



To: Oregon Global Warming Commission
From: Oregon Association of Conservation Districts
RE: **June 4 Meeting: Draft Strategic Recommendations**

The Oregon Association of Conservation Districts (OACD) represents the 45 Soil and Water Conservation Districts (SWCDs) who are local governments serving the rural and urban constituents of the counties they represent. The districts provide technical services to constituents as well as partial project funding and working with landowners to access other funding opportunities from state and federal partners. The OACD Working Lands Committee is currently developing a working lands guidebook and workshops for further development of programs for both working lands protection and restoration that can be used by the districts in their technical outreach efforts. Sequestration is an important tool for future district work. There are currently 5 sequestration projects underway within Oregon SWCDs and there is considerable interest in pursuing additional sequestration opportunities.

We are pleased with many of the recommendations in the May 24th OGWC summary as they tie into our districts' goals as well. The proposed implementation plan will help us achieve the work on the ground with technical assistance that we plan to pursue with our districts. Districts work with projects on agriculture lands, on forestry lands and our coastal area districts also work with areas with blue sequestration opportunities. Our comments are in response to all three areas.

Your strategies recognize that sequestration has many other benefits in its outcomes: increased care and protection of both natural and working lands, improved air quality, consideration of economic needs, ancillary job creation, health, and equity standards, as well as the reduction of greenhouse gases. And the strategies include many of the recommendations that were brought forward in the two recent surveys in which many of our members participated. The 5 goals listed in your recommendations (page 1) would assure program success. We recommend a strong program with ambitious goals to further promote statewide opportunities for sequestration on natural and working lands.

In regard to specific objectives:

Legislature and Governor's Role

While the legislature only began hearing about sequestration in informational hearings in May this year, we are hopeful that some funding can be found in Ways and Means to support OWEB and the OGWC in developing an implementation plan. The Governor's budget provided a baseline study for soil health through ODA, but NRCS had to step up to bring on a staff person at ODA to begin development of a soils program. We are attempting to get funding to bring back the vacancy position of an SWCD partner in ODA to enhance our work in sequestration, but that outcome is still unknown. Many of the positions needed to really fulfill the Governor's EO were not included in funding and hamper the implementation of agency plans regarding GHG reduction. We look forward to hearing more about legislative strategies from OGWC at the June meeting.

We strongly support expansion of the urban forestry program. Our districts in Multnomah, Clackamas and Marion Counties especially are involved in urban forestry work, but many other communities statewide also address urban forestry. My own city of Sandy is a national tree city and as a member of Sandy's planning commission, I strongly support urban forestry.

And we very much need the Oregon Agricultural Heritage Program. Many associations worked together in 2019 to get an overwhelming majority of legislators supporting the program, but it has never been funded nor has the Governor included funding in her budget for the program.

Under Oregon's progressive land use laws, we have not lost as much land to development as other states have experienced, but we are on the edge of major change with a large loss of long-time work on the lands by our aging farmers and foresters. The OAHP program would provide for conservation management planning, succession planning and easement protection on working lands to stop that bleeding. Thank you for identifying the support for OAHP as a recommendation. We suggest that the OGWC strategy recommendations more explicitly make the point that conservation easements are a critical tool to assuring that the management practices that sequester carbon are continued on a long-term basis to assure carbon benefits.

Congressional Support

Oregon could use some of the federal funds received from the ARPA program to fund additional agency support and programs toward the goal of further climate solutions, including sequestration. As President Biden's "Climate 21" strategy and his ensuing executive order supports, the federal government will step up to be a major supporter in climate change. His plan indicated that up to 20% of greenhouse gas reductions could come from sequestration. I am sure Oregon's NRCS Director, Ron Alvarado, will expound more on the resulting changes at USDA at the meeting this Friday. Recommendations to USDA presented by ODA, OWEB and ODF include many of the same items that our national organization (National Association of Conservation Districts) also shared with USDA.

The steps outlined in your recommendations for next steps are important:

1) Development of Working Lands Implementation Plan

The recommendation suggests a natural and working lands council to convene public engagement for the plan's development. As the state executive of OACD, I have the opportunity to meet bi-monthly with other state executives around the country through our national organization and hear of their work in connection with the U.S. Climate Alliance program. Oregon has contributed to this work as one of the member states and Alliance states are leading the country in combating climate change through policies that encourage investment in clean energy, energy efficiency and climate resilience, with a result if a 14% reduction in greenhouse gas emissions between 2005 and 2016 alone.

2) Creation of Centers of Excellence for Research

Science should be a major factor in an implementation plan and your goal of creating centers of excellence in Oregon universities is central to current and ongoing implementation strategies. Creating centers of excellence will support the education and research to make the implementation plan viable.

3) Maintain and Enhance Land Use Laws

Oregon's land use laws should be supported, but also require further implementation, to fully support urban and rural protections that will be important to maintaining OGWC's implementation plan. For example, current land use laws allow solar development on high value farmlands. Other development considered in expansion of UGB boundaries further removes agriculture and forestry lands from production and limits the benefit of carbon storage.

4) Support Climate Smart Forest Management

We generally agree with the recommendations under this goal. However, we would be opposed at this time to expanding OAHP to both forestry and agriculture with a minimal funding of \$5 million for OAHP as adding forest lands would seriously deplete agriculture land programs. Perhaps at a future time when the program is more fully funded consideration of combining the two programs would have validity. The \$5 million was a mere placeholder for donations. The state really needs no less than \$15 million to have a viable program.

[There appears to be a goal "5" missing.]

6) Invest in Climate Smart Agricultural Practices

There has been minimal work by state agencies in this area, but there is considerable work to be accomplished. Funding will be required above what is currently in place, more forward thinking from our state agency partners is needed, and incentives must be developed to reach the goals of this program. The two earlier surveys conducted by OGWC and OWEB show the broad interest in implementing a program and shared ideas to build toward success. One agency, OWEB, has shown outstanding commitment in its work under the EO by developing a climate committee, implementing grant programs to accommodate climate work and investing in the coming biennium in supportive policy work. This will provide a watershed approach to climate work. DEQ is now finalizing its draft rules for the Climate Protection Program (Cap and Reduce) and offsets and a vision for Community Climate Investments to particularly support rural and underserved communities, will provide an opportunity for sequestration project implementation, among other projects.

7) Protect and Restore Blue Carbon Ecosystems

Development of a blue carbon strategy is important to our districts working in coastal areas and the recommendations outlined would be extremely helpful. There was a bill to develop “Blue-green Task Forces” in the legislature, but it did not move forward. Hopefully the bill’s sponsor will be able to do some work in this area with volunteers from the public.

We believe that another strategy recommendation should be added to address the ongoing work of the DEQ to develop rules for greenhouse gas emission reductions. Specifically, these rules should provide opportunities for carbon sequestration as a path to achieve compliance with emissions targets. This mechanism has the potential to generate funding and momentum of the state’s efforts to promote sequestration.

All in all, we are supportive and appreciative of the work the commission has provided toward an implementation plan and we look forward to participating in your continuing work.

Jan Lee, Executive Director
Oregon Association of Conservation Districts
(503) 545-9420 Jan.lee@oacd.org
<https://oacd.org>

To: Chair Macdonald and Members of the Oregon Global Warming Commission
From: Metro Climate Action Team
Cc: Governor Brown, Kristen Sheeran, Oregon Board of Forestry
Re: Executive Order 20-04 Forest Climate Policy Brief
Date: 5/25/2021

Dear Chair Macdonald and members of the Oregon Global Warming Commission,

We, the Metro Climate Action Team, a group of dedicated volunteers sponsored by the Oregon League of Conservation Voters, urge you to recognize and act on the scientific fact that our forests represent by far the most important natural climate solution for storing and sequestering carbon on both state and private lands.

Much has been written about climate smart forestry. We offer you a rather simple but science-based definition: Climate smart forestry is simple when you boil it all down. Primarily, it is about ensuring forest stewardship that increases forest carbon storage across the landscape. Research shows that the biggest bang for the buck from natural climate solutions is to have longer logging rotations –80 years or more can provide good timber production and financial returns while increasing stored carbon. We also need to keep more standing and diverse species of trees - especially mature and old growth - on the land. Maintaining and increasing stored carbon should be compatible with the additional benefits of promoting biodiversity, protecting our drinking water supply watersheds and providing for resilience to climate change.

We encourage the OGWC to be bold in your recommendations and to position Oregon as a national leader in shifting our approaches to natural resource management so that our chief priority is to take advantage of these resources as invaluable in combatting climate change. This requires that we question long accepted practices and recognize the need to change many of these practices.

Oregon will need to adopt a host of new rules, regulations and practices to both mitigate and then help us adapt to the harms we are experiencing now as a result of climate change, ranging from catastrophic wildfires to severe draughts. And we know these harms will only increase in the future. One simple approach will be to adopt practices that will meet the standards defined to achieve Forest Stewardship Council certification. We know such an approach to forest management can provide environmental, social and economic benefits.

Be Bold! Do the Right Thing! Ensure Oregon is National Leader!

Sincerely,



Daniel D. Frye, PhD

On behalf of the Metro Climate Action Team Steering Committee: Brett Baylor, Rick Brown, Pat DeLaquil, Daniel Frye, Debby Garmin, Mark McLeod, KB Mercer, Michael Mitton, Rich Peppers, Rand Schenck, Jane Stackhouse

Dear members of the Oregon Global Warming Commission:

I am Dr. Suzanne Fouty. I have lived in Baker County for the last 18 years where I was a hydrologist/soils specialist for the Forest Service until my retirement. I hold a Ph.D. from the University of Oregon and a Master's from the University of Arizona. My research and professional work experience have involved multiple aspects of soil and water resources. I am also a citizen who is afraid of all this inaction – commissions upon commissions, walk outs by Republican legislators, Democratic legislators in charge of committees refusing to bring good bills forward that help address climate change because of fear of walk outs or pandering to special interest groups, declining salmon, a failure to make good on our legal and moral obligations to the tribes as it applies to salmon and first foods. Finally, I am a taxpayer who is tired of subsidizing farmers and ranchers during drought when the agencies that represent them (Oregon Farm Bureau, Oregon Department of Agriculture) resist any changes that would lead to improved soil and water resource conditions in the state and thus minimize impacts of drought on them. Why am I paying for bad behavior? Why are we taxpayers constantly bailing out farmers and ranchers while many of these very same farmers and ranchers, the politicians, and Farm Bureau and DOA that support them refuse to make changes to improve conditions? It is from these three places: scientist, citizen, and taxpayer that I make the suggestions below.

Any climate change response strategy must use all strategies and partnerships available to us to dramatically and rapidly

- 1) Improve stream and riparian conditions and increase wetlands across the state and maintain those places with existing high-quality soil and water conditions
- 2) Restore degraded soil conditions and increase the amount of carbon sequestered in the soil.
- 3) Accelerate Oregon's shift to renewable and non-fossil fuel-based energy projects.

Soil is a major storage location of stored carbon and healthy streams, riparian areas, and wetlands help improve water quality and timing of flows. The existing and repetitive water crisis of the Klamath Basin and declining salmon numbers are both examples of why this is so important. A focus on renewable energy and a cessation of efforts to force on Idaho Power's Boardman to Hemingway on eastern Oregon by Oregon Department of Energy would assist at the other end of the climate change effort by eliminating carbon emissions as discussed below.

Improve soil productivity and amount of carbon sequestered in soil and prevent damage

- Increase the numbers, area extent and distributions of wetlands.
 - o Close beaver trapping and hunting on public lands immediately.
 - o Close beaver trapping and hunting on private lands and make funds available to assist private landowners in hiring qualified individuals and companies to devise co-existence strategies that eliminate or minimize infrastructure conflicts.

- Change and support farmers financially as they shift from till to no till to compensate for a period of declined yields. This shift will decrease soil erosion and increase the amount of carbon in the soil which increases the water holding capability of the soil. Eventually, there will be large increases in soil health and productivity.
- Encourage federal land management agencies to modify livestock grazing practices on public lands and ODA on private lands to control use in meadows, stream and riparian corridors and wetlands as a means of improving the vegetation vigor of above and below ground. This will increase the amount of carbon sequestered in the key areas and improve soil health.
- End the Idaho Power's Boardman to Hemingway effort to install massive transmission lines in eastern Oregon. This project is not in line with Oregon's climate goals. Project construction and operation will result in carbon losses as vegetation is removed and soil damaged and increases the potential for the transmission lines once active to start or exacerbate a wildfire. The Energy Siting Facility Council needs to make this happen rather than allowing it to be dragged out in court.

Close beaver trapping and hunting in the state

- Oregon Fish and Wildlife Commission (OFWC) and ODFW have failed Oregonians. They have willfully ignored the science, economics, changing social values, and the urgency of climate change presented to them in June 2020 and again in November 2020 as well as their own Ocean and Climate policy. The June 2020 request was and remains a low-cost, highly effective climate change response and preparation strategy. Ending beaver trapping and hunting would allow beaver populations to increase. In those streams where beaver dams can be built, one would begin to see expansion of beaver created and maintained habitat. This habitat serves a host of fish and wildlife (including more than 70 Oregon Conservation Strategy Species), supports salmon recovery (a moral and legal obligation that Oregon has to the tribal nations), create wetlands that serve as carbon sequestration areas and natural fire breaks, and lead to improvements in water quality and stream flows. The ecosystem services that this habitat provides are in the 100s of millions to billions of dollars. Improved stream and riparian health would decrease the economic burden on taxpayers to repeatedly provide financial relief to farmers and ranchers during drought conditions.

OFWC justification for refusing to vote was based on a last-minute interpretation by the Department of Justice regarding the Notice of Rulemaking language. They have deferred their responsibility to make an important climate change contribution to a non-rule making body called a beaver working group (a third attempt) to make recommendations when the science and economics is clear what needs to be done. They need to be held financially accountable as decision makers for the damage done to farmers, ranchers, cities, tribal nations and Oregonians by their refusal to make change.

There is precedent for closing public lands (the source of much of the water in the state) and the entire state to beaver trapping and hunting. The entire state has been closed twice before because of resource needs: 1899-1917 and 1932-1952. Closing the 32 million acres of federally-managed public lands is the minimum needed to begin meaningful ecological and economic change with benefits spread across the state. Currently more than 23,000 miles of 1st-4th order streams (beaver dam building size) exceed the state's temperature standards. Many of these miles are on public lands and human-powered stream restoration efforts simply cannot address the scale of the restoration need. Many streams on private lands would also benefit which would assist private land owners both during drought and wildfires.

Less than 170 people state-wide trap and hunt beavers under ODFW's furbearer regulations but these individuals and this recreational activity inflict huge economic and ecological harm on Oregon's diverse communities. Unlike hunting, trapping is indiscriminate and 24/7 when traps are deployed. This recreational activity, which occurs November 15-March 15, prevents populations from expanding and dispersing for a variety of reasons. Without expanding populations, beaver-dam building activity in size-appropriate streams is prevented to the detriment of stream processes, fish, wildlife, downstream users, and Tribal nations.

This simple action has remained politically difficult because groups like the Oregon Hunters Association, the Oregon Wildlife Society, the Oregon Department of Agriculture, and The Farm Bureau oppose any changes to beaver trapping and hunting regulations despite the impacts to big game habitat, and farmers and ranchers and cities and towns – in addition to salmon recovery. Drought impacts could be mitigated if abundant and widely distributed beaver created and maintained wetlands and complex stream and riparian systems existed on both private and public lands.

Creating conditions for the development of widespread and abundant beaver-created and maintained wetlands and complex stream and riparian areas fits well within the Oregon Global Warming Commission's carbon sequestration goals for natural and working lands, and its identification of the investments, programs, and policies needed to support those goals.

Consistency of approach and message.

Oregon's various Commissions (i.e., OFWC and ODOE) are at odds with the need to address climate change clinging to old attitudes and ways despite the Governor's Executive Order 20-04. The OFWC failure is described above. The ODOE support of Idaho Power proposed Boardman to Hemingway transmission line in eastern Oregon is another prime example of agency failure to take climate change seriously and described below.

Idaho Power's Boardman to Hemingway (B2H) project is not in alignment with Oregon's climate goals because it will have a cumulative negative effect on climate. The Oregon Global Warming Commission's 2018 Forest Carbon Accounting Report (OGWC 2018a) directly addresses forest harvest and fire as carbon sources and has identified the importance of intact forests as carbon sinks which are lost during construction, maintenance, and should the power lines initiate or

exacerbate a wildfire. Under ORS 468A.250(i), an accurate forest carbon accounting is required to meet the directive to the Oregon Global Warming Commission (OGWC) to *"track and evaluate the carbon sequestration potential of Oregon's forests, alternative methods of forest management that can increase carbon sequestration and reduce the loss of carbon sequestration to wildfire, changes in the mortality and distribution of tree and other plant species and the extent to which carbon is stored in tree-based building materials."*

Climate change makes the project's centralized power grid approach and old outdated technology vulnerable to climate and human disruptions with regional economic and ecological consequences. IPC has ignored emerging issues and new science (as has ODOE) related to climate change and the importance of carbon sequestration. IP is incorrectly optimistic about their ability to restore lost soil productivity and maintain a monitoring and rapid response effort over the long-term. They have minimized the difficulty of restoring soil productivity once organic matter has decomposed and soil structure lost, and ignored the carbon dioxide emissions related to the project.

Financial Accountability recommendations

Finally, please address the question of financial accountability when designing policy and making recommendations for funds. The state legislature, both Republicans and Democrats have consistently failed Oregon. Republicans have walked out on climate bills and Democrats have refused to bring even beaver-related bills to the floor to appease a few trappers and state legislators. Hold financially accountable agencies (ODA, Oregon Farm Bureau, EFSC, ODOE), individuals (including politicians) and groups (such as OHA, Trappers Associations) who use their political power to prevent action on climate change. If they like the status quo so much, then they, not the taxpayers, should be the ones responsible for compensating ranchers and farmers and the tribes for losses due to failing stream and riparian systems and loss of wetlands and salmon habitat. This includes having them pay for losses due to wildfires due to climate change because they are impeding action that could help mitigate the situation.

We are out of time. As a scientist I would prefer to be working with communities to restore soil and water resources and watch the improvements to salmon numbers, migratory birds, farm and ranch health. As a taxpayer I want less demands on the public pocket book for repeated and expected drought and wildfire relief given climate change when the beneficiaries of those dollars are not taking steps to improve conditions. I want those dollars to instead be spent in restoration, assisting farmers and ranchers address any infrastructure challenges with beaver dams that leave the beaver and habitat benefits intact, help communities of color and tribal nations improve their water infrastructure and so forth. And as a citizen, I want to feel and know hope and excitement at a future that is less grim, less damaged.

I urge you to be bold and clear.

Thank you.

Suzanne Fouty, Ph.D.
Hydrologist/Soils specialist
retired USDA Forest Service
Baker City, OR

June 1, 2021

To: the Oregon Climate Change Commission

From: J Boone Kauffman PhD

Re: Addressing climate change in Oregon's Agriculture and Natural Resource Sectors through cessation of grazing on public lands

The animal agriculture sector is now viewed as a major source of greenhouse gas emissions due to land clearing for pasture, feed production, manure, and the methane emitted by the animals. Because the biggest warming contributions in the agricultural sector comes from the methane and land use related to livestock production (Lazarus et al 2021) it makes sense that natural resource agencies and the agricultural sector should address these sources of greenhouse gases. Livestock grazing has also resulted in widespread vegetation and soil degradation including reductions in biological diversity, declines in carbon stocks, net primary productivity, and soil nutrient contents (Kauffman and Pyke 2003; Kauffman et al. 2009.; Kauffman et al 2016). All of these exacerbate the effects of climate change (Beschta et al.2012).

Livestock generate more greenhouse gases than the entire transportation sector (FAO 2006). Oregon is no exception. Beef cattle in the state of Oregon comprise about 15% of the total agriculture commodities but they account for at least 64% of the total greenhouse gas emissions arising from the Agricultural sector. Beef cattle, are in effect, the "Dirty Coal" of the Agriculture sector. Yet, to date there has been no reductions in emissions or progress in developing strategies to reduce this important source of greenhouse gases (methane and nitrous oxide).

Beef cattle influence climate change on public lands in three profound ways: (1) they are significant sources of greenhouse gases through enteric fermentation and manure deposition; (2) defoliation, trampling and the spread of exotic species by cattle results in landscape shifts from significant carbon sinks to sources of greenhouse gases; and (3) they exacerbate the effects of climate change by creating warmer and drier conditions beyond that of climate change. On dryland ranges a single cow-calf pair grazing for one month (1 animal unit month – AUM) produces 875 kg CO₂e through enteric fermentation and manure deposition alone. This results in a social carbon cost of \$35.50 per AUM.

Given their vast area, coupled with the past and ongoing effects of livestock grazing on public lands in the west, public land has the potential to be a significant natural climate solution to the climate crisis. For example, on the Lakeview BLM resource Area, about 108,134 AUMs graze these public lands resulting in emissions of 94,642 tons CO₂e each year. This has an annual social carbon cost of \$ 4.8 million.

Natural climate solutions to climate change includes the conservation, restoration, and/or improved land management actions that increase carbon storage and/or avoid greenhouse gas emissions across forests, wetlands, grasslands, and agricultural lands (Griscom et al 2017).

While this is an incredible expanse of land, less than 2.7% of all livestock operators use public lands. Rimbey et al. (2015) estimated that 3.8% of annual livestock forage is coming from western US public lands. Cessation of grazing on public lands (Oregon State Lands and Federally managed public lands) would be a cost-effective and ecologically sound approach to climate change mitigation and adaptation that would result in significant economic savings to the public with little impact to food supply.

Please do not hesitate to contact me for further information or citations included in this letter.

Sincerely

J Boone Kauffman PhD.
Illahee Sciences International LLC
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June 1, 2021

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Given their vast area, coupled with the past and ongoing effects of livestock grazing on public lands in the west, public land has the potential to be a significant natural climate solution to the climate crisis. For example, on the Lakeview BLM resource Area, about 108,134 AUMs graze these public lands resulting in emissions of 94,642 tons CO₂e each year. This has an annual social carbon cost of \$ 4.8 million.

Natural climate solutions to climate change includes the conservation, restoration, and/or improved land management actions that increase carbon storage and/or avoid greenhouse gas emissions across forests, wetlands, grasslands, and agricultural lands (Griscom et al 2017). While this is an incredible expanse of land, less than 2.7% of all livestock operators use public lands. Rimbey et al. (2015) estimated that 3.8% of annual livestock forage is coming from

western US public lands. Cessation of grazing on public lands (Oregon State Lands and Federally managed public lands) would be a cost-effective and ecologically sound approach to climate change mitigation and adaptation that would result in significant economic savings to the public with little impact to food supply.

Please do not hesitate to contact me for further information or citations included in this letter.

Sincerely

J Boone Kauffman PhD.
Illahee Sciences International LLC
1440 NW Lincoln Ave
Corvallis OR 97330

Dear members of the Oregon Global Warming Commission:

Attached is a May 2020 letter signed by nearly 40 Oregon scientists, educators, and economists, a letter supporting the citizen and conservation group-led request that went before the Oregon Fish and Wildlife Commission (OFWC) to close federally-managed public lands to beaver trapping and hunting. These scientists supported this request because of the many benefits that abundant and widely distributed habitat, created and maintained by beaver, would bring to Oregon, including the mitigation of effects from climate change and I urge you to carefully consider the information in the attached letter. The request that went before the OFWC was and remains a low-cost, highly effective climate change response and preparation strategy.

Unfortunately, the OFWC chose to ignore the science and the climate change response contributions made by beavers when refusing to vote on the request, based on a last-minute interpretation by the Department of Justice regarding the Notice of Rulemaking language. The OFWC also refused to even initiate the rulemaking process and begin an open and transparent public process on beaver management in November when a petition to initiate rulemaking was brought before them. These agency decisions have increased the risk to Oregonians and our fish and wildlife as we enter yet another drought and potentially wildfire season as well as prevented beginning the important positive effects that beavers can provide during this period of climate change.

If the one cause of beaver mortality that humans have direct control over was eliminated (i.e., hunting and trapping), many streams draining federally-managed public lands would begin to see improved ecological conditions in response to the habitat that beaver create and maintain. Beaver-created habitat serves a host of native fish and wildlife species (including more than 70 Oregon Conservation Strategy Species). It also supports salmon recovery (a moral and legal obligation that Oregon has to the tribal nations), creates wetlands that serve as carbon sequestration areas and natural fire breaks, and leads to improvements in water quality and stream flows. The ecosystem services that this habitat could potentially provide are in the 100s of millions of dollars. Furthermore, improved stream and riparian health would reduce the economic burden on taxpayers to periodically provide financial relief to farmers and ranchers during drought conditions.

An effective response to climate change requires use of all tools and strategies at our disposal. Currently more than 23,000 miles of 1st-4th order streams (streams of a size where beaver dams can be effective) exceed the state's temperature standards. Many are on public lands and human efforts simply cannot address the scale of the restoration need. Ending beaver trapping and hunting on federally-managed public lands is a logical, economical, environmentally sound, and appropriate step that would help to mitigate these temperature problems.

ODFW maintains that beaver populations are fine, based on annual hunting/trapping mortality numbers, yet the agency also indicates it has no idea how many beavers are in the state. Other sources, however, indicate beaver numbers across many portions of the state were once historically abundant and that current populations are only a fraction of what they once were, or could be again.

The termination of beaver trapping/hunting on federally-managed public lands by the OFWC, affecting less than 170 trappers/hunters, is technically simple to accomplish. However, such action has remained politically difficult because groups like the Oregon Hunters Association (OHA), the Oregon Department of Agriculture (ODA), and the Farm Bureau (FB) oppose any changes to beaver trapping and hunting regulations. Their opposition is odd because at the same time OHA talks about the importance of improving habitat for big game, and ODA and FB regularly request money to assist farmers and ranchers during drought. Drought impacts could be mitigated if abundant and widely distributed beaver-created and maintained wetlands as well as complex stream and riparian habitats.

You may hear that there is a beaver working group effort underway to look at the trapping/hunting regulations. However, this group was requested by the OFWC in June 2020 and only a year later does it look as if it will convene. Furthermore, it is unknown if the beaver working group will come to recommendations that match the scale of the economic and ecological crisis brought on by climate change, and if they do, whether the OFWC will accept them and put them into action.

Creating conditions for the development of widespread and abundant beaver-created and maintained wetlands, as well as complex stream and riparian areas, fits well within the Oregon Global Warming Commission's carbon sequestration goals for natural and working lands, and its identification of the investments, programs, and policies needed to support those goals. Furthermore, because beaver dams, beaver ponds, wetlands, and decreasing stream temperatures related to expanding beaver habitat are measurable, it will be possible to assess and track success over time. Thus, to help mitigate the ongoing and expected changes in climate, the Oregon Global Warming Commission should include a cessation of beaver trapping and hunting on federally-managed public lands in Oregon at the minimum, with consideration given to a state-wide trapping/hunting cessation as one of your recommendations.

Sincerely,

Robert L. Beschta, PhD
Professor Emeritus
Dept. Forest Ecosystems & Society
Oregon State University*
Corvallis, OR

* The campus of Oregon State University in Corvallis, Oregon, is located within the traditional homelands of the Mary's River, or Ampinefu, Band of Kalapuya. Following the Willamette Valley Treaty of 1855, Kalapuya people were forcibly removed to reservations in Western Oregon. Today, their living descendants are part of the Confederated Tribes of Grand Ronde Community of Oregon and the Confederated Tribes of the Siletz Indians.

Attachment: May 20, 2020 letter to the Oregon Fish and Wildlife Commission

Oregon Fish and Wildlife Commission
Oregon Department of Fish and Wildlife
4034 Fairview Industrial Drive SE
Salem, OR 97302

Dear Commissioners:

We, the undersigned, are writing in support of the following request that is before the Commission to amend OAR 635-050-0070 as it pertains to where beavers (*Castor canadensis*) may be trapped within the state:

Permanently close to commercial and recreational beaver trapping and hunting all National Forests, Bureau of Land Management lands, National Monuments, Federal Wildlife Refuges, National Parks, and National Grasslands in the state of Oregon.

This request directly addresses goals and objectives of the 2016 Oregon Conservation Strategy, which were developed with input from Oregon Department of Fish and Wildlife.

We support this request based on several considerations. Oregon is called the Beaver State, for a reason. Prior to European arrival in North America, Oregon's streams and rivers may have harbored an estimated one million North American beaver (Guthrie and Sedell 1988). However, six decades of widespread beaver trapping, from the 1780s through the 1840s, had devastating effects on their population. "Beaver pelts became dominant in the Pacific Northwest fur trade around 1820" with production from trapping peaking in 1833 (ODFW 2005). As a result, beaver populations were "considerably reduced" between Fort Vancouver and northern California and "nearly extinct" in the lower portion of the Columbia (Rainbolt 1999). In eastern Oregon, beaver populations were similarly decimated as the Hudson's Bay Fur Company attempted to create a "fur desert," a strategy aimed at clearing beaver from broad areas south and east of the Columbia River to keep encroaching Euro-American trappers from coming west of the Continental Divide (Ott 2003). With the widespread loss of Oregon's beavers, there was a concurrent loss in beaver-associated riparian habitat and wetlands across the state. These effects were later exacerbated by the introduction of large herds of livestock on public lands, splash dams related to large-scale logging, and the conversion to farmland and urban areas along major valley bottoms.

National forests comprise nearly one-fourth of the state, yet in 1929 less than 4,000 beaver were estimated to reside on these lands (Bailey 1936). This population estimate represented less than one-half of one percent of the total number of beavers that may have been present in Oregon before the widespread trapping in the late 1700s and early 1800s, indicating little if any recovery nearly a century later. Given this lack of recovery on National Forest lands and other public lands, it is likely that Oregonians have generally been unaware of the impacts that widespread beaver loss has had on riparian areas and aquatic ecosystems for many of the state's streams, rivers, and wetlands and therefore, on its fish and wildlife. However, those impacts have been far reaching and both ecologically and economically devastating.

Beaver activity affects stream systems of all sizes and in a variety of ways. In many streams it is the assembly of a simple but robust instream feature, the beaver dam, that sets extraordinary changes in motion. These dams slow and store a portion of streamflow or surface water that is

moving down the valley, thereby creating a pond that helps protect their lodges while increasing their aquatic and vegetative habitats. Dams will vary in lengths, heights, and widths depending upon topography and other site conditions, and their configuration may change over time. Some continue to increase in size as beavers add additional wood or sediment, whereas others periodically wash-out during high flows, only to be subsequently rebuilt or replaced with a dam in another location. Some dams only cause water to be backed-up within the banks of a channel whereas others spread water across floodplains. In nearly all instances water tables in the vicinity of a beaver dam will be elevated leading to changes in the riparian vegetative community.

In other streams, dams are not built due to river size or the existence of abundant water. In these cases, beavers will build their lodges in the banks and create a different set of benefits for fish. For example, Parish (2016) found that juvenile coho and other salmonid species used beaver bank lodges for summer rearing habitat. Coho salmon and other salmonids were also commonly observed utilizing other burrows and woody debris piles created by beavers, and summer rearing was strongly correlated with the volume of cover created by beavers.

Riparian areas are defined by the National Research Council (NRC 2002) as “areas that are transitional between terrestrial and aquatic ecosystems and are distinguished by gradients in biophysical conditions, ecological processes, and biota.” In the western United States, it is in these areas that beaver dams are so effective at working their ecosystem magic for the benefit of plant communities, terrestrial wildlife, birds, amphibians, fish and other aquatic organisms. Where beaver dams occur, ponded water increases the availability of surface and subsurface moisture seasonally, over time, and along stream systems. These changes in turn allow for a wide range of plant types to grow in a given area, ranging from wetland to upland species, thereby creating compositionally diverse and structurally complex plant communities. This increase in diversity and complexity in riparian areas is particularly noticeable in arid land ecosystems, such as east of the Cascades in Oregon where water is normally in short supply. Thus, beaver are not simply “engineers” proficient at building dams, but instead are recognized as “ecosystem engineers” because of their capability, *via* their dams, to create riparian and aquatic systems that are biologically diverse and highly productive, as summarized by Wright (2009) and Johnston (2017).

It has taken time for the scientific community to understand the significance of beavers at the landscape scale due to the separation in time between when trapping, Euro-American settlement, and scientific studies of streams began. In the years between trapping and settlement, streams and riparian systems underwent their first transformation as dams failed and were not repaired. They experienced a second transformation when land uses following settlement triggered widespread erosion and changes in vegetation. Then, decades to over a hundred years passed before the field of scientific inquiry of stream systems began. By that time, evidence of beavers as a defining influence on the landscape had faded. In the East, logging and agriculture had triggered erosion that buried the beaver-created wetlands beneath feet of sediment by the late 1700s to early 1800s. In the Southwest and Intermountain West, only spotty and rapidly changing evidence of beaver remained in the 1850s when the General Land Office surveys and expeditions arrived, and thus was considered of local rather than regional significance. Though they missed the regional significance at the time, their notes would later prove key to helping unravel the story of change (Fouty 2018).

Bailey’s (1936) publication about mammals in Oregon identified some of the attributes beaver provide for riparian areas and aquatic ecosystems. His publication has been followed by field research related to beavers since at least the 1940s. Masters and PhD research in Oregon

includes the following studies: food selection and utilization by beaver (Roemhildt 1940); fish occurrence in beaver ponds and other channel habitats (Duke 1982); beaver effects on stream, streamside habitat, and coho salmon fry populations (Bruner 1989); small mammal and amphibian communities in beaver-pond habitats (Suzuki 1992); beaver effects on channel morphology (Dent 1993); groundwater levels and stream temperatures adjacent to a beaver pond (Lowry 1993); sediment capture and retention in beaver ponds (Ringer 1994); groundwater tables adjacent to beaver ponds (Sharps 1996); distribution of beaver ponds and effects on plant communities (Perkins 2000); effects of beaver ponds and water temperature on Lahontan cutthroat trout (Talabere 2002); and beaver relocation for enhancing salmon habitat (Petro 2013).

In the second half of the 20th century, and particularly in the first two decades of the 21st century, there has been a major increase in "*Castor canadensis*" publications, with fully two-thirds of them occurring in the last 20 years (**Figure 1**). In addition to the sheer number of beaver-related studies, this literature covers a range of topics whose relative importance can be indexed by the occurrence of keywords in publications that also contain "*Castor canadensis*." Doing such a search of publications with "*Castor canadensis*" found they also included the following keywords: ecology (72% of the publications), fish (62%), habitat (60%), diversity (54%), and ecosystems (42%) (**Figure 2**). Thus, only in recent decades has the scientific community come to more fully understand the crucial effects beavers had as ecosystem engineers and keystone species, effects which may be recovered, at least in part, for many of the state's riparian areas and aquatic ecosystems with a change in the trapping regulations.

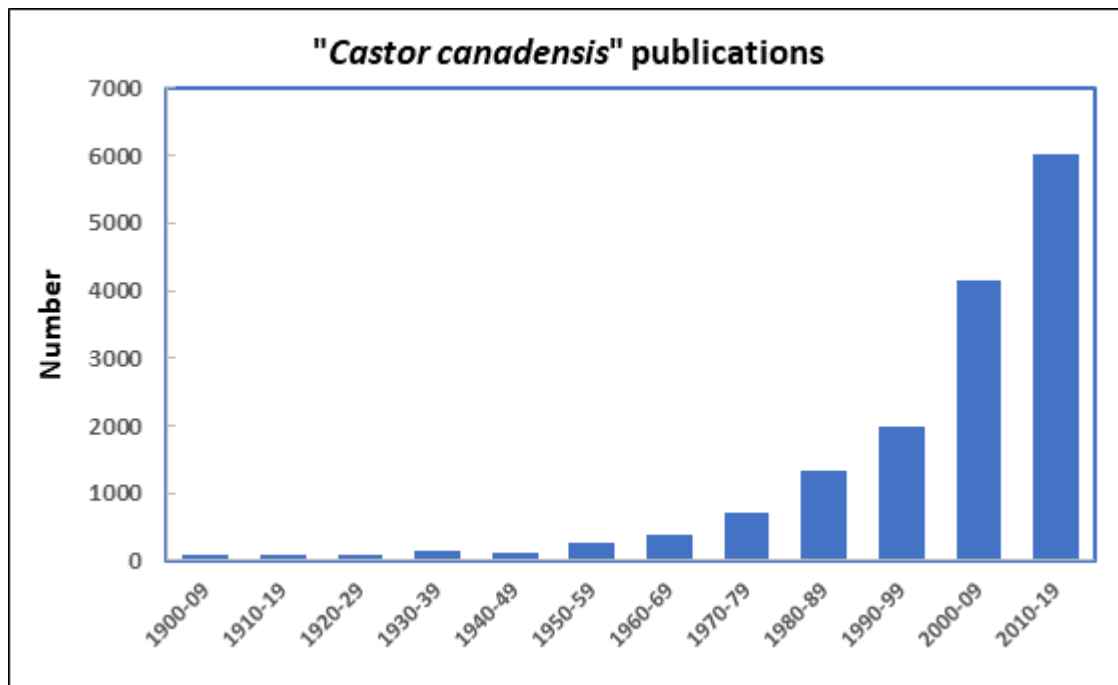


Figure 1. The number of publications containing "*Castor canadensis*" by 10-yr periods from 1900-2019 (n = 13,600). (Source: April 13, 2020 Google Scholar[®] search).

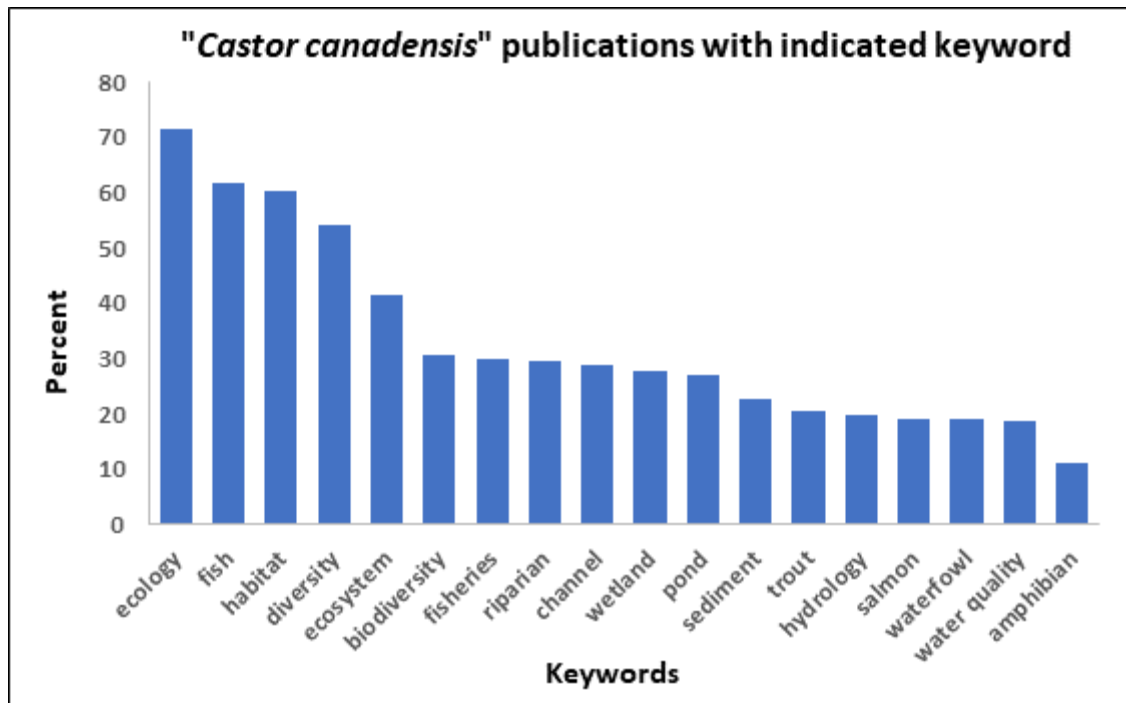


Figure 2. The percent of “*Castor canadensis*” publications that also contain the indicated keyword (n = 13,600). (Source: April 13 2020 Google Scholar® search).

From this increasing amount of “*Castor canadensis*” research and publications in recent decades, the scientific literature has confirmed that beaver dams, ponds, stream bank lodges, foraging, dispersal and other activities of this mammal can have a vast array of ecosystem benefits, such as:

Creating ponds and wetlands -- Beaver dams impound water, creating ponds of various sizes and dimensions. In low gradient environments, these ponds help create wetlands or expand existing ones. These effects were aptly demonstrated in Acadia National Park where beaver recolonization resulted in nearly a 90% increase in ponded wetlands (Cunningham et al. 2006).

Spreading water, storing groundwater, causing hyporheic flows -- Beaver dams often spread water onto adjacent floodplains, particularly during periods of high flow, enhancing the availability and storage of soil moisture on those landforms. Raised water tables adjacent to beaver ponds may also contribute to hyporheic flows (subsurface flow around and under a dam) and help to maintain base flows. In Yellowstone National Park, beaver dams were found to reduce late-summer water table declines by as much as 40 cm (16 inches) (Bilyeu et al. 2008).

Trapping sediment -- The slow-water environments associated with beaver ponds make them extremely effective at trapping sediments of all sizes, thus helping to maintain high water quality (Ringer 1994, Fouty 2003, Rosell et al. 2005, Demmer and Beschta 2008).

Growing a diversity of plants, storing carbon -- Riparian areas adjacent to beaver ponds contain a diversity of plant species because of the soil moisture gradients that commonly occur. These plant communities effectively remove and sequester carbon, both above-ground (stems of woody plants) and below-ground (root systems and the organic carbon in soils). The potential importance of carbon

sequestration was illustrated by results from a study in Rocky Mountain National Park where valley-bottom carbon storage declined by two-thirds following the removal of beaver, from 23% of the total landscape carbon storage to only 8% as wetlands were lost and meadows dried up (Wohl 2013).

Sustaining salmon and other aquatic species -- Broad, deep pools provide critical habitat for anadromous fish, such as young coho salmon in Oregon's coastal streams (Bruner 1989, ODFW 2005, Romer et al. 2008, Strickland et al. 2018), as well as resident fish species, such as Lahontan cutthroat trout and bull trout in the relatively arid portions of the state (Talabere 2002). An extensive loss of beaver ponds along Washington's Stillaguamish River was found to be the primary factor contributing to an 86% reduction in overall smolt production potential for coho salmon (Pollock et al. 2004). In Oregon's John Day River, an increase in beaver dam density in one tributary led to a 175% increase in juvenile steelhead production (Bouwes et al. 2016). Along with fish, amphibians, and aquatic invertebrates also benefit from the habitat created in beaver-influenced stream reaches.

Providing habitat for terrestrial wildlife -- Moisture gradients and abundant water are major factors in the diverse structure and composition of plants found in beaver-created ecosystems. Various deciduous tree species (e.g., aspen, willow, cottonwood) grow well in these moist environments. In turn, these species along with their understories of shrubs, forbs, and graminoids provide important physical habitat and food resources for a wide range of wildlife species, including pollinators, small mammals, bears, ungulates, and others. In Oregon and Washington, 95 of 147 mammal species (65%) utilize riparian areas (Kauffman et al. 2001).

Benefiting birds -- Some of the most important beneficiaries of having beavers present are birds. Ducks and migratory birds utilize beaver ponds and wetlands while songbirds commonly use willows, irrigated by elevated water tables, for nesting and perch sites as well as adjacent habitats with their variety of food resources. In northern Colorado 82% of breeding birds use riparian areas and in the southwestern US more than 75% of all bird species nest in riparian areas (Knopf 1985). Wyoming streams with beaver had 75 times more waterfowl than streams without beaver (McKinstry et al. 2007).

Moderating the effects of climate change -- Less snowfall, earlier springtime melt, lower summer flows, and increasing annual temperatures are becoming a prevalent signature of climate change in the American West (Abatzoglou et al. 2011, 2014). Such changes bring with them rising concerns about increased droughts and wildfires and their economic impacts on agricultural communities and ecological impacts to fish and wildlife. Beaver dams, ponds and associated wetlands can locally help maintain moisture-loving plant communities, as well as the terrestrial wildlife and avian species dependent upon them. Such areas also provide refugia during wildfires (Fairfax 2019). Thus, beaver provide a vital ecosystem buffer to many of the adverse effects of a changing climate.

The science today is abundantly clear, beavers have a fundamental role in sustaining productive riparian/aquatic and wetland ecosystems. Beavers can provide major benefits for supporting diverse plant communities, a large number of terrestrial and avian wildlife species, and fisheries and other instream organisms, while also helping to mitigate the effects of climate change and wildfires. Because of these critical ecosystem benefits, we urge the Commission to favorably consider the proposal to amend OAR 635-050-0070.

Sincerely,

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purposes and indicate the credentials
of the cosigners.*

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TO: Oregon Global Warming Commission
FROM: Beyond Toxics
DATE: June 1, 2021
RE: June 4th Meeting--NWL Goal Draft Strategy

Dear Chair Macdonald and Members of the Commission,

We are submitting these comments in response to the [Draft Strategy Recommendations](#) posted for the Commission's upcoming June 4th meeting on behalf of Beyond Toxics, a statewide environmental justice organization advancing policies that ensure meaningful participation and cultivating grassroots leadership from Oregon's frontline and impacted communities. Beyond Toxics also serves as Co-lead of the Natural and Working Lands Policy Tables of the Oregon Climate Action Plan (OCAP) Coalition, which engages at every step of the Executive Order on Climate Action (EO 20-04) implementation process to ensure the strongest possible outcomes for our climate, our communities, and our economy.

We appreciate the efforts the Oregon Global Warming Commission (OGWC or Commission) and the Oregon Watershed Enhancement Board have taken to engage with a variety of stakeholders and synthesize recommendations for ways in which we can reach statewide emissions reduction targets. These comments focus on Oregon's agricultural lands, which provide an important opportunity to enhance carbon sequestration and storage, support associated co-benefits, and improve community health and wellbeing.

First, we appreciate the common theme to "[e]nsure that equity is fully embedded in the prioritization and design of natural and working lands strategies." We wish to see more specific ways in which the proposed strategies will accomplish this and offer the following recommendations:

- Recognize that traditional best management practices and ecological knowledge form the foundation for the practices that sequester and store carbon on natural and working lands and that Black, Indigenous, and People of Color (BIPOC) communities have been practicing these for generations. Honor and support the production of traditional foods.
- Acknowledge that historically and currently disadvantaged groups face unique barriers to participation in the programs in place now and those imagined in the Draft Strategy. The state must actively and continually reach out to determine what resources socially disadvantaged farmers need to engage fully in these programs and successfully implement regenerative practices; then, design the programs to meet those needs.
- Set aside funding specifically for BIPOC farmers. The most effective way to ensure that program benefits are available to BIPOC and other disadvantaged producers is to set aside funds specifically for these groups. Refer to [HB 3112](#) as an example. The Commission could recommend the establishment of a similar model/program to create an Equity Fund for Oregon

farmers implementing climate-smart practices. Recommend continual appropriation of monies to the fund to be provided to qualified applicants for the equity program.

- Recommend that any technical assistance, education and outreach services be provided in multiple languages and formats to ensure these programs are accessible and culturally competent. Agency staff must be equipped with the skills needed to meaningfully engage with producers and workers from a wide range of backgrounds and cultures.
- Support all efforts to protect farmworkers from climate-related dangers like heat stress and exposure to wildfire smoke. Ensure that employers have a plan in place to provide these basic needs and that farmworkers are fully aware of the plan by working in direct conjunction with Oregon OSHA to ensure enforcement of climate-related worker protection standards.
- When developing the “centers of excellence” in Oregon Universities (Strategy #2) to support climate-smart land use and management practices, recommend that the programs actively seek out and provide direct financial support to BIPOC staff, students and faculty. We would like to see more details from the Commission about what the centers of excellence would look like.

Further, we fully support the creation of a natural and working lands implementation plan (Strategy #1) and recommend making the related programs more effective in the following ways:

- Ensure that the Natural and Working Lands Council is composed of a diverse group of councilmembers, including Native Tribal representatives.
- Application processes for programs stemming from the plan should be simple and straightforward. Staff should be available to assist applicants and provide support in multiple languages and formats. The application period should align with the off-season to minimize interference with production periods.
- Technical assistance will need to be available long-term for many of the techniques suggested in the Draft Strategy to successfully store carbon. This requires necessary investments in state agency resources and staff capacity so that producers receive continued support.

We also support the following recommended strategies to increase carbon sequestration and storage on Oregon’s natural and working lands and offer ways to strengthen them below:

- We appreciate the Commission’s clear focus on improving soil health and agree that the Legislature should provide funding for an in-house soil specialist at the Oregon Department of Agriculture. We also want to call for an emphasis on the importance of organics and regenerative farming practices in the establishment of this position, which reduce the need for additional inputs and increase climate resilience. We would like to see OGWC assist in the fulfillment of the position to ensure the specialist will take a climate-focused, holistic approach to improving Oregon’s soil health.
- We support the creation of an integrated soil health and climate-smart agriculture program in Oregon (Strategy #6). We advocate for a holistic approach to increasing soil health by incentivizing transitions to systems that build resilience to climate impacts and result in more fertile soil. For example, the state can do this by funding nutrient management research and incentivizing practices that optimize fertilizer application timing, placement, amount, and method, composting, and returning on-farm generated manure and plant residues to the land effectively recycling nutrients rather than applying more. This will reduce emissions and pollution resulting from fertilizer manufacturing and application as well.

- More can be done to promote the diversification of crop rotations and cover crops. These practices sequester carbon in the soil and reduce the need for synthetic fertilizers, thus mitigating emissions and improving water quality. Diversification also reduces vulnerability to pests and disease, in turn reducing the need for pesticides that harm pollinators, water quality, and soil health.¹ The state should set regionally-appropriate targets for adoption of diverse crop rotations and cover crops, provide technical assistance for implementing these practices, and incentivize these practices.

Finally, the Draft Strategy Recommendations should also address the following:

- In addition to expanding urban forest canopy, the Commission should recommend support for community-based gardens and urban farms. This will further aid in reducing heat island effects while providing sources of education, community connections, and nutrition.
- The Draft Strategy should address renewable energy. Encourage and incentivize the use of renewable energy (wind and solar) in agriculture to reduce GHG emissions and energy costs. Provide grants and/or tax incentives for installation of renewable energy projects on farmland. Offer education, outreach, and technical assistance to help farmers integrate renewable energy projects on land for crop or livestock production and develop resilient food-production and energy-generation systems.
- The Draft Strategy should address manure from industrial-scale livestock facilities. Manure emits significant amounts of potent GHGs methane and nitrous oxide, contaminates groundwater, and introduces toxic pollutants like hydrogen sulfide and particulate matter into the air. This leads to grave environmental and public health concerns for workers and communities living near these operations. Support practices that reduce the production and concentration of manure and improve its storage and application, such as imposing size limitations on industrial livestock facilities or incentivizing producers who transition from industrial livestock systems to grazing-based systems.

Thank you for your work in developing a strategy to achieve Oregon's climate goals and the opportunity to provide feedback.

Sincerely,

Grace Brahler, Oregon Climate Action Plan & Policy Manager, gbrahler@beyondtoxics.org

Wendy Mintey, Southern Oregon Environmental Justice Grassroots Organizer,
wmintey@beyondtoxics.org

[Beyond Toxics](#)

Lane County Office: 120 Shelton McMurphey Blvd., Suite 280, Eugene, OR 97401

Jackson County Office: 312 N. Main St., Suite B, Phoenix, Oregon 97535

Phone: (541) 465-8860

¹ See Giovanni Tamburini et al., Agricultural Diversification Promotes Multiple Ecosystem Services Without Compromising Yield, 6 *Sci. Advances* 2020 eaba1715 (2020), available at <https://advances.sciencemag.org/content/6/45/eaba1715>.

Written Public Comment for Oregon Global Warming Commission Meeting 6/4/21

Date: May 31, 2021

To: Oregon Global Warming Commission (OGWC)

From: Megan Kemple and Grace Brahler, Co-Leads of Ag/water subtable of Oregon Climate Action Plan (OCAP) Coalition

Re: [Draft Strategy Recommendations](#) and process for feedback on future drafts

Oregon Climate and Agriculture Network (OrCAN) and Beyond Toxics serve as Co-leads for the ag/water policy table of OCAP Coalition. The OCAP Coalition engages at every step of implementation of the EO on Climate Action to ensure the strongest possible outcomes for our climate, our communities and our economy.

Our policy table provided shared recommendations for practices, incentives and other policy options Oregon should pursue to achieve a natural and working lands emissions and sequestration goal via email to the OGWC and state agencies on May 10, 2021. Those recommendations are attached again, here.

We have reviewed the [Draft Strategy Recommendations](#) posted for the June 4th meeting. We are both pleased to see so many of the strategies that we recommended reflected in the Commission's draft and think that there are several areas where the draft strategies could be strengthened.

The Commission's Draft Strategies include this language: "In addition to the immediate actions the Legislature should take to jump start a natural and working lands program, state agencies should take steps now to position the state to capitalize on federal investments in natural and working lands strategies that are being considered by the Federal Administration and Congress." We believe state agencies may only have capacity to do this well if they are provided with funding to do so, which is certainly an action the Legislature can take as it determines agency budgets for the 2021-23 biennium. We encourage you to include some reference to this priority and funding in both immediate and longer term recommendations.

Overall:

The development and implementation of these programs and practices should focus on public health improvements and economic opportunities, prioritize disadvantaged communities, and reduce risks to disadvantaged and vulnerable communities from climate impacts. We encourage you to be more specific/explicit about this, especially in light of the Commission's past discussions to be mindful of the community impacts associated with the forthcoming natural and working lands goal.

We appreciate the inclusion of Strategy 1) Develop a natural and working lands implementation plan. Additional stakeholder engagement will be needed to provide

input on the Plan as well as programs that may be developed. The State should facilitate multi-stakeholder collaboration, both public and private, to advance these recommendations and engage in soil health, carbon sequestration and climate resiliency programs that would benefit Oregon's agricultural lands and watersheds. Stakeholder engagement must include: farmers and ranchers engaged in a variety of types of agricultural practices including organic, conventional, regenerative and sustainable practices; BIPOC producers and farmworkers; soil and climate scientists; environmental and water advocates. Engage stakeholders including local governments, irrigation districts, state and federal agencies, and non-governmental organizations, etc. Engage in regional discussions considering collaborative and multi-state efforts.

We would like more clarity on Strategy 2) Design and support the creation of centers of excellence for research on sequestration in natural and working lands in Oregon. As currently written, it is unclear what "centers of excellence" means.

In relation to agriculture:

Overall, the Draft Strategy Recommendations include effective strategies to create and fund management programs to support agricultural practices that increase sequestration of carbon in the soil and reduce greenhouse (GHG) gas emissions.

We appreciate the inclusion of Strategy 6) Invest in Climate Smart Agricultural practices on Oregon's crop and rangelands. We encourage you to be specific about the importance of providing incentives directly to farmers and ranchers in the form of grants. In addition to funding for implementation of practices, research and technical assistance, the Program should include funding for education. The Program should prioritize distribution of funding to historically disadvantaged producers.

In relation to water and watershed health:

The Draft Strategy Recommendations properly call attention to the need to preserve and restore wetland ecosystems that sequester carbon as well as the numerous co-benefits that stem from managing aquatic ecosystems using a climate lens.

We appreciate the inclusion of Strategy #7) Increase protection and restoration of carbon rich ecosystems tidally influenced coastal ecosystems. However, the Commission could encourage climate-focused watershed management on a broader scale. River floodplains offer carbon sequestration potential, and watersheds across the state should be managed from a climate mitigation and adaptation perspective. State agencies should be adequately staffed and resourced to be able to integrate climate mitigation and adaptation into their plans and programs.

We appreciate the many opportunities for stakeholder engagement in this process, however it has been unclear exactly when and how we'll be given the opportunity to provide input on draft recommendations. For example, the draft strategies were posted as meeting materials with the usual opportunity for public comment, but there was no information provided in the meeting materials or agenda about upcoming opportunities for stakeholder review and feedback on drafts. We are not providing comprehensive feedback on the draft strategies at this time and would like the opportunity to do so. We'd appreciate as much clarity as the Chair can provide about when drafts will be posted for review and how we can provide feedback so that we can prepare for those opportunities.



May 10, 2021

Chair Macdonald and members of the Oregon Global Warming Commission:

On behalf of the Oregon Climate Action Plan (OCAP) Coalition, we are providing shared recommendations for practices, incentives and other policy options Oregon should pursue to achieve a natural and working lands emissions and sequestration goal. The OCAP Coalition engages at every step of the Executive Order on Climate Action (EO 20-04) implementation process, working to ensure the strongest possible outcomes for our climate, our communities and our economy.

Overarching Goals and Objectives

Increase adoption of practices that sequester carbon in the soil or reduce GHG emissions on Oregon's natural and working lands.

The adopted policies and practices should contribute to Oregon's path to reduce its GHG emissions (1) at least 45 percent below 1990 emissions levels by 2035; and (2) at least 80 percent below 1990 emissions levels by 2050.

Create and fund management and conservation programs to support practices that increase Oregon's overall sequestration of carbon in the soils and waters and reduction of other greenhouse (GHG) gases. These practices provide co-benefits such as enhanced soil health and productivity, soil water retention and quality, enhanced fish and wildlife habitat.

The development and implementation of these programs and practices should focus on public health improvements and economic opportunities, prioritize disadvantaged communities, and reduce risks to disadvantaged and vulnerable communities from climate impacts.

Facilitate multi-stakeholder collaboration, both public and private, to advance these recommendations and engage in soil health, carbon sequestration and climate resiliency programs that would benefit Oregon's agricultural lands and watersheds. Stakeholder engagement must include: farmers and ranchers engaged in a variety of types of agricultural practices including organic, conventional, regenerative and sustainable practices; BIPOC producers and farmworkers; soil and climate scientists; environmental and water advocates. Engage stakeholders including local governments, irrigation districts, state and federal agencies and non-governmental organizations, etc. Engage in regional discussions considering collaborative and multi-state efforts.

AGRICULTURE

Policy:

Create and fund management programs to support agricultural practices that increase sequestration of carbon in the soil and reduction of greenhouse (GHG) gas emissions. These practices provide multiple co-benefits such as: enhanced soil health and productivity, water retention and water quality, reduced erosion, microbial balance, pollinator, fish and wildlife habitat, and reduction of harmful algae blooms.

Practices and Incentives

1. Develop and periodically update an Oregon Agriculture Climate Resiliency and Mitigation Plan as a basis to strategically plan and implement future sequestration and emission goals and respond to existing and future climate impacts.
2. Support expansion of technical assistance by state and federal agencies, soil and water conservation districts, Oregon State University Extension, and non-governmental organizations to promote soil health practices that contribute to carbon sequestration such as:
 - a) reduced tillage or no-till,
 - b) rotational grazing,
 - c) cover cropping,
 - d) mulch and compost application,
 - e) hedgerow and riparian plantings,
 - f) silvopasture or agroforestry,
 - g) growth of deep rooted annual and perennial crops and rangeland grasses,
 - h) reduced and selective chemical inputs,
 - i) diversified cropping systems, and
 - j) other organic and regenerative practices.
3. Invest in programs to support adoption of practices which reduce GHG emissions or otherwise mitigate climate change:
 - a) Climate friendly nutrient management to reduce nitrous oxide emissions;
 - b) Alternative manure management in dairy, poultry and livestock production;
 - c) Organic waste composting systems;
 - d) Sustainable and organic production systems;
 - e) On farm strategies to reduce fossil fuel use such as reduced tillage and renewable energy systems;
 - f) Production systems which reduce or eliminate the use of black plastic;
 - f) Irrigation modernization and other water and energy conservation strategies;
 - g) Practices that predict and preempt insect pressure and outcompete invasive weed species, rather than using fossil-fuel based pesticides and delivery systems;
 - h) Climate-related wildfire prevention on agricultural and range lands.

4. Build on ODA's planned [Soil Health Baseline Assessment](#) and other existing tools to guide policy and program priorities:

- a) Expand the planned [Soil Health Baseline Assessment](#) to include soil microbial health;
- b) Use the Moore et al. report, "[Potential for Conservation Practices to Reduce Greenhouse Gas Emissions and Sequester Carbon on Croplands and Grazing Lands in Oregon,](#)" as a reference guide for generating priorities and identifying research needs;
- c) Use existing estimating and mapping tools to estimate the potential for soil carbon sequestration on agricultural lands.

5. Encourage the Oregon Legislature to adopt Healthy Soils Legislation that would create a Soil Health Grant Program or other incentive programs to fund the implementation of soil health practices including those that promote carbon sequestration. Consider models from other states such as New Mexico, Washington and California. In addition to funding for implementation of practices, the Program should include funding for research, education, demonstration, and technical assistance. The Program structure should provide technical assistance to BIPOC producers for the grant application process; prioritize distribution of funding to historically disadvantaged communities; and support community-based and urban farm projects supporting youth and BIPOC farmers.

6. Support Oregon's Land Use Planning Program and other efforts to protect Oregon's agricultural and other natural and working lands, to reduce GHG emissions and assure their potential for carbon sequestration, in ways such as:

- a) Significantly reducing the number of non-agriculture related uses permitted on lands zoned "exclusive farm use" (EFU) and allowing the conversion of these lands to non-resource uses only under limited circumstances;
- b) Maintaining compact urban growth boundaries, allowing expansion onto natural and working lands only when proven necessary;
- c) Preventing and/or mitigating impacts of major public and private facilities such as highways, pipelines, energy production and storage, etc.;
- d) Providing sustainable funding for the Oregon Agricultural Heritage Program;
- e) Supporting land trusts and other organizations engaged in farmland conservation, farm and ranch succession planning, and assistance and support to new farmers.

7. When natural and working lands are proposed for conversion to non-resource uses, or when major public facilities are proposed, the decision-making criteria shall include an assessment and mitigation of climate impacts, including greenhouse gas emission consequences and loss of carbon sequestration potential.

WATER AND WATERSHED HEALTH

Policy:

Develop watershed health and management plans and programs from a climate perspective. These plans and programs should address carbon sequestration, greenhouse gas emissions reductions, and associated co-benefits such as forest health, groundwater storage, improved watershed health and water quality, and enhanced fish and wildlife habitat.

Practices and Incentives

1. Preserve, restore, and protect floodplains, wetlands, riparian buffers, and estuaries to promote carbon sequestration.
2. Encourage the Governor and the Legislature to fund the necessary staff positions and programs to support carbon sequestration, emissions reduction, and other climate mitigation practices in Oregon's aquatic habitats.
3. State agencies should incorporate climate criteria into water agency grant programs and dedicate staff to incorporating climate change mitigation and sequestration objectives into agency programs.

Signed by member organizations of the Agriculture and Water Policy Sub-table of the Oregon Climate Action Plan (OCAP) Coalition,

Greg Holmes, Food Systems Program Director, 1000 Friends of Oregon

Addie Candib, Pacific Northwest Regional Director, American Farmland Trust

Lisa Arkin, Executive Director, Beyond Toxics

Ray Seidler, Cultivate Oregon

Amy Wong, Policy Director, Friends of Family Farmers

Jan Lee, Executive Director, Oregon Association of Conservation Districts

Megan Kemple, Co-Director, Oregon Climate and Agriculture Network

Karen Lewotsky, Rural Partnerships and Water Policy Director, Oregon Environmental Council

Ira Cuello-Martinez, Climate Policy Associate, PCUN

Sent via form submission from [Keep Oregon Cool](#)

Name: Marilyn Feldhaus

Email Address: mjfeldhaus@jps.net

Subject: Ex. Order 20-04 Forest Climate Policy

Message: Having fairly recently moved to Portland from San Jose, CA I am concerned at just how rapidly the climate here in Oregon appears to be changing, and not for the better. It seems to me that Portland is beginning to experience the sort of climate we ended up with in San Jose - less rain, hotter temperatures, warmer winters and hotter summers, and of course, drought.

Knowing that all these affect forests negatively, I urge climate and forest friendly practices when it comes to forest management. Healthy forests can mitigate the effects of climate change and preserve our water supply; effective, science based forest and logging policies can also assist in preventing the sort of destruction that out of control wildfires cause.

Our forests and woodlands are vital for the health of Oregon's people, wildlife, economy, and natural beauty. Please be as bold and ambitious as you can be with preserving the long and short term health of our forests via implementation of science based, natural forest management practices.

Thank you.

Sent via form submission from [Keep Oregon Cool](#)

Name: John Christensen

Email Address: nagarkot247@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy

Message: Dear Chair Macdonald and Members of the Oregon Global Warming Commission:

I am a small woodland owner living in the rural area of East Multnomah County. In our forested property we have experienced the effects of global warming with increased length of fire seasons, drought conditions as the underground aquifer is drawn down toward the end of summer, and decreased humidity and increased dryness of woody fuels in the forest. Four years ago, we had to evacuate our farm because of the Eagle Creek fire. Last fall we endured several days of unhealthy air from wildfire smoke—above 596 ppm. These effects, however, pale to insignificance with climate change stress happening in many parts of the world: increased frequency of violent storms, increased drought, food insecurity, spread of tropical diseases as mosquito-borne illnesses spread to higher latitudes and altitudes, and increased climate migration as refugees move to less impacted areas.

I urge you to adopt climate smart forestry practices that would meet the standards set by the Forest Stewardship Council. Climate smart forestry relies on forest stewardship that increases carbon storage across the forest landscape while also recognizing the need to increase forest resilience. Research shows that the biggest bang for the buck from natural climate solutions is to keep trees in Pacific Northwest forests standing longer before logging them – 80 years or more can provide good timber production while increasing stored carbon. We also need to keep more diverse species of trees - especially mature and old growth trees - on the land. If we do this, we increase stored carbon, promote biodiversity and protect our drinking water supplies.

We have made the decision to sequester carbon in our forest and have entered into a contract with the California Air Resources Board to sell carbon credits on their cap and trade exchange. In turn we agree not to harvest trees for 125 years. I urge you to develop incentives for private woodland owners to implement climate smart forestry practices on their lands.

In conclusion, I ask that you be bold and ambitious and to do all you can to make Oregon a national leader in using natural climate solutions to address our climate crisis.

Sent via form submission from [Keep Oregon Cool](#)

Name: Inga Fisher Williams

Email Address: ifisherw@gmail.com

Subject: Comments for June 4 meeting, EO 20-04 Forestry Climate Policy

Message: Dear Chair MacDonald and members of the OGW Commission,

Urging you to craft a forestry management policy that recognizes science of stewardship and climate change impacts we have already witnessed. It must aim for diversity of stands, protect areas of rich biodiversity, save remaining old growth stands and protect water resources.

Oregon should be a leader to adapt to new realities of droughts, higher temperatures and vulnerabilities for trees, animals and people. Business as usual won't do.

We need longer rotations for Douglas fir logging, 80 years not 40.. I have seen on hikes the incredible destruction of logging that rips out ALL trees and scoured the land, destroying natural water flows. A moon scape is left, baking in the summer sun. The most productive chanterelle stands on Mary's Peak wiped out when old growth was cut, trees toppled, gigantic root balls torn free, leaving the hillside as if B52s had used it as a bombing range. Clear cuts are an abomination should be phased out completely. This is long over due.

Here are a few principles that must undergird forestry practices moving forward:

- Use the best available science for all forest management practices to ensure both the short and long term ecological health of our forests.
- Adopt climate smart forest practices that are adapted to the various climate and geographic regions of our state.
- Adopt key climate smart practices for our state and private forested lands such as: longer logging rotations – at least 80 years for our Douglas fir forests; increasing retention of green trees and greater diversity of trees after logging; elimination of logging in our most biologically significant, carbon rich, mature and old growth forests.
- Manage our forests so that we are also protecting our water resources for people and wildlife.
- Provide incentives for small forest landowners to implement climate smart forestry practices on their lands.

Thank you for your consideration.

Inga Fisher Williams

NE Portland

Sent via form submission from [Keep Oregon Cool](#)

Name: Jeanne Roy

Email Address: jeanneroy62@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy

Message: To: Chair Macdonald and Members of the Oregon Global Warming Commission.

From: Jeanne Roy, 6805 SW 12th Ave, Portland 97219

Date: May 29, 2021

Oregon must do more to prevent the serious fires and storms caused by climate change. My husband and I were without power for six days during the ice storm in mid-February and spent weeks cleaning up the downed tree branches.

I understand that Oregon is not on track to meeting our climate goals, and to get on track we need to cut fossil fuels emissions and establish strong policies for our working lands. I urge you to adopt practices that

- Meet the standards set by the Forest Stewardship Council.
- Establish longer logging rotations – at least 80 years for Douglas fir forests.
- Require a diversity of trees after logging.
- Eliminate logging in our most biologically significant, carbon rich, old growth forests.
- Provide incentives for small forest landowners to implement climate-smart forestry practices on their lands.

Let's make Oregon a national leader in addressing climate change.

Sent via form submission from [Keep Oregon Cool](#)

Name: Jay Hughes

Email Address: wjayhughes@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy.

Message: Chair MacDonald and Members of the Oregon Global Warming Commission: I call on you to adopt climate smart forestry practices that meet the standards set by the Forest Stewardship Council. Thank you, Jay Hghes

Dear Chair Macdonald and Commission Members,

When you meet June 4, please consider carefully the actions needed to help meet our Greenhouse Gas reduction goals. Oregonians want to lead the nation in using natural climate solutions to help us both mitigate and adapt to the many harms we face with climate change. They are key tools to mitigate droughts and wildfires and other issues around climate change.

I urge the OGWC to adopt forestry practices that would meet the standards set by the Forest Stewardship Council. Among the practices needed: longer logging rotations; elimination of logging in mature and old growth forest; management of forests to protect water resources; and incentives for small forest landowners to implement smart practices.

Be ambitious about this and make Oregon a leader in addressing our very real climate crisis!

Thank you.

Marilyn McFarlane

Sent via form submission from [Keep Oregon Cool](#)

Name: Sylvia Hart-Landsberg

Email Address: shartlandsberg@gmail.com

Subject: Take bold action to protect the environment in June 4th meeting on recommendations

Message: I am writing to urge the Oregon Global Warming Commission to take strong actions to reduce greenhouse gas. I urge you, in the June 4 meeting for developing climate policy recommendations, to remember that how we treat our natural and working lands will play a pivotal role in achieving this goal. You are in the position to have an outsize impact on the climate by helping to make Oregon a national leader in mitigating crisis Earth and its inhabitants are facing.

One of several areas of concern the Commission can affect is forestry. Please do all you can to promote and guide the adoption of climate-smart practices for our state and private forested lands:

longer logging rotations – at least 80 years for our Douglas fir forests

increasing retention of green trees and greater diversity of trees after logging

elimination of logging in our most biologically significant, carbon rich, mature and old growth forests

The health of our environment and our population depends on these practices and on the use of the best science for forest management, adaptation of practices to diverse Oregon ecosystems, policies for water-protection, and incentives for small forest landowners to prioritize sustainability.

Thank you for your service and for your consideration of this letter.

Sylvia Hart-Landsberg

Sent via form submission from [Keep Oregon Cool](#)

Name: Emily Herbert

Email Address: ewh1960@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy.

Message: Chair MacDonald and members of the OGWC, As the daughter of a career USFS parent, I have always cared about the preservation of Oregon forests in their natural state. I care now more than ever in the face of climate chaos. Our recent learnings from peer reviewed science, e.g., Beverly Law at OSU, indicate that simply lengthening rotations of Douglas Fir to an average of 80 years and following the practices of the Stewardship Council in managing the lands for biodiversity, watershed protection and preservation of riparian areas will go a long way to preserve the forest ecosystem. Please be courageous in acting for the good of the future of generations to come and break the hold of distant corporate profiteers from the continued early harvesting and treating of forests as plantations instead of the carbon sequestering natural systems they are and may continue to be. Thank you for your service to our climate future.

Sent via form submission from [Keep Oregon Cool](#)

Name: Daniel Frye

Email Address: danielfrye@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy

Message: Chair Macdonald & Committee Members,

Climate change is the most important economic, public health & safety, national security & environmental crisis of our time and Oregon Forests are not yet being managed to help combat the crisis.

I urge the Committee to adopt climate-smart forestry practices that meet or exceed the standards set by the Forest Stewardship Council. Some key elements of that would be:

- * Manage our forests for all Oregonians - protect our water sources, our wildlife, our recreation areas, not just for our timber industry
- * Adopt climate smart forestry practices region by region
- * Make increased carbon stores a pervasive goal for our forests in all regions - Do this by incentivizing longer logging rotations (80+ years for Doug fir) and eliminating logging in our carbon rich mature and old growth forests

The current forestry practices in Oregon are far behind our nearest neighbors and need to be comprehensively upgraded to practices based on the best available science.

Please help lead Oregon to make sure Oregon Forests are a major part of Oregon's part of combating the climate change crisis.

Sincerely,
Daniel Frye, PhD
Metro Climate Action Team
Portland

Sent via form submission from [Keep Oregon Cool](#)

Name: David DeVore

Email Address: the2devores@gmail.com

Subject: Executive Order 20-04 Forest Climate Policy

Message: Dear Chair Macdonald and Members of the Oregon Global Warming Commission,

Most Oregonians I know and I are extremely concerned with the impact of climate change in Oregon and around the world. This past year gives a small clue of what the present and future look like with uncontrollable wildfires and devastating droughts. Oregon has a chance to be a leader in combating climate change through using natural climate solutions.

I urge you to adopt the standards set by the Forest Stewardship Council. We need to adopt practices like letting Douglas Fir forests grow for a minimum of 80 years, save our old growth forests for biodiversity, and have diverse tree species after logging.

Be the leading state and show by example that Oregonians care about capturing carbon through bold forest policies.

Sent via form submission from [Keep Oregon Cool](#)

Name: Lisa cohn

Email Address: lisaEllenCohn1@gmail.com

Subject: Please Adopt Climate Smart Forestry Practices!

Message: Dear Oregon Global Warming Commission,

I live on Forest Park and value the beauty and diversity of the forest. It means so much to me to walk, hike and run in this magical place that's rich in plant species and home to birds, squirrels, coyotes and other wildlife. Every day, walking in Forest Park brings me peace and happiness.

As a forest lover, I am devastated by the fires occurring in Oregon.

I urge the OGWC to adopt climate smart forestry practices that would meet the standards set by the Forest Stewardship Council. That means using the best available science for all forest management practices to ensure both the short-term and long-term ecological health of our forests, adopting climate smart forest practices that are adapted to the various climate and geographic regions of our state. It means adopting specific climate smart practices for our state and private forested lands such as: longer logging rotations – at least 80 years for our Douglas fir forests; increasing retention of green trees and greater diversity of trees after logging. It means eliminating logging in our most biologically significant, carbon rich, mature and old growth forests.

I also urge you to manage our forests so that we are protecting our water resources for people and wildlife.

Please provide incentives for small forest landowners to implement climate smart forestry practices on their lands.

Oregon's forests are such incredible resources to citizens like me. Please do all you can to ensure Oregon is a national leader in using natural climate solutions to address the climate crisis.

Thank you for reading.

Lisa Cohn

Sent via form submission from [Keep Oregon Cool](#)

Name: Maria Nazzaro

Email Address: marianazzaro@mail.com

Subject: Upcoming OGWC meeting

Message: Please adopt climate smart forestry practices that would meet the standards set by the Forest Stewardship Council.

Use the best available science for all forest management practices to ensure both the short and long term ecological health of our forests.

- Adopt climate smart forest practices that are adapted to the various climate and geographic regions of our state.
- Adopt key climate smart practices for our state and private forested lands such as: longer logging rotations – at least 80 years for our Douglas fir forests; increasing retention of green trees and greater diversity of trees after logging; elimination of logging in our most biologically significant, carbon rich, mature and old growth forests.
- Manage our forests so that we are also protecting our water resources for people and wildlife.
- Provide incentives for small forest landowners to implement climate smart forestry practices on their lands.

Sent via form submission from [Keep Oregon Cool](#)

Name: James Newcomer

Email Address: jnewcomer@spiretech.com

Subject: Importance of Forest Sequestration - Public Knowledge is Key

Message: Although I've worked at both wind energy project planning and recycled wood products and have been dedicated to sustainability since 1972, I have no professional knowledge of forestry.

Nevertheless, I am told that our old growth forests on the West Slope are among the most efficient natural ways to sequester CO2 in the world.

There are several critical elements to consider - ownership,, finance, livelihoods among them. But the most important, IMO, is gaining widespread public awareness and acceptance of the importance of our old forests in turning global warming around.

So I plead for you to focus on getting the word to media and the public. When the public knows about the issue and demands solutions, the rest will follow.

Why hasn't anyone lobbied the Governor for more solar programs for private home owners ?

Thank you !

Rick Conant 153 N. West 17th. Street Ontario, Oregon 97914

To: Chair Macdonald and Members of the Oregon Global Warming Commission
From: Metro Climate Action Team
Cc: Governor Brown, Kristen Sheeran, Oregon Board of Forestry
Re: Executive Order 20-04 Forest Climate Policy Brief
Date: 5/25/2021

Dear Chair Macdonald and members of the Oregon Global Warming Commission,

We, the Metro Climate Action Team, a group of dedicated volunteers sponsored by the Oregon League of Conservation Voters, urge you to recognize and act on the scientific fact that our forests represent by far the most important natural climate solution for storing and sequestering carbon on both state and private lands.

Much has been written about climate smart forestry. We offer you a rather simple but science-based definition: Climate smart forestry is simple when you boil it all down. Primarily, it is about ensuring forest stewardship that increases forest carbon storage across the landscape. Research shows that the biggest bang for the buck from natural climate solutions is to have longer logging rotations – 80 years or more can provide good timber production and financial returns while increasing stored carbon. We also need to keep more standing and diverse species of trees - especially mature and old growth - on the land. Maintaining and increasing stored carbon should be compatible with the additional benefits of promoting biodiversity, protecting our drinking water supply watersheds and providing for resilience to climate change.

We encourage the OGWC to be bold in your recommendations and to position Oregon as a national leader in shifting our approaches to natural resource management so that our chief priority is to take advantage of these resources as invaluable in combating climate change. This requires that we question long accepted practices and recognize the need to change many of these practices.

Oregon will need to adopt a host of new rules, regulations and practices to both mitigate and then help us adapt to the harms we are experiencing now as a result of climate change, ranging from catastrophic wildfires to severe draughts. And we know these harms will only increase in the future. One simple approach will be to adopt practices that will meet the standards defined to achieve Forest Stewardship Council certification. We know such an approach to forest management can provide environmental, social and economic benefits.

Be Bold! Do the Right Thing! Ensure Oregon is National Leader!

Metro Climate Action Team Steering Committee: Brett Baylor, Rick Brown, Pat DeLaquil, Daniel Frye, Debby Garmin, Mark McLeod, KB Mercer, Michael Mitton, Rich Peppers, Rand Schenck, Jane Stackhouse

To: Catherine MacDonald OGWC

Committees/SEE/Overview LPRO Staff Beth.Reiley@oregonlegislature.gov

Committees/HAGNR/Overview LPRO. stuty.maskey@oregonlegislature.gov

[House Committee On Energy and Environment](#). erin.pischke@oregonlegislature.gov

Cc: Megan Kemple - Oregon Climate and Agriculture Network

Find below 'Role of Agriculture in Carbon Sequestration' possible expert witness . This information came via a League member, a recent retired OSU faculty member. The League has prioritized Natural and Working Lands topic within the Natural Resource and Climate related policy areas and specifically in the Governors 20-04 Executive Orders and encourage more timely discussion and legislation and related funding on this important critical resource.

Let us know how we can continue to assist in with this critical policy area. Perhaps Megan Kemple, copied, Co-Director of Oregon Climate and Agriculture Network, knows of Georgine Yorgey or has other suggestions for expert testimony.

Claudia

Claudia Keith
LWVOR Action – Climate Emergency Coordinator
LL 5417520591
Ca.keith@comcast.net

Georgine Yorgey the Associate Director of Washington State University’s Center for Sustaining Agriculture and Natural Resources, where she has worked since 2009 and among other things, co-leads The Center’s efforts related to climate change and agriculture. She grew up in Oregon, “where early exposure to vegetable and fruit breeding and food processing convinced her that she wanted to work on issues related to agriculture and sustainability” (<https://loop.frontiersin.org/people/381143/bio>).

Two publications of Georgine Yorgey seem relevant to the committee’s needs:

a) **Carbon sequestration potential in cropland soils in the Pacific Northwest: A summary of what we know and what gaps there are.**

Cropland agricultural soils have the potential to either release (be a source of) or capture and sequester (become a sink for) carbon. **We provide a summary of existing experimental and modeling evidence for the potential that cropland soils in the Pacific Northwest have for sequestering organic carbon, and identify remaining knowledge gaps.** The purpose of this summary is to provide context for regional policy discussions intent on fostering farming practices that show the best potential for carbon sequestration. We review regional research on the impacts of agricultural management strategies on carbon sequestration, including tillage, crop rotation, fallowing, perennial crops, crop fertilization, soil amendments, reduced burning, and reduced erosion. **Our summary suggests that a number of practices can provide real but modest contributions to carbon sequestration.** The opportunities to build soil organic carbon are greater in annually cropped systems with higher productivity, though the benefits of particular management practices are variable and depend on multiple environmental and physical conditions. **Therefore, there is a need to establish credible estimates of carbon fluxes for Northwest agricultural systems. These estimates must also be accompanied by monitoring to determine whether cropland soils are achieving carbon sequestration goals.** Thoughtful consideration of the environmental and production contexts surrounding Pacific Northwest agriculture, combined with targeted research to identify the most effective carbon sequestration practices, could lead to the development of policies that can realize the real contributions that croplands in the Pacific Northwest can make to climate change mitigation efforts.

<http://s3-us-west-2.amazonaws.com/wp2.cahnrs.wsu.edu/wp-content/uploads/sites/32/2019/04/CarbonSeqPNW-for-CSANR-website-FINAL.pdf>

b) **Farmer-to-Farmer and Rancher-to-Rancher Case Studies series.**

Authors include: Yorgey, G., Borrelli, K., Painter, K., Davis, H., Hall, S., Hudson, T., Neibergs, S., Reeves, M., Kruger, C., McGuire A., Finkelnburg, D., Roe, D., Brooks, E., and Kantor, S. 2016-2019. PNW Extension Publications and videos. **These series explore strategies that innovative regional farmers and ranchers are using that enhance resilience to climate change and other future challenges.** Case studies highlight producers in dryland and irrigated annual cropping, rangeland, and dairy production systems. Practices relate to soil health, diversification, responsive management, and many others.

[Visit Farmer-to-Farmer & Rancher-to-Rancher Case Studies Series https://csanr.wsu.edu/case-studies/](https://csanr.wsu.edu/case-studies/)

Janine Benner, Director, Oregon Dept. of Energy (Janine.Benner@oregon.gov)

Catherine MacDonald, Chair, Oregon Global Warming Commission (cmacdonald@tnc.org)
(Oregon.GWC@oregon.gov)

Janine and Catherine, please provide an update for what detail budget funding is needed to ensure OGWC has staffing and other required resources, specifically related to implementing Governor Brown's 20-04 Executive Orders and any other new related legislation.

This earlier League March 3, 2021 Letter has this description that needs to be updated.

"The League also supports at least one staffer for the Oregon Global Warming Commission (per the OGWC 2020 Report recommendations to the Legislature: #5 "Increase funding for the Oregon Global Warming Commission to expand staff and analytic capacity. ") Currently their budget includes part of a position within the Planning and Innovation Division according to notes from their July meeting. We see listed at least four ODOE staff presenting at the OGWC's March 5 meeting. **As more is being asked of this important volunteer group, including two tasks under the Governor's Executive Order 20-04, Oregonians should help pay for staffing and contract work needed to address their 2020 Report.** Among OGWC's work assignments: Coordinating with the Dept. of Agriculture, Dept. of Forestry and the Oregon Watershed Enhancement Board focused on state goals for carbon sequestration and storage by Oregon's natural and working landscapes. While a report on this assignment is due by the end of this biennium, implementation of the recommendations will fall on the 2021-23 biennium. As this session moves forward, we expect that this legislature will add tasks to this important Commission."

<https://olis.oregonlegislature.gov/liz/2021R1/Downloads/PublicTestimonyDocument/10428>

Thank you for assisting us with our budget concerns,. The League wants to ensure this critical OGWC funding is addressed during this Legislative session.

Claudia

Claudia Keith

LWV Oregon Action - Climate Emergency Coordinator

LL5417520591

Ca.keith@comcast.net

Sent via form submission from [Keep Oregon Cool](#)

Name: Elizabeth Cordova

Email Address: cakid61@yahoo.com

Subject: Oregon Should Restore and Protect Tidal Swamps

Message: The Oregon Global Warming Commission has a chance to help protect and restore forested tidal wetlands when it meets in June to determine how the state can best fight climate change. Here are nine reasons the commission should prioritize action on tidal swamps:

Tidal swamps support nature-based industries, such as commercial and recreational fisheries, that are key to the economic vitality of Oregon communities.

These tidal wetlands slow and absorb floodwaters, helping protect coastal communities.

Tidal swamps are laced with deep tidal channels that support massive numbers of aquatic insects, an important food source for salmon and other wild fish.

The brackish waters of these areas provide a refuge between rivers and the sea where young salmon can make the physiological transformation from fresh water to salt water in preparation for the ocean stage of their lives.

Oregon's tidal forests are dominated by Sitka spruce, also known as coastal or tidewater spruce, which can grow in fresh and brackish water. More than half of Oregon's coastal tidal wetlands were forested in the 1800s. Today, all but about 5% of these areas have been logged and converted to pasture or other uses.

The Pacific Northwest's tidal forests store more carbon per acre than almost any other place in the world, according to Oregon scientist and tidal swamp champion Laura Brophy. This is one reason these under-appreciated areas could be an essential part of Oregon's plan for dealing with climate change.

Coastal tribal nations, stewards of Oregon's estuaries from time immemorial, use spruce roots to weave baskets. Basket-weaving is functional and sustains tribal cultural identity and their way of life.

These areas provide exceptional habitat for a wide range of wildlife, from marsh wrens to mink, and bats to bobcats.

As the sea level rises, scientists say forests at the upstream end of estuaries will help sustain estuarine habitats and provide room for landward habitat migration so these areas can continue to provide the benefits listed here.

Sent via form submission from [Keep Oregon Cool](#)

Name: Karyn Winrich

Email Address: karyn@financial-literacy.info

Subject: Ideas for a greener, more energy-efficient lifestyle

Message: Hi,

I have two great passions in my life (other than my family, of course!): helping people find better financial footing and caring for the environment. What's funny to me is that a lot of people don't realize these two ideas go hand in hand — by taking steps to live a more energy-efficient and overall greener life, you can save money AND the planet!

Since you clearly share my passion, I'm passing along some resources that offer easy-to-implement ideas for making your home more eco-friendly. My thought was you may like to add them to one of (-keeporegoncool.org)'s pages to help your readers make changes that will help the environment (and as a bonus, their budget!):

12 Steps to Energy Efficiency and Affordable Zero Energy Homes

<https://zeroenergyproject.org/build/twelve-steps-affordable-zero-energy-home-construction-design/>

How To: Energy Efficient Heating and Cooling

<https://www.delmarfans.com/educate/energy-efficient-heating-cooling/>

Your Guide to Identifying & Unplugging Standby Power Appliances

<https://20somethingfinance.com/electrical-leaking-standby-appliance-list/>

The Homeowner's Guide To Energy Efficient Mortgages

<https://www.mortgagecalculator.org/helpful-advice/energy-efficient-mortgages.php>

20 Ways to conserve water at home: A room-by-room guide

<https://www.thezebra.com/resources/home/how-to-conserve-water-at-home/>

Eco-Friendly Cleaning Products to Replace Harsh Household Cleaners

<https://reelpaper.com/blogs/reel-talk/eco-friendly-cleaning-products>

The Essential Guide to Green Cleaning for Pet Owners

<https://greencleaningreviews.com/the-essential-guide-to-green-cleaning-for-pet-owners/>

How To Start Composting - How To Start A Compost Pile

<https://rurallivingtoday.com/gardens/how-to-start-composting/>

Eco-Friendly Gardens: 10 Meaningful Ways To Create An Eco-Garden With The Environment In Mind

<https://www.homefortheharvest.com/eco-friendly-garden/>

Your Guide To Hybrid And Electric Vehicles

<https://www.geico.com/living/driving/auto/auto-care/a-guide-to-hybrid-and-electric-vehicles/>

I hope you can find a way to use these!

By the way, I think one of the first things people think of when they think about green home improvements (based on my experience) is solar panels. Since roof solar panels are such a great way to make your home greener and save energy, would you be interested in reading an original article I write for you on this topic?

Best,
Karyn

Karyn Winrich
karyn@financial-literacy.info

If I've reached out to you by mistake, please reply to this email with "no more contact" in the subject line. Thanks!

Chair Macdonald and members of the Oregon Global Warming Commission:

Please find attached policy recommendations to achieve a natural and working lands emissions and sequestration goal for Oregon, submitted on behalf of the Oregon Climate and Action Plan Coalition's (OCAP) Natural and Working Lands policy tables.

I've attached two documents:

- 1) Recommendations from the OCAP Agriculture/Water Policy Table
- 2) Recommendations from the OCAP Forests Policy Table

Thank you so much for your consideration of these recommendations.
Let us know if you have any questions or need anything additional.

Megan Kemple, Co-Director, Oregon Climate and Agriculture Network (OrCAN)
Director of Policy Advocacy, Development and Operations
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megan@oregonclimateag.org
www.oregonclimateag.org



Recommended Practices, Policies and Programs to Sequester Carbon and Reduce Emissions on Oregon's Agricultural Lands

Agriculture plays an important role in the solution to climate change. According to the International Panel on Climate Change, we cannot reach our goals to cool the planet without investing in carbon sequestration strategies¹. Agriculture provides one of the most ready, cost effective pathways for carbon sequestration. Agricultural practices that mitigate climate change provide co-benefits including: improved soil health to sustain agriculture and enhance the profitability of farmers and ranchers, water conservation, and improved wildlife habitat.

Farmers and ranchers are on the front lines of both the impacts of climate change and being part of the solution. Oregon Climate and Agriculture Network (OrCAN) has engaged with a wide range of producers to better understand the barriers and opportunities to implementing practices that mitigate climate change. We heard loud and clear from producers that they are interested in better technical assistance and education opportunities. Technical assistance in many areas to date has not provided a holistic, soil health-driven approach to farm planning. Producers want to know more about how to produce healthy soil, not just crops. As one producer put it, "On soil health I want to know where am I right now? Where can I go? What's going to help me get there?" There's interest in having producer-driven research lead the way to better understand how practices can work on the ground in each region for more specific crop types. Financial incentives are important, but they must be provided in a streamlined, simplified way. These programs will require a source of sustainable funding.

From our work with Black, Indigenous and other Farmers of Color, we know that we have to create an equity lens for all the decisions we make big and small. We have weaved in their specific recommendations throughout this document. As the OGWC moves forward on developing policies and programs we hope they can use the following questions at every step of the way: Who are we centering in this decision? Who are we leaving out? How are people that might be affected included in our decision making? How does this advance racial, gender, cultural, class, and/or geographic equity? ²

¹ "In the recent IPCC Special Report SR15, agriculture and food was again identified as both a significant contributor to and potential mitigation strategy for climate change. The report highlighted that it is vital that we develop removal solutions, in addition to reduction strategies, because all 1.5°C emissions pathways rely upon carbon removal to some extent. Regenerative agriculture production methods is one of the best known removal solutions we have currently." (Source: Barriers For Farmers & Ranchers To Adopt Regenerative Ag Practices In The US: Identifying Key Levers and Opportunities-A Roadmap For Funders and Stakeholders by Jennifer O'Connor, Guidelight Strategies. August 2020)

² Developed by the Oregon Community Food Systems Network's Diversity, Equity and Inclusion Committee

We recommend that the Oregon Global Warming Commission propose a goal to: Increase adoption of agricultural practices that have the potential sequester carbon in the soil and reduce GHG emissions.

Below we have done our best to answer the question: “What practices, policies and programs should Oregon pursue to achieve a natural and working lands emissions and sequestration goal?” and we have provided issues to consider for some of them.

Agricultural practices that have the potential to sequester carbon in the soil and/or reduce emissions on farms and ranches:

- no till and reduced tillage
- cover cropping
- strip cropping
- compost application (or other organic amendments like biochar)
- mulching
- rotational grazing
- conservation crop rotation
- hedgerow and riparian plantings
- silvopasture and agroforestry
- climate-friendly nutrient management
- composting of manure and other organic “wastes”
- sustainable and organic production systems

Additional strategies to reduce fossil fuel usage or generate renewable energy:

- on-farm renewable energy use, both infrastructure and technology upgrades
- modernizing irrigation systems to conserve and produce energy

Recommendation #1

Support expansion of education and technical support to beginning farmers and those who are newly transitioning to implementing practices with the potential to sequester carbon in the soil and reduce greenhouse gas emissions, listed above in the Practices section. Expand support provided by experienced producers, Soil and Water Conservation Districts, OSU Extension, non-profits, and/or ODA in these areas:

- Support on-farm demonstrations, mentoring, communities of practice and educational/informational resources and outreach.
- Free/reduced-cost soil health testing (including soil biology) to help producers understand the state of their soils, the potential for improving soil health on their land, assist researchers in linking management practices to outcomes, and potentially provide baseline data for carbon markets.
- Increased capacity for soil health technicians to work on behalf of the state to support Oregon's farmers and ranchers including: BIPOC producers, tribal liaisons, those in all parts of the state, and range and pasture soils.

Issues to consider:

Farmers learn best from the successful examples from other farmers through farm visits, demonstrations, consultations and mentorship from experienced farmers, and case studies of working farms.

While most of the producers we spoke with indicated that mentorship was more valuable than technical assistance, they also provided feedback on how technical assistance could be best delivered. Some producers would like to see more remote learning opportunities like e-campus modules, made accessible to producers through state funded research universities. Several of OrCAN's producers expressed interest in increased need for support from SWCDs, OSU Extension, and/or NRCS, but other producers, specifically BIPOC producers recognized that these entities don't support everyone and can be exclusive. Providing a variety of technical assistance options will be best to meet farmers where they are at and will be more likely to provide what they need. We recommend focusing on providing funding to farmer mentors and training the trainers (for example OSU Extension and SWCD staff).

Mentorship and technical support must be specific and consistent over time. We recommend providing support for two to four years during adoption of new practices.

Case studies are an example of educational resources which can provide roadmaps for transition challenges.

Farmers value knowledge about their soils and want both training in field indicators for soil health as well as more access to soil testing. Farmers consider soil testing to be a significant expense and want support paying for soil testing. Policymakers and funders should invest in upgrading regional soil testing lab infrastructure to make sure that Extension labs are able to provide affordable soil health assessment long-term. Farmers also want training to help them learn soil health field assessment.

Recommendation #2

Build on ODA's planned [Soil Health Baseline Assessment](#) and other existing tools to guide policy and program priorities:

- Expand the planned [Soil Health Baseline Assessment](#) to include microbial health
- Use Moore, et al's report "[Potential for Conservation Practices to Reduce Greenhouse Gas Emissions and Sequester Carbon on Croplands and Grazing Lands in Oregon](#)" as a reference guide for generating priorities and identifying research needs;
- Use existing tools including American Farmland Trust's CaRPE tool and Ecotrust's mapping tool to estimate the potential for soil carbon sequestration on agricultural lands;
- Ground truth CaRPE modeling exercises by region, with on the ground interviews with NRCS, SWCDs, and producers to better understand past successes and challenges in adoption of practices; and
- Work in collaboration with NRCS to calibrate the COMET model for Oregon.

Issues to consider:

- Use the information provided in these assessments and inventories. We don't want these reports to sit on a shelf. These resources can drive policy and investments in the future.
- Prioritize regions with poor soil quality, for example east of the Cascades.
- It's important to include and consider range and pasture lands in addition to crop land.
- Use existing tools or resources developed by NRCS. Collaborate with NRCS to develop additional tools and resources.

Recommendation #3

Provide funding to support the adoption of other practices that reduce emissions or otherwise mitigate climate change, listed above in the Practices section.

Recommendation #4

Create a sustained source of funding for research on climate change and climate mitigation strategies on Oregon's agricultural lands.

Issues to consider:

On-farm demonstrations and trials, as well as trials and research at experiment stations are both needed. There has been a lot of research done on productivity. There's a need for more research on maximizing soil carbon.

Research needs to be leading the way, to make sure we're investing our limited resources effectively.

Recommendation #5

Encourage the legislature to adopt Healthy Soils legislation to create a Soil Health Grant Program including:

- Incentives, such as grants, for implementation of soil health practices that promote carbon sequestration, listed above in the Practices section;
- Support for on-farm demonstrations, mentoring, communities of practice and educational/informational resources and outreach as described in recommendation #1.

Issues to consider:

Incorporate lessons learned from California's Healthy Soils Grant Program. OrCAN can provide these lessons learned.

A focus on soil health and additional co-benefits, rather than carbon sequestration, will make this program more relevant to farmers and ranchers and more politically viable. We may want to have a suite of different motivators/ incentives that could speak to different decision-makers. Other options for financial incentives explored in other states include property tax exemptions or rebates, and reduced crop insurance rates.

Farmers want and need more support to access existing financial assistance. Technical assistance for completing grant applications with very few requirements of the producer, except for adoption of the practices, will be important. Policymakers and funders should evaluate the administrative task load for existing and proposed financial assistance programs and consider minimum base payments that level the playing field and encourage participation from small-acreage producers. Direct-to-producer grants and micro-grants are a useful tool to help farmers of all scales access equipment and cover transition-related cost increases.

Adopting a new healthy soils practice involves uncertainty, risk and a learning curve. Farmers need financial assistance for a minimum of two years and up to four years during adoption of new practices. But at the same time incentive programs must be designed to compensate innovators, pioneers and long-term practitioners and not be based solely on proof of "additionality".

Soil sample requirements are problematic and are a barrier. Incentive programs should rely on modeling to provide the carbon sequestration potential of a practice. Incentives need to be available to producers who lease their land in addition those who own their land.

Consider how payments should be made for example: per ton of carbon sequestered, by practice or by acre. Acreage-based payment structures leave out smaller-scale farmers. The inclusion of rangeland will be important.

Ensure we are not leaving federal dollars on the table and are leveraging existing funding rather than creating new grant programs, where resources already exist. We recommend funding for a state soil health program be administered by OWEB and distributed through SWCDs, because of their existing role as funders and resource providers.

Recommendation #6

Facilitate multi-stakeholder collaboration, both public and private, to advance the recommendations above.

Issues to consider:

Producers, especially BIPOC producers, as well as farmworkers, are important stakeholders and need to be heard and included in this stakeholder engagement process.

Recommendation #7

Fund the [Oregon Agriculture Heritage Program](#) to protect agricultural lands. Studies have shown that an acre of farmland provides “58-70 times fewer greenhouse gas emissions than an acre of urban land.”³

Some of the “issues to consider”, included above, were provided by the National Organic Farming Association in their Report: Farmers Share Experiences and Challenges Adopting Healthy Soils Practices.

These recommendations were drafted by:

Megan Kemple and Ashley Rood, Co-Directors, Oregon Climate and Agriculture Network

Contact: megan@oregonclimateag.org

www.oregonclimateag.org

³ Source: Greener Fields: California Communities Combating Climate Change. American Farmland Trust.

To: Chair Macdonald and Members of the Oregon Global Warming Commission
Cc: Governor Brown, Kristen Sheeran, Oregon Board of Forestry
Re: Executive Order 20-04 Forest Climate Policy Brief
Date: 5/10/21

Dear Chair Macdonald and members of the Oregon Global Warming Commission,

The Oregon Global Warming Commission was directed by the Governor to propose state goals for carbon sequestration and storage on Oregon's natural and working landscapes by June 30th, 2021. The undersigned organizations are writing to ask that you take a broad and truly ambitious approach to elevating forests within Oregon as a natural climate solution.

Studies estimate that annual logging-related emissions average 33 million metric tons of carbon dioxide equivalent per year (Mmt CO₂-e/yr) since 2000.¹ This means that logging is the largest source of emissions in the state (more so than the 23 Mmt CO₂-e/yr attributed to transportation). Not only does the OGWC have an obligation to account for and minimize these emissions, it also has an incredibly valuable opportunity to increase carbon storage and sequestration in its forests. With ambitious policies, Oregon can increase net ecosystem carbon balance in its forests by 56% by 2100.² State goals must reflect this opportunity to dramatically reduce emissions while simultaneously increasing storage and sequestration.

With the direction given under EO 20-04,³ Oregon has an opportunity to position itself as a national leader in carbon storage, sequestration, and climate-smart management of its natural and working lands. The state has an incredibly carbon-rich and biodiverse landscape that provides clean drinking water and outdoor recreation opportunities for millions of Oregonians. The state agencies that are responsible for managing these natural resources have struggled to evolve to meet the state's 21st century needs, especially in the face of twin threats from the climate crisis and the biodiversity crisis. Oregon's decision makers must take a step back and reevaluate some of the deeply ingrained policies and practices that have defined how Oregon approaches natural resources management. Now is the time to take bold action, and launch a new approach that prioritizes natural climate solutions as a central strategy in the state's efforts to combat climate change.

A growing scientific consensus has developed around two aspects of Oregon's ecosystems: (1) that they have an incredible potential for sequestering and storing atmospheric carbon; (2) that

¹ Law, B.E., Hudiburg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences <https://www.pnas.org/content/115/14/3663>

² Law, B.E., Hudiburg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences <https://www.pnas.org/content/115/14/3663>

³ EO 20-04. https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

this potential is being significantly underutilized due to outdated forest management practices. In its draft biennial report, the Oregon Global Warming Commission cites several of the leading studies in support of these propositions, which we summarize and supplement below:

- [Diaz et al. 2018](#): Expanded riparian protections, increased green tree retention, and the extension of rotation ages can translate into substantially higher carbon storage than contemporary common practice for Douglas-fir management in the Pacific Northwest. The combination of forest practices required for FSC certification always stored more carbon than business-as-usual.
- [Fain et al. 2018](#): On private forest lands west of the Cascades, extending harvest rotations,⁴ maximizing utilization of harvested biomass, focusing on production of durable and long-lived wood products, and altering harvest practices to retain more live trees on-site, all could result in significant net carbon gains.
- [Law et al. 2018](#): Reforestation, afforestation, lengthened harvest cycles on private lands, and restricting harvest on public lands in Oregon is projected to increase net ecosystem carbon balance by 56% by 2100, with the latter two actions contributing the most.
- [Harmon 2019](#): Half of harvested carbon is emitted to the atmosphere almost immediately after logging.

This body of scientific research emphasizes the value of natural climate solutions and demonstrates numerous practices that can help the state meet its potential to both adapt to the worsening impacts of climate change and mitigate future emissions. Studies and goals are helpful for framing this approach, but Oregon needs new rules, regulations, and policies to fully realize its potential to store and sequester carbon in its natural and working lands.

Further, new rules, regulations, and policies should be adopted and implemented using an equity framework. Equitable and ecologically-appropriate stewardship of Oregon forests is critical for all Oregonians, but especially for historically disadvantaged populations. The impacts of unsustainable natural resource management decisions disproportionately burden disadvantaged groups, including Black, Indigenous, and People of Color (BIPOC) communities and low-income communities. The impacts of forest management decisions unfold against a backdrop of enduring racial and socioeconomic inequities that have shaped how historically underserved and underrepresented communities can withstand those impacts. We cannot be blind to equity and justice issues when addressing environmental and climate concerns unless we wish to repeat and reinforce the decisions that have created sacrifice zones in low-income and BIPOC communities and left rural communities behind. Decision-makers must engage multiple perspectives, communicate directly with impacted communities, and consider unintended outcomes when developing policies that advance natural climate solutions. Decision-makers must ensure that these communities may continue to reap the recreational, health, social, and cultural benefits of

⁴ 80-120 years depending on assumptions about product longevity and substitution.

our forests for generations to come and are not disproportionately burdened by unsustainable forest management practices as the climate crisis worsens.

We respectfully request that you take a broad, ambitious, and equitable approach to elevating forests as a central component of Oregon’s strategy to address the climate crisis. The recommendations in the accompanying “Executive Order 20-04 Forest Climate Policy Brief” demonstrate this ambition, and we hope that they will be part of your June proposal to the Governor.

Sincerely,

Lauren Anderson
Forest Climate Policy Coordinator
Oregon Wild

Grace Brahler
Oregon Climate Action Plan & Policy Manager
Beyond Toxics

Alan Journet Ph.D.
Co-facilitator
Southern Oregon Climate Action Now

Bill Bradbury
Former Oregon Secretary of State
Chair, Oregon Coast Energy Alliance Network (OCEAN)

Rand Schenck
Forestry Lead
Metro Climate Action Team

Bill Harris
Member
Metro Climate Action Team

Executive Order 20-04 Forest Climate Policy Brief

Oregon Climate Action Plan Coalition, Forest Policy Table

May 10th, 2021

Table of Contents

| | |
|---|----|
| Recommendations for Climate-Smart Forestry | 4 |
| Recommendations for Ecologically Appropriate Post-Fire Restoration | 6 |
| Recommendations for Protecting Communities From the Threat of Wildfire | 9 |
| Recommendations for Woody Biomass | 11 |
| Recommendations for Climate Adaptation in Forested Watersheds | 16 |
| Recommendations for Elevating Climate Change in Oregon’s Current Forest Practices | 17 |
| Recommendations for Implementation of Good Neighbor Authority in Oregon | 20 |
| Recommendations for Implementation of Forest Carbon Offset Program in Oregon | 22 |

Recommendations for Climate-Smart Forestry

The following policy opportunities represent “low-hanging fruit” for the state of Oregon to adopt as its decision-makers work to “*prioritize actions that reduce GHG emissions in a cost-effective manner,*” and “*prioritize actions that will help vulnerable populations and impacted communities adapt to climate change impacts*” as directed in EO 20-04.⁵

- 1. Permanent protections for mature and old growth forests on state lands** (EO 20-04, ss. 3.A, 3.C.(1), 12.A). Mature and old growth forests store and sequester immense amounts of carbon. Wherever native stands of large trees exist, they should be protected as climate reserves. Further, decision makers should work to identify additional areas of the highest carbon storage potential that should also be protected as part of this carbon

⁵ EO 20-04. https://www.oregon.gov/gov/Documents/executive_orders/eo_20-04.pdf

reserve. These same stands also provide high quality habitat for salmon and other at-risk wildlife, helping managers achieve two objectives at once.

2. **Lengthen logging rotations** (*EO 20-04, ss. 3.A, 3.C.(1), 12.A*). The best available science⁶ has made clear that current standard logging rotations (often as short as 35 years) undermine the ability of forests to optimize carbon stored.⁷ By allowing trees to grow for longer time periods, managers can improve carbon stocks while also increasing timber yield and timber quality. Studies suggest that rotations of 80 years in Coastal Douglas fir may provide optimal carbon storage benefit, depending on assumptions about product longevity and substitution.⁸
3. **Increase green tree retention on the land during harvest and promote diversity of species as opposed to monoculture plantations** (*EO 20-04, ss. 3.A, 3.C.(1)-(3), 12.A*). Greater retention of standing trees (especially bigger and older trees) after logging will keep more carbon on site, help to make regrowing forests more resilient to natural disturbance, increase availability of native seed stock for future restoration efforts, and provide for more higher-quality habitat for native species.
4. **Ensure better incentives for non-industrial forest owners to implement climate-smart forestry on their lands** (*EO 20-04 s. 3.C(1)*).
 - a. Agencies should prioritize promoting stronger incentives and market development for non-industrial private lands, tribes, land trusts, and local government entities willing to implement climate-smart forest management⁹ on their lands (such as protection of larger stream buffers and late successional characteristics), including better state incentives for the production of FSC certified wood products.
 - b. Forest owners should be allowed to aggregate small acreage into larger more impactful projects.

⁶ See, e.g. Law, B.E., Hudiburg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences <https://www.pnas.org/content/115/14/3663>

<https://web.archive.org/web/20180727130028/http://www.pnas.org/content/pnas/115/14/3663.full.pdf>

⁷ See, e.g. Mark E. Harmon, 2019. Have product substitution carbon benefits been overestimated? A sensitivity analysis of key assumptions. Environmental Research Letters <https://doi.org/10.1088/1748-9326/ab1e95>

⁸ See, e.g. Stephen J. Fain, Brian Kittler, Amira Chowyuk, 2018. Managing Moist Forests of the Pacific Northwest United States for Climate Positive Outcomes. Multidisciplinary Digital Publishing Institute. DOI: 10.3390/f9100618. https://www.researchgate.net/publication/328229114_Managing_Moist_Forests_of_the_Pacific_Northwest_United_States_for_Climate_Positive_Outcomes

⁹ Climate-smart forest management integrates the challenges and opportunities of climate change mitigation and adaptation into forest policy, planning and practices, aiming to optimize carbon storage and sequestration in a manner that accounts for the worsening impacts of climate change. See, e.g. Stein, B.A., P. Glick, N. Edelson, and A. Staudt (eds.). 2014. Climate-Smart Conservation: Putting Adaptation Principles into Practice. National Wildlife Federation, Washington, D.C. https://www.nwf.org/~media/PDFs/Global-Warming/Climate-Smart-Conservation/NWF-Climate-Smart-Conservation_5-08-14.pdf, David D. Diaz, Sara Lorenzo, Gregory J. Ettl and Brent Davies 2018 Tradeoffs in Timber, Carbon, and Cash Flow under Alternative Management Systems for Douglas-Fir in the Pacific Northwest. Forests 9 (8) 447 <https://www.mdpi.com/1999-4907/9/8/447>, OGWC 2018 Forest Carbon Accounting Project Report 2018. Keep Oregon Cool, Oregon Global Warming Commission. <https://static1.squarespace.com/static/59c554e0f09ca40655ea6eb0/t/5c2e415d0ebbe8aa6284fdef/1546535266189/2018-OGWC-Biennial-Report.pdf>

- c. Agencies should develop accountability standards to ensure incentives are awarded to forest owners who are currently practicing verifiable climate-smart forestry or will adopt verifiable, high standards of climate-smart forestry.
- 5. Establish new partnerships with Tribes, indigenous communities, and tribal climate activists.** (*EO 20-04, ss. 3.C.(2)-(3), 3.E*). Incorporate tribal climate mitigation and adaptation practices that can support increased carbon storage and sequestration in Oregon’s forests, and seek to build bridges between Western (conventional) and Indigenous practices, including through use of prescribed fire in Oregon’s eastern and southern forests.

Recommendations for Ecologically Appropriate Post-Fire Restoration

In Oregon, logging is a far more significant source of greenhouse gas emissions than wildfire, particularly on the west-side of Cascades. And while wildfire does cause carbon emissions, only 5-10 percent of stored carbon on the landscape is emitted compared to over 50 percent emitted by logging.¹⁰ Further, fire is a natural process that supports a diversity of ecosystems across a landscape. Leaving burned trees on the landscape allows the carbon they contain to remain stored for decades, and released slowly through natural decomposition, often transferring the remaining carbon to the soil.

If partially burned trees are harvested for timber, very little of the stored carbon will be contained in long-lived wood products. Approximately half of harvested carbon is emitted to the atmosphere soon after logging.¹¹ In Oregon, 65 percent of wood carbon harvested since 1900 has returned to the atmosphere, 16 percent is in landfills, and only 19 percent remains in long-term products.¹² And because much of a forest’s carbon is stored in the soil (nearly 50 percent on average in Oregon’s forests), soil disturbance from logging operations can release additional carbon that is challenging to re-sequester.¹³

Allowing forests to recover naturally following a wildfire also ensures complex forest structure with diverse vegetation, which in turn supports increased biodiversity. Removing burned trees

¹⁰ Law, B.E., Waring, R. 2015. Carbon implications of current and future effects of drought, fire and management on Pacific Northwest forests, *Forest Ecology and Management*. <https://doi.org/10.1016/j.foreco.2014.11.023>

¹¹ Harmon, M.E. 2019. Have product substitution carbon benefits been overestimated? A sensitivity analysis of key assumptions. *Environ. Res. Lett.* 14 065008. <https://iopscience.iop.org/article/10.1088/1748-9326/ab1e95>

¹² Hudiburg, T.W., Law, B.E., Moomaw, W.R., Harmon, M.E. and Stenzel, J.E. 2019. Meeting GHG reduction targets requires accounting for all forest sector emissions. *Environ. Res. Lett.* 14 095005. <https://iopscience.iop.org/article/10.1088/1748-9326/ab28bb>

¹³ Christensen, G.A., et al. 2019. Oregon Forest Ecosystem Carbon Inventory: 2001-2016. <https://www.oregon.gov/ODF/ForestBenefits/Documents/Forest%20Carbon%20Study/OR-Forest-Ecosystem-Carbon-2001-2016-Report-FINAL.pdf>

and snags and replanting the forest with monoculture Douglas-fir can prevent development of this complex structure, harming fish and wildlife.¹⁴ Further, if burned forests are allowed to keep their structural complexity, according to the Bureau of Land Management, they can develop old growth forest characteristics twice as fast¹⁵ as dense, replanted forests, and old growth forests store far more carbon than young growth.

Burned landscapes are already at increased risk of sediment runoff, flooding, and landslides, but that risk is dramatically amplified by post-fire logging which disturbs the soil and removes standing trees that would otherwise help anchor soil until new vegetation regenerates. This can lead to even more sediment runoff which in turn can clog waterways, degrade fish habitat, and impact drinking water for local communities. Widespread planting of young, single aged, single species trees after large fires not only creates conditions that are conducive to future large fires,¹⁶ but also leads to a significant increase in evaporative water demand which depletes summer streamflow and degrades fish habitat.¹⁷ Overall, post-wildfire logging can hinder forest regeneration, does not reduce future fuel loads,¹⁸ and can even increase future fire risk.¹⁹

However, while post-fire logging holds little ecological value, other post-fire restoration practices can help forests recover in an ecologically appropriate manner. Especially in dry forests, climate change is impacting fire regimes and leading to bigger fires and longer fire seasons. Combined with other ecological stressors, such as drought and invasive vegetation, and human caused stressors, such as fire exclusion, past timber harvest practices, livestock grazing, and water diversion, the ecological integrity of some forests can be undermined. Because resources for post-fire, ecologically appropriate restoration are limited, it is essential that managers use the best available science to determine when and where post fire recovery efforts are actually needed. West of the Cascades there is little evidence that climate change is impacting the natural, infrequent fire regimes of our moist temperate rainforests, so small

¹⁴ Swanson, M.E., Franklin, J.F., Beschta, R.L., et al. 2010. The forgotten stage of forest succession: early-successional ecosystems on forest sites. *Front Ecol Environ* 2010; doi:10.1890/090157 https://www.fs.fed.us/pnw/pubs/journals/pnw_2010_swanson001.pdf and Donato, D.C., Campbell J.L, and Franklin J.F., 2012. FORUM Multiple successional pathways and precocity in forest development: can some forests be born complex? *Journal of Vegetation Science* 23 (2012) 576–584 http://people.forestry.oregonstate.edu/john-campbell/sites/people.forestry.oregonstate.edu/john-campbell/files/Donato_2012_JVS.pdf

¹⁵ Bureau of Land Management 2008. Western Oregon Plan Revision Draft Environmental Impact Statement. https://www.blm.gov/or/plans/wopr/files/Science_Team_Review_DEIS.pdf

¹⁶ Zald, H.S.J., Dunn, C.J., 2018. Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. *Ecological Applications*. Online Version of Record before inclusion in an issue. 26 <https://phys.org/news/2018-04-high-wildfire-severity-young-plantation.html> and Thompson, J.R, Spies, T.A., and Ganio L.M., 2007. Reburn severity in managed and unmanaged vegetation in a large wildfire. *Proceedings of the National Academy of Sciences*. PNAS. http://www.fs.fed.us/pnw/pubs/journals/pnw_2007_thompson001.pdf

¹⁷ Perry, T. D., and Jones, J. A. 2016. Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA. *Ecohydrology* <http://onlinelibrary.wiley.com/doi/10.1002/eco.1790/full>

¹⁸ Leverkus, A.B. et al 2020. Salvage logging effects on regulating ecosystem services and fuel loads. *Frontiers in Ecology and the Environment*. <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/fee.2219>

¹⁹ Donato, D. et al. 2006. Post-Wildfire Logging Hinders Regeneration and Increases Fire Risk. *Science* 311(5759):352

diameter thinning and prescribed fire should be prioritized in other ecosystems. Below are policy recommendations for appropriate practices, and practices that should be avoided in post-fire recovery.

Recommendations for post-fire recovery

1. Encourage fire-affected local communities to rebuild in a responsible, fire-wise manner that improves community safety and resilience to future wildfires.
2. Managers should focus efforts on the restoration or maintenance of essential ecosystem services, such as:
 - a. Carbon storage and sequestration (e.g. promoting old growth forest characteristics),
 - b. Water quality and quantity (e.g. preventing soil erosion and avoiding tree plantations),
 - c. Soil productivity (e.g. ensure burned vegetation remains on the landscape), and
 - d. Biodiversity (e.g. preserving habitat for at risk wildlife).
3. Focus on stabilizing watersheds, by mitigating damage caused by past fire suppression (such as fire lines), limiting erosion using native vegetation, and treating invasive species. Other smart adaptations to deal with climate-driven shifts in precipitation and hydrology should include installing bigger culverts and decommissioning roads that increase the risk of erosion, mudslides, and peak stream flows.
4. Focus hazard tree felling on imminent hazards located within 150 feet of high use areas, such as developed sites, parking lots, and paved roads. Do not remove felled danger trees from reserves, including the full extent of riparian reserves. If trees are removed, use them for restoration of streams and old clearcuts that lack large wood. The carbon should remain on the landscape for as long as possible.
5. Retain all large wood to mitigate the shortage of snag habitat and for long-term ecological benefits and carbon storage. Fires create an apparent abundance of snags, but that is misleading because snags are ephemeral; the abundance of snags is short-lived and hides the fact that after those snags fall down, there will be a long-term shortage of snags that lasts until large trees regrow. Salvage logging will exacerbate the expected shortage of snags.

Avoid the following post-fire practices:

1. Avoid post-fire logging. Post-fire logging can have significant negative impacts on water quality, fish and wildlife habitat, and forest successional trajectories. If post-fire logging is deemed necessary, managers should focus on removing trees that pose a threat to infrastructure, such as power lines and roads.
2. Avoid removal of live, green trees. Surviving trees can help to rebuild the ecosystem and can serve as a legacy structure and a recruitment pool for future large trees and snags.

3. Avoid road construction, including temporary roads, as they have long-term impacts on watersheds, soil, and vegetation, can introduce invasive weeds, and fragment habitat. Many watersheds are already damaged by hundreds of miles of hastily constructed firelines.
4. Avoid dense, monoculture replanting. Such practices can create hazardous fuel conditions and truncate development of a desired complex early seral forest. If replanting is deemed necessary, replant diverse species in patches, at low density, far from existing seed sources. In drought impacted areas of the state, selecting more drought-tolerant species to plant may help forests recover.

Recommendations for Protecting Communities From the Threat of Wildfire

Most large fires are driven by extreme weather conditions – high temperatures, low fuel moisture, high winds and drought – and so our rapidly changing climate, coupled with a massive expansion of homes into fire-prone areas, will increasingly influence the extent and impacts of fire in the West. To address these issues, studies suggest focusing on treatments in the home ignition zone is a more effective strategy than logging operations in more distant forested regions.²⁰ Factors such as the type of materials homes and buildings are made of and the design and maintenance of our infrastructure are huge factors in determining residential losses,²¹ and addressing these factors is the best use of limited funding.

While some small-diameter tree thinning can reduce fire intensity when coupled with burning of slash debris under appropriate conditions,²² recent evidence shows intensive forest management characterized by young trees and homogenized fuels burn at higher severity.²³ Reduced forest protections and increased logging tend to make wildland fires burn *more* intensely.²⁴ Studies have clearly demonstrated that increased wildland logging is *not* an effective strategy for

²⁰ Calkin, D.E., et al. 2014. How risk management can prevent future wildfire disasters in the wildland-urban interface. Proc. Nat. Acad. Sci. 111: 746-751. <https://www.pnas.org/content/111/2/746>

²¹ Calkin, D.E., et al. 2014. How risk management can prevent future wildfire disasters in the wildland-urban interface. Proc. Nat. Acad. Sci. 111: 746-751. <https://www.pnas.org/content/111/2/746>

²² Perry, D.A., et al. 2004. Forest structure and fire susceptibility in volcanic landscapes of the eastern High Cascades, Oregon. Conservation Biology 18: 913-926. http://www7.nau.edu/mpcer/direnet/publications/publications_p/files/Perry_et_al_2004.pdf and Strom, B.A., and P.Z. Fulé. 2007. Pre-wildfire fuel treatments affect long-term ponderosa pine forest dynamics. International Journal of Wildland Fire 6: 128-138. https://www.fs.fed.us/rm/pubs_other/rmrs_2007_strom_b001.pdf

²³ Zald, H.S.J., and C.J. Dunn. 2018. Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. Ecological Applications 28:1068-1080. doi: 10.1002/eap.1710. <https://pubmed.ncbi.nlm.nih.gov/29698575/>

²⁴ 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 USA? Ecosphere 7: article e01492. <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.1492>

reducing a community’s wildfire risk. The extremely low probability (less than 1 percent)²⁵ of thinned sites encountering a fire especially limits the effectiveness of such activities to forested areas near homes.

Further, to make thinning operations economically attractive to logging companies, commercial logging of larger, more fire-resistant trees often occurs across large areas. This is an ecologically inappropriate strategy for thinning, as it can severely degrade the resilience of ecosystems already stressed by the impacts of climate change — such as heat waves and more frequent drought. The shade and healthy root system provided by large mature trees helps retain moisture in the soil and keep rivers and streams cool as fish also contend with more severe impacts.

Mechanical thinning also results in a substantial net loss of forest carbon storage and a net increase in carbon emissions that almost always exceed those of wildfire emissions.²⁶ As an example, logging in U.S. forests emits 10 times more carbon than fire and native insects combined.²⁷ And, unlike logging, fire cycles nutrients and helps increase new forest growth. Thinning across broad landscapes is costly, by some estimates \$2,000 per acre, and also causes collateral damage to the ecosystem from increased road building, creating pathways for the introduction of invasive species and more human entry and more ignitions.²⁸

Encourage sound strategies for wildfire risk reduction

1. Increase emergency planning and preparedness for rural communities located in and near forested areas. Well established evacuation routes, designated “safe” areas where people can shelter in place, and established channels of communication where residents can go for trusted information can save lives and property.
 - a. Wildfire information should be made available in Spanish and other Indigenous Latin American languages to ensure that our most vulnerable populations, including migrant and Latinx communities living and working in rural areas, are prepared for fire emergencies. ODF could coordinate with and provide financial

²⁵ Schoennagel, T., et al. 2017. Adapt to more wildfire in western North American forests as climate changes. Proceedings of the National Academy of Sciences of the USA 114: 4582–4590. <https://www.pnas.org/content/114/18/4582>

²⁶ Hudiburg, T.W., et al. 2013. Interactive effects of environmental change and management strategies on regional forest carbon emissions. Environmental Science and Technology 47: 13132-13140. <https://europemc.org/article/med/24138534> and Campbell, J.L., M.E. Harmon, and S.R. Mitchell. 2012. Can fuel-reduction treatments really increase forest carbon storage in the western US by reducing future fire emissions? Frontiers in Ecology and Environment 10: 83-90. <https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/110057>

²⁷ Harris, N.L., et al. 2016. Attribution of net carbon change by disturbance type across forest lands of the conterminous United States. Carbon Balance Management 11: Article 24. <https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-016-0066-5>

²⁸ Balch et al 2017. Human-started wildfires expand the fire niche across the United States. National Academy of Sciences. <https://doi.org/10.1073/pnas.1617394114>

and technical support to community-based organizations already serving Latinx populations to disseminate information and increase preparedness.²⁹

2. Increase fire-wise home hardening and retrofitting (i.e. application of construction design and materials that are fire resistant). Hardening homes to fire can be > 95% effective at preventing structure loss. Wind-driven fire events can ignite homes from flying embers miles ahead of the fire front, and there are examples of home burning even though the actual fire was never in direct contact with the buildings.
3. Reduce fuels in the home ignition zone. Reducing fuels in close proximity to houses (within 200 feet of the home) can help protect property from damage in the event of a fire.
4. Limit new development in high risk areas. It is critical that land use planners account for the increased risk of wildfire. Building homes in fire adapted ecosystems carries risk, and developers and landowners need to be made aware of this risk.
5. Ensure disadvantaged communities have equal access to resources. It is the most vulnerable populations that carry the highest costs when a fire impacts a community. Investing in air filtration systems for disadvantaged communities is an affordable and effective way to ensure vulnerable people have a safe space to shelter from smoke inhalation and the associated health impacts.
6. Use ecological fire management to restore natural fire regimes in appropriate areas. In the West, the health of some forest ecosystems has declined as a result of past fire suppression. Restoring natural fire regimes, through a place-specific combination of ecologically appropriate thinning and prescribed fire, should be a priority for land managers as they seek to restore ecological health.
7. Avoid or minimize actions that increase fire hazard such as clearcutting and dense monoculture replanting. Encourage more thinning and longer rotations on plantations as these forest management strategies will reduce the proportional area of forest in the most vulnerable dense, young fuel conditions.

Recommendations for Woody Biomass

Within the Oregon Department of Forestry, and as part of other state policies, biomass is treated as a low carbon fuel source that can support the state's climate objectives. This view misrepresents the carbon benefits of using woody biomass for energy production, and fails to account for the numerous environmental and equity challenges associated with biomass. An updated review of the best available science invalidates the case for treating all woody biomass on an equal basis with other renewable energy resources and the need for agency incentivization of biomass.

²⁹ Alai Reyes Santos. Oct. 22, 2020. Fires shed light on marginalized groups. Available at <https://www.registerguard.com/story/opinion/columns/2020/10/22/fires-shed-light-marginalized-groups/5999702002/>.

These issues with biomass *must* be addressed in order to ensure that the burning of woody biomass does not exacerbate the climate crisis, endanger vulnerable communities, or degrade ecosystems and biodiversity in Oregon. We recommend that the OGWC promote the following policy recommendations with regards to woody biomass as part of its OCAP policy recommendations for natural and working lands:

1. **Do not define biomass as carbon neutral:** Woody biomass emits significant amounts of carbon when burned to produce energy. A detailed analysis of biomass energy generation commissioned by Massachusetts, the Manomet Study, compared the lifetime greenhouse gas effects of a continuous harvesting and replanting scenario to burning natural gas to generate the same energy. This analysis showed that, considering the first 35 years of operation, the biomass plant would have one and a half times the net CO₂ emissions of a natural gas plant generating the same amount of energy.³⁰ Based on this study and many others,³¹ incentivizing biomass energy generation will put Oregon *further behind* on its current 2050 greenhouse gas goals, which aim to reduce greenhouse gas emissions in the state by at least 45 percent below 1990 levels by the year 2035, and by 80 percent by 2050.³²

Advocates of the biomass-as-carbon-neutral policy claim that when biomass is removed from the forest and combusted for energy, the emitted carbon is eventually re-sequestered by the forest's regrowth; however, this stance does not account for the long time lag between the immediate short-term of release of carbon emissions from logging and combustion of the wood products, and the long-delayed tree regrowth and recapture of carbon in the ecosystem. The carbon stocks of forests are a result of two factors: carbon

³⁰ Manomet Study 2018. https://www.manomet.org/wp-content/uploads/2018/03/Manomet_Biomass_Report_Full_June2010.pdf

³¹ McKechnie J, Colombo S, Chen J, Mabee W and MacLean H L 2011 Forest bioenergy or forest carbon? Assessing trade-offs in greenhouse gas mitigation with wood-based fuels Environ. Sci. Technol. 45 789–95 <https://pubs.acs.org/doi/abs/10.1021/es1024004>,

Bernier P and Paré D 2013 Using ecosystem CO₂ measurements to estimate the timing and magnitude of greenhouse gas mitigation potential of forest bioenergy *GCB Bioenergy* 5 67–72 <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1757-1707.2012.01197.x>,

Walker T, Cardellicchio P, Gunn J S, Saah D S and Hagan J M 2013 Carbon accounting for woody biomass from massachusetts (USA) managed forests: a framework for determining the temporal impacts of wood biomass energy on atmospheric greenhouse gas levels *J. Sust. Forest* 32 130–58 <https://www.tandfonline.com/doi/abs/10.1080/10549811.2011.652019>,

Stephenson A L and MacKay D J C 2014 Life Cycle Impacts of Biomass Electricity in 2020 (London: UK Department of Energy and Climate Change) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/349024/BEAC_Report_290814.pdf, and

Laganière J, Paré D, Thiffault E and Bernier P Y 2017 Range and uncertainties in estimating delays in greenhouse gas mitigation potential of forest bioenergy sourced from Canadian forests *GCB Bioenerg.* 9 358–69 <https://onlinelibrary.wiley.com/doi/full/10.1111/gcbb.12327>.

³² EO 20-04 https://www.oregon.gov/gov/Pages/carbonpolicy_climatechange.aspx

capture by biomass growth and the duration of carbon in biomass.³³ Therefore, the longevity of trees in the forest matters a great deal in terms of maximizing carbon benefits.

Further, there is no guarantee that replanted trees will eventually reach the same maturity as those that were cut down — drought, fire, insects, climate change, or land use conversion could prevent the same level of sequestration even in the long-term.³⁴ And because much of a forest's carbon is stored in the soil (nearly 50 percent on average in Oregon's forests), disturbance can release additional carbon that is also challenging to re-sequester.³⁵ These near term greenhouse gas emissions are a serious problem from a climate change perspective. Even if the forest someday recovers the carbon emitted decades earlier by biomass combustion, there is no way to mitigate the warming that occurred during the lag period due to the excess CO₂ released into the atmosphere.

2. **Avoid impacts to vulnerable communities:** EPA data shows that even the best-performing biomass plants produce as much or more air pollution as a similar-sized coal plant.³⁶ These pollutants include nitrous oxide that generates ozone, small particulate matter that drives lung inflammation, volatile organic compounds, and other harmful compounds. The American Lung Association “does not support biomass combustion for electricity production” and “strongly opposes the combustion of wood and other biomass sources at schools and institutions with vulnerable populations.”³⁷

Air pollution is clearly linked to decreased lifespan, causing more than 100,000 early deaths in the United States every year.³⁸ Power plants are often located in low income and minority neighborhoods, and so the effects of air pollution are unequally distributed in ways that perpetuate historical environmental injustices. Black Americans have the highest mortality rate from exposure to fine particle air pollution.³⁹

³³ Köhl M., Neupane P.R., Lotfiomran N. 2017. The impact of tree age on biomass growth and carbon accumulation capacity: A retrospective analysis using tree ring data of three tropical tree species grown in natural forests of Suriname. PLoS ONE 12(8): e0181187. <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0181187>

³⁴ Duffy, Moomaw, Schlesinger et al 2016. Scientists letter to Congress about carbon neutrality of biomass energy. 2-22-2016. <http://whrc.org/letter-to-the-senate-on-carbon-neutrality/>

³⁵ Christensen, G.A., et al. 2019. Oregon Forest Ecosystem Carbon Inventory: 2001-2016. <https://www.oregon.gov/ODF/ForestBenefits/Documents/Forest%20Carbon%20Study/OR-Forest-Ecosystem-Carbon-2001-2016-Report-FINAL.pdf>

³⁶ Partnership for Policy Integrity (2011). Air pollution from biomass energy. <https://www.pfpi.net/air-pollution-2>

³⁷ American Lung Association (2019). Policy Principle on Energy. <https://www.lung.org/policy-advocacy/public-policy-positions/public-policy-position-energy#:~:text=The%20American%20Lung%20Association%20does,as%20construction%20and%20demolition%20waste>

³⁸ Fann, N et al. (2012). Estimating the National Public Health Burden Associated with Exposure to Ambient PM_{2.5} and Ozone. Risk Analysis (32) 81-95. <https://doi.org/10.1111/j.1539-6924.2011.01630>

³⁹ Maninder, P.S., et al. (2019). Fine Particulate Air Pollution from Electricity Generation in the US: Health Impacts by Race, Income, and Geography. *Environmental Science and Technology* (53) 14010–14019. <https://doi.org/10.1021/acs.est.9b02527>

- 3. Avoid negative impacts to forest carbon storage and biodiversity:** An expansion of industrial biomass for energy production also would lead to an increased demand for biomass fuel. This demand could be disruptive to existing Oregon industries that currently rely on the same raw materials, as new demand may not be fully met by mill and logging residue alone. Many of these alternative uses of waste are better for the climate — for instance, making particle-board from wood chips can lead to long-term carbon storage in furniture and subfloors. If the demand for clean chips leads to increased harvest through shorter rotations, deforestation, or the conversion of native forests to timber plantations, it will reduce carbon storage on the landscape and degrade the forest habitats that support biodiversity and the survival of some of Oregon’s most important species.

If biomass is associated with large tree removal, road building, commercial logging, or meeting timber targets, this can have far-reaching ecological impacts that can negatively affect the area's biodiversity. Mature and old forest habitats are still quite rare compared to the conditions necessary to sustain healthy populations of Oregon native fish and wildlife. Expanded biomass energy development will make it harder to restore mature and old forests and perpetuate the creation of young forests that are already vastly over-represented on the landscape.

- 4. Avoid displacement of zero-emissions energy and ensure better environmental outcomes:** Zero-emission energy resources, such as wind, solar, and geothermal are critical for decarbonizing the power sector. Oregon’s decision makers should be focusing the state’s resources on supporting the growth of these industries. Continuing to encourage and subsidize biomass energy infrastructure will compete with wind, solar and other carbon free energy sources for scarce resources needed to advance these critical technologies. Using the same amount of land area,⁴⁰ solar panels produce up to 80-times as much electricity as wood burning with no point source emissions at all.⁴¹
- 5. Define the scope of “renewable” biomass appropriately:** Given that the U.S. Energy Information Agency estimates that for each 1 percent of forest biomass electricity added to current U.S. electricity production an additional 18 percent increase in U.S. forest harvest is required,⁴² strict limits on the role of biomass electricity generation from woody debris are needed to avoid destruction of intact ecosystems and loss of old growth and late successional reserves, which hold far more carbon than the reseeded monoculture that would replace them if harvested. The following examples, while not

⁴⁰ All energy infrastructure should be sited in a manner that minimizes impacts to the environment. See, e.g. Defenders of Wildlife 2012. Smart from the Start. https://defenders.org/sites/default/files/publications/smartfromthestartreport12_print.pdf

⁴¹ Duffy, Moomaw, Schlesinger et al 2016. Scientists letter to Congress about carbon neutrality of biomass energy. 2-22-2016. <http://whrc.org/letter-to-the-senate-on-carbon-neutrality/>

⁴² Duffy, Moomaw, Schlesinger et al 2016. Scientists letter to Congress about carbon neutrality of biomass energy. 2-22-2016. <http://whrc.org/letter-to-the-senate-on-carbon-neutrality/>

comprehensive, highlight renewable (and environmentally appropriate) categories for woody biomass:

- Byproducts of wood or paper mill operations;
 - Woody matter removed from within 100-200 yards of man-made structures or campgrounds for the purposes of hazardous fuels thinning;
 - Thinned small diameter trees (<12” dbh) that are removed to restore fire adapted ecosystems; and,
 - Logged residues such as slash piles that would otherwise increase wildfire risk or hinder ecologically appropriate restoration.
6. **Use woody biomass for biochar production:** Some types of biomass, such as slash for logging operations, is too “dirty”⁴³ to be used in electricity generation, but can still be used to produce biochar. In addition to retrofitting existing biomass facilities, managers can also utilize biochar kilns⁴⁴ in the field to address the challenges of burning slash after logging operations. According to practitioners, “When compared to the pile burning method, this approach produces considerably less smoke, does less damage to the soil, is safer, extends the season possible for fuel reduction efforts, sequesters carbon, and yields biochar, a charcoal-like product made from organic material.”
7. **Where appropriate to reduce wildfire risk for communities, use wood waste as a source of biomass:** Oregon’s communities that are in high wildfire risk areas should focus resources on community defense and emergency planning. Part of these defensible-space efforts can incorporate vegetation management near vulnerable infrastructure in order to establish a defensible zone for fire prevention. Vegetation waste can be transported to biomass facilities where it can be burned safely, or burned on site via biochar kilns. This vegetation removal should be focused in close proximity to infrastructure (specifically within 100-200 yards of a structure), as this is the most effective way to mitigate future wildfire risk.⁴⁵

As the literature review and best practices above demonstrate, utilizing woody biomass for energy production in an environmentally responsible manner is challenging. In order for Oregon to meet its goals for reduction of near-term carbon emissions, preservation of intact forests for maximal carbon sequestration, water quality and quantity, wildlife conservation, and equity and justice, the state’s decision makers must take a nuanced and cautious approach to any expansion of woody biomass energy production.

⁴³ Forest residues are often unsuitable for use because of their high ash, dirt and alkali salt content. See: Brack, D. 2017. Research Paper Woody Biomass for Power and Heat Impacts on the Global Climate. Chatham House.

<https://www.chathamhouse.org/2017/02/woody-biomass-power-and-heat>

⁴⁴ Utah State University 2019. <https://forestry.usu.edu/news/utah-forest-facts/hazardous-fuels-reduction-using-flame-cap-biochar-kiln>

⁴⁵ Cal Fire 2019. <https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/>

Recommendations for Climate Adaptation in Forested Watersheds

In addition to carbon storage, climate adaptation strategies are needed to ensure that forest practices are protecting watersheds. Healthy forests protect clean water resources for people and wildlife. Clearcuts and post-fire logging operations increase the risk of mudslides and sediment runoff, negatively impacting Oregon's rivers and streams, and pesticide spraying can pose a risk to local community drinking water sources. Water infrastructure for water service providers is outdated and treatment needs are costly. Further, drinking water violations disproportionately occur in communities of color, especially in rural and tribal areas.⁴⁶ As the impacts of climate change worsen (including drought, heat waves, and more extreme precipitation events), Oregon's forests must be managed for clean water quality, water quantity, and flood prevention as an adaptation tool.

Climate change vulnerability assessments are key in synthesizing the best available scientific information to assess climate change vulnerability and develop strategies to mitigate potentially adverse effects of climate change on ecosystem services. Watershed processes including peak flow events are going to change as a result of climate change.

With the support of the U.S. Forest Service Office of Sustainability and Climate and Pacific Northwest Research Station, the [Adaptation Partners](#) is a federal group of experts that have assembled researchers and land managers in the U.S. Forest Service and other organizations to provide scientific information on climate change effects and adaptation. They have regionally downscaled climate change projections in Oregon and determined the types of management practices that are needed to mitigate the worst impacts of climate change on stream systems and aquatic species.

The Adaptation Partners have completed several assessments in Oregon, including one for southwest Oregon⁴⁷ that is in press as a General Technical Review paper. Adaptation Partners recommended the following forest practices related to aquatic conservation in climate change:

- Where they currently exist, the conservation and maintenance of productive stream habitat conditions will help ensure persistence of native fish populations in a changing climate.

⁴⁶ Samayoa, Monica. "Study: Safe Drinking Water Violations Are Higher For Communities Of Color." September 25, 2019. <https://www.opb.org/news/article/safe-drinking-water-act-violations-communities-color-study/>

⁴⁷ See Halofsky, J.E.; Peterson, D.L.; Gravenmier, R.A., eds. 201X. Climate change vulnerability and adaptation in southwest Oregon. Gen. Tech. Rep. PNW-GTR-xxx. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. In press.) <http://www.adaptationpartners.org/swoap/>

- Decommission roads with relatively low benefits for access to help maintain a sustainable road network under a changing climate.
- Build new or replace existing infrastructure (bridges and culverts) based on climate informed streamflow projections to prevent future degradation.
- Establish safeguards such as drain dips at stream crossing to prevent diversions. Construction of sediment retention structures and out-sloping of road segments would also minimize sediment input to streams.
- Landslide risk will be reduced by stabilizing slopes, mapping areas of highest risk, relocating roads in areas that are less vulnerable to landslides, and decommissioning roads in vulnerable locations.
- In-stream restoration techniques will improve floodplain hydrologic connectivity and increase water storage capacity (e.g., adding downed trees to streams).
- Reintroduction of American beaver may also help to slow water movement and increase water storage.
- Maintain and diversify monitoring programs to provide information about the status and trends of stream conditions and traditional fish habitat metrics.
- Strategically prioritize and restore natural regimes of flow, sediment, wood, and temperature.
- Enhance floodplain connectivity to help ensure the success of migratory life history forms.
- Detection and removal of nonnative species will help to maintain and restore certain fish populations.

Recommendations for Elevating Climate Change in Oregon's Current Forest Practices

Many of the rules and regulations that govern forest management in Oregon were developed nearly 50 years ago. Today, we are facing twin ecological crises, both from the threat of climate change and biodiversity loss. It should be a top priority for Oregon's state legislators to address these challenges, starting with revision of problematic statutes that require modernization. As described in detail above, current language for all statutes governing forest management must be reviewed and rewritten to elevate carbon storage and sequestration as a central climate strategy for the state, and to ensure Oregon's forest and wildlife can continue to thrive in a rapidly changing world. Through revision of these rules and regulations, Oregon can address the climate crisis and become a national leader in climate-smart management of its natural and working lands. The below examples highlight straightforward areas where carbon and climate change can be elevated, though the need for review and revision is far more extensive.

- Related to [527.630](#) Policy; rules:
 - Carbon and climate considerations should be prioritized along with the list of sound management priorities — *“(1) Forests make a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of carbon, soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 and to ensure the continuous benefits of those resources for future generations of Oregonians.”*
 - The Oregon Board of Forestry should use the following authority to develop climate-smart forestry objectives for the Oregon Department of Forestry — *“(3) To encourage forest practices implementing the policy of ORS 527.610 to 527.770 and 527.990 and 527.992, it is declared to be in the public interest to vest in the **State Board of Forestry exclusive authority to develop and enforce statewide and regional rules** pursuant to ORS 527.710 and to coordinate with other state agencies and local governments which are concerned with the forest environment.”*

- Related to [527.710](#) Duties and powers of board; rules; inventory for resource protection; consultation with other agencies required.
 - Carbon Storage and sequestration should be included as priority resources in Oregon’s forests — *“(2) The rules shall ensure the continuous growing and harvesting of forest tree species. Consistent with ORS 527.630, the rules shall provide for the overall maintenance of the following resources:*
 - a) **Carbon storage and sequestration**
 - b) *Air quality;*
 - c) *Water resources, including but not limited to sources of domestic drinking water;*
 - d) *Soil productivity; and*
 - e) *Fish and wildlife.*

 - State forests that exhibit old forest characteristics should be prioritized by the Board for their carbon and biodiversity value — *“(3) In addition to its rulemaking responsibilities under subsection (2) of this section, the board shall collect and analyze the best available information and establish inventories of the following resource sites needing protection:*

a) Carbon-dense mature and old growth forests;

b) Forest with high carbon storage potential;

c) Threatened and endangered fish and wildlife species identified on lists that are adopted, by rule, by the State Fish and Wildlife Commission or are federally listed under the Endangered Species Act of 1973 as amended;

d) Sensitive bird nesting, roosting and watering sites;

e) Biological sites that are ecologically and scientifically significant; and

f) Significant wetlands.”

- The Board should use its authority to establish a carbon and biodiversity reserve system across state forest lands, prioritizing forests that exhibit old forests characteristics — “(3) (b) The board shall determine whether forest practices would conflict with resource sites in the inventories required by paragraph (a) of this subsection. **If the board determines that one or more forest practices would conflict with resource sites in the inventory, the board shall consider the consequences of the conflicting uses and determine appropriate levels of protection.**”

➤ Related to [ORS 477](#) — Fire Protection of Forests and Vegetation

- The state should revise rules governing the use of prescribed fire, weighing the risk of low levels of localized smoke pollution against the threat of megafires that cause far more air pollution — “(Smoke Management) 477.552 Policy. It is the policy of the State of Oregon: (1) To improve the management of prescribed burning as a forest management and protection practice; and (2) **To minimize emissions from prescribed burning consistent with the air quality objectives of the federal Clean Air Act and the State of Oregon Clean Air Act Implementation Plan developed by the Department of Environmental Quality under ORS 468A.035. [1989 c.920 §2]**
- The state should revise its declaration that *all* wildfire is a public nuisance. While human life and property should always be protected, some wildland fires must be allowed to burn over extensive areas in order to restore the state’s natural fire regimes — “**477.064 Uncontrolled fire declared nuisance.** Any fire on any forestland in Oregon burning uncontrolled or without proper action being taken to prevent its spread, notwithstanding its origin, is **declared a public nuisance** by reason of its menace to life, forest resources or property. The spread of fire in forestland across an ownership boundary is *prima facie* evidence of fire burning uncontrolled. [Formerly 477.034; 1997 c.274 §3]

➤ Related to [530.050](#) Management of lands acquired; powers of forester; rules.

- The State Forester should be strongly encouraged to identify and establish permanent protections for forests that exhibit old forest characteristics on state lands — *“Under the authority and direction of the State Board of Forestry except as otherwise provided for the sale of forest products, the State Forester shall manage the lands acquired pursuant to ORS 530.010 to 530.040 so as to secure the greatest permanent value of those lands to the state, and to that end may: (1) Establish permanent carbon reserves across state forests that exhibit old forest characteristics.”*
- Related to [340-215-0010](#), Oregon Greenhouse gas Reporting Program— The authority granted to the Oregon Department of Environmental Quality does not yet include ability to count logging related emissions in the state's annual inventory of greenhouse gases. Studies estimate that annual logging-related emissions average 33 million metric tons of carbon dioxide equivalent per year (Mmt CO₂-e/yr) since 2000.⁴⁸ This means that logging is the largest source of emissions in the state (more so than the 23 Mmt CO₂-e/yr attributed to transportation).

Recommendations for Implementation of Good Neighbor Authority in Oregon

In 2001 Congress authorized Good Neighbor Authority on a limited basis for five years as part of the Interior Appropriations Act. The Authority was expanded nationally and made permanent by the 2014 Farm Bill. Oregon Governor Kate Brown signed a GNA master agreement with the US Forest Service in 2016. Good Neighbor Authority was intended to allow federal land management agencies to work with state agencies to develop and implement forest and watershed projects on national public lands. Projects to date have taken place on seven National Forests and one BLM District and have been almost exclusively associated with timber sale activities. This emphasis on natural resource extraction underscores how this authority can be problematic without adequate policy guardrails. Below we offer several suggestions to ensure the program leads to better outcomes for the public and for Oregon’s forests and wildlife.

1. **Projects should be non-controversial, include robust public and environmental review, and be ecologically sound.** The state should not be using GNA on projects that skirt NEPA or other review through the use of Categorical Exclusions, except in very limited circumstances when projects are clearly based on ecological restoration and have broad public support. State resources should be increasing the robustness of analysis and

⁴⁸ Law, B.E., Hudiburg, T.W., Berner, L.T., Kent, J.J., Buotte, P.C., Harmon, M.E. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. Proceedings of the National Academy of Sciences <https://www.pnas.org/content/115/14/3663>

public input and/or supporting those projects that have undergone sufficient process. The state should *not* use GNA or other resources to support:

- Commercial logging projects that occur in sensitive areas like roadless areas, Wild & Scenic River Corridors, and proposed Wilderness, or that are likely to negatively impact sensitive, endangered, or threatened wildlife or the habitats of extirpated native species;
- Projects that lead to a net addition of roads on our already over-roaded National Forests; and
- Projects that are rightly controversial, including post-fire logging, *de facto* clear-cutting, “fuels reduction” in backcountry areas outside of the infrastructure ignition zone, or overly aggressive hazard/danger tree proposals.

- 2. State resources should support good projects that may not otherwise get done.** Good projects are those that have broad public support, are science-based, and are the result of robust public and environmental review. Projects supported by established collaborative groups with meaningful representation from a broad array of stakeholders may provide good opportunities.

GNA projects should be the right activities in the right places, for the right reasons. For instance, forest thinning projects designed to reduce risk to human life and infrastructure should be near the resources meant to be protected and scientifically-based.

While timber projects are well-funded by federal agencies, other important work simply doesn't get done - and often doesn't even get proposed due to a lack of resources. State funds should go to projects and activities that are not already commercially viable rather than further subsidize private industry and corporate profits. State resources should allow the implementation of activities the USFS should do, but is generally unable to accomplish. That includes activities such as controlled burns, culvert replacements, road removal, wildlife & other resource surveys, trail creation and maintenance, and instream work. This is the work that the public most wants done. These activities directly benefit the public and provide family-wage jobs.

- 3. GNA projects should focus objectives besides natural resource extraction.** Like the USFS and other public agencies, ODF and others at the state level have become enamored of “increasing the pace and scale of restoration”. Terms like “restoration”, “thinning”, “fuel reduction,” and “resilience” have unfortunately become so overused and misapplied that they are often euphemisms for continuing a paradigm of commercial logging, road-building, and fire suppression that will only make problems of forest and watershed health worse. The state should be careful not to feed that trend and harm public trust by approving GNA projects that focus on resource extraction.

Even if GNA work is focused on restoration-based activities, including commercial thinning in young plantations, these contracts should be carefully scrutinized to ensure that they are not simply enabling the USFS or BLM to implement forest management projects that are *not* restoration, but purely meant to accomplish timber production goals.

In addition, “increasing pace and scale” basically means doing bigger things faster which is not a recipe for good outcomes. It must become no less important to ensure an increase in the *quality* of work. That may include more upfront planning and meaningful monitoring.

To ensure the quality, as well as quantity, of restoration outcomes, they should be measured in a way that’s as quantifiable as board feet sent to a mill and could include things such as – miles of road obliterated, miles of trails maintained, culverts replaced, stream miles reconnected, miles of stream fenced from livestock, stream temperature improvement, wildlife surveys conducted, acres protected, etc.

- 4. State employees or contractors doing work under GNA on federal lands must be well trained to do work under federal laws and guidelines.** ODF and ODFW employees and contractors are generally unfamiliar with the laws, policies, and guidelines that federal lands are subject to. It is vitally important that state employees and contractors doing work on federal lands under GNA be trained for the specific work they are assigned and the regulations that work is subject to, and that they are supervised by federal employees accountable to these federal regulations and the public.

Recommendations for Implementation of Forest Carbon Offset Program in Oregon

We support the inclusion of alternative compliance mechanisms as part of DEQ’s efforts to establish a cap and reduce program in the state of Oregon. These mechanisms can help drive down costs and speed the timeline for achieving decarbonization goals. Forest carbon offsets specifically can offer numerous climate, environmental, and economic co-benefits if designed effectively, but first and foremost, emitters must utilize or commit to utilizing the “Lowest Achievable Emissions Rate” to reduce emissions as quickly as possible. An offset component should only be for emitters where effective reduction technologies do not already exist and it should not be used as a substitute for immediate emissions reductions.

Industrial scale logging operations in Oregon are one of the largest sources of greenhouse gas emissions in the state, and should also be accounted for within an emissions-capping rulemaking. While we recognize that DEQ may not have the statutory authority to directly regulate biogenic greenhouse gas emissions, we do feel that DEQ should make every effort to incorporate this source of emissions into its rulemaking via the employment of alternative compliance options.

Notably, a carbon offsets program within Oregon has the potential to provide financial support for forest protections on private lands. While there are existing policy mechanisms for requiring better management practices on Oregon's corporate timber lands, there are comparatively far fewer opportunities for incentivizing better practices on private lands that have smaller forested areas. Current tax and financial incentives are geared strongly towards short rotation logging as opposed to protecting valuable carbon stocks. Therefore we believe a forest offset program should be tailored to incentivize participation by non-industrial private lands, tribes, land trusts, and local government entities as opposed to large corporate forest owners, as a targeted alternative compliance option mechanism within the broader cap and reduce program.

But while a carbon offset program holds promise as a climate solution, even an alternative compliance mechanism targeted at non-industrial lands could have its effectiveness undermined if not designed properly. As such, DEQ should take these policy priorities under consideration:

- 1) Any future carbon offset program policies must incorporate strong integrity mechanisms that do not enable the continuation of any toxic air or water pollution as a result of the offset program, with special consideration for communities of color and lower income areas that are already facing higher pollution burdens.
- 2) DEQ should work closely with non-industrial forest owners to ensure an open and transparent decision making process in regards to a forest offset program, and ensure informational resources are readily available in rural communities.
- 3) DEQ should permit and create incentives for non-industrial lands forest owners to qualify for offset programs by aggregating small acreages.
- 4) Any future offsets program should focus on privately owned lands, especially non-industrial lands forest owners, as there are few options for ensuring protections of these forests and they have significant potential in terms of carbon sequestration — data have shown that the carbon stocks on privately owned forests in western Oregon's Coast Range are only a third of their ecological potential. Publicly owned forests are already, by law, held to higher standards for balancing multiple values and should therefore not be included in offset mechanisms.
- 5) A future forest offset should be designed in a manner that makes it compatible with other existing forest offset programs, though Oregon's program should require outside investments to meet the state's standards. By expanding the market for offsets beyond the

state and linking jurisdictions, Oregon can access additional funding for forest offsets in its carbon rich forests.

- 6) Forest offset projects must be durable and aim toward long-term storage — that is, they should not only sequester carbon, but also be managed to withstand the stresses of a changing climate in the long-term. Forest projects should be managed for species diversity and climate resilience, with an emphasis on natural forest composition (i.e. high biodiversity and diversity in tree species, size widths, density and spacing).
- 7) Forest offset projects must be additional — that is, they must incentivize forest practices that are better for the climate than business-as-usual as opposed to rewarding people for current practices. Further, an offset program should incorporate requirements for credit replacement by forest owners for any intentional reversals (they must pay back the credits if they log or develop the offset project).
- 8) The carbon benefits of any projects must be quantifiable and verifiable, and therefore DEQ must establish a working third-party accountability program with the capacity to ensure this. This program must account for industry-based greenhouse gas emissions assessed in terms of their carbon dioxide equivalent, including emissions from fuel use in industry operations, emissions from road construction, soil and native vegetation disturbance during harvest operations, slash burning and transport of slash offsite, emissions from trucking in and spraying pesticides, and the estimated loss of carbon when a tree is harvested, transported, and processed into wood products. Approved offset transactions must be subject to third-party follow up monitoring to ensure compliance over time, with meaningful penalties should a party violate their commitments.
- 9) An offset program should incorporate meaningful buffer accounts that are large enough to mitigate for natural processes (natural or human-induced) that impact carbon sequestration, including wildfires. A forest buffer account is a holding account for offset credits issued to forest projects and acts as a general insurance mechanism against unintentional reversals for offset credits issued to forest projects.
- 10) Any offset program must avoid leakage of greenhouse gas emissions in unregulated sectors.

We believe an alternative compliance option that complies with the above priorities, as part of the design of the overall Climate Protection Program rulemaking, would provide the best balance between maximizing emissions reductions, accounting for equity considerations, and minimizing cost burdens to businesses and consumers.

Chair Macdonald, members of the Oregon Global Warming Commission, and partners at Oregon Department of Agriculture and Oregon Watershed Enhancement Board,
Please find attached Oregon Climate and Agriculture Network's recommended practices, programs and policies to achieve a natural and working lands emissions and sequestration goal for Oregon.

Thank you so much for your consideration of these recommendations.
Let me know if you have any questions or need anything additional.

Megan Kemple, Co-Director, Oregon Climate and Agriculture Network (OrCAN)
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My regular schedule with OrCAN is Monday-Friday 1pm-5pm



May 10, 2021

Chair Macdonald and members of the Oregon Global Warming Commission:

On behalf of the Oregon Climate Action Plan (OCAP) Coalition, we are providing shared recommendations for practices, incentives and other policy options Oregon should pursue to achieve a natural and working lands emissions and sequestration goal. The OCAP Coalition engages at every step of the Executive Order on Climate Action (EO 20-04) implementation process, working to ensure the strongest possible outcomes for our climate, our communities and our economy.

Overarching Goals and Objectives

Increase adoption of practices that sequester carbon in the soil or reduce GHG emissions on Oregon's natural and working lands.

The adopted policies and practices should contribute to Oregon's path to reduce its GHG emissions (1) at least 45 percent below 1990 emissions levels by 2035; and (2) at least 80 percent below 1990 emissions levels by 2050.

Create and fund management and conservation programs to support practices that increase Oregon's overall sequestration of carbon in the soils and waters and reduction of other greenhouse (GHG) gases. These practices provide co-benefits such as enhanced soil health and productivity, soil water retention and quality, enhanced fish and wildlife habitat.

The development and implementation of these programs and practices should focus on public health improvements and economic opportunities, prioritize disadvantaged communities, and reduce risks to disadvantaged and vulnerable communities from climate impacts.

Facilitate multi-stakeholder collaboration, both public and private, to advance these recommendations and engage in soil health, carbon sequestration and climate resiliency programs that would benefit Oregon's agricultural lands and watersheds. Stakeholder engagement must include: farmers and ranchers engaged in a variety of types of agricultural practices including organic, conventional, regenerative and sustainable practices; BIPOC producers and farmworkers; soil and climate scientists; environmental and water advocates. Engage stakeholders including local governments, irrigation districts, state and federal agencies and non-governmental organizations, etc. Engage in regional discussions considering collaborative and multi-state efforts.

AGRICULTURE

Policy:

Create and fund management programs to support agricultural practices that increase sequestration of carbon in the soil and reduction of greenhouse (GHG) gas emissions. These practices provide multiple co-benefits such as: enhanced soil health and productivity, water retention and water quality, reduced erosion, microbial balance, pollinator, fish and wildlife habitat, and reduction of harmful algae blooms.

Practices and Incentives

1. Develop and periodically update an Oregon Agriculture Climate Resiliency and Mitigation Plan as a basis to strategically plan and implement future sequestration and emission goals and respond to existing and future climate impacts.

2. Support expansion of technical assistance by state and federal agencies, soil and water conservation districts, Oregon State University Extension, and non-governmental organizations to promote soil health practices that contribute to carbon sequestration such as:
 - a) reduced tillage or no-till,
 - b) rotational grazing,
 - c) cover cropping,
 - d) mulch and compost application,
 - e) hedgerow and riparian plantings,
 - f) silvopasture or agroforestry,
 - g) growth of deep rooted annual and perennial crops and rangeland grasses,
 - h) reduced and selective chemical inputs,
 - i) diversified cropping systems, and
 - j) other organic and regenerative practices.

3. Invest in programs to support adoption of practices which reduce GHG emissions or otherwise mitigate climate change:
 - a) Climate friendly nutrient management to reduce nitrous oxide emissions;
 - b) Alternative manure management in dairy, poultry and livestock production;
 - c) Organic waste composting systems;
 - d) Sustainable and organic production systems;
 - e) On farm strategies to reduce fossil fuel use such as reduced tillage and renewable energy systems;
 - f) Production systems which reduce or eliminate the use of black plastic;
 - f) Irrigation modernization and other water and energy conservation strategies;
 - g) Practices that predict and preempt insect pressure and outcompete invasive weed species, rather than using fossil-fuel based pesticides and delivery systems;
 - h) Climate-related wildfire prevention on agricultural and range lands.

4. Build on ODA's planned [Soil Health Baseline Assessment](#) and other existing tools to guide policy and program priorities:

- a) Expand the planned [Soil Health Baseline Assessment](#) to include soil microbial health;
- b) Use the Moore et al. report, "[Potential for Conservation Practices to Reduce Greenhouse Gas Emissions and Sequester Carbon on Croplands and Grazing Lands in Oregon,](#)" as a reference guide for generating priorities and identifying research needs;
- c) Use existing estimating and mapping tools to estimate the potential for soil carbon sequestration on agricultural lands.

5. Encourage the Oregon Legislature to adopt Healthy Soils Legislation that would create a Soil Health Grant Program or other incentive programs to fund the implementation of soil health practices including those that promote carbon sequestration. Consider models from other states such as New Mexico, Washington and California. In addition to funding for implementation of practices, the Program should include funding for research, education, demonstration, and technical assistance. The Program structure should provide technical assistance to BIPOC producers for the grant application process; prioritize distribution of funding to historically disadvantaged communities; and support community-based and urban farm projects supporting youth and BIPOC farmers.

6. Support Oregon's Land Use Planning Program and other efforts to protect Oregon's agricultural and other natural and working lands, to reduce GHG emissions and assure their potential for carbon sequestration, in ways such as:

- a) Significantly reducing the number of non-agriculture related uses permitted on lands zoned "exclusive farm use" (EFU) and allowing the conversion of these lands to non-resource uses only under limited circumstances;
- b) Maintaining compact urban growth boundaries, allowing expansion onto natural and working lands only when proven necessary;
- c) Preventing and/or mitigating impacts of major public and private facilities such as highways, pipelines, energy production and storage, etc.;
- d) Providing sustainable funding for the Oregon Agricultural Heritage Program;
- e) Supporting land trusts and other organizations engaged in farmland conservation, farm and ranch succession planning, and assistance and support to new farmers.

7. When natural and working lands are proposed for conversion to non-resource uses, or when major public facilities are proposed, the decision-making criteria shall include an assessment and mitigation of climate impacts, including greenhouse gas emission consequences and loss of carbon sequestration potential.

WATER AND WATERSHED HEALTH

Policy:

Develop watershed health and management plans and programs from a climate perspective. These plans and programs should address carbon sequestration, greenhouse gas emissions reductions, and associated co-benefits such as forest health, groundwater storage, improved watershed health and water quality, and enhanced fish and wildlife habitat.

Practices and Incentives

1. Preserve, restore, and protect floodplains, wetlands, riparian buffers, and estuaries to promote carbon sequestration.
2. Encourage the Governor and the Legislature to fund the necessary staff positions and programs to support carbon sequestration, emissions reduction, and other climate mitigation practices in Oregon's aquatic habitats.
3. State agencies should incorporate climate criteria into water agency grant programs and dedicate staff to incorporating climate change mitigation and sequestration objectives into agency programs.

Signed by member organizations of the Agriculture and Water Policy Sub-table of the Oregon Climate Action Plan (OCAP) Coalition,

Greg Holmes, Food Systems Program Director, 1000 Friends of Oregon

Addie Candib, Pacific Northwest Regional Director, American Farmland Trust

Lisa Arkin, Executive Director, Beyond Toxics

Ray Seidler, Cultivate Oregon

Amy Wong, Policy Director, Friends of Family Farmers

Jan Lee, Executive Director, Oregon Association of Conservation Districts

Megan Kemple, Co-Director, Oregon Climate and Agriculture Network

Karen Lewotsky, Rural Partnerships and Water Policy Director, Oregon Environmental Council

Ira Cuello-Martinez, Climate Policy Associate, PCUN

Thank you for the opportunity to address the Commission.



Mark Porter

President

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For the record, my name is Mark Porter and I am the President of Sales for Hampton Lumber. Thank you for taking my comments today.

In my role at Hampton, I manage traders who buy and sell lumber all over the world. It is truly a global marketplace with cedar from Japan, fir from Scandinavia, softwoods species from Indonesia, and Douglas fir from Oregon. To the subject at hand, you may hear proposals that would reduce the wood volume harvested in Oregon for an extended period of time with the objective of increasing the amount of wood carbon stored in our forests. However, from my perspective, such proposals are fundamentally flawed insofar as they ignore the risk of leakage. Timber is a high-demand global commodity and a basic human need, making demand for lumber highly inelastic. Reducing or delaying harvests in Oregon will do nothing to address global climate change. Rather, harvest will only “leak” from Oregon and serve to increase forest harvest elsewhere. Unlike other local policies that can play a role in reducing global carbon emissions such as greener vehicle standards, carpooling incentives, investments in public transport, and building optimization, forest carbon storage schemes in Oregon would only export any associated emissions to another region or country. What’s worse, it would also export many of the economic benefits we currently enjoy thanks to our abundant and sustainable working forests. The global market perspective has been lacking in the discussions of climate policies related to working lands. Losing sight of this important reality will undermine the effectiveness of our actions to combat global warming. I can assure you that if we harvest less wood locally it will only be harvested somewhere else and likely in places with less stringent environmental laws than Oregon’s.

As someone who is deeply concerned with climate change and the implications for future generations, I urge you to focus on areas where Oregonians can make significant and sensible contributions in the fight against global warming. If the state is interested in taking meaningful action to address global climate change vis-à-vis its forests, it should be promoting and expanding sustainable use of locally produced wood

products right here at home, especially in our urban environments where we anticipate significant growth over the next several decades. Thirty-nine percent of global emissions come from commercial construction, building operations, and the production of building materials. Most of those building materials are not wood and are non-renewable. As the top softwood lumber producer in the U.S., Oregon should be leading the country, indeed the world, in rethinking what we build and how we build it, including through development and application of mass timber products. In this way, we can not only reduce our local carbon footprint but we can also create products the rest of the world can utilize to reduce their own emissions. Please consider the broader environment in which we operate when making policy recommendations related to our working forests.

Thank you for your consideration and your work to advance smart, climate-friendly policies in Oregon.

Mark Porter,
President
Hampton Lumber Sales

Dear members of the Global Warming Commission:

My name is Kate McMichael. My wife and I live in Lane County on a small woodland that burned in the Holiday Farm Fire. Prior to the fire, key among our management goals was carbon sequestration and storage. Concern over climate change and strategies to minimize its impacts and maximize our proactive response are not uncommon among the forestry and timber community. After all, we plant trees for the long haul. Hoping to contribute positively to Oregon's carbon mitigation goals remains a priority to us—we have made sure that the carbon stored in our older burned trees is able to remain stored as they become wood products (perhaps even contributing to the rebuilding efforts in communities, like ours, devastated by the Labor Day fires). In the acres salvage logged and the acres of trees too young to do anything other than burn, we have planted seedlings—seedlings that we are hand-watering as these unusually dry and hot spring days threaten their survival. We are doing our part—like many of our woodland owning cohort—as best we can.

Notably absent from carbon mitigation conversations are two key things that I, as a concerned forest-owning, carbon-mitigating Oregonian, am convinced should be high on your agenda: acknowledgement of the considerable contribution already being made by Oregon's forests and forest sector; and incentives rather than increasing regulatory and tax burdens on a sector that is already paying (frequently more than) its fair share.

Today, Oregon's forest products sector already makes an outsized contribution to capturing and storing human-caused emissions, and it is imperative to prevent regulations that might hinder our ability to continue to contribute to the carbon solution. Bearing this in mind, a more collaborative strategy would be for the Global Warming Commission to focus its efforts on incentive-based mechanisms that encourage maintaining Oregon's working lands and avoid unnecessary regulatory burdens that hinder our sector's ability to remain operational, or worse, encourage the conversion of working lands to some other use.

Putting aside the fundamental inequity of making forestland owners solve a problem caused by others, curtailing harvest means curtailing the forest products industry and the 60,000 carbon-neutral jobs in rural communities our industry supports. Furthermore, the demand for wood products is higher than ever—evidenced by the sky-high price of lumber. New single family housing starts are on the rise in Oregon and across the United States. Reducing Oregon's timber harvest would at worst increase net emissions depending on what products are substituted for wood, or at best simply shift demand for wood products to some other jurisdiction (with likely weaker environmental laws) making any theoretical climate benefits illusory.

Not only is Oregon the largest softwood producer in the U.S, but Oregon's forests serve as the best available carbon sink, which is ONLY made possible through the sustainable cycle of harvesting and replanting trees. The most productive forest lands in the Pacific Northwest, which, on average, produce five times more wood than any other forestlands, are still carbon sinks.

Forests are an excellent place to absorb carbon, but they are not a good place to store it long term—those forests are destined to ultimately emit carbon through wildfire or natural decomposition. One large wildfire season can release twice as much carbon as all the cars in Portland produce in one year. According to the [most recent data](#), carbon emissions from 2020 Oregon wildfires surpassed those from both our energy and transportation sectors – which were previously our largest sources of emissions. And though emissions from wildfires may be categorically different than fossil fuel emissions, the point remains that these are emissions that, through widespread forest management, can be avoided.

In 2007 and 2008, the International Panel on Climate Change concluded that in "the long term, a sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, **while producing an annual sustained yield of timber, fiber or energy from the forest**, will generate the largest sustained mitigation benefit." [emphasis added].

Wood buildings produce less air and water pollution, require less energy and generate less carbon-dioxide emissions than other building materials. In fact, building with wood instead of steel and concrete would reduce CO2 emissions by 20 percent.

If our state truly wants to pursue a meaningful carbon mitigation policy for working forests, it should work with rather than against the forest sector, strategizing priorities—perhaps leaning hard on the federal government to re-open federal forests to harvest?—practices and incentives to acknowledge and build upon the good work forest landowners are already doing, quite literally, from the ground up.

Thank you for your time to listen to a woodland owner who remains, no matter how often I feel demonized or unheard, your ally in this effort.

--

Kathryn McMichael

Dear members of the Global Warming Commission:

My name is Theresa Hausser. My wife and I live in Lane County on a small woodland that burned in the Holiday Farm Fire. Prior to the fire, key among our management goals was carbon sequestration and storage. Concern over climate change and strategies to minimize its impacts and maximize our proactive response are not uncommon among the forestry and timber community. After all, we plant trees for the long haul. Hoping to contribute positively to Oregon's carbon mitigation goals remains a priority to us—we have made sure that the carbon stored in our older burned trees is able to remain stored as they become wood products (perhaps even contributing to the rebuilding efforts in communities, like ours, devastated by the Labor Day fires). In the acres salvage logged and the acres of trees too young to do anything other than burn, we have planted seedlings—seedlings that we are hand-watering as these unusually dry and hot spring days threaten their survival. We are doing our part—like many of our woodland owning cohort—as best we can.

Notably absent from carbon mitigation conversations are two key things that I, as a concerned forest-owning, carbon-mitigating Oregonian, am convinced should be high on your agenda: acknowledgement of the considerable contribution already being made by Oregon's forests and forest sector; and incentives rather than increasing regulatory and tax burdens on a sector that is already paying (frequently more than) its fair share.

Today, Oregon's forest products sector already makes an outsized contribution to capturing and storing human-caused emissions, and it is imperative to prevent regulations that might hinder our ability to continue to contribute to the carbon solution. Bearing this in mind, a more collaborative strategy would be for the Global Warming Commission to focus its efforts on incentive-based mechanisms that encourage maintaining Oregon's working lands and avoid unnecessary regulatory burdens that hinder our sector's ability to remain operational, or worse, encourage the conversion of working lands to some other use.

Putting aside the fundamental inequity of making forestland owners solve a problem caused by others, curtailing harvest means curtailing the forest products industry and the 60,000 carbon-neutral jobs in rural communities our industry supports. Furthermore, the demand for wood products is higher than ever—evidenced by the sky-high price of lumber. New single family housing starts are on the rise in Oregon and across the United States. Reducing Oregon's timber harvest would at worst increase net emissions depending on what products are substituted for wood, or at best simply shift demand for wood products to some other jurisdiction (with likely weaker environmental laws) making any theoretical climate benefits illusory.

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Thank you for your time to listen to a woodland owner who remains, no matter how often I feel demonized or unheard, your ally in this effort.

--

Theresa Hausser

Well behaved women rarely make history.

Laurel Thatcher Ulrich

To: Oregon Global Warming Commission,

WOOD- beautiful, strong, natural, renewable, sustainable, recyclable, CO2 eating, energy efficient, easy-to-use WOOD! No other resource on earth can match its environmental advantages. Clearly, the world should be using more wood, not less.

To put things in perspective, every man, woman and child in America uses the equivalent of one 16" in diameter by 100' tall tree every year to meet their needs for paper related products. If your tree was harvested in Oregon--it was harvested using the most careful and strict environmental protections in the world.

Each of us used more than one tree before recycling became efficient.

Americans recover approximately 46% of all paper used. Currently, our growing population uses 2% more paper each year--more than the rate of recycling. Pulp and paper mills use waste wood, recycled fiber, and logs too small or not usable for lumber to make our paper and cardboard which makes up the largest component that contributes to our MSW (municipal solid waste). Some items that make up our MSW are paper plates, newspapers, shipping boxes, milk cartons, and paper grocery bags.

Wood is the only renewable and sustainable building material on earth. It's produced by trees using free energy from the sun, carbon dioxide from the air, plus water and nutrients from the soil. In return trees sequester great amounts of CO2, for free. Healthy managed forests generate far more pure oxygen than do old slow growing forests.

Oregon is the #1 softwood producer in our country, despite the strictest of regulation and laws on harvest, related roads, reforestation, waterways, etc. We are the number #1 because Oregon's private timberland owner's take care of their natural resources for future generations. We are the true stewards, the true Environmentalists and can prove it.

Strict forest laws assure trees are planted and growing to replace timber harvested. For every one tree harvested we plant 4. Out of 300 healthy, growing trees we are allowed to harvest only 1.

Oregon has the highest private land reforestation compliance rate in the nation -- averaging 97%. More than 40 million seedlings are planted in Oregon each year, by hand. That's more than 9 seedlings for every Oregonian.

40% of Oregon's forests (about 11 million acres) are preserved for old growth reserves, stream corridors, wetlands, wildlife habitats, natural areas, recreation zones, wilderness, parks, and other withdrawals, and will never be harvested. How much preservation instead of conservation is enough?

Statewide harvest crested during the decades of the 1950s and 1960s, before the Forest Practices Act (1971) and has been declining ever since.

1950's = 8.71 mmbf/yr

1960's = 8.79 mmbf/yr

1970's = 8.36 mmbf/yr

1980's = 7.52 mmbf/yr

1990's = 4.71 mmbf/yr
2000's = 3.83 mmbf/yr
2010's = 2.65 mmbf/yr

The fall-off in statewide annual timber harvest is not because Oregon is running out of trees—in fact just the opposite is the case.

Oregon's calculated sustainable forest growth of available timber is between 6 to 8 billion board feet / year.

From the end of World War II until 1989, timber harvests in Oregon generally ranged from 7 billion to the high 8 billion board feet annually - a long-term sustainable volume. In 2020 over 15 billion Board feet burned. That's enough wood to build 1 million houses.

Today, more than 75 percent of Oregon's timber harvest consistently comes from private forestlands, but around 90% of wildfires devastate public forests. Manage it or watch it burn.

Since 1989, timber harvests on federal lands have dropped intensely by more than 90 percent, due to environmental litigation and conflicting federal forest laws, policies and plans set by bureaucracies who have aligned themselves with Environmental groups, especially in Oregon. Environmental groups have held Oregon's timberlands hostage by threatening lawsuits and throwing planned harvesting operations into court for years until resources are exhausted. Exhausting critical resources leaves less to properly manage forests.

To add to the time and expense of planning a timber harvest, NEPA, The National Environmental Policy, costs taxpayers \$millions and takes years! NEPA requires federal agencies to assess and disclose the effects of proposed actions prior to making decisions. At the Forest Service the costs and time needed to complete NEPA work have ballooned. It typically takes over three years to complete the environmental paperwork for something as simple as a routine forest thinning project. NEPA needs to be revised to better suit our forests and proper forest management.

The Forest Service has realized this is unacceptable, why haven't the self-claimed Environmentalists?

Harvest levels are well-below the sustainable forest growth for the past two decades.

Oregon needs to increased timber harvest and forest products production for Oregon's future and to help reduce and mitigate forest fires.

Reforestation following forest fires is not required by law, but Salvage harvesting triggers legal requirements for reforestation. So far this year Oregon has lost a million acres to forest fire. Reforestation after salvage harvesting is a part of proper forest management. Oregon needs to support salvage harvesting for revenue, forest clean-up and reforestation.

Shutting down, extending age of trees for harvest, creating more harvest prohibitions and forest preserves will only deprive future generations of the wood they need, forcing increased use of other non-renewable, non-sustainable wood substitutes that pose a far greater risk to the environment than forestry ever has, or ever will. For example, the cement industry contributes 8% and the iron and steel

industries contribute 5% of worldwide emissions. Cement and metal are not sustainable or renewable, and they do not eat CO2 like trees, they add to Green House Gas emissions.

Oregon's economy depends on healthy and well managed forests for revenue, to mitigate wild fires and sequester CO2. Oregon must make a major commitment to manage our productive forests to sequester CO2, and grow & harvest our daily wood consumption.

Sincerely,
Jen Hamaker

Resources:

<https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/paper-and-paperboard-material-specific-data>

https://www.oregonloggers.org/Forest_facts_SimpleFacts.aspx

<https://e360.yale.edu/digest/the-cement-industry-one-of-the-worlds-largest-co2-emitters-pledges-to-cut-greenhouse-gases>

https://www.oregonloggers.org/Forest_facts_HarvestData.aspx

<https://hrcak.srce.hr/file/56088>

Sent from my treehouse made from renewable, sustainable wood.