GEOS INSTITUTE

June 10, 2016

The Honorable Lisa Murkowski
U.S. Senate, SH-709 Hart Senate Office Building

The Honorable Maria Cantwell
U.S. Senate, SH-511 Hart Senate Office Building

The Honorable Michael Enzi
U.S. Senate, SR-379A Russell Senate Office Building

The Honorable Patty Murray
U.S. Senate, SR-154 Russell Senate Office Building

Sent via: wildfire@energy.senate.gov

Re: Comments on Senate ENR Discussion Draft "To provide for the conduct of certain wildfire budgeting and response activities and forest management activities"

Dear Chairwoman Murkowski, Chairman Enzi, Ranking Member Cantwell, and Ranking Member Murray:

Geos Institute would like to thank the Senate Energy and Natural Resources Committee ("Committee") for this opportunity to comment on draft legislation related to wildfire budgeting, wildfire response, and forest management activities.

Geos Institute is a science-based nonprofit that works on solutions to climate change by partnering with decision makers, conservation groups, and land managers. Our forest legacies program specifically is finding ways for communities to live safely with the myriad ecosystem benefits of wildfires as we have authored numerous scientific publications on this topic, including a recent book on fire ecology co-authored by 27 fire scientists[1]. We strongly support efforts to improve firefighter and community safety, containment and transparency controls on fire suppression costs, and science-based wildland fire use for ecosystem benefits, forest resilience, and wildlife habitat.

We also would like to thank the Committee for its efforts to track fire-suppression costs of federal agencies in fiscal year budgets submitted to

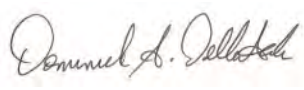
[1]DellaSala, D.A., and C.T. Hanson (eds). 2015 The ecological importance of mixed-severity fires: nature's phoenix. Elsevier: NY

Congress by the Departments of Agriculture and Interior. We note, however, that the Committee's fire suppression provisions are mainly directed at finding ways to continue suppression funding (e.g., even when they exceed the increased Congressional appropriations – i.e., *Supplemental Appropriations*) without critically examining what the public and taxpayers are getting from those expenditures or the substantial impacts to the environment.

We feel strongly that suppression costs need to be contained by stopping government overspending through effective and transparent cost-containment measures rather than finding new ways to pay for fire suppression. We therefore encourage the Committee to require the Secretaries of Agriculture and Interior to report back to Congress on how they are implementing specific criteria for allowing more fires to burn in the backcountry under safe conditions for ecosystem and cost saving benefits as mentioned in our comments herein.

Importantly, we have six major concerns with the draft legislation and recommendations for your consideration as indicated below. We share the Committee's urgency in finding a solution to fire suppression and the need to provide the public with an effective means for dealing with the threat of wildfires. However, we encourage the Committee to strengthen provisions of the bill that deal with cost containment and transparency standards in fire suppression in order to place much needed cost controls on fire suppression spending that are in the best interest of the American taxpayer. We also urge the Committee to reconsider provisions of the draft legislation that are not comprehensive or science-based with respect to ecosystem benefits of wildfires. The bill in its current form would harm public lands by encouraging logging and unmitigated fire suppression that damages fire-dependent ecosystems and does little to protect homes from fire risks. Thank you again for opening discussion around your draft legislation.

Sincerely,



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Six Specific Shortcomings of the Draft Legislation

(1) *Ecological role of wildland fire in resilient and fire-adapted ecosystems is missing from the draft* - The use of the bill's disaster terminology throughout cuts against the grain of numerous fire-ecology studies compiled over decades of research in fire-dependent western forests[2] and the bill's disaster language continues to support the notion that suppression is always needed even when fires are burning under safe conditions performing vital ecosystem services, including cost-effectively and naturally thinning forested ecosystems[3]. In doing so, the bill sets in motion a view on fire that is actually detrimental to forest health and wildlife habitat (c – Elements of No-Action Alternative) because most fires are ecologically beneficial and are not ecological disasters[1,2]. We encourage the Committee to revise this draft language so it is based on best available science regarding the myriad ecosystem benefits of wildland fires to the health and resilience of fire-adapted ecosystems.

(2) *Restricts provisions of the National Environmental Protection Act (NEPA) by restricting forest planning to the "no action" vs. "action" alternative and allowing for expansive use of emergency "alternative arrangements" will harm the environment* - The legislative constraint on NEPA alternatives limits the public's ability to participate in forest planning and the collaborative processes emphasized in the draft legislation by restricting stakeholders from coming up with creative solutions that may not simply meet an action vs. no action alternative. It also allows the Secretaries to make emergency determinations with minimal public review that maybe unnecessary and harmful to the environment.

(3) *Allowing for long-term (20-year) federal "hazardous fuel reduction" contracts (d – Long-Term Contracts) in dry mixed conifer and ponderosa pine forests is a disincentive to ecologically based restoration* – While we appreciate the Committee's interest in maximizing the retention of large trees in fuel reduction projects ("*as appropriate*" A – In general (v)), long-term logging contracts historically have not been in the best interest of the public given they incentivize overcutting of forests and lead to boom and bust timber cycles. Further, wood products coming from logging projects should not be considered de-facto "*green building construction*" (3-i –

[2]Examples: Arno, S.F., and S. Allison-Bunnell. 2002. Flames in our forest: disaster or renewal? Island Press: Washington, D.C. Dale, L. 2006. Wildfire policy and fire use on public lands in the United States. Society and Natural Resources 19:275-284. Perry, D.A., et al. 2011. The ecology of mixed severity fire regimes in Washington, Oregon, and Northern California. Forest Ecol. & Manage. 262:703-717. Donato, D.C., J.L. Campbell, and J.F. Franklin. 2012. Multiple successional pathways and precocity in forest development: can some forests be born complex. J. Vegetation Sci. 23:576-584. Moritz, M.A., et al. 2014. Learning to coexist with wildfire. Nature 515: 58-66. DellaSala, D.A., and C.T. Hanson. 2015. Ecological and biodiversity benefits of megafires. Pp. 23-54. *In* DellaSala, D.A., and C.T. Hanson (eds), The ecological importance of mixed-severity fires: nature's phoenix. Elsevier: NY. Dunn, C.J., and J.D. Bailey. 2016. Tree mortality and structural change following mixed-severity fire in *Pseudotsuga* forests of Oregon's western Cascades, USA. Forest Ecol. & Manage. 365:107-18.

[3]Examples: Donovan, G.H., and T.C. Brown. 2005. An alternative incentive structure for wildfire management on National Forest land. Forest Science 51:387-395. Donovan, G.H., and T.C. Brown. 2008. Estimating the avoided fuel-treatment costs of wildfire. Western J. Applied Forestry 23:197-201.

Preferences) given large-scale treatments have environmental consequences, including logging-related greenhouse gas emissions that are most often greater than emissions from fires[4].

(4) *Not excluding inventoried roadless areas and other ecological important lands recognized in forest plans (e.g., Wilderness Study Areas, Areas of Critical Environmental Concern, Late-Successional Reserves, "high-value watersheds") will cause harm to public lands with some of the highest ecological values* - The bill seems to over-ride the Roadless Conservation Rule 2000 (which already allows for limited fuels reduction) and local forest plans that have protections in place for special places not recognized by Congress and where ecological damage from proposed fuels reduction and temporary road building and fuel breaks would occur. As support for special area exclusions, we are including as an appendix to our comments, a new soon-to-be published (in final peer review) analysis that demonstrates how areas with more intensive logging are actually burning more severely than protected areas like wilderness, parks, and other categories (Appendix A). Our study used over four decades of fire data compiled for 11 western states covering over 23-million acres and 1,500 wildfires in mixed conifer and pine forests. We specifically found that protected areas are burning in lower fire severities and thus places like roadless areas and special places protected by forest plans need to be excluded.

(5) *Not addressing the risk of human-caused fire ignitions from an extensive and damaging road system on public lands misses an important contributing factor to uncharacteristic fires* – While we appreciate the Committee's desire in limiting road building to "*temporary roads*" (e – Road Building), such roads are costly to decommission and typically are not engineered to environmental standards. Roads, in fact, are associated with an increase in the probability of human-caused ignitions due to greater access particularly during fire season[5]. More attention and funding should be given to seasonal road closures and decommissioning of failing roads that contribute to fire ignitions and environmental impacts.

(6) *Reducing hazardous fuels in the backcountry diverts much needed attention away from homeowner safety* – We appreciate the Committee's support of the Firewise Program and its interest in "*developing, updating, and implementing community wildfire protection plans for at-risk communities*" (b – Planning and Preparing At-Risk Communities for Wildfire). We believe that the vast majority of appropriations should go into assisting communities with proven

[4]For examples of carbon released from thinning being greater than that of fire see – Mitchell, S.R., et al. 2009. Forest fuel reduction alters fire severity and long-term carbon storage in three Pacific Northwest ecosystems. Ecol. Applic 19:643-655. Hudiburg et al. 2009. Carbon dynamics of Oregon and northern California forests and potential land-based carbon storage. Ecol. Applic. 19:163-180. Law et al. 2013. Thinning effects on forest productivity: consequences of preserving old forests and mitigating impacts of fire and drought. Plant Ecology & Diversity 6:73-85. Hudiburg et al. 2013. Interactive effects of environmental change and management strategies on regional forest carbon emissions. Environmental Science & Technology 47:13132-13140. Law, B.E., and R.H. Waring. 2015. Carbon implications of current and future effects of drought, fire and management on Pacific Northwest forests. Forest Ecol. Manage. 355:4-14.

[5]DellaSala, D.A., and E. Frost. 2001. An ecologically based strategy for fire and fuels management in National Forest roadless areas. Fire Management Today 61:12-23.

measures for reducing fire risks closet to home structures. This is particularly important given that the HFRA definition of the Wildland-Urban Interface (WUI) is so expansive that in practice federal agencies have been conducting expensive and ineffective fuel treatments more than 6 miles from the WUI where there are no effects at lowering fire risks to communities[6]. The draft legislation adds to this expansive view of the WUI by including "*all undeveloped land*" (Sec. 205 – a – Development) and municipal watersheds (Title III – D). We are also concerned that the draft legislation ties community funding to "*subject to the availability of appropriations*." We see this as an unfunded mandate, particularly if there is a sequence of very active fire years when appropriations would go mainly toward suppression and not to fire-risk reduction closet to communities. We would rather see the bulk of funding go toward treating hazardous fuels and other preparation steps within the so-called home-ignition zone, a narrow zone of 100-200 feet nearest a home structure, where the science on fire-risk reduction is unequivocal[7].

Additional Concerns and Recommendations:

- *Allow more fires to burn in the backcountry* - We would like to see federal agencies implement standards that *allow* for more fires to burn in the backcountry under safe conditions as a means for reducing "fuels." We recommend having the agencies develop a rule set regarding when to allow for "*managed wildland fire*" or "*ecologically appropriate fire use.*" The rule set might also include a process for developing the standards (e.g., science based) for fire use, who to involve, and how to proceed with fire vs. suppression. We also recommend fire risk management models be used to classify wildfire risk to homes and to maintain ecosystem benefits of wildland fires rather than to just focus narrowly on forest health and fire risks. Additionally, as support for allowing more fires to burn in the backcountry, I would like to call the Committee's attention to a recent study of how climate change will likely affect wildland fire severity in the western United States[8]. Researchers used the latest climate change science to project potential changes to fire regimes by mid-century. Surprisingly, they found that evidence for "*widespread reduction in fire severity for large portions of the western US (emphasis added).*" With aggressive fire suppression, however, more severe fires are anticipated as vegetation density increases overtime.

- *Provide a more balanced view of suppression impacts* - The draft legislation only treats wildfires as a risk to the environment and suppression as a benefit (I – cost drivers; B –

[6]Schoennagel, T, et al. 2009. Implementation of national fire plan treatments near the wildland-urban interface in the western United States. PNAS 106:10706-10711. Schoennagel, T., and C.R. Nelson. 2011. Restoration relevance of recent national fire plan treatments in forests of the western United States. Frontiers in Ecol. & Enviro. 9:271-277.
[7]Cohen, J.D. 2000. Preventing disaster: home ignitability in the wildland-urban interface. Journal of Forestry 98: 15-21. Cohen, J.D. 2004. Relating flame radiation to home ignition using modeling and experimental crown fires. Canadian J. Forest Resources 34: 1616-1626. Syphard, A.D., et al. 2014. The role of defensible space for residential structure protection during wildfires. International J. Wildland Fire 23: 1165-1175.
[8]Parks, S.A., et al. 2016. How will climate change affect wildland fire severity in the western US? Environmental Research Letters 11 035002: 1-10.

Components (i)). The legislation examines the efficacy of suppression in terms of an "*analysis of resources lost*" (cost drivers (V)), ignoring the resources benefited by fire and impacted by suppression and logging that have had substantial impacts to water quality, soils, wildlife habitat, and invasive species encroachment. Suppression efforts also cause damage to public lands via bulldozed fire lines that become de-facto roads, pathways for invasive species, increased fire risks from additional ignition sources (roads), water quality damages, and other problems not addressed in this legislation. It is also unclear what standards will be used to judge the "*effectiveness of any fuel treatments on fire behavior and suppression expenditures*" or how that would be carried out in an unbiased manner given large fires are mostly governed by top down drivers such as extreme fire weather rather than vegetation density[9]. We note that the scientific literature has frequently pointed to the over-riding effects of extreme fire-weather (drought, high winds, high temperatures) as dominant in large fires, and not vegetation[10].

- *Recognize fire for restoring resilient landscapes* - The proposed legislation emphasizes the National Cohesive Strategy for ways to create fire-adapted communities and restore and maintain resilient landscapes (b- Project Priorities – 2 A,B). However, the cohesive strategy also recognizes the importance of allowing fires to burn without suppression and this should be acknowledged as well.

- *Direct federal managers to conduct analysis of the costs of fire suppression to the environment and taxpayers vs. the substantial benefits (and savings) accruing from letting more fires burn safely in the backcountry* – In cost-benefit analyses, we suggest the use of point source analysis of sedimentation effects of logging and roads to identify baseline conditions prior to fire, point sources from active management, and ways to reduce point sources as part of a watershed and transportation plan. We also suggest that you consider macro-benthic index protocols for monitoring chronic sediment sources (e.g., California Stream Bioassessment Procedure[10]) to water quality.

- *Eliminate the provision to install fuel and fire breaks (Title III – B)* – installing fuel breaks does not guarantee reduction in fire risks because most large fires burning under extreme fire-weather will send out fire brands miles ahead of flame fronts. Fuel breaks also require periodic and costly maintenance as treated vegetation typically grows back in 10 years or less depending on site conditions. Fuel breaks can also become de-facto roads leading to the potential for future human-caused fire ignitions as mentioned.

- *Recognize the role that fire plays in improving wildlife habitat* – the draft bill directs forest management activities to improve wildlife habitat to meet management and conservation goals (Title III – E) but does not recognize the myriad species that depend

[9]DellaSala, D.A., and C.T. Hanson. 2015. Ecological and biodiversity benefits of megafires. Pp. 23-54. *In* DellaSala, D.A., and C.T. Hanson (eds), The ecological importance of mixed-severity fires: nature's phoenix. Elsevier: NY
[10]www.dfg.ca.gov/cabw/cabwhome.html.

on periodic fires, including severe ones, many of which are declining because of fire suppression and post-fire logging activities[1]. We urge the Committee to include wildland fire use in conserving and restoring wildlife habitat and not just as detrimental to wildlife.

APPENDIX A: LOGGED FORESTS ACROSS THE WEST BURN AT HIGHER SEVERITIES COMPARED TO PROTECTED FORESTS (SUMMARY OF FINAL PEER REVIEW ARTICLE)

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Chad Hanson, Ph.D., John Muir Project, Earth Island Institute
Curtis Bradley, Center for Biological Diversity

Biscuit 2002 fire, southwest Oregon, ten years post-fire showing natural regeneration (D. DellaSala)

It is a commonly held perception of decision makers and land managers that protected areas like parks and wilderness burn more severely in a forest fire compared with "actively managed" forests, due to higher densities of vegetation/fuels in areas excluded from logging. A new analysis by conservation scientists challenges this claim (full analysis is in final peer review in a science journal and summarized for now herein).

Summarized Findings:

- From 1984-2014, we studied 1,500 forest fires affecting over 23-million acres of pine and mixed-conifer forests across 11 western states, including the Pacific Northwest, California, Southwest, and Rockies. We used the largest dataset ever to test the assumption of increasing fire severity with increasing forest protections and our results were consistent across regions.

- Forests with the lowest levels of protection (i.e., active management) had the highest levels of fire severity and the differences were greatest between strictly protected (Level 1) vs. no protection (Level 4).

- Degree of forest protection was among the top ranked variables of 45 variables explaining fire severity levels (ecoregion, climate and topography were also important).

Our findings are especially relevant as Congress is poised to introduce legislation that would increase logging in response to forest fires on national forests. Additionally, the Governor of California recently issued a state of emergency that proposes to log millions of acres of dead trees in response to drought and insect outbreaks under the assumption that logging can reduce future fires.

Both the U.S. Forest Service and Bureau of Land Management have proposed extensive thinning/logging projects across dry portions of the West. The assumption is that, in the absence of logging, fires burn severely and forests may not recover in time without logging and tree planting post-fire.

Given the interest in large-scale logging and assumptions about how it can lower fire severities, we set out to determine whether the level of forest protection had anything to do with fire severity while accounting for topographic and climatic variability. We used government published burn severity data for all forest fires >1000-acres that has been collected from 1984 – 2014 (Figure 1).

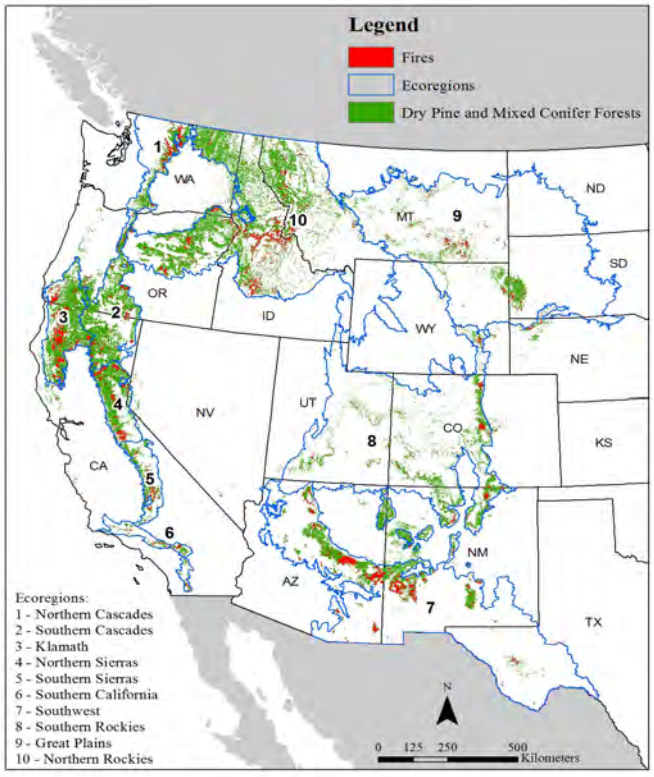

Figure 1. Location of fires >1,000 acres in pine and mixed-conifer forests with relatively frequent fire regimes in ecoregions of western USA from 1984 to 2014 (Bradley et al. in final peer review).

We then analyzed this large dataset using computer algorithms and statistical testing to determine if the relationship between protected areas and severe fires held. The federal government classifies fire severity using the "monitoring trends in burn severity" (MTBS) project dataset. We displayed severity levels using a continuous variable (-500 to 1500) rather than arbitrary break points (low, medium, high). Higher values represent higher fire severity (i.e., higher levels of tree mortality). Severity was then overlaid onto a US Geological Survey protected areas database using four protection levels that

ranged from highest (level 1: national parks, wilderness) to lowest (level 4: private lands).

Main Results

- A total of 1,500 forest fires affected over 23-million acres of pine and mixed-conifer forests in the West from 1984 – 2014, the largest dataset ever used to test the assumption of increasing fire severity with increasing forest protection.
- Forests and fires were examined across 11 western states, including the Pacific Northwest, California, Southwest, and Rockies.
- Degree of forest protection was among the top ranked variables of 45 variables explaining fire severity (climate, ecoregion, and topography were also important).
- Contrary to common belief, forests with the lowest levels of protection (i.e., active management) had the highest levels of fire severity and the differences were greatest between strictly protected (Level 1) vs. no protection (Level 4).

Heavily post-fire logged areas like this tend to burn at higher severities in subsequent fires compared to unlogged areas (D. DellaSala, Biscuit burn, southwest Oregon, 2012).

We found no evidence to support the prevailing forest/fire management view that higher levels of forest protection are associated with more severe fires when fires eventually occur. On the contrary, using over three decades of fire severity data and a broad analysis area, we found support for the opposite—burn severity tended to be higher in pine and mixed-conifer forests with lower levels of protection—more intense management— after accounting for topographic and climatic conditions.

Thus, despite the plethora of forest policies and congressional legislation claiming active management will lower fire severity, such policies may have the reverse effect. By using logging to reduce fire severity, managers may actually be increasing severity in the long run, while degrading important wildlife habitats through intensive logging.

While we did not test for the specific mechanism responsible for our findings, we suspect, based on published literature[11], that logged areas tended to burn more severely than protected ones due to logging slash and homogenization of dense vegetation found in most forest plantations. Also, in forests with higher canopy cover, which are frequently found in protected areas, woody material on the forest floor can stay moister later into the fire season, due to the cooling shade of the forest canopy.

Tree plantations like this one in northern Idaho tend to burn severely in forest fires due to high density of small trees that act as kindling for fires (D. DellaSala).

While we determined that higher levels of fire severity occurred in areas where there was more active management, high severity fires in natural areas are actually quite beneficial ecologically. The difference is that a severe fire burning through a natural, mature forest will produce a much needed pulse of "biological legacies" (large dead trees) that becomes a "complex early seral forest" or snag forest[12]. This

[11]For instance see - Odion, D.C., et al. 2004. Fire severity patterns and forest management in the Klamath National Forest, northwest California, USA. Conservation Biology 18:927-936.

[12]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

unique habitat, important unto itself, provides the structures for later development of a new forest—one that is biological rich and eventually becomes old growth if unlogged.

Severe fire in a mature forest produces "complex early seral forest" with live and dead standing (snags) and down trees. Plant and wildlife diversity rivals that of old-growth forests and these new forests are at least as rare as old growth because they are almost always logged post-fire (D. DellaSala, Biscuit area).

Severe fire is part of the natural ecology of fire-adapted forests that native forests need to replenish themselves. Plantations and heavily logged areas lack this biodiversity because they do not have complex forest structures and native shrub patches. Therefore, when they eventually burn they remain biologically impoverished[13]. Because of dense tree planting and logging slash left after logging, they tend to re-burn in uncharacteristically severe fires[1].

[13]DellaSala, D.A., et al. Odion. 2014. Complex early seral forests of the Sierra Nevada: what are they and how can they be managed for ecological integrity? *Natural Areas Journal 34:310-324.*