type groups for use in determining the extent and distribution of old growth forests."iiiDue to regional variation in forest types, any prescriptive criterion at the national scale for old-growth forests would be arbitrary and based predominantly on social values.iv There are as many definitions of old-growth as there are old-growth forest types. Without a scientific foundation for a universal framework definition of old-growth, EO 14072 should be understood as a policy exercise with direct management implications. In the case of an inventory and mapping exercise, setting a uniform national criterion for old growth would lead to erroneous forest classifications, which would lead to erroneous inventorying and, as a result, improper management and conservation planning. Functional management and conservation planning require scientific data and information related to regionally specific stand dynamics, disturbance regimes, forest threats, ecosystem adaptations, and anticipated climate change impacts.Each National Forest has a Forest Plan that must "provide for key characteristics associated with terrestrial and aquatic ecosystem types," which includes "old growth."v The majority of National Forest Plans have definitions of old growth, each with their own

regional definitions and criteria and in many cases are already accompanied by management guidelines. When commenters requested specific requirements for old growth in the 2012 Planning Rule, the Forest Service responded that "[m]ore specific requirements were not included in the final rule because these issues are best identified and determined at the forest or grassland level, reflecting ecosystems and plant and animal communities on the unit."viThe 1989 initiative of the USDA Forest Service to create regional ecological old-growth definitions[mdash]and the subsequent adaptation of National Forest Plans to incorporate and manage those old-growth forest types[mdash]provides a successful precedent for the current exercise under EO 14072 that adheres to both existing legal structures and the most accurate reflection of old-growth diversity and management needs. Using this existing structure and body of research would facilitate the timely completion of the current exercise and save resources that the agencies can reallocate to other pressing policy concerns like the wildfire crisis.b. Defining MatureIn many ways the term "mature" is more difficult to define than old growth. Crafting a universal standard for the term is impossible for many of the same reasons it is for old-growth, most apparent of those reasons being the extreme diversity and nuance of physical characteristics both within and across forest types. For instance, determining "mature" status based on tree size or diameter should be avoided because these characteristics vary dramatically across forest types; forests of a mature age-class may be populated with small trees due to harsh environmental conditions, such as dwarf pitch pines of the northeastern US or bristlecone pines of the southwestern US.There is no consensus on the scientific meaning of the term mature; if it is used, it is used in the combined context of regional ecology and landowner objectives. "Mature" is therefore used colloquially rather than with any universal meaning. For instance, in the context of timber management of even-aged stands, the term mature may refer to the culmination of mean annual increment. However, if a landowner is instead managing an uneven-aged stand for wildlife diversity, mature may simply refer to the point at which gap creation in a closed canopy results in the initiation of low- and mid-canopy strata. Mature may even refer to the age of sexual maturity of a tree or of the culmination of net primary productivity of a forested stand.If mature must be defined, it should be defined: (1) separately from the definition of old growth; (2) at the stand scale rather than by individual tree attributes; and (3) based on a holistic set of criteria informed by regional variation that may include structural complexity, age and size classes, and indicator plant and animal species.Key Takeaways[bull] There is no scientific consensus for a universal framework definition of mature or old-growth forests; the ecological variation between and within forest types defies a uniform set of criteria at the national scale.[bull] If established, a universal framework definition should dictate a regional process of developing ecological definitions for each old-growth forest type. The 1989 initiative to define old growth set an accurate and replicable precedent for the current exercise.The greatest and most immediate threats to our mature and old-growth forests are impacts from disturbance. A universal framework definition that aims to foster resilience to such disturbance as well as maximize forest carbon sequestration and storage requires the flexibility to adopt appropriate forest management strategies.To have a meaningful impact on conservation, any regional definitions of mature and old-growth forests need to be paired with adaptive management criteria that can inform the practices necessary to achieve a given solution. The greatest and most immediate threats to our mature and old-growth forests are disturbances from natural events like drought, wildfire, insects, and disease outbreaks.vii As the Forest Service's recent Climate Adaptation Plan explains, "climate-amplified disturbances like these have become the primary threat to old-growth stands on national forests."viiiMany of our forests are currently overstocked and fuel-laden as a result of a "fire deficit" on seasonally dry forests; historically, North American forests experienced more frequent low- and mid-severity fires that helped maintain forests with a lower density of trees and biomass.ix Forests with a high density of trees can limit the resources available to each individual tree, making them more susceptible to landscape-scale disturbance. The national forests of the Intermountain West, for instance, now emit more carbon than they store on an annual basis due to tree mortality from natural disturbances.x Based on colloquial definitions, forests reaching unhealthy densities may very well be nearing or in a "mature" phase of development, indicating that mature forests can benefit from active forest management to both avoid excessive mortality and, where appropriate, promote successional development toward old-growth structure.xiA high density of floor and ladder fuels can result in the loss of old-growth stands altogether.xii Two National Park Service reports indicate that 13-19% of all large giant sequoias were lost in 2020-2021xiii because of a warming climate and fuel build-up from fire suppression techniques over the last century, which together led to a dramatic increase in high-intensity wildfire within the groves.xiv Adding to high mortality rates is climateinduced stress from drought and a lower resistance to insect infestation.xvFire was both natural to the pre-Columbian landscape and implemented by Indigenous communities of North America.xvi The forest sector understands that restoration treatments in the form of thinning and prescribed fire can foster resilient forest conditions that mimic historic fire regimes and which can help maintain and enhance the function of old-growth forests.xvii Forest management is therefore important for long-term climate strategies, as research has shown that disturbances like insect and disease events can significantly reduce forest carbon sequestration in US forests.xviiiDr. John D. Bailey[mdash]Professor of Silviculture and Fire Management at Oregon State University[mdash]helped illustrate the connection between old-growth protection, forest management, and wildfire risk:"If you want to protect old-growth forests from wildfire, then you must maintain fuel levels (particularly surface and ladder fuels in a horizontal and vertical arrangement) that promote resistance and resilience of those fire-prone forest types. Future wildfire behavior can be projected based on a range of fuels, topography, and weather conditions to guide restoration and conservation treatments (e.g., prescribed fire with or without partial harvest). However, despite our best efforts at conservation, many old-growth forests will continue to burn before we can treat them or under particularly severe (and unpredictable) future weather conditions. Therefore, we also must be growing potential new old-growth stands as replacements for habitat, recreation, and other sociocultural needs."Detailed in SAF's national position statements on wildland fire management and prescribed burning, appropriate thinning and controlled fire techniques can restore fire-adapted ecosystems under threat.xix When managed by natural resource and forestry professionals, adaptive management is proven to restore ecosystem health, lessen the severity and extent of wildfires resulting in less mortality and less carbon emissions, and improve the safety of communities in the wildland urban interface. This science is reflected in the Forest Service 10-Year Strategy entitled "Confronting the Wildfire Crisis," which sets treatment of over 20 million additional acres of fire prone National Forests as the top priority for the Forest Service. This strategy focuses on reducing forest stocking levels and taking immediate actions to protect fire-prone communities.xxSAF's national position statement on forest management and climate change also provides a foundation for the long-term benefits of active forest management on atmospheric carbon levels.xxi The Forest Service acknowledges that management can increase overall carbon sequestration and storage.xxii Numerous studies have shown that management[mdash]including harvest[mdash]is the best way to maximize carbon sequestration on forest lands.xxiii The Forest Service's Climate Adaptation Plan also supports the position that "[s]ome forests, such as those at risk for high severity wildfire, might require hazardous fuels treatments and other forest health interventions that reduce carbon storage in the short term even as they stabilize carbon in the long term."xxivThe Intergovernmental Panel on Climate Change promotes harvested wood products as instrumental to the future of mitigating greenhouse gas emissions, not only because of their inherent carbon-storing capacity but because of their ability to substitute similar non-renewable products with higher emissions patterns.xxv Harvested wood products can be a natural by-product of adaptive management techniques and illustrate that prudent, thoughtful management by forestry professionals is an important conservation and climate solution that should be central to domestic forest policy.Beyond carbon considerations, proactive forest management is also critical to lessening the severity of wildfire impacts on human communities. As forester John Todd reflects, "Human suffering has reached new levels for modern-times as entire communities, like Paradise and Grizzly Flats, were lost in fast-moving forest conflagration." Through science-based and climate-smart management techniques, climate-smart forestry can be balanced with assurances that we are prioritizing the safety of vulnerable communities in the wildland-urban interface.Key Takeaways[bull] Timber harvesting and forest management are not threatening the existence of mature and old-growth forests. In fact, a science-based and ecological approach to management is critical to the long-term health and resilience of our forests and the communities who rely on them.[bull] If established, a universal definition framework should include adaptative management criteria informed by risk assessments of landscape-scale disturbance to motivate conservation outcomes on mature and old-growth sites.To motivate conservation, a universal framework definition must actively consider and shape its policy implications. Any attempt to define mature and old-growth forests should (1) be based on stand characteristics rather than individual tree characteristics and (2) include an assessment of forest stability.Successional and structural criteria are a common foundation for researchers attempting to define old-growth forest types. When and how such criteria apply to a specific old-growth forest types varies greatly, but these criteria may generally includexxvi:[bull] Existence of relatively large and/or old late-successional tree species with ages close to their life expectancy and a mean age of half the longevity of the dominating trees[bull] Structural and compositional features witnessing self-replacement through gap-phase dynamics, including:o Uneven-agedo Regeneration of shade-tolerant specieso Presence of canopy gapso Large snags and logs in varying stages of decayThese characteristics are a product of time-dependent stand dynamics, but an exercise that intends to map and inventory mature or old-growth forests runs the risk of seeing them as static traits that can be captured in a "snapshot." In this static snapshot, an inventory of old growth shows a single stage at a single time in an ongoing succession of forest development across a landscape. This landscape is inevitably subject to change by natural disturbance patterns regardless of human action or inaction. An inventory or mapping exercise that only captures a particular stage of forest development on the landscape at a given time does not provide a definitive guide to future management, whether that management is to maintain, enhance, or protect mature and old-growth forests.Unmanaged forests are increasingly risky, unstable pools of carbon. Emissions from 2020 wildfires in California, for instance, which burned predominantly on National Forest System lands, emitted over 112 million metric tons of carbon dioxide, or the equivalent of 24.2 million passenger cars driving in a single year.xxvii Understanding the risks to our forests is essential to understanding how adaptive management can conserve them. A universal framework definition should additionally include stability as a feature in order to develop definitions that can support long-term conservation goals and related management strategies.Stability, as originally defined by Thomas A. Spies, "refers to the duration of the old-growth stages given successional change and the occurrence of stand replacement disturbances."xxviii With the onset of more severe disturbance regimes on many public lands from the compounding effects of climate change, insects, disease, and wildfire, an assessment of stability it critical to understanding anticipated shifts in mature and old-growth habitat across landscapes. Incorporating stability as an additional characteristic of old-growth forest types provides a scientific foundation to consider landscape-scale threats and related strategies for successful conservation.The successional patterns and structural criteria used to define mature and old-growth forest types can only be understood at the "stand" scale because it involves the interaction between multiple trees in an area. Additionally, an accurate inventory of mature and old-growth forests must reflect the dynamic shifts in disturbance across a landscape, which makes assessments of individual trees inappropriate. As a matter of practical policy setting, management must be made at the scale of forested stands to have meaningful impacts. Therefore, a universal framework definition should avoid using individual tree criteria. The following section further elaborates on what should be excluded from a universal definition framework.Key Takeaway[bull] Any attempt to define mature and old-growth forests should be based on stand-scale criteria and include an assessment of stability.A universal definition framework of old-growth forests should exclude any prescriptive ecological characteristics related to age, diameter, height, and/or carbon-storing capacity. Additionally, prior human disturbance should not be determinative of old-growth status.One of the central problems in characterizing old-growth stands has been that the distinctive and relatively common old-growth stands of the Pacific Northwest have influenced public perception of old-growth attributes.xxix Adding to this perception is the scarcity in old-growth populations and their respective research in other regions of the country.xxx As a result, old-growth is often conflated with forests of exceptional age, diameter, height, and/or carbon storing capacity. Such features are also often associated with individual tree criteria, which does not reflect the successional and structural components that best reflect old-growth attributes (e.g., structure at the stand scale based on the relationship between individual trees). Previous research efforts to define old-growth illustrate that age, size, and carbon storing capacity differ vastly[mdash]not only at the individual tree scale, but also at the stand scale[mdash]across old-growth forest types of different regions. These same principles and concerns apply to any attempt to define and/or associate prescriptive criteria with mature forests.For instance, relatively young Douglas fir stands may be greater in diameter, height, and biomass accumulation than old-growth beech-oak forests of the Northeast. Fire-adapted dwarf pitch pine barrens in the Northeast can reach ages between 200 and 300 years old but are just several inches in diameter and are less than 16 feet tall. Age, size, and biomass accumulation are indicator attributes of mature and old-growth only relative to regional forest type and development and are dependent on both biology and site conditions, and therefore no particular parameter value of those attributes is dispositive of mature or old-growth status and should not be included in the universal definition framework.Another historic contention is that a forest with a history of human-caused disturbance cannot be deemed old-growth.xxxi A notion of untouched or "virgin" forest as a requirement for old-growth status presents a position where social values begin to encroach on functional scientific definitions and land use history. Social values have a role to play in conservation, but this position ignores a rich body of research indicating active management and human-caused disturbance by Indigenous peoples across North America, particularly through fire. Additionally, while land use history and human action may be important factors in stand development, neither bar a forest from taking on old-growth qualities and features. As Research Forester Thomas A. Spies writes, "if stands are defined largely on the basis of structural development, the source of the disturbance (e.g., human or fire) is irrelevant as long as the diagnostic features are present."xxxiiConflating old-growth with forests undisturbed by humans also motivates preservation or passive management policies under the assumption that forests left to grow by themselves will become healthier, old-growth forests. Disturbance is natural and most forests are adapted to respond well to certain types and intensities of disturbance; in general, a forest disturbance can either delay or promote forest succession depending on the type and intensity. As previously noted, a history of fire suppression has left many forests in a condition to burn at unprecedented levels of severity, leading to high mortality rates and the subsequent loss of old growth. In such landscapes, active management can be instrumental in ensuring their survival, promoting optimal ecological functioning, as well as fostering and maintaining old-growth attributes.xxxiiiIn summary, the list below sets out forest characteristics which should be excluded from a universal framework definition of mature and old-growth forests. These characteristics include:[bull] Age[bull] Height[bull] Diameter[bull] Carbon storage capacity or biomass accumulation[bull] Whether a forest has been disturbed by humansKey Takeaway[bull] If established, a universal framework definition should avoid using prescriptive criteria at the national scale.[bull] Prior disturbance[mdash]whether or not caused by humans[mdash]is not determinative of whether a forest accrues mature and old-growth attributes.Any mature or old-growth definitions should explicitly state that they apply only to federal lands and that such definitions are not intended or appropriate for privately owned forests.Executive Order 14072 indicates a focus on federal lands but invites coordination on conservation measures with "any landowners who volunteer to participate."xxxiv The RFI also suggests an exclusive focus on federal lands but is not explicit about this intention.xxxv Any universal framework definition should explicitly state it only applies to federal land and that it does not apply to private land.The following are additional comments from forestry professionals who support the use of appropriate active forest management and silvicultural prescriptions to achieve conservation and climate-smart outcomes on public forests.Comments from Tony Cheng, Professor in Forest & Rangeland Stewardship and Director of the Colorado Forest Restoration Institute, Colorado State UniversityForests are bedrock to the health and well-being of society, both for instrumental goods and services, and their intrinsic values. Forests in the U.S. are experiencing large-scale mortality from multiple and compounding stressors due to climate change (drought, wildfire, insect epidemics), land use (conversion of forest to non-forest), and historic and current management (i.e., fire suppression in historically fire-dependent ecosystems).xxxvi Forests, - whatever their age, structure and composition - are never in a static state; regardless of policy and management intentions, forests will always change and this change is anticipated to accelerate based on evidence of widespread climate change-induced forest decline stressors.xxxvii Preserving any forest condition under the assumption that it will remain static in perpetuity runs counter to the evidence. By the same token, policy and management direction would be wise to align with this growing body of evidence.Comments from Dr. David Coyle, Assistant Professor of Forest Health and Invasive Species at Clemson University; Forestry and Wildlife Resources Program Team, Forestry and Environmental Conservation DepartmentTrees fulfill a critical role of capturing and storing carbon, as well as providing oxygen; thus, having as many trees alive and photosynthesizing as possible will only benefit our society and planet. Climate change is one of the most important threats to forests worldwide and threatens the health of forests in several ways. Climate change leads to an increase in the unpredictability and intensity of storms - many of which are extremely damaging to forests. By physically changing the structure and presence of forests, climate change can directly impact the ability of forests to store carbon and widespread tree mortality events can release carbon into the atmosphere. For example, hurricanes, tornadoes, and derechos can all lead to widespread destruction of forested areas, and this has occurred many times in the last several years alone. For example, Hurricane Michael caused nearly 88% tree mortality near its center in the Panhandle of Florida in 2018xxxviii and likely resulted in long term reductions in the capacity of that forest to store carbon (Henderson et al. 2022).xxxix A tornado in Texas resulted in an 83% reduction in canopy coverxl and the 2020 Midwest derecho was estimated to kill nearly 2.7 million trees on 23 thousand hectares in Iowa.xli Climate extremes can also lead to elevated levels of tree mortality due to increased heat and drought.xliiFurther impacting forests are the myriad of insects and pathogens that use trees as hosts. The vast majority of forest invertebrates are secondary pests, meaning they only attack trees that are already weakened (e.g., from drought or heat stress).xliii While invasive species (those not native to a particular region or continent) are typically more aggressive and able to attack healthy trees (i.e., not limited to using stressed trees as hosts), climate change can facilitate these species' range expansion. For instance, the redbay ambrosia beetle (Xyleborus glabratus) is estimated to have caused the death of over 300 million redbay trees (Persea borbonia) alonexliv and this number is no doubt larger as laurel wilt (Raffaelea lauricola) has spread across the southeastern U.S. and is now impacting sassafras (Sassafras albidum) trees outside redbay's natural range.xlv We know that redbay ambrosia beetles can survive in latitudes further north than where they are currently establishedxlvi and a changing climate will only help facilitate their spread north leading to further devastation of those hardwood forests, some of which have a large sassafras component.While the situation may seem dire, there most certainly is hope. Proper forest management can alleviate many concerns and help keep trees alive and providing their myriad benefits. These management activities include planting the right species on the right site and avoiding situations where trees become stressed from a lack of or poor management decisions. When forests are overstocked, they are stressed, and stressed forests are much more susceptible to forest pests. Proper management includes harvesting when appropriate and replanting to ensure an adequate supply of this renewable resource. Concurrently, promoting and using wood products for building will help store captured carbon, further helping to mitigate the impacts of climate change.Comments from Dr. Alan Long, Professor Emeritus, Forest Management & Wildland Fire, University of FloridaMy professional background includes over 50 years of forest management, reforestation, and wildland fire management in the western states and Southeast. Defining and inventorying the nation's mature and old-growth forests is not a new activity. It has been a key professional program for decades and has resulted in definitions throughout the National Forest system and other lands that are appropriate for different regions, ecosystems, and historical development. All efforts under this part of the EO should build on our long track record of definitions and inventory rather than diverting resources from ongoing programs to restore forests and mitigate fire effects. At the same time, I would hope that a focus on inventorying forest conditions will also ask some important national level questions about just how much forest we need to provide the various federal land benefits. The EO recognizes that we are at a critical juncture in addressing climate change and it may be necessary to adjust our priorities on how land is used and science-based management priorities.As the EO recognizes, the nation's forests play a key role in "retaining and enhancing" carbon (C) storage. Understanding carbon dynamics in forests is instrumental to optimizing their role in carbon storage. By definition, old and mature forests represent major C storage entities, but they are generally in a neutral C condition, emitting as much carbon as they sequester, through mortality and decay. Only in young and maturing forests is C sequestered faster than it is emitted. In all forest types, it is important to recognize that all the stored C, in leaves or old wood, has been cycling through those natural systems for eons. They are not new additions to the atmosphere as occurs with burning fossil fuels.Ideally, then, the optimum C mitigation using forests would be to turn all forests into young and maturing forests until they reach maturity (neutral carbon exchange), then use solid wood products from harvested trees to store the sequestered carbon and start the cycle over again. Of course, we recognize that other values such as retaining old growth in Wilderness and Roadless Areas must still be considered and will play into forest management plans, but the ideal C mitigation with forests argues for harvesting mature trees and dead trees after wildfires for solid wood carbon storage and for intensive science-based reforestation as soon as possible after harvest. The focus on widespread, intensive, science-based reforestation may well be the most important component of the EO for increasing carbon sequestration. Increased use of fuel reduction and prescribed fire will be equally important for wildfire mitigation.Conclusion Forestry and natural resources professionals are dedicated to the long-term health and resilience of all forest types. Old-growth and mature forests possess a diverse array of benefits to society, including air, water, carbon storage, wildlife habitat, recreational use, and spiritual value. Forestry and natural resources professionals work to foster and balance these values across forested landscapes using science-based management approaches tailored to regional considerations. Today, the greatest threats to mature and old-growth forests are the compounding disturbances from climate change, wildfire, insects, disease, and drought. An attempt to define, inventory, and map mature and old-growth forests presents an opportunity to facilitate science-driven policies that aim to balance

conservation and climate-smart outcomes by directly addressing these documented threats.i Pesklevits, Anthony, Peter N. Duinker, and Peter G. Bush. 2011. "Old-growth Forests: Anatomy of a Wicked Problem" Forests 2, no. 1: 343-356. https://doi.org/10.3390/f2010343ii See, for instance, OLD-GROWTH FOREST TYPES OF THE NORTHERN REGION, P. Green et. al., USDA Forest Service, April 1991. iiiiii U.S. Department of Agriculture, Forest Service. 1989. Position statement on national forests old-growth values. Unnumbered internal memo to regional foresters, station directors, and Washington Office staff, October 11, 1989. On file with: U.S. Department of Agriculture Forest Service Auditors Building 201 14th Street, S.W. at Independence Ave., S.W. Washington, DC 20250.iv Thomas A. Spies, Ecological Concepts and Diversity of Old-Growth Forests, Journal of Forestry, Volume 102, Issue 3, April 2004, Pages 14-20, https://doi.org/10.1093/jof/102.3.14v 36 C.F.R. 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