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**Key Considerations in Planning to Reduce Wildfire Risk to Communities and Protecting Pacific Northwest Forests for Climate Mitigation and Adaptation
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As the climate warms, extended drought and heat events in the United States are driving an increase in wildfire activity and homes lost to wildfire. When fire occurs in and around homes, the homes become the fuel that ignites other nearby homes, causing mass conflagrations. Experts are telling us that we must shift from defining wildfires as the problem to defining the vulnerability of our homes and communities as the problem.

In September 2023, the Presidential Wildfire Mitigation and Management Commission issued its consensus report entitled *On Fire*¹ and underscored that society has to learn to live with fire. The report emphasized the need for agencies to recalibrate their suppression activities, recognized beneficial fire and recommended investing in actions that focus on making homes and communities ignition resistant.

1. 80-90% of ignitions are human caused. There should be increased emphasis on *prevention* of ignitions. This includes *Public Safety Power Shutoffs*, more use of fire safety *public land closures* (FSLC) during high fire risk conditions, and *tighter regulation* of forestry activities on *private lands* during high fire risk conditions. The Forest Service can play an important role in limiting human caused ignitions on public lands, particularly lands in and around communities.

2. Urban encroachment on wildlands is increasing, making forests more vulnerable to human-caused ignitions. Proximity to neighborhoods and powerlines increases the chance of human-caused ignitions. A useful exercise in the context of the NW Forest Plan revision process would be to produce a map of all public lands within ¼ mile of census designated towns in Oregon, Washington and California. This map would provide a focal area for activities on public lands that would reduce fire risk to communities and provide operable space for firefighting.

3. Home Outward. Stated simply, the US Forest Service does not own the problem of home and community loss, nor does it have the solution. Community wildfire risk focus begins with individual homes. To prevent home loss, the highest priority should be to work in the Home Ignition Zone (zero to five feet around the home) and then creating defensible space in and around the home in a gradient around the home, and fire hardened structures and communities. (e.g. Missoula Fire Lab - Dr. Jack Cohen; Insurance Institute for Business and Home Safety, <https://wildfireprepared.org>).

4. Dry forests. Dry forest types are present in a small portion of the total lands covered by the NW Forest Plan. These dry forests have historically experienced fire more frequently, though some may not have burned as frequently because of suppression. For these dry forests, it is necessary for the U.S. Forest Service to

¹ <https://www.usda.gov/sites/default/files/documents/wfmmc-final-report-09-2023.pdf>

examine the recent fire history and determine which of these landscapes may have been impacted by suppression and which have burned in recent fires. Options may include activities that involve careful pruning from below followed by the introduction of prescribed fire. Thinning smaller diameter trees with heavy equipment may have impacts on soil health, carbon stores and may increase the speed and intensity of fires. In sum, there are trade-offs from management activities that result in direct, indirect and cumulative impacts that need to be explicitly considered in these sensitive ecosystems.

5. Westside, moist forests. The vast majority of NW Forest Plan lands have historically burned as moderately frequent mixed severity fires or infrequent high severity fires. Large westside forest fires are the result of dry synoptic winds and suppression is ineffective during those events. Given the wind-driven nature of these fires, it is not practical nor scientifically defensible to alter fire behavior by thinning or through prescribed fires. Cutting trees to affect future fire severity has either no or uncertain ecological benefits, and has undeniable adverse impacts on forest carbon, water, and wildlife. Closed canopy forests are cooler, and buffer climate extremes. While thinning increases heat loads that impact native plants and animals.

6. Thinning forests has significant carbon costs, far greater than fire. Careful study has demonstrated that forest thinning emits about *~4 to 10 times as much carbon* as would be released in fires. Medium to heavy thinning reduces carbon stocks that will not recover to the original levels in a meaningful timeframe to address the climate crisis.

7. Protection for Mature & Old Growth Forests. Forests with mature and old trees are more fire resilient due to thicker bark and taller canopies found on these trees, and the cooler microclimates they provide. These trees and forests are critical for storing carbon. For example, the NWFP's protections of mature and old growth forests resulted in far greater carbon storage on federal land than would have been the case without the protections. To align forest management activities with climate mitigation and adaptation goals, we need to protect mature and old forests at the highest levels of protection (USGS GAP 1 and 2).

8. Alignment with national policy. The PNW forests are a very high priority for protection of carbon, water and biodiversity for climate mitigation and adaptation. Biden's EO 14008 set a goal of conserving at least 30% of lands and waters by 2030 to address "a profound climate crisis." In 2022, President Biden's EO 14072 recognized the climate importance of mature and old-growth forests for a healthy climate and called for conserving them on federal lands. The amended national forest management plans for 128 NFs would prohibit logging old-growth trees for economic purposes, so there should be no allocation to "Matrix" (forests dedicated to logging) in the revised NWFP. *There is great concern that the outcome of the NWFP amendment process will not be aligned with these national efforts, and that it will allow more logging of the very forests that have national importance for climate change mitigation. Therefore, the expedited planning process should be slowed down or put on hold* until the efforts can be assessed and informed by people with scientific expertise in these areas.

Citations

Buotte, P.C., B.E. Law, W.J. Ripple, L.T. Berner. 2020. Carbon sequestration and biodiversity co-benefits of preserving forests in the western United States. *Ecol. Applic.* 30(2):e02039. Doi: 10.1002/eap.2039

Buotte, P.C., S. Levis, B.E. Law, T.W. Hudiburg, D.E. Rupp, J.J. Kent. 2018. Near-future vulnerability to drought and fire varies across the western United States. *Global Change Biol.* 25:290-303. Doi:10.1111/gcb.14490

Campbell, J., M.E. Harmon, S.R. Mitchell. 2012. Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? *Front. Ecol. Env.* Doi:10.1890/110057

Calkin, D.E, Barrett, K., Cohen, J.D., Finney, M.A., Pyne, S.J., Quarles, S.L., Wildland-urban fire disasters aren't actually a wildfire problem. *PNAS.* 120(51): e2315797120. <https://www.pnas.org/doi/10.1073/pnas.2315797120>

Evers, C.; Holz, A.; Busby, S.; Nielsen-Pincus, M. Extreme Winds Alter Influence of Fuels and Topography on Megafire Burn Severity in Seasonal Temperate Rainforests under Record Fuel Aridity. *Fire* 2022, 5, 41. <https://doi.org/10.3390/fire5020041>

Griscom, B.W., J. Adams, P.W. Ellis, R.A. Houghton, G. Lomax, D.A. Metiva, W.H. Schlesinger et al. 2017. Natural climate solutions. *Proc. Nat. Acad. Sci.* 114:11645-11650. Doi:10.1073/pnas.1704651114.

Harris, N.L., Hagen, S.C., Saatchi, S.S. *et al.* 2016. Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. *Carbon Bal. Manage.* 11, 24. Doi: 10.1186/s13021-016-0066-5

Hudiburg, T.W, B.E. Law, W.R. Moomaw, M.E. Harmon, J.E. Stenzel. 2019. Meeting GHG reduction targets requires accounting for all forest sector emissions. *Env. Res. Lett.* 14: 095005.

Law, B.E., L.T. Berner, C. Wolf, W.J. Ripple, E.J. Trammell, R.A. Birdsey. 2023. Southern Alaska's forest landscape integrity, habitat, and carbon are critical for meeting climate and conservation goals. *AGU Advances*, 4, e2023AV000965. <https://doi.org/10.1029/2023AV000965>

Law, B.E., L.T. Berner, D.J. Mildrexler, R. Bloemers, W.J. Ripple. 2022. Strategic reserves in Oregon's forests for biodiversity, water and carbon to mitigate and adapt to climate change. *Frontiers in Forests and Global Change* 5: 1028401. <https://doi.org/10.3389/ffgc.2022.1028401>

Law, B.E., L.T. Berner, P.C. Buotte, D. Mildrexler, W.J. Ripple. 2021. Strategic Forest Reserves can protect biodiversity in the western United States and mitigate climate change. *Nature Comm. Earth & Environ.* 2, 254. <https://doi.org/10.1038/s43247-021-00326-0>

Law, B.E., R. Bloemers, N. Colleton, M. Allen. 2023. Redefining the wildfire problem and scaling solutions to meet the challenge. *Bulletin of the Atomic Scientists*. <https://doi.org/10.1080/00963402.2023.2266941>

Law, B.E. and M. Harmon. 2011. Forest sector carbon management, measurement and verification, and discussion of policy related to climate change. *Carbon Management* 2:73-84.

Law, B.E., T.W. Hudiburg, L.T. Berner, J.J. Kent, P.C. Buotte, and M. Harmon. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. *Proc. Nat. Acad. Sci.* 115:3663-3668. Doi: 10.1073/pnas.1720064115

Law, B.E., W.R. Moomaw, T.W. Hudiburg, W.H. Schlesinger, J.D. Sterman, G.M. Woodwell. 2022. Creating strategic reserves to protect forest carbon and reduce biodiversity losses in the United States. *Land* 11, 721. <https://doi.org/10.3390/land11050721>

Lindenmayer, D.B., et al. 2009. Effects of logging on fire regimes in moist forests. *Conservation Letters* 2, 271-277.

Reilly, M. J., Zuspan, A., Halofsky, J. S., Raymond, C., McEvoy, A., Dye, A. W., Donato, D. C., Kim, J. B., Potter, B. E., Walker, N., Davis, R. J., Dunn, C. J., Bell, D. M., Gregory, M. J., Johnston, J. D., Harvey, B. J., Halofsky, J. E., & Kerns, B. K. (2022). Cascadia burning: The historic, but not historically unprecedented, 2020 wildfires in the Pacific Northwest, USA. *Ecosphere*, 13, <https://doi.org/10.1002/ecs2.4070>

Ripple, W.J., C. Wolf, J.W. Gregg, J. Rockström, T.M. Newsome, B.E. Law, L. Marques, T.M. Lenton, C. Xu, S. Huq, L. Simons, D.A. King. 2023. The 2023 state of the climate report: Entering uncharted territory. *Bioscience*, 2023, biad080, <https://doi.org/10.1093/biosci/biad080>

Schoennagel, T., J.K. Balch, H. Brenkert-Smith, P.E. Dennis, et al. 2017. Adapt to more wildfire in western North American forests as climate changes. *Proc. Nat. Acad. Sci.* 114:4582-4590. Doi:10.1073/pnas.1617464114

Stenzel, J.E., D.M. Berardi, E.S. Walsh, T.W. Hudiburg. 2021. Restoration thinning in a drought-prone Idaho forest creates a persistent carbon deficit. *JGR Biogeosci.* Doi:10.1029/2020JG005815

Still, C., et al. 2022. No evidence of canopy-scale thermoregulation to cool leaves below air temperature across a range of forest ecosystems. *PNAS* 119(38) e2205682119. <https://doi.org/10.1073/pnas.2205682119>

Zhou, D., S. Liu, S. Zhao, J. Oeding. 2013. A meta-analysis on the impacts of partial cutting on forest structure and carbon storage. *Biogeosci.* 10:3691-3703. Doi: 10.5194/bg-10-3691-2013