TO: Oregon Board of Forestry November 6, 2018

FROM: Carolyn Eady

SUBJECT: Testimony November 7, 2018, re. Item 6, Ecosystem Services Valuing

My purpose in testifying today is an urgent appeal to this Board to take an action that would make a highly significant contribution to reducing Green-House-Gases (GHG) in Oregon. You are the only group in this State with the authority to take this action. The recent IPCC Report (Inter-governmental Panel on Climate Change) states that unless action is taken in the next few years to reduce GHG, it is likely that we and future generations will see some of the worse effects of climate change.

The paper in your packet entitled Ecosystem Services details how complex and challenging this rapidly developing, inter-disciplinary scientific field is. The paper outlines five key environmental and social-political challenges that still limit practical application. While acknowledging ecosystem *should* inform decision makers to clearly identify differences in outcomes, the following statement is made:

> At the same time, we cannot wait for high levels of certainty and precision to act when confronting significant irreversible and catastrophic consequences. (See "Lessons Learned", page 13.)

This could be restated as "Do not let the pursuit of perfection stand in the way of action."

The logging practices of *global investment type forest land owners* are responsible not only for causing significant damage to the forests and ecosystem, but they are also the major contributor to Oregon's GHG emissions, making Forestry the number one contributor in the State, topping Transportation, which is second! Stopping these practices is this Board's challenge.

My testimony at the September 2018 BOF meeting (see attached) describes the practices that are causing destruction of forests all along the Coast Range, but especially in Clatsop County[1] and has resulted in the loss of approximately a million acres of coverage in western Oregon. It proposes a straight forward modification of the FPA and cites the Oregon Revised Statutes that gives the Board the authority to take the action proposed.

Once you understand the stakes involved, I believe you will accept this challenge. The people of Oregon need your leadership, as well as support from the Governor and Legislature to make this happen. This is an ethical choice for the future of young people of today and tomorrow.

[1] Lewis & C Tree Farms LLC now owns approximately 48% of all forestland in Clatsop County. Since the County has virtually no federal forestland, the remaining acreage is primarily State forestland and small private land owners.

Thank you for the opportunity to testify.

Carolyn Eady

CC: Governor Kate Brown, Senator Betsy Johnson, Representative Debbie Boone

Attachments: 1. Testimony of Carolyn Eady ay the September 2018 BOF Meeting.

2. 1.5 vs. 2 degrees of global warming, Carolyn Gramling, Science News, October 27, 2018.

Note: If you would like to know more about the impacts that climate change is already having in Oregon, I have given the Board support person a copy of a paper in Keep Oregon Green, entitled “Climate change in Oregon”, March 18, 2018.

August 31, 2018

To: Oregon Board of Forestry

From: Carolyn Eady, 1990 SE Sheridan St., Astoria, OR 97103

Subject: Written Testimony – Meeting September 5, 2018 - Item 3

The two attachments in your packet reflect the dedication and professionalism of a considerable number of ODF personnel who were involved in studying and evaluating key indicators of the private forestland in Oregon. However, as the appointed leaders of all forestland in Oregon, I would like to raise the question: "How do these studies impact the near-term decisions you are required to make?" Getting a more in-depth scientific understanding of the forests in this region is worthwhile and should continue, but, given accelerating climate disruption (ACD) as documented every day in the nightly news, can this Board afford to wait until the studies provide all the 'answers' before any action is taken?

This Board's responsibilities are captured in Oregon Revised Statutes (**ORS's**). Two of the most significant responsibilities are cited in part below:

ORS 527.630(3):

> .. **it is declared to be in the public interest to vest in the State Board of Forestry exclusive authority to develop and enforce statewide and regional rules.** You have the authority to act.

ORS 527.630(1):

> .. **Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices ... and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water and wildlife resources ... and to ensure the continuous benefits of these resources for future generations of Oregonians.** One segment of the forest industry is violating the intent of this law and jeopardizing the quality of life of curtain and future Oregonians.

The reality in Clatsop County is far different than the goals just cited. The devastation that has occurred the past three years in the private forestlands along a 6 to 8 miles stretch of the north face of the Coast Range is shocking, especially when you consider the damage done here to the Young's River estuary[1] is occurring all along the Oregon Coast!

Global investment type forestland owners have caused the vast majority of this devastation. To attract investors looking for a 5% return on their investment (ROI) and a hedge against inflation, they use the harshest logging practices to minimize their costs: i.e. heavy equipment, which compacts the soil, and multiple spraying of fertilizers and herbicides by helicopter to speed up growth. This type of logging effectively leaves a 'dead zone' with increased risk of floods. It has also been documented[2] that helicopter spraying can easily drift to adjacent residential areas and community water sources, causing health problems and requiring local residents to invest large sums of money in an attempt to maintain a potable water supply. Finally, as a result of their short rotation schedule of about 25 years, the northwest section of Oregon has lost approximately one million acres of coverage[3], a critical issue in these times of accelerating climate disruption.

The investment type logging firm in Clatsop County is part of a network of limited liability companies (LLC's):

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[1] See the **attached map** that shows the extent of the Young's River estuary from the south slope of Astoria to Saddle Mtn.

[2] See "Behind the Emerald Curtain" a 30-minute film, published by Pacific Rivers, 2017.

[3] Coverage is defined as sufficient growth in the canopy as seen from the air to provide coverage or shade on the ground, which in this area is usually 13-15 years

- **L & C Tree Farms LLC** now owns approximately 48% of *all forestland in Clatsop County*. The other 52% is primarily State forestland. (Clatsop County has virtually no federal forestland.) L & C is a subsidiarity of
- **GreenWood Resources LLC**, which is a subsidiarity of
- **Nuveen Asset Management, LLC,** an affiliated investment advisor & broker for
- **TIAA LLC**, one of the largest owners of timber assets around the globe, worth close to one billion dollars.

The destructive forest practices described earlier are only *half of the story*. John Talberth et al posted a study in 2016 that stated, Oregon forests were a very large contributor of greenhouse gases (GHG). Their estimates have recently been supported by another independent study at Ohio State that used a different method to arrive at the same conclusion.[4] Now, it is estimated that forest practices in Oregon top transportation as the number one emitter of GHG.

Discussion: Over the past 3 years, one large investment logging company has been able to consolidate all the large industrial forestland in Clatsop County. Unless they are prevented from doing so, any remaining acres not yet logged will be logged in the same destructive way.

At the same time, by any measure, Oregon is not meeting its obligations to combat climate change. The Oregon Global Warming Commission has stated Oregon will not achieve either the 2020 or 2030 state goals. Around the globe, various countries are racing to restore forests and plant millions of trees; they recognize that trees are one of the best ways to remove carbon dioxide and other pollutants from the atmosphere. It is ironic that Oregon, as one the best places in the world for growing large trees, is in the midst of a wholesale removal of trees up and down the length of the state, while ODF's best FPA enforcement tool is the incentive of investment owners for no violations on their record, so as to maintain their 'SFI seal of approval' and thus be able to sell their timber products to Home Depot and other outlets.

Recommendations:

1. Consider the most straight forward and narrowly defined way of quickly stopping the destructive practices of investment type owners by adding a requirement in the FPA rules that all large private forestland owners must be able to show through an audit of their logging records that their replanted trees have grown sufficiently to provide 'coverage.' Large, responsible logging firms will have no problem meeting this requirement, but it will effectively shut down the investment owners. Legal opinions need to be obtained about their liability for restoring this land or, if they 'walk away' from their holdings, does this land revert to the County or ODF?

2. If a majority of the Board decides to move forward on this or a similar proposal, devote the November workshop to this topic, inviting various experts, government officials, and other affected state agencies, such as DEQ and the Department of Agriculture.

3. Meet in either Astoria or Tillamook. Your tour day will allow you to actually see the results of these destructive logging practices, a scene that is very difficult to accurately describe.[5]

Conclusion:

These recommendations are very narrowly targeted. Many other efforts are underway to address other issues related to forestry in Oregon and should continue. However, your decisive action on this issue would still be a very significant step. Oregon must act quickly if we are to meet our goals and hope to do our part to impact the dire climate disruption projections by scientist around the world. With the Board's leadership and the essential support of the Governor and Legislature, Oregon has the opportunity to re-imagine its future: to begin to restore the damaged forestlands, to stimulate the state's economy and to make a significant contribution to controlling climate change.

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[4] Law et al, Proceeding of the National Academy of Science, Nov. 16, 2017.

[5] See the **attached photo** of the north face of the Coast Range as seen from the south slope of Astoria.

EARTH & ENVIRONMENT

1.5 vs. 2 degrees of global warming

Climate report shows benefits of lower temperature target

BY CAROLYN GRAMLING

Half a degree can make a world of difference. If Earth warms by just 1.5 degrees Celsius over preindustrial times by 2100, rather than 2 degrees, we would see fewer extremes of life-threatening heat, drought and precipitation, less sea level rise and fewer species lost.

Those findings are detailed in a report that the Intergovernmental Panel on Climate Change released October 8 following the IPCC's week-long meeting in Incheon, South Korea. "This will be one of the most important meetings in the IPCC's history," Hoesung Lee, a climate economist at Korea University in Seoul and current IPCC chair, said in his opening address October 1.

To compile the report, scientists sifted through more than 6,000 papers probing the impact of a global temperature hike of 1.5 degrees, says Natalie Mahowald, a climate scientist at Cornell University and one of the report's authors. But the heavy lift was worth it: The report's message is compelling and urgent, she says. "Such a small change in temperature will have big impacts on people."

In 2015, 195 nations signed the Paris Agreement to curb greenhouse gas emissions sufficiently to limit global warming to "well below" 2 degrees by 2100 (*SN: 1/9/16, p. 6*). Many scientists have warned that the target isn't stringent enough to prevent major environmental changes. And during the Paris talks, many nations called for a lower target of 1.5 degrees.

At the time, scientists knew relatively little about how to compare the risks of a 1.5-degree-warmer world with a 2-degree-warmer world, Lee noted in his October 1 address. As part of the decision to adopt the Paris Agreement, the nations invited the IPCC to assess those impacts.

As it turns out, the differences are stark. For instance, a half a degree less warming means about 0.1 meters less sea level rise on average by the next century, the report finds. As a result, at least 10 million fewer people would be exposed to such risks as flooding, infrastructure damage and saltwater intrusion into freshwater resources.

Somewhere between 1.5 and 2 degrees, ice sheets may become increasingly unstable, further increasing the potential for sea level rise. And in the 1.5-degree scenario, the Arctic Ocean is projected to be ice-free during the summer only once per century. An ice-free Arctic would happen once a decade in the 2-degree scenario.

For many plant and animal species, the lower temperature increase would mean less risk of habitat loss compared with 2 degrees of warming, (*SN: 6/9/18, p. 6*). Other risks to these species, including forest fires and the spread of invasive species, would also be lower.

Despite building a case for a lower temperature target, the trick will be how to get there. In 2017, the Paris climate accord faced a major setback when President Donald Trump announced that the United States, a major contributor of the greenhouse gases that drive warming, would pull out of the agreement. Achieving an even more stringent target seems particularly daunting.

The IPCC report examines various possible paths that limit the environmental impacts of warming. One variable considered is when emissions are projected to reach net zero, the point at which the amount of carbon released to the atmosphere is balanced by the amount removed. Another variable is how many more emissions will be allowed in the meantime.

Almost all of the projected pathways to 1.5 degrees have one thing in common, says Zeke Hausfather, a climate scientist with the London-based website Carbon Brief: They overshoot that temperature threshold around the year 2050. "They all exceed it — and then back down," he says.

To overshoot the mark by only a small amount, or not at all, requires reducing emissions by about 45 percent relative to 2010 levels by 2030 and reaching net zero by around 2050, the report notes. In comparison, to get to below 2 degrees, emissions must decline by about 20 percent by 2030 and reach net zero by about 2075.

Many species, including the pika, are already suffering habitat loss due to climate change. Limiting global warming to 1.5 degrees Celsius instead of 2 degrees could minimize the losses.

Barring such early, deep cuts, it will take "negative emissions" to bring the temperature back down after overshooting the mark. Negative emissions are a hoped-for reduction in emissions due to future technologies that can remove enough atmospheric carbon dioxide to reverse the greenhouse effect.

Those technologies, such as carbon capture and storage, are not yet commercially viable. And reversing the greenhouse effect is not so straightforward. "It's generally true that there's a linear relationship between warming and carbon dioxide in the atmosphere, as long as both are increasing," Hausfather says. "But once you start sucking carbon out of the atmosphere ... you need more negative emissions to reduce temperatures than positive emissions to increase them."

The challenges may seem insurmountable. Yet one of the report's key messages is that holding warming to 1.5 degrees "is not impossible," Mahowald says. Achieving the goal would require people to start cutting emissions right now and undergo behavioral changes, from diet to energy conservation.

But people would also face huge adjustments in a world that's 2 degrees warmer, or even higher, Mahowald says. "It still might be easier to reach 1.5 than to adapt to those higher temperatures." ■

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KeepOregonCool
Oregon Global Warming Commission

Climate Change in Oregon

Oregonians strongly value our state's natural beauty, outdoor recreation opportunities, and clean air and water. Climate change is threatening these values, as well as our economy, environment, and way of life. These impacts will affect Oregonians throughout the state. Certain populations—including low-income communities, communities of color, and rural areas—are particularly vulnerable and less able to respond to and cope with climate change.[1]

THE SCIENTIFIC EVIDENCE IS OVERWHELMING THAT HUMAN-CAUSED CLIMATE CHANGE IS HAPPENING—A CONCLUSION AFFIRMED BY 97 PERCENT OF THE WORLD'S CLIMATE SCIENTISTS (COOK ET AL., 2016 (HTTP://IOPSCIENCE.IOP.ORG/ARTICL 9326/11/4/048002/PDF)).

Local scientists from the Oregon Climate Change Research Institute have found "strengthening evidence that Oregon is already experiencing the effects of climate change." Check out their Third Oregon Climate Assessment Report (http://www.occri.net/publications-and-reports/third-oregon-climate-assessment-report-2017/)[2] for more comprehensive information on what's happening now and what we can expect from continuing future climate change. We highlight some of the important impacts below from their report and other information sources about the economic and health implications of climate change.

IT IS EXTREMELY LIKELY THAT HUMAN ACTIVITIES, ESPECIALLY EMISSIONS OF GREENHOUSE GASES, ARE THE DOMINANTCAUSE OF THE OBSERVED WARMING SINCE THE MID-20TH CENTURY (USGCRP, 2017 (HTTPS://SCIENCE2017.GLOBALCHANGE.GOV/))

If we as a society are able to significantly reduce our emissions of greenhouse gases (especially carbon dioxide) to the levels identified in Oregon's statewide goals (http://www.keeporegoncool.org/meeting-our-goals/) and the global Paris climate agreement (http://unfccc.int/paris_agreement/items/9485.php), we can reduce the amount and speed of future climate change and its associated impacts. Without major reductions in emissions, the likelihood grows that we will face more severe impacts and some potentially irreversible changes.[3]

OREGON'S ECONOMY

Oregon's diverse natural resources sustain livelihoods for rural, coastal, and tribal communities, in addition to being a cornerstone of our state economy. Increasing temperatures, changing precipitation patterns, and changes in coastal ocean waters are affecting agricultural and fishery productivity.[2] This was seen most prominently in 2015's record-setting drought, loss of snowpack (lowest on record at 89 percent below average), and record-high ocean temperatures that led to a harmful algal bloom of unprecedented magnitude stretching along the West Coast. Additionally:

- Two Pacific oyster hatcheries endured a 22 percent loss of production, a 13 percent decline in gross sales, and $73 million product loss related to ocean acidification in 2009.[4] Disruptive ocean acidification conditions are expected to be commonplace in Oregon coastal surface waters by mid-century.[2]
- Drought reduces forage and water availability for livestock grazing, and warmer temperatures reduce beef and dairy production and may enable crop diseases, pests, and invasive weeds.[2] The severe lack water for irrigation in 2015 led to damaged crops, reduced yields, and fewer crops being planted.[5]
- The 2015 drought conditions and lack of snowpack led to a historically severe wildfire season with more than 1.6 million acres burned across Oregon and Washington, resulting in more than $560 million in fire suppression costs.[2]
- Forest disturbances (wildfires, drought, and insect outbreaks) are negatively affecting forestry yields, and climate change will continue to stress forests.[2]

Our water, transportation, and energy infrastructure is also essential to support the economy and livelihoods of Oregonians. Flooding, landslides, drought, wildfire, and heat waves related to climate change are all existing threats to critical infrastructure across the state. These types of extreme events are projected to increase in the future, putting at risk Oregonians' access to safe and adequate water supplies, hydropower, and transportation.[2]

ENVIRONMENT & HEALTH

The region has warmed substantially—nearly 2°F since 1900—and Oregon's climate is projected to warm on

average 3–7°F by the 2050s and 5–11°F by the 2080s under continued increasing greenhouse gas emissions. However, if emissions are substantially reduced by mid-century, we reduce our risk of the highest temperature increases—in other words, slowing down the turn of the dial to projected ranges of 2-5°F warmer by the 2050s and 2-7°F warmer by the 2080s.[2]

These are average annual conditions, but it's also important to consider seasonal changes and extremes. Summers are expected to warm more than the annual average and are likely to become drier. Extreme heat events are expected to become more frequent. Winter snowpack is expected to decline, while overall precipitation stays near normal or may increase slightly. With more rain instead of snow, fall and winter flood risk is expected to increase in most river basins. More extreme rainfall events are also expected in the future.[2]

Warmer waters affect both river and coastal ecosystems, threatening salmon runs and other important marine and freshwater species. In eastern Oregon, large mountain areas have been hit by mountain pine beetle infestations, wildfires, or both, causing widespread shifts in forest ecosystems. Shifting weather patterns bring more drought to some forests, more rain and flooding to others.[2]

Climate change is also taking a toll on our health, but studies show that the worst of future health risks may be avoided in scenarios in which greenhouse gas emissions are significantly reduced by mid-century.[1][2] Extreme heat events, wildfires, changes in infectious and waterborne disease trends, and flooding are key climate-related health hazards in the Pacific Northwest:

- More frequent and long-lasting heat waves in Oregon are expected to increase heat-related illness and death. Older adults (especially those 85 years and older), infants, children, pregnant women, outdoor workers, and those with chronic illness are particularly vulnerable.[1][2]
- More frequent wildfires make for poor air quality, which exacerbates health conditions, especially for children with asthma, pregnant women, and people with heart and lung illnesses.[1][2] During the peak day of wildfire season this year, our state saw 586 emergency department visits related to asthma and respiratory-related issues, a 39 percent increase over the number expected for that day.[6]
- Warming temperatures, changes in precipitation, and more extreme weather are projected to increase populations of disease-carrying vectors like mosquitoes with West Nile Virus and of the types of bacteria and toxic algae that contaminate shellfish and recreational waters for activities like swimming and boating.[1][2]
- The projected increase in flooding related to extreme rainfall (combined with sea level rise at the coast) threaten infrastructure like roads, hospitals, and drinking and waste water treatment plants that are essential to safeguarding physical safety and human health.[1][2]

OREGON'S WAY OF LIFE

Climate change uniquely affects the culture, sovereignty, health, economy, and ways of life of the nine federally-recognized tribes in Oregon.[2] Tribes that depend upon natural resources and ecosystems, both on and off reservations, are among the first to experience the impacts of climate change. Of particular concern are changes in the availability and timing of traditional foods such as salmon, shellfish, and berries, and other plant and animal species important to tribes' traditional ways of life.[1][2]

Oregon's coast will face more flooding and erosion hazards in the future from global sea level rise and extreme weather, including storm surge. Along significant portions of Oregon's coast, sea levels are expected to rise about 1 to 4 feet by the end of the century.[2] Nearly a fifth of all housing in the state is located in vulnerable coastline counties, and property damages have been estimated to reach $33 million by 2040.[4]

Oregon's outdoor recreation industry is estimated to support $12.8 billion in consumer spending, $955 million in local and state tax revenue, $4 billion in wages and salaries, and 141,000 jobs. Sixty-eight percent of Oregon residents participate in outdoor recreation, with fish and wildlife-based recreation in Oregon valued at around $2.5 billion annually.[4]

Additionally:

- Warmer stream temperatures, increased risk of habitat-damaging flooding, and reduced summer streamflows are expected to reduce suitable habitat by 47 percent for native fish like trout and salmon. Estimated negative effects on cold-water angling and the sport fishing industry may rise to up to $266 million by 2040.[4]
- Climate change could result in a 72 percent reduction in snow-based recreation revenue (about $300 million) and visits (about 4.2 million) annually in the Northwest.[4]

Salmon bake blessing photo courtesy of Oregon State University (https://www.flickr.com/photos/oregonstateuniversity/), via Creative Commons.

CITATIONS

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