

Data Submitted (UTC 11): 8/26/2022 4:00:00 AM

First name: Luke

Last name: Ruediger

Organization: Klamath Forest Alliance

Title: Conservation Director

Comments: August 26, 2022 RE: Request for information on Federal Old-Growth and Mature Forests Executive Order 14072 Submitted via Jamie Barbour, Assistant Director, Ecosystem Management Coordinator via roy.barbour@usda.gov; <https://cara.fs2c.usda.gov/Public/CommentInput?project=NP-3239> Introduction Although our organizations strongly support the intent of President Biden's Earth Day Executive Order (EO 14072) on forests, we are concerned that the order completely fails to mention one of the biggest and most pervasive threats to mature and old-growth forest on federal lands, the federal land timber sale. Commercial logging and inappropriate vegetation management projects are routinely logging mature and old forests on federal lands and must be addressed if meaningful protections are implemented and the Earth Day Executive Order is to have the intended effect. Mature and old-growth forest are one of the most important habitats found on federal lands from a climate mitigation and biodiversity perspective. They are also increasingly rare due to both decades of overcutting and recent increases in commercial logging dishonestly proposed as "fuel reduction" or "forest health" thinning by federal land managers at BLM and the US Forest Service. The mature and old growth forests in question provide important habitat for rare, threatened, or endangered species, protect water quality, store and sequester carbon, and maintain climate refugia. Despite their importance, these habitats are not adequately protected on federal lands and unfortunately, are regularly threatened by both National Forest and BLM timber sales. In fact, in southwestern Oregon and northern California where our organizations operate, nearly every timber sale proposed by federal land managers in the past 20 years (and before that) has contained a significant old forest logging component. If our federal government is serious about the climate crisis, these forests must be protected through federal rule making, all currently proposed or approved timber sales including an old forest logging component must also be withdrawn and federal timber quotas should be eliminated. President Biden's Earth Day Executive Order requires the administration to take bold, decisive and meaningful action to both protect old forests throughout the country and protect our global climate. Yet, as noted above the Biden Executive Order fails to protect forests or even mention the threat of mature and old forest logging on federal lands. This must be corrected and our comments are focused on demonstrating both the scope and scale of the problem in our region, although we know these problems are evident throughout federal lands. This comment will answer the specific questions in the Federal Registry Notice for this comment period, address the continuing and growing threat of old forest logging on federal lands, provide documentation of the problem on both Forest Service and BLM lands and offer solutions. What Criteria is needed for a universal definition framework that motivates mature and old-growth forest conservation and can be used for planning and adaptive management? Mature and old forest expresses themselves differently in different climates, on different soils, and in different ecoregions. Structurally and compositionally forests vary widely across the west and can include anything from pinyon/juniper woodlands, to oak woodland or savannah, towering closed forests of Douglas fir, diverse mixed conifer forests, dry ponderosa stands and everything in between. These species and the environments they grow in support different growth rates, plant associations, structural conditions, and expressions of mature or old forest characteristics. Yet, a universal definition is relatively easy to define based on age. These forests no matter the species composition, structural conditions, or size of the trees begin to demonstrate mature forest characteristics at roughly 80 years of age. At 80 years, trees begin to mature, decadence begins to develop, canopy conditions begin to diversify, large trees, snags and downed wood are often beginning to accumulate, and high canopies have developed casting canopy shade, providing additional thermal regulation as well as, foraging and dispersal habitat for late successional species. By protecting stands over 80 years of age, all mature, old-growth and carbon rich forest could be captured. In productive forests 80 years is about the time the forests transition from the stem exclusion phase and begin to develop complexity, which is the hallmark of mature and old forest habitat. Additionally, in dry forests 80 years is generally when canopies either begin to close or individual trees begin to develop complex branching structure and girth. In savanna or woodland stands 80 years is usually when individual tree decadence becomes more prominent and trees reach a size where cavities, large, complex branching, canopy shading and other attributes begin to develop. This comment period is responsive to Executive

Order 14072 which specifically identifies the protection of forests to store carbon. At roughly 80 years of age, carbon storage ramps up in most forested stands due to tree maturity. According to recent research, an 80-year stand age limit would likely capture at least 40% of the carbon stores accumulated in the largest trees because carbon stocks increase dramatically as forests mature (Stephenson et al. 2014, Mildrexler et al. 2020, Law et al. 2022, DellaSala 2015., Frey 2016., Betts. 2017). It is also important to note that older, more mature stands are generally more resistant and resilient to wildfire, even during climate and wind driven fire events. This is due to natural fire adaptations associated with maturation of trees. This includes thick insulating bark, high canopy base height from self-pruning, stand complexity, and canopy cover conditions that reduce solar radiation through canopy shading. This in turn dramatically reduces ambient air temperatures and wind speeds, while increasing humidity, all of which moderate fire behavior and effects. Canopy cover also mitigates the development of young, dense, highly flammable understory growth including regenerating trees, shrubs, chaparral and thick herbaceous growth. Additionally, stand complexity in mature and old-growth stands naturally reduces fire spread and severity by creating diverse often discontinuous fuel beds. The result is that mature and old-growth forest often burns at lower severity than managed stands and provide a buffer against the worst effects of climate change (Lesmeister 2019, Bradley, 2016. Zald. 2017). In the Klamath-Siskiyou Mountains where our organizations operate, forests are extremely varied and habitat mosaics are very diverse. The area supports everything from juniper and oak woodland to subalpine forests with diversified forest conditions, endemic conifer species and disjunction relictual populations of species far from their prevailing range like Alaska yellow cedar, subalpine fir, Pacific silver fir, and Engelmann's spruce. Yet, throughout these diverse forest types, stands around 80 years of age begin to support and sustain mature and old forest characteristics. For the purpose of federal rule making and integrity of Biden's Earth Day Executive Order protecting stands over 80 years of age from commercial logging operations would most effectively capture the mature and old-growth stands that store the most carbon, provide climate mitigation, and climate refugia, maintain wildlife habitat conditions, support elevated levels of biodiversity and the highest levels of fire resilience. Given the significant lack of mature and old forest in many locations, afforestation or allowing forests to mature for climate benefit must be implemented immediately, and this purposeful maturation of forest habitats over time requires the protection of mid-seral and mature stands today. What are the overarching old-growth and mature forest characteristics that belong in a definition framework? Old-growth and mature forests throughout the West support similar characteristics, but with varying levels of abundance. For example, the moist older forests of the Pacific Northwest often support relatively long fire return intervals and high growth rates. This creates older forests with closed canopy conditions, large diameter trees, an abundance of large snags and downed trees, and multi-layered canopy structure. Drier pine forests support more open groves of pine trees with less tendency to accumulate large quantities of snags or downed wood. These pine forest maintains groupings or groves of relatively even-aged older trees, with patches of regeneration, dry bunchgrass habitat, and some understory shrub species. Meanwhile lodgepole pine may be relatively dry, but cool and maintains denser, closed forest conditions as they mature. Oak woodland on the other hand can accumulate downed wood, snags and decadence very slowly and often does not support extensive closed canopy conditions. Instead canopy conditions are often very diverse, ranging from open savannah form groves, to relatively even-aged stands of stump sprouting hardwoods. Some forests have evolved with fairly frequent, mixed severity natural disturbance processes, while other locations have evolved with relatively infrequent, but often very severe natural disturbance processes that create overstory tree mortality and alter forest characteristics through disturbance and succession. The following characteristics of mature and old-growth should be used in the definition framework for President Biden's Earth Day Executive Order and should be defined relative to the plant community in which they are located. For example, as described above different forest communities will contain different concentrations of these characteristics, but the following characteristics can be used to define mature and old-growth forest throughout the federal land system.

[bull] Large Snags: Large snags can be abundant at different quantities in different forest types, but in general large snags are a characteristic of mature or old-growth forest habitats. In mature forest snags will either be present in sufficient quantity or they will contain sufficient forest habitat to adequately recruit snags for old-growth forest development. This requires stand and tree redundancy, where enough trees are present on site to allow for mortality from natural disturbance processes and snag recruitment. It also requires maintaining stand density sufficient to sustain some level of inter-tree competition, canopy cover and enough trees per acre to allow for tree mortality as

a stand transitions overtime from mature to old-growth forest conditions. In moist forests both snags and downed wood can be quite abundant, while more open, arid forests and woodlands snags would be relatively less abundant. Additionally, the definition of large snags can be relative. In more productive forest types including more coastal or moist Douglas fir forests, most mixed conifer forests, and other more productive forest types, large snags could be defined as those over 20" in diameter, while in oak woodlands and arid pine forests large snags could include those down to 12" diameter. Obviously, the size and frequency of snags will vary depending on forest types, precipitation levels and soil types, but mature stands are generally in the processes of recruiting adequate snag habitat, while old-growth forest often supports relatively abundant snag habitat. Either way, snags are important characteristics of mature and old forest habitat and in many cases the largest, oldest forest structures standing in a forested environment are the snags that have lived a long, productive life and now as they decay create some of the most important wildlife habitats.

Coarse downed wood: Coarse downed wood is an important characteristic of mature and old forest habitat. Old-growth forests often contain significant coarse wood, which has accumulated over many years and through many natural disturbance events. These natural disturbance processes often create flushes of tree mortality and can accelerate the development of old-growth characteristics if mixed severity events also leave enough living forest cover to sustain a mosaic of age-classes including old-growth trees, tree groupings, groves or forests. Drier, more open woodlands and forests will naturally generate less coarse wood and in fire prone forests downed wood is also subject to repeated fire events which can reduce coarse wood abundance. Thus, like snags, the size, frequency and complexity of coarse downed wood habitat is relative and will be impacted by general stand productivity, slope position, solar exposure, plant community, soil types, and other conditions. Some mature and old-growth forests will sustain, develop and build large quantities of coarse downed, while other habitats will sustain less due to lower levels of productivity or more active fire regimes. Either way, coarse downed wood creates important wildlife habitats and is vital for both water retention and ongoing soil productivity. In fact, a study conducted in southwestern Oregon following an extended drought and large wildfire event demonstrates the importance of downed wood as a water reserve in both living forests and in habitats that have sustained stand replacing disturbance events. Living forests generate coarse wood incrementally through small scale natural disturbance patterns that create new snags and as old snags or live trees fall to the forest floor. In a stand replacing disturbance (either wildfire, windthrow, or bark beetle outbreaks) snag habitat and in turn coarse downed wood is developed in pulses that are important for habitat complexity, soil productivity, regeneration following that disturbance event, wildlife, and water retention through extended drought events. They are also important because at times they are the only input of snags and coarse downed wood for many decades, until forest habitats can again mature and begin producing a new cohort of large diameter snags and downed wood. Coarse wood retention and recruitment is important for both maintaining the health of existing old forest habitats and recruiting additional old forest habitat by allowing mature forests to develop additional old-growth characteristics including coarse downed wood. It is also a characteristic of old-growth forest and most mature forest have at least begun recruiting adequate coarse wood.

Large diameter trees: Obviously, large diameter trees are an important component of mature and old-growth forest habitat, but the size and/or definition of a large diameter tree will change depending on the productivity of the site, the annual precipitation, soil conditions, solar exposure, slope position, historical land management patterns, historic disturbance patterns and other factors. In the arid forests of the West, potential tree diameter and height can be very different depending on site conditions and tree species. Yet, in the moist forests of the Pacific Northwest individual or mean tree diameter can be potentially far greater. Some woodlands such as oak habitats and some pine habitats, as well as some alpine or subalpine forest associations simply do not grow large diameter trees or trees of stature, but they can become quite old and successional developed nonetheless. In general, in the moist forests of the Pacific Northwest trees over 20" diameter should be considered large diameter trees due to their relative lack of abundance (from historic logging and natural disturbance processes) and due to physiological and structural changes that often occurring in trees roughly 80 years of age and older and over 20" diameter. Trees over 20" diameter should be retained and all stands over 80 years of age should be protected from commercial logging. This should apply to the moist forests of western Oregon, western Washington, northwestern California and portions of northern Idaho. Additionally, we believe the 20" diameter rule and 80 year old stand age protections should be extended to forests in the arid West, east of the Cascade Mountains and should be considered in other arid forest types dominated by pine, dry site Douglas fir, and white

fir. We would defer to local ecologist and forest scientist to determine the applicability of this rule in the arid, interior mountain West and in dry forest habitats in Montana, Idaho, Utah, Colorado, New Mexico, Arizona and other locations.. In these less productive forests, we believe the 80 year rule should also apply, but the diameter definition of large diameter trees may need to adjusted downward.[bull]

Interlocking branch structure: Like all characteristics of mature and old forest, the importance of interlocking branch structure is relative. In the moist forests of the Pacific Northwest and in many mixed conifer plant associations interlocking canopy structure is an important component of mature or old-growth habitat. The habitat complexity and canopy conditions created by interlocking branches and canopy habitat is highly important in maintaining the unique habitats and species found in complex, old forest habitats throughout the Pacific Northwest. Interlocking canopy structure also provides important habitat features including denning and resting habitat for species like the Humboldt marten and Pacific fisher, nesting, roosting and foraging habitat for the Northern spotted owl, habitat for northern spotted owl prey species such as red tree voles and flying squirrel, and contributes to the canopy conditions that allow so many species to thermoregulate and find thermal cover. Species such as great grey owls, black bear, ungulates, song birds, raptors, terrestrial salamanders and nearly every other species benefits from closed canopy habitats that remain cooler in the summer heat and both warmer and less snow covered in the winter storms. In moist, closed forests interlocking branch structure and complex canopy interactions are a regular and dominant feature of mature and old-growth forest, while in more arid plant communities and sites, interlocking canopy structure many be associated with clumps, groves or groupings of large overstory trees. Either way, interlocking branch structure (including mistletoe bromes) and the habitat features this structural condition provides are important for late successional wildlife species and is an important characteristic of mature and old forest habitat.[bull]

Canopy cover: Canopy cover and closed canopy conditions is often a very important characteristic of mature and old forest habitat. Obviously, as groves of younger trees develop and age, canopy cover generally increases, unless checked by natural disturbance agents. In moist forests, most mature and old-growth forests sustain significant canopy cover and generally support closed canopy stand conditions between 60% and 100%. The high canopy, relatively dense tree structure and interlocking branching are important characteristics of mature and old forest structure. In mixed conifer stands canopy cover can also often be quite extensive in mature and old-growth stands, but will be layered or stratified into a higher, more dominant conifer canopy of massive old growth trees and a lower canopy of mature hardwood species such as madrone, live oak, tanoak, black oak, white oak or other species. In these stands conifer spacing can be fairly large between groves of groupings, but canopy cover conditions can be quite dense. In other locations and often in more productive sites succession will develop conifer dominated stands with less of a hardwood canopy component. This same pattern is evident in mature stands but stands contain smaller trees and less developed old forest structure. In arid "eastside" or interior pine forests canopy cover can vary from closed to open. From forests of mature or old-growth pine to pine savanna. Yet, it should not be assumed that old-growth pine was always open grown and widely spaced. Pinyon/juniper, juniper steppe, and oak woodland can grow to very old ages and reach mature and/or old-growth conditions, yet do not in many cases, support closed canopy conditions. Additionally, in dry sites, pine savanna can develop with large, mature or old-growth trees and a more open character. Although closed canopy conditions are not necessary in all circumstances to support mature, late successional or old-growth conditions, most forest associations tend towards closed canopy conditions as they age. In these forests, canopy cover is an important characteristic of mature and/or old-growth forests. Additionally, mixed severity fire can promote relatively open old-growth conditions either through repeated low to moderate severity fire and periodic moderate to high severity fire events.[bull]

Canopy Layering: Canopy layering is especially important in relatively productive conifer and mixed conifer forests. In these sites, where understory regeneration can often create uneven-aged forest habitats, canopy layering is an important form of conifer reproduction and provides an important habitat feature for species like the northern spotted owl. The development of multiple cohorts within a stand creates stand complexity. These cohorts are signs of mature to old forest in all but the most open, arid environments.[bull]

Age: Stand age can be used as the best and most implementable and objective surrogate for mature and old-growth forest because the conditions that define mature and old-growth forest take time to develop. As described earlier in this comment, we believe most forest and woodland habitat begin expressing habitat complexity, growing mature trees and generating large diameter snags at roughly 80 years of age. By limiting commercial logging to stand less than 80 years of age, nearly all mature, late successional and old-growth forest can be protected for

habitat, for watersheds and for climate mitigation. Special Circumstances: [bull] Fire mediated old forest habitats: In locations subjected to previous mixed severity fire, live, old forest habitat can be somewhat fragmented and mixed with snag forest, chaparral, oak woodland or grassland habitats. In some locations, scattered old growth trees grow among habitats effected by natural disturbance processes like wildfire and bark beetle outbreaks. If not subjected to post-fire logging, these habitats can support significant densities of standing snags or early seral plant communities interspersed with patches, stands or groves of mature and old-growth trees. These are highly diverse plant communities and highly productive wildlife habitats (Swanson. 2011). They also contain the biological legacies from mature and old growth forests, that are the building blocks for forest regeneration and the development of habitat complexity. At times, this pattern of fire can create open stands of pine, cedar, or fir that may lack some characteristics of mature or old-growth forest, but are indeed dominated by large, open grown trees of significant age. These types of habitats if dominated by widely spaced old trees or snag forest that consisted of mature or old forest before the disturbance should still be considered mature or old-growth forests from a carbon storage standpoint. They contain old-growth trees, abundant biological legacies, habitat complexity, high levels of biodiversity, and often very vigorous, but ephemeral plant communities. These unique habitats are tomorrows old-growth due to habitat and structural continuity and the same protections should continue extending to mature and old forests after stand replacing or partially stand replacing wildfire events. [bull] Serpentine and other unproductive soils: Serpentine soils are common in the Klamath- Siskiyou Mountains and support unusual forest and woodland communities. Toxic to most plant species, serpentine soils are low in essential plant nutrients and high in heavy metals. This created highly unproductive forests, woodlands and savannas with pronounced limits on tree growth. The resulting forests can be extremely diverse, filled with rare and endemic plants species, but somewhat deficient in old forest characteristics. These habitats should also be protected with the 80-year rule, especially since they have recently been limited by very large scale and particularly high severity fire events in the Kalmiopsis Wildlands. In the Klamath-Siskiyou Mountains serpentine soils stunts common species, creates unusual, highly charismatic, but incredibly diverse plant communities found nowhere else in the world. Although many serpentine soils grow non-forest plant communities, in southwestern Oregon and northern California it can also grow Jeffrey pine woodland, widely spaced stands of Port Orford cedar groves and an unusual mixture of knobcone pine, western white pine, sugar pine, incense cedar, and Douglas fir. In some places these stands can be quite old, but so unproductive that they cannot create closed canopy conditions, do not support significant interlocking branch structure and do not support large quantities of large snags or downed wood. In other locations, live tree density is very low, but the trees themselves are very old and both standing snags and downed wood are abundant due to previous fires. In the Klamath-Siskiyou Mountains serpentine soils often create these sorts of conditions, but similar habitats can develop on arid, low nutrient granitic soils and heavy shrink swell clays often support oak woodland with only scattered conifer species. Despite growing in harsh conditions and failing to support some of the characteristics of mature or old-growth forest, these forests and woodlands should be considered for mature and old forest protections. How can a definition reflect changes based on disturbance and variation in forest type/composition, climate, site productivity and geographic region? The comments above describe ways to identify mature and old-growth forest on a variety of ecoregions, climatic zones and habitat types. The same criteria (listed above) could be applied throughout forest and woodland habitats to identify mature and old-growth habitats. This includes large snags, coarse downed wood, canopy cover, interlocking canopy structure, canopy layering, and age class distribution, but these values are relative. In arid environments or on less productive soils, criteria could be adjusted downward to compensate for site specific environmental conditions. In these more harsh locations, tree size, canopy cover, snag and downed wood abundance and canopy layering may be less important and naturally less abundant than in more mesic, productive forest types. Woodland habitats dominated by hardwoods or minimally colonized by conifer species, as well as dry forests can support mature and old-growth conditions and the protection of these seral stages would benefit carbon storage, wildlife habitat, watershed values, and biodiversity. We strongly support a universal criteria with application of those criteria adjusted to address site specific, region to region and habitat level considerations. Obviously, forest types vary dramatically across the country and take on different characteristics in different locations, yet the general response to maturation is similar among all woody vegetation types, with larger tree structures, more decadence, more complexity, and more canopy cover being found in older, more mature stands. In woodland or savanna form environments, these values are relative and are

naturally limited by site productivity, soils and climatic conditions, but none-the-less these values do accumulate overtime, as trees mature and grow, and microclimate conditions change. Even if trees per acre have not increased over time, larger more mature trees contain more decadence, cast more shade, support more complex wildlife habitat, and demonstrate more interlocking canopy structure than their younger counterparts. In more productive forest environments forest density, snag habitat, downed wood habitat, more canopy and interlocking branch structure are more abundant and characteristic of mature and old forest habitats. These values will be more abundant in more mesic, productive forests types and where appropriate, criteria could be adjusted upward to compensate during mature and old forest inventory efforts. In all forest types, identifying a 80-year rule to limit commercial logging would capture the old forests and future old forests existing on the landscape. How can a definition be durable but also accommodate and reflect changes in climate and forest composition? The definition can be durable if fire mediated old-forest habitats, serpentine soils and other unproductive soil types, as well as non-fire related natural disturbance are considered in the definition of mature and old forest habitat. This allows nearly limitless pathways to old forest habitat. This also allows mature and old forest habitats subjected fires, bark beetles and other natural disturbance factors will benefit from habitat protection and will not be salvage or post fire logged. These forests and snag habitats, if left unlogged after wildfire or other disturbance processes contain the biological legacies of mature or old-growth forest, complex and highly diverse early seral habitats, and all the building blocks of future habitat complexity. Protecting these disturbance-oriented forests, maintains biological continuity both before and after wildfire events, and supports a natural, diverse regenerative process. Meanwhile we recommend utilizing merging President Bidens Earth Day Executive Order on forest, and the 30X30 Initiative as a framework for change. If carbon rich forest could be reserved to for carbon storage and under the 30X30 framework and multiple layers of Executive Orders, Federal Rule Making and increased habitat protections could be crafted to protect wildlands and intact forests these protections could also be made more politically durable. What, if any, forest characteristics should a definition exclude? This question is worded in a contradictory manner. If something is truly a forest characteristic, there is no reason it should be excluded from the definition of mature or old-growth forest. Characteristics should be adjusted to reflect site productivity and overarching climatic conditions, but should not be excluded from the definition. The Ongoing Impact of Mature and Old Forest Logging in southwestern Oregon and northwestern California We believe it is important to consider the lasting, negative impact of mature and old forest logging on federal lands throughout the West. Although unjustifiably absent in President Biden's Earth Day Executive Order, the threat of public land logging in mature and old forest habitats is unfortunately routine, significant and pervasive on federal land. In the past 20-30 years (and before) mature and old forest logging has been proposed in virtually every federal land timber sale in the southern Cascade and Klamath-Siskiyou Mountains of southwestern Oregon and northern California. Although the examples we provide are regional in scope, similar proposals and timber sale projects are being proposed throughout nearly all federal lands in the West, diminishing and degrading our last older forests and most important terrestrial carbon stores. Scientist's debate the exact level of mature and old forest remaining, but it has certainly dwindled to below 10% of its historic abundance, and while old, fire resistant woodlands and forest are becoming increasingly rare, federal land managers regularly and aggressively log these habitats in nearly every federal land timber sale or so-called "fuel reduction project." This impact is steadily degrading the quality and quantity of old forests remaining on our landscape and has implications for long term climate resilience. Despite the rhetoric and misleading agency narrative, these are not benign, small diameter thinning projects intended to maintain so-called "forest health," restore forest habitats and reduce fire risks. Instead they are industrial logging projects with devastating consequences for forests, wildlife, watersheds, fire resilience and carbon cycling. These regional examples demonstrate the threat of old forest logging on BLM and Forest Service land and its impact on climate resilience. Below are examples of timber sales either proposed or implemented on BLM lands in the past 20 years that proposed an old forest logging component Wagner Anderson Timber Sale Between 2008 and 2014, the Medford District BLM implemented and illegally over-logged four consecutive timber sales in the Applegate River watershed. It was later found that between 25% and 50% of all logging implemented during this time period on the Medford District BLM was over-logged, illegally downgrading or removing Northern spotted owl habitat by removing more trees and more canopy cover than analyzed in the applicable Environmental Assessments or authorized in the Decision Records. The Wagner Anderson Timber Sale was one of the four sale over-logged in the Applegate River between 2008 and 2014. Implemented by the

Medford District BLM under a collaborative agreement and Memorandum of Understanding (MOU) with Applegate Neighborhood Network (now Applegate Siskiyou Alliance), the Wagner Anderson Timber Sale was proposed as a compromise to resolve Administrative Protests of the Bald Lick Timber Sale. Under this MOU the BLM approved the Wagner Anderson Timber Sale with a "treat and maintain" northern spotted owl strategy and proceeded to violate that agreement by systematically over-cutting nearly every unit in the timber sale, logging more trees than allowed and reducing canopy cover to well below the 40% required for dispersal and 60% required for nesting, roosting and foraging habitat. The Wagner Anderson Timber Sale logged hundreds of acres of mature forest and the result of project implementation was the clear degradation of northern spotted owl habitat values, as well as a dramatic reduction in forest cover, canopy cover, and carbon storage on site. IMAGE: Page 11 of 43 - Extensive blow down and noxious weed spread following thinning operations in unit 18-1 of the Wagner Anderson Timber Sale. IMAGE: Page 11 of 43 - A group selection cut converts mature forest to grassland in unit 22-1 of the Wagner Anderson Timber Sale

O'Lickety Timber Sale Another of the four consecutive timber sales illegally overlogged by the Medford District BLM by removing more trees and canopy cover than allowed in the Decision Record or in Fish and Wildlife Endangered Species Consultation, the O'Lickety Timber Sale was also implemented in 2014 under a collaborative agreement and Memorandum of Understanding (MOU) with Applegate Neighborhood Network (now Applegate Siskiyou Alliance) and the BLM, the O'Lickety Timber Sale was proposed as a compromise to resolve Administrative Protests surrounding the Bald Lick Timber Sale. Under this MOU the BLM approved the O'Lickety Timber Sale with a "treat and maintain" northern spotted owl strategy and proceeded to violate that agreement by systematically overcutting nearly every unit in the timber sale, logging more trees than allowed and reducing canopy cover to well below the 40% required for dispersal and 60% required for nesting, roosting and foraging habitat. Following commercial logging operations canopy conditions and northern spotted owl habitat values continued to decline through bark beetle outbreaks, wind throw, snow downed trees, drought stress and other forms of "accelerated overstory mortality" induced by inappropriate industrial logging. The O'Lickety Timber Sale logged hundreds of acres of mature forest and the result of project implementation was the clear degradation of northern spotted owl habitat values, as well as a dramatic reduction in forest cover, canopy cover, and carbon storage on site. IMAGE: Page 12 of 43 - Extensive blow down and the continuing loss of canopy following logging treatments in Unit 64-1 of the O'Lickety Timber Sale. IMAGE: Page 12 of 43 - Large canopy gaps created by group selection logging and extensive blow down has significantly degraded Northern spotted owl habitats in unit 6-1 of the O'Lickety Timber Sale. Lick Stewardship Project The Lick Stewardship Project was implemented with the O'Lickety Timber Sale under a Stewardship Contract and was logged by Lomakatsi Ecological Services, the for-profit contracting wing of the Lomakatsi Restoration Project. As a stewardship contract, portions of the project were publicly subsidized, but included a marginal commercial logging component. This project was also overlogged, inappropriately removing northern spotted owl habitat and exceeding the authorized harvest intensity. Like other projects implemented on BLM lands in the drier, more eastern portions of the Applegate River watershed, forest cover removed during this group selection logging operation was converted to grassland, releasing significant carbon emissions, dramatically reducing potential carbon storage and creating a multi decadal carbon deficit. IMAGE: Page 13 of 43 - Group selection logging in unit 46-1 of the Lick Stewardship Project converted mature forest into grassland habitat. IMAGE: Page 13 of 43 - Large openings created during logging operations removed whole groves of mature mixed conifer forest in unit 46-1 of the Lick Stewardship Project.

White Hat/Bald Lick Timber Sale The White Hat/Bald Lick Timber Sale was implemented by the Medford District BLM under a collaborative agreement and Memorandum of Understanding (MOU) with Applegate Neighborhood Network (now Applegate Siskiyou Alliance). Under this MOU the BLM approved the project with a "treat and maintain" northern spotted owl strategy and proceeded to violate that agreement by systematically over-cutting nearly every unit in the timber sale, logging more trees than allowed and reducing canopy cover to well below the approved levels. In the end, virtually none of the Northern spotted owl habitat was "maintained" during the logging operations and The White Hat Timber Sale logged hundreds of acres of mature forest resulting in the clear degradation of northern spotted owl habitat values, as well as a dramatic reduction in forest cover, canopy cover, and carbon storage on site. IMAGE: Page 14 of 43 - Logging and burning operations dramatically reduced

canopy cover and created post-logging mortality in unit 88C further degrading Northern spotted owl habitat and diminishing carbon storage. IMAGE: Page 14 of 43 - Large group selection openings and post treatment blow down have taken a toll on forest habitats in the White Hat/Bald Lick Timber Sale. The Pilot Joe Timber Sale was implemented as the first project in the Dry Forest Secretarial Pilot Projects. Identified as "ecological forestry" the project proposed commercial logging on 245 acres in the mixed conifer forests surrounding Ruch, Oregon and the Applegate Valley. Claiming to move into a new era of forest restoration on federal lands, the project was implemented amid significant controversy surrounding the removal of large diameter trees. IMAGE: Page 14 of 43 - The 42" and 32" diameter Douglas fir trees marked for removal in unit 26-1A were logged in the Pilot Joe Timber Sale, retaining the small 19" diameter ponderosa pine at the center of the photo. IMAGE: Page 14 of 43 - A grouping of large, old trees logged in the Pilot Joe Timber Sale in unit 26-2. IMAGE: Page 14 of 43 - A large group selection "opening" implemented in the Pilot Joe Project that now functions as a clearcut and once supported mature, carbon rich forest. IMAGE: Page 14 of 43 - Large, old trees logged in the Pilot Joe Timber Sale. Pilot Thompson Timber Sale The Pilot Thompson Timber Sale was the second secretarial pilot project and was designed after the Pilot Joe Timber Sale. This project was located around the community of Applegate, at the heart of the Applegate Valley and included a mixture of previously logged forests and unlogged, fire adapted forest that unburned in a 1987 wildfire. In total, over 1,200 acres was approved for commercial logging and sold to the highest bidder. Following sale of the timber, changed environmental circumstance surrounding a relatively largescale flat headed fir borer outbreak forced the BLM to withdraw the project, and it was never implemented. This project like so many others currently proposed on federal lands included numerous units designed to log mature, fire-adapted forests and important Northern spotted owl habitats. IMAGE: Page 15 of 43 - This grouping of large, old trees was proposed for logging in the Pilot Thompson Timber Sale, retaining only the large tree at the center of the photo and removing the adjacent trees. IMAGE: Page 15 of 43 - Fire-adapted stand conditions proposed for heavy industrial logging in the Pilot Thompson Timber Sale. IMAGE: Page 15 of 43 - Unit 19-4 of the Pilot Thompson Timber Sale showing the proposed tree removal mark. Trees marked take would have been logged, while trees marked leave would have been retained in the Pilot Thompson Timber Sale. IMAGE: Page 15 of 43 - A 32" diameter tree proposed for logging in unit 19-4 of the Pilot Thompson Timber Sale. Nedsbar Timber Sale Following the extensive, systematic and illegal overcutting of four consecutive timber sales in the Applegate River watershed, the Medford District BLM proposed the controversial Nedsbar Timber Sale. This project proposed approximately 1,400 acres of commercial logging in some of the last unlogged forest habitats in the Little Applegate and Upper Applegate Valley's. The community of the Applegate Valley invested heavily in opposing the BLM's proposed action alternative and developed what remains the most viable community alternative ever developed for a BLM timber sale. Although analyzed in the EA, not a single provision or recommendation in the community alternative was included in the final Decision Record. Controversy, public protests, and Administrative Protests ensued until finally the BLM failed to sell the Nedsbar Timber Sale at federal timber auction and withdrew the project. If implemented the Nedsbar Timber Sale would have degraded Critical Habitat for the Northern spotted owl, damaged important unroaded, recreation areas, damage scenic values, dramatically reduce carbon storage in treated stands, increase fire risks, reduce forest cover, canopy cover, and climate refugia. IMAGE: Page 16 of 43 - The large, old trees painted with white bands were intended for logging in the Nedsbar Timber Sale, which proposed logging off the majority of this beautiful old forest habitat. IMAGE: Page 16 of 43 - The white banded trees in unit 28-11B were proposed for removal in the Nedsbar Timber Sale and constitute some of the largest trees in this mature and old forest habitat. Sterling Sweeper Timber Sale The Sterling Sweeper Timber Sale was proposed and implemented in 2013 just before the Nedsbar Timber Sale. Although the Sterling Sweeper Timber Sale included only 57 acres of group selection logging, these acres were implemented as small clearcuts within previously thinned stands. No thinning took place in this project, instead small clearcut openings were implemented in already relatively open, mature stands of Douglas fir. The timber sale resulted in clear forest degradation, fragmentation and the deforestation and the average tree diameter removed was over 18" diameter, meaning mostly relatively large trees were removed. With the removal of these large diameter trees, significant carbon emissions were released and stands of mature fire resistant, carbon rich trees were replaced with young highly flammable growth. Fire risks have dramatically increased in affected stands and the microclimate conditions that create climate refugia were destroyed. Logging treatments in the Sterling Sweeper Timber Sale produced timber for the industry at the

expense of the environment, the climate and the communities adjacent to federal lands. IMAGE: Page 17 of 43 - Group selection logging was implemented across the Sterling Sweeper Timber Sale removing whole groves of large, old trees. IMAGE: Page 17 of 43 - Heavy canopy reduction associated with group selection logging has degraded forest habitat throughout the Sterling Sweeper Timber Sale. Cheney Slate Timber Sale The Cheney Slate Timber Sale was approved in 2011, but not implemented until 2014 on the ground. In total, 140 acres of commercial logging were approved and implemented using density management" and "group selection" logging techniques. The result of this timber sale was to significantly degrade forest habitats and to downgrade 77 acres and remove 22 acres of Nesting, Roosting and Foraging habitat for the northern spotted owl. IMAGE: Page 17 of 43 - Unit 13-7 in the Cheney Slate Timber Sale removed whole groves of large old trees in group selection logging areas. IMAGE: Page 17 of 43 - A grouping of large, dominant trees logged in the Cheney Slate Timber Sale. Pickett West Timber Sale At the time it was proposed, the Pickett West Timber Sale was one of the largest, most egregious timber sales proposed in southwestern Oregon for numerous decades. The project included proposed timber sale units the Applegate River watershed, in the mountains above Selma, Oregon and above the Wild and Scenic Rogue River near Galice, Oregon. The project proposed 5,980 acres of commercial logging with 2,525 acres proposed in LSR forest. Approximately 48% of the timber sale units were located in old-growth forests between 150-240 years of age. Blatantly proposing to log old-growth forest the project would have taken closed canopy old-growth forest and converted these stands into "open" forest through heavy industrial logging that would reduce canopy cover to as low as 30%. Ultimately, the project was mostly withdrawn due to public outcry and unacceptable impacts to the red tree vole, a major prey source for the threatened Northern spotted owl. IMAGE: Page 18 of 43 - Old-growth forest proposed for logging in unit 35-11 of the Pickett West Timber Sale. IMAGE: Page 18 of 43 - Old-growth forest proposed for logging in unit 3-11 in the Pickett West Timber Sale and at the headwaters of Deer Creek, a major tributary of the Illinois River watershed. IMAGE: Page 18 of 43 - Fire adapted mature forest with open stand conditions were proposed for logging in the dry forests of the Applegate River watershed in the Pickett West Timber Sale. IMAGE: Page 18 of 43 - Old-growth forest proposed for logging above the Wild and Scenic Rogue River in unit 10-1 of the Pickett West Timber Sale. Clean Slate Timber Sale Although the BLM withdrew the Pickett West Timber Sale, the agency then proposed a subset of mature and old-growth timber sale units as the Clean Slate Timber Sale. Located in the mountains above Selma, Oregon this project proposed heavy commercial thinning and 4 acre group selection clearcuts staggered throughout mature forest habitats and important Northern spotted owl habitats. According to the project's Environmental Assessment, "For the first 1 to 5 years after harvest, these stands would remain a slash fuel type until the shrubs, grasses, and planted trees become established. After the establishment of regeneration, these stands would move into a brush fuel type. Brush fuel types are more volatile and are susceptible to high rates of fire-caused mortality. Stands could exhibit higher flame lengths, rates of spread, and fire intensity. Fires started within these stands could be difficult to initially attack and control. For 5 to 20 years following planting, the overall fire hazard would increase in these stands." The Clean Slate Timber Sale was approved by the Medford District BLM, Grants Pass Resource Area, but failed to sale at federal timber auction and was withdrawn. IMAGE: Page 1 of 43 - The Clean Slate Timber Sale was retention tree marked, meaning only those trees marked with red paint would be retained. The large, old trees at the center of this photo were proposed for removal in unit 3-11. IMAGE: Page 1 of 43 - Only one tree (marked with a red painted band) at the center of the photo would have been retained if unit 3- 10 had been logged in the Clean Slate Timber Sale.

Late Mungers Timber Sale The Late Mungers Timber Sale is being "tiered" to the highly controversial IVM Project, which proposes to limit public involvement, virtually eliminate open, transparent scientific analysis of proposed timber sale activities, and log up to 20,000 acres of Late Successional Reserve (LSR) forest in the next decade. The first timber sales proposed under the IVM Project are located in the mountains above Williams and Murphy, Oregon in Late Successional Reserve (LSR) forest set aside to protect old forest habitat for the northern spotted owl. The Late Mungers Timber Sale is one of these initial timber projects and would log approximately 500 acres and 5 million board feet of timber. The prescriptions and tree removal marking demonstrate that many large, old trees are proposed for removal including trees well over the 36" diameter limit identified in the Draft Determination of NEPA Adequacy. We have found trees up to 45" diameter identified for removal and we have documented many mature and old forest habitats proposed for heavy canopy removal. If implemented the Late

Mungers Timber Sale would degrade habitat conditions, increase fire risks, release large volumes of stored carbon and create a lasting carbon deficit in affected stands. The Late Mungers Timber Sale should be canceled to comply with President Biden's Earth Day Executive Order. IMAGE: Page 20 of 43 - These 37" and 40" diameter trees are proposed for removal in unit 5-1 of the Late Mungers Timber Sale. Trees in this diameter class are important for carbon storage, wildlife habitat, and fire resistance, but will be logged if the Late Mungers Timber Sale is approved. IMAGE: Page 20 of 43 - The Late Mungers Timber Sale, including unit 7-1 is "leave" tree marked, meaning only those trees marked with yellow paint would be retained if logging occurs. The 36" diameter Douglas fir on the right is

proposed for felling and removal in Late Mungers Timber Sale. Penn Butte Timber Sale The Penn Butte Timber Sale is also one of the initial projects proposed for implementation under the provisions of the IVM Project. It includes roughly 300 acres of commercial logging and 3 million board feet of timber in the mountains above Williams, Oregon. Much of the timber sale targets mature and old-growth forest with heavy industrial logging prescriptions. The project includes significant old forest habitat in the Mungers LSR. It also proposes significant large tree removal and canopy reduction in relatively intact mature and old forest stands. The resulting loss of carbon stores would be significant and the loss of cool, moist climate refugia would fragment habitat connectivity in one of the most important corridors connecting the Siskiyou Crest region to the Wild Rivers region of southwestern Oregon. The Penn Butte Timber Sale will increase fire risks, damage old forest habitat, and degrade outdoor recreational opportunities in the Mungers Butte Extensive Recreation Management Area. Current analysis is the Draft Determination of NEPA Adequacy is entirely inadequate and fails to acknowledge many of the important social, biological and recreational values of the region proposed for logging. The Penn Butte Timber Sale should be immediately withdrawn to

comply with President Biden's Earth Day Executive Order. IMAGE: Page 21 of 43 - Unit 26-1A in Penn Butte Timber Sale was leave tree marked, meaning only the tree marked with yellow paint would be retained if logging occurs. The large unmarked Douglas fir in this photograph is targeted for removal in the Penn Butte Timber Sale. IMAGE: Page 21 of 43 - Every large old tree in this photograph is proposed for removal in a group selection clearcut. These trees reach up to 37" in diameter and are among the largest, most dominant trees in unit 31-1B of the

Penn Butte Timber Sale. Poor Windy Forest Management Project The Poor Windy Forest Management Project was approved in a series of eight separate Decision Records authorized between the fall of 2019 and the spring of 2022. The project proposes over 8,193 acres of commercial logging including 2,380 acres in LSR forest and 1,176 acres in Riparian Reserves. The project also proposes 22.3 miles of new "temporary" road construction and heavy industrial logging including large tree removal, canopy reduction, and group selection logging that removes whole groves of mature trees. The Poor Windy Forest Management Project and the various timber sales authorized under its provisions are currently being implemented, releasing significant carbon emissions, damaging wildlife habitats, fisheries, and climate refugia. The Poor Windy Forest Management Project should be canceled to comply with President Biden's Earth Day Executive Order on forest protection. Griffin Halfmoon Timber Sale The Griffin Halfmoon Timber Sale proposed 933 acres of commercial logging including 758 acres of regeneration or clearcut logging with between 15% and 30% canopy retention. The timber sale would have converted some of the last old forest habitats in the area surrounding the Howard Prairie Lake Recreation Area into young, highly flammable and carbon deficient regeneration. The loss of old tree structure would have damaged habitat values, reduced fire resilience, and damaged biodiversity values directly adjacent to the Cascade-Siskiyou National Monument. According to the Griffin Halfmoon Vegetation Management Project Environmental Assessment, "Alternatives 2 and 3 include units proposed for regeneration harvest that would reset the stands to early seral conditions. Post-harvest, natural regeneration is expected and artificial regeneration (planting) would occur as needed, to reforest the site to the required 130 trees per acre or greater within five years after harvest.... For the first one to five years after harvest, these stands would remain a slash fuel type until the shrubs, grasses, and planted trees become established. After establishment of regeneration, these stands would move into a brush fuel type. Brush fuel types are more volatile and are susceptible to high rates of fire-caused mortality. Stands could exhibit higher flame lengths, rates of spread, and fire intensity during this time. Fires started within these stands could be difficult to initially attack and control." IMAGE: Page 1 of 43 - The Griffin Halfmoon Timber Sale units are depicted in red and demonstrate that they agency was targeting

some of the last mature and late successional forest in the Howard Prairie area for regeneration logging. Notice the checkerboard of clearcuts and heavily logged stands surrounding the Griffin Halfmoon Timber Sale area. Much of this area has already been deforested by industrial logging and converting additional mature or old forest into "early seral" habitat is both damaging and unjustified from a biological standpoint. The Griffin Halfmoon Timber Sale was successfully litigated by conservation interests and withdrawn due to unanalyzed impacts to nearby great gray owl nesting habitat. If implemented the project would have released significant stored carbon and reduce the potential for future carbon storage by removing whole groves of large, carbon rich trees. Rogue Gold Timber Sale The Rogue Gold Timber Sale has been recently proposed by the Medford District BLM in the mountains between the towns of Jacksonville and Rogue River, Oregon. The project proposes log some of the last mature and old-growth forest in the Kane Creek, Galls Creek and Foothills Creek watershed, which flow north into the Rogue River. The project would log 2,052 acres including LSR logging, Riparian Reserve logging, and logging in suitable habitat for the Northern spotted owl. Currently only "scoped" by the BLM, the agency is in the process of developing an Environmental Assessment, but initial unit monitoring shows that numerous mature and old-growth logging units have been proposed. The timber sale proposes heavy commercial thinning and group selection logging, which would remove whole groves of mature and old-growth trees up to four acres in size and in up to 30% of a given stand. This would leave the last currently intact forest habitats in these heavily logged watersheds riddled in staggered clearcuts, euphemistically called "group selection opening." Make no mistake these are staggered clearcuts create the same impacts to habitat values, fire risks, forest fragmentation, and habitat connectivity as clearcut logging just on a slightly smaller scale. The commercial components of the Rogue Gold Timber Sale should be immediately canceled to comply with President Biden's Earth Day Executive Order. IMAGE: Page 23 of 43 - Old forest proposed for logging on Foothills Creek above the Rogue River in the Rogue Gold Timber Sale. IMAGE: Page 23 of 43 - One of the last stands of old forest in the Galls Creek watershed is proposed for logging in the Rogue Gold Timber Sale. Bear Grub Timber Sale The Bear Grub Timber Sale was proposed by the Medford District BLM in 2020. The project proposed mature and old forest logging along the popular East Applegate Ridge Trail, in a 7,500-acre roadless area known locally as Wellington Wildlands and surrounding rural residence and communities in the Applegate Valley. The timber sale target predominantly mature and old-growth forest with commercial logging and was predominantly designed to implemented group selection logging, where whole groves of large old trees were identified for removal. The project proposed logging approximately 12 million board feet from 702 acres of mature and old-growth forest. The logging was proposed in the driest major watershed in Western Oregon where previous timber sales have converted mature forest habitat into grassland, chaparral or early seral hardwood forest. In other locations, commercial thinning supposedly to increase forest health has trigger significant windthrow, drought stress, and bark beetle outbreaks, leading to a continuing loss of canopy cover. The project was highly controversial in the community and heavily opposed by local residents in the Applegate Valley. The BLM approved the project, sold the timber sale, and receive 18 Administrative Protests. Recently when processing those Administrative Protests, the BLM rescinded the project due to unanalyzed impacts to the Pacific fisher, a sensitive species dependent on old forest habitats for denning, resting and raising young. Unfortunately, the BLM has committed to reviewing the Bear Grub Timber Sale with new NEPA analysis, yet the project should be withdrawn to comply with President Biden's Executive Order to protect mature and old-growth forests. IMAGE: Page 24 of 43 - Large, old carbon and habitat rich trees proposed for logging in the Bear Grub Timber Sale along the East Applegate Ridge Trail. IMAGE: Page 24 of 43 - A group selection logging unit in the Bear Grub Timber Sale. All trees marked with white bands would be removed if the Bear Grub Timber Sale is logged. Whole groves of mature trees and open, fire resistant forest would be logged. IMAGE: Page 24 of 43 - Many large trees over 30" diameter and in open grown, healthy, fire resistant stands are proposed for large tree removal and group selection logging. IMAGE: Page 24 of 43 - Proposed group selection logging would remove whole groves of large tree in this fire resistant old forest stand. These stands are located in the Wellington Wildlands, and are proposed for heavy industrial logging in the Bear Grub Timber Sale. Below are examples of US Forest Service timber sales either proposed or implemented in the last 20 years that proposed a mature or old forest logging component Shasta Agness Timber Sale The Shasta Agness Timber Sale was approved by the Rogue River Siskiyou National Forest in LSR forest near Agness, Oregon at the confluence of the Wild and Scenic Rogue and Illinois River's. Its approval required permission from the Regional Office to exceed both age class limitations placed on federal land logging in the

Northwest Forest Plan and limitations on large tree removal in LSR forest. The project authorizes the removal of larger, more mature trees up to 28" in diameter and 140 years of age in LSR forest. It also authorizes 3,770 acres of commercial logging, 5 miles of new road construction, and 4.3 miles of new motorized trails. The area contains unique biodiversity, relatively intact old forest habitats and moist, productive growing conditions that allow these coastally influenced forests to efficiently store large volumes of atmospheric carbon. The Shasta Agness Timber Sale proposes to convert mature and old forest habitats into oak woodland habitats in locations where few, if any oak trees are currently found. The resulting canopy loss, the loss of carbon storage and the release of carbon currently stored in living trees will be significant, as well as the loss of important old forest habitat and climate refugia. Species such as the threatened Northern spotted owl and Humboldt marten would be impacted. In fact, conservation interests located one Northern spotted owl nesting site within proposed commercial logging units. No survey's took place to confirm or disprove occupancy by these species and significant damage to their habitat will occur, when the project is fully implemented suitable habitats will be either downgraded or removed from the Northern spotted owl habitat baseline. IMAGE: Page 25 of 43 - Unit 51 of the Shasta Agness Timber Sale has been identified as an "oak woodland restoration" treatment, but almost no oak trees are found in the unit and instead

closed forest dominates the area. Prescriptions call for removing all conifers up to 28" diameter and replanting the stand with oak saplings. IMAGE: Page 25 of 43 - Unit 53 of the Shasta Agness Timber Sale contains closed forests with a canopy of large, dominant Douglas fir trees. This unit is proposed for "oak woodland restoration," logging all conifers to 28" diameter and reducing canopy cover to below 30%. This will require removing more than half the stand, which will then be replanted with oak saplings. Upper Briggs Restoration Project The Upper Briggs Project has been approved by the Rogue River-Siskiyou National Forest, but not fully implemented. The timber sale proposes over 4,000 acres of commercial logging in Briggs Creek, an important tributary of the Wild and Scenic Illinois River and key watershed under the NW Forest Plan. The project was reportedly proposed to increase fire resilience due to an assumed risk associated with potentially catastrophic fuel loading and fire risks. Yet, ironically before the project was approved, the area burned at roughly 80% low severity during the 2018 Klondike Fire, underburning most of the stands proposed for commercial logging and fuel reduction. The agency responded by claiming that the low severity fire did not kill enough trees or create the structural conditions they have arbitrarily defined as "healthy" and "fire resilient." The agency then approved the project despite the beneficial fire effects and currently resilient stand conditions. The project includes industrial logging prescriptions in currently intact, fire adapted, old forest habitats in the Briggs Creek watershed. Large tree removal and extensive canopy removal will impact forest values, increase fire risks, and impact natural fire regeneration following the beneficial Klondike/Taylor Fire. It will also damage scenic values in the Briggs Creek watershed, along popular hiking trails and adjacent to well used campgrounds. The project also includes so-called "meadow restoration" which would be implemented with meadow side clearcuts at the margin of numerous meadows including the Horse Meadows Wildlife Area where timber harvest is prohibited in the Siskiyou National Forest Land & Resource Management Plan. Carbon storage will be diminished and significant carbon will be released through large tree logging and canopy reduction. Additionally, cool, moist climate refugia and closed forest stands would be damaged through logging activities. The currently unimplemented portions of the Upper Briggs Restoration Project should be canceled to comply with President Biden's Earth Day Executive Order on the protection of forests. IMAGE: Page 26 of 43 - Unit 63 of the Upper Briggs Restoration Project contains mature and old-growth forest that underburned at low severity in the Klondike/Taylor Fire of 2018.

IMAGE: Page 26 of 43 - Unit 23 of the Upper Briggs Restoration Project is located along the popular Onion Way Trail and burned at low severity in the 2018 Klondike/Taylor Fire, but is none-the-less proposed for heavy industrial logging. Slater Fire Re-entry Project The Slater Fire Re-Entry Project was inappropriately proposed through the use of a road maintenance Categorical Exclusion. The project proposed 4,106 acres of commercial roadside logging, including the removal of trees within 300' of Forest Service roads, along 146 miles of Forest Service road. This included proposed logging treatments in LSR forest, Riparian Reserves, Special Wildlife Sites, and designated Back Country Areas. It also included provision to remove both fire killed snags and living "green" trees that survived the fire. In many cases, old-growth forest was logged and was even posted like a trophy on the Rogue River Siskiyou National Forest facebook page. Portions of the project were implemented under an emergency declaration for the Slater Fire with no public input or oversight. The agency logged the area under an

emergency declaration long after the fire was contained. The entire Takilma-Happy Camp Road extending over the Siskiyou Crest has been clearcut to 300' on either side of the road. Many living trees that survived the fire and fire killed snags were removed. Ultimately, the project was largely withdrawn due to an out of court settlement that resolved potential litigation and roughly 80% of the project was withdrawn. Currently the project is being repackaged as the Slater Fire Re-open Project and an Environmental Assessment is being developed to analyze potential project impacts. This project now proposes 9,650 acres of post fire logging within 200' of over 200 miles of road. During the initial implementation stage hundreds of acres were clearcut, massive amounts of carbon stored in standing snags and surviving "green" trees was released, soils and vegetative recovery was impacted, and massive, old growth logs were hauled to the mill. The Slater Fire Reopen Project should be canceled to comply with President Biden's Earth Day Executive Order. IMAGE: Page 27 of 43 - Massive old growth trees posted like a trophy on the Rogue River Siskiyou National Forest facebook page. These old growth trees are among hundreds of old growth trees

logged during the so-called "emergency" logging operation. IMAGE: Page 27 of 43 - A post fire clearcut at the Page Mountain Sno-Park showing the logging of large old trees and snags along with significant soil damage.

Seiad Horse Project This post fire logging project implemented in the Johnny O'Neil Late Successional Reserve (LSR) logged approximately 1,200 acres of fire affected forest habitat, and was approved in the aftermath of the 2017 Abney Fire. Although much of the area, burned at high severity, living trees and green islands within the fire perimeter were also removed in the logging operations. The project removed large diameter trees and snags along the Pacific Crest Trail, near the Condrey Mountain Inventoried Roadless Area, and in the Kangaroo Inventoried Roadless Area. IMAGE: Page 28 of 43 - These post-fire logging units in the Seiad Horse Project release carbon stored in standing snags, damaged forest regeneration, created extensive soil damage, surface erosion and sedimentation in important coho salmon streams in the Klamath River watershed. These units are also located at the edge of the Condrey Mountain Inventoried Roadless Area and designated Back Country Area, as well as the Cook and Green Pass Botanical Area, known as the most diverse location in the state of California. The project area is located in an important connectivity corridor between the Red Buttes Wilderness Area and surrounding Inventoried Roadless Area. The project also impacted connectivity for the Pacific fisher, LSR habitat, and Riparian Reserves within the planning area. The removal of large diameter trees and fire killed snags released significant carbon emissions during logging operations, dramatically reduced the carbon naturally stored on site, and damaged the natural regeneration of vegetation following the 2017 Abney Fire.

Westside Project At the time it was proposed and approved, the Westside Project was one of the largest timber sales in Forest Service history. The project was largely implemented in LSR forest and in important salmon and steelhead streams in the Klamath River watershed. The effects on wildlife were immense including impacts to 70 Northern spotted owl activity centers, 19 Siskiyou Salamander sites, and damage to Pacific fisher habitats. The Klamath National Forest also refused to survey for numerous sensitive plant and animal species within the planning area, creating undetermined and unmonitored impacts. The agency approved 11,700 acres of clearcut logging in fire affected forests and 20,500 acres of roadside "hazard" tree logging, including 7,560 acres of LSR logging. It also included 22 miles new temporary roads with 14 stream crossings and 152 new log landings. The project had significant impacts to water quality, triggered large landslides, and created legacy sediment sites with lasting implications for the threatened Klamath River fisheries. The project's Water Quality Permit was predicated on the treatment or mitigation of existing legacy sediment sites, but most of these mitigations have not been implemented. Most of the timber sales associated with the Westside Project were sold and implemented across thousands of acres in the Mid-Klamath River watershed. The clearcutting of fire affected forest led to habitat simplification, a loss of stored carbon, the sedimentation of important fish bearing streams and the disruption of natural regeneration processes on the landscape scale. IMAGE: Page 29 of 43 - The Westside Project converted complex early successional snag forest and converted it to highly simplified slopes lacking large snags, downed wood and habitat complexity, creating deficits for hundreds of years and damaging forest regeneration. IMAGE: Page 29 of 43 - The Westside Project was implemented as clearcut logging on very steep, unstable slopes like this one above Walker Creek, a tributary of the Klamath River.

Chetco Bar Fire Recovery Project The Chetco Bar Fire Recovery Project was a massive post fire logging proposal that included both unit logging and roadside logging components. The project was approved by the Rogue River

Siskiyou National Forest following the 2017 Chetco Bar Fire. The project included 13,626 acres of logging, including over 9,000 acres in previously unlogged stands and hundreds of miles of roadside logging. The project included the removal of both live and dead trees in fire affected areas. The planning area is located adjacent to the Kalmiopsis Wilderness and the surrounding Inventoried Roadless Areas. The Chetco River is also an important fishery and the river contains exceptional water quality. The extensive logging implemented on federal lands, combined with private industrial post-fire logging has badly damaged the lower Chetco River watershed. Although much of the forest burned at high severity during a large east wind event, the coastally influenced forests supported massive, old trees. In the post-fire environment, both living "green trees" and standing snags store vast quantities of carbon and sustain the biological legacies important for the natural regeneration of the forests in the lower Chetco River watershed. Ultimately, large portions of the Chetco Bar Fire Recovery Project were implemented including many, many miles of roadside logging throughout the lower Chetco River watershed. The project created extreme impacts to the Chetco River watershed, to natural forest regeneration and to the climate by logging large old trees and snags in the aftermath of the 2017 Chetco Bar Fire. IMAGE: Page 30 of 43 - Massive old fire killed trees proposed for post-fire logging in the Chetco Bar Fire Recovery Project. This unit was logged in roadside logging projects near Quail Prairie Lookout. Note the size of the individual in the photo compared to these massive carbon-rich snags. IMAGE: Page 30 of 43 - This over 5' diameter snag was logged along near Quail Prairie Creek in the roadside logging projects following the 2017 Chetco Bar Fire. Snags like this store huge volumes of carbon on the landscape and provide important biological values.

Crawford Timber Sale The Crawford Timber Sale was proposed on the Klamath River between Happy Camp and Orleans, California in some of the last occupied northern spotted owl habitat in the western Klamath National Forest. The timber sale proposed commercial logging on 1,650 acres, the removal of 139 acres of foraging habitat for the Northern spotted owl in forests identified as Critical Habitat. The project would have degraded 4 northern spotted owl home ranges and included the "incidental take" of two of the areas last reproducing pairs of northern spotted owls. The project was litigated by conservation interests and subsequently withdrawn by the Klamath National Forest. IMAGE: Page 31 of 43 - A view across the Crawford Timber Sale and the connectivity corridor between the Siskiyou Wilderness Area and Marble Mountains Wilderness in the distance. IMAGE: Page 31 of 43 - Old forest proposed for logging in the Crawford Timber Sale.

Bear Country Timber Sale The Bear Country Timber Sale is located on the Wild and Scenic North and South Fork Salmon River watersheds, in some of the most remote, diverse, and mountainous country on the West Coast. The timber sale proposes 4,195 acres of commercial logging, 3,704 acres of which is proposed in natural, unlogged stands and 2,330 acres of LSR logging. This logging would remove 235 acres of nesting, roosting and foraging habitat for the northern spotted owl and an additional 701 acres of foraging habitat. This would include logging related impacts to northern spotted owl home ranges and to one of the only nesting habitats documented to reproducing on the Scott/Salmon Ranger District. The project also proposes 5.2 miles of commercial roadside "hazard" tree logging 300' from existing roads and 2,271 acres of mastication on 24.4 miles of remote ridgeline at the heart of the Salmon River watershed. This project proposes heavy industrial logging, large tree removal, canopy reduction, and damage to mature, late successional and old-growth forest habitats. If approved and implemented this project would release abundant carbon stored in large, living trees and degrade important intact forests habitats and climate refugia. The Bear Country Timber Sale should be canceled to comply with President Biden's Earth Day Executive Order on the protection of forests. IMAGE: Page 32 of 43 - Unit 80 of the Bear Country Timber Sale is located in old-growth LSR forest and proposes heavy commercial logging in high quality Northern spotted owl habitat. IMAGE: Page 32 of 43 - Unit 126 on Butcher Gulch contains spectacular oldgrowth forest above the Wild and Scenic South Fork Salmon River.

South Fork Timber Sale The South Fork Timber Sale has been proposed by the Klamath National Forest just upstream from the Bear Country Timber Sale on the South Fork Salmon River. Located in an important connectivity corridor between the Trinity Alps and Russian Wilderness Areas and a large LSR forest, the project proposes significant old forest logging in previously unlogged forest habitats. It also surrounds numerous popular trailheads, campgrounds and recreation areas around Carter Meadows at the headwaters of the Wild and Scenic South Fork Salmon River. The South Fork Timber Sale has undergone public scoping and it is current planning status is officially "on hold" due to undisclosed reasons. The South Fork Project should be canceled to comply

with President Biden's Earth Day Executive Order on the protection of forests for climate resilience. IMAGE: Page 32 of 43 - Unit 71 of the proposed South Fork Timber Sale includes high elevation true fir forests near the headwaters of the Salmon River and adjacent to the Russian Wilderness Area. IMAGE: Page 32 of 43 - Unit 65 of the South Fork Timber Sale includes mature and old-growth forest. Logging prescriptions call for significant canopy reduction and large tree removal.

Incorporate the following information and links by reference into this comment: The information and links provided below demonstrate how widespread and systemic mature and old forest logging is on federal lands. The level of mature and old forest logging currently being implemented and proposed creates concerns regarding the sustainability of such logging activities, the impact this logging has on fire risks, wildlife habitat, watersheds, and carbon storage, as well as the effect it will have on the scenic and recreational value of our public lands. These links demonstrate that mature and old forest logging is a significant threat to federal forests and climate resilience. Worth More Standing Report: <https://www.climate-forests.org/worth-more-standing> Pilot Projects: <https://siskiyoucrest.com/2013/03/05/middle-applegate-pilot-projects/> [https://www.dropbox.com/s/a7n3ezf5dcru15e/Pilot Thompson Community Monitoring Report.pdf](https://www.dropbox.com/s/a7n3ezf5dcru15e/Pilot%20Thompson%20Community%20Monitoring%20Report.pdf) [http://www.dropbox.com/s/j1tizckl4vbgvi0/Pilot Joe The Myth and The Reality.pdf](http://www.dropbox.com/s/j1tizckl4vbgvi0/Pilot%20Joe%20The%20Myth%20and%20The%20Reality.pdf) Nedsbar Timber Sale: <https://siskiyoucrest.com/2015/02/01/a-hike-through-nedsbar-timber-sale/> <https://siskiyoucrest.com/2015/01/25/nedsbar-timber-sale-bald-mountain-units/> <https://siskiyoucrest.com/2015/01/21/nedsbar-public-hike-unit-28-22a-28-22b/> <https://siskiyoucrest.com/2015/01/07/nedsbar-community-monitoring-program/> <https://siskiyoucrest.com/2014/12/23/update-nedsbar-timber-sale-community/> <https://siskiyoucrest.com/2014/12/13/nedsbar-timber-sale-regeneration-unit/> Crawford Timber Sale: <https://siskiyoucrest.com/2020/08/12/keeping-klamath-wild-crawfordtimber/> Pickett West Timber Sale: <https://siskiyoucrest.com/2017/06/03/pickett-west-timber-sale/> <https://siskiyoucrest.com/2017/06/15/zig-zag-creek-hellgate-canyon-and/> <https://siskiyoucrest.com/2017/06/26/pickett-west-timber-sale-panther-gulch/> <https://siskiyoucrest.com/2017/07/14/pickett-west-timber-sale-logging-off/> <https://siskiyoucrest.com/2017/07/17/pickett-west-timber-sale-logging-last/> <https://siskiyoucrest.com/2017/07/29/the-pickett-west-timber-sale-old-growth/> Clean Slate Timber Sale: <https://siskiyoucrest.com/2018/07/02/clean-slate-timber-sale-oldgrowth/> Seiad Horse Project: <https://siskiyoucrest.com/2017/12/17/klamath-national-forest-proposes/> <https://siskiyoucrest.com/2018/04/13/klamath-national-forest-proposes-post/> <https://siskiyoucrest.com/2018/05/11/proposed-logging-along-pct-at-cook-and/> Chetco Bar Fire Recovery Project: <https://siskiyoucrest.com/2018/03/23/chetco-bar-fire-salvageproject-quail/> Briggs Project: <https://siskiyoucrest.com/2018/05/30/the-upper-briggs-restoration-project-2/> <https://siskiyoucrest.com/2019/06/18/the-upper-briggs-restoration-project/> Bear Grub Timber Sale: <https://siskiyoucrest.com/2020/03/09/bear-grub-timber-sale-threat-toforests/> <https://siskiyoucrest.com/2020/05/19/wellington-wildlands-threatened-with/> <https://siskiyoucrest.com/2020/06/01/bald-mountain-biodiversity-and-bear/> <https://applegatesiskiyoualliance.org/the-bear-grub-timber-sale-and-the-wellington-wildlands/> <https://applegatesiskiyoualliance.org/bear-grub-timber-sale-deming-ridge-units/> <https://applegatesiskiyoualliance.org/bear-grub-timber-sale-save-the-east-applegate-ridge-trailfrom-logging/> <https://applegatesiskiyoualliance.org/bear-grub-timber-sale-bald-mountain-units/> Shasta Agness Timber Sale: <https://siskiyoucrest.com/2020/08/26/shasta-agness-timber-sale/> <https://siskiyoucrest.com/2020/08/26/shasta-agness-timber-sale-industrial-logging-dressed-up-in-restoration-language/> Bear Country Timber Sale: <https://siskiyoucrest.com/2021/06/23/the-bear-country-timber-sale-old-forest-logging-on-the-wild-and-scenic-salmon-river/> Rogue Gold Timber Sale: <https://siskiyoucrest.com/2021/10/18/the-rogue-gold-timber-sale-logging-the-last-old-forest-above-the-rogue-river-valley/> Late Mungers Timber Sale: <https://applegatesiskiyoualliance.org/late-mungers-timber-sale-old-forest-logging-on-murphy-creek-deer-creek-and-tributaries-of-the-applegate-river/> Penn Butte Timber Sale: <https://applegatesiskiyoualliance.org/the-ivm-and-late-mungers-project-intentionally-very-misleading/> <https://applegatesiskiyoualliance.org/blm-targets-mungers-powell-creek-the-rain-forests-of-the-applegate-with-logging-in-the-penn-butte-timber-sale/> <https://applegatesiskiyoualliance.org/penn-butte-timber->

sale-old-forest-logging-in-the-williams-creek-watershed/The impact of so-called "forest health" or "fuel reduction" logging and commercial thinning projects on federal lands. The logging projects listed above and discussed in the incorporated links demonstrate the continuing impact of mature and old forest logging on federal lands in a small portion of the Klamath-Siskiyou Mountains. Although we can demonstrate the problem in our region, colleagues across the West report similar problems with the federal timber sale program in the Sierra-Nevada Mountains, in the Rocky Mountains, the southwest and any forested region in the federal land system. Old forest logging is not the exception, but instead it is the current policy of federal land managers to log mature and old forest habitats in an effort to meet arbitrary and unsustainable timber quotas. It is also the policy of the agencies to use so-called "fuel reduction" or "restoration" timber sales as a guise for reaching annual timber quotas. Unfortunately, these timber sales are effective at producing timber, but counterproductive to fuel reduction and forest restoration objectives. Historically, logging has been responsible for the majority of loss in mature and old-growth forest cover on both the continental, national, regional and global scale, and its impact cannot be ignored. Mature and old-growth forests have been almost entirely lost on private ownerships and are now found primarily on federal lands, making their protection disproportionately important for climate, for biodiversity, for watersheds, for wildlife and for the scenic and recreational values the public enjoys on federal lands. The current policies and practices of federal land managers are contributing to the loss and decline of mature and old-growth forest habitats, and should be immediately discontinued. Every timber sale proposed or implemented on federal lands in our region has a mature and old forest logging component with impacts and effects that are contrary to President Biden's 30X30 Initiative and Earth Day Executive Order on the protection of forests for climate resilience. This is not only because these projects are logging intact environments and releasing naturally stored carbon by logging large carbon dense trees and forests, it is also because of the impact this logging has on habitat values, and watershed values, while increasing, not decreasing fire risks and forest health concerns. For additional information on the real-world impacts or effects of commercial thinning on public lands, please review and incorporate these links by reference into this public comment.

The O'lickety Timber Sale: Illegal BLM Logging and the Continuing Loss of Northern Spotted Owl Habitat in the Applegate Valley <https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=BLM+ESA+Monitoring+Report.pdf> BLM ESA Monitoring Report https://www.dropbox.com/s/rui3gqhx3zcznyo/FINAL_2015_Medford_BLM_Post_Harvest_Monitoring_Report.3.4.16.pdf?dl=0 Bark Beetles, Timber & The BLM in the Applegate Valley: An overview of bark beetle science and land management on the Medford District BLM https://www.dropbox.com/s/h188fxpbm2xxow3/Beetles_Timber%26theBLM%282017%29.pdf?dl=0 The Squishy Bug Timber Sale: "Salvage" Logging, Bark Beetles and Invalid Assumptions for NEPA Analysis <https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=Squishy+Bug+Timber+Sale+Report.pdf> Medford District BLM Fire/Fuel Analysis for Timber Sales Authorized under the 2016 Resource Management Plan for Southwestern Oregon https://www.dropbox.com/s/50u8m52bk41ih3p/BLM_Fire%3AFuel_Analysis_for_recent_sales.pdf?dl=0 New Research on Forest, Fires and Northern Spotted Owl Management in Southwestern Oregon <https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=NSO+%26+Fire+Resilience+Letter.pdf> Information and Policy Recommendations Pertaining to Forests, Fire and Smoke Management in Southwestern Oregon <https://www.dropbox.com/home?select=BLM+Fire%3AFuel+Analysis+for+recent+sales.pdf&preview=NSO+%26+Fire+Resilience+Letter.pdf> Della Sala, D.A., Baker, B.C., Hanson, C.T., Ruediger, L., and Baker. W. 2022. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus? *Biological Conservation* <https://doi.org/10.1016/j.biocon.2022.109499> Commercial logging & thinning on federal lands impacts climate resilience Mature and old-growth forests are both regularly threatened by federal land timber sales and important as carbon reserves where live trees, standing snags, downed trees and forest soils have stored immense amounts of carbon for hundreds, if not thousands of years (Law. 2022). Carbon storage accelerates dramatically with age (Stephenson et al. 2014, Mildrexler et al. 2021, Law et al. 2022), demonstrating the positive effects of protecting mature and old forests on federal lands from a carbon sequestration and storage standpoint. Yet, mature and old forests should be protected for not only the carbon they store, but also for their important watershed values and connectivity values. As climate refugia and

as habitat for species requiring overstory canopy, cool, moist habitat conditions, thermal regulation, late successional forest habitats for nesting, roosting, denning and foraging, and habitat for threatened, rare, or endangered species. The effects of mature and old forest protection have innumerable positive outcomes and few drawbacks. According to regional research, the wood products industry is the largest single source of greenhouse gas emissions in the state of Oregon, accounting for 39% of the state's total emission load (Law. 2018). Additional studies have shown that protected mature and old forest habitats are far more efficient and effective at storing carbon than actively managed forests or commercial logging supposedly implemented to reduce fire risks (Law 2022.). In the largest study of actual wildfire effects ever conducted in the US, protected landscape were shown to burn at lower levels of fire severity than heavily managed and less protected areas (Bradley. 2016). Additionally, logging or "thinning" to reduce wildfire intensity produces far more emissions over a comparable area when compared to wildfire. In fact, emissions from logging were five times those from disturbances from wildfire, wind and insects combined. (Harris et al. 2016, Law et al. 2018). The amount of carbon removed by thinning is much larger than the amount that might be saved from being burned in a fire, and far more area is harvested than would actually burn (Mitchell et al. 2009, Rhodes et al. 2009, Law & Harmon 2011, Campbell et al. 2011, Hudiburg et al. 2011, Hudiburg et al. 2013). Most analyses of mid- to long-term thinning impacts on forest structure and carbon storage show there is a multi-decadal biomass carbon deficit following moderate to heavy thinning (Zhou et al. 2013). Even thinning in young forests can have significant carbon impacts. For example, a study in a young ponderosa pine plantation vulnerable to drought in Idaho found that removal of 40% of the live biomass from the forest would subsequently release about 60% of that carbon over the next 30 years (Stenzel et al. 2021). Although thinning is commonly used to reduce fire severity and associated tree mortality, a comparison of thinned with adjacent unthinned stands in the burn area of a large California wildfire showed that thinning resulted in more tree mortality than unthinned stands, showing that the fire killed more trees than thinning prevented from being killed (Hanson 2022). Additionally, the likelihood of a fire intersecting these treatments is also less than 1% and potential treatment effectiveness often lasts less than 10-20 years (Schoennagel. 2017, Campbell et al. 2011). It has also been shown that these thinning operations create far more impacts to northern spotted owl habitat (a surrogate for mature and old forest) than wildfire alone (Odion. 2014). There are high forest carbon losses associated with thinning, and only minor differences in the combusive losses associated with high severity fire and the low-severity fire that fuel treatment is meant to encourage. (Campbell et al. 2011). Additional habitat protections for mature and old-growth forests under both President Biden's 30X30 Initiative and his Earth Day Executive Order on the protection of forests must be immediately enacted to protect, preserve, restore and maintain adequate carbon storage in the natural environment. Fire/fuel reduction efforts should shift from focusing on logging miles from communities, in backcountry environments and in mature and old forest habitats to reducing fuels manually and with prescribed fire near homes and communities. ((Moritz et al. 2014, Schoennagel et al. 2017, Law et al. 2022). This would have extremely positive impacts on community fire safety, while protecting habitat values, reducing logging related impacts to ecosystems and carbon storage, reducing structure, home and infrastructure losses during wildfire events, work towards mitigating the home ignition problem and support management that is consistent with President Biden's applicable Executive Orders. This shift to home and community fire protection would be win-win for society, while the reducing direct taxpayer costs to citizens and reducing impacts to ecosystems services that support our economies, communities and quality of life. Incorporate needs for connectivity and climate refugia Biological connectivity has taken on an elevated importance in the era of climate change and is necessary for facilitating climate adaptation, species dispersal and species survival for many, many species. The agency should incorporate connectivity analysis by mapping connectivity corridors both between mature and old-growth forests, and on a landscape scale between ecosystems. This will allow for the species migrations that will become necessary as our climate warms and habitats become altered by novel climatic conditions. With vegetation shifts, wildlife will respond, and species of all taxa will be on the move, looking for suitable habitat and climate refugia. Providing adequate connectivity will allow the necessary shifts in home ranges, species ranges, and habitat types across the country, and must be incorporated into forest management and climate adaptation planning. Connectivity corridors should be protected on a regional scale, like the Siskiyou Crest in southwestern Oregon and northern California that connects the Cascade Mountains to the Coast Range creating one of the most important high elevation biological corridors in the Pacific Northwest. These regional connectivity corridors

should be spatially identified and protected from human cause stressors and industrial resource extraction. Additional, corridors should also be spatially identified on a localized watershed scale and to connect mature and old-growth forest patches and climate refugia. These macro and micro scale connectivity corridors should be protected with strong GAP 1 or GAP 2 protections forming core areas and corridors for species dispersal. These actions would be responsive to both Executive Order 14008 and 14072 and would enhance the durability of these orders to rapidly changing climatic conditions.

Conclusion We know how to define mature and old-growth forest habitats. Additionally, research currently undergoing peer review and publication has already mapped out mature and old forest on a national scale (Mackey and DellaSala in review). These projects mapped the mature and old growth forest of the conterminous US and related mapping of Tongass National Forest old-growth forests. These maps should be incorporated into and utilized for the Biden Earth Day Executive Order. This inventory identifies spatially explicit mature and old forest polygons across the country and could replace the federally initiated mapping process, allowing federal agencies to immediately begin protecting these forests for the habitat they provide, watersheds they support, the incredible biodiversity they contain, and the natural climate mitigation they provide. We should utilize this science and move the ball immediately forward protecting these important habitats. Yet, these same forests are regularly threatened with federal land logging projects that degrade their public, biological, scenic, recreational and climate mitigating benefits. This comment demonstrates that the scope and scale of the problem is significant and is impacting the last old forests remaining in the Klamath-Siskiyou Mountains and beyond. Federal rule making is necessary that prohibits mature and old forest logging, designates a series of federal carbon reserves on federal forest lands, eliminates annual timber quotas on all federal lands, and incentivizes carbon storage and sequestration on those federal lands. The biggest threat to our global environment is climate change and as a society, we believe we should do our part by protecting all mature and old-growth forests on federal lands. It is time for our federal land managers and the Biden Administration to become part of the solution, and protect federal forests for both their natural climate mitigation values and the many ecosystem services they provide. If federal action and federal rule making to protect these forests is not taken now, we will not preserve our forest legacy for future generations, we will not meet our climate targets and we will not pass along a livable future to our children or grandchildren. The temperate forests of the Pacific Northwest represent a climate solution with global implications. We must not just point the finger at other nations and advocate for the protection of forests in under-developed countries in the Amazon, the Congo Basin and elsewhere across the world., while refusing to protect our own forest carbon reserves. We must also do our part, and make our globally significant forests part of the solution. The protection of our last mature and old-growth forests on federal land is an important initial step and creates a positive example for forested nations around the world. It also creates tangible climate solutions with long-lasting benefits. The world's forests are a significant contributor to global climate mitigation and currently our federal land managers are missing the mark. Please protect our last mature and old-growth forests through the mechanisms identified in this comment. Additionally, the Department of Interior, Department of Agriculture and the National Park Service should cancel all currently approved or proposed federal land timber sales or "fuel reduction" projects under their jurisdiction with a mature and old forest logging component. We support the efforts to define, inventory and plan for the protection of mature and old-growth forests, but we do not believe the process will meaningfully address the climate crisis or increase carbon storage on federal lands unless protections from federal old forest logging are codified with federal rule making that can guide and define federal forest management moving forward. We support federal rule making that includes the following provisions to protect, maintain and restore the mature and old-growth forests of our country, positively contribute to our climate mitigation efforts and climate targets, protect

- 1) Maximize protection of accumulated carbon stocks and maximize the future accumulation of carbon stocks by protecting all mature and old-growth forests over 80 years of age from commercial logging.
- 2) Designate National Carbon Reserves (Gap 2 Conservation Status) in a broadscale network that provides connectivity between existing blocks of mature, late successional and old-growth forests over 80 years of age.
- 3) Cancel or withdraw all timber sales on federal lands either approved or proposed that contain an old forest logging component in stands over 80 years of age.
- 4) Eliminate the timber quota system on all federal lands. This system incentivizes and even requires mature and old forest logging on federal lands. Historic logging created mature and old forest deficits, which is now pushing federal logging activities into the last mature and old forest habitats to meet arbitrary timber quotas.
- 5) Identify and protect landscape or regional scale connectivity and

climate migration corridors with Gap 1 or Gap 2 Conservation status.6) Focus fire and fuel reduction efforts in the areas nearest homes and communities. This will both best protect these communities and best protect our nation's vital natural carbon stocks.Sincerely,Luke Ruediger, Executive DirectorApplegate Siskiyou AlliancePO Box 114Jacksonville, Oregon 97530Luke Ruediger, Conservation DirectorKlamath Forest AlliancePO Box 1155Jacksonville, Oregon 97530Jeanette LeTourneux, SecretaryWellington Wildlands CouncilPO Box 1137Jacksonville, Oregon 97530Greg Stanko, Board PresidentWilliams Community Forest ProjectWilliams, Oregon 97544Liza Crosse, FacilitatorSiskiyou Crest Coalition13617 Highway 238Jacksonville, Oregon 97530References:Betts, M.G., Phalan, B, Rousseau, J.S., Yang, Z. (2017). Old-growth forests buffer climate-sensitive bird populations from warming. *Diversity and Distribution* 24:439-447<https://onlinelibrary.wiley.com/doi/full/10.1111/ddi.12688>Bradley, C.M., C.T. Hanson, and D.A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western United States? *Ecosphere* 7:1-13 <https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.1492>Campbell, J.L., M.E. Harmon, S.R. Mitchell. 2011. Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? *Frontiers in Ecology and the Environment* Doi:10.1890/110057DellaSala, D.A. et al. 2015. In the aftermath of fire: logging and related actions degrade mixed and high-severity burn areas. In, D.A. DellaSala and C.T. Hanson (eds), *The ecological importance of mixed-severity fires: nature's phoenix*. Elsevier: Boston.<https://www.elsevier.com/books/the-ecological-importance-of-mixed-severity-fires/dellasala/978-0-12-802749-3>DellaSala, D.A., Baker, B.C., Hanson, C.T., Ruediger, L., and Baker. W. 2022b. Have western USA fire suppression and megafire active management approaches become a contemporary Sisyphus? *Biological Conservation* <https://doi.org/10.1016/j.biocon.2022.109499>Frey, S.J.K., Hadley, A.S., Johnson, S.L., Schulze, M, Jones, J.A., Betts, M.G. (2016). Spatial models reveal the microclimatic buffering capacity of old-growth forests. *Sci. Adv.* 2016; 2:e1501392. <https://www.fs.usda.gov/tree-search/pubs/52562>Hanson, C.T. 2022. Cumulative severity of thinned and unthinned forests in a large California wildfire. *Land* 11, 373. <https://doi.org/10.3390/land11030373>Harris, N.L., et al. 2016. Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. *Carbon Balance Manage* 11:24 DOI 10.1186/s13021-016-0066-5 <https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-016-0066-5>Hudiburg, T.W., B.E. Law, C. Wirth, and S. Luysaert. 2011. Regional carbon dioxide implications of forest bioenergy production. *Nature Climate Change* 1:419-423. <https://doi.org/10.1038/nclimate1264>Hudiburg, T., S. Luysaert, P.E. Thornton, B.E. Law. 2013. Interactive effects of environmental change and management strategies on regional forest carbon emissions. *Environmental Science & Technology* 47(220):13132-40. Doi: 10.1021/es402903u.Law, B.E. and M.E. Harmon. 2011. Forest sector carbon management, measurement and verification, and discussion of policy related to climate change. *Carbon Management* 2:73-84.<https://www.tandfonline.com/doi/pdf/10.4155/cmt.10.40>Law, B.E., Hudiburg, T.W., Berner, L.T., Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. *PNAS*<https://www.pnas.org/doi/10.1073/pnas.1720064115>Law, B.E., multiple authors. 2022. Creating strategic reserves to protect carbon and reduce biodiversity losses in the United States. *Land* 2022, 11, 721. <https://doi.org/10.3390/land11050721>Lesmeister, D. B., S. G. Sovern, R. J. Davis, D. M. Bell, M. J. Gregory, and J. C. Vogeler. 2019. Mixed-severity wildfire and habitat of an old-forest obligate. *Ecosphere* 10(4):e02696.10.1002/ecs2.2696 <https://esajournals.onlinelibrary.wiley.com/doi/pdf/10.1002/ecs2.2696>Mildrexler, D.J. et al. 2020. Large trees dominate carbon storage in forests east of the Cascade Crest in the United States Pacific Northwest. *Frontiers in Forests and Global Change*<https://www.frontiersin.org/articles/10.3389/ffgc.2020.594274/full>Mitchell, S., M.E. Harmon, K.E.B. O'Connell. 2009. Forest fuel reduction reduces both fire severity and long-term carbon storage in three Pacific Northwest ecosystems. *Ecological Applications* 19: 643-655.https://harvardforest1.fas.harvard.edu/sites/harvardforest.fas.harvard.edu/files/publications/pdfs/Mitchell_EcoIApp_2009.pdfMoritz, M.A. et al. 2014. Learning to Coexist with Wildfire. *Nature* 515, no. 7525 (November 6, 2014): 58-66. <https://doi.org/10.1038/nature13946>Odion, Dennis C., Hanson, Chad T., DellaSala, Dominick A., Baker, William L., Bond, Monica L. 2014 Effects of Fire and Commercial Thinning ON Future Habitat of the Northern Spotted Owl. *The Open Ecology Journal*, 2014, 7, 37-51<https://benthamopen.com/contents/pdf/TOECOLJ/TOECOLJ-7-1-37.pdf>Rhodes, J.J., W.I. Baker. 2009. Fire

probability, fuel treatment effectiveness and ecological tradeoffs in Western US public forests. *Open Forest Science J.* 1: 1-7. <http://www.energyjustice.net/files/biomass/library/Rhodes-Baker.pdf>

Schoennagel, T. et al. 2017. Adapt to more wildfire in western North American forests as climate changes. *PNAS* <https://www.pnas.org/content/114/18/4582>

Stephenson, N. L., et al. 2014. Rate of Tree Carbon Accumulation Increases Continuously with Tree Size. *Nature* 507, no. 7490 (March 6, 2014): 90-93. <https://doi.org/10.1038/nature12914>

Stenzel, J.E., Berardi, D.M., Walsh, E.S. Hudiburg, T.W. 2021. Restoration Thinning in a drought-prone Idaho forest creates a persistent carbon deficit. *Journal of Geophysical Research: Biogeosciences*, 126(3), p.e2020JG005815. <http://agupubs.onlinelibrary.wiley.com/doi/ampdf/10.1029/2020jg005815>

Swanson, M.E. et al. 2011. The forgotten stage of forest succession: early-successional ecosystems on forested sites. *Frontiers in Ecology and Environment* 9:117-125 [doi:10.1890/090157](https://doi.org/10.1890/090157)

Zald, H.S.J., and C. Dunn. 2017. Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. *Ecological Applications* 28 DOI:10.1002/eap.1710 <https://esajournals.onlinelibrary.wiley.com/doi/10.1002/eap.1710>

Zhou, D., S.Q. Zhao, S. Liu, J. Oeding. 2013. A meta-analysis on the impacts of partial cutting on forest structure and carbon storage. *Biogeosciences*, 10(6):3691-3703. <https://www.nature.com/articles/srep03547.pdf>