

Data Submitted (UTC 11): 8/30/2022 4:00:00 AM

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Hi Jamie,

Thank you for your assistance in uploading comments in response to the USDA Request for Information on Federal Old Growth and Mature Forests. I have attached the document to this correspondence as well.

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Thank you on behalf of the Theodore Roosevelt Conservation Partnership for the opportunity to participate in the process.

Very best,

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The Theodore Roosevelt Conservation Partnership (TRCP) is a national conservation organization with a mission to guarantee all Americans quality places to hunt and fish by strengthening laws, policies, and funding affecting fish and wildlife conservation and access. We do this by uniting and amplifying the voices of 135,000 individual members and our 62 partner organizations.

On April 22, 2022, President Biden issued Executive Order (EO) 14072, Strengthening the Nation's Forest, Communities, and Local Economies directing the USDA Forest Service and other federal agencies to categorize and monitor old-growth trees on federal lands. This letter is in response to the notice for Request for Information (RFI) on Federal Old-growth and Mature Forests prepared by the United States Department of Agriculture (USDA), United States Forest Service (Forest Service), the United States Department of the Interior (DOI), and the Bureau of Land Management (BLM) on July 15, 2022. The primary goal of the RFI is to gather public comments that will inform development of definitions for old-growth and mature forests to facilitate the most accurate and reliable identification, inventory, and needs of ecosystems and ecosystem services they support.

The Forest Service Needs a Comprehensive Approach to Forest Management

Old forests are one of many important successional stages. We believe that emphasizing old growth and mature forests with a broad brush and without respect to forest type, and in a way that places priority over other forest types, could hinder the ability of the USFS to optimize carbon stewardship, resilience, and biodiversity. Therefore, as the Forest Service moves forward as directed per Executive Order 14072, TRCP believes the agency needs to utilize a comprehensive forest management framework, that manages forests based on the best available science and in ways that aligns with the needs of individual forest types, including old growth and early seral habitats. In doing this, we believe the USFS should build upon and improve the existing systems rather than reinvent them.

Thomas Spies, USFS Research Forest Ecologist stated:

An ecological understanding of old growth requires a multiscale perspective, ranging from individual trees to regions. A consensus on a single general ecological definition of old growth will never be reached, but that should not preclude the development of specific definitions needed by managers. Old-growth forests share many attributes, such as spatial heterogeneity, but they also differ in many ways. Given the complexity and dynamics of forests, efforts to conserve biodiversity must be sensitive to the diversity of old-growth forests and must consider forests of all developmental stages, not just old-growth. One implication is that forest policies and management practices may need to be as diverse as the old-growth forests they address (Spies, 2004).

The complexities of defining and managing old growth and mature forests may be addressed in the staged decision-making approach of the USDA 2012 Planning Rule which also mandates an ecological reference model for evaluating the Natural Range of Variation and Historical Range of Variation. This document includes considerations for forest type, composition, productivity, and region and may play an important role in developing comprehensive forest management strategies for forest systems across the country. As such, the TRCP recommends:

[bull] Developing a standard framework for old growth and mature forests, including characteristics of under-, mid-, and overstory, density, range, and basic ecosystem services provided, if practical.

[bull] Including considerations of forest heterogeneity, biodiversity, and resilience when planning forest management building upon the USDA 2012 Planning Rule.

[bull] Including available and reliable scientific data on capacity for carbon sequestration, store, and flux in defining old-growth and mature forests.

[bull] Including language that distinguishes a universal definition of forests from a universal approach to forest management.

Forest Types and Management Needs Vary Greatly Across the USFS System

The United States Forest Service National Forest System (NFS) manages 193 million acres of national forests and grasslands. NFS includes nine regions including Alaska, Eastern, Intermountain Northern, Pacific, Pacific Southwest, Rocky Mountain, Southern, and Southwestern regions (USFS, 2022). The NFS includes a tapestry of complex, diverse, and unique lands grounded by a wide range of tree species that define them. As you can see from the following regional examples, different forest types have unique attributes and management needs. Developing a singular definition and management approach for all forest types seems not only difficult, but it could also have a negative effect on forest health and biodiversity.

[bull] The Eastern Region is comprised of 20 states with 12 million acres of contiguous national forest system public lands. It is the most urban region with more than 43 percent of the U.S. population, and is considered the most geographically, ecologically, and socially diverse in the country. Although these forests provide habitats for a wide range of plant and wildlife, species such as the American chestnut which was once a common species has been nearly decimated, and oak and hickory trees are in sharp decline due to impacts from exotic pathogens, invasive species, and fire suppression. Ruffed grouse (RG) is one of the most critical indicator species in the Eastern Region because it is one of the most widely distributed game birds, presenting in 38 of 50 states, typically above 1500-foot elevations. It is considered a keystone species because of its importance as an abundant food source for a wide array of wildlife species. Their abundance is often an indicator of sustainably managed forest ecosystems that can provide cover for RG populations in young, middle-aged, and old forests (RGS, 2022); However, they have experienced a steep decline due to decreases in young forests, ages 6-15, largely due to a lack of disturbances (Dessecker and McAuley, 2001; Askins, 2001). In addition to providing benefits to game wildlife, many species listed as threatened and endangered, such as New England cottontails and Golden-winged warblers, also require the openness, dense ground cover, shrubs, and young trees that early successional habitats offer for re-establishing and maintaining these populations (Livatitis et al. 2021).

[bull] The Southern Region extends from Texas to Virginia on the U.S. mainland and includes Puerto Rico, comprising approximately 13.5 million acres of public land in 13 states. It has the largest and most productive prescribed burn program in the country and is home to more than three million acres of longleaf pine forests. These forests provide a critical ecosystem service by creating buffers from wildfire, mitigating damage from hurricanes, providing erosion control, and presenting opportunities for significant carbon sequestration through restoration efforts following a dramatic decline from 90 million acres in the twentieth century. These forests also support a variety of game species, including Northern Bobwhite quail, Eastern wild turkey, American Woodcock, Florida black bear, and the white-tailed deer. Longleaf thrives in humid, subtropical climates and can withstand extended summers with often excessively high temperatures. Additionally, its ability to grow in sandy soil with low levels of organic matter, tolerance of prescribed fires, resistance to insect infestations, and high tolerance for frequent droughts and a wide range of drainage conditions make it especially resilient to climate change. Maintaining an active, prescribed burn program is critical for the health of longleaf pine forests.

[bull] The Northern Region includes 25 million forest acres across five states including Idaho, Montana, North Dakota, South Dakota, and Washington. Ponderosa pine (Ponderosa) is a wide[1]ranging conifer occurring throughout the United States and often dominates low-elevation savannas, woodlands, and forests of the Northern Region. These forests support a range of fish and wildlife species, including wild trout, Rocky Mountain elk, mule deer, and white-tailed deer. Non-lethal, mixed, and lethal wildfires historically burned through most

ponderosa forests providing a canvass for a wide variety of species compositions and vegetative structures. Although the extent of wildfires that currently burn in these altered forests is not noteworthy, their severity is with the greatest impacts reported in Arizona, Colorado, and South Dakota. The Hayman and Cameron Peak fires were two record breaking wildfires that impacted Colorado in 2002 and 2020, with losses of 138,114 and 208,663 acres respectively. Compounding the challenges associated with managing naturally occurring forest fires are those prompted by anthropogenic activities. Between 2002 and 2011, Arizona lost more than one million acres of forests due to direct human impacts that contributed to fires. Regardless of the cause, loss of forested land will be exacerbated by climate change. A University of Colorado study projects that by 2051, less than 18 percent of ponderosa and Douglas fir forests will recover if moderate steps are taken to mitigate climate change. Recovery drops to three and a half percent for ponderosa if minimal action is taken (Rodman et al 2021). Ponderosa forests have been transformed significantly since the 1800s due to factors such as fire exclusion, animal grazing, timber harvest, and climate cycles. Appropriate management of Ponderosa includes mechanical treatment and prescribed fire to mimic natural and indigenous created disturbance. Alternatively, the lodgepole pine (LPP) grows throughout the western U.S., north to the Yukon, south to Baja California, east to the Black Hills, and extends west to the Pacific Ocean (UC, 2022). Typical LPP forests are homogenous, but heterogenous stands are not uncommon (Lotan et al. 1985). Because they are relatively homogenous, they also have relatively low diversity of plant and animal species, but provide an important habitat for mule deer, elk, black bear, and a host of birds. These forests have endured because they can withstand a wide variety of adverse environmental conditions under different fire regimes (Brown, 1975). Most Rocky Mountain LPP forests were established as a result of repeated fires, particularly forest fires because they provide high temperatures needed for cones to release seeds as the thin bark on their trunks are scorched. During forest fires, the resin that seals and protects LPP cones melts and releases its seeds which will germinate when the environment becomes conducive for growth. The average lifespan of a LPP is between 150 and 200 years, and they depend on stand replacement disturbances as part of their life cycle.

[bull] The two largest national forests, the Tongass and Chugach, are in the Alaska Region. The Tongass National Forest is in Southeast Alaska and stretches 500 miles north to south. It is the largest U.S. Forest at approximately 17 million acres. The Tongass hosts a wide range of fish and wildlife, ranging from Pacific salmon to grizzly bears and Sitka black-tailed deer, but it is also home to mature temperate rainforests comprised of cedar, spruce, and hemlock trees. More than two-thirds of these old growth forests have been lost in the southern half of the forest primarily due to timber harvesting. In the hunting community, these old growth forests play an invaluable role because of the ecosystem service they provide for Sitka black-tailed deer populations in Southeast Alaska, where they are the most pursued species of big game. Sitka black-tailed deer are an important food source for subsistence hunters and support a rich tradition for recreational hunters. Key factors that influence suitability and consequently survival of the Sitka black-tailed deer are understory productivity of nutrient-rich vegetation and canopy density that limits the depth of snow covering understory vegetation. As snow depth increases, the quantity and quality of vegetation accessible to deer decreases (Leahy, 2022). Deer will forage deciduous shrubs and conifers, opportunistically, when nutrient-rich understory vegetation is not accessible, but foraging plants with lower nutritional value cause deer to lose weight (Hanley et al. 1984). Increased snow depths also require increased use of energy for mobility. Decreased access to food sources as well as increased use of physiological energy stores contribute to declining Sitka black-tailed deer populations. However, denser canopies help to reduce the snow that reaches the ground in layers atop food supply. In the Tongass, protection of old growth stands should be a priority, while young growth forests should be actively managed to accelerate the process to restore old growth characteristics to previously managed stands.

Large Tree Harvest to Support Aspen Restoration

The quaking aspen is the most widely distributed tree species in North America, and aspen forests are important for mule deer, elk, moose, black bear, ruffed grouse, etc. Aspen is a monodominant forest (one in which more than 60 percent of the tree canopy comprises a single species [Perala, 2019]). Stands dominated by a single species and containing trees of a uniform age and canopy height may be especially vulnerable to climate

change. It is important to develop management strategies that are unique to aspen forests because they play a disproportionately important role providing ecosystem services such as carbon sequestration and mitigation of forest disturbances (Rogers et al. 2020).

One of the greatest threats to aspen stands is competition from conifers that often grow within stands and then crowd out aspen, in large part because of a lack of disturbance resulting from fire suppression. Frequently, once conifers become large enough to crowd out aspen stands, they are large in diameter. As USFS sets its policies around old growth and mature forests, we encourage the agency to consider—and account for this in its policies—the unique needs of specific tree species and forest types and the necessity to manage and/or remove large diameter trees to maintain or restore biodiversity and forest health. Similar consideration of the need to remove what could be considered old growth forests should be given where pinyon-juniper forests are crowding out native grassland and sagebrush steppe environments in the arid and semi-arid regions of the Intermountain West.

Additional Comments in Detail Without question, an argument can be made for the benefits of forest heterogeneity, including correlations between increased biodiversity with increasing heterogeneity which provides more opportunities for niche habitats (Heidrich et al. 2020). Additionally, some studies show biomass production and thus carbon capture is highest in younger and middle-aged stands but declines as forests age (Pregitzer and Euskirchen, 2004). Greater variations in growth patterns of heterogeneous stands increase the distribution of soil and light resources that influence ecosystem dynamics (Dovciak et al. 2001) and contributes to maintenance of biodiversity (Halpern and Spies 1995). Heterogeneity in ecosystem structure has been recognized by ecologists as an essential tenet of forest management for its value in regulating forest composition and function (Puettmann et al. 2008). It should also be noted that long-term soil carbon sequestration is significantly lower in younger forests (Schlesinger 1990). Many studies suggest that old-growth forests are near carbon neutral. These assumptions, however, do not consider root and leaf litter production, accumulation of coarse woody debris with highest occurrences in old-growth forests, or the potential for soil carbon storage to occur in deeper soil layers rather than in the topsoil layers, which are more heavily researched (Gleixner et al. 2009). Considerations for the role that old growth and mature forests play in climate resilience management should be posited during short- and long-term old-growth and mature forest distinctions and adaptive management strategies.

Protection and conservation of old growth forests should not equate to an absence of active management planning to restore desired qualities of old and mature forests. While much attention has been given to protecting old growth or virgin forests, less has been given to creating old-growth characteristics in woodland landscapes. Old forests need active management to maintain their characteristics. Such is the case for Ponderosa pine (Ponderosa). Ponderosa forests are found throughout the contiguous United States, with the highest concentration in Colorado, representing eight percent of the state's forested lands. These forests historically experienced natural burns every five to 25 years singeing the grasses, small trees, and other understory vegetation necessary to maintain open stands for larger ponderosa pine trees to thrive (NPS, 2022a). Past events involved a mixed-severity of burn events ranging from frequent, low- to moderate-severity surface fires to less frequent, stand replacement surface and crown fires. This created optimal conditions for Ponderosa forests because they typically perform better following moderate, slow burning fires that burn plants on the ground but leave taller trees unaffected. Persistent fire suppression practices have led to increased fuels in Ponderosa stands. When vegetation in the understory is allowed to accumulate, impending fires inevitably burn faster, with more intense heat, and with greater potential for flames to reach the overstory.

Another example of the adverse impacts of passive forest management is the Giant Sequoias. Giant Sequoias are only found in 77 groves of Northern California. Between 2015 and 2021, more than 85 percent of all giant sequoia grove acreage was burned in six wildfires affecting the Sierra Nevada. In the century preceding these events, only 20 percent of sequoia groves had been burned by wildfires. In the mid twentieth century, the National Park Service focused on protecting big trees from harvest and fire. Fire and pests were aggressively controlled, and the cutting of live trees was prohibited. During this era, preservation took an unequivocal hands-

off approach. (Hartesveldt 1962). The lessons learned with both Ponderosa pine forests, and Giant Sequoia groves is that a passive management approach is detrimental to the long-term health of the ecosystems they support. Planned forest management provides the opportunity to accelerate the development of old-growth structure (larger trees, canopy gap variations, downed logs, diversity of tree sizes, etc.) through carefully planned treatments, including prescribed fires. Proper active forest management creates opportunities to mimic natural disturbance which increases growth rates and the development of old-growth characteristics (D[rsquo]Amato and Catanzaro, date undetermined).

Fully functioning ecosystems have a natural resistance and resilience to disturbances. Resistance is anecosystem[rsquo]s ability to retain biodiversity during and after a disturbance. Resilience is the magnitude of disturbance an ecosystem can tolerate and return to its original state or carrying capacity after the disturbance. When an ecosystem is degraded, its resistance and resilience to disturbance weaken. Permanent changes may occur in ecosystems that reach their threshold when there is an absence of ongoing efforts to mitigate the natural and anthropogenic impacts of plant and wildlife (NRCS, 2006). Fire suppression, for example, is detrimental to forests, and eventually destroys all old growth in many systems. The reintroduction of fire into degraded frequent-fire, old-growth forests, accompanied by appropriate thinning, can restore a balance to these ecosystems (Binkley et al. 2007).

Implementation of old-growth and mature forest active management strategies should not be designed or implemented with a singular set of outcomes in mind. In contrast to painstaking efforts to restore and strengthen old growth characteristics of forests such as the Longleaf, Tongass, or Ponderosa because of their contributions to healthy ecosystems, ecologists and managers have been challenged by the aggressive growth characteristics of the pinyon-juniper (PJ), considered an invasive species by the BLM. PJ woodlands occupy areas in ten states of the Great Basin, the Colorado Plateau, the Rocky Mountains, and the Sonoran and Chihuahuan Deserts, and are estimated to cover between 42 and 136 million acres. Old-growth PJ forests are some of the most unconventional forests when compared to the more traditional forests aforementioned. Their close-growing habits help them tolerate a broad range of environmental conditions that allows them to compete in a variety of plant communities. Of particular concern is that PJ growth has increased more than 150 percent since European settlement due in part to changes in land-use and climate. This is of particular concern for sagebrush ecosystems where sage grouse rely on large continuous areas of land for population persistence. In the Great Basin, PJ encroachment has been identified as a primary threat to sage grouse populations by contributing to fragmentation of continuous expanses of sagebrush. Increased PJ communities also contributes to accelerating wildfire and the proliferation of invasive annual grass which often eliminates and replaces sagebrush (Balch et al., 2013, Chambers et al., 2014a). The spread and persistence of PJ woodlands, many of which may be considered old growth communities, is an example of the need for old growth and mature forests to be evaluated, defined, and managed based on their unique ecosystem characteristics and contributions.

Healthy forests provide rich habitats for diverse wildlife. Biodiversity boosts productivity and resilience across all levels of the ecological food web, promoting the balance needed to support sustainable ecosystems that are important for hunting and fishing communities throughout the country. In past decades, forests have been defined primarily by age and structural attributes. The increasingly adverse impacts of climate change and emerging scientific research and data that supports the need for management and conservation strategies which promote resilience and adaptation, dictates the necessity of integrating considerations of carbon capture, storage, and sequestration at all stages of planning.

The TRCP is sensitive to the legal mandate under which NFS must provide multiple-use landscapes including timber, recreation, watersheds, and wildlife. From prescribed fires and water quality to invasive species and climate solutions, the NFS is faced with a complex decision-making environment in which the needs of many end-users must be met. The TRCP believes the USDA Forest Service[rsquo]s efforts to develop a universal definition framework of old-growth and mature forests may distract us from developing practical management strategies that are unique to various regions across the country based on the available science for each

ecosystem. We believe management approaches unique to forest type and ecosystem needs is most appropriate, and this includes conserving large trees and old growth in appropriate forest types and locations, and in supporting active management and early seral habitats. The TRCP appreciates the opportunity to participate in the EO 14072 public comment process and is committed to continued solutions-oriented engagement.

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