Submitted: Sat 09/04/2021 11:52 PM

Subject: BOF Meeting 9/8/21, Agenda Item #1

Dear ODF,
I am writing to you to voice my deep concern about the quality of my town's drinking water that is sourced from the Jetty Creek watershed. Much of this area has already been heavily logged in the last 10 years or so. My tap water comes from here. During the time these earlier clearcuts were occurring, the City of Rockaway was repeatedly fined by the EPA for failing federal water standards. The city spent over $1 million dollars to upgrade the drinking/tap water plant. This expense was passed on to us with a substantial increase in our water bills. (Flat basic rate: $95.74 every 60 days. This does not include my sewer bill!)

I am concerned about the safety of our drinking water and our escalating, expensive water bills.
To the best of my knowledge, the proposed draft of the State Forest Management Plan (FMP) does not include any provisions for protecting our coastal watersheds with regular monitoring of our drinking water sources for allowable levels (set by EPA and DEQ) of herbicides, as well as moratorium periods to halt spraying of herbicides to allow environmental impact studies. There seems to be no provisions for dealing with our drought situation, either.

To protect what is left of our heavily logged watershed here in Rockaway, as well as in other coastal areas, I urge you to include in the FMP: plans for environmental studies of our watersheds; periodic testing by an independent third party of the herbicide compounds and other chemicals used by timber companies near our water source; moratoriums on herbicide spraying by our creeks and rivers supplying our water; banning of steep hillside logging; and to require ALL forest management (including privately held forest lands) comply with the federal Clean Water Act.

Why should I be paying $95.74 every 60 days for contaminated tap water, which I must treat with two separate filtration systems before it is even drinkable? Why aren't the logging companies paying the clean up costs for ruining my drinking watershed? Instead, I, and all the Rockaway area folks are shouldering outrageously expensive bills for heavily processed water that is polluted.

We all need and deserve clean, drinkable tap water. Would you people on the ODF Board pay $95.74 every 60 days for water that occasionally comes out of your tap colored pink or orange, or is foamy, like there is a soap residue in it? Would you drink it, let alone bathe in it? Would you want your kids, grandkids, grandparents, spouses, and all those you love and care about to do so?

I bet not. Please make safe, clean water a top priority in the ODF FMP. I am fed up. Something's got to change, and you people have the power to do it in this ODF Forest management plan, so just do it!!

Sincerely,
Theresa Anne Bosserman, property owner
Twin Rocks, Oregon (City of Rockaway Beach tap water district)
goldentheresann@gmail.com

Submitted: Fri 09/03/2021 1:25 PM

Subject: Comments For the Sept 8 board meeting Agenda Item 1

Dear Board Of Forestry,

I live in the North Fork of the Nehalem River drainage approximately four miles north of the city of Nehalem. My home water supply comes from a small drainage part of which is private commercial forest and part is state forest. Obviously I am very interested in how forest management may impact my water supply.

I believe it should be clear at this point in time that the most valuable product of our forest land is now clean cold toxic free water. This is true for both the many cities and private landowners throughout the state and for valuable fish species such as threatened coho salmon. Our coastal bays and the industries they support including shellfish and specifically oysters are suffering from siltation originating on forest land.

Maintaining a reliable safe water source and yield from forest land must be a priority especially as we face a warming likely drier future. The FMP needs to include goals specific to assuring future needs of safe water will be met for people and wildlife. One way to accomplish this is to protect all mature and old growth on state forest since those forest types are best at water conservation.

I see massive clear cuts in my area on slopes almost too steep to stand on. I see active logging during our rainy season here on the coast range. That is not sustainable. On state land especially we need to manage for a healthy forest. Management seems geared toward short rotation tree plantations and while trees are a renewable resource forests are not under much of the current management.

Sincerely,
Ted Chu
41400 Anderson Rd, Nehalem, Oregon 97131
yuiqwe1@gmail.com

Submitted: Tue 09/07/2021 3:58 PM

Subject: BOF meeting for Sept 8, 21 Agenda item #1

To the Board of Forestry,

Regarding meeting Sept 8, 2021 in reference to Agenda item #1.

I can not think of a more critical or urgent community issue than safe drinking water for Oregonians. It is just a reality that due to the fact that many of our coastal watersheds are within private timber stands that it is CRITICAL that we have safe practice regulations to ensure that the people that rely on their drinking water being safe from these harmful substances. What good does any economic development to if they communities they serve suffer health damage from their drinking water? This is a multi faceted issue that effects not just the health of individuals but also of the entire community to thrive. Clean, safe water is the most critical issue of the future for all of us. It seems it should be in the interest of the timber companies to protect our communities for all the reasons that will be presented to you. If cities can not provide safe water , there can be no safe cities. I ask that there be regulations set up to protect the watersheds from the use of herbicide, pesticides and clear cut logging that damage the soils , increase evaporation and leach into the ground and run off waters. What would the private interests need in return for this? Should the collective bodies in the federal , state and city governments plus rate payers look at buying these rights of way to ensure the proper management of these vital resources? I don't think people want to do damage to the private interests involved but asking for a healthy drinking source is not unreasonable either but conversely is essential to the future of all our communities . The future of all of us is in your hands as you decide these crucial things. Please remember that water is the primary life nutrient and poisoning of this resource will damage all of us, from children to the elderly and all of the other life on this planet.

Sincerely julie and John copley. Rockaway Beach, Oregon

jcopley1504@gmail.com

Submitted: Wed 09/01/2021 11:34 AM
Subject: Public comment for the BOF Sept. 8th meting -agenda #1

My concern is that the OBF become more integrated with the overall environmental vision of the state at large. Our biggest economic and existential threat is global warming. While the BOF has little power to shape the policy on global warming, if the mitigation of global warming is considered a fundamental responsibility of all Oregon governmental bodies and an overarching goal of each, then there is the chance of improvement in our forest management practices as set by your board.

Reforestation is being called for by the world's climate scientists as an important means to mitigating the climate crisis. Oregon could contribute to reforestation in meaningful ways beyond simple replanting after clearcutting, which has been called the most CO2 spewing extraction process of them all by the Centre for Biological Diversity. More balance between mitigating the effects of the climate crisis and the need for timber products could be struck by setting aside one acre of forest land for conservation for every two acres that are clearcut. This would comply with suggested federal guidelines regarding one third of our lands be left natural. The policy could apply to both state and private forest holdings. Private forest land holders could be rewarded for selective logging which would not trigger the set aside. Reforestation should become the main charge of the ODF. Rather than spending time cruising timber on the public's land to sell for clearcutting by timber companies, ODF could begin an aggressive reforestation and fire mitigation process employing workers who might find less employment if clearcutting on state land is halted. Monies for the counties from timber sales of state land should be made available by inacting a new severance tax and an adjustment of the property tax on private timber land. Additional funding for the counties could be derived by eliminating OFRI which has functioned as a PR firm for the timber industry for years.
I recognize these suggestions are beyond the function of OBF. But I believe that OBF having a vision of what is possible and where Oregon needs to go is important in making the decisions on issues you do have a say on. Our state has the capacity to grow trees like no other. It's a beautiful place that could become an eco-paradise once there is a commitment to restore our forests.

In acknowledging our need for wood products we acknowledge the difficult task that reforestation presents. Our success will be measured acre by acre of forests we can restore while acting with the wisdom born of gratitude toward any tree we fall.

Roger Dorband
462 6th Street
Astoria, Oregon 97103
info@ravenstudiosart.com

Northwest Trout Farms Inc.
1001 Wright Creek Rd. Toledo, Oregon
P.O. Box 185 Toledo, Oregon 97391
northwesttroutfarmsinc@gmail.com
Dennis Fletcher CEO
(971)267-4684

RE:
Oregon Board of Forestry
BOF meeting Sept. 8, 2021
Agenda item #1 & #2

September 4 ,2020

Dear chairman of the board Kelly and all other sitting member, thank you for the opportunity to present my comments for consideration regarding the Sept.8 2021 board meeting i.e., agenda item #1 & #2. My name is Dennis Fletcher I live in Toledo, Oregon (Lincoln County) on 80 acres within the Montgomery creek watershed. I have provided a legal description as it is very important to my direct comments and helps with understanding how the geology of the area compounds the ramifications of surrounding timber investment groups forest practices: **East one half of the Northwest one quarter of Section 32 T 11 S, R 10 W, W.M.** There is a property use and management agreement between Dennis Fletcher and legal property owner Ramsay I Cowlishaw II whom is 83 years old and has lived on this property for 45 years with the sole water source coming from a spring. Quite frankly, I am terrified to drink our water, and quite apprehensive about moving forward with the operating my business on the property after recently seeing on FERNS notification regarding pesticide spraying by three surrounding properties. While I am assured by my local ODF representative (direct quote follows) “As long as protocols are followed there should be no movement of pesticide into our water source” I was also assured by the local ODF rep that there would be adequate oversight to prevent such an occurrence.

Based on my previous observations in my area, it is my belief the statements by the OFD rep are nothing more than lip service and the burden is placed on the small forest landowner to battle with large timber investment groups such as Hancock, Plumb Creek and VanEck alone. These investment groups operate with maximizing profits trumping habitat conservation. It appears that ODF has become complacent and allowed this type of business model to threaten and possibly even undermine Oregon’s Habitat Conservation plan. Which is why I ask you to put in place a moratorium on pesticide use until adequate testing, planning and adequate oversight has been accomplished.

Agenda #2 In 2019 I was given the opportunity to be landowners representative of this property during a selective harvest of 23 acres. Because I had actively worked in the Timber industry from 1982-1992 and unsure of changes to the laws. The first thing I did was obtain all of the Oregon forest practice laws in place and even the very handy illustrated manual to assure I had all the updated information to be successful during the harvest. Again, what I perceive as lack of adequate oversight regarding plans in place, bowing to corporate demands of the timber investment groups as well as complacency is plaguing ODF and threatening Oregon Wildlife and their habitat.

ODF rep had no idea logging had begun on our unit, though it was posted on Ferns. And the rep only arrived on the unit when I called asking for a meeting three weeks into the harvest to discuss reforestation. It was at that time that we located a shovel stuck in an area that it had no business being. The 80,000 lb piece of logging equipment stayed buried up to the cab for two weeks while water began to pool behind. It was at that time the ODF rep threatened me the landowner would be liable. Another piece of equipment was brought in to excavate a 150 long,10 foot Wide, and 6-foot-deep canal to mitigate water behind shovel. Which consequently ran to the creek less than 100 feet away. Then the ODF rep required me to mitigate erosion control around canal with 100 bales of straw less again the landowner be liable.

The ODF rep did visit our unit after the logging ceased and discussed how the piles should be burnt and verified our reforestation plans. It was at this time he advocated for the use of pesticides though we had been adamant we would be using other means for vegetation mitigation. It was also at this time he warned us that the pile of unmarketable logs left by the processor was far too large and that is was very common for marketable timer to be left behind. I must say this is unacceptable.

I have to date pulled cut split and delivered 75 cords of premium firewood from the processor pile alone. I have also pulled apart three slash piles only to find very large logs hidden beneath slash. I have recovered, cut split and delivered an additional 13 cords of premium firewood from the three piles. On a 23-acre harvest this is unacceptable.

Why does ODF place the burden on small landowner?

Why Is ODF advocating the use of pesticides without testing?

Why are we wasting resources by not hand piling slash?

Why are we not setting unmarketable logs on landing to be utilized for habitat restoration or even firewood?

At the physical address above Northwest Trout Farms Inc. operates a dedicated lab and office related solely to my business separate from my residence on the same listed property. All business-related work is done on the physical address listed with SAM. The primary function of the business currently, is research and design of innovative Hatchery and Aquaculture facilities. With the primary focus being on insect-based feeds for use in the Aquaculture industry. The primary long-term goal of the business model is for a vertically integrated insect-based feed production and hatchery facility for use in the Aquaculture industry. The project is designed to produce a full-scale commercial application and support the initial trials and effectiveness, as well as to demonstrate the feasibility of clearing the Social, Economic and Ecological hurdles with the innovative feed production facility and hatchery being proposed by Northwest Trout Farms Inc.

Sincerely

Dennis Fletcher

TO: Oregon Board of Forestry and State Forester Hirsch
FROM: Beyond Toxics
DATE: September 22, 2021
RE: Aerial Herbicide Application in State Forests on Drinking Water

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Dear Chair Kelly, State Forester Hirsch, and members of the Board:

Please consider these comments as a follow-up to the September 8th presentation by Beyond Toxics, a statewide environmental justice organization with offices in Lane and Jackson Counties. While we're compiling comprehensive findings to submit to the Board in the near future, we wanted to share with you our main takeaways from a preliminary set of data we have obtained regarding the application of pesticides in state forests. Data was taken from the Forest Activity Electronic Reporting and Notification System (FERNS).

We urge the Board of Forestry to consider this preliminary data and ultimately call for a thorough, immediate evaluation of the full range of impacts of aerial herbicide application in state forests on drinking water quality, greenhouse gas emissions, essential fish habitat, and community health and wellbeing.

I. Herbicide Applications on Oregon State Forests

The data in this section details herbicide applications on state forest lands spanning from January 1st, 2020, to August 30th, 2021. In Figure 1, it is clear that most sprays during this period occurred in the Western Lane District, followed by Astoria and Forest Grove.

Figure 2 illustrates that, of the 326 herbicide applications on state forest lands between January 2020 and August 2021, 215 were ground sprays and 111 were aerial sprays. In the past 20 months, 34% of all sprays on state forests were aerial herbicide sprays. However, previous analysis Beyond Toxics completed using FERNS data showed that aerial spraying could comprise as much as 70% of all herbicide sprays in a state forest district over a broader time period.

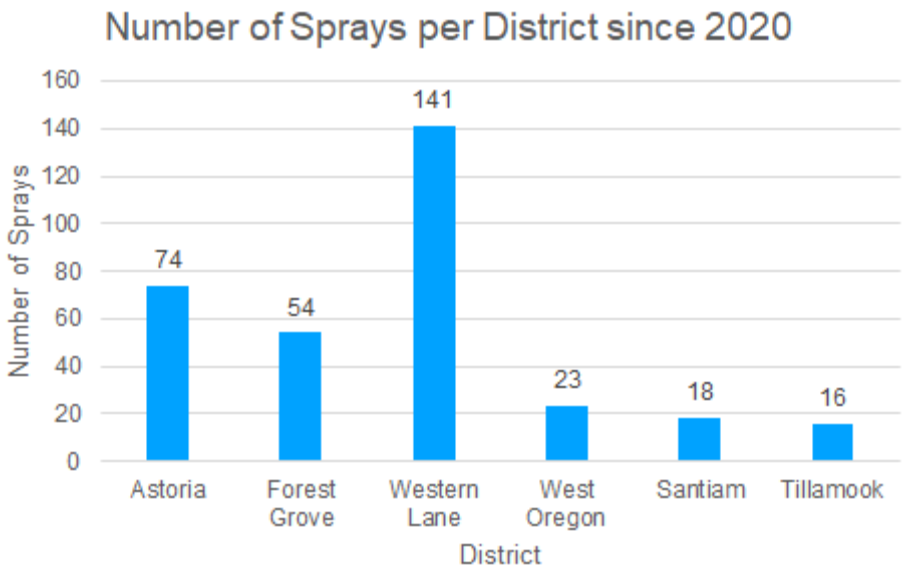

Figure 1. Number of sprays per state forest district since January 1, 2020.

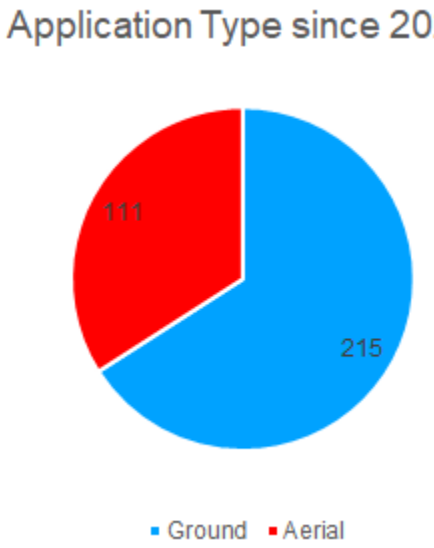

Figure 2. Herbicide spray application types on state forests since January 1, 2021.

Of the 326 tank mixes sprayed in state forests, 227 or 69.6% contained three or more active ingredients, as shown in Figure 3. Typically, multiple adjuvants are also added to the tank mixes to alter the characteristics or increase the effectiveness and potency of the herbicide formulation.

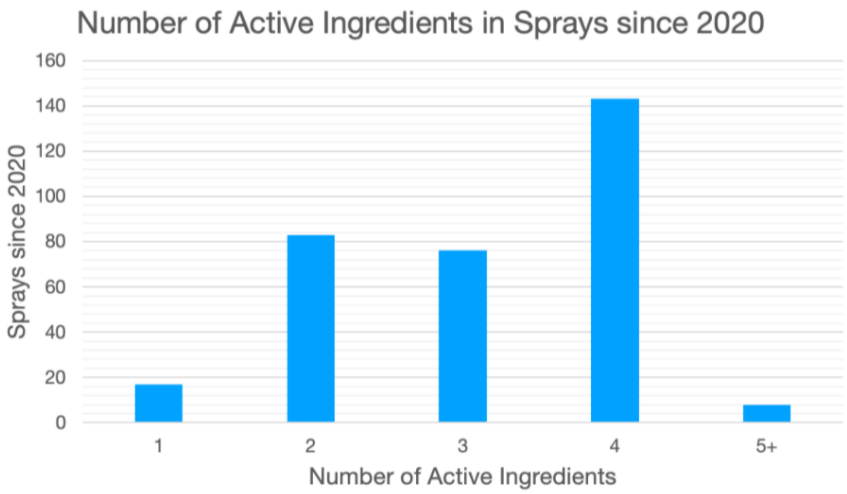

Figure 3. Number of active ingredients in herbicide mixes applied to state forests since January 1, 2020.

In Figure 4, we see that in 175 of the 326 total tank mixes, four or five adjuvants were added, which represents 54% of the total used multiple adjuvants. This creates chemical mixtures of active ingredients and adjuvants that have not been researched for their synergistic or additive effects in the environment or in drinking water. In any single tank mix, there could be seven to eight hazardous chemicals present, possibly increasing the overall toxicity[1] being introduced into the environment and making its way into streams that support fish, amphibians and other aquatic species and provide drinking water to thousands of Oregonians.

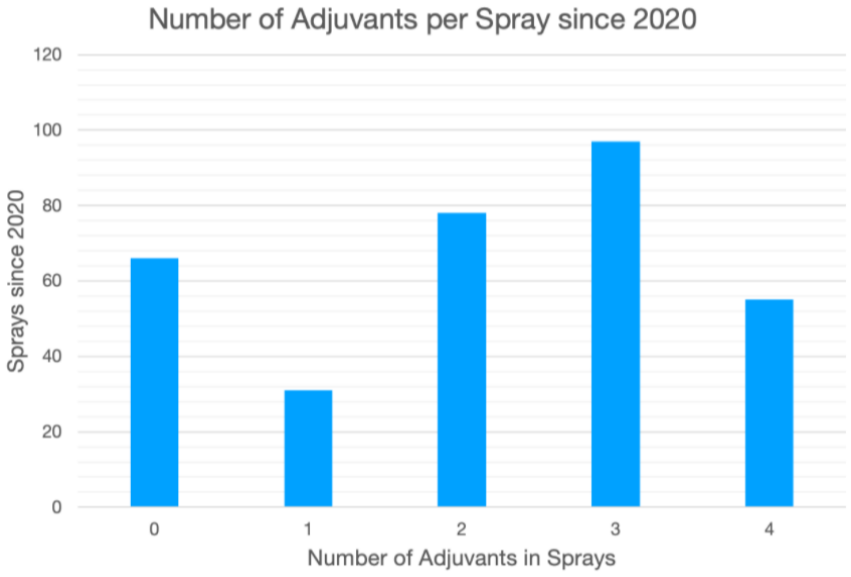

Figure 4. Number of adjuvants in herbicide mixes applied to state forests since January 1, 2021.

[1] See "Ubiquitous Herbicide Glyphosate/Roundup Threatens Nearly All Endangered Species, Says EPA." Beyond Pesticides, December 4, 2020. https://beyondpesticides.org/dailynewsblog/2020/12/ubiquitous-herbicide-glyphosate-roundup-threatens-nearly-all-endangered-species-says-epa/

II. Common Active Ingredients in Tank Mixes and Associated Impacts

Many of the chemicals used by ODF in their sprays can lead to harmful symptoms when people are exposed to them, including rashes, asthma attacks, vomiting, and nosebleeds. There have been several instances where hazardous chemical mixtures, poorly timed spraying and high winds have led to sickened communities in Oregon. Figure 5 shows specific examples of active ingredients used in herbicide sprays on Oregon state forests.

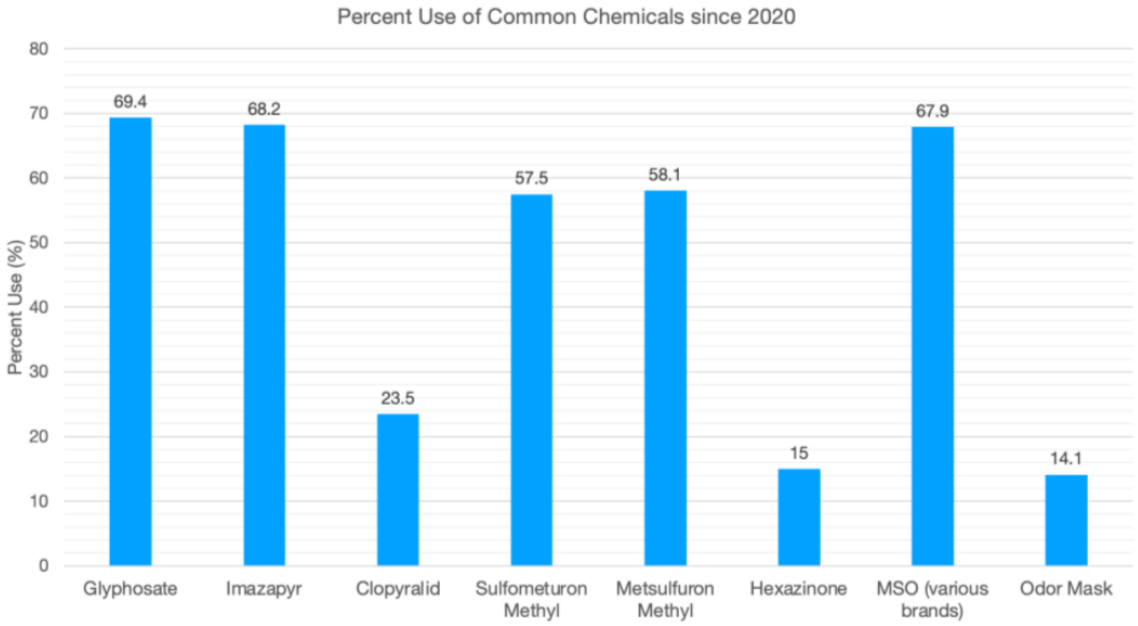

Figure 5. Common active ingredients present in herbicide mixes applied to state forest lands since January 1, 2021.

These pesticides are known to have negative environmental and health effects:

Glyphosate was used in 69.4% of the tank mixes applied to state forests since January 1st, 2020. A draft biological evaluation[2] from the U.S. Environmental Protection Agency states that glyphosate herbicides are associated with growth and reproductive effects in terrestrial and aquatic animals as well as adverse effects on plant growth.[3] The EPA found that glyphosate was likely to adversely affect 93% of threatened and endangered species.[4] Glyphosate has been found

[2] U.S. EPA. Glyphosate Draft Biological Evaluation, November 2020. https://www.epa.gov/endangered-species/draft-national-level-listed-species-biological-evaluation-glyphosate#executive-summary

[3] Erickson, Britt. 2020. "Glyphosate likely harms nearly all endangered species." Chemical and Engineering News, November 30, 2020. https://cen.acs.org/environment/pesticides/Glyphosate-likely-harms-nearly-endangered/98/web/2020/11

[4] "Ubiquitous Herbicide Glyphosate/Roundup Threatens Nearly All Endangered Species, Says EPA." Beyond Pesticides, December 4, 2020.

to persist in plants within a forest environment for more than twelve months, which may have implications for the edible and/or medicinal use of native plants.[5] This is a concern for Native American and members of other cultures who depend on native plants for food and medicinal uses or for people who forage forest products.[6]

Hexazinone, which was present in 15% of the tank mixes applied to state forests over the past 20 months, is a particularly hazardous "restricted use pesticide" that can cause eye damage and harm aquatic species. Hexazinone is persistent in ground water and **can persist in soils** and aquatic systems for some time, concerning both ground- and surface water quality.[7] As a result of its relative persistence and high mobility, it has a high potential to move off-site and contaminate water or kill desirable plants.[8] Washington State banned the use of pesticides containing hexazinone in forestry practices on all forestlands in the state due to its toxicity in groundwater (WAC 16-228-1231(3)).

C**lopyralid** is a highly persistent chemical in the environment, meaning it doesn't break down easily. This chemical was used in 23.5% of tank mixes. As an example of its extreme persistence, clopyralid has been found in compost facilities, getting there through clopyralid-laced manure, then damaging home gardens at concentrations of only 3 parts per billion. This took place in Portland just last year.[9]

Finally, and alarmingly, **odor masks** were added to 14.1% of the tank mixes applied since January 1, 2020. Masking agents are used to inhibit Oregonians from sensing the chemical concoctions being applied in their forests in an attempt to superimpose a pleasant fragrance upon an unpleasant odor. This would be concerning for people picnicking, hiking and camping in our state forests, who may not realize they are inhaling dangerous toxins.

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https://beyondpesticides.org/dailynewsblog/2020/12/ubiquitous-herbicide-glyphosate-roundup-threatens-nearly-all-endangered-species-says-epa/

[5] Botten, N., Wood, L.J., and Werner J.R. 2021. "Glyphosate remains in forest plant tissues for a decade or more." Forest Ecology and Management 493, August 1, 2021, https://doi.org/10.1016/j.foreco.2021.119259

[6] Wood, Lisa. 2019. "The presence of glyphosate in forest plants with different life strategies one year after application." Canadian Journal of Forest Research 49:6, January 8, 2019. https://doi.org/10.1139/cjfr-2018-0331

[7] U.S. EPA, Hexazinone: Reregistration Eligibility Decision (RED) Fact Sheet. https://archive.epa.gov/pesticides/reregistration/web/pdf/0266fact.pdf&sa=D&source=editors&ust=1632337300152000&usg=AOvVaw0LOK1FIDZgzUuhyt7u0_uY

[8] Tu et al. "Weed Control Methods Handbook: Hexazinone." The Nature Conservancy, April 2001. https://www.invasive.org/gist/products/handbook/15.Hexazinone.pdf&sa=D&source=editors&ust=1632337300154000&usg=AOvVaw1K0Z6VtK0l5FE4mTmggFY_

[9] Danovich, Tove. 2020. "Contaminated compost: How an industrial herbicide is ruining backyard gardens." The Counter, July 7, 2020. https://thecounter.org/contaminated-compost-herbicide-industrial-agriculture-backyard-gardens-clopyralid/

III. Proximity of Aerial Herbicide Applications to Drinking Water Intakes

Based on some of the health risks that come with intaking pesticides, what is especially concerning is the proximity of aerial herbicide applications to drinking water intakes. The map below shows the locations of aerial sprays that occurred from 2015 to 2018 (shown in red). Tillamook State Forest lands (shown in brown) overlap with areas designated as drinking watersheds by the Oregon Department of Environmental Quality and Oregon Health Authority (shown in pink). As you can see, several aerial sprays occurred where state forest lands overlapped with these drinking water source areas, which provide drinking water for thousands of Oregonians. This is very concerning in the context of public health.

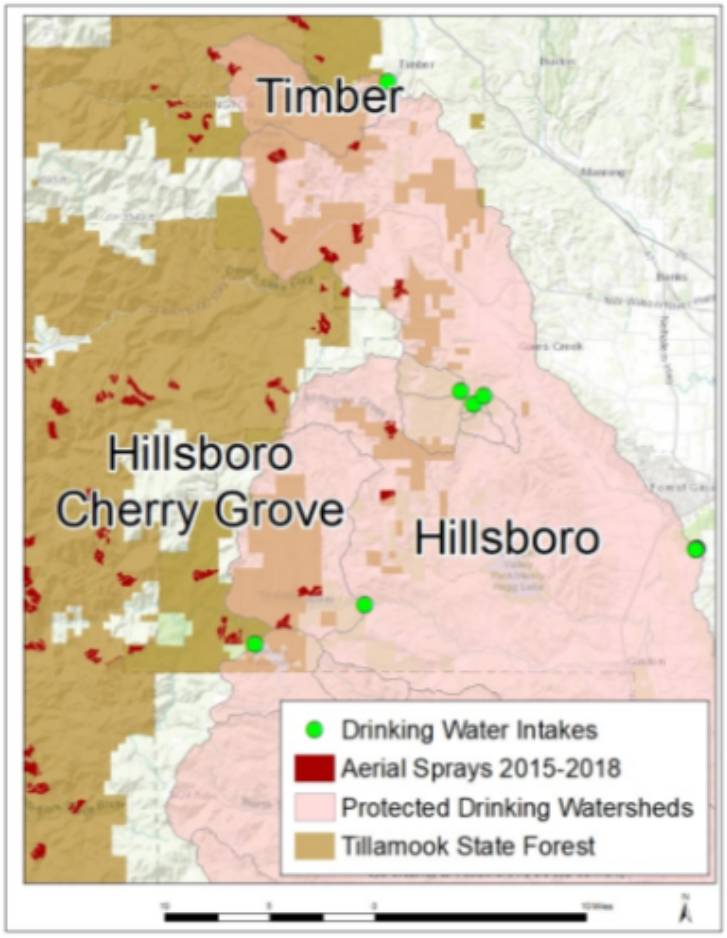

Figure 6. Aerial sprays that occurred from 2015-2018 compared to watersheds and drinking water intakes.

IV. Concerns and Recommended Next Steps

We and many other Oregonians are deeply concerned about the long-lasting impacts of aerial spray on our drinking water quality. Management plans being developed by the Department of Forestry do not adequately prioritize safe drinking water. They fail to adequately recognize the

role that forestry practices like aerial spray can play in threatening our water supplies and in exacerbating climate change. We should not forget that ODF's unsustainable logging policies and practices on the coast lost the state over $1.2 million in federal grant funding in 2016.

Forest Management Plans do not underscore the urgency many Oregonians feel as we experience severe drought--plus greater levels of pollution--in waters of the state that are critical to health and sustenance for people and wildlife alike.

Solving our water and forest problems requires more urgency and greater corrective action than appears in the Department's efforts. We must protect our watersheds. Access to safe, reliable water is a basic human right that is necessary for viable communities and future generations. Further, if we protect our watersheds, we get more than safe water resources: we also get healthy forests, fish and wildlife habitat, carbon storage, a stronger economy and ecologically-appropriate forest practices.

Along with many other concerned Oregonians, we ask that the Board place a moratorium on aerial pesticide sprays in watersheds in state forests until such time that the Board can establish a panel of scientists, sustainable forestry management experts and community members to study the impacts of aerial spray to communities, water and the environment. During a two-year moratorium ODF should conduct a study to map drinking water sources and critical groundwater areas and perform an independent analysis of water quality and pesticides.

Only when informed by a comprehensive analysis will ODF be able to chart a better path forward for our drinking water, our fish habitats, and community health and wellbeing. We will provide the Board with more comprehensive data and findings in support of this request as soon as possible. We are happy to answer any questions you may have at this time. Thank you for considering this urgent request.

Sincerely,

Lisa Arkin, Executive Director, Beyond Toxics
larkin@beyondtoxics.org

Grace Brahler, Oregon Climate Action Plan and Policy Manager, Beyond Toxics
gbrahler@beyondtoxics.org

Jenna Travers, Water Quality Intern, Beyond Toxics
jtravers@beyondtoxics.org

Submitted: Sat 09/04/2021 1:52 PM

Subject: Comments for 9/8 BOF meeting, Agenda Item #1

350PDX supports the request by North Coast Communities for Watershed Protection for a two-year moratorium on the use of pesticides in drinking watersheds. The drinking water of many Oregon communities is threatened by pesticides used for industrial logging operations. Scientific evidence suggests at least some of these chemicals cause cancer in humans, and these chemicals are used in combinations never tested for safety or persistence in the environment. Pesticide pollution is one of several ways industrial logging harms community drinking water in our state, as reported by the Oregonian (https://www.oregonlive.com/environment/2020/12/timber-tax-cuts-cost-oregon-towns-billions-then-clear-cuts-polluted-their-water-and-drove-up-the-price.html).

Portland residents' water supply from the Bull Run watershed is well-protected from pesticides and other harmful effects of logging, and 350PDX believes all Oregonians deserve the same. The ODF must make bold changes to ensure safe, clean drinking water for all Oregon communities that depend on forested watersheds.

Thank you,
Leslie Grush
Volunteer Organizer
350PDX
lesliegrush@gmail.com

Submitted: Sun 09/05/2021 3:12 PM

Subject: for BOF mtg on Sept 8, re: agenda item #1

In your consideration of all things commerce, please take into larger account our drinking water, as we live and pay taxes on the north Oregon Coast. That water's quality and availability is a matter of life and death for us all, and you control it.

Watersheds must be protected, yes?, Forestry Management 101, right?

Allowing clear cutting on, near and around out watersheds, is threatening our health and lives. Can you stop doing that? Let's start with a multi-year moratorium on pesticide use so that heretofore problems lack-of-a-plan has caused can be assessed.

Please represent us people, not logging companies, who do not have to live here. Our children and families do have to. Please add drinking water protections to your playbook.

Thanks

Richard Henry

555rahenry@gmail.com

Public comments re: Forest Management Plan Draft Goals

Betsy Herbert, Ph.D.

6560 NW Vineyard Dr.

Corvallis, OR 97730

betsyherbert4trees@gmail.com

My comments regarding ODF's August 4, 2021 Forest Management Plan Draft Goals are as follows:

I have two overall comments about this list of goals:

1. Please identify the primary goal. I suggest that the primary goal be to protect the natural ecosystem services (e.g., hydrologic function and natural filtration for clean drinking water, carbon storage for clean air and climate change mitigation, and habitat provision for native species and biodiversity) provided by state forest lands.

2. Explain how ODF will act when one or more goals are conflicting. My research shows that when two or more goals conflict with regards to how forests are managed, it is the goal that results in the greatest short-term monetary gain that takes priority (Herbert, 2004; Herbert 2007). Oregon's State Forests must not be managed for short-term monetary gain.

With regards to specific goals, my comments are as follows:

Goal: Forest Health

Ensure healthy, sustainable, and resilient forest ecosystems that over time help achieve environmental, social, and economic goals to benefit all Oregonians.

Comment: This goal should be identified as the primary goal. Also, the term "forest health" can mean many different things to different people, just like the term "sustainable."

I recommend a different way of stating this goal:

The primary management goal is to ensure that the natural ecosystem services provided by state forests are protected and enhanced to help achieve long-term environmental, social, and economic benefits to all Oregonians.

Goal: Climate Change

Lead by example in demonstrating climate-smart forest management that supports climate adaptation, mitigation, and the achievement of forest resource goals.

My comments:

I suggest changing the text of this goal to read:

Lead by example in demonstrating science-based, climate-smart management that supports climate adaptation, mitigation, and the achievement of the primary goal.

Goal: Wildfire

Mitigate the risk of wildland fire effects on forest production, wildlife habitat, landscape function and to support wildfire resilience of local communities.

My comments:

Please spell out effects on drinking water

I suggest changing the text of this goal to read:

Mitigate the risk of wildland fire effects on drinking water, forest production, wildlife habitat, landscape function and to support wildfire resilience of local communities.

Goal: Wildlife

Maintain, protect, and enhance functional and resilient systems and landscapes that provide the variety and quality of habitat types and features necessary for long-term persistence of native wildlife species.

My comment:

No change needed.

Goal: Aquatics & riparian:

Maintain, protect, and restore dynamic, resilient, and functioning aquatic habitats that support the life history needs of a full range of aquatic and riparian-dependent fish and wildlife species.

I suggest changing the text of this goal to read:

Maintain, protect, enhance and restore dynamic, resilient, and functioning aquatic habitats that support the life history needs of the full range of aquatic and riparian-dependent fish and wildlife species.

Goal : Aquatics & riparian:

Maintain and protect forest drinking water sources that provide high quality for private and public domestic use.

Comment: I recommend changing the resource from "Aquatics and riparian" to "Drinking Water." Drinking water is a highly acknowledged and valued resource that deserves to be singularly identified for protection. There should be a moratorium placed on chemical spraying in drinking watersheds until the full scientific assessment of the impacts on drinking water from state lands is conducted.

I suggest changing the text of this goal to read:

Maintain, enhance and protect forest drinking water sources that provide high quality for private and public water systems and domestic use.

Goal: Transportation system

Manage the transportation system to facilitate the anticipated activities in a manner which provides for resource protection, transportation efficiency, safety, and sound fiscal management.

Comment: The transportation system, i.e., the road network density needs to be reduced to less than 3 miles of road/1 square mile of watershed land.

I suggest changing the text of this goal to read:

Manage the transportation system to reduce its hydrologic impact and facilitate the anticipated activities in a manner which provides for resource protection, transportation efficiency, safety, and sound fiscal management.

Goal: Mining, Agriculture, Administrative Sites and Grazing

Permit mining, agricultural use, administrative sites and grazing when resource use is compatible with other forest resource goals.

Comment: These uses can have a devastating impact on other resources, so permit approval should error on the side of caution.

I suggest changing the text of this goal to read:

Permit mining, agricultural use, administrative sites and grazing only when resource use is compatible with the primary goal and all other forest resource goals.

References cited:

Herbert, Elizabeth. 2007. Forest Management by West Coast water utilities: Protecting the Source? American Water Works Association, Journal AWWA, peer-reviewed, 99:2

Herbert, Elizabeth. 2004. Forest Management by West Coast Water Utilities: Influences and Consequences. Ph.D. dissertation, Environmental Studies. University of California, Santa Cruz.

Submitted: Sun 09/05/2021 9:13 AM

Subject: Testimony for the September 8, 2021 Agenda Item #1

My name is Peter Karnig. I own property and pay taxes in Oceanside Oregon and live full time on the coast.

Human behavior is driving Global Warming and is an existential risk for life as we know it on our planet. Old growth Forests in Oregon (80 or more years old) provide the best known method for storage of carbon and maintaining sustainable supplies of clean and healthy drinking water for all Oregonians.

The Oregon Timber industry produces more carbon than any other industry in the state. The Timber Industry with it's practice of Plantation Farming, short term 35/45 year harvest cycles and the use of toxic and carcinogenic substances is destroying our coastal watersheds.

1. Given this reality, please identify the primary goal of this survey. I suggest that the primary goal be to protect the natural ecosystem services (e.g., hydrologic function and natural filtration for clean drinking water, carbon storage for clean air and climate change mitigation, and habitat provision for native species and biodiversity) provided by state forest lands.

2. Explain how ODF will act when one or more goals are conflicting. Our research shows that when two or more goals conflict with regards to how forests are managed, it is the goal that results in the greatest short-term monetary gain that takes priority. Oregon's State Forests must not be managed for short-term monetary gain.

Here follows my full response to the Forest Management Plan Draft Goals.

1. Forest Health Watersheds up and down the our coast are being destroyed by current logging practices. This must stop. The only way to protect our Drinking water is GROWING OLDER FORESTS. By doing this, we will also be helping our coastal fisheries and mitigating the effects of GLOBAL WARMING.

2. Climate Change One of the most effective ways to store carbon is to grow and maintain old forests and Oregon is one of the best places to do just that. In addition to that it will become a major source of revenue for the future Timber industry.

3. Wildfire The current increase in destructive Wildfire is caused to a large extent by the shorter grow cycles that have been adopted by the industry. Wild land fire effects on forest production are more severe when young plantations burn and it results in a total loss of timber as well as habitat.

4. Wildlife I strongly support this goal as proposed.

5. Aquatic and Riparian I strongly support the first part of the goal as proposed and for the second section, I would suggest adding the following: "excluding industrial usage".

6. Pollinators and Invertebrates I strongly support this goal as proposed and would like to add the following "and invertebrate species especially those essential for the soil food web.

7. Plants I strongly support this goal as proposed.

8. Timber Production I strongly oppose part one. The timber industry is already doing this and has also managed to avoid paying their fair share of taxes to rural counties around the state. I strongly oppose part two. The timber industry should pay it's fair share of State and County taxes.

9. Forest Carbon I strongly support this goal. Do this NOW.

10. Air Quality I strongly support this goal. Do this NOW.

11. Soil I strongly support this goal. Do this NOW.

12. Recreation, Education, and Interpretation I strongly support this goal.

13. Cultural I strongly support this goal. The Timber industry has a lot to learn from our indigenous peoples in Oregon. Insights from indigenous peoples need to be incorporated into forest, wildlife, and fish management by the Oregon Department of Forestry. These insights also need to be communicated in the educational efforts of ODF.

14. Transportation System I oppose this goal. Forest roads are a major source of water pollution. The resource protection aspect of this goal must be more fully resolved in order to mitigate further destruction of our valuable natural resources.

15. Scenic I strongly support this goal. Old growth forests should be our goal for the future of the planet. This goal implicitly supports management of older forests which in turn support all three components of Greatest Permanent Value: Environmental, Social and Economic.

16. Special Forest Products I oppose this goal. More detail is needed before new product areas are supported.

17. Mining, Agriculture, Administrative Sites, and Grazing. I strongly oppose this goal. The activities mentioned are incompatible with forest and stream health and quality drinking water for Oregon.

Peter Karnig
pkarnig@gmail.com

Submitted: Tue 09/07/2021 4:39 PM

Subject: BoF Testimony Sept 8 2021 Agenda Item 1

Nancy Laga Lanyon
621 S. Anchor St. (PO Box 1466)
Rockaway Beach, OR 97136
Cell (847) 863-9686
nancy.lanyon@gmail.com

Board of Forestry Testimony Sept. 8, 2021
Agenda Item #1
BoardofForestry@oregon.gov

Hello Everyone:

I'm Nancy Laga Lanyon, I believe resident 1,423 from my rough homework in October, 2019, when I bought my forever home here in Rockaway Beach. Thanks so much for letting me be a part of this important and necessary conversation about our most critical resource: water. I choose to say "most" critical because, to me, water is the globally connected system which impacts the health of our other critical resources - the air we breath and which protects us, and the land which both feeds and shelters us. Water is essentially nature's thermostat, and, as in our bodies, it is that overarching component, circulating sky to ocean, that keeps everything else going on track.

As any resident would, I want good water quality. I learned the hard way to heed fellow neighbors' advice to have a tap water filter to drink our water - I bought a Brita after my body told me to.

I daily see the myriad streams, creeks and lakes here in Rockaway Beach at the base of the Coast Range - I'm literally five streets from a border mountain and two blocks from the Pacific. One of my concerns is the amount of silt running through Rockaway's many waterways - why is there so much silt when the water runs downhill through so many miles of forest and undeveloped wetland at the base? Well, inspired and shown to me by NCCWP, I found it's because our water doesn't run through forests anymore.

I know from doing my homework that in 1978, Oregon put SB100 into law, mandating that all land use in Oregon be evaluated by weighing all aspects of outcome and, therefore, value before any change could take place. Aside from leading other states and countries in adopting this policy, we created the Bull Run Reservoir system protecting metro Portland and other surrounds' drinking water - both of these achievements continue to be exemplary. Unfortunately, Oregon has gotten off-track from its own guidance at times - just last year there was a hard-fought re-protection of the Sandy River being threatened by development even though it is a part of the Bull Run system.

As in so many communities, such as my neighboring Cape Meares and Nehalem/Wheeler, Rockaway needs a Bull Run-type protected watershed. It's too late for my generation to enjoy it due to clear-cutting and poor stewardship on the private lands in our Coast Range here - the last old growth stand in our Jetty watershed was cut last December-January though over 100 letters were sent to Stimson Lumber, state and local representatives and agencies. To no avail, the cut happened. The state and federal lands are, for the most part, properly stewarded, but have lost sight that SB100 is there to also support stewardship of private lands as well.

I attended the public presentation on Aug. 10, 2021 (via zoom) regarding BoF's process and outline of the HCP. My "chat" question regarding watershed drinking water quality came back with the response that this is not a parameter of the HCP and forest management going forward. We residents are obviously stakeholders in forest management, not just private timber land owners, due to the water quality impact forests have. This from the Oregon Dept. of Forestry outline:
The Western Oregon State Forests Habitat Conservation Plan (HCP) process seeks to explore an HCP as an opportunity to provide a more holistic and cost-effective way to comply with the federal Endangered Species Act (ESA), while managing state forests for economic, environmental and social benefits.
That stated, we must include drinking water quality and watershed protection in Oregon's management plans.
Oregon Coast (and all Oregon) residents need:

- Watershed protections to protect drinking water: a moratorium (at least two years) on spraying after timber harvests, a ban on clear-cutting near watersheds, a ban on steep-slope timber harvests
- Timber harvest profits to reimburse and/or initiate clean water management systems where silt, chemicals and negligent cutting practices have lowered potable water quality in communities such as Rockaway Beach, Nehalem, Wheeler and Cape Meares.
- Lumber companies should be required to monetarily contribute to local (water) public works when any logging occurs in municipal watershed locations.Too many coast communities have had to pay for their own new water systems which were necessitated by adverse logging practices.
- All Oregon communities' watersheds should have Bull Run-type protection systems.

I have to say, not only have I heard from various professionals about timber company analysis being done on water sources which were done inaccurately or in a manipulative fashion to skew results, for example evaluating "fish presence" when fish would not be present due to seasonality. I can see that my own Salt Air Creek is completely blocked with silt and debris though it is our dry time in August - anyone can look at the water way and see that little water will reach the Pacific. Rockaway Beach Public Works will try to address this, but, again, how can so much silt build up after flowing over miles and acres through "undeveloped, protected forest land"?

In closing, from climate to commerce to consumption, we are all stewards of our resources and Oregon simply has to do a better job - we need to revisit and regain our good stewardship practices. Water is key to every other resource, and Oregon's forest management must prioritize water protection and quality.
I am a member of the Tillamook Beekeepers Association and North Coast Community Watershed Protection (NCCWP), I attend elected representative town halls, and have written letters to diverse stakeholders including Stimson Lumber (which harvests in our local watershed) … please let's do a better job taking care of Oregon's precious resources.
Thank you for your consideration.
Nancy Laga Lanyon nancy.lanyon@gmail.com

Submitted: Sun 09/05/2021 3:44 PM

Subject: Board of Forestry Meeting - Wednesday, September 8 - Agenda Item #1

We must protect our watersheds because **water is life**. I live on the northwest Oregon coast and our water sources are threatened because of vast clearcutting in our watersheds. The logged areas are sprayed with toxic chemicals to control both wildlife and plant growth. Many streams in the clearcut areas are in danger. These streams provide life-giving water to coastal communities and for that reason, these streams should be protected for the well-being of the residents. However, with the lax rules in Oregon, huge areas of forested lands are being decimated which leads to the life-giving watersheds being destroyed, as well.

The Oregon state forest management plan draft goals do **not** prioritize safe drinking water. Those people who are accountable for complying with the Clean Water Act and protecting our water sources should place our water security as the top priority. The Forest Management draft plan does not include the urgency and corrective actions that are necessary. Clearcut logging decreases water volume because the newly-planted trees use much more than old growth forests—this decreases water volume. Logging roads and culverts also disturb and divert water. Steep-slope logging increases sediment loads in water and as a result water for our communities and fish, must be treated with additional chlorine which produces carcinogenic by-products (trihalomethane) and increases water treatment costs, as evidenced by the history of the Rockaway Beach water that flows from Jetty Creek.

I and numerous other coastal residents request that the Oregon Department of Forestry take a two-year moratorium on pesticide applications in watersheds until drinking water sources can be mapped and independent water analyses can be completed. Forest logging practices and pesticide applications all need to be studied because at present, chemicals are being used in combinations that have never been tested for safety or persistence in the environment. Studies have shows that some of the chemicals now being applied are carcinogenic.

There is no Forest Management Plan goal identified for the protection of entire watersheds. We need to protect our watersheds to get **more** than just safe water sources. As a result we will have healthy forests and wildlife habitat, carbon storage and sustainable forestry practices.

Betsy McMahon
411 North Avenue
Manzanita, Oregon 97130
betmcmahon@yahoo.com

Natural Resource Economics

1430 Willamette St., # 553
Eugene, Oregon USA 97401-4049
Mobile • + (541) 505-2704
www.nreconomics.com
ernie.niemi@nreconomics.com

3 August 2021

TO: **Members, Oregon Board of Forestry**
FROM: **Ernie Niemi, President**
SUBJECT: **COMMENTS FOR 8 SEPTEMBER BOARD MEETING, AGENDA ITEM #1**

Please consider in your deliberations and decisions the information I am submitting on the attached pages.

The information shows that timber production and conservation/restoration have dramatically different socio-economic consequences. A decision to produce timber on ODF-managed lands will generate some short-term benefits for a few Oregonians, but impose much larger and long-lasting costs on all Oregonians as a whole. The overall impact on social well-being will be starkly negative. The costs will be especially severe for today's children. Every increment of timber production will reinforce and contribute to powerful forces and trends that promise future degradation of the resources on ODF-managed lands, but every increment of additional conservation/restoration will offset these forces and trends. Every investment in timber production will yield a much lower rate of return for Oregonians than would result from investment in conservation/restoration, so that the relative rate of return from timber investments will be negative. Every decision to produce more timber will leave workers and communities chained to an antiquated model of economic development with a long record of eliminating jobs, not creating new ones, whereas a greater emphasis on conservation/restoration will open 21st-century opportunities for more jobs, higher incomes, and sustained prosperity in Oregon's rural communities.

This information comes from the cited research and other sources, plus my professional experience, which includes more than 40 years analyzing the economic importance of natural resources. Much of this work has focused on Oregon and the mechanisms through which the state's forests, waters, and fish/wildlife generate or eliminate jobs for Oregon's workers, increase or decrease the prosperity of its communities, and improve or diminish the social well-being of rural and urban residents. I also have conducted similar analysis in neighboring states, in other regions of the U.S., and in other countries. I have been President of Natural Resource Economics, a consultancy in Eugene, since 2012. I previously worked as an economist for Coos, Curry, and Douglas Counties; under contract with the timber industry in Douglas County, and as a Vice President with the regional consultancy, ECONorthwest.

If you have any questions about the information I am submitting to you, please feel free to let me know.

I. Introduction and Summary

The Oregon Department of Forestry (ODF)) is currently developing a Habitat Conservation Plan and Forest Management Plan for about 640,000 acres west of the Cascades, in the context of a broad obligation of provide economic, environmental, and social benefits to Oregonians. ODF often distorts this broad obligation, however, applying instead a narrow institutional focus on timber production, with the justification that this is the best way to generate economic benefits: "Timber sales on these forests produce jobs and revenue that funds counties, local districts, and schools throughout the state."[1] This statement diverts attention away from the high costs timber production imposes on all Oregonians.

This report provides information regarding the potential economic consequences of shifting away from the narrow focus on timber production. This information shows:

I. Timber Production on Imposes Costs on Society that Far Exceed Timber Revenues

Timber production imposes economic costs on society through adverse impacts on the environment and communities. Economists use the term, external costs, to describe these costs because they fall on individuals and groups other than those who directly make timber-production decisions or receive benefits from timber production. The evidence presented below demonstrates that these external costs currently far exceed timber revenues, and that this gap likely will grow rapidly. Hence, continued production of timber from ODF-managed lands will have a large and growing net negative impact on society's overall economic well-being.

II. Short-Term Timber Production Diminishes the Long-Term Productivity and Value of ODF-Managed Resources

The evidence presented below shows that industrial timber production on ODF-managed lands intensifies the climate crisis and, hence, increases the risk that climate changes—hotter temperatures, more drought, wider wildfires, etc.—will reduce the lands' future ability to produce timber, jobs, and revenues in the future. The evidence also shows that timber production degrades the ability of ecosystems to generate ecosystem services that contribute to the well-being of society as a whole.

III. Greater Emphasis on Conservation and Restoration Would Reinforce Opportunities for More Jobs, Higher Incomes, and Stronger Local Economies

Contrary to oft-repeated assertions by its supporters, the timber industry, for many decades, has had deep, negative impacts on workers, families, and communities. Some of the impacts occur directly, as the industry persistently eliminates jobs, with correlative impacts on the number of families living in poverty and other indicators of social distress. Others occur indirectly, as the industry's legacy and influence distract communities from pursuing opportunities that have greater potential to strengthen local economies. Giving greater emphasis to managing lands for conservation and restoration would bolster powerful forces that have potential to create more jobs, raise incomes, and strengthen local economies.

[1] ODF. 2021. State Forests: About.

I. External Costs Timber Production Imposes on Non-Beneficiaries

Whenever ODF produces timber, it generates both benefits and costs. The benefits are measured by the revenues it receives from timber sales, i.e., the value of the logs. The costs include economic damage imposed on society as a whole. Economists commonly apply the term, "external costs" to describe these costs because they accrue to workers, families, businesses, communities, and future generations who lie outside the pool of individuals and institutions that exert decision-making authority over timber production or directly enjoy the benefits. The external costs from timber production materialize in many ways. One useful way to sort through and understand their scope and scale looks closely at those associated with (a) the climate crisis, and (b) the biodiversity/ecosystem crisis.

A. Climate-Related External Costs

This section describes the climate-related external costs of timber production from two perspectives:

1. The total costs to society
2. The costs borne by today's children

1. Total Costs To Society

Timber production in Oregon substantially increases atmospheric carbon dioxide, and these increases will impose economic costs on society for the foreseeable future. These external costs are complex and difficult to measure, but the data currently available indicate that they are perhaps more than 84 times larger than the logging revenues. Recent research findings strongly indicate that the climate-related external costs from future increases in atmospheric carbon dioxide will grow rapidly, perhaps catastrophically, in the coming years.

In recent years, ODF has produced about 300 million board feet (mmbf) of timber per year.[2] For example, it produced 297 mmbf in 2019, generating about $140 million in net revenue.[3] Doing so increased atmospheric CO_2 through several pathways. Trees killed by logging will no longer grow bigger and sequester more carbon, logging residue was burned as slash, mills burned sawdust, and many wood and paper products will decompose within a few years. The extent of the CO_2 emissions was recently determined by researchers, who found that timber production increases atmospheric CO_2 by about 8,500 metric tons per million board feet (mmbf) of timber.[4] Multiplying these numbers indicates that ODF's FY2019 timber-production program contributed about 2.5 million metric tons of CO_2 to the atmosphere.

This additional CO_2 in the atmosphere will impose economic harm on all people by exacerbating the many components of the climate crisis. It will make heatwaves, droughts, and

[2] University of Montana, Bureau of Business and Economic Research. 2021. Oregon Timber Harvest.
[3] ODF and Association of Oregon Counties. 2020. Council of Trust Land Counties Annual Report.
[4] Law, B.E., et al. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests; Center for Sustainable Economy (CSE). 2017. Oregon forest carbon policy: scientific and technical brief to guide legislative interventions.

wildfires more frequent and intense, for example. Many economists have developed estimates of the economic damage per metric ton of carbon dioxide, commonly called the "social cost of carbon dioxide" (sometimes abbreviated as the "social cost of carbon"). In 2016, federal agencies estimated that each metric ton of CO_2 added to the atmosphere will cause economic damage of about $40-$50.[5] The agencies acknowledged that the true social cost is considerably higher, insofar as these numbers rest on some powerful simplifying assumptions and fail to incorporate the full range of potential damage likely to result from increases in atmospheric CO_2. Nonetheless, in 2016 the Bureau of Land Management used this estimate to determine that the external, climate-related costs resulting from logging on the forests it manages in Oregon are more than four times the value of the logs produced.[6]

The Trump Administration downplayed the concept that CO_2 emissions cause economic damage. President Biden, however, has ordered the agencies to reinstate $50 per metric ton on an interim basis, and to recalculate the social cost of carbon dioxide using scientific findings that have emerged since 2016, with a revised estimate due in 2022.[7]

Since 2016, researchers not subject to President Trump's restrictions have continued to develop new estimates of the social cost of carbon dioxide, using updated assumptions and data. One prominent study, published in 2018, found that each metric ton of CO_2 added to the atmosphere will impose economic damage of $417, and perhaps as high as $800.[8] Another, submitted for publication in 2021, concluded that the social cost of carbon dioxide is at least $562 and perhaps $3,319 per metric ton.[9] Until the federal agencies publish their new findings, these estimates of the social cost of carbon dioxide—$50 at the lower end, up to $3,319 at the upper end—provide the basis for developing provisional estimates of the climate-related external costs imposed on society by timber production on the lands managed by ODF.

Multiplying the lower bound of the social-cost estimates times the expected level of CO_2 emissions indicates that it would be reasonable to anticipate that logging on ODF-managed lands in FY2019 imposed external costs of at least $125 million (Figure 1, column B). This amount offsets about 90 percent of ODF's FY2019 timber-sale revenues, $140 million. In other words, when one considers the lowest estimate of climate-related external costs, logging on ODF-managed lands in FY2019 contributed just $15 million, not $140 million to economic well-being.

The estimates of the social cost of carbon dioxide higher than $50 per metric ton show it is reasonable to anticipate that the FY2019 logging will have large, overall negative impacts on societal well-being. With the estimates of the social cost from the 2018 study, $417 – $800 per ton, the external costs for FY2019 will exceed the value of the logs by $902 million - $1,860 million (Figure 1, column C). With the estimates of the social cost from the 2021 study, $562 – $3,319 per ton, the external costs for FY2019 will exceed the value of the logs by $1,265 – $8,158 million (Figure 1, column D). These numbers indicate it would be reasonable to expect that the

[5] EPA Fact Sheet: Social Cost of Carbon.
[6] U.S. Bureau of Land Management. 2016. Proposed Resource Management Plan, Final Environmental Impact Statement: Western Oregon, Vol. 2.
[7] The White House. 2021. Executive Order on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis.
[8] Ricke, K., Drouet, L., Caldeira, K., and Tavoni, M. (2018). Country-Level Social Cost of Carbon.
[9] Kikstra, J., P. Waidelich, J. Rising, and others. 2021. The Social Cost of Carbon Dioxide Under Climate-Economy Feedbacks and Temperature Variability.

climate-related, external costs will be at least 7.4 times the value of the logs and, perhaps, 59.3 times the value of the logs.[10]

Climate-Related External Costs from Log Production on ODF-Managed Lands…			
A	**B**	**C**	**D**
Estimate of the Social Cost of CO_2 ($/metric ton)	$50 (Biden Interim)	$417 - $800 (Ricke et al. 2018)	$562 - $3,319 Kikstra et al. 2021)
CO_2 Emissions, FY2019 (metric tons)	2.5 million	2.5 million	2.5 million
Climate-Related External Cost	$125 million	$1,042 - $2,000 million	$1,405 – $8,298 million
…Versus the Value of the Logs			
Value of Logs (FY2019 Timber-Sale Revenue)	$140 million	$140 million	$140 million
Net Social Benefit or Cost (Revenue Minus External Cost)	$15 million	$902 – $1,860 million	$1,265 – $8,158 million
Ratio: External Cost-to-Log Value	0.9	7.4– 14.3	10.0 – 59.3

Figure 1: Recent Research Indicates the Climate-Related External Costs Resulting from Timber Production Far Exceed the Value of the Logs Produced

There is a high likelihood that the negative impacts on societal well-being will be even greater than those shown in Figure 1. This conclusion is supported, for example, by more than 11,000 scientists who warned in 2019 that we now are facing a climate emergency that threatens human existence:

> *"[W]e declare, with more than 11,000 scientist signatories from around the world, clearly and unequivocally that planet Earth is facing a climate emergency. … The climate crisis has arrived and is accelerating faster than most scientists expected…. It is more severe than anticipated, threatening natural ecosystems and the fate of humanity…."*[11]

In 2021, almost 14,000 scientists expanded the warning, concluding that the climate emergency is even more dire than previously expected, and calling for immediate, transformative action to slow and halt catastrophic trends:

> *"On the basis of recent trends in planetary vital signs, we reaffirm the climate emergency declaration and again call for transformative change, which is needed now more than ever to protect life on Earth and remain within as many planetary boundaries as possible. The speed of change is essential…."*[12]

Given these warnings, it appears that ODF will continue to significantly exacerbate the climate crisis—with climate-related costs far exceeding the value of the logs produced—unless it

[10] It is important to note that, whichever study is used to estimate the climate-related external costs, the actual costs will be larger insofar as, despite all the climate-related research completed to date, none of the available methods fully incorporates all the expected costs resulting from CO_2 emissions. For example, they do not yet fully account for the costs associated with ocean acidification or for the potentially catastrophic costs expected to materialize if global warming causes ocean currents or other natural systems to cross so-called tipping points so they no longer function as they have for millions of years.

[11] Ripple, W.J., et al. 2019. World Scientists' Warning of a Climate Emergency.

[12] Ripple, W.J. 2021. World Scientists Warn of a Climate Emergency.

implements transformative changes to reduce or eliminate CO_2 emissions from its timber-production program as quickly as possible. Continued timber production will have a net, negative impact on overall societal well-being.

2. The Costs Borne by Today's Children

The imperative for implementing transformative changes soon is highlighted by the results from a recent analysis that estimates the costs climate change will impose on today's children. To help in its deliberations in a lawsuit seeking to halt expansion of a coal mine, a Federal Court in Australia asked an independent expert witness to describe the costs that foreseeable changes in climate will impose on the country's children over their lifetime. The expert looked at just three of the many types of climate-related costs: (1) reductions in home values resulting from increased probability of wildfires and other risks, (2) reductions in earnings as workers and farmers experience lower productivity in response to more intense heatwaves and other climate impacts, and (3) negative health impacts resulting from higher temperatures. The analysis found that if current trends in the atmospheric levels of greenhouse gases continue, each of today's children will experience costs of about $126,000 over their lifetime because of just these three impacts of climate change.[13]

This analysis provides useful insights into the economic importance of the climate-related external costs that will result from future timber production on ODF-managed lands. The analysis indicates that, unless steps are taken to markedly reduce increases in atmospheric CO_2, just three types of climate impacts will impose costs of $126,000 onto each of the Oregonians currently under age 18.[14] For this group as a whole and over their lifetime, the total cost will total almost $110 billion (Figure 2). Changes in climate will impose costs through more than just the three pathways, so the total costs will be much higher.

No. Oregonians Under Age 18	864,636
Climate-Related Costs Each Will Experience Over Lifetime	$126,000
Total	$108.9 bil.

Figure 2. Costs To Today's Oregonians Under Age 18, Over Their Lifetime, from Three Types of Climate Impacts If Current Trends Continue

The Australian court's recognition of these findings highlights some of the economic consequences that could follow if ODF were to markedly reduce or eliminate its timber-production program.[15] The court declared that, although withholding governmental approval for the mine, by itself, would not free today's children from all these costs, it would be consistent with the government's obligation to protect children from climate-related harms. Specifically, withholding approval for the mine would provide benefits for today's children through two pathways. One, it would ensure that the incremental increases in CO_2 emissions, which would result if government approved the mine, will not intensify the climate harms today's children will experience from emissions elsewhere. Two, it might show the way and

[13] Mallon, K. 2020. Independent Expert Report by Dr. Karl Mallon. Amount shown in U.S. dollars, equivalent to the original estimate in Australian dollars.
[14] U.S. Census Bureau. 2021. QuickFacts: Oregon.
[15] Readfern, G. 2021. Australian Government Must Protect Young People from Climate Crisis Harm, Court Declares.

facilitate taking other appropriate actions to reduce CO_2 emissions that otherwise would harm today's children.

Similar reasoning applies to ODF's timber-production program. Continued production of timber will indicate disregard for the resulting increase in atmospheric carbon dioxide and the resulting intensification of harm imposed on today's children. It also will indicate that ODF is unwilling to step forward and provide leadership in the effort to reduce the risk of catastrophic climate outcomes. But, if ODF were to markedly curtail or eliminate the timber program, it would decrease or eliminate the program's incremental CO_2 emissions, and thereby not intensify the climate harms today's children will experience from emissions elsewhere. In addition, significant curtailment or elimination of the program and its emissions might show the way and facilitate similar actions by others, and thereby accelerate and multiply the reductions in emissions and harms borne by today's children.

B. External Costs from Impacts on Biodiversity and Ecosystems

Industrial timber production on lands managed by ODF generates external costs not just by intensifying the climate crisis but also by contributing to the crisis in biodiversity and ecosystems. This latter crisis has received much less attention than climate, but it is also severe and an existential threat to human life as we know it.[16] Evidence for the harms associated with loss of biodiversity and ecosystems has emerged from research conducted and compiled by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), which stands parallel to the comparable institution, the Intergovernmental Panel on Climate Change (IPCC).[17]

The biodiversity/ecosystem crisis is occurring across the globe, and here in Oregon. Concern about biodiversity and ecosystems arises from research that shows nature makes countless contributions to human well-being, but its capacity to continue providing these so-called ecosystem services is diminishing at an unprecedented rate. This decline is more than worrisome because more than one-half of the economic activity measured by conventional indicators, such as the world's gross domestic product (GDP) is dependent on ecosystem services from nature.[18] Globally, about one-third of the world's forest area has been destroyed, more than 85 percent of wetlands have been lost, one-third of the topsoil has been degraded, freshwater species and vertebrate species have experienced population declines of 83 percent and 60 percent, respectfully, since 1970. These losses and trends create societal and economic risks through their impacts on global health, global peace, intra- and international trade, gender equity, cultural and social connections between ecosystems and indigenous communities, and economic development. A major driver of these losses and trends has been the industrial exploitation of ecosystems to produce wood products and other materials. Industrial timber production, which is more dependent upon ecosystems than many other industries, is among the greatest contributors to the biodiversity/ecosystem crisis.

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[16] A just-published peer-reviewed report from a panel of 50 of the world's leading biodiversity and climate experts states: "Biodiversity loss and climate change are both driven by human economic activities and mutually reinforce each other. **Neither will be successfully resolved unless both are tackled together.**" [Bold emphasis added.]

[17] For more information about the IPBES, please see the home page.

[18] Support for the facts in this paragraph come from World Economic Forum. 2020. Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy.

Industrial timber production in Oregon imposes negative impacts on biodiversity and ecosystems. Many of the negative impacts on biodiversity and ecosystems follow from practices that include mechanized logging, which removes the majority of forest stands on a parcel and replaces them with single-aged stands of conifers (referred to as "regeneration harvest" or "variable retention harvest," but commonly known as clearcut logging), a core feature of industrial timber production in this region. For example, this practice has negative impacts on nature by reducing the flow of streams in late summer and raising the water temperature.[19] These effects can increase the likelihood that streams will experience algae blooms that create health risks for recreationists and their pets who come in contact with the water, and increase the cost of providing safe drinking water to communities downstream.

These negative impacts on streamflows also can play a role in reducing populations of salmon and other species that depend on cold water, and increase the cost of restoring these populations to higher levels.[20] Timber production can have negative impacts on salmon and other cold-water species directly, through the impacts of timber-management on stream flows and temperatures, and indirectly, by increasing atmospheric CO_2 and intensifying the impacts of the climate crisis on stream temperatures. Research from EPA confirms that, if left unchecked, changes in climate will raise stream temperatures enough to eliminate, throughout most of the state, the cold-water habitat salmon require (Figure 3). ODF's timber-production program, thus, contributes to the warming effects of changes in climate and exacerbates the impacts by diminishing streamflows and exposing them to warm sunlight.

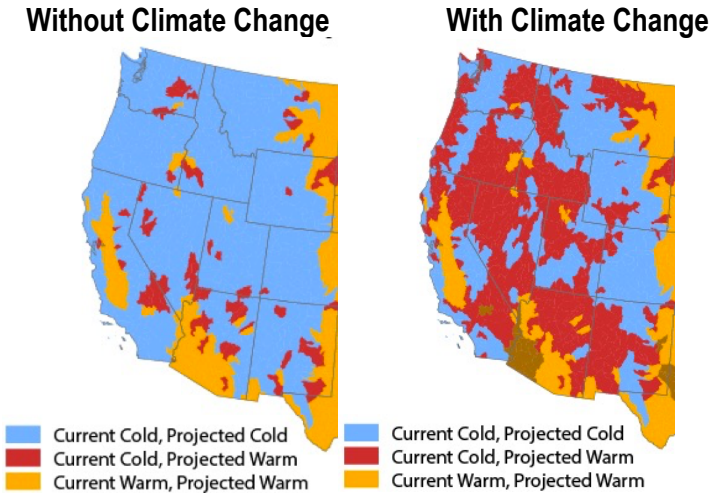

Figure 3. Climate Change Is Raising Stream Temperatures and Eliminating Habitat Required by Salmon and Other Cold-Water Fish Across Much of Oregon

ODF has not published an estimate of the value of the external costs resulting from its impacts on salmon. There can be no doubt, however, that the external costs exist: a 2009 analysis by a team of regional economists estimated that anticipated declines in Washington's salmon populations resulting from climate change would impose costs of $175 – $640 per household per

[19] Perry, T.P., and J.A. Jones. 2017. Summer Streamflow Deficits from Regenerating Douglas-fir Forest in the Pacific Northwest, USA; and Oregon State University. 2011. Study Outlines Stream Temperature Changes Following Timber Harvests. Referring to Groom, J.D. 2013. Stream Temperature Responses to Timber Harvest and Best Management Practices

[20] National Marine Fisheries Service, West Coast Region. 2016. Final ESA Recovery Plan for Oregon Coast Coho Salmon (Oncorhynchus kisutch).

year.[21] These numbers also apply to Oregon's 1.6 million households, with a total, statewide cost of about $280 million – $1.0 billion. Timber production on lands managed by ODF increases the probability—the risk—that these costs will materialize.

Other negative impacts on biodiversity and ecosystems also impose external costs on all the people. Smoke from burning post-logging slash can harm the health of humans, livestock, and wildlife, for example. Clearcuts and forest roads established to support timber production can become precursors for landslides. Logging of large, old trees degrades habitat for northern spotted owls and other species dependent on these trees. Discouraging the growth of brush and other vegetation that might compete with seedlings can devastate biological diversity. Each of these actions, and others that comprise biodiversity and ecosystems' ability to provide services, generate external costs via global and local processes that negatively affect health, peace, intra- and international trade, gender equity, cultural and social connections between ecosystems and indigenous communities, and economic development.

Global efforts to quantify the external costs from negative impacts on biodiversity and ecosystem services have only just begun (they lag behind analogous efforts to quantify the social cost of carbon dioxide, described above). The preliminary evidence suggests that they are huge. For example, the loss of biodiversity and degradation of ecosystems can contribute to the emergence of devastating diseases, the degradation of forest wetlands can diminish their ability to retard, even arrest wildfires, and industrial modification of ecosystems can diminish soils and degrade their productivity.[22]

The global research suggests it would be prudent to expect that the external costs from the negative impacts on biodiversity and ecosystem services of timber production is equal to or greater than the value of the logs produced. A recent review of global research, for example, reached these conclusions:

> *"Our analysis shows that both conservation and ecological restoration bring considerable net benefits in terms of public goods and common pool resources, regardless of the habitat or type of ecosystem state change being considered. … [O]ur findings do suggest that, within the broad habitat and geographic range present in our data,* ***we have typically passed the point where the benefits of further change from nature towards human-modified uses exceed the costs to society****."*[23] *[bold emphasis added]*

ODF's counterpart, Washington's Department of Natural Resources (DNR), has confirmed this conclusion. After comparing two alternatives—one that would allow logging to proceed, and another that would restrict logging to protect potential nesting sites for northern spotted owls—DNR concluded that the benefits of protecting the habitat are 2–5 times the benefits from logging.[24]

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[21] Niemi, E. K. Baird, W. Barnes, and others. 2009. An Overview of Potential Economic Costs to Washington of a Business-As-Usual Approach to Climate Change.
[22] UN Environment Programme. 2021. Making Peace with Nature: A Scientific Blueprint to Tackle the Climate, Biodiversity and Pollution Emergencies, Executive Summary.
[23] Bradbury, R.B., S.H.M. Butchart, B. Fisher, and others. 2021. The Economic Consequences of Conserving or Restoring Sites for Nature.
[24] Krug, D., 2007. Preliminary Economic Analysis: Forest Practices Rulemaking Affecting Northern Spotted Owl Conservation. Olympia, WA: Department of Natural Resources.

In other words, the global findings indicate that the biodiversity/ecosystem-related external costs from timber production in FY2019 will be at least as large as the benefits from these actions, i.e., the value of the logs produced, $140 million. DNR's findings specific to northern spotted owls suggests that the biodiversity/ecosystem-related external costs could be 5 times greater, or $700 million. The net result: ODF gives a biased, incomplete assessment of its impacts on Oregonians when it states: "Timber sales on these forests produce jobs and revenue that funds counties, local districts, and schools throughout the state."[25] It is important to recognize that these revenues come at great external costs that greatly exceed revenues if fully accounted. Greater value would be derived from ODF-managed lands if ODF fully took into account not just the revenue generated from logging but also the costs imposed, and sought to achieve maximum net benefit. The current practice of ignoring the external costs while highlighting logging revenue is economically inefficient and operates to the detriment of Oregonians as a whole.

[25] ODF. 2021. State Forests: About.

II. NEGATIVE IMPACTS ON RESOURCES MANAGED BY ODF

The preceding section shows that, by exacerbating the climate and the biodiversity/ecosystem crises, industrial timber production on lands managed by ODF has negative impacts on many resources located in or dependent on these lands. Continued timber production likely will have negative impacts on the future value of resources managed by ODF, retarding growth in, or even generating absolute declines in the value of these resources. Continued timber production, for example, likely will increase the risk of wildfire on these lands, slow forest growth, degrade the quantity and quality of streams, and contribute to the loss of habitat for salmon and other species. Producing timber likely will yield markedly lower returns than would be realized by managing them for conservation and restoration.

ODF does not publish statewide data on log prices, but Washington's DNR does. The data show that the stumpage price of logs has exhibited long-term decline since FY1995 (Figure 4). It seems reasonable to assume that, although the actual prices in the two states might differ, the long-term trends in prices apply equally. Moreover, it seems reasonable to assume there is a sizeable risk that the prices ODF receives for the logs it produces will continue to decline.

Figure 4. Stumpage Prices for Timber Sold from Washington's Trust Lands Have Been Declining

More important, strong evidence indicates a high risk that the rate of return on ODF's investments in timber production will fall far short of the rate of return that would result from managing the lands for conservation and restoration. This evidence comes most recently from the findings of a landmark assessment, commissioned by the UK government and with support from the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES).[26] The assessment examined the performance of timber and other industries that extract materials from ecosystems around the globe and concluded that, regardless of focus or location, they typically exhibit a financial rate of return of about 5 percent. Perhaps more important, this assessment expects the rate of return for timber and other extractive industries will stagnate or

[26] HM Treasury. 2021. The Economics of Biodiversity: The Dasgupta Review.

decline. It reaches this conclusion after reviewing catalogs of scientific and economic research regarding the economic consequences of the biodiversity/ecosystem crisis (described above) that arises because human actions "have degraded the biosphere to the point where the demands we make of its [ecosystem] goods and services far exceed its ability to meet them on a sustainable basis."

In other words, humans have so degraded nature that it no longer can sustain past and current levels of production of timber and other materials. This degradation comes from more than just the emission of greenhouse gases and the obliteration of biodiversity. It also includes soil degradation, the emission of toxic pollutants, modifications to stream flows, elimination of wetlands, and more. Moreover, the degradation has become a worldwide reality, so there is no opportunity for an industry to exhaust the extraction of materials in one location, then move to another that has been untouched, and enjoy transitory higher levels of productivity. This reality, thus, is a major component of the biodiversity/ecosystem crisis: as nature becomes more degraded, ecosystems provide fewer services, suppressing the productivity of timber and other extractive industries. Insofar as these global relationships apply to the lands managed by ODF, it is reasonable to anticipate that the rate of return from timber production on them will remain stagnant or, more likely, decline.

Research locally confirms this conclusion. Notably, climate researchers have long recognized that increases in atmospheric CO_2 are expected to have these impacts:

> "*Past studies have shown the overwhelming importance of the summer drought and extreme plant moisture stress on the distribution of tree species and productivity of forest ecosystems in the Pacific Northwest. It is highly likely, therefore, that climatic changes which 1) increase the length of the summer moisture deficit, 2) increase the intensity of the summer moisture deficit, or 3) increase the frequency of multiple summer droughts – or any combination of the three –* ***will result in a reduction in forest cover and biomass and in loss of species at the dry end of their ranges****. … Consequently, even with increased total annual precipitation or increased WUE [water use efficiency****], any climatic changes (such as reduced summer precipitation or increased summer temperature) that result in a net increase in soil and plant moisture deficits are likely to result in increased physiological stress and reduced productivity****."*[27] *[Citations omitted. Bold emphasis added.]*

In sum, with continued timber production, the productivity and value of the resources managed by ODF will decline. Additional decline in productivity and value will occur for resources, such as downstream salmon populations, that are linked to ODF-managed resources. It is reasonable, therefore, to ask if a greater emphasis on conservation and restoration would yield better outcomes. ODF has not quantified the rate of return for these activities, but there are strong reasons to conclude that they generally will outperform the rate of return from continued production of timber. The study commissioned by the UK government, described above, shows that investments in conservation and restoration typically yield a rate of return greater than 19 percent, almost four times greater than the rate of return on timber production and other forms of resource exploitation. This estimate of the superior performance of conservation and restoration is consistent with the research, described above, that found "both

[27] University of Washington, JSIAO Climate Impacts Group. 1999. Impacts of Climate Variability and Change in the Pacific Northwest.

conservation and ecological restoration bring considerable net benefit."[28] Both of these findings stand in sharp contrast with the discussion in the preceding section, which shows that continued timber production likely will generate external costs far greater than benefits.

[28] Bradbury, R.B., S.H.M. Butchart, B. Fisher, and others. 2021. The Economic Consequences of Conserving or Restoring Sites for Nature.

III. More Conservation and Restoration Can Bolster Jobs, Incomes, and Local Economies

Representatives of the timber industry and its supporters often have asserted that deviation from timber production would reduce revenues for beneficiaries and have negative, perhaps severe, economic consequences for communities and workers. ODF, itself, makes these claims.

The economic facts, however, reveal a vastly different truth. These facts show that, instead of creating jobs, boosting local economies, and providing a foundation for sustained prosperity in local communities, the timber industry has destabilized and depressed local economies by eliminating jobs and fostering unhealthy social conditions in local communities. Moreover, the facts show it has had these job-destroying, destabilizing, depressing impacts for decades. For example, Oregon's mining and logging industry and wood processing industry have eliminated jobs throughout the past 30 years, averaging almost 1,000 jobs per year over the period (Figure 5).[29]

	1990	2020	1990–2020
Mining & Logging	13,000	6,700	–6,300
Wood Products Manufacturing	46,100	23,000	–23,000
Total	59.100	29,700	-29,300

Figure 5. Oregon's Employment in Mining & Logging and Wood Products Manufacturing Has Declined Almost 1,000 per Year for the Past 30 Years

These declines come as no surprise. Evidence presented in the preceding section shows that log prices have been declining for decades. Facing this reality, the timber industry aggressively strives to cut costs, most notably by eliminating jobs. Thus, rather than being a pillar of continued job opportunities for rural workers and stability for the economy, the timber industry is a major source of decline and instability.

The negative economic impacts of timber production extend beyond timber-industry workers to the communities where the industry and its workers reside. Extensive research has documented the industry's negative impacts on local communities. Much of this research occurred in response to the decline in logging on federal lands in the Pacific Northwest during the 1990s. A summary of this research, compiled by the National Research Council, concluded that a higher concentration of timber-related activity "seemed to hurt rather than help communities" (Figure 6).[30] Much of this "hurt" comes directly from the industry's impacts on workers. Eliminating jobs in the timber industry, for example, can have ripple effects that increase unemployment and the incidence of families in poverty throughout the local community. These outcomes can diminish activity within the local economy, diminish tax revenues for local communities, and

[29] St. Louis Federal Reserve. 2021. All Employees: Mining and Logging in Oregon; and All Employees: Durable Goods: Wood Products Manufacturing in Oregon.
[30] National Research Council. 2000. Environmental Issues in Pacific Northwest Forest Management. Washington, DC: The National Academies Press. https://doi.org/10.17226/4983.

stimulate communities to divert resources from other programs to provide public services to the affected families. Note that, although the research underlying Figure 6 comes from the 1990s, when logging on federal lands declined, most of the jobs eliminated, shown in Figure 5, occurred afterward and reflect industry's protracted determination to reduce labor costs.

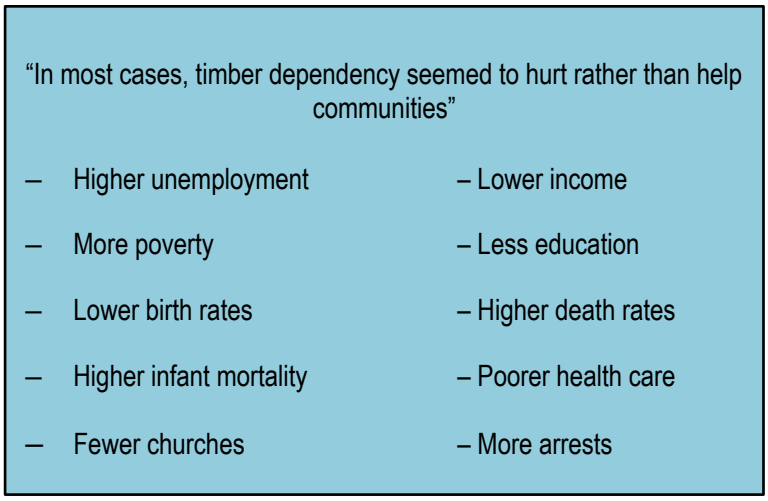

Figure 6. Summary of Research Findings Regarding the Timber Industry's Influence on Community Well-Being

The negative relationship between timber and the social health of communities, shown in Figure 6, was reaffirmed recently by the Bureau of Land Management (BLM), which examined the relationship between log production and local economies. It found that the timber industry is among the world's most volatile and this volatility has negative spillover impacts on local communities. As a result, the BLM concluded that proposed increases in log production likely would destabilize, rather than stabilize, the economy of nearby rural communities.[31]

Research in Oregon provides some detail to the negative effects on local economies, by showing a strong statistical correlation between logging and negative economic indicators. Specifically, counties with more logging have lower median wages, and a higher percentage of the population lives in poverty (Figure 7).[32]

[31] Bureau of Land Management, 2014. Final Environmental Impact Statement for the Proposed Resource Management Plan for Western Oregon, page 702. Portland, OR: USDI Bureau of Land Management, Oregon State Office.
[32] County harvest data courtesy of Oregon Department of Forestry. Poverty and median wage data are taken from the U.S. Census. See Talberth, J., 2017. Modernizing State Forest Practices Laws to Halt and Reverse Deforestation. West Linn, OR: Center for Sustainable Economy.

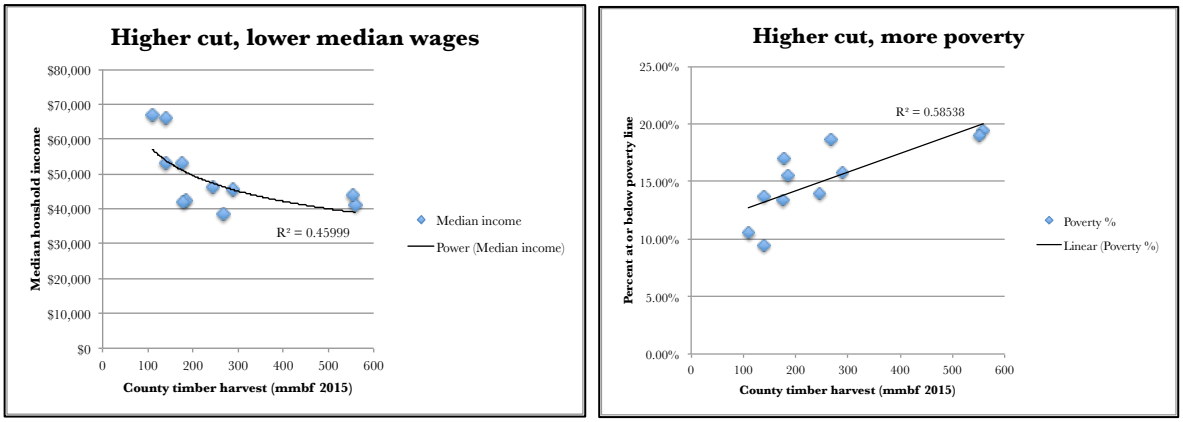

Figure 7. In Counties in Western Oregon with Significant Timber Harvest, More Logging Correlates with Lower Wages and More Poverty.

The discussion above undercuts ODF's boast that its timber-production program has positive economic impacts. The facts support the conclusion, that, if it continues to emphasize timber production, ODF likely will not foster robust economic outcomes for workers, families, and communities. Instead, the production of timber will, instead, likely contribute to persistent economic and social decline.

Would the outlook be different if ODF curtailed or eliminated timber production and managed with an emphasis on conservation and restoration? Substantial evidence says, "Yes!" Research reaching back over several decades indicates that this change in emphasis likely would yield a much brighter future for jobs, incomes, and overall economic activity.

Some of this evidence comes from research conducted in Oregon, which found that proximity to conserved forestlands typically correlates with faster growth in community wealth. Specifically, communities within 10 miles of land designated for species protection "experienced higher growth in community wealth than communities more than 10 miles from…protected land, even among those that were dependent upon logging."[33] More broadly, this research found that actions—known as the Northwest Forest Plan (NWFP)—to manage federal lands for conservation rather than for timber production had wide-ranging, positive impacts on rural communities:

> *"The preservation of natural forest capital through the NWFP ultimately has induced a redistribution of the forest-related benefits of Federal forestland across communities. Historically, the major benefits came from the timber production which went mainly to the timber-dependent communities. The implementation of the NWFP, signaling that the federal government wanted to protect old-growth forestland, appears to have promoted community wealth in communities close to the protected land, and to have redistributed the economic benefits from the timber-dependent communities to a broader set of NWFP-adjacent communities."*

[33] Weber, Bruce, and Yong Chen. 2012. "Federal forest policy and community prosperity in the Pacific Northwest." *Choices*. 27(1). http://www.choicesmagazine.org/choices-magazine/theme-articles/rural-wealth-creation/federal-forest-policy-and-community-prosperity-in-the-pacific-northwest-.

Two major factors underlie the likelihood that that forest conservation would stimulate an increase in jobs and community prosperity. One is the outdoor recreation/tourism industry; the other is the movement of families and businesses to communities with attractive amenities. The outdoor recreation/tourism industry is huge—nationally it is larger than the motor vehicle manufacturing industry, the motion picture industry, and many other economic heavyweights—and it has been growing doggedly and rapidly—about 5 percent annually between 2005 and 2011, a period that includes a major recession and contraction for most industries.[34] ODF might stimulate activity in this industry by managing forests to provide more recreational opportunities rather than converting them into stumps. Some have disparaged this possibility, however, because, relative to timber, this industry pays lower average wages. But, for many workers and families, an industry that can deliver 5 percent growth in jobs, even with lower wages, is preferable to one that promises more layoffs, higher unemployment, and greater social distress.

Despite its huge size and robust growth, the ability of the outdoor recreation/tourism industry to stimulate growth in jobs, incomes, and economic activity often comes up short, relative to the forces and trends that drive the movement of workers, families, and businesses to communities with attractive amenities. New workers often have higher levels of skill and incomes, new families typically have higher incomes to spend in local shops, and new businesses generally have the ability to grow more rapidly than long-established businesses. All of these factors can contribute to a more robust local economy.

This is not a new phenomenon. In 1999, an economist with the USDA Economic Research Service, looked back and concluded:

> *"Climate, topography, and water area are highly related to rural county population change over the past 25 years. A natural amenities index, derived and discussed here, captures much of this relationship. Average 1970-96 population change in nonmetropolitan counties was 1 percent among counties low on the natural amenities index and 120 per- cent among counties high on the index. … Employment change is also highly related to natural amenities…. The importance of particular amenities varies by region…people are attracted to the West for its varied topography."*[35]

A more recent analysis concluded that, on average, counties with more public land protected from logging and other extractive activities enjoy increased economic performance. After statistically controlling for other factors, the researchers found that, on average, a western county with 10,000 additional acres of protected public land exhibited higher average per capita income (additional $436 in 2010), faster growth in per capita income (additional $237 for 1990-2010), and faster growth in non-labor per capita income (additional $174 for 1990-2010).[36]

An even more recently completed review of this phenomenon found that it has been transforming the economies of communities across the West:

> *"During the past three decades, rural communities in the American West have experienced significant economic restructuring, transitioning from extractive-based industries toward service-based economies. A major impetus for economic restructuring in the Western U.S. (hereafter, the West) has been amenity migration, a phenomenon in which people relocate to communities for*

[34] Outdoor Industry Association. 2021. The Outdoor Recreation Economy.
[35] McGranahan, D.A. 1999. Natural Amenities Drive Population Change.
[36] Rasker, R., Gude P.H., and Delorey, M., 2013. The Effect of Protected Federal Lands on Economic Prosperity in the Non-Metropolitan West.

physical and social amenities derived from an abundance of desired ecosystem services as opposed to simply following employment opportunities. These amenity migrants include footloose entrepreneurs, retirees, and people willing to trade income for a higher quality of life. … [P]ublic lands have consistently been shown to play a role in attracting amenity migrants."[37] [Citations omitted]

The last sentence of this text indicates that, by managing to produce attractive amenities, ODF could encourage significant economic restructuring, transitioning away from extractive timber production and toward a service-based economy. In other words, by producing less timber and more conservation and restoration, ODF could facilitate the transition of local communities away from an industrial focus that evolved in the 1800s and encourage economic activities characteristic of the 21st Century.

The researchers who produced this last review also described the factors that have discouraged ODF and local communities from making this transition. They observed that, in many counties and communities with historically strong ties to timber and other extractive industries, community leaders often fail to see the opportunities for conserving and restoring resources so they provide environmental amenities and then marketing these amenities to attract economic activity that can more than offset declines in the extractive industries.

"Our results…illustrate that protected areas have a substantial influence on migrant relocation decisions and have become a marketable commodity in their own right. The economic value associated with protected areas and their influence on amenity migration should become a regular component of the discourse that surrounds new proposals for protected areas and new proposals for resource extraction. Currently, these economic values are largely left out of conversations about rural development. County commissioners, conservationists, and regional policymakers would do well to become more fluent in understanding the wealth-attracting influence of protected areas."

This statement captures the core messages supported by the evidence presented above. Those who advocate for more timber production typically focus on the positive impacts for workers lucky enough to retain their jobs, but overlook the negative economic effects that the logging has on the overall welfare of all the people and on the economic and social well-being of local workers and communities. They would do well to investigate and understand the likelihood that conserving and restoring these lands would create opportunities for more jobs for a wider segment of the population, stimulate higher incomes and wealth, and thereby provide a stronger foundation for the local public services that currently receive timber revenues.

Stated differently, the evidence presented above shows that, if conservation and restoration activities can yield amenities attractive potential in-migrants, recreationists, and tourists, the lands managed by ODF likely would become a powerful engine of economic development advantageous to local workers, families, and communities. This is not just tourism, far from it. Instead, it represents the economic realities of today's American rural West, where resource managers and communities that emphasize attracting talent and diverse investments have a far higher chance of enjoying prosperity and sustainable population than communities that emphasize the production of logs and stumps and monocultural plantations. By shifting its focus to conservation and restoration, ODF can help nearby communities and rural residents have access to these realities. If it continues to focus on log production, however, it will continue laying the foundation for more economic decline and instability.

[37] Hjerpe, E., A. Hussain, and T. Holmes. 2020. Amenity Migration and Public Lands: Rise of the Protected Areas.

Submitted: Mon 08/30/2021 4:46 PM

Subject: Board Meeting on September 8

Hello—as a home owner in Twin Rocks, Or just south of Rockaway Beach, I've been concerned for quite awhile about the quality of the water that we are drinking in the area. I'm specifically concerned that the forestry practices currently in use do not protect our water supplies. Because of the large amount of clear cutting that's happening in the coast ranges, the quality and quantity of water that is available is affected. After an area is clear-cut the watersheds are sprayed with untested pesticides. Current research also brings into question the need to kill off all other vegetation that is erroneously thought to inhibit prime tree growth. The forest is an ecosystem that to be healthy and vibrant needs a variety of plant growth if it, and other living things are to thrive. In conversations with neighbors, we'd like to see a moratorium on untested chemical-use, until an independent study can be done on the state of the watersheds and the quality of our drinking water.

Thank you.
Nancy Osborne
18840 Pacific St.
Twin Rocks, OR
nancyaosborne@outlook.com

I am Professor Trygve Steen. My background involved 12 years of post-high school education, including a Ph.D. from Yale University. I have spent over 45 years teaching at Portland State University, including many courses on forest ecology and several focused on the principle of sustainability. I have done region wide documentation of forest management on Federal, State, and private lands.

Operations of the Oregon Department of Forestry show a clear need for change, especially in relation to climate change. Unfortunately, even with ODF's current knowledge of our need to protect older forests in order to sequester carbon dioxide and mitigate climate change, the ODF 2022 FMP includes logging of 80-year-old stands of trees. **We do not have the time to regrow the old trees that will be optimally effective for carbon dioxide sequestration. A course correction is imperative.**

The twin crises of climate change and drinking water for coastal cities scream out for change. The Oregon Department of Forestry appears trapped by their focus on selling timber in order to generate cash flow. Industrial forestry's tree plantations are making both crises more severe. While there is a glimmer of hope from ODF and the Governor, the Board of Forestry needs to exert its management influence to address these problems.

Oregon's forests have the capacity to be a major global contributor to carbon dioxide sequestration, as documented in peer reviewed scientific publications and recognized in the ODF draft "Climate Change and Carbon Plan". The scientific literature supports high effectiveness for carbon sequestration by older forests and especially old-growth forests. **For ODF and private lands in Oregon, forests 80 or more years old provide the best-available method for sequestering carbon dioxide.** Unfortunately, this tree and stand age is not delineated in the extensive ODF draft "Climate Change and Carbon Plan". A more definite delineation of stand age needs to be made by ODF under the supervision of the Board of Forestry. The ODF must begin to lead by example. A priority needs to be placed on protecting all old forest on ODF lands, to form the maximum possible forest area to function for effective carbon sequestration. **Clearly, the Board of Forestry needs to upgrade the Forest Practice Administrative Rules so that climate change and the required older forests can be part of all forest management decisions for ODF and ideally for private lands.**

Moving the focus of forest management to older forests that can effectively sequester carbon dioxide is a fundamentally valuable action, and there are many additional forest ecosystem services and features that benefit:

WATER: **Unlike our present situation with tree plantations, older forests provide a more even and reliable flow of quality drinking water.** In the water supplies for many coastal cities, summer flows of water from watersheds covered by

short rotation plantations are becoming inadequate to support their summer tourist-based economies. Older forests could provide critically needed summer flows. At a minimum, the ODF and Board of Forestry both need to protect drinking water more fully by providing wider buffers along all components of a watershed that supply drinking water, so those larger areas can grow older more protective forests. Ideally, entire drinking watersheds need to have higher levels of protection so that they can be completely covered by older forest. This will enable the water storing capacities of older forest ecosystems to be fully taken advantage of. Older forests effectively absorb higher intensity precipitation events, which minimizes the flooding that would otherwise occur during the winter months in landscapes covered by young plantations. Instead, the water absorbed by the older forest ends up being delivered by providing a higher flow of water during Oregon's normally dry summer season. In addition, the canopy structure of an older forest enables it to intercept more fog and mist, which significantly increases precipitation in the spring and fall seasons on either side of the dry summer period.

BIODIVERSITY: **Older forests support and better protect the biodiversity on which forest ecosystems depend**. This helps address the planetary biodiversity crisis. The biodiversity crisis is real and very significant, in spite of the general lack of recognition of that reality.

SOIL BENEFITS: **Older forests protect and enhance the fundamental soil resource.** Logging operations unavoidably cause damaging soil compaction, this harms the soil food web, which is essential for supporting optimal forest growth. Forest soils need more time to recover in order to maintain Greatest Permanent Value for ODF managed lands.

FIRE RESISTANCE: **Older forests are more fire resistant than plantations, and they will be even more fire resistant when they include areas of deciduous trees.** Remember, the most easily ignited and burned parts of a landscape are the young monoculture plantations of conifers.

POST FIRE VALUE OF TREES: **Older trees retain significant economic value after they have been killed by a fire, unlike trees in plantations younger than 25 years.** When a plantation of trees burns before about the age of 25 years, it burns easily and represents a total loss of the timber value. In fact, the residue is a liability. Growing trees for only 35 to 45 years, as is common for both ODF and industrial tree growing operations, leaves a major fraction of the growing period vulnerable to a total loss. For ODF, this would appear to make growing short rotation plantations a violation of the Greatest Permanent Value principle.

CARBON SEQUESTRATION IN WOOD PRODUCTS: **Older forests provide valuable, larger wood that is likely to sequester carbon better than smaller wood products,** as ODF states in its climate change document. This is a help in relation to

carbon sequestration, however it is not an adequate substitute for the substantial carbon dioxide sequestration accomplished by a forest ecosystem more than 80 years old.

ECONOMIC IMPACTS**: Large trees also produce higher quality wood, which is a niche that has special value here in Oregon. However, excessive focus on a resource extraction-based economy has serious liabilities, especially with the increasing dominance of large out of state investors in Oregon's timber industry**. Oregon's more difficult terrain makes it hard to compete with the easier to manage landscape in the southeast, when just growing fiber. Remember the above section on water for very important economic details. For an in-depth analysis, I would refer you to the superb economic analysis in the submission by Ernie Niemi, which you should have.

SPIRITUAL AND RECREATIONAL: **Older forests provide an important amenity value, through their recreational and spiritual values.** This substantial benefit of older forests represents a second paycheck for all Oregonians and is a major factor in supporting a more diversified economy. Clear-cuts and tree plantations have a very low recreational value. They provide a disincentive for people to move here and contribute to producing a stronger, diversified economy.

IN SUMMARY: **We need to be carefully protecting and growing old trees and their ecosystems in Oregon's forests. We need to recognize that moving Oregon's forests toward being older, at least 80 years old and ideally over 100 years old, has significant benefits for ourselves and our future.** This will be a challenge that is essential to meet. Resolute action needs to be taken so that change can occur to support the maintenance and growth of older forests in Oregon.

In closing, the following observations of an Oregon Department of Forestry operation are relevant to my presentation. I have done a detailed study of the Homesteader Area 2 logging operation which was substantially logged in the spring of 2016. The forest in Area 2 included a significant stand of Douglas-fir trees that showed clear old-growth characteristics, even though ODF insisted it could not be old-growth because the trees were younger than their definition. The size and ages of those trees were inaccurately characterized in the ODF planning documents, which compounded the bad decision making by ODF. I was personally involved in assessing the area during the planning phase and strongly objecting to logging this area. Also, a large number of Oregonians wrote letters objecting to this logging. The apparent response by ODF was to log this area even more quickly. Area 2 of Homesteader contained a stand of conifers with numerous trees between 4 and 5 feet in diameter that were over 100 years old. This stand should have been fully protected as a site with exceptional carbon dioxide sequestration capacity, as well as the ability to function as a reserve

protecting important tree and forest related biodiversity. There were significant numbers of sensitive species in that area of forest. The ground-based yarding compacted the soil so severely that the planted Douglas-fir seedlings have hardly grown during the subsequent years. The compacted soil contained almost none of the normal array of organisms that would be found in healthy old forest soil. As ODF is continuing to log the limited old forest on its lands, this has long-term consequences. **We do not have the time required to regrow the old trees that will be optimally effective for carbon dioxide sequestration. A course correction is imperative.**

Submitted: Fri 09/03/2021 9:05 AM

Subject: for Sept 8 BOF meeting, agenda #1

I live in Cape Meares near Tillamook. I am concerned about our water supplies here on the coast, especially during the summer months of high demand. Much of our water comes from forestlands that surround our communities. Industrial logging practices have a significant impact on our watersheds and our drinking water. Please manage our state forests so as to protect our water sources.

Beverly Stein
steinbeverly@gmail.com

To: Oregon Board of Forestry
For: September 8, 2021 meeting

Re: Drinking Water Protection inclusion in Forest Management Plan

From: Meg Eastman Thompson
8/30/2021

All of Oregon's **drinking watersheds should have the same protections as Portland's Bull Run** watershed. Instead, coastal communities continue to suffer from the lack of strong action by the Board of Forestry. Drinking watersheds are unsafe, thanks to inaction by the Board.

As a property owner in Oceanside and a Child Psychologist concerned about the risks to children's brain development from aerial spraying, I began testifying to the Board of Forestry and the Environmental Quality Commission in 2014. Seven years later, **nothing has been done to protect drinking watersheds.**

Currently, most coastal drinking watersheds are on private land which is clear cut and sprayed with probable carcinogen chemical cocktails. The lack of lush, moisture-retaining undergrowth and the ever shortened cycles of cutting 'plantations' leave watersheds high and dry, undermining the source water capacity. Water districts are forced to spend huge amounts of money for treatment upgrades and wells. Rockaway Beach had to notify its customers that cancer-causing chemicals were in the drinking water due to clear-cuts and aerial spraying. Other districts had had their surface watersheds go dry.

Failure to protect our drinking watersheds is a serious public health and safety issue. Problems with pollution and drying up of drinking watersheds could be prevented by **eliminating logging on drinking watershed acreage**. An ounce of prevention will save millions of dollars in public works costs and protect the public health.

I urge the Board to **develop a land swap program for each community with a surface drinking watershed on private forest land. Public forest lands can be traded for the acreage the private landholders own on drinking watersheds.** These drinking watersheds are a very small percentage of logging lands. This would provide a low cost solution and allow full Bull Run type protections to all Oregonians, not just the city dwellers in Portland.

The Board of Forestry needs to embrace their role as protectors of drinking water for rural Oregonians.

Submitted: Sun 09/05/2021 12:45 PM

Subject: Comments for BOF Meeting, Sept. 8, 2021, Agenda Item 1

Please consider the following topic for discussion drinking *water.* Many people who live in Coast communities are concerned about the quality and quantity of drinking water that is sourced from State Forests, whether they obtain it from spring boxes or municipal water treatment plants. I believe these people's concerns are valid and that this is a crisis that urgently needs to be addressed. Our forestland drinking water sources are being threatened by drought, heat waves, climate change, and forest practices that do not prioritize drinking water.

Would ODF identify those *drinking water* sources that originate in State Forests, whether for use in small spring boxes or by larger municipalities? Would ODF meet with the people who depend on this water to plan how to ensure both its quality and quantity? How can these drinking water sources be evaluated, protected, and restored? What would be "best practices" to protect this drinking water? Would ODF make protecting *drinking wate*r its *highest priority* in forest management plans? All communities deserve protected water sources similar in quality to Bull Run.

Kind Regards.
Nancy Webster, Rockaway Beach, Oregon 97136
rockawaycitizen.water@gmail.com

Submitted: Sun 09/05/2021 6:51 PM

Subject: Written Testimony for the Sept 8th meeting -Item #1

Oregon Department of Forestry Board Members
CC: North Communities for Watersheds & Coast Range Association

Dear Oregon Department of Forestry Board Members,

I have 60 acres of forestland in Lincoln County, R11. T12, Section 15, Lot 503; I've lived on it for 47 years. The lower half of Bower Creek runs through it, just before entering N. Beaver Creek, 6 miles to the ocean. This formerly Coho rich habitat was severely damaged by 2 separate logging operations; and here's how it happened. I will be brief.

In the late 90's, I met the new owner of the upper half of Bower Creek, and pointed out the fish habitat. He told me he was "just taking a few trees for my retirement" (He lived in Denmark and my attempts at future contact failed). Around 2001, two ODFW stream surveyors showed me the hundreds of Coho fingerlings around our feet (I had no idea it was that dense) aw we watched the logging start on the Bower Creek headwall. They said it was illegal but out of their hands, as it was regulated by State Forestry. The entire upstream watershed was clear cut and bulldozed, including a trout pond, resulting in scouring all of the topsoil below it and a mudflow that filled several hundred yard of Bower Creek. That Coho fingerling habitat was packed with mud for years until Beaver finally moved in. My domestic water source was also destroyed.

Seven years later, logging on the east slope severely damaged the remaining tributaries of Bower Creek. A big spring that produced hundreds of gallons an hour, even in the dry end of summer, was bulldozed. The small marsh below it was gone, and our pond was silted in (former home to blue herons and wood ducks) and the outflow below the pond was warm and slimy.

Although that spring showed as THE major source of Bower Creek on the 1980 Geological Survey, it was not listed as a resource on the logging permit. Since that clear cut, 90% of the year round rivulets of water on the east slope are dry; this was years before the start of our current drought.

Around 2012, an OSU 1,000 meter creek survey counted 1 Crawdad, and 1 Newt. With drought and climate change, we cannot afford to lose more water or fish. Forestland water quality and quantity must be a priority. It's the Forestry Board's job to do it. Please start now with:

- Stronger stream protections, with pre and post-logging evaluation, and moratoriums on logging in some places.
- Chemical application records, thorough and detailed, and maintained for public review. State Forestry's lack of such records blocked a CDC epidemiological investigation of Coast Range miscarriages and birth defects in the 1980's. Lincoln County voted to hault aerial herbicide spraying, recently overruled by state courts; so detailed records could be crucial to the debate over safety to workers, the public water, and wildlife etc.

If you have any questions, please contact me. Thank you for reading this.

Kathy S Williams R.N. (retired)
715 N Wolkau Road
Seal Rock, OR 97376
jody.becker@lincoln.k12.or.us

Northwest Trout Farms Inc.
1001 Wright Creek Rd. Toledo, Oregon
P.O. Box 185 Toledo, Oregon 97391
northwesttroutfarmsinc@gmail.com
Dennis Fletcher CEO
(971)267-4684

RE:
Oregon Board of Forestry
BOF meeting Sept. 8, 2021
Agenda item #1 & #2

September 4 ,2020

Dear chairman of the board Kelly and all other sitting member, thank you for the opportunity to present my comments for consideration regarding the Sept.8 2021 board meeting i.e., agenda item #1 & #2. My name is Dennis Fletcher I live in Toledo, Oregon (Lincoln County) on 80 acres within the Montgomery creek watershed. I have provided a legal description as it is very important to my direct comments and helps with understanding how the geology of the area compounds the ramifications of surrounding timber investment groups forest practices: **East one half of the Northwest one quarter of Section 32 T 11 S, R 10 W, W.M.** There is a property use and management agreement between Dennis Fletcher and legal property owner Ramsay I Cowlishaw II whom is 83 years old and has lived on this property for 45 years with the sole water source coming from a spring. Quite frankly, I am terrified to drink our water, and quite apprehensive about moving forward with the operating my business on the property after recently seeing on FERNS notification regarding pesticide spraying by three surrounding properties. While I am assured by my local ODF representative (direct quote follows) “As long as protocols are followed there should be no movement of pesticide into our water source” I was also assured by the local ODF rep that there would be adequate oversight to prevent such an occurrence.

Based on my previous observations in my area, it is my belief the statements by the OFD rep are nothing more than lip service and the burden is placed on the small forest landowner to battle with large timber investment groups such as Hancock, Plumb Creek and VanEck alone. These investment groups operate with maximizing profits trumping habitat conservation. It appears that ODF has become complacent and allowed this type of business model to threaten and possibly even undermine Oregon’s Habitat Conservation plan. Which is why I ask you to put in place a moratorium on pesticide use until adequate testing, planning and adequate oversight has been accomplished.

Agenda #2 In 2019 I was given the opportunity to be landowners representative of this property during a selective harvest of 23 acres. Because I had actively worked in the Timber industry from 1982-1992 and unsure of changes to the laws. The first thing I did was obtain all of the Oregon forest practice laws in place and even the very handy illustrated manual to assure I had all the updated information to be successful during the harvest. Again, what I perceive as lack of adequate oversight regarding plans in place, bowing to corporate demands of the timber investment groups as well as complacency is plaguing ODF and threatening Oregon Wildlife and their habitat.

ODF rep had no idea logging had begun on our unit, though it was posted on Ferns. And the rep only arrived on the unit when I called asking for a meeting three weeks into the harvest to discuss reforestation. It was at that time that we located a shovel stuck in an area that it had no business being. The 80,000 lb piece of logging equipment stayed buried up to the cab for two weeks while water began to pool behind. It was at that time the ODF rep threatened me the landowner would be liable. Another piece of equipment was brought in to excavate a 150 long,10 foot Wide, and 6-foot-deep canal to mitigate water behind shovel. Which consequently ran to the creek less than 100 feet away. Then the ODF rep required me to mitigate erosion control around canal with 100 bales of straw less again the landowner be liable.

The ODF rep did visit our unit after the logging ceased and discussed how the piles should be burnt and verified our reforestation plans. It was at this time he advocated for the use of pesticides though we had been adamant we would be using other means for vegetation mitigation. It was also at this time he warned us that the pile of unmarketable logs left by the processor was far too large and that is was very common for marketable timer to be left behind. I must say this is unacceptable.

I have to date pulled cut split and delivered 75 cords of premium firewood from the processor pile alone. I have also pulled apart three slash piles only to find very large logs hidden beneath slash. I have recovered, cut split and delivered an additional 13 cords of premium firewood from the three piles. On a 23-acre harvest this is unacceptable.

Why does ODF place the burden on small landowner?

Why Is ODF advocating the use of pesticides without testing?

Why are we wasting resources by not hand piling slash?

Why are we not setting unmarketable logs on landing to be utilized for habitat restoration or even firewood?

At the physical address above Northwest Trout Farms Inc. operates a dedicated lab and office related solely to my business separate from my residence on the same listed property. All business-related work is done on the physical address listed with SAM. The primary function of the business currently, is research and design of innovative Hatchery and Aquaculture facilities. With the primary focus being on insect-based feeds for use in the Aquaculture industry. The primary long-term goal of the business model is for a vertically integrated insect-based feed production and hatchery facility for use in the Aquaculture industry. The project is designed to produce a full-scale commercial application and support the initial trials and effectiveness, as well as to demonstrate the feasibility of clearing the Social, Economic and Ecological hurdles with the innovative feed production facility and hatchery being proposed by Northwest Trout Farms Inc.

Sincerely

Dennis Fletcher

September 8, 2021

Chair Kelly
Acting State Forester Hirsch
Members of the Board of Forestry

For the record, I am Tillamook County Commissioner David Yamamoto, Chair of both the Council of Forest Trust Land Counties (CFTLC) and Forest Trust Lands Advisory Committee (FTLAC). Thank you for this opportunity to address you this afternoon.

Let me start by again acknowledging the brave men and women of the Oregon Dept of Forestry who continue to place their lives on the line in order to save the lives of Oregonians and our State's visitors, along with their properties and livelihoods. This continues to be another devastating fire season in Oregon with 1700 fires logged burning almost 700K acres while expending over $117M to date. There is no other group of professionals that I would want to protect our lives, properties and livelihoods than these brave individuals.

My review of the Climate Change & Carbon Plan (CCCP) submitted to ODF is troubling on many levels. This plan will be a guiding policy for ODF which seeks to make Oregon forestry a leader in climate change mitigation and adaptation. This is a high-level plan consisting of 37 pages with lots of aspirational language but few specifics. This document asserts as a "given" a number of principles about climate change, without much if any supporting documentation.

A key initial question is, should ODF have consulted with your partners, the trust counties, before publishing this draft and holding a public webinar on May 27th. Your partners think this is the case.

Key to the CCCP is the idea of "Climate-Smart Forestry". This seems to be a bit of an ambiguous term at this point as there are not any specific silvicultural treatments or strategies. The CCCP concept of Climate-Smart Forestry places priority on our forests to sequester and store very high levels of carbon and I will provide additional comments on this concept in a moment.

Unanswered questions include, what are the costs of the CCCP to your partners, the trust counties, and will we be compensated for these costs? It seems that ODF looks to the State Forests as a tool that can be used to slow climate change, but doing so will reduce harvest levels creating a financial impact to your partner trust counties and the taxing districts, as well as all of Oregon's forest sector. I might suggest a principle that, to the extent that State Forest Trust Lands are used to sequester carbon, that your partner trust counties are made whole.

On page 10 of the CCCP titled Forestry Climate Action Goals, your first goal is to establish a just and equitable transition to climate-informed silviculture and climate-smart forestry that optimizes climate mitigation and adaptation, while maintaining a sustainable flow of wood products to ensure long-term resource benefits and viability of the forest products industry and flow of long-lived forest products. No mention is made of your partners…the trust counties.

The CCCP asserts that Black, Indigenous and People of Color communities are some of the most climate-impacted. Perhaps a distinction also important for forestry should be the rural communities that depend on natural resources vs. urban communities that don't. Either losing the forests to climate change, or locking the forests up as carbon reserves, will have heightened impact on rural timber communities and those living in them.

Let's get back to the carbon sequestration question. Substituting harvested wood products in place of cement, steel, or plastic composites has significant climate change mitigation benefits. Research by the Consortium for Research on Renewable Industrial Materials (CORRIM) has identified replacing carbon-intensive building materials with wood products as an implementable, near-term climate change mitigation tool.

The CCCP lacks strategies for encouraging the use of harvested wood products. The CCCP states that long-lived wood products are "part of the carbon equation, and that the Dept. will encourage use of wood as a long-term mechanism for the storage of carbon, including using wood in place of more resource-intensive and high carbon cost manufactured products like steel and cement." However, the plan does not include strategies to encourage use of wood products in place of high-carbon materials. Likewise, CCCP acknowledges that Oregon's forests and wood products provide opportunities for carbon sequestration and storage but lacks specific silvicultural treatments or strategies to be implemented under "climate-smart forestry".

The CCCP proposes to slowly extend rotations to increase storage while maintaining wood fiber flow. This proposal is at odds with the climate change mitigation benefits identified by CORRIM, which show that the benefits of substitution (use of wood instead of cement and steel) outweigh the benefits of extended rotations. The CCCP does not show how this difference would be analyzed and resolved.

Further, CORRIM has found that:

1) Continued investment in sustainably managed Pacific Northwest forests stabilizes forest carbon and can maximize carbon storage.
2) Harvesting and replanting transfers carbon stored in the forest to wood products, increasing stores year after year.
3) Sustainable manufacturing of wood products can displace emission from fossil-fuel intensive manufacturing

CORRIM's research focuses on two objectives: First to develop a database and modeling system for environmental performance measures associated with materials use; and Second respond to specific questions and issues related to environmental performance and the cost effectiveness of alternative management and technology strategies.

By comparing the results of life cycle analysis of different materials in different real-world uses, CORRIM has found it possible to determine the environmental effects and tradeoffs of using these materials. These analysis also allow for assessment of the effects of carbon policy alternatives that affect forest management investments and forest product use.

So, what is CORRIM. Fifteen research institutions formed CORRIM in 1996 to provide a scientific database of information for quantifying the environmental impacts of producing and using renewable wood materials. Their mission is to conduct and manage life cycle assessment research on environmental impacts of production, use and disposal of forest products. Several Pacific NW institutions are members of CORRIM including Oregon State University, University of Washington, University of Idaho, and Washington State University. Federal entities include US Forest Service Forest Products Lab and US Dept. of Energy. It is our plan to provide a detailed presentation of CORRIM's work at our upcoming FTLAC meeting Sept. 17.

It should be apparent that much additional work needs to be done before making decisions on implementing the CCCP as a guiding policy…at least more than a single Board of Foresty meeting to discuss this concept with adoption at your next meeting. This policy will have profound consequences for your partners, the trust counties. To many Commissioners at our last FTLAC meeting, this was discussed as "experimenting" with State forests, lands granted to the State by the trust counties.

Respectfully submitted,

David Yamamoto
Tillamook County Commissioner
Chair of CFTLC and FTLAC

Associated Oregon Loggers, Inc.

PO Box 12339 • Salem, Oregon 97309-0339 • (503) 364-1330 • Fax (503) 364-0836

Date: September 7, 2021
To: Danny Norlander, Forest Carbon and Forest Health Policy Analyst
Oregon Department of Forestry
From: Amanda Astor, Forest Policy Manager
Associated Oregon Loggers

Subject: DRAFT Climate Change and Carbon Plan (8-23-21)

Introduction

Associated Oregon Loggers (AOL) is a local trade association which represents nearly 1,000, family-owned forest contracting businesses. Our member companies have been involved in the management of the Oregon's forests for decades. These nearly 23,000 owners, operators and employees are essential to conduct most, if not all, activities in the woods, be that road work for access, timber falling for management and restoration, reforestation for sustainability, trucking for product transportation, and many other services. AOL's member companies provide a diverse array of services that are necessary for Oregon Department of Forestry (ODF or the Department) to conduct all of their forest management activities in order to achieve the goals and objectives of their Forest Management Plan (FMP). As ODF works towards a new FMP, the Climate Change and Carbon Plan (CCCP) will inform the allowable actions under the new Plan as well as any other actions ODF takes. The CCCP will also inform new regulations, programs and visions for the Department over the long term across all ownerships. It is vital to the success and long-term stability of AOL members to ensure their collective voice is heard during this Plan development. AOL believes the best way to ensure economic viability and operational feasibility of the CCCP is to work with the forest contracting sector and other timber stakeholders.

AOL provided extensive comments to ODF's first DRAFT CCCP on June 30th, 2021. We will comment in this letter specifically on the new draft, what has changes and what still needs attention. Please note that all comments previously submitted still remain viable and these new comments from AOL build upon those previously submitted.

Healthy Forests with High Rates of Growth are Climate Solutions

In California's *Getting to Neutral: Options for Negative Carbon Emissions in California*,[1] there is an understanding that healthy forests, not just forests with large trees, are climate solutions. It states that increasing harvest rotation lengths is one climate solution, but that maintaining stocks at a high level and increasing productivity by removing diseased or suppressed trees can also be just as useful tools.

At their core, natural climate solutions are natural phenomenon or assisted action in the natural environment that result in net positive benefits for climate change. When we speak of carbon sequestration and storage in the forested environment, what we are really talking about is photosynthesis and growth (volume production). Thus, when trees are healthy and putting on large

amounts of annual growth at high rates, they are a natural climate solution. When that growth starts to slow due to suppression, insects/disease or culmination of mean annual increment, it is time to convert the aboveground biomass carbon into harvested wood products carbon through a thinning or final harvest (depending on individual tree vs stand conditions).

Unfortunately, it is not as simple as that, because some would argue that it is better to leave those trees in place rather than remove them and plant more in their place.

But what is also synonymous with growth is fuel build up. This is why it is going to be necessary to strike a balance between rotation ages, allowable fuel build up in the forested environment, wildfire risk reduction priority, social license to cut larger trees (if the state grows larger trees) and a recognition for the benefit of storing more carbon in secure and durable harvested wood products.

The CCCP Needs to Address Wildfire's Negative Effects on All Lands

Oregon is one of the top five[2] states in the nation regarding carbon density in our forests, but as wildfires continue to jeopardize this permanence[3] and increase biogenic carbon emissions, it has become paramount that above all, climate-smart forestry must focus on long-lived storage of carbon in durable wood products and the creation of landscape resiliency and healthy forests.

California's *January 2019 Draft California 2030 Natural and Working Lands Climate Change Implementation Plan* states, "California's lands are losing carbon, with an estimated net loss of approximately 170 MMT of carbon from 2001–2014. The majority of these losses are due to wildfire.[4] This loss of carbon is equivalent to a cumulative 630 MMT CO2e of sequestered carbon removed from the land over the same period." The report recognizes that some of the net forest carbon loss moves into the harvested wood products pool which allows the carbon to persist in durable wood products. Regrettably, this report does not even consider the massive amount of carbon released in California's 2020 wildfire season, nor the 2021 fire season of which we are currently still within.

The report goes on to say, "The scientific assessment supporting this Plan found that almost all the activities evaluated provide both near-and long-term climate benefits. Others, particularly forest fuel reduction treatments, involve near-term carbon costs but long-term benefits from removing excess material from overstocked forests that has resulted from decades of fire suppression. These fuel reduction activities, such as mechanical thinning and prescribed fire, reduce stand densities and fuel loads, restore the structure and composition of forest ecosystems, and lower the potential for damaging, high-severity fire,[9] which is currently the primary cause of GHG emissions and carbon loss from the land sector.[10] In the long-term, these activities result in climate benefits and healthier, more stable, and more resilient forests. Modeling results are in line with our understanding that many forests are currently overstocked (hold too much carbon) due to fire suppression, and therefore are highly susceptible to disturbance and loss over the long-term. Despite near-term carbon losses, thinning overstocked forests will result in lower forest densities,

larger and more fire-resistant trees, and reduced fuel loads to minimize long-term black carbon and GHG emissions and create more stable carbon sequestration."

Although the CCCP does address wildfire in both the Fire Management, Response and Fire / Smoke Adapted Communities AND Forestlands Climate Resilience and Ecological Function Restoration Sections of the Climate-Smart Forestry Goals, the emphasis and weight of these goals seems to be equal to all other goals. Through the use of Federal Initiatives and the Federal Forest Restoration Program to follow through with the priorities and agreements signed off on by this state with the federal government in the Memorandum of Understanding on Shared Stewardship[5] and outlined in the recommendations of the Governor's Council on Wildfire Response,[6] the Department should be placing much more emphasis on the use of the Good Neighbor Authority to archive meaningful actions on climate change throughout the state. Unfortunately, the Good Neighbor Authority only appears in the CCCP as a tool to be utilized in increasing reforestation and afforestation across the state. AOL believes this is a huge misstep and wasted opportunity.

According to California's *Getting to Neutral* Report,[1] "Fuel treatments have been shown to effectively mitigate fire behavior and effects in wildfires [75], thus playing an important role in adaptation to a changing climate. Based on this, California has signed into law SB 901[4] which requires the state to double forest fuel removal. California's Forest Carbon Plan, prepared by a consortium of state agencies and stakeholders, contemplates an increase in mechanical fuels treatment to firmly establish California's forests as a more resilient and reliable long-term carbon sink [76]. CalFire and the United States Forest Service have begun implementation of a variety of fire-prevention treatments—including both mechanical thinning as well as controlled burns—to eventually reach an aspirational goal of treating 1 million acres of land annually, in order to reduce the likelihood and severity of wildfires [76]. This represents a significant increase from the current rate of treatment."

According to Joe Restaino, Senior Environmental Scientist with the California Department of Forestry and Fire Protection's (CalFire) Fire and Resource Assessment Program, the mitigated wildfire emissions[7] that result when forest thinning and prescribed fire are used on a landscape are key in increasing net climate change benefits from forestlands. This makes sense because there is abundant published science[8,9] that supports his findings and anecdotal observations[10] from the Bootleg Fire. It is however important to be clear that we may not be able to disaggregate avoided from negative emissions when it comes to wildfire mitigation treatments however.

Soil Organic Carbon Pool is More Severely Impacted by Wildfire than Harvest Activities

New research by the National Institute of Applied Climate Science which is currently in the review process, notes that losses in carbon from the soil organic carbon (SOC) pool are driven by wildfire not harvesting. In an interview with the lead scientist, he stated, "Our work for the PNW (including OR, WA, and portions of adjacent states) shows quite clearly that there are major SOC losses with fires (most of all wildfires) but rarely or not at all with harvesting. Our analysis is based upon real

experimental and observational data, and follows a set of approaches we've used successfully in other ecoregions over the last few years."

By only focusing on forests to store carbon and completely ignoring leakage, substitution factors, wildfire emissions and storage potential in the harvested wood products pool, the Department is missing a great opportunity to innovate and lead the way in meaningful climate smart forestry and collaboration with other state efforts.

The Department Needs to Fully Recognize the Potential of Durable Wood Products

In California's *Getting to Neutral* Report,[1] there is a firm acknowledgement of the harvested wood products pool being a negative emission. It states on page 20 in Table 1., "Negative emissions are based on ongoing sequestration of carbon, including the transfer of harvested carbon to durable wood products."

According to the Oregon Forest Resources Institute's Oregon Forest Facts 2021-22 Edition[11], "the amount of wood harvested each year is about 77 percent of the annual timber growth" and "11 percent of that growth is offset by trees that die from causes such as fire, insects and disease." They also state, "the total carbon sequestered in Oregon by the state's forests and wood products made here is estimated to be 49.5 million metric tons of carbon dioxide equivalent each year, according to the Oregon Forest Resources Institute Report *Carbon in Oregon's Managed Forests*[12]. Oregon's forests also annually sequester about 30.9 million metric tons of carbon dioxide equivalent. This forest carbon sequestration rate is the highest of the western states, and one of the highest in the country."

As stated in our previous comments, ODF can enhance the stability of Oregon's carbon stores by continually adding carbon to the harvested wood products pool and creating legislation that mandates the use of more wood construction, mass timber buildings and carbon dense cities.

Engineered wood has been around for half of a century but has been gaining a lot of attention lately[13]. Products such as cross laminated timber (CLT), I-joists, and glulam beams help reduce the need for carbon intensive non-renewable building materials like steel and concrete[14]. New research from Yale published in *Natural Sustainability* titled "Buildings as a global carbon sink",[15] shows when these wood innovations are used through construction in cities, our urban environments can act as carbon sinks that are long-lived, less risky and farm more permanent than the forested environment.

Milwaukee, WI has acknowledged this opportunity and is preparing to construct a 25-story mass timber building for residential apartments sometime in the summer of 2022[16]. Oregon is a leader in this technology as well, especially because Oregon is—and will continue to lead the nation in structural wood growth, production and technology innovation. Oregon has the most engineered wood plants in all of the United States[11]. Oregon grows, mills and engineers the most structural wood in Oregon—doing this better than all other states. Oregon should also be maximizing its use

and forest production here in Oregon for its dual advantages of carbon capture AND structural storage.

New Research Points to Concerns with Biomass Utilization

The United Nations Intergovernmental Panel on Climate Change (IPCC), widely considered the world's leading authority on climate science, has consistently confirmed the important role of forest products and bioenergy in combating climate change and carbon emissions. According to the IPCC, every pathway to keeping temperature increases under 1.5 degrees Celsius includes sustainable forestry and wood biomass.

There is a high liklyhood that as SB 762 is implemented in Oregon, massive amounts of non-commercial woody biomass will be cut through the development of fuel management programs. It would be wise for the state to engage in climate smart investments to mitigate negative climate change effects through the decay or burning of this excess material and/or determine if the fuel reduction benefits of burning the slash outweigh the negative emissions.

California found that 15.1 million bone dry metric tons of biomass residue would be created per year under their agreement with the US Forest Service to increase fire prevention treatments across the state[1]. There is value in woody biomass if there is a viable market for its utilization. However, California has found that the economic breakeven value for use of equipment like mobile biochar kilns is 192.7-485.7 USD/ton CO_2 when CO_2 emission benefits are monetized[17]. So, if the state wishes to mitigate emissions from slash burning and decay, then there needs to be a concerted effort by the state to develop viable markets and capacity.

Conclusion

ODF has the opportunity to tell the good story of carbon sequestering forestry practices according to the Forest Practices Act, Tree Farm Certification and Sustainable Forest Initiative Certification; carbon storing and innovative engineered wood and biomass opportunities; and green forest contracting jobs. ODF should instead be protecting robust forest products markets through active engagement in economic development, workforce development and research.

ODF should also focus on wildfire mitigation and cross-boundary work to achieve statewide goals thought Shared Stewardship Agreements, use of Federal Initiatives and statewide strategic planning, rather than seeing forests as simple carbon storage facilities due to the impermanence and risk associated with forests in the age of carbon emitting mega-fires.

Sincerely,

Amanda Astor (She/Her); Forest Policy Manager
Associated Oregon Loggers
aastor@oregonloggers.org

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Chair Kelly and Members of the Board

My name is Mike Barnes and I reside on my family forest near Newberg. I also serve as a Vice President of the Oregon Small Woodlands Association. As a consulting forester, I have been involved in a number of carbon projects on private and public lands.

I will focus my brief remarks on some of the elements in the draft plan that will affect the viability of private forest owners. The initial principal states Quote"we have less than a decade to alter behaviors if we want to avoid catastrophic impacts" end quote. This statement is not consistent with the elements within the plan that extend far beyond a decade. The timing of specific measures should be consistent with a realistic time to institute, monitor and change as needed.

The plan points to voluntary measures to incorporate changes to management activities. However the opening statement of this section indicates regulatory measures are within the departments authority. To the extent possible, voluntary incentives should be utilized to encourage family forest owners to participate. Additional regulations may make it more difficult for family forest owners to engage in "climate smart forestry".

Leaving trees in place until carbon sequestration is maximized as stated in the plan is not defined. Considerable more study and information is needed to quantify and compare various alternatives. Family forest owners often must make decision based on economic circumstances that may prevent holding trees an older age class.

All forest management alternatives will have an impact on the health of the industry and the communities where they are located. Without a viable market for forest products, family forest owners may look to alternative uses for their forest lands.

Many of the current carbon sequestration programs are financially difficult and minimize participation of family forest owners. ODF could assist in informing owners of the potential and provide real financial and technical support to family forest owners to encourage participation.

The recognition of of those that are incorporating innovative management and harvesting methods to address climate issues should be an effort of ODF. This recognition may assist in informing the public and other owners, to

include family forest owners, of the successful efforts to manage lands and harvest in innovative ways. This could be done similar to the current recognition of the Regional Operators of the Year.

I recognize that is this a major undertaking within the Department. With the increased pressure from fire occurrence to the administration of the Forest Practices Act, this may well overwhelm an already burdened department. Prioritize the elements that can be accomplished and defer others as needed.

To: Oregon Board of Forestry
Cc: Danny Norlander
Date: 9/22/2021
RE: September 8, 2021, Board Workshop on
ODF Draft Climate Change and Carbon Plan

Dear Chair Kelly and Members of the Board,

We appreciate the Oregon Department of Forestry (ODF) and Board of Forestry's (the Board's) desire to expand and modernize the state's approach to climate-smart forestry, especially in light of the climate crisis Oregon is facing. The organizations and individuals signed on to this letter represent members of the Forest Policy Table of the Oregon Climate Action Plan (OCAP) Coalition and Pacific Northwest Forest Climate Alliance (PNWFCA). The Forest Policy Table and the PNWFCA work to ensure the strongest possible outcomes for our forests, climate, wildlife, water, and communities.

We believe ODF and the Board can and should develop a climate-smart forestry model that other states look to for how to best use our forests as a critical natural climate solution. The plan represents a critical first step in achieving that goal.

We strongly support the CCCP's recommendations to:

- Ensure "Forest policies will be shaped through the lens of social justice and equity." (Principles section, page 1)
- Identify and protect climate refugia. (Maintain and Conserve Forests Goal, page 25)
- Use the Oregon Global Warming Commission's Natural and Working Lands goals to guide the Department. (Supporting actions, page 28-29)
- Revise the Oregon Forest Practices Act to better prioritize climate change. (Supporting actions, page 29)
- Incentivize the adoption of climate-smart forestry practices on private lands. (Supporting actions, page 29)
- Incorporate climate change into the Forest Management Plan (FMP) process (Supporting actions, page 30-31), including through:
    - Extending harvest rotations;
    - Identifying areas that have high carbon storage potential, and establishing priorities for these areas that include long-term carbon storage; and
    - Establishing an Internal Carbon Pricing Process and using this to inform future forest management planning and decisions.

- Restore ecological function when addressing the need to manage forests for increased wildfire severity and develop a prescribed fire program within the Department. (Supporting actions, page 31-32)
- "Work with landowners and managers, large and small, to create resilient landscapes. Work with the same landowners and managers to identify areas that can have alternative priorities for fire suppression. The results would be pre-identified actions that may take place based on the burning environment at the specific time and the anticipated impact the fire would have. The ultimate aim would be appropriately returning fire to natural systems." (Supporting actions, page 32)
- "Account for forestry related carbon impacts. To make management decisions related to reducing emissions, the emissions of the possible actions need to be established. This would include estimates ranging from post-harvest pile burning, broadcast burning for restoration and climate change resilience efforts, the emissions from operations, and fleet emissions including during fire suppression activities." (Supporting actions, page 37)
- Ensure "Climate change [is] a foundational consideration in all agency planning processes. From the top levels (Forestry Plan for Oregon, Agency Strategic Plan, Forest Action Plan) to the day-to-day plans (Annual Operating Plans, Implementation Plans, etc.), climate change should inform the work that is prioritized." (Supporting actions, page 38)

Adopting these recommendations would represent a significant step towards positioning Oregon as a national leader in climate-smart forestry, and we are very grateful for ODF and the Board's leadership in developing the CCCP.

In addition to the excellent objectives already outlined in this document, we would also recommend that the proposal:

- Include the need to retain mature and old growth forests as essential carbon sinks in the State Forests Management Goal (page 20). It is misleading and insufficient to "encourage the use of wood as a long-term mechanism for the storage of carbon" as a primary carbon storage strategy. Protecting old growth carbon stores is a more effective climate strategy. The total mass balance of carbon over time matters more than the rate carbon uptake into young forests. As an analogy, it is preferable to have a bank account with $10,000 making a 4% return rather than a bank account with $100 making a 5% return. The $100 account is a young tree, and the $10,000 account is an older forest. ODF should immediately prohibit logging on any remaining intact stands (mature/old growth forests) on state lands.
- In the "Barriers" section (Page 11), please change the title to "Key considerations for climate-smart forest policy in Oregon." While there are a number of Oregon statutes and administrative rules to consider as Oregon moves forward with changes to reflect the best available science and address the public health and safety risks posed by increasing

drought, heat, wildfire and floods, these do not necessarily represent barriers. If they are called "barriers" it implies ODF cannot evolve its practices until they are addressed.
    - Also in this section, note that to ensure adequate water quality and quantity as part of climate-smart forestry practices, ODF would benefit from increased coordination and collaboration with the Oregon Department of Environmental Quality (ORS 527.630(3) and ORS 468B.110).
- Clarify the definition of climate-smart forestry to mean specific practices and policies that reduce greenhouse gas emissions, improve forest resilience, and sequester carbon, including through growing trees longer (at least 80 years for douglas fir), growing a greater diversity of trees, protecting old growth and more mature trees, and using a variable density harvesting approach.
- Include more green tree retention, bigger riparian buffers, less post-fire logging (in addition to longer logging rotations) in the Climate-Informed Silviculture Goal (page 17).
- Include the need to identify managed fire zones where wildfires would not threaten people or property in the Fire Management, Response and Fire / Smoke Adapted Communities Goal (page 18). Thinning and prescribed fire are insufficient tools for addressing the threat of wildfire, and ODF should consolidate resources and focus suppression and risk reduction efforts on fires that pose a direct threat to communities. Along the same lines, any thinning efforts should be focused in close proximity to at-risk communities. Backcountry thinning is costly and ineffective. In California's southern Sierra Nevada, three national forests recently revised their forest plans and have developed strategic fire-management zones that greatly expand opportunities to manage wildfires for resource objectives (North et al. 2021).
- Note that current forest restoration practices contribute to overstocked forests (dense, monoculture replantings following clearcutting) in the Forestlands Climate Resilience and Ecological Function Restoration Goal (page 21). In addition to fire exclusion, this contributes to higher wildfire risk. "With the exclusion of fire from natural ecosystems, there has been an increase in over-stocked forests that are more prone to fire, damaging insects, and forest diseases" (page 21). Forest restoration practices cannot mean "business as usual;" they must evolve and change.
- Note that post-fire ecosystems are essential for biodiversity across the landscape in the Reforestation and Afforestation Goal (page 23). Any reforestation efforts should be focused on restoring ecological function, not dense, monoculture plantings that negatively impact biodiversity. Further, all afforestation efforts should be focused on previously forested lands--not on different ecosystem types like grasslands and wetlands. ODF should strive not to displace one ecosystem type for another.
    - Also, under the Reforestation and Afforestation Goal, for "managing future-climate appropriate tree species," ODF should only utilize native species and should rely on best available science. Transitioning one forest ecosystem to another should be an action of last resort--NOT a priority for the agency. Any

efforts along these lines should be focused on maintaining ecological function, NOT increasing timber yield.

- In the Maintain and Conserve Forests Goal, note that while "the state has lost less than three percent of existing wildland forest," it has lost most of its mature and old growth forest stands (page 25). Very little intact forest remains. In addition to maintaining forest area, ODF should also strive to protect and grow state forest lands with old growth characteristics.
- In addition to tracking the "status and trends of the natural resources" ODF must partner with DEQ to track the GHG emissions from the forestry sector in the Research and Monitoring Goal (page 25). For addressing climate change, this effort should be central to ODF's research and monitoring efforts.
    - ODF should acknowledge that logging is a significant source of emissions in Oregon, and reducing these emissions must accompany efforts to increase carbon sequestration on the landscape and in wood products.
    - Estimations of emissions from the forestry sector should also include: 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.
- Note that post-fire logging can be harmful from a carbon perspective. If a burned forest is not logged, the vast majority of the carbon remains on-site. The downed and dead trees may decay over time, but the decay is slow (decades) and offers better carbon storage than post-fire logging.
- Please acknowledge that storing carbon in wood products is not equivalent to sequestering carbon in trees that are left standing on the landscape. Wood products remain a critical part of numerous U.S. industries, and there is a need for a sustainable timber industry. However, when it comes to measuring significant long-term climate and carbon benefits, the science is clear that the net value of wood products is quite limited.
    - Logging in U.S. forests is one of the largest sources of emissions, emitting 617 million tons of CO2 annually (Harris et al 2016). In Oregon, 65 percent of wood carbon harvested since 1900 has returned to the atmosphere (Hudiburg et al. 2019). Therefore, while the CCCP should strive to improve on current harvest practices and maximize carbon sequestration in long-lived wood products, this strategy is not a substitute for protecting mature and old growth forests as critical carbon sinks.
    - ODF should include a specific recommendation for R&D funding focused new and innovative wood products that enhance long-term carbon storage using a lifecycle analysis to determine the true carbon benefits of wood products,

- In addition to "Incentivizing the adoption of climate-smart forestry practices on private lands," please include a specific recommendation for incentivizing long-term and permanent conservation easements on private lands as a means of creating more carbon-rich and resilient forests (Supporting actions, page 29).
- Agencies should also recommend stronger incentives for market development for the production of Forest Stewardship Council (FSC) certified wood products for private lands.

Sincerely,

Lauren Anderson
Forest and Climate Policy Coordinator
Oregon Wild

Lisa Arkin
Executive Director
Beyond Toxics

Grace Brahler
Oregon Climate Action Plan & Policy Manager
Beyond Toxics

Mary Fleischmann
Co-leader
Central Oregon Chapter of Great Old Broads for Wilderness/Bitterbrush Broads

Debby Garman
Team Lead
350.org Washington County

Patricia Hine
President
350 Eugene

Sean Jacobson
SunrisePDX

Linda Kelley
350 Eugene Coordinator
350 Eugene

Dr. Felice D. Kelly
Forest Defense Team Co-lead
350PDX

Angus McLean
Policy Associate
Pacific Forest Trust

Kelly OHanley
Needlers - of Cedar Action

Rand Schenck
Forestry Lead
Metro Climate Action Team

Hogan M Sherrow
Director
Rural Oregon Climate Political Action Committee

Catherine Thomasson
Chair
Environmental Caucus of DPO

Dave Toler
Founder
Advocates for Forest Carbon

Joseph E Vaile
Climate Director
KS Wild

Carol Valentine
Forest Team Coordinator, Oregon Chapter
Sierra Club Conservation Committee
Oregon Chapter Sierra Club

Rebecca White
Wildlands Director
Cascadia Wildlands

Joseph Eugene Youren
Audubon Society of Lincoln City

Elizabeth Dix

Martha Dragovich
Volunteer, 350 Eugene

Julianne Gale

Joan Kleban
Volunteer, 350 Eugene

August 28, 2021

TO: Oregon Department of Forestry

Board Members

FROM: Ron Byers, Tillamook

RE: Comment on Climate Change and Carbon Plan (CCCP)

Thank you for the opportunity to comment on the draft CCCP. Along with your review of FMP and HCP efforts, this represents a significant opportunity to make changes that are critically needed.

My comment is essentially the same as I submitted on the FMP and HCP: Why isn't water mentioned and addressed more prominently? The CCCP does mention drought in several places, but drought consequences are not covered. One of the most severe aspect of climate change is water shortages in areas unaccustomed to the dryness. The Oregon coast will run out of water during the summer months of high demand if projections are accurate. That's a major climate change result, and deserves more attention and strategies in the CCCP. A lot of our water flows through state forestlands.

The draft CCCP is impressive except for the failure to prioritize water. It could move Oregon to the head of the class in many ways, but not unless it highlights all aspects of how our forests effect our environment. Please acknowledge that forests provide water quality and quantity for surrounding communities. In many cases, we're talking about our drinking water sources, an essential necessity. It should be in a category of its own.

The threat to our water supplies has grown to the point that we encourage you to use your rulemaking authority to create solutions for a looming water crisis. Please insert water as a high priority in all your draft plans so appropriate actions can be taken later, whether that be changes to forest practices, compliance with the Clean Water Act, and helping coastal communities acquire and protect their watersheds. ODF is just one of the players in all this, but taking the lead on water would help a lot. It's hard to imagine a more permanent and valued benefit to Oregonians.

Thank you for your consideration.

The Nature Conservancy

The Nature Conservancy in Oregon
821 SE 14th Avenue
Portland, OR 97214-2537

tel 503 802-8100
fax 503 802-8199
nature.org/oregon

September 22, 2021

Comments on penultimate ODF Draft Climate Change and Carbon Plan

Submitted by: Pete Caligiuri, Forest Strategy Director

To the Oregon Board of Forestry:

Thank you for the opportunity to provide comments on the development of the Oregon Department of Forestry's Climate Change and Carbon Plan. The Nature Conservancy (TNC) recognizes that climate change is one of the defining challenges of our time and we value the ongoing opportunity to provide feedback during this process. TNC advocates that ODF adopt a bold and ambitious plan to advance climate mitigation, adaptation and resilience in Oregon's forests. While climate change is a global challenge, within Oregon the impacts are already driving shifts in ecological processes and hydrological cycles, negatively impacting biodiversity and influencing human well-being across our state, often most burdening the vulnerable members of our society. Oregon's forests have a key role to play in meeting our state's Natural and Working Land climate mitigation targets and improving community resilience.

We appreciate the commitment of the Department and Board to position Oregon as a leader in climate-smart and socially equitable forest management. As a guiding document the Climate Change and Carbon Plan (hereinafter referred to as "the CCCP") sets the framework in which the Board, Department, and staff evaluate future actions and policies related to forests in Oregon. We are pleased to see the focus on ensuring forest policies be shaped through the lens of social justice and equity, and the recognition that climate change should inform priorities at all levels of the Department including development of top-level plans and day-to-day operations. We strongly support using the Oregon Global Warming Commission's Natural and Working Lands goals to guide the Department and using incentive as well as policy tools to prioritize and encourage adoption of climate-smart forestry practices. Here, we provide additional support for specific actions and highlight areas we believe still need attention.

The Department should develop time bounded and specific goals coupled with concrete strategies to drive a shift away from business-as-usual forest management and toward climate-smart forest management. Healthy forests in Oregon are integral to achieving the vision set forth by Executive Order 20-04 and reaching the draft Natural and Working Lands goal set forth by the Oregon Global Warming Commission: to sequester, at minimum, an additional 9.5 MMT CO_2e per year by 2050[1]. The CCCP should ensure that the outsize role forests can play to meet these goals is realized. The draft CCCP provides a general guiding framework for ODF to address climate change mitigation, adaptation, and resilience efforts. However, it lacks concrete, actionable, and time-bounded targets and the implementation strategies remain vaguely described. The CCCP should include additional clarity and specificity to ensure consistent interpretation, enable progress evaluation and ensure accountability.

Retaining in-forest carbon stocks and sequestration is a priority for climate mitigation and should be emphasized in 'State Forest Management' and 'Climate Smart Forestry on Private Lands' Goals and through the inclusion of specific and targeted Supporting Actions. We encourage the Department to include a paragraph explicitly prioritizing retaining in-forest carbon stocks and sequestration within the State Forests Management Goal (page 20) as well as in the Climate-Smart Forestry on Private Lands section (page 29). The Department should include this priority alongside the already recognized role of long-lived harvested wood products (i.e., "Part of the carbon equation includes using long-lived wood products", page 20). We support the inclusion of lengthened harvest rotations, particularly in Coast Range and West Cascades forests, as a Supporting Action for State Forest Carbon Storage (page 30) as well as the inclusion of mid-term harvest deferral as a Supporting Action (page 35). We recommend the Department insert language to tie these Supporting Actions to numerical (e.g., volume, acres, % deferral) targets or the need to develop these targets. We summarize the research in support of prioritizing in-forest carbon stocks and sequestration below.

Oregon's forests store on the order of 3 billion metric tons of carbon across all ownerships in various pools that include standing live trees, standing and fallen dead trees, forest floor vegetation, and soils[2]. These forests are a net sink of carbon which sequester approximately 30.9 ± 7.4 MMT CO2e per year, across all ownerships and ecoregions, with the majority of that being in the West Cascades and Coast Range ecoregions[2]. However, while these forests are some of the most naturally carbon-rich forests in the world, they currently store carbon volumes much less than their ecological potential and older forests store significantly more carbon than younger forests[3-5]. When forests are harvested, much of the carbon removed from forests is lost to the atmosphere shortly after harvesting either through decay of logging residues and short-term wood products or combustion[5,6]. Under business-as-usual management, only a small portion of the harvested wood carbon is transferred into long-term wood products pools, which is insufficient as a primary carbon storage strategy [6,7]. Thus, deferring timber harvest results in substantial carbon benefits both by keeping stored carbon in the forest and by allowing continued sequestration[8,9], which can be relatively low in the initial years following a clearcut or regeneration harvest[5,10], helping foster development of more old and complex forest, increase in-forest carbon stocks, and deliver a suite of other important co-benefits for people and nature[8,11-15]. We recognize that efforts to implement timber harvest deferral proposals must consider the impacts on related industries and communities and note that deferred timber harvest can be achieved through multiple mechanisms ranging from lengthening harvest cycles or changing harvest strategies to partial harvest and alternative management on forestlands[16,17].

Ecological thinning and prescribed burning in dry, fire prone forests are important climate resilience, adaptation, and mitigation tools that should be retained in the CCCP. We support the CCCP's recommendation to restore ecological function when addressing the need to manage forests for increased wildfire frequency and severity and to develop a prescribed fire program within the Department. Climate adaptation and carbon stabilization can both be promoted with ecologically informed mechanical forest thinning and prescribed burning. These tools are best applied with a landscape approach and maintained over time (i.e., with fire) to reduce fuels and restore dry forest habitats and watersheds, provide community wildfire safety, and increase ecosystem resilience and resistance to future wildfire, drought, and other natural disturbances (e.g., insect and disease)[18]. Thus, we are encouraged to see a focus on cooperative management and public-private partnerships for increased ecological function and resilience in the CCCP. While in the near-term, forest thinning and controlled burning reduce carbon stocks and release carbon into the

atmosphere, forest health treatments can improve carbon stocks over longer time periods (> 25-50 years) as carbon accumulates in large fire-resistant trees as well as in the soils, forest loss to severe fire is minimized, and carbon emissions from high-severity wildfires are avoided[19-24].

The Department should de-emphasize afforestation of low-productivity lands that are understocked or not in forest use. We support the continued inclusion of post-fire reforestation and restoration of riparian forest areas which are likely to provide climate benefits alongside other societal benefits related to clean air and water. These forest restoration actions should be guided by the best-available science to prioritize investments in places and species with high potential to sustain forests. While planting trees in areas that are currently not forested presents a potential opportunity to add forest carbon and storage, we urge the Department to remove afforestation as a primary Goal within the CCCP and shift it to a potential Supporting Action. Afforestation should be considered secondary to protecting and restoring existing forests and native ecosystems and must be carefully evaluated to ensure that naturally low-productivity ecosystems, such as pine or oak woodlands, woodland savannahs, or other native shrub and grasslands, are not displaced.

The Department should clarify throughout the CCCP that ecologically based Climate-Smart Forestry should be tiered to Forest Type. Oregon is home to a diverse array of forest types, each experiencing or projected to experience different impacts resulting from a rapidly changing climate. Climate-smart forestry and climate-informed silviculture must consider these differences and apply appropriate on-the-ground tools based in the best available science. For example, large-scale dry forest restoration using controlled burning and ecological thinning of small trees is likely to stabilize carbon over time by minimizing losses to intensifying wildfires in fire-prone forests with relatively low potentials for growth and regeneration. In these areas, climate-smart forestry should focus on ecological restoration as a primary climate adaptation strategy. Whereas in wet, productive forests, climate-smart forestry may rely on a suite of forest practices such as lengthened rotations, protecting riparian forests and existing old and complex wet forests, and silvicultural techniques that promote development of more old and complex wet forests to increase in-forest carbon sequestration and storage.

We commend the Department and the Board for pursuing this critical work, and for the strong foundation presented in the CCCP. Climate considerations and actions must remain a priority, embedded in the daily work of every state agency, if we are to mitigate the worst effects of our changing climate while simultaneously preparing for the resulting challenges. The science is clear that forests hold immense potential to support this work, if we commit to and invest in appropriate climate mitigation, adaptation, and resilience efforts at a scale commensurate with the challenge. In this work, ODF must be bold, creative, aspirational, and accountable, utilize the best available science, and collaborate with a wide variety of stakeholders. By adopting the above recommendations, we believe the CCCP would present a strong framework for these necessary efforts. The Nature Conservancy looks forward to working alongside you to find pragmatic, durable solutions in this effort. Thank you for your consideration.

Sincerely,

Pete Caligiuri
Forest Strategy Director
The Nature Conservancy

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Darlene Chirman
Great Old Broads for Wilderness,
Cascade Volcanoes Chapter
7017 SE Martins Street
Portland OR 97206
805-455-3541

September 22, 2021

Oregon Board of Forestry
Chair Jim Kelly
Members of the Board of Forestry
Via Board Administrator at Hilary.Olivos-Rood@oregon.gov

Comments on Draft Climate Change and Carbon Plan

Dear Chair Kelly and members of the Board of Forestry:

I am submitting these comments on the draft Climate Change and Carbon Plan (CCCP) for the Oregon Department of Forestry on behalf of the Cascade-Volcanoes chapter of the Great Old Broads for Wilderness (GOB). The mission of the Great Old Broads is protection of public lands through education, stewardship and advocacy. We appreciate the efforts of the Department of Forestry to expand climate-smart forestry in Oregon, and plans to make Oregon State Forests a model of forests as a critical natural climate solution. With the extensive wildfires across the state in 2020, with smoke affecting most Oregonians even when not threatened directly from the fires, and this year's heat dome, it is clear that climate action is needed. In addition to efforts to reduce greenhouse gas emissions across the state, the Department of Forestry can reduce climate impacts by preserving carbon storage and expanding carbon sequestration in our forests, to the benefit of all Oregonians.

Oregon's forests, especially on the west side, have the capacity to sequester and store more carbon on a per acre basis than the Amazon rainforests. Thus our forests can play a critical role in climate mitigation as we reduce greenhouse gas emissions. An ambitious Climate Change and Carbon Plan is the first step in this process.

We are pleased to see that the current draft of the Climate Change and Carbon Plan includes:

1) The need to identify and protect climate refugia. Found in Maintain and Conserve Forests Goal, page 25
2) Forest policies will be shaped through the lens of social justice and equity. Found in Principles section, page 1.
3) Incorporating the Oregon Global Warming Commission Natural and Working Lands
4) goals to implement programs carbon sequestration projects and greenhouse gas emissions reductions. Supporting actions, page 28
5) Plans to review and provide recommendations for revisions to the Forest Practices Act to explicitly address climate change. Supporting Actions, page 29.
6) Design incentives for private forest lands for climate-smart forestry practices. Supporting Actions, page 29.

7) Incorporation of climate change in revisions of Forest Management Plans (Supporting Actions pages 30-31) including;
   a) Extended harvest rotations
   b) Identify forest stands with high carbon storage potential, and establish priorities that include long-term carbon storage.
   c) Establish an Internal Carbon Pricing Process and utilize in future forest management planning and decisions.
8) Emphasis on restoration of ecological function for management decisions re increased wildfire severity; development of prescribed fire program within the DOF (Supporting actions, page 31-32)
9) Work with private landowners to create fire-resilient landscapes; with goal of returning fire to natural systems. Supporting actions, page 31.
10) Acknowledge the need for accounting of forestry related carbon impacts. Supporting actions, page 37.
11) Recognition that climate change needs to be a foundational consideration in DOF planning from strategic to annual operating plans. Supporting actions, page 38.

We have some specific recommendation for changes in the Climate Change and Carbon Plan:

Maintain and Conserve Forests. The draft plan presents 8 goals. Number 7 states Maintain and Conserve Forests on Private Lands. We would prefer to see Goal number 1 to be Maintain and Conserve Forests. The primary focus should be the Oregon State Forests, over which the Department of Forestry and Board of Forestry have the most control, to conserve old growth and mature forest stands. These forests contain the most carbon storage, and this is a Carbon Plan.

> "The mitigation value of forests lie not in their present net uptake of CO2 but in the longevity of their accumulated carbon stocks." Mackey et al[1]

We request that the CCCP include a prohibition of harvest of all old-growth stands and trees in Oregon State Forests. Furthermore, guidelines for banning harvest of older trees should be clearly stated, and include directives for specific age and classes by tree species. This would accomplish the most effective climate mitigation component of the CCCP. One study in eastern Oregon by Mildrexler et al.[2] found that the older trees represent 3% of the trees but contain 50% of the carbon.

Climate Smart Forestry. The definition of sustainable forest management, and climate smart forestry (page 12) needs to include the climate lens of *preserving forest stands for carbon storage that are not managed for timber production.* For example, the DOF is developing a new Forest Management Plan as a companion plan to the Habitat Conservation Plan for Western State Forests. About one half of these forests will be managed for covered endangered species. These same Habitat Conservation Areas and Riparian Conservation Areas could be co-managed as carbon reserves.

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[1] Mackey, Bendan et al. Untangling the Confusion Around Land Carbon Science and Climate Change Mitigation Policy. Perspective, published online, May 29, 2013.

[2] Mildrexler, David et al. Large Trees Dominate Carbon Storage in Forests East of the Cascade Crest in the United States Pacific Northwest. Front. For. Glob. Change, 05 November 2020 | https://doi.org/10.3389/ffgc.2020.594274

The draft CCCP states that forests "have an innate ability to provide **mitigation** benefits to the global carbon balance." p13. We concur. It goes on to say that: "Forests sequester and store very high levels of carbon in the above-ground biomass and in the soils." We concur. "Leaving trees in place until sequestration is maximized, *followed by harvest will likely provide the greatest mitigation benefit*." Emphasis added. If harvest is going to occur on a given forest stand, a longer rotation does provide greater carbon sequestration and carbon storage, and greater timber value, however it is patently **wrong to say that harvest provides the greatest mitigation benefit.** Leaving trees in the forest to store carbon and continue to sequester carbon is the greatest climate mitigation. Clearly there is value in wood products, and we should find the most efficient use of timber removed from the forest having the least greenhouse emissions in the removal process. Carbon in wood projects retains about 20% of the carbon value of the standing forest. Hudiburg et al.state that "Western US forests are net sinks because there is a positive net balance of forest carbon uptake exceeding losses due to harvesting, wood product use, and combustion by wildfire. However, over 100 years of wood product usage is reducing the potential annual sink by an average of 21%, suggesting forest carbon storage can become more effective in climate mitigation through reduction in harvest, longer rotations, or more efficient wood product usage. Of the~10 700 million metric tonnes of carbon dioxide equivalents removed from west coast forests since 1900, 81% of it has been returned to the atmosphere or deposited in landfills."[3]

Additional research in forest practices could determine more efficient utilization of wood now left as slash and pre-commercial thinning waste, perhaps for particle board or other wood products, could increase the carbon value of wood products. Research that is underway for biochar creation on site in the woods for slash may provide a mechanism for long-term carbon storage in the forest, while increasing the productivity of the soil. For a Power Point demonstration of the technology, see "BioChar in the Woods".[4]

Harvested wood products for carbon storage. The CCCP sates that the DOF will partner with other organizations to "support and encourage the use of wood as a long-term mechanism for storage of carbon" (page 21). Given the low value of carbon storage (about 20%), this is not an effective strategy for climate mitigation. See discussion improve our ability to provide them sustainably; it is disingenuous to promote cutting trees as a mechanism for carbon storage. The CCCP also supports promoting "wood fiber in place of more resource-intensive and high carbon cost manufactured projects like steel and cement…where it is reasonable and prudent." Several timber industry representatives provided testimony at the September 8th meeting promoting wood products as a sustainable building material. It is accurate that production of steel and concrete are carbon-intensive. There are several efforts at low-carbon processes in experimental stages; steel and aluminum manufacturing has all but disappeared in Oregon. Concrete manufacture is a significant source of carbon emissions in Oregon, although we are unaware of efforts in Oregon to reduce the carbon intensity of concrete manufacture. What does appear to be verifiable is that in our fire hazard communities in the Wildland-Urban Interface, construction with non-flammable materials will become more common and at some point will likely be

[3] Hudiburg, Tara W. et al. Meeting GHG reduction targets requires accounting for all forest sector emissions. Environ. Res. Lett. 14 (2019) 095005

[4] Wilson, Kelsie. Biochar in the Woods: What Technologies Are Best for Small Scale Production? https://westernforestry.org/wp-content/uploads/2019/05/Wilson.pdf

required in new construction. Rebuilding a wood home lost to wildfire with the same flammable materials is not climate-smart.

Greatest Permanent Value (GPV). The CCCP provides a definition: "Healthy, productive, and sustainable forest ecosystems that over time and across the landscape provide a full range of social, economic, and environmental benefits to the people of Oregon. While ***carbon storage and carbon sequestration*** can fall under the categories of social, economic and especially environmental benefits, this should be explicitly stated in the definition. It is unclear if the Board of Forestry can provide a more detailed definition or if it must be changed by legislation. Perhaps the Board of Forestry can provide guidelines for meeting the GPV, with later legislative change as the Forest Practices Act is modified to incorporate climate mitigation.

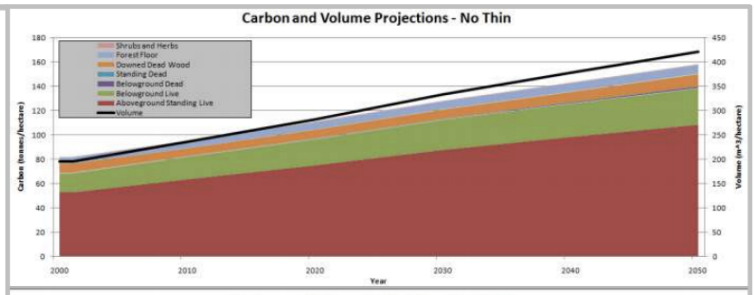
Logging as a source of emission in Oregon. The Oregon Department of Environmental Quality (DEQ) estimates the carbon dioxide emissions in the state, but apparently does not include timber industry emissions. These are a significant source of CO2 emissions and must be calculated as a baseline to determine how they can be reduced as required by the Governor's Executive Order 20-04. This should include all aspects of timber harvest and processing: fuel use of harvest equipment and transport, mill operations, road building, soil and vegetation disturbance, and slash management. We suggest working with DEQ and recommend that the legislature authorize the DEQ to quantify GHG emission for the forestry sector. The Oregon Global Warming Commission stated in 2017 that not counting timber harvest and production emissions in Oregon could result in understating GHG emissions in the state by as much as 55%.

Forestlands Climate Resilience and Ecological Function Restoration. Forest thinning may reduce the severity of a wildfire if a treated stand happens to burn during the time period, approximately 20 years, before it regrows. The problems with extensive fuels management is that it always reduces the carbon storage capacity of the treated stands, even though there is a low probability that they will experience fire. Studies have shown that protection of people and communities are better served by focusing fuels management around communities and evacuation routes. The heavier the thinning, the longer the reduced fire risk lasts, but also the greater carbon loss. The Oregon Global Commission's 2018 Forest Carbon Accounting Project Report provides a graph, Figure 1, that shows that even a light thinning, while it may reduce crown fires, can result in *24-40 years* to recover the carbon that would be stored in a comparable undisturbed stand. One can acknowledge that fuel treatments around front-line communities reduces carbon storage but that protecting communities is the highest priority in those areas.

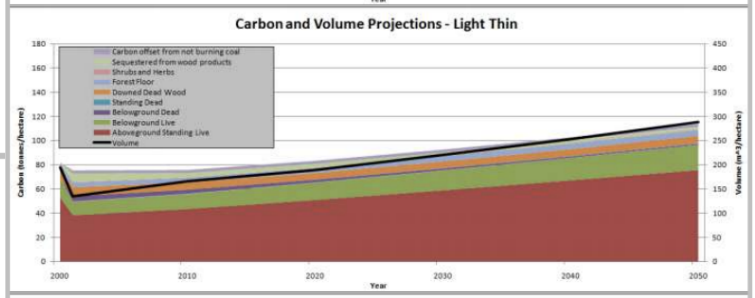
Studies have also shown that complex forests, with multiple size classes and species, especially with retention of older, more fire-resistant trees, are more resistant to fire than single age plantations. Complex forests serve multiple goals, including higher wildlife diversity and greater carbon storage (especially due to older trees).

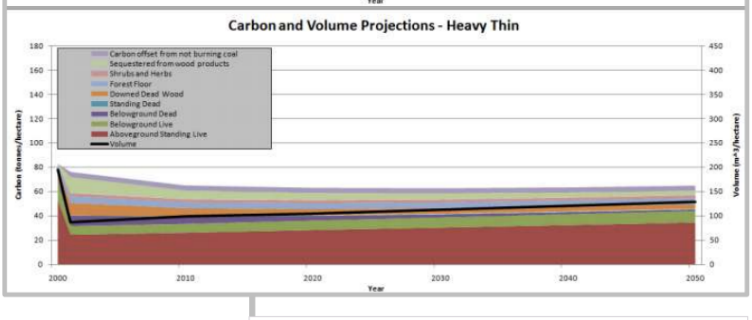
Forest Carbon Retained:

No Thin
- +400 tonnes/ hectare
- No recovery time required



Light Thin
- ±300 tonnes/ hectare
- 24-40 year carbon-recovery
- 208 trees/acre remain
- Remove all trees less than 10" diameter
- Improved resistance to crown fire





Heavy Thin
- ±150 tonnes/hectare
- 50+ year carbon-recovery
- 46 trees/acre remain
- Remove all trees less than 12" diameter; 30% of trees 12-16" diameter; 10% of trees 16-20" diameter
- Leaves the stand in relatively park-like condition, with little understory and only a few of the largest trees remaining.
- Significant increase in resistance to torching and crowning.

Reforestation. *Goal: Facilitate and encourage the reforestation of areas burned by wildfire and afforestation of low-productivity lands that are understocked or not in forest use.*
We ask that the CCCP recognize that wild fire is a natural process in forests, and has a rejuvenating force. Climate change does increase the extent of wildfires with hotter, drier summers. It is less clear

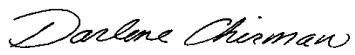
from scientific research that the severity of wildfires has increased. As human habitations have expanded in the Wildland Urban Interface (WUI), wildfires have become much more destructive of structures and a greater risk to people in the WUI.

GHG are released in wildfires, but only 10-15% of the carbon is released during a fire. The greatest carbon loss occurs if post-fire logging occurs. We urge that post-fire logging in State Forests be restricted to hazard tree removal, such as along public roadways and near structures, and within plantations managed for harvest to facilitate replanting. In forest stands managed for Future Complex Forests, both Layered and Old Forest Stand Structure, Habitat Conservation Areas and Riparian Conservation Areas, post-fire logging should be prohibited, and natural regeneration be allowed to occur. This will retain most of the forest carbon, with slow decay over time as new growth replaces the trees and the carbon sequestration. If trees need to be cut for safety in these stands, we recommend that the trees be felled and left as downed wood.

Active reforestation after wildfires is best focused on burned plantations managed for harvest, and hazard tree removal areas. 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 fast[5] as dense, replanted forests, and old growth forests store far more carbon than young growth.

Summary. The Great Old Broads is pleased with the efforts to date in the draft Climate Change and Carbon Plan. We have provided constructive comments we believe will improve the Plan. The most effective strategy for expanded carbon sequestration and carbon storage is protecting old growth and mature trees from harvest, and advocate for this protection as the primary strategy of the CCCP.

Sincerely,



Darlene Chirman
Leadership Team, Cascade-Volcanoes Chapter

[5] 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

Submitted: Sat 09/11/2021 9:40 AM

Subject: Testimony on Climate Change Carbon Plan

Chair Kelly and Members of the Oregon Board of Forestry:

I am a small woodland owner with over 30 years of actively managing our family forest. Recently we entered into an agreement with the state of California to sequester carbon and sell carbon credits on their exchange. I am also a member of the Forestry Working Group of the Metro Climate Action Team.

I applaud the scope and depth of your Climate Change Carbon Plan. Specific elements of the plan I support as critical include:

- Your first guiding principle—that climate change is a serious threat. The extreme weather and fire events of the last few weeks bring home dramatically that we are in a climate emergency. On a personal note, during the Eagle Creek fire of 2017 we had to evacuate our forested property in Corbett. More recently, many of our conifers are showing signs of heat stress after the extreme heat event of late June.
- Another part of the plan I applaud is your supportive action to help private landowners participate in carbon markets and exchanges, and to assist them in creating carbon easements on their property.

Here are six areas in which I believe your Plan could be strengthened:

1. **Provide more specifics on what you mean by "climate smart forestry,"** such as growing trees longer—at least 80 years, growing a greater diversity of tree species, and protecting old growth and more mature trees.

2. **De-emphasize your estimates of the amount of carbon stored in wood products.** Research has indicated that in Oregon, 65 percent of wood carbon harvested since 1900 has returned to the atmosphere, and only 19 percent remains in long-term wood products.[1] The plan should promote **cooperative research** with materials scientists and other industries **to develop alternative building materials to wood products**, as well as steel and concrete, which all have a huge carbon footprint.

3. **Acknowledge more emphatically the evidence that clear-cut logging contributes significant amounts of GHG emissions in Oregon**—more than the transportation sector.[2] ODF needs to sound this alarm clearly, since the amount of these emissions has until now been omitted from Oregon's GHG emissions data.

4. Amplify the kinds of **technical assistance provided to small woodland owners to convert their forest practices from harvesting to carbon**

sequestration, such as providing reliable metrics for estimating the amount of carbon stored in trees of varied species, ages, and sizes. There are about 44,000 woodland owners who own 10 or more acres of forestland in Oregon, for a total of 3.3 million acres,[3] and the potential of increasing carbon sequestration on this land is enormous.

5. **Address the enormous assistance needed for impacted communities**, which traditionally have depended on the resource extraction of harvesting trees. Massive education and retraining will be required to provide living wage jobs, based on the new carbon economy, especially in rural forested areas.[4]

6. **Include methods of quantifying the changing value of stored carbon as a cost offset** to the future societal costs due to climate-driven disasters.

Thank you for your ongoing work in developing a robust plan to utilize the enormous carbon sequestration potential of Oregon's forests in mitigating climate change.

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1. Oregon Global Warming Commission, *Forest Carbon Accounting Project.* 2018

2. Law, Beverly, et al. Land Use Strategies to mitigate climate change in Carbon Dense Temperate Forests. PNAS, Jan 22, 2018. www.pnas.org/lookup/suppl/doi:10.1073/pnas.1720064115/-/DCSupplemental.

3. National Woodland Owner Survey (NWOS): https://www.fia.fs.fed.us/nwos/

4. For an example, see *Putting California on the High Road: a Jobs and Climate Plan for 2030.*

Sincerely,

John F Christensen, PhD
39825 Gordon Creek Rd.
Corbett, OR 97019
(971) 645-3882
nagarkot247@gmail.com

LEAGUE OF WOMEN VOTERS® OF OREGON

The League of Women Voters of Oregon is a 101-year-old grassroots nonpartisan political organization that encourages informed and active participation in government. We envision informed Oregonians participating in a fully accessible, responsive, and transparent government to achieve the common good. LWVOR Legislative Action is based on advocacy positions formed through studies and member consensus. The League never supports or opposes any candidate or political party.

September 3, 2021

To: Oregon Department of Forestry
Board of Forestry

Email: Danny.NORLANDER@oregon.gov; BoardofForestry@oregon.gov; odf@oregon.gov

Re: ODF Climate Change and Carbon Plan - Comments

The LWVOR's new forestry positions state: "all benefits of the forests—ecological, human and economic—are inextricably interconnected. Healthy forests are essential to habitat for a diversity of plant and animal life, to the hydrologic cycle, and to carbon storage to mitigate global warming. In addition, healthy forests are essential to a forest-products industry with the jobs and goods they provide, and to the economic and aesthetic values of their recreational opportunities. Therefore, the League of Women Voters of Oregon supports laws and policies to ensure that forest management (for timber extraction, recreation or any other activity) is carried out in a manner that will sustain healthy forests, streams and habitats." In addition, one of our forestry positions says "Full accounting of all costs, including cumulative ecological impacts, of timber harvests and other forest uses must be considered in forest activity decisions."

The final Climate Change and Carbon Plan has made some good modifications and rearrangements to the organization of the draft plan presented last June. It includes some changes based on the comments it received from stakeholders and the public and consolidated by PSU's Oregon Consensus in July. These include:

- Identify barriers (regulatory, social, economic) that may hinder the implementation of the CCCP as footnotes, or in a section of the document.
- Include accounting for emissions from the forestry sector within the greenhouse gas reporting program.
- ODF should build partnerships with other entities, agencies, and academic partners to assist in the workload, create a shared accountability, and leverage resources.
- ODF doesn't have to lead on every initiative or strategy. Examples of this include the department coordinating with entities working on addressing related efforts (e.g., energy distribution, fireproofing housing, and affordable housing) and building partnerships with organizations so they can help serve as messengers to spread the word about particular assistance grants in their communities.
- Continue to provide technical and grant support in urban forestry. This includes assistance for forest health, providing management scenarios assessment, and ongoing maintenance for trees.
- Build inclusive decision making by routinely engaging underrepresented and rural communities in carbon and climate change discussions and actions, and particularly in post-fire response actions.

However important elements of the report that were **not** incorporated into this recent iteration of the plan include:

- **Operationalize and embed meaningful community engagement in the collaborative planning process**. *Comment: Oregon Consensus's conclusion noted "there was a shared desire expressed among different stakeholders to assist and help shape the future of ODF's policy and operations related to carbon and climate change." A brief window for providing comments after an ODF plan is presented is not the same as helping to shape policy through public discourse.*
- **Be clear about the ecological nuances of climate smart forestry across the landscape in Oregon**. *Comment: The definition of climate smart forestry is very brief and insufficient. Climate Smart Forestry Management is not merely an extension of sustainable management, a term that is also not clearly defined, as "sustainable" is not merely replacing and replanting the same tree species as was harvested, as some would define it, as Dr. Beverly Law has stated in her previous comments to the Board. There needs to be a more complete and thorough explanation of "climate smart forestry" upfront, not developed later in the plan. The League supports the OCAP Forest Table's Guiding Principles for Climate-Smart Forest Policy. Because climate smart forestry is a guiding principle, the LWVOR thinks the wording for the first principle should read "**All forest management activities should be planned in light of both present and future impacts from climate change."***
- **Include more specificity with regards to metrics, goals, accountability measures, and implementation timelines as part of this plan**. *Comment: This last bullet item was brought up by many stakeholders, including the LWVOR. Our previous comments noted the need for the following to be included.*

Components of an action plan:

- **A well-defined description of the goal to be achieved** (how much *additional* CO2e in metric tons must be reduced each year going forward to meet the Governor's goal targets.)
- **Tasks/steps needed to reach the goal** (identify geographic areas most in need of afforestation and reforestation. We are glad that this is included under short term needs: "Clearly and concisely prioritize landscapes for restoration and resiliency treatments that may include protection of climate refugia.")
- **People to be in charge of carrying out each task** (if additional staff is needed as this plan suggests, then job description requirements should be spelled out now.)
- **When these tasks will be completed** (deadlines and milestones. We are happy to see that "Request Department of Justice assessment of Measure 49 impact on implementation of climate goals" was added to short term needs.)
- **Resources needed to complete each of the tasks** (specific funding requests of the legislature. Fortunately, the passage of SB 762 and other funded legislation will provide some of the resources needed to carry out the work needed.)
- **Measures to evaluate progress** (should be defined in this plan).

The draft plan does not include these elements, but refers these steps to the staff, the Board of Forestry and a lengthy rule-making process sometime in the future. The short term "Future Work Needs section should provide a more detailed and inclusive prioritized list that includes immediate steps the Department will take. Given that climate change is already devastating the planet and forestry can play a huge role in reducing emissions and keeping the planet cool, the

lack of specific, quantifiable, measurable steps to be taken in this document is a disappointment, especially as it relies on voluntary participation exclusively, with monetary incentives and "recognition events" rather than much-needed regulatory changes to the Forest Practices Act that the Board of Forestry (BoF) can recommend. The DOJ has already clearly established that ODF and the Board have this regulatory authority and in addition can develop carbon offsets. We think the BoF should start making tough decisions now based on current best science, climate-smart forest practices and the existing Forest Inventory Analysis (FIA) already in hand to demonstrate how Oregon can become a regional "leader in climate change mitigation and adaptation."

The following "Supporting Actions" (pages 20) are especially important in counteracting the negative impacts of climate change through carbon sequestration:

- "Slowly extend harvest rotations to increase storage while maintaining wood fiberflow to the forest industry.

- Identify areas particularly susceptible to the deleterious effects of climate change and the work to conserve them. This includes climate-sensitive habitats, areas of high conservation value, and areas of cultural significance that may become threatened by climate change. This should be done with input from tribal and community-based organizations. (*Comment: This should specifically include mature and old growth stands.*)

Until metrics are included, however, this cannot be considered an "actionable plan," but an aspirational guide for future work for the department.

We thank you for this second opportunity to provide comments on the Climate Change and Carbon Plan, and hope our comments will be useful.

Rebecca Gladstone	Claudia Keith	Josie Koehne
LWVOR President	LWVOR Climate Coordinator	LWVOR Forestry Portfolio

EXECUTIVE OFFICE
HAMPTON LUMBER

9600 SW Barnes Road
Suite 200
Portland, Oregon 97225-6666
Telephone 503.297-7691
Fax 503.203-6618
www.HamptonAffiliates.com

September 22, 2021

VIA EMAIL: BoardofForestry@oregon.gov

Oregon Board of Forestry
2600 State St.
Salem, OR 97310

Re: Draft Climate Change and Carbon Plan

Dear Chair Kelly and Board of Forestry Members:

On behalf of Hampton Lumber, thank you for the opportunity to provide comments on the Oregon Department of Forestry's (ODF) draft Climate Change and Carbon Plan (CCCP). We appreciate the Board of Forestry's discussion of this plan at the September 8, 2021 Board meeting, as it has the capacity to make drastic changes to how Oregon forests are managed. Hampton Lumber provided comments on the previous draft of the CCCP and we are disappointed to see that little to no changes were made to the latest draft based on those comments. Our concerns remain the same, but would like to provide additional thoughts and perspectives on this draft and issue as a whole.

We support the Board's efforts to use its authorities to meaningfully address the impacts of climate change. Our ask is that you take the time necessary to ensure your actions are meaningful. We are especially concerned that policies that delay harvest on Oregon's forest lands will likely result in increased carbon dioxide emissions, and further compound Oregon's challenges with rural poverty.

As you know, the United States and most developed countries across the globe are facing acute housing affordability crises driven principally by lack of supply. The global population is expected to increase by 2 billion over the next 30 years. Unless we intend to further impoverish vulnerable communities, there will be no meaningful curtailment in the demand for housing development.

The question becomes what materials are we going to use to build this necessary housing. Wood products are universally understood to be the best answer. Contrary to the statement on page 14 of the CCCP, absent a curtailment in development, the emissions associated with manufacturing and transporting building materials will be generated either way. It is for that reason that most international protocols assess transportation and energy generation emissions separate and apart from manufacturing emissions. The use of wood products may involve industrial emissions, but so too do all other building materials – and usually more. Increasing the proportion of wood building materials, the only renewable building material on earth, results in a net decrease in carbon emissions, not a net increase. Constraining Oregon wood product production will only drive the use of alternatives or substitutes. **Any climate policy pursued by the Board should acknowledge and specifically account for these trade-offs.**

The goal should not be to grow older forests – at least not in this context. As the Board discussed at the last meeting, the goal is to decrease carbon emissions. Therefore, **the first bullet on page 30, calling for extended harvest rotations, should be deleted or at least modified to require no decrease in volumes of wood fiber flowing to wood product manufacturers.** The definition of "climate-informed silviculture" also includes "use and planning for longer rotations". **We also ask this be removed or modified to require no decrease in volumes of wood fiber flowing to wood product manufacturers**.

The plan states that "larger timber will yield greater efficiency in processing" on page 13. We can assure you that "larger timber" does not increase efficiency at our sawmills. In fact, in response to failed federal policy changes to protect the northern spotted owl, the majority of sawmills that are left in Oregon have been retooled over the past few decades to process smaller logs. It is clear with statements like this throughout this entire document that expertise from the forest products sector has been overlooked in the development of this plan. **Such misstatements should be removed from this plan and language should be added that speaks to the actual impact of longer rotation ages on local sawmills.**

ODF rightly notes that any climate policies should be "shaped through the lens of social justice and equity," with special regard for the needs and realities of our most climate-impacted communities. Multiple state-level climate plans, like the Oregon Health Authority's Oregon Climate and Health Report, the State of Oregon Climate Equity Blueprint, and the Oregon Global Warming Commission Natural and Working Lands proposal, include "rural communities" among those most vulnerable to the effects of climate change. Not only are rural communities not given special consideration in this document, there is no acknowledgement of the fact that they will be forced to bear the brunt of the costs associated with any policy that delays or reduces timber harvests. **We appreciate the Board's recognition of this fact during your discussion of the plan at the last board meeting and expect this oversight to be corrected before the plan is approved.**

We are also concerned with the language used on page 11 that lists a barrier as "pressures to produce revenue (internally and externally; country payments)." How is ODF's legal obligation to produce revenue to the trust land counties a "barrier" to addressing climate change? The production and use of local wood products - and the revenue generated for counties, rural communities, and social services – are not barriers to climate change mitigation but opportunities.

In addition, on page 11 the potential barriers are listed "in no particular order". Listing these barriers in order of significance is important information for the Board to have and will be useful when prioritizing potential activities. We urge ODF to take the time to assess each potential barrier and provide information on the relative impact each would have on the plan's ability to reach its own goals. Again, on page 11, "*Concerns* over leakage and substitution effects" is listed as a barrier. The use of the word 'concern' here implies leakage is a perception problem rather than a well-known economic phenomenon. **This potential barrier on page 11 should be reworded to simply state, "Leakage and substitution effects."**

New language is included on page 12 that says, "the holistic view of this plan is that there is a need for all types of management, including no management across the forest landscape." The Board must consider and address the consequences of non-management. You don't need to look further than the outcomes we've seen as a result of non-management on federal forests in Oregon. The

economic, social, and environmental costs of non-management are staggering and increasing year to year.

Like climate change, poverty imposes massive human costs. Board policies designed to address climate change should acknowledge responsibilities to rural communities and explicitly weigh the trade-offs between the anticipated change in global temperatures due to increased sequestration in Oregon forests, which will likely be very small, and the impact these policies will have on rural Oregon economies, which will likely be very large.

Thank you again for considering our comments and requests. We look forward to working with ODF and the Board in a meaningful way as we continue to address our changing climate.

Very truly yours,

Heath A. Curtiss
Vice President, Legal and Government Affairs

HAMPTON LUMBER

PO Box 2315
Salem, Oregon 97308-2315
Telephone 503.365.8400
Fax 503.365.8900
www.HamptonLumber.com

June 30, 2021

Via Email: Danny.NORLANDER@oregon.gov

Oregon Department of Forestry
2600 State St.
Salem, OR 97310

RE: Climate Change and Carbon Plan Comments

Dear Chair Kelly and Acting State Forester Hirsch:

Thank you for the opportunity to provide comments on the Oregon Department of Forestry's (ODF) draft Climate Change and Carbon Plan (CCCP). Climate change is a global problem that will need large scale and innovative ideas to solve. The forest sector alone cannot solve this problem, but will play a vital role in addressing climate change.

As noted, this plan will be used to inform several significant policy documents, including the Forest Management Plan (FMP) and the Forestry Program for Oregon. The potential negative impacts could be immense and inequitably distributed throughout the state. ODF should use this opportunity to promote and partner with the private forest sector, encourage the use of wood products, and highlight the full benefits of working forestlands through this plan.

Importance of Wood Products

Wood products are the greenest building material on earth. They sequester carbon and play a major role in helping the world address climate change and meet the growing demand for new housing and construction. By 2060, the earth's population is expected to reach 10 billion. The United Nations estimates that cities will need to construct or renovate an additional 2.5 trillion square feet of building space to accommodate this increase. That's the equivalent to adding another New York City to the planet every month for the next 40 years, according to the non-profit Architecture 2030.

The wood for all this new development and renovation will need to come from somewhere. Timber is a high-demand global commodity. Forest carbon storage schemes that reduce or delay harvests in Oregon's sustainable working forests only serve to export harvests to another region or country. Thirty percent of lumber used in the U.S. is already imported from other countries. Reducing log supply from Oregon forests will only increase our reliance on imports.

If Oregon is interested in taking meaningful action to address global climate change vis-a-vie its forests, it should be promoting and expanding use of sustainable, locally produced wood products though policies that promote the substitution of wood for non-renewable, high emissions materials

like steel and concrete. With nearly 40 percent of global human-caused carbon emissions coming from construction and the built environment, rethinking what we build and how we build it should be a top priority in our fight against climate change. Luckily, the state is already well-positioned to be a leader in using wood products to help meet our climate goals in thoughtful and productive ways that benefits all Oregonians.

However, without a steady and sustainable delivery of wood fiber to local mills, our ability to produce these products will be limited. Reduced or delayed harvests will only hurt rural communities, force consumers to purchase nonrenewable and carbon intensive products, and increase harvest in places with less stringent environmental laws than we have in Oregon.

Inaccurate Depictions of Modern Forest Management

The language used in this draft plan is at times inaccurate and irresponsible. At several points, references are made with regard to extending rotation ages, deferring harvest, and incentivizing landowners to manage forests with the singular focus of sequestering carbon, omitting the real-world direct and indirect impacts such policies will have on other forest values, not to mention carbon emissions elsewhere. There is also language that implies that "traditional forest management," "planted stands," or "business-as-usual" is somehow detrimental to our climate change goals. There is even a mention of "resource degradation," which incorrectly implies that forest management is akin to deforestation. There are more trees today than there was a century ago, thanks in large part to the forest products industry. As ODF finalizes this plan, we encourage you to revisit this language to ensure it is both accurate and reflective of the diverse values that "traditional" working forests provide the state. Oregon has some of the most protective forest practice laws in the world and our science-based forestry regimes should be encouraged and recognized as part of the solution, not the problem.

The draft plan mentions encouraging "reforestation of burned lands" and to "restore ecosystem function and carbon sequestering trees to fire affected areas". Restoration after fire should be a priority for all landowners, but the draft plan fails to mention salvage logging of burned stands. Salvage not only allows the landowner to recover financial losses caused by the fire, but also generates revenue for local communities and prepares the stands to be replanted for faster recovery. Take the Tillamook State Forest for example. After the Tillamook Burn, stands were heavily salvaged and replanted. The Tillamook State Forest now provides benefits to all Oregonians by providing recreation, ecosystem services, and economic activity from timber harvest. Salvage and reforestation should be prioritized on all lands that suffer wildfire damage.

Undermining the Role of State Forests

The draft plan states that "the Department will lead by example and demonstrate climate-smart forest management on State Forests to achieve Greatest Permanent Value" (GPV) and that concept will be incorporated into the FMP. State forests already sequester the highest amount of carbon across all landowners in Oregon. ODF is also pursuing a habitat conservation plan that would limit the acres available for timber harvest to less than half of the land base. Non-management is a management decision, but not one that ODF must take. The state is obligated to balance social, environmental, and economic values.

State forests play a critical role to the delivery of wood fiber to local mills. As previously mentioned, renewable wood products should be amplified to provide sustainable options to consumers and create healthy forests and communities. Active management and timber harvest from state forests must be part of the solution to addressing climate change.

Setting aside more stands to grow unmanaged would replicate the devastation witnessed on our federal forests where surrounding communities have deteriorated and forest ecosystems have grown unhealthy and prone to severe wildfire. It should be noted that mega-fires are significant contributors to greenhouse gas emissions in the state. One large fire year (roughly 1 million acres burned) can emit up to 15 million tons of carbon. That's twice as much carbon as all the cars in Portland emit in one year.

The draft plan states that "the Department, and specifically the State Forest Division, should work towards determining an internal carbon price for the lands and forests that it manages." The plan does not go into details or specifics, but mentions "a variety of measures from selling carbon offsets to adjusting harvest to capitalize on changing long-lived product ratios." Can ODF explain what "long-lived product ratios" are? If the intention is to replace traditional markets with carbon markets for state forestlands, rural communities will pay the price. The economic activity that is generated from harvest on state lands goes far beyond the direct revenue from the sale. It is impossible to know what the true cost of carbon offsets will be until a thorough socio-economic study and cost-benefit analysis is done. The lost downstream benefits of harvest must be fully understood and considered before priorities are adjusted or carbon offsets are factored into a long-term management plan.

Inequities and Information Gaps

Executive Order 20-04 directs agencies to "prioritize actions that reduce GHG emissions in a cost-effective manner". How does ODF plan to implement this directive? As previously mentioned, there are a myriad of potential costs to making drastic changes to forest management practices and policies. How will ODF calculate these costs and mitigate them?

The draft plan mentions the use and guidance of "best available science" in several sections. This is essential. The definition of the best available science should at a minimum mean using empirical on-the-ground evidence to back up any modeling, all of which should be available for public review. Peer reviewed science and widely accepted carbon protocols must be the driver of decisions made by ODF. Using these standards will help alleviate unrealistic political pressure to go beyond what is feasible.

There are also significant gaps in ODF's current understanding of the full socio-economic impacts that state forest harvests have on surrounding counties and communities. This information is not available because the research has not been commissioned. Moving significant policy changes forward without this information is unacceptable. As mentioned earlier, the social and economic benefits of state forest harvest greatly surpass any direct payments made from the sale of state timber. Unless ODF conducts a full socio-economic analysis of the impacts of harvests on surrounding communities, we will not know whether the proposed measures are cost effective.

There could be far more effective and less harmful ways to mitigate climate change in this state, but potential tradeoffs won't be fully understood until the agency knows the true value of state timberlands.

Finally, the draft plan states that,

> "Working with partners to incentivize landowners to defer harvest voluntarily can lead to greater sequestration and storage over the next 30 to 50 years (e.g., 2050-2070), a period when our natural and working lands will be leaned on heavily until technologies and other sectors can catch up and work to reduce atmospheric carbon."

Why should the forest sector be responsible for carrying the weight of sequestering emissions generated by other sectors? This puts an undue burden on the industry while giving a pass to those who continue to emit carbon. We need economy-wide solutions to address climate change that focus on areas where we can have the greatest actual impact on global climate change. Relying on rural Oregon to bear all the costs of carbon offsets is deeply inequitable, particularly given other sectors and urban areas would be able to claim the credit while still emitting carbon.

Again, the forest sector should be considered partners in mitigating the effects of climate change. We appreciate the ability to provide feedback on this plan and would welcome the opportunity to work directly with ODF as it continues to develop this and other forest management plans.

Sincerely,

Laura Wilkeson
State Forest Policy Director
Hampton Lumber

Southern Oregon Climate Action Now

SOCAN

Confronting Climate Change

https://socan.eco

Alan R.P. Journet Ph.D.
Co-facilitator
Southern Oregon Climate Action Now
7113 Griffin Lane,
Jacksonville
OR 97530-9342
alan@socan.eco
September 7th 2021

Chair Kelly & Members of the Oregon Board of Forestry

I write on behalf of the 1500 rural Oregonians who are Southern Oregon Climate Action Now (SOCAN) with comments on the draft Climate Change and Carbon Plan. SOCAN's mission is to promote understanding about climate science and to motivate individual and collective action to address global warming and its climate change consequences. How ODF adjusts its forest management following the issuance of Governor Brown's Executive Order 20-04 falls very much within our zone of interest. As SOCAN co-facilitator, I have consistently engaged with DEQ in the development of their draft Climate Protection Plan and will offer a substantial thought below (p. 6) regarding carbon offsets based on that experience.

My overall assessment of the proposed plan is favorable, but with several caveats as indicated below.

Climate Smart Forestry:

It is extremely encouraging to see repeated reference throughout the plan to climate smart forestry since climate smart management of all our natural resources must be the model for future natural resources management not only by our federal and state agencies, but also by private resource owners. However, I am somewhat concerned that the climate smart model selected to follow may not be the best example. Employing a model from Europe that assumes harvest products seems strange when we have a model available from the National Wildlife Federation (Stein et al. 2014, https://www.nwf.org/~/media/PDFs/Global-Warming/2014/Climate-Smart-Conservation-Final_06-06-2014.pdf) that has been applied to U.S. National Forests (for a brief summary, see the attached documents prepared by Charisse Sydoriak). In the repeated reference to climate smart forestry, the plan seems to fluctuate between assuming that ODF already engages in climate smart forestry, and acknowledging that forest managers will need to be educated and incentivized to implement that approach.

In the discussion of Barriers (p 9) it appears that the basic principles of climate smart forestry are not fully understood. This is apparent in this statement (p.9/10): "Natural barriers to moving to climate-smart forestry include a rapidly changing climate and events causing tree

and forest damage and mortality at a speed and magnitude that exceeds management and forests' ability to adapt." This statement is disturbing since the entire basis for, and purpose of, climate smart management is to adapt to a changing climate. Rather than constituting a barrier to employing climate smart forestry, this comprises exactly the reason for it.

Then, in the Table (p. 11) the resolution to addressing the problem of Public perceptions is stated as "Provide transparent processes and increase engagement opportunities." Surely the way to overcome the problem of Public perceptions is to address those perceptions with a program of education regarding forests, climate change, and the need for climate smart management.

Then, again, surely one response to the barrier of "Pressures to produce revenue (internally and externally; county payments) would be for ODF to acknowledge the merit of a Severance Tax, funds from which could be used to restore county payments.

It was encouraging to see (p. 15) that under Agency Leadership: "Department leadership will prioritize climate change in their planning to align with Executive Order 20-04." While this is very encouraging, the ongoing emphasis on promoting timber harvest suggests that ODF has not yet acknowledged the urgency of addressing the impact of climate change on our forests, nor the urgency of addressing role that our forests should be playing to minimize that problem.

It was particularly encouraging to see this statement (p. 15) on Agency Decisions:

To the full extent allowed by law, agencies shall consider and integrate climate change, climate change impacts, and the state's GHG emissions reduction goals into their planning, budgets, investments, and policy making decisions. While carrying out that directive, agencies are directed to:
(1) Prioritize actions that reduce GHG emissions in a cost-effective manner;
(2) Prioritize actions that will help vulnerable populations and impacted communities adapt to climate change impacts; and
(3) Consult with the Environmental Justice Task Force when evaluating climate change mitigation and adaptation priorities and actions.

This suggests a real effort on the part of ODF to incorporate climate change into its planning, and to strengthen efforts to address environmental injustices that have existed for decades.

My concern about the acceptance of Climate Smart principles is exemplified in the statement on p 17 regarding Climate Smart Forestry in Silviculture:

Goal: Establish a just and equitable transition to climate-informed silviculture and climate-smart forestry that optimizes climate mitigation and adaptation, while maintaining a sustainable flow of wood products to ensure long-term resource benefits and viability of the forest products industry and flow of long-lived forest products.

Unfortunately, the proposal seems to be taking Climate Smart principles and shoe-horn into them the demands of the timber industry. This may be a function of a preconceived notion on

the part of ODF as to what constitutes Climate Smart management, the search for a definition or model that includes timber harvest, or some combination. However, if our goal is genuine climate smart forestry according to the principles articulated in Stein et al. (2014), they should comprise: ""the intentional and deliberate consideration of climate change in natural resource management, realized through adopting forward-looking goals and explicitly linking strategies to key climate impacts and vulnerabilities" Note that this does not include any mention of timber harvest. The implication of the discussion of climate smart principles by Stein *et al* (2014) would lead to timber harvest not being so much a goal of the management as a by-product of management that is consistent with the climate smart framework. This is not to suggest that timber harvest should be abandoned since there is substantial evidence that genuinely sustainably managed timber products are superior to other materials for construction. Rather, the point of this comment is to recognize the difficulty, if not impossibility, of managing concurrently for two potentially mutually exclusive (or at least conflicting) goals.

The Restoration Conundrum

It is notable that the plan states (p. 19):
"Natural resource agencies and stakeholders working together to increase forest resiliency through **restoration** and resilience activities like thinning and prescribed fire will be essential to adapt and maintain functioning forest ecosystems in a changing fire environment."

"While there may not be any way to address this issue [smoke] directly during a wildfire, the Department should continue working with local and sibling agencies (e.g., Oregon Health Authority) to establish ways for these impacted populations to avoid smoke impacts as well as research and monitoring to assess other resource and health effects. Additional **restoration** burning will produce varying levels of smoke."

In the same context of climate smart forestry, this exemplifies the frequent reference to forest restoration though it is unclear what this means. The reason that such a concept is fraught with hazard is that a basic premise of climate smart management is that future climatic conditions will be so unlike historic conditions that attempts to return to some historic composition is untenable. If the concept of 'restoration' refers to ecosystem composition, which is often its meaning, then this should be recognized as implausible as a goal. If, on the other hand, restoration refers to ecosystem function, then such a meaning should be clarified in the text.

I find laudable the statement of a State Forests Management Goal (p. 20) to:
Lead by example and demonstrate climate-smart forest management on State Forests to achieve adaptation, mitigation, and the achievement of forest resource goals.

However, this is of course tinged with the caveat regarding whether climate smart principles are really understood.

The reported statement of Greatest Permanent Value (p 20) is troubling:

"As provided in ORS 530.050 (Management of lands acquired), "greatest permanent value" means healthy, productive, and sustainable forest ecosystems that over time and across the landscape provide a full range of social, economic, and environmental benefits to the people of Oregon. These benefits include, but are not limited to:

(a)Sustainable and predictable production of forest products that generate revenues for the benefit of the state, counties, and local taxing districts;
(b)Properly functioning aquatic habitats for salmonids, and other native fish and aquatic life;
(c)Habitats for native wildlife;
(d)Productive soil, and clean air and water;
(e)Protection against floods and erosion; and
(f)Recreation."

This is because it offers no room for management in the face of climate change. This statement should be accompanied by a recommendation to add enhancing carbon sequestration and limiting greenhouse gas emissions as among the Greatest Permanent Values.

Also laudable is the subsequent statement:

"The Department will lead by example and demonstrate climate-smart forest management on State Forests to achieve Greatest Permanent Value. This concept will be incorporated into the revision of the Western Oregon State Forests Management Plan (FMP), which "will be implemented to adapt to climate change and mitigate its impacts on the management of state forest lands."

There is an example (p. 21) of the repeated reference to ''thinning' the forest to mitigate fire risk. The term 'thinning' raises an alert in the minds of many who are aware of a history wherein this has been used as justification (or cover) for logging operations. It would be helpful for ODF to define this process in such a way that the meaning is explicit. If this includes commercial timber harvest, I suggest identifying so; but if the focus is removal of small diameter non-commercial understory shrubs and trees, this should be clearly stated.

The following statement (p.23) are similarly laudable:

Urban and Community Forests

GOAL: Increase the extent and resilience of urban and community forests to maximize the climate mitigation and health benefits of urban forests canopy.

Reforestation and Afforestation

Goal: Facilitate and encourage the reforestation of areas burned by wildfire and afforestation of low-productivity lands that are understocked or not in forest use.

I offer kudos for recognizing (p. 24):

"There may be instances where the most current knowledge of plant communities and climate envelopes indicate that there should be alternative management on affected lands. This may include the use of alternative, non-traditional tree species, alternative seed sources, or a shift from traditional forest management to a long-term ecologically-sustainable ecosystem."

However, it is worth noting that my understanding of climate smart principles is that this is exactly what they represent. This again raises a question about what is meant throughout the plan by 'climate smart forestry' that doesn't encompass this principle.

A question is raised by the suggestion (p. 25) in relation to Maintain and Conserve Forests

Goal: Support a strong, but flexible, Land Use Planning System as a cornerstone of maintaining Oregon's forests on private lands.

Since it is now a priority sequester carbon in our natural and working lands, this item probably deserves incorporation into the Forest Management Practices laws..

Meanwhile, since monitoring and reassessing are critical components of climate smart forestry the following constitutes an excellent recommendation (though it should be understood as already existing within the framework of climate smart management:

Research and Monitoring
Goal: Maintain a research and monitoring program to track the status and trends of ecological, economic, and social indicators and the effects of climate change and to track progress related to this plan.

In relation to the question (p.26):
To what extent will forest ecosystems change in response to rising atmospheric CO_2?

It's worth noting that Gerry Rehfeldt formerly with the Forestry Research Station in Idaho has developed projections for the future distribution of wester tree species under various scenarios based on their historic climate envelopes: http://charcoal.cnre.vt.edu/climate/species/, so information is already available to address this to some extent.

The statements on p 29 are excellent:

Integrate Climate Change in FPA Rule Revision Processes:

Climate-Smart Forestry Incentives on Private Forestlands:

The only caveat, again, is that the climate smart principles being employed are appropriate (see attached and referenced materials).

The suggestion to incorporate climate change considerations into the forest management plan (p.30) and identify and operationalize carbon storage in harvest operations are both excellent as is the concept of internalizing carbon pricing in decision-making and promoting ecological function (p.31)

I offer a concern under Afforestation of Low Productivity Lands (p. 33) regarding the concept of genetically improved trees. While we know that selective breeding is a tactic employed in agriculture, forestry and fisheries, beware the concept does not become mingled with that of artificially modified organisms through gene insertion, GMO techniques.

In relation to the discussion of **offsets** undertaken on p. 35 it is essential to appreciate that in the development of its Community Climate Investment funding opportunity, DEQ has specifically excluded carbon sequestration projects. If ODF wishes to discuss this issue with DEQ, the first request would be to reinstall carbon sequestration as an option. This was present during earlier iterations of the Community Climate Investment fund but was deleted at the last minute without explanation despite opposition from many (including this witness).

It was with some relief that I finally encountered reference (p. 37) to the need to account for forestry-related impacts and assess emissions from forest harvest and (p. 38) Incorporation of Climate Change and Climate Change Impact in Agency Planning Processes.

I was also delighted finally to see (p 40/41) the suggestion to include Diversity, Inclusion and Equity (DEI) in both short and long-term planning

I offer a final note about: *Carbon Sequestration in Wood products.*

There occurs repeated reference to the sequestration of carbon in forest products as though this comprises a substantial contribution by the timber industry to the state's carbon balance. While it may well amount to a seemingly large absolute number, the question really should be: what percentage of the carbon flux is in those products. On a national level, the Congressional Research Service Forest Carbon Primer (2020) (https://sgp.fas.org/crs/misc/R46312.pdf, Table 3) reported, for example, that for 2019, among our national forest's carbon stocks of 58.72 billion tons, only 5% was contained in harvested wood products, with only 3% in use and 2% in the disposal stream. Meanwhile 95% existed within the forest ecosystem, with 54% in the soil. Meanwhile, reports from several years ago on the net percentage of carbon surviving from a harvested tree in the final timber product amounts merely to some 15%. (https://www.nrs.fs.fed.us/pubs/gtr/ne_gtr343.pdf and https://www.nrcm.org/wp-content/uploads/2013/10/TWS_US-Forest-Carbon-and-Climate-Change_2007.pdf. Given that the Carbon Primer data above indicate over 50% of the C is in the soil with 16% scattered among below ground biomass, deadwood, and litter, this brings the 15% value down close to the 3% reported nationally. In other words, the carbon stored in timber products is a very small percentage of the carbon in the forest ecosystem While the ODF report on harvested wood product carbon (https://www.oregon.gov/odf/Documents/forestbenefits/oregon-harvested-wood-products-carbon-inventory-report-1906-2018.pdf) identified the carbon stocks in Timber Product Output, I did not see what percentage of the total harvest or total ecosystem carbon that value represented. In addition to the small percentage of forest carbon that is represented in the harvested products, it is also important to recall that harvesting trees compromises completely the capacity of those trees to sequester further carbon. While plantations certainly

will sequester carbon, as Lewis *et al.* 2019 (https://media.nature.com/original/magazine-assets/d41586-019-01026-8/d41586-019-01026-8.pdf) argue: "…natural forests are 6 times better than agroforestry and 40 times better than plantations at storing carbon…."

Thank you for this contribution to increasing the sensitivity in our forest management to the climate crisis. As always, I am happy to discuss these issues with you.

Respectfully submitted

Alan Journet

Cofacilitator
Southern Oregon Climate Action Now

August 22, 2021

Adapting to Climate Change: An Introduction to the Climate-Smart Conservation Approach (by Charisse Sydoriak)

- Addressing the growing threats brought about or accentuated by climate change requires a fundamental shift in the practice of natural resource management (Glick et al. 2021, Schuurman et al. 2020, Stein et al. 2014). Preserving or restoring natural ecosystems to some sort of historic condition is becoming increasingly difficult due to accelerated climatic change, altered disturbance regimes, and the far reach of human influence. Using a historic target for restoration is highly unlikely to be a viable long-term strategy.

- The future climate will be the primary factor determining vegetation conditions and species viabilities in this century. Species will have to adapt in place; shift in distribution to track with evolving suitable conditions; or go extinct. The ability of humans to alter species responses will be limited.

- Management activities should be evaluated continuously to determine whether goals, objectives, and assumptions remain viable. For valued species and ecosystem services to persist, more diverse natural resources management approaches over extended timescales and geographic scope, are needed.

- Being "climate-smart" is "the intentional and deliberate consideration of climate change in natural resource management, realized through adopting forward-looking goals and explicitly linking strategies to key climate impacts and vulnerabilities" (Stein et al 2014). It entails INTENTIONALLY making a transition from a paradigm of protection and restoration (resisting change), to one that anticipates and actively manages for uncertain yet plausible future conditions. The challenge is to manage for acceptable outcomes, with uncertainty clearly in mind.

- Climate-Smart Conservation: Putting Adaptation Principles into Practice (Stein et al 2014) offers guidance for designing and carrying out natural resources management activities in the face of a rapidly changing climate.

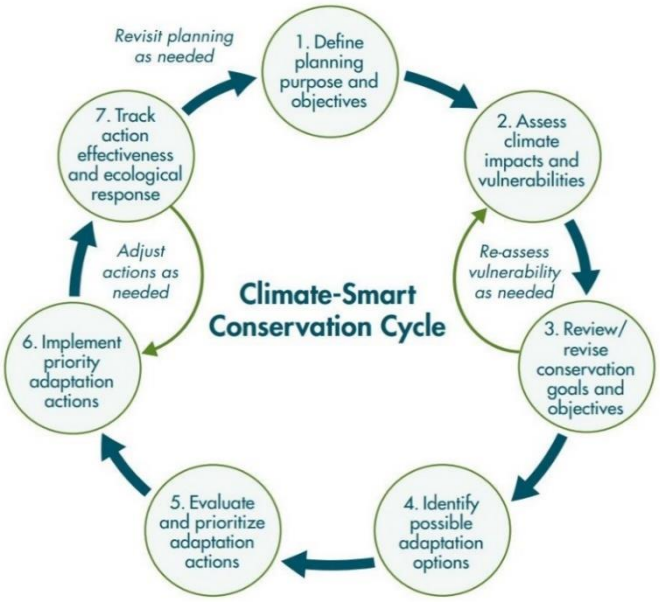
- Key characteristics of the "Climate Smart" approach are:
  - ✓ **Linking actions to climate impacts.** Natural resources management strategies and actions are designed specifically to address the impact of climate change in concert with existing threats. Actions are supported by an explicit scientific rationale and understanding of potential climate vulnerabilities.
  - ✓ **Embrace forward-looking goals**. Management goals focus on current and future, rather than past conditions. Strategies take a long view (decades to centuries) but account for near-term challenges and needed transition strategies.
  - ✓ **Consider broader landscape context.** On-the-ground actions are designed in the context of broader geographic scales to account for likely shifts in species distributions, to sustain ecological processes, and to promote collaboration across land management boundaries.
  - ✓ **Adopt strategies robust to uncertainty.** Strategies and actions ideally provide benefit across a range of possible future conditions to account for uncertainties in future climatic conditions, and in ecological and human responses to climate shifts.
  - ✓ **Employ agile and informed management.** Natural resources managers and the public embrace experimentation, continuous learning and dynamic adjustment to accommodate uncertainty--regularly taking advantage of new knowledge to cope with rapid shifts in climatic, ecological, and socioeconomic conditions.
  - ✓ **Minimize carbon footprint.** Adopt strategies that minimize energy use & greenhouse gas emissions and employ tactics that enable systems to naturally cycle and store carbon.

- ✓ **Account for climate influence on project success.** Monitor the results of actions taken. Avoid investing effort likely to be undermined by climate-related changes unless part of an intentional strategy.
- ✓ **Safeguard people and nature.** Adopt strategies and tactics that enhance ecosystems' capacity to protect human communities and co-beneficial biota from climate change impacts.
- ✓ **Avoid maladaptation.** Avoid choosing activities that ostensibly reduce vulnerabilities to climatic change but actually have unintended adverse consequences on human or natural communities.

Climate-Smart Adaptation Process Cycle

While there are other adaptation planning tools (i.e., Swanston et al.), the National Wildlife Federation climate-smart adaptation process approach (Stein et at., 2014, Figure 1) emphasizes iterative review of current and future conditions, assessing vulnerabilities, questioning assumptions, educating and engaging stakeholders, monitoring, and agility—key characteristics of the climate-smart approach. The process steps are briefly described here.

Figure 1. Climate-Smart Adaptation Process Cycle



Step 1: The first step is to clearly articulate values of concern in a collaborative manner and describe why they are important ecologically and socio-economically. The purpose of the organization's goals for a resource is often defined in law or policy, but sociopolitical concerns (i.e., equity) should be integrated in the process.

Step 2: The next step is what makes the climate-smart process unique. The values identified in step 1 are evaluated for their vulnerability based on the best available science and global climate change modeling to determine if those values are likely to be affected positively or negatively by climatic change. All living things exist within a range of environmental conditions that are likely to shift and may be entirely lost from an area in a future climate. Vulnerability is assessed by looking at exposure potential over time, inherent sensitivity, and adaptive capacity. At a minimum, the value-of-interest is examined relative to existing stressors such as pollution, habitat loss, or invasives and its physiological vulnerability to increasing temperatures and changes in precipitation in the next decade, mid-century, or longer. This step requires expert knowledge, geospatial tools, and review of the scientific literature.

Step 3: This step requires critical reflection on the vulnerabilities developed in step 2 for a reality check. If the value is at high risk in the face of climatic change, the original goals and objectives may be unrealistic unless the value can survive somewhere else. When this occurs, the goals and objectives should be intentionally revised.

Step 4: In step 4, a suite of adaptation options or "strategies" are identified based on the vulnerability assessments (step 2), and on management feasibility and cost (step 3). Step 4 entails looking at a range of plausible future conditions (i.e., scenario planning) to find places where valued resources could persist with or without management intervention; and intentionally deciding where, why, and how to take action to protect values-at-risk. A tool called the Resist-Accept-Direct (RAD) decision framework which "captures the entire decision space for responding to ecosystems facing the potential for rapid, irreversible ecological change" is introduced below to facilitate development and implementation of realistic (climate-smart) management strategies across space and time.

Climate-Smart Approaches/Strategies: Making climate-smart decisions in the face of uncertain future conditions can be overwhelming. Fortunately, the Resist-Accept-Direct (RAD) Framework (Glick et al. 2021) narrows the decision space to only three choices (Table 1). Common to all is a commitment to "intentionally intervene to shape the trajectory of ecosystem change" based on "underlying goals and values, and motivations for taking each approach." All three approaches are warranted simultaneously depending on acceptable outcomes and where, when, and why management action is being considered.

Table 1. Resist-Accept-Direct (RAD) approaches (modified from Schuurman et al. 2020)

Category	RESIST Change	ACCEPT Change	DIRECT Change
How is the approach defined?	***Work to maintain or restore ecosystem processes, function, structure, or composition based upon historical or acceptable current conditions***	***Allow ecosystem processes, function, structure, or composition to drift autonomously (away from historical conditions), without intervening to alter the trajectory of change***	***Actively shape ecosystem processes, function, structure, or composition, resulting in a new ecosystem configuration based upon desired conditions and ecosystem services***
What each approach may entail	• Reduce the magnitude of directional transformative forces • Reduce the ecosystem effects of forces • Restore changing ecosystems to a more historical condition • Monitor to look for unforeseen consequences and evaluate success and feasibility of resisting	• Avoid acting to alter the magnitude, trajectory, or ecological outcome of directional transformative forces • Monitor to see what happens, look for unforeseen consequences, and consider the need for active intervention • Possibly take management actions other than active intervention such as educating stakeholders	• Act to direct the magnitude and effects of directional transformative forces • Direct ecosystems toward a specific condition that differs from the past but is more resilient to future climatic conditions • Monitor to look for unforeseen consequences and assess if trajectory of change aligns with expectations
Desired Outcome/ Goals	Persistence or restoration of historical conditions and services, using a retrospective benchmark	New conditions and services resulting from intentionally not guiding change. No specific benchmark needed	New conditions, clearly defined, intentionally sought and ideally part of a self-sustaining system
Motivations for each approach	• Conserve historical or current conditions • Retain existing or re-create former ecosystem services • Buy time for autonomous species response or further management actions	• Conserve some ecosystems in an unmanipulated condition • Insufficient resources (e.g., funds or knowledge) or inability to shape the trajectory of change • Desirable ecosystem services are not threatened	• Provide a new set of conditions and ecosystem services preferable to those that would result from accepting change, or where resisting change is considered futile • New conditions can be envisioned from geographic analogs or as novel systems

Step 5: An action plan is produced in step 5. To support the plan, stakeholders need to be educated starting with the original goals and objectives (step 1) and walked through the findings in steps 2-4 to show why, where, when, and how goals and objectives can or cannot be attained based on the best available science, plausible future condition forecasts, time constraints, and available resources (i.e., costs). The plan should intentionally incorporate the nine key characteristics of the climate-smart approach (listed above), identify assumptions made, and provide the means for evaluating success based on climate sensitive metrics. In addition to articulating the strategic framework (step 5), the action plan should prescribe implementation tactics and projects. The "Adaptation Workbook" (Swanston et al. 2016) provides a "menu of adaptation strategies and approaches" to facilitate project level action planning and implementation in forest ecosystems.

Steps 6 & 7: During implementation (steps 6 & 7) it is likely that adjustments will be needed. This means that metrics need to be regularly monitored and an administrative structure set up to be responsive to unforeseen situations. The plan implementors should take the long view and be humble, nimble, and responsive when things don't go as planned. When conditions warrant, the planning process should be reinitiated to validate and correct original assumptions and planned actions.

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To
The Board of Forestry
Oregon Department of Forestry
2600 State St,
Salem, OR 97310

Date: 09.07.2021

Chair Kelly and Members of the Board of Forestry

I am submitting the following comments on behalf of Defenders of Wildlife ("Defenders"), as a feedback to the recently shared Orgeon Department of Forestry's (ODF) Climate Change and Carbon Plan ("Plan"). Defenders is a national wildlife conservation organization dedicated to protecting imperiled and native species and their habitats. We have close to 2.1million members and supporters nationwide, of which over 30,000 are Oregonians.

Defenders appreciates that the report not only recognizes the impact of climate change on human and natural communities but also makes note (in the second principle and in the "Future Work Needs") that the impacts are disproportionate in human communities, especially in reference to BIPOC communities. The benefits of climate resilient forests and, conversely, the impact of impacted forest ecosystems are skewed and as we develop strategies to mitigate and adapt to climate change it is important to keep this fact in mind when we look at who bears the costs of poor forest health, and who enjoys the benefits of our healthy forests.

In the same theme of argument, we also urge the Department of Forestry to look at the disproportionate impact on certain populations of the natural community. ODF's Climate-Smart Forestry is based on the definition of sustainable forest management developed in 2011. The definition, however, doesn't recognize the disproportionate impact climate change has on imperiled species. While all native species are impacted by climate change and poor forest health, the impact on threatened and endangered (T&E) species is even more simply because, by definition, T&E species faces larger threats and higher risks of extinction which makes them especially vulnerable to climate change impacts. We urge the Department and the Board to broaden the definition to specifically include imperiled species, in addition to native species.

We agree that Oregon's forest sector needs to take additional, bold steps in climate mitigation and adaptation as stated in the Plan. The ability of mature and old growth forests of the Pacific Northwest to sequester carbon stands out as a natural asset and a natural solution that is of benefit not just to Oregonians but the entire country. Fully protecting today's old growth forests is key as is science-led ecological management of mature forests to be tomorrow's old growth. Along with this, harvesting timber only in younger forests and according to longer rotational cycles could go a long way to ensure this natural asset and natural solution to carbon sequestration in maximized. Identifying

areas of climate refugia and those that function as important corridors for wildlife movement and adaptation to changing conditions also need to be prioritized. The protection of such areas then needs to be comprehensively supported. Accordingly, the Department's leadership on communicating with stakeholders on the far-reaching value of these and other climate-smart forestry measures at the local level, developing mechanisms to encourage various forest owners to participate in them and as well as promoting conservation easements when possible will also be key. Such communications should be cognizant and sensitive to language, culture, communication and convening styles of Oregon's diverse communities in order promote active understanding, discussion, participation and to be as inclusive as possible.

Finally, with regards to forestry and forest health, Oregon has been unfortunate in having to play a reactive role than a proactive role in addressing climate change in recent times, as the report rightfully identifies in the "barriers" section. With our raging wildfires, prevailing drought and invasive species of plants and insects, a lot of the state's resources are being diverted to addressing the impacts which leaves us with little time and resource to be proactive. One opportunity lies in collaborating with other departments, such as Oregon Department of Fish and Wildlife. Consideration of climate in forestry management and wildlife conservation can result in incorporation of refugia in protected habitat areas and prioritizing the protection of connectivity corridors among habitats (Olsen and Burnett 2013). Especially around conservation of species that are our allies in creating and enhancing climate refugia (such as beavers), or conserving species that are good indicators of climate change impacts on a habitat such as amphibians and reptiles, we believe inter-agency collaboration can further both agency's goals.

Addressing climate issues is the over-arching umbrella that will affect every aspect of ODF's functions and operations in the state, and every Oregonian who dependent on our forests for sustenance, livelihood and/or recreation. We hope that ODF can take these broad goals and objectives outlined in the Plan and translate them into actionable strategies that protect our forests and its wildlife for current and future generations of Oregonians.

Thanking you

Sincerely

Sristi Kamal, Ph.D.
Senior Representative, Defenders of Wildlife
Portland, Oregon

Reference:

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Dear Chair Kelly and Members of the Board,

I write to expres my appreciation for the Oregon Department of Forestry (ODF) and the Board of Forestry's work to update the state's approach to climate-smart forestry to take into account the climate crisis Oregon is facing and to urge some refinements to the ODF's Draft Climate Change and Carbon Plan.

I strongly support these recommendations in the CCCP.
- Identify and protect climate refugia.
- Use the Oregon Global Warming Commission's Natural and Working Lands goals to guide the Department.
- Revise the Oregon Forest Practices Act to better prioritize climate change.
- Incentivize the adoption of climate-smart forestry practices on private lands.
- Incorporate climate change into the Forest Management Plan process through extending harvest rotations, identifying areas that have high carbon storage potential and establishing priorities for these areas that include long-term carbon storage, and establishing an ICP process and using this to inform future forest management planning and decisions.
- Restore ecological function when addressing the need to manage forests for increased wildfire severity and develop a prescribed fire program within the Department.
- Work to create resilient landscapes.
- Account for forestry related carbon impacts.
- Ensure that "Climate change [is] a foundational consideration in all agency planning processes."

I hope, though, that some refinements can be made as you continue to work on the draft. My suggestions include the following.
- Mandate retaining mature and old growth forests as essential carbon sinks in the State Forests Management Goal.
- To ensure adequate water quality and quantity as part of climate-smart forestry practices, ODF should increase coordination and collaboration with the Oregon Department of Environmental Quality.
- Make clear that climate-smart forestry means specific practices and policies that reduce greenhouse gas emissions, improve forest resilience, and sequester carbon, including through growing trees longer, growing a greater diversity of trees, protecting old growth and more mature trees, and using a variable density harvesting approach.
- In the Climate-Informed Silviculture Goal include more green tree retention and bigger riparian buffers, and forego most or all post-fire logging.

evolve and change.
- In the Reforestation and Afforestation Goal ensure that reforestation efforts are focused on restoring ecological function, not on creating dense, monoculture plantings that negatively impact biodiversity.
- In the Maintain and Conserve Forests Goal, the emphasis should be on maintaining forest area, *and* protecting and growing state forest lands with old growth characteristics.
- The ODF must partner with DEQ to track the GHG emissions from the forestry sector in the Research and Monitoring Goal, and begin by acknowledging publicly that logging is a significant source of emissions in Oregon and that reducing these emissions must accompany efforts to increase carbon sequestration on the landscape and in wood products.
- Forego post-fire logging to leave the vast majority of the carbon on-site. Downed and dead trees may decay over time, but the decay is slow, it offers better carbon storage than post-fire logging, and it encourages natural, carbon-storing new growth.
- Acknowledge publicly—clearly, loudly, and repeatedly!—that storing carbon in wood products is not equivalent to sequestering carbon in trees that are left standing on the landscape. Wood

products remain a critical part of numerous U.S. industries, and there is a need for a sustainable timber industry. However, when it comes to measuring significant long-term climate and carbon benefits, the science is clear that the net value of wood products is quite limited vis-à-vis leaving older trees standing.

- In addition to "Incentivizing the adoption of climate-smart forestry practices on private lands," please include specific recommendations for incentivizing long-term and permanent conservation easements on private lands. Private landowners will be more inclined to participate if they have some direction from the agency.

Again, I want to be very clear about my appreciation for the incredible work done so far on the draft CCCP and the promise it holds for making Oregon's forest more resilient and a key player in the state's overall strategy for meeting the challenges of climate change. And as you move forward to refine the draft, I hope you will take my suggestions and concerns into serious consideration. I think with such improvements the CCCP can be a model for other states seeking to make the best of their forests for industry and the environment.

With all best wishes for you in your important work,

Robert Kugler

Robert Kugler
4970 Bonnet Dr
West Linn, OR 97068

Oregon Board of Forestry, Sept. 22nd, 2021

The CCCP needs to define "Climate-Smart Forestry" as clearly excluding clearcut logging. There is nothing climate-smart about clearcut forestry. Studies, by OSU and Center for Sustainable Economy, have shown that industrial clearcut forestry is the greatest source of greenhouse gas pollution in Oregon (35% of all state emissions, followed by Transportation at 23%, then Energy Usage at 21%). Meanwhile, Pacific NW forests, particularly in the Oregon Coast Range are able to sequester more carbon than any other ecosystem on Earth, if allowed to grow older (Law et al., 2018).

Water – Clear-cut forestry results in half the water on the landscape in the summer time, compared to 100+ year old forests, hurting fish populations and increasing the fire risk of water-stressed trees (Perry, Jones 2017). Researchers did not find any summer streamflow deficit, however, in forests that were selectively harvested (Jones 2020).

Drinking water resources are also impacted by timber. Many people have wells and springs that used to provide for them year-round, but now go dry every summer after headwater areas were clear-cut. Headwater streams, small non-fish bearing streams, make-up an average 80% of a watershed, and yet they are afforded no logging buffer zones under the Oregon Forest Practices Act, and a cocktail of herbicides are sprayed right on top of them many times after a clearcut. Furthermore, the W. OR FMP does not prioritize safe drinking water. I stand with Oregonians across the state who are demanding **a 2-year moratorium on the use of pesticides** in watersheds water sources while water sources are studied and mapped, and an independent analyses of water quality is done.

Fire – Despite what the timber industry says, cutting down trees isn't stopping catastrophic wildfires. Analysis of the 2013 Douglas Complex fire concluded that young plantation forests managed by industrial owners experienced higher severity fire than did nearby public forests (Zald, 2018). Analysis by OPB and Propublica also showed that 2020's catashrophic wildfires burned more intensely on industrial timberland. Research increasingly shows that intensively managed private forestlands burn with greater severity than older federal forests that have not been clear-cut. The hydrological cycle is severely disrupted in plantation forests, leading to extremely dry fire-prone summers.

Fungi - Today no soil carbon respiration study is able to account for the carbon sequestered by fungi. Fungi continually armor their hyphae with highly stable forms of carbon like mannins and chitins. Older parts of fungal hyphae can have carbon to nitrogen ratios of 1000:1. Clearcut forestry practices (compaction, herbicide spray, burning slash, and fertilizer use) all kill beneficial soil fungi, leaving the soil dominated by bacteria. Bacteria exhale 80% of the carbon they intake from decomposing plant matter. These disturbed, bacteria dominate, landscapes then become big sources of carbon pollution. In less disturbed forest, conifer trees give 50-70% of all their carbon to mycorrhizal fungi (Yirka, 2013). But, clearcut forestry practices sanctioned by the BOF destroy soil fungi, preventing the mycorrhizal relationships that allow trees to sequester much more carbon and acquire water from an area 10 times larger than their

own root zone. We need to manage our forests for carbon, this means we need to start managing forests for fungi.

Selective Harvest – Selectively harvested forests can provide more board feet per acre than clearcut forests, while keeping the forest floor intact, allowing water to infiltrate. In these forests, large mother trees are retained to seed out, eliminating the need to spray herbicides or replant. For example, in Wildwood Forest in Vancouver, BC, original timber cruises showed the 137-acre property contained 1.5 million board feet. Between 1945 and 1996 2.1 million board feet were selectively harvested. In 1996 timber cruises showed that the forest still contained 1.65 million board feet, 10% more than when they started logging. The entire time the forest retained old growth characteristics supporting wildlife and protecting water resources. We can harvest timber without destroying our environment!

Justice - The CCCP also needs to define rural timber communities as **environmental justice** communities. Coos County includes a lot of Wall Street owned timberlan. Coos residents suffer the most herbicide spray events per acre, compared to any other county, we also suffer high rates of cancer which many believe connected to herbicide exposure. Additionally, local logging and hauling contractors suffer record low profits (4-5% is common) while performing dangerous work, because the corporate forest managers/owners pay inadequate compensation. Timber corporations do not provide health care, pension plans, or guaranteed work to any logging or hauling contractor. The least secure and lowest paid are the Mexicans and Central Americans who are brought here, may on H-2B visas, to do most of the reforestation work. Occupational segregation by race is a typical occurrence in industrial forestry. The investigative series by Emily Green in Street Roots (2016), titled Timbers Fallen, documented extensive reforestation worker abuses. Other reports have shown that the health and safety conditions of Oregon's reforestation workers are woefully inadequate (Wilmsen et al., 2019).

The tattered condition of timber contractors and abysmal conditions for reforestation workers, is largely the price paid for the $8 billion given to Weyerhaeuser's shareholders between 2014 and 2020. The industry is now thoroughly reorganized to exploit everyone and everything in service of Wall Street investors, even at the expense of timber production. The Board of Forestry needs to do something to balance out the power dynamics between rural communities and large timber corporations.

Thank you,

Janét Moore
Coos Bay, OR

Members of Oregon's Board of Forestry and the Oregon Department of Forestry:

As you think about approaches for carbon dioxide sequestration and storage, I would urge you to **seriously consider how to provide protection to the forests of the entire catchment basins of drinking watersheds, so they can reach stand ages of over 100 years.** This combination of protections offers significant multiple benefits to the people of Oregon. Such forested watersheds would provide important biodiversity refugia, which addresses an underappreciated planetary crisis that parallels the climate change crisis. Biodiversity protection is role that state forests have a special ability to play on behalf of the people of Oregon and on which the future of the timber industry is likely to depend. Please remember, forested watersheds containing ecosystems over 100 years old provide a more even and reliable flow of quality drinking water as well as significant climate change benefits.

This will be a challenge that is essential to meet. Resolute action needs to be taken so that change can occur to support the maintenance and growth of older forests in Oregon (over 100 to 150 years old). This combination of approaches would be especially beneficial and should be possible to meet on Oregon's State Forest Lands.

Thank you for your serious consideration of this combination of approaches.
Trygve Steen, Ph.D.
Professor of Environmental Science and Management (retired)

To: Oregon Board of Forestry
Cc: Danny Norlander
Date: 9/22/2021
RE: September 8, 2021, Board Workshop on ODF Draft Climate Change and Carbon Plan

Dear Chair Kelly and members of the board:

The environmental Caucus of the Democratic Party of Oregon would like to comment on the Climate Change and Carbon Plan. We appreciate your clarification that this is a visioning type of document and that the specifics would follow in further action and rulemaking. I have found the definition of sustainable forestry in the plan to be a useful construct.

I greatly appreciate ODF's desire to increase the role of Oregon's forest in sequestering carbon. As a physician, it was chilling to hear the call to action by 200 medical journals that immediate action to reduce carbon emissions by 50 percent by 2030 to protect the current and future health and survival of humanity. We feel that part of the solution is the great ability of Oregon's forests to take up carbon uptake and store.

- We are pleased to see that the draft CCCP includes the Global Warming Commission sequestration goals.
- I was heartened to hear that you recognize the need to revise the Oregon Forest Practices Act to better prioritize climate change. (Supporting actions, page 29)
- It is so important that you have called for incentives to adopt climate-smart forestry practices on private lands (Supporting actions, page 29) specifically to
    - extend harvest rotations—the second most impactful action
    - prioritize long-term carbon storage in high carbon storage potential areas.
    - And especially using an Internal Carbon Pricing Process to inform future forest management planning and decisions.

To expand on the carbon pricing process—we would like to see application of the social cost of carbon, which means applying a clear value to our human health that is achieved by increasing carbon sequestration of forests with a low discount rate since we must achieve 50% reduction in net CO2e by 2030 according to IPCC.

This needs to be compared to clearcut logging, which emits very high amounts of CO2 in contrast to Forest Stewardship Certified management (which is not mentioned in this document). This management method markedly reduces carbon loss by reducing clearcuts, loss of understory, allows slow absorption of carbon from downed limbs rather than broadcast burns, retains larger trees (1% of largest trees hold 42-50% of the above ground carbon-depending on the forest), and reduces soil disturbance which holds 42-47% of carbon.

This internal carbon pricing process should also include a monetary factor for the 50% loss of summer water flow thru plantations after clearcuts for over 10 years of growth and impacts to water quality from clearcuts.

The call for wood fiber at current levels is probably not possible especially in the next 40-60 years as rotation harvest increases for best practice and the value of carbon set asides. Given some of the potential current federal and state funding for forest management jobs, we don't necessarily have to see a loss of jobs but rather a shift in the types as we increase forest fire management and apply prescribed fire, create an increase in recreational opportunities, improve watershed and other in forest activities.

Please include quantification of carbon emissions from logging and reduce these emissions with clear targets and plans because logging is one of Oregon's largest source of emissions for the state.

The implied valuation of long-term wood products is significantly overstated. Most wood fiber ends in landfills or burned on site. Many buildings do not last over 100 years. The use of cross-laminated timber needs a marked increase in life cycle analysis as wood products don't continue to absorb carbon. Just to note, that there are life cycle studies that show that wood is no better than recycled steel, and that it is worse if it comes from old growth. Acknowledgement that storing carbon in wood products is not equivalent to ongoing sequestration of carbon in trees that are left standing on the landscape. When it comes to measuring significant long-term climate and carbon benefits, the science is clear that the net value of wood products is quite limited (16-19% in long-lived wood products at best). (Hudiburg et al. 2019).

Further recommendations:

I would recommend changing the title of the "barriers section" to one requiring extra effort. These factors can all be overcome. ODF would benefit from increased coordination and collaboration with the Oregon Department of Environmental Quality. In fact, a regular monitoring program for water quality and quality needs to be devised and regulations improved to address them. (We will work towards increasing access of both ODF and DEQ to private forest harvesting sites.

While the report calls for restoring "ecological function" when addressing the need to manage forests for increased wildfire severity, this needs to be better defined to include carbon storage, wildlife habitat and water quality and quantity along with a program of prescribed burns where appropriate. (Supporting actions, p. 31-32)

A clearer definition of climate-smart forestry that is more focused on reducing emissions from logging and increasing carbon sequestration on the landscape.

Discussion of the impact of clearcut logging on emissions and developing incentives for variable density (FSC-type) logging with its marked increase in carbon storage in less disturbed soils, retention of much more tree cover on the land, leaving largest trees, intact understory and downs debris, and reduced roads.

ODF should immediately prohibit logging on any remaining intact stands (mature/old growth forests) on its lands.

Lastly, please add collaboration/ coordination principle in the intro (w/ Tribes, NGO's, other state agencies, and the public).

Thank you so much for your efforts and desire to work seriously to mitigate climate change and avert its impacts.

Catherine Thomasson, MD
Chair Environmental Council, DPO
503-819-1170
thomassonct@gmail.com