From: Thomas Scoggins [mailto:[redacted]]
Sent: Wednesday, April 01, 2020 5:28 PM
To: TILLOTSON John E * ODF <John.E.TILLOTSON@oregon.gov>
Subject: Draft Astoria District AOP

Hi John-

I have read over the individual pre-sale plan reports for 2021 and have a few comments. I realize you are no longer the "planning forester" and so don't have all that much control over the format or the content, but I know that much of what has been planned has your input. You may have to refer some, or all, of these questions to Derrick, since I believe he's the local planning forester.

1. The way the website is constructed makes it quite hard to access what I want to view. I thought the older method was much easier.
2. Where can I find a table (I know one exists) that lists all of the planned sales, showing totals of volume, acres and expected revenue? I was unable to find such a summary sheet while trying to navigate around in the website.
3. I just came back from a drive around in the Simmons Ridge area, looking at stands that could be harvested/thinned really soon, and so I was quite pleased to see the plan for the "Double North" sale. It incorporates all of the stands I had looked at with an eye toward harvest. Congratulations!
4. I notice that one of the sale plans refers to Hampton Affiliates, while another refers to Agency Creek. Likewise, some plans refer to Greenwood Resources while others refer to Lewis & Clark Timiber (these are in the access - easement portions of the reports). I think that these should be consistent.

That's about it for now. Thanks for the opportunity to comment.

Tom

To:
Liz Dent, ODF Division Chief
Mark Main, Tillamook State Forest
Colleen Kiser, Planning Manager
Ron Zilli, Planning Deputy
From: Bob and Kay Pendleton
Re: 2021 Draft Annual Operations Plans

First, we commend the ODF staff; they are knowledgeable, earnest and helpful, and we appreciate the difficulty of their jobs.

Our concerns have grown out of fifty years of experience and disagreement with the notion that healthy forests can be attained through clearcutting and chemical applications of herbicides, pesticides and fertilizers. This practice has threatened many native animal and plant species, damaged watersheds, required roads and culverts, and eliminated natural and healthy habitat for endangered species. ODF and the timber industry have a huge economic responsibility, and we believe that significant, wise and creative mitigation of environmental damage is economically sound and critically important.

We suggest the following:

- Preserve and Improve damaged habitat for recovering endangered species.
- Dramatically reduce frequent clearcutting, and increase conservation set-asides.
- Stop widespread spraying of chemicals: pesticides, herbicides and fertilizers.
- Stop building new roads; close more old ones in sensitive areas (watersheds, critical habitat, etc.). Plan so that endangered wildlife will prosper.
- Use helicopter selective thinning and non-invasive practices like horse-logging.
- Promote more climate-friendly practices, restoration and preservation. Consider moratoria on cutting older stands (future old growth?)
- Settle the current endangered species lawsuits by meeting and exceeding the Act's environmental requirements.
- Continue and improve transparency and public involvement opportunities.
- Use best scientific knowledge and practices to foster carbon sequestration more aggressively.

Nature heals fairly quickly when nurtured by wise labor-intensive and diverse practices, and we urge staff to research and follow best practices to improve true, ecological forest health.

Sincerely,

Bob and Kay Pendleton

From:	INFORMATION Forestry * ODF
To:	COX Jason R * ODF
Subject:	FW: Input Received: Comments for Oregon Department of Forestry
Date:	Friday, April 10, 2020 10:50:22 AM
Attachments:	Comments for Oregon Department of Forestry - Entries.csv

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From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** leeman.duncan[redacted]
Sent: Friday, April 10, 2020 10:03 AM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 4/10/2020 10:02:36 AM

Name	Lee Duncan
Phone	[redacted]
Email	leeman.duncan@[redacted]
Comment	I read the Annual Operations Plan from ODF for Tillamook and Forest Grove districts. I mostly wanted to see what your plans are for finishing the Wilson River Trail. It looks like you are planning to plan, but have no idea where the trail will go yet? So what is the $15,000 dollars for? I would like to see where you are proposing to put the trail, and I'd like to be part of the process of reviewing your proposal. Otherwise, all of your non-motorized trail and facility plans look good to me.
Response	Please respond by email
Comments are based on interaction with these ODF offices	Tillamook District

From: INFORMATION Forestry * ODF
To: COX Jason R * ODF
Subject: FW: Input Received: Comments for Oregon Department of Forestry
Date: Wednesday, April 08, 2020 5:11:39 PM
Attachments: Comments for Oregon Department of Forestry - Entries.csv

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From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** Cory.m.mack[redacted]
Sent: Wednesday, April 08, 2020 4:49 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 4/8/2020 4:48:39 PM

Name	Cory Mack
Phone	[redacted]
Email	Cory.m.mack[redacted]
Comment	I am writing to voice my support of the expansion of mountain bike trails and multi-use trails in the Tillamook state forest, specifically the expansion of the Wilson River trail and surrounding trails. There is a high demand for new trails across oregon and ODF has a great opportunity to improve a good trail system into a great one. Mountain bike trail systems are good for rural economies and greatly improve recreation opportunities for Oregonians.
Response	Just sharing my thoughts. No response is necessary.
Comments are based on interaction with these ODF offices	

From: INFORMATION Forestry * ODF
To: COX Jason R * ODF
Subject: FW: Input Received: Comments for Oregon Department of Forestry
Date: Thursday, April 09, 2020 8:42:20 AM
Attachments: Comments for Oregon Department of Forestry - Entries.csv

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From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** Customerservice[redacted]
Sent: Wednesday, April 08, 2020 5:20 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 4/8/2020 5:20:22 PM

Name	Joe Oshman
Phone	[redacted]
Email	Customerservice[redacted]
Comment	Hello, We are a Portland Made bike rack company and we are lovers of the forest. I am so pleased to hear about all the good work going into Tillamook forest mountain bike trails! I can only think of positive outcomes for everyone involved. I'm also glad to see the trails are progressive and claiming rather than the typical boring trails. Thank you for your service.
Response	Please respond by email
Comments are based on interaction with these ODF offices	Tillamook District

KISER Colleen R * ODF

To: COX Jason R * ODF
Subject: RE: Input Received: Comments for Oregon Department of Forestry

From: ORPrdSupport@egov.com <ORPrdSupport@egov.com> **On Behalf Of** leoragregory[redacted]
Sent: Thursday, May 14, 2020 10:28 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 5/14/2020 10:27:44 PM

Name	leora gregory
Phone	[redacted]
Email	leoragregory[redacted]
Comment	This is about the Mountain Cat Timber sale just east of Glenwood (I'd been told I had until 5/15 to comment, but today saw that the comment period actually ended 5/6). It looks as though the no-harvest buffers are 115ft wide for only part of the stream source to my stream. Is that true? It seems that means that I'll be getting a lot of crap coming down the stream into the stream that feeds into Beaver Creek which has federally-listed Upper Willamette River steelhead and Lower Columbia River Coho (according to BPA's permit for the work they'll be doing on a culvert on my stream to allow for fish passage). Also, I'm wondering what time of year the sale would take place.
Response	Please respond by email
Comments are based on interaction with	Forest Grove District

these ODF
offices

From: ORPrdSupport@egov.com on behalf of rontraskbyers[redacted].
To: ODF_DL_ForestryInformation
Subject: Input Received: Comments for Oregon Department of Forestry
Date: Tuesday, May 05, 2020 9:53:50 AM
Attachments: Comments for Oregon Department of Forestry - Entries.csv

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Comments for Oregon Department of Forestry

Submitted: 5/5/2020 9:53:38 AM

Name	Ron Byers
Phone	[redacted]
Email	rontraskbyers[redacted]
Comment	I live on the Trask River about 4 miles downriver from the scheduled South Fork Coast Bill timber sale in the Tillamook State Forest. This sale has two parcels on steep slopes above the South Fork. Jenny Creek and Bill Creek both border the sale sites, and flow into the South Fork. This sale would have significant negative impacts on declining fish runs in the Trask River, and specifically Coho salmon, listed as endangered under the Endangered Species Act. There are major slides from previous clear-cuts adjacent to and across the river from the Coast Bill sites. It's easy to see how the scheduled sale sites will have similar slides with debris ending up in the river and creeks. This sale site provides evidence of why there is an ongoing federal lawsuit against the State and the Department of Forestry for failure to adopt adequate safeguards to protect Coho salmon and other species.
Response	Please respond by email
Comments are based on interaction with these ODF offices	Tillamook District

COX Jason R * ODF

From:	INFORMATION Forestry * ODF
Sent:	Wednesday, April 08, 2020 2:09 PM
To:	COX Jason R * ODF
Subject:	FW: Input Received: Comments for Oregon Department of Forestry
Attachments:	Comments for Oregon Department of Forestry - Entries.csv

From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** seneca01[redacted]
Sent: Wednesday, April 08, 2020 1:40 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 4/8/2020 1:39:58 PM

Name	Seneca Lacombe
Phone	[redacted]
Email	seneca01[redacted]
Comment	Hello! I want to strongly advocate for the expansion of biking trails in the Tillamook Forest complex. I have been lucky to experience trails in the forest and now share these rides with my friends and my children. More access to the worlds best biking terrain seems like a logical and responsible step in stewarding recreation for bikers (as well as hikers, equestrians, and other forms of non-motorized travel). I read about Oregon and it's mountain biking "epicness" as a child and was fortunate to marry a native years ago. We are members of the Northwest Trail Alliance and they are an incredible advocate and builder/maintainer for such trails. We also participate in "dig days" and I would support this level of engagement while minimizing the impact on state workers, while also defining responsibility to said riders! Their model of also working with private land owners (Rocky Point Trails, Klootchy Canyon trails) is a model to share with the rest of the country. Thank you for hearing me, I would be

	happy to discuss any ideas further. I very much appreciate your access to our ideas. All my best, Seneca
Response	Please respond by email
Comments are based on interaction with these ODF offices	Tillamook District

To: The Oregon Department of Forestry (Jason.R.COX@oregon.gov)

From: Bob Van Dyk, Wild Salmon Center
Bob Sallinger, Audubon Society of Portland
Sean Stevens, Oregon Wild
Nancy Webster, North Coast Communities for Watershed Protection
Steve Griffiths, Audubon Society of Lincoln City
Ray Temple, Salem Audubon
Noah Greenwald, Center for Biological Diversity
Mary Scurlock, Oregon Stream Protection Coalition
Ian Fergusson, Association of Northwest Steelheaders
David Moskowitz, Conservation Angler
Lisa Arkin, Beyond Toxics
Josh Laughlin, Cascadia Wildlands
Chuck Willer, Coast Range Association
Greg Jacob, Oregon Chapter, Sierra Club
Michael Manzulli, Oregon Coast Alliance (President)
Doug Moore, Oregon League of Conservation Voters
Conrad Gowell, Native Fish Society
Bob Rees, Northwest Guides and Anglers Association
Chandra Ferrari, Trout Unlimited

Cc: Governor Kate Brown
Oregon Board of Forestry

Date: May 6, 2020

Re: Comments on 2021 Annual Operations Plans.

On behalf of the many thousands of Oregonians who support our 19 organizations, we submit our comments on the FY2021 Annual Operations Plans (AOPs). As in past years, it is a daunting task to review these plans, which include dozens of separate units of clear-cut timber sales, numerous partial cuts, many miles of new roads, and thousands of acres of aerial spray (locations not identified).

We appreciate the effort of staff to prepare these plans, and also the individual efforts of ODF staff members Cox, Zilli, and Wilson who responded quickly and professionally to requests for information.

We also recognize that Oregon and our nation are facing an unprecedented crisis due to the coronavirus epidemic. We realize there is currently great hardship for many in our nation, and likely very hard times ahead. Despite these difficulties, our members and supporters remain committed to long-term, sustainable, and balanced management of our publicly owned forests. Unfortunately, these values are not reflected in the AOPs.

These AOPs are again harmful to watersheds, biodiversity, and ODF's credibility as a manager of public lands, particularly regarding the Astoria District, where continued destruction of complex forest is proposed, and the Tillamook District, where clearcutting of steep, landslide prone slopes continues.

Plans focus on revenue for agency and neglect of other performance measures

The guidelines for development of the AOPs continue the recent ODF trend of centering management of these public lands on hitting revenue targets to pay short-term ODF expenses. The *State Forests Division Fiscal Year 2021 Annual Operations Planning Guidance* makes the prominence of revenue clear when it states that "each District shall strive to meet the established Revenue Target."[1] There is nothing wrong with setting a revenue target, but the problem lies in the lack of targets for any of the many other forest values with which ODF is entrusted. Instead, the AOPs describe a list of activities without any guidance on targets to be attained for other values. Moreover, the revenue target is unsustainable because it is pegged to a time of very high revenues.

Of course, metrics are available to assess progress on other aspects of forest managment, such as those found in the Performance Measures adopted by the Board of Forestry to guide state forest management.[2] The Performance Measures contain useful and specific targets on forest management goals, including on such topics as hydrologic connectivity of roads. The AOPs should include direction to meet performance measures beyond producing the revenue ODF uses to pay itself. Without those additional goals, the AOPs devolve, as they have, into primarily an exercise in generating revenue for the agency while engaging in other activities without reference to metrics for evaluation.

Unsustainable harvest levels

The aggressive clearcutting pace set out in the AOPs reflect harvest levels that are very likely unsustainable and thus inconsistent with the FMP. According to the analysis completed by ODF as part of the exploration of a new FMP, current restrictions on harvestable areas were presented to the Board in a document entitled "Planning Area Constraints."[3] That document concluded that 49% of the area was constrained, which in practice meant these areas were closed to clearcutting.[4] This left 51% available for clearcutting (on average across the planning area). Given that 51% of the forest is available for clearcutting, cumulative clearcut acres in recent years provide an estimate of the rate of final harvest, or rotation age, in the area available for clearcut harvest. These numbers show that the areas available for clearcutting are being managed on an approximately 55 year rotation.[5]

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[1] Oregon Department of Forestry. State Forests Division Fiscal Year 2021 Annual Operations Planning Guidance ,

[2] The 2013 Board of Forestry State Forests Performance Measure Report (84pp) identifies only 3 of 9 performance measures tied to revenue production. It can be found here: https://digital.osl.state.or.us/islandora/object/osl:29613. But not on the Department of Forestry website.

[3] https://www.oregon.gov/ODF/Board/Documents/AFMP/15%20-%20Constraints.pdf

[4] Only some of these constraints were related to conservation values. For example, road surfaces are "constrained" from clearcutting as they have no trees, and the roads generally represent a threat to many conservation values, and rarely a benefit.

[5] For example, the north coast districts have 518,000 acres. 51 percent (area available for clearcutting) is 264,000 acres. According to Table 4 in the AOPs, 38,448 acres have been allocated for clearcutting in these districts since 2014, over an 8 year period, resulting in a rate of 1.82% of the available area clearcut per year.

A 55-year rotation is more typical of an industrial forest, and is troubling for several reasons. First, the vast majority of the stands harvested by ODF are well over 55 years of age, with many harvests in 80 year and older stands. These older stands produce much higher volumes that will not be available under the shorter rotation, creating an unsustainable volume and revenue picture for the future.

Second, intensive harvests at this rate are not consistent with structure based management (SBM), the guiding principle of the current plan. SBM requires that areas outside those currently designated to grow complex forest be allocated to growing complex forest in the future, so that eventually the currently-designated stands can be open to clearcutting while new stands in the currently available acres become complex. Thus the conservation designations are supposed to move across the landscape. But under a 55-year rotation, there will be no developing complex forest for species to migrate into. In short, ODF is currently implementing a "zoned approach" where some areas get light or no harvest and the rest is managed under something akin to industrial plantations. This approach is clearly not consistent with the FMP and will require significant reductions in harvest to comply with the plan. ODF should not be harvesting at levels that impair or prevent the attainment of its long-term commitments under its operative, Board-adopted management plan.

Clearcutting complex forest

In 2007, the Board of Forestry set performance measures for management of state forests. These included a goal of reaching 17-20% of the forest to be complex by 2027. On the north coast, the Astoria District is short of this target, at 15%. Despite being short of the 2027 goal, the Astoria District is proposing to clearcut hundreds of acres of complex stands in such sales as Bam Bam, Saba Jabi, Walk and Crawl, Summit Shake, Double North, and Blue Bucket. Widespread clearcutting of complex stands is particularly alarming because of the sharp decrease in overall complex forest that has occured in recent years, largely due to corrections in modeling and partly due to ODF elimination of such stands.[6] Clearcutting layered stands while already short of performance measure goals and while operating at an effective 55-year rotation on the available acres clearly contravenes Board direction and the mandates of the forest management plan.

Last year ODFW discouraged destruction of these forests in their comments on the 2020 AOP for the Astoria District:

> Layered Stands: ODFW also noticed several examples where layered stands with larger diameter trees have a proposed treatment of modified clear-cut (MC). We recognize the financial situation of ODF, but **these habitats provide some of the highest quality wildlife habitat on the district**. We encourage modified clear cuts to be focused in closed single canopy (CSC) or understory development (UD) stands. (*our emphasis*)[7]

[6] https://www.oregon.gov/ODF/Board/Documents/BOF/20190904/D1_BOFATTCH_20190904_D_01_Annual%20Performance%20Progress%20Report%202019.pdf

[7] Astoria District AOP 2020, Appendix C.

We endorse ODFW's recommendation. In addition to deferring harvest of complex stands, ODF should track by district the progress toward the stand structure goals in the AOPs. It is a relatively easy thing to do, and would help the public better understand the trajectory of forest development.

Road network continues to expand, lack of metrics, concern on disinvestment

The AOPs indicate many miles of new roads will be built in the forests, adding to the several thousand miles of roads already owned and managed by ODF. In addition to concerns about specific units with construction of roads on steep, unstable slopes (see item on specific sales, below), we have two overarching concerns about roads. First, ODF has a specific performance measure regarding roads that sets targets for hydrologic connectivity across watersheds. There is little sign in the plans that ODF is tracking or pursuing this target in a systematic way. Instead, the attention to roads in AOPs is generally related to maintenance and construction needed to facilitate timber sales. Second, given the extensive existing road network owned by ODF, we are concerned that disinvestment in non-revenue producing activities could be leading to insufficient road maintenance. Roads are expensive to build and expensive to maintain and repair. While new roads built to current standards may create limited environmental impacts, they unavoidably create an ongoing financial liability for the maintenance necessary to ensure standards are met.

As we noted last year, a third-party assessment of ODF's short and long-term road-maintenance challenges is urgently needed.

Timber sale on the Salmonberry River

The Clay Corner timber sale includes clearcutting of 112 acres of 90-year old stands in Unit 503, and Unit 816 is a clearcut directly fronting the Salmonberry River. Unit 503 contains some of the oldest stands in the Salmonberry drainage, and the Salmonberry is a popular fishery and recreation area that deserves better protection from actions like Unit 816. We ask you to drop these units.

Timber sale with older forest near coast

South Minich timber sale includes older forest near the coast. The eastern half of the sale is older and more diverse mixed hemlock stands that are uncommon in this part of the coast. We ask that you drop the older part of this unit.

Timber sales on steep slopes in the Trask, Wilson watersheds

Coast Bill timber sale contains very steep ground with debris flow torrent channels that lead directly to coho streams. Nearby harvest units show signs of recent landslides, including a slide in the already logged Alder Joy sale, which is directly below Coast Bill. The slide in question clearly delivered harmful fine sediments to the South Fork Trask River, and we're concerned Coast Bill will magnify harmful sediment impacts.

Hembre Falls timber sale similarly contains numerous areas of very steep ground with debris flow torrent channels leading to perennial streams.

Power Range timber sale requires six miles of new roads on very steep ground dissected by numerous debris flow torrent channels and above the Wilson River.

Each of these sales was noted by the ODF geotech as having numerous potential landslide hazards, but insufficient information was included for us to comment on them, except to note they are hazardous to water quality and possibly people. We ask that you defer these sales until you can provide the public with more specific maps that show areas where harvest will be excluded and where measures will be taken to protect the public. Currently this work is to be done after public comments, which is not appropriate.

In addition, we reviewed all the sales using the well-accepted model Shalstab parameterized to identify areas with a slope over 45 degrees or areas having a slope over 27 degrees that have a sufficient catchment area to capture precipitation and generate landslides. We conducted this modeling using a lidar based digital elevation model and in consultation with Dr. Josh Roering from the University of Oregon. Based on this modeling, the following timber sales present serious concerns of generating landslides that impact streams with listed salmonid habitat: Coast Bill, Hembre Falls, Power Range, Thundercat, Jordan Ridge (ALT), South Minich and Steampot. We also found that the following sales had buffers that fail to include all of the landslide terrain consistent with ODF policy and thus may impact watershed health and salmonid habitat: Wage Earner, Plympton East, Hard Target, Popeye, Devil Ray, Mountain Cat, Rooster Cogburn, Mac's Back, Mainly Sain, and Clay Corner.

Protecting complex forest patches in timber sales

In addition to stopping the harvest of complex forests across the state lands until the performance measure target is reached, we encourage ODF foresters to be mindful of small patches of complex forest that often can be found in larger units that are typed as less complex. A good example is Wage Earner Unit 2, proposed for clearcutting in the Astoria District. While ODF categorizes this stand as less-complex understory, a site visit indicated areas of complex stands in the sale. ODF should exclude from sales smaller patches of complex forest, too.

Taking the lead on pesticides

Many members and supporters of our organizations, as well as broader members of the public, are concerned with the intensive use of pesticides on state forests. Signatories of these comments and supporters of our organizations have repeatedly provided testimony to the Board of Forestry regarding concerns on state forest pesticide use.

We have also shown our interest and concern in other ways.

For example, last year there was significant public objection to pesticide use on state lands during the controversy over the Norriston Heights timber sale. ODF planned clearcutting and spraying in close

proximity to water sources for a small community, but ODF had done little to notify the neighbors. This past legislative session, an agreement between the conservation and timber communities resulted in a broadly supported proposal to increase spray buffers on homes, schools, drinking water sources, and many streams. Most recently some of our supporters have become very concerned with the large state forest clearcuts on East Foley Creek, where steep ground is in close proximity to prime chum habitat. Pesticide spray of these clearcuts is planned. As a manager of public lands, ODF should take the lead in both reducing the use of pesticides, especially aerial applications, and in communicating with the public about their use. The AOPs show little sign of response to the ample public concern on this issue.

Closing comment

For the reasons we have noted above, the 2021 AOPs are inconsistent with Board direction and with the Forest Management Plan. ODF's neglect of approved and effective performance measures, prioritization of department revenue as the only quantified goal, continued destruction of scarce complex stands, and harvest of extremely steep slopes with risks for listed fish speak poorly of ODF as a manager of public lands. ODF's leadership casts a shadow on the staff of ODF, who are not to blame for the leadership of the Department and State Forest Division. We are acutely aware of the tough choices that Oregon faces in the management of its state lands. ODF's job is to serve the public by presenting its management choices accurately and transparently and to implement board direction. Instead, ODF leadership has chosen to ignore Board and FMP directives that threaten revenue to the agency. The priorities of ODF staff as seen in the AOPs make clear why the Division leadership proposed the alternative FMP, which removes legal constraints, so the agency can operate with less public accountability. We have no confidence in the agency leadership to navigate the coming storms with transparency and integrity.

* Forest Carbon Coalition * Natural Resource Economics * Center for Sustainable Economy * Umpqua Watersheds * Cascadia Wildlands *Coast Range Association * Sunrise Eugene * Community Rights Lincoln County * Our Revolution Oregon * 350 PDX * Portland Rising Tide * 350 Corvallis * Our Revolution Lane County * Concerned Citizens for Clean Air * Geos Institute * Our Forests * Friends of Douglas Fir National Monument * Blue Mountains Biodiversity Project * Forest Web of Cottage Grove * Pacific Rivers

May 6th, 2020

Liz Dent, State Forests Division Chief
Oregon Department of Forestry
2600 State Street
Salem, OR 97310
Liz.F.DENT@oregon.gov
jason.r.cox@oregon.gov

RE: *Comments on FY 2021 Annual Operating Plans for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon Klamath Lake and Western Lane Districts*

Dear Ms. Dent,

The undersigned organizations use and enjoy state forestlands lands managed by the Oregon Department of Forestry (ODF) for scientific, recreational, cultural and aesthetic purposes and value these lands for their role in providing clean water supplies, maintaining viable populations of native fish and wildlife and mitigating the effects of climate change. We have the following comments to offer on the FY 2021 Annual Operating Plans (AOPs) for the Astoria, Forest Grove, North Cascades, Tillamook, Klamath Lake, West Oregon and Western Lane Districts.

Both Common School and Board of Forestry lands managed by ODF must be managed in a manner that achieves greatest permanent value (GPV) for multiple ecosystem goods and services. Under Oregon law, GPV means "healthy, productive, and sustainable forest ecosystems that over time and across the landscape provide full range of social economic and environmental benefits to the people of Oregon" (ORS 530.490; ORS 530.050; OAR 629-035-000 et seq).

Governor Brown's recent Executive Order (EO NO. 20-04) highlights one critical value associated with state forests that should be prioritized – their role in mitigating the effects of climate change through carbon sequestration and storage. Given that the industrial logging and wood products sector is Oregon's most carbon intensive and presents one of the state's most serious threats to climate resiliency we believe it is imperative that ODF exercise any and all authority and discretion to:

(1) Reduce greenhouse gas (GHG) emissions from industrial logging activities;
(2) Regrow climate resilient forests on damaged and degraded lands, and;
(3) Implement these tasks in the most cost-effective manner possible.[1]

Because ODF exerts direct management authority over state forests, each of these mandates should be reflected in the FY 2021 AOPs. Despite these obligations, proposed management activities take state forests in the opposite direction by continuing to emphasize clearcutting, short rotation timber plantations and other industrial forestry practices that generate significant GHG emissions, reduce carbon storage and sequestration, make the landscape more vulnerable to wildfires and climate change and externalize costs to taxpayers and society that are far more than revenues generated for the state. By continuing this management emphasis, ODF is creating a landscape that minimizes, rather than maximizes, its permanent value. In particular, proposed management activities will:

- **Increase GHG emissions:** As early as 2013, the Oregon Global Warming Commission (OGWC) published estimates of timber harvest related emissions in Oregon. Between 1990 and 2002 the OGWC report estimated emissions to range between 21 million and 36 million metric tons CO_2 equivalent per year (MMT CO2-e/yr).[2] These findings have been updated in OGWC's most recent report to the legislature.[3] In 2017 and 2018, two studies in Oregon – one by OSU researchers and one by Center for Sustainable Economy estimated emissions to average roughly 34 MMT CO_2-e/yr between 2000 and 2015.[4]. Based on these methods, ODF's FY 2021 AOPs can be expected to release at least 1.6 million tons of CO_2 into the atmosphere.

- **Reduce carbon sequestration:** ODF's FY 2021 AOPs will not only increase GHG emissions but reduce carbon sequestration capacity through clearcutting or intensive thinning. The AOPs propose 5,932 acres of new clearcutting. Recent clearcuts are net emitters of CO_2 for ten to fifteen years after logging because emissions associated with the decay and burning of logging residuals is greater than the CO_2 new growth can capture.[5]

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[1] General state agency duties to reduce emissions and climate impacts in a cost-effective manner are set forth in Executive Order No. 20-04 § 3(A-D).
[2] Kelly, Peter. 2013. A Greenhouse Gas Inventory of Oregon's Forests. Salem, OR: Oregon Department of Energy, Oregon Global Warming Commission.
[3] Oregon Global Warming Commission (OGWC), 2018. Forest Carbon Accounting Project Report. Salem, OR: OGWC.
[4] Law, B.E., et al. 2018. Land use strategies to mitigate climate change in carbon dense temperate forests. *Proceedings of the National Academy of Sciences of the United States of America* 115: 3663-3668; Talberth, J., 2017. Oregon Forest Carbon Policy: Scientific and technical brief to guide legislative intervention. Lake Oswego, OR: Center for Sustainable Economy.
[5] Turner, D.P., Guzy, M., Lefsky, M.A., Ritts, W.D., Van Tuyl, S., Law, B.E., 2004. Monitoring forest carbon sequestration with remote sensing and carbon cycle monitoring. *Environmental Management* 33(4): 457-466.

- **Deplete water supplies**. Dry season stream flows are today dramatically depleted across western Oregon and the Pacific Northwest as a consequence of extensive logging and vegetative regrowth in plantations after logging. Paired watershed studies have found dry season depletion rates to be 50% or more as intact watersheds are converted to tree plantations.[6] Climate change will make matters worse by further reducing dry season flows thereby straining "the ability of existing infrastructure and operations to meet the many and varied water needs of Oregonians."[7]

- **Generate thermal pollution into streams and rivers**. As the climate warms and dries in the summer, Oregon's waterways will also warm. This thermal pollution is intensified by plantation forestry. Department of Forestry modeling concludes that a typical clearcut compliant with the Oregon Forest Practices Act on average, boosts water temperatures by 2.6 degrees Fahrenheit on top of any background increase due to climate change.[8] According to multiple federal agencies, "the evidence is . . . overwhelming that forest practices on private lands in Oregon contribute to widespread stream temperature problems."[9]

- **Increase wildfire risk**. Timber plantations burn hotter and faster than natural forests.[10]This is because of dense stocking densities of small trees in the same age cohort and flammable logging slash. Decades of monitoring by firefighters and researchers show that fires burning in complex natural forests are less severe and retain more on-site carbon compared to industrially logged landscapes.[11] Two recent

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[6] Perry, T. D., J.A. Jones, 2016. Summer streamflow deficits from regenerating Douglas-fir forest in the Pacific Northwest, USA. *Ecohydrology*. 1-13; Segura, C., K.D. Blandon, J.A. Hatten, J.A. Jones, V.C. Hale, G.G. Ice, 2020. Long term effects of forest harvesting on summer low flow deficits in the Coast Range of Oregon. *Journal of Hydrology* 585: 124749. https://doi.org/10.1016/j.jhydrol.2020.124749.
[7] Dalton, M.M., K.D. Dello, L. Hawkins, P.W. Mote, and D.E. Rupp, 2017 *The Third Oregon Climate Assessment Report*, Oregon Climate Change Research Institute, College of Earth, Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR, page 18.
[8] Oregon Department of Forestry (ODF), 2015. Detailed analysis: predicted temperature change results. Agenda Item 7, Attachment 3 to the meeting packet prepared for the Board of Forestry, June 3rd, 2015. Salem, OR: ODF.
[9] EPA-FWS-NMFS, 2/28/01 Stream Temperature Sufficiency Analysis Letter to ODF and ODEQ.
[10] See, e.g. Zald, H.S.J., and C.J. Dunn, 2018. Severe fire weather and intensive forest management increase fire severity in a multi-ownership landscape. *Ecological Applications* 28:1068-1080. doi:10.1002/eap.1710; Bradley, C.M. C.T. Hanson, and D.A. DellaSala. 2016. Does increased forest protection correspond to higher fire severity in frequent-fire forests of the western USA? *Ecosphere* 7: article e01492.
[11] *See, e.g.,* Stone, C., Hudak, A., Morgan, P., 2008. Forest harvest can increase subsequent forest fire severity. In Proceedings of the Second International Symposium on Fire Economics, Planning and Policy: A Global View. Armando González-Cabán**,** ed. Riverside, CA: USDA Forest Service, Pacific Southwest Research Station; Bradley, Hanson and DellaSala, 2016, note 11.

court decisions have supported the connections between clearcut-style logging and increased fire hazard, and further underscored the need for thorough scientific analysis of fire risk as a result of clearcut style management on public lands[12].

- **Increase the incidence and severity of landslides**. The vast network of clearcuts and logging roads on state and private lands present a significant risk of landslides, especially during extreme precipitation events, such as the 1996 floods. Under almost all climate change scenarios for Oregon, the frequency of these events will increase during the wet fall and winter months. Maintenance of strong root systems is an important factor in stabilizing soils during these events. Clearcutting reduces the strength of root systems dramatically, and thus is a major factor in increased landslide risk.[13] Logging roads channel water runoff and cause debris torrents that can travel many miles downstream, pick up momentum, and become heavily destructive.[14] Studies indicate that clearcuts exhibit landslide rates up to 20 times higher than background rates. Near logging roads, landslide rates are up to 300 times higher than in forested areas.[15]

- **Increase the risk of flooding**. Research has demonstrated that heavily logged watersheds are at a much higher risk of flooding than those maintained in natural forest conditions. For example, Jones and Grant found that logging increased peak discharges by as much as 50% in small basins and 100% in large basins over a 50-year study period. A 2008 Forest Service science synthesis confirmed the detrimental impacts of logging and logging roads on peak flows across western Oregon and Washington.[16]

- **Enhance habitat for invasive species and organisms that put public health at risk**. Invasive species find few barriers in monoculture tree plantations since key natural

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[12] Cascadia Wildlands; and Oregon Wild v. Bureau of Land Management; and Seneca Sawmill Company 6:19-cv-00247-MC. United States District Court of Oregon. 2019; and Bark; et al. v. United Stated Forest Service; and High Cascade Inc. No. 19-35665 D.C. No. 3:18-cv-01645-MO. United States Court of Appeals, Ninth Circuit. 2020.

[13] Schmidt, K.M, J. J. Roering, J.D. Stock, W.E. Dietrich, D.R. Montgomery, Schaub, T. 2001. The variability of root cohesion as an influence on shallow landslide susceptibility in the Oregon Coast Range. *Can. Geotech. J* (38): 995-1024.

[14] Swanson, F. J., J. L. Clayton, W. F. Megahan, Bush, G., 1989. Erosional processes and long-term site productivity, pp. 67-81 in *Maintaining the Long-Term Productivity of Pacific Northwest Forest Ecosystems*. D. A. Perry, R. Meurisse, B. Thomas, R. Miller, J. Boyle, J. Means, C.R. Perry, R. F. Powers, eds. Portland, Oregon: Timber Press.

[15] Heiken, D., 2007. Landslides and Clearcuts: What Does the Science Really Say? Eugene, OR: Oregon Wild.

[16] Grant, G.E., Lewis, S.L., Swanson, F.J., Cissel, J.H., McDonnell, J.J. 2008. Effect of Forest Practices on Peak Flows and Consequent Channel Response: A State-of-Science Report for Western Oregon and Washington. PNW-GTR-760. Portland, OR: USDA Forest Service, Pacific Northwest Research Station.

processes that keep such species in check have been removed. As succinctly stated by Norse, "in monocultures, without barriers to dispersal, insects and pathogens find unlimited resources in all directions."[17] As Oregon's climate changes, a wide variety of non-native plants, insects, and disease-causing organisms, such as viruses, bacteria, prions, fungi, protozoans, and internal (roundworms, tapeworms) and external (lice, ticks) parasites will spread, adversely affecting the health of humans, livestock, and pets in addition to fish and wildlife. A recent Forest Service assessment concluded "[e]vidence suggests that future climate change will further increase the likelihood of invasion of forests and rangelands by nonnative plant species that do not normally occur there (invasive plants), and that the consequences of those invasions may be magnified."[18]

- **Elevate the risk of harmful algae blooms**. Harmful algal blooms (HAB) are an urgent concern statewide as climate change unfolds. Industrial forest practices greatly amplify this risk through three channels: (a) by warming waters; (b) by decreasing natural flow rates, and (c) by contaminating water supplies with glyphosate, urea along with other chemicals and fertilizers that enhance HAB growth. Warmer are slower water in streams will cause "harmful algal blooms to occur more often, in more waterbodies and to be more intense."[19] With the presence of glyphosate and urea in streams, nontoxic algae growth is inhibited and HABs dominate without competition.[20]

- **Externalize costs that far exceed revenues from timber sales:** State forestlands are relatively unimportant from a timber supply perspective but are the only places where public trust resource values – clean water, fish, wildlife, recreation and carbon storage can be maximized. As such, logging these lands is not cost effective: it generates social costs far in excess of benefits. In Oregon, climate-related damages from logging on public forests is at least 10 times and perhaps more than 80 times revenues earned from timber sales.[21] As planned, the FY 2021 AOPs will generate 1.6

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[17] Norse, E., 1990. Ancient Forests of the Pacific Northwest. Washington, DC: The Wilderness Society.
[18] Kerns, B., Guo, Q., 2012. Climate Change and Invasive Plants in Forests and Rangelands. U.S. Department of Agriculture, Forest Service, Climate Change Resource Center. Available online at: https://www.fs.usda.gov/ccrc/topics/climate-change-and-invasive-plants-forests-and-rangelands.
[19] US Environmental Protection Agency, "Climate change and harmful algae blooms," available online at: https://www.epa.gov/nutrientpollution/climate-change-and-harmful-algal-blooms.
[20] Glibert, P. M., Harrison, J., Heil, C., & Seitzinger, S., 2006. Escalating worldwide use of urea–a global change contributing to coastal eutrophication. Biogeochemistry, 77(3): 441-463.
[21] Niemi, E., 2020. Climate Costs and Risks of Logging on State Forests. Memorandum submitted to ODF 3 November 2019. Available online at: https://forestcarboncoalition.org/wp-content/uploads/2019/11/BoF-L-2019-1104.pdf.

million metric tons CO_2-e at a social cost of at least $667 million[22] and further degrade the landscape's resiliency to the effects of climate change.

ODF's FY 2021 Annual Operating Plans, the implementation plans on which they are based, and the underlying Northwest Oregon State Forest Plan all fail to include any analysis of how these logging related impacts affect GPV or how the AOPs comply with the mandates of EO 20-04. As such, we are asking for a stay of implementation until these deficiencies are addressed.

As part of the reconfiguration of the AOPs, a full range of climate smart alternatives to industrial forest practices should be analyzed. Climate smart forestry techniques are those that simultaneously reduce logging related emissions, build carbon stocks on the landscape, maintain or enhance sequestration capacity and improve climate resiliency. Proforestation (setting aside forest carbon reserves and letter trees grow big and old)[23], afforestation, reforestation, long rotations, alternatives to clearcutting (i.e. variable density thinning) and ecological restoration of tree plantations to expedite development of old growth characteristics are examples of such climate-smart techniques.

Thank you for your time and consideration of the issues set forth in this letter.

Sincerely,

John Talberth, PhD
Center for Sustainable Economy
Forest Carbon Coalition
(505) 657-7336
jtalberth[redacted]

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Natural Resource Economics
Forest Carbon Coalition
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Dominick Dellasala, PhD
Geos Institute

Bill Moomaw, PhD
Tufts University

Debra Fant
Community Rights Lincoln County

Chuck Willer
Coast Range Association

Dee Tvedt
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Chris Palmer
350 PDX

[22] Based on a median social cost of carbon estimated at $417per tonne CO2 by Ricke, K., L. Drouet, K. Caldeira, M. Tavoni, 2018. Country-level social cost of carbon. *Nature Climate Change*, 24 September 2018.

[23] Moomaw, W.R., S.A. Masino, E.K. Faison, 2019. Intact forests in the United States: proforestation mitigates climate change and serves the greatest good. For. Glob. Change, 11 June 2019: https://doi.org/10.3389/ffgc.2019.00027.

Kris Paul
350 Corvallis

Dylan Plummer
Sunrise Eugene

Angelique Orman
Our Revolution Oregon

Maxine Centala
Concerned Citizens for Clean Air

Nick Cady
Cascadia Wildlands

Paula Hood
Blue Mountains Biodiversity Project

Greg Haller
Pacific Rivers

Paula Hood
Blue Mountains Biodiversity Project

Audrey Canes
Portland Rising Tide

Linda Perrine
350 Eugene

Garret Fleetwood
Sunrise Corvallis

Joy Thomson
Our Revolution Lane County

Nick Cady
Cascadia Wildlands

David Stone
Friends of Douglas Fir National Monument

Cristina Hubbard
Forest Web of Cottage Grove

Kasey Hovick
Umpqua Watersheds

David Tvedt
Our Forests

From: INFORMATION Forestry * ODF
To: COX Jason R * ODF
Subject: FW: Input Received: Comments for Oregon Department of Forestry
Date: Wednesday, April 08, 2020 2:27:32 PM
Attachments: Comments for Oregon Department of Forestry - Entries.csv

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From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** Jpilot32[redacted]
Sent: Wednesday, April 08, 2020 2:24 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 4/8/2020 2:23:30 PM

Name	Justin Saxe
Phone	[redacted]
Email	Jpilot32[redacted]
Comment	I became aware ODF is looking into expanding the Wilson river bike trail to segment D. I think this is a great idea to link up with other trails on the east side of the Wilson river trail. The non motorized trails in the Tillamook state forest are much smaller than the motorized trails in comparison and I would like to see growth in the non motorized network. I like many others enjoy these trails very much and think it's a great idea to expand them to meet the demand of increasing population in the Portland area.
Response	Just sharing my thoughts. No response is necessary.
Comments are based on interaction with these ODF offices	

COX Jason R * ODF

From:	INFORMATION Forestry * ODF
Sent:	Monday, March 23, 2020 1:13 PM
To:	COX Jason R * ODF
Subject:	FW: Input Received: Comments for Oregon Department of Forestry
Attachments:	Comments for Oregon Department of Forestry - Entries.csv

From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** kenyan.potter[redacted]
Sent: Monday, March 23, 2020 12:59 PM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 3/23/2020 12:58:54 PM

Name	Ken Potter
Phone	[redacted]
Email	kenyan.potter[redacted]
Comment	I am all about the the greatest SUSTAINABLE value of our forests. Maximizing yield for one year at the cost of the future is just crazy. Also, a forest that looks like a tree farm is not a healthy way to maintain the land. Let's be smart and take care of the land and the people. I'm opposed to using herbicide to cut payroll costs, then blaming others for job losses. In fact, I'm opposed to the use of herbicides and insecticides on forest lands. Any perceived benefits are temporary, and generally ignore the consequences.
Response	Just sharing my thoughts. No response is necessary.
Comments are based on interaction with these ODF offices	Northwest Oregon Area

COX Jason R * ODF

From: INFORMATION Forestry * ODF
Sent: Monday, March 23, 2020 1:13 PM
To: COX Jason R * ODF
Subject: FW: Input Received: Comments for Oregon Department of Forestry
Attachments: Comments for Oregon Department of Forestry - Entries.csv

From: ORPrdSupport@egov.com [mailto:ORPrdSupport@egov.com] **On Behalf Of** matmcd2002[redacted]
Sent: Monday, March 23, 2020 10:32 AM
To: ODF_DL_ForestryInformation <ODF_DL_ForestryInformation@oregon.gov>
Subject: Input Received: Comments for Oregon Department of Forestry

Comments for Oregon Department of Forestry

Submitted: 3/23/2020 10:32:10 AM

Name	Pamela Mattson McDonald
Phone	[redacted]
Email	matmcd2002[redacted]
Comment	Regarding the Oregon Forest Practices Act Revision The Oregon Department of Forests (ODF) is almost entirely dependent on timber sales for funding. A volatile revenue stream which it can't control and is affected by market swings, political agendas and legal challenges. The Department gets no taxpayer money but is asked to provide services which cost millions of dollars annually and generate little or no revenue. As two thirds of the revenue from timber sales go to the fifteen counties and special taxing districts where the logging takes place little is left to fund the ODF operations. After reading and reviewing the draft, it's not clear in the proposed Forest Practices Plan how the stated aims will intersect with other goals, such as maximizing the volume of wood available for harvest and maximizing wildlife habitat for native wildlife species. Nor is it protective of streams or watersheds. The ODF mandate is to manage the public land for the "greatest permanent value" to Oregon. Yet the definition of value and to whom it should go is a

	controversial question. Under the current plan, water quality, salmon and wildlife have suffered. The Department must clearly identify improved conservation outcomes in specific terms within the plan and identify which measures enhance habitat for species of concern. The Plan must include unambiguous, conservation commitments, such as precise amounts of complex forest to be developed, specific stream strategies with buffer distances increased and practices identified.
Response	Please respond by email
Comments are based on interaction with these ODF offices	Astoria District

May 6th, 2020 *SENT BY ELECTRONIC MAIL*

Liz Dent, State Forests Division Chief
Oregon Department of Forestry
2600 State Street
Salem, OR 97310
Liz.F.DENT@oregon.gov
jason.r.cox@oregon.gov

RE: *Comments on Annual Operating Plans for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon and Western Lane Districts*

Dear Ms. Dent;

CSE is an Oregon non-profit with members who use and enjoy state forestlands lands managed by the Oregon Department of Forestry (ODF) for scientific, recreational, cultural and aesthetic purposes and value these lands for their role in providing clean water supplies, maintaining viable populations of native fish and wildlife and mitigating the effects of climate change. We have the following comments to offer on the FY 2021 Annual Operating Plans for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon and Western Lane Districts:

- Both Common School and Board of Forestry lands managed by ODF must be managed in a manner that achieves greatest permanent value of the land for multiple ecosystem goods and services (ORS 530.490; ORS 530.050; OAR 629-035-000 et seq.).

- Governor Brown's recent Executive Order (EO NO. 20-04) highlights one critical value associated with state forests that should be prioritized – their role in mitigating the effects of climate change through carbon sequestration and storage.

- The AOPs fails to maintain state forestland in a condition that achieves the greatest permanent value (GPV) for both existing and future generations of Oregonians.

- In particular, on forestlands managed for timber, the AOPs reflect a management direction that emphasizes short rotation clearcutting, timber plantations, dense

networks of logging roads and use of chemical pesticides and fertilizers that result in a landscape that minimizes, rather than maximizes, its permanent value for timber and other ecosystem services.

- In contrast, and as set forth in the attached declarations and accompanying analysis by Dr. John Talberth and Mark Wigg, long rotations and climate smart, ecological forestry present economically viable alternatives for ODF that are superior in meeting the GPV standard on these lands.

- The clear GPV benefits of long rotations and climate smart, ecological forestry continue to be overlooked because the AOPs, the implementation plans on which they are based, and the underlying Northwest Oregon State Forest Plan fail to include any analysis of the impact of management activities or alternatives on GPV or how the AOPs comply with the mandates of EO 20-04.

- For these reasons, we request a stay of implementation of the FY 2021 Annual Operating Plans for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon and Western Lane Districts until the State Forest Division completes the requisite analysis of GPV and how it can be maximized for timber, carbon, water and other ecosystem services. This must include an analysis of extended rotations and alternatives to clearcutting and tree plantations.

CSE has presented all the information contained in these comments to the Board of Forestry and State Forests planning team on several occasions. Facts supporting our comments are attached in the form of two expert declarations from myself and Mark Wigg (for the FY 2020 AOPs) a forester and former ODF employee.

Thank you for your time and consideration of the issues set forth in this letter and the attached declarations.

Sincerely,

H. John Talberth, Ph.D.
President and Senior Economist
Center for Sustainable Economy
P.O. Box 393
West Linn, OR 97068
(503) 657-7336
jtalberth[redacted]

BEFORE THE OREGON DEPARTMENT OF FORESTRY
IN THE MATTER OF FY 2021 ANNUAL OPERATING PLANS FOR STATE FORESTS

DECLARATION OF DR. JOHN TALBERTH

1. I, John Talberth, make this declaration pursuant to the Oregon Rules of Civil Procedure at ORCP 7 D(3)(a)(iv)(A):

2. My name is John Talberth. I am an Oregon resident. I am President and Senior Economist of Center for Sustainable Economy and have over 30 years of experience in forest economics and policy, including research on the ways public forestland owners like the Oregon Board of Forestry can manage their lands, resources, programs, and budgets to maximize economic, social, and environmental returns for existing and future generations.

3. I hold a Ph.D. in Environmental Economics from the University of New Mexico and a Master of Arts in Urban and Regional Planning from the University of Oregon. I have published in peer reviewed journals and regularly provide expert support for publications of governments and non-governmental organizations on topics that include sustainable forest management, sustainable agriculture, net public benefits analysis of land management decisions, green infrastructure, new indicators of progress, climate change and biodiversity.

4. I have reviewed the proposed FY 2021 Annual Operating Plans (AOPs) for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon and Western Lane Districts, Implementation Plans for these districts, the Northwest Oregon State Forest Management Plan (NW Plan), the Forest Management Assessment Report for the Northwest and Southwest Forest Management Plans and the State Forests Monitoring Program Strategic Plan for

compliance with legal standards contained in Oregon's constitution as well as other laws and rules governing management of state forestlands and have the following conclusions to offer:

5. Both Common School and Board of Forestry lands managed by the Oregon Department of Forestry (ODF) must be managed in a manner that achieves greatest permanent value (GPV) and maximum benefit of the land for multiple ecosystem goods and services (ORS 530.490; ORS 530.050; OAR 629-035-000 et seq.).

6. The concept of GPV is well known to economists because it is simply a variant on the fundamental economic objective of maximizing sustainable net revenue for a firm or akin to managing a retirement portfolio for maximum sustainable income. However, unlike private firms or individuals, public forestland managers like ODF must take into account economic values for a wide range of ecosystem goods and services that are supported by public forestlands including timber, water, recreation, scenery, wildlife, carbon storage, water purification, flood control, pollination, and natural control of insects and disease.

7. A 1992 Attorney General opinion related to the GPV standard and management of Common School lands underscored the importance of taking into consideration all of the resources that could produce revenue as well as non-commercial resources that play a role in maintaining long term productivity:

8. "The 'resources' of Admission Act lands are not limited to those, such as timber, that currently are recognized as revenue generators for the Common School Fund, but include all of the features of the land that may be of use to schools. Just as a trustee diversifies a trust portfolio, the board should consider uses of other resources, such as minerals, water, yew bark etc., that may offer revenues for the fund…..Also, the board may have good trust

reasons for conserving resources that have little or no commercial value at the present time. With conservation of productive trust property as its goal, the board must view the land resource as an interrelated whole. Promoting the long-term health of revenue-producing resources may require conservation measures aimed at non-commercial resources such as water or soils" (46 Op. Atty. Gen. 468 (1992), Opinion No. 8223, July 24, 1992).

9. In order to achieve the GPV standard, ODF must maintain information about the asset value of its lands for various uses as well as the value of ecosystem goods and services that produce income and otherwise generate economic benefits now and for future generations. Information about the interrelationships between resources must also be considered since managing the land with emphasis on one resource or the other (i.e. timber) may reduce the lands ability to produce other valuable goods and services (i.e. clean water). Such information must then be used in comparing and ranking management alternatives in the context of long-term forest management plans, implementation plans, and annual operating plans and then selecting the alternatives that achieve GPV.

10. This is the standard process (valuation of resources, interrelationships, ranking alternatives and selection of alternatives) for forest planning for any clear statutory objective, such as GPV. The science of achieving GPV (often stated as maximizing net public benefits) on forestlands with multiple resources and interactions between them has been the subject

of much forest economics research and modeling – literature and models ODF can rely upon in its management of state forestlands.[1]

11. The Board of Forestry has acknowledged that meeting the greatest permanent value standard requires consideration of the asset value of state forestlands for various uses and income streams that can be generated by those assets. For example, in its November 2013 State Forest Performance Measures Report the Board of Forestry adopted Performance Measure 2: Net return on asset value (ROAV) as a way to monitor economic performance of its management activities on state forestlands.[2] ROAV is a standard metric used by businesses to measure the profitability of a firm. It is most commonly measured as net income divided by the total value of the asset used to produce that income. The higher the ratio, the greater the benefit earned.

12. Despite a clear statutory duty to achieve GPV and an abundance of tools, sources of information and metrics that can be applied to achieve it I find no evidence that ODF has completed any analysis whatsoever that attempts to determine what combination of land allocations or management prescriptions result in the greatest permanent value of the land. The requisite analysis does not appear in any of the forest planning documents I reviewed, including the AOPs.

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[1] See, e.g. Stevens, J.A. and Montgomery, C.A., 2002. Understanding Compatibility of Multiple Uses on Forest Land: A Survey of Multiresource Research with Application to the Pacific Northwest. PNW-GTR-539. Portland, OR: USDA Forest Service, Pacific Northwest Research Station; Wang, X.L., Zhu, J.J., Xi, W.M., 2017. Quantifying ecosystem service tradeoffs for plantation forest management to benefit provisioning and regulating services. *Ecology and Evolution* 7(19): 7807-7821.

[2] Board of Forestry. 2013. State Forests Performance Measures Report. Salem, OR: Oregon Board of Forestry, pages 15-20.

13. Because of ODF's failure to conduct analysis of how various management alternatives can achieve GPV, ODF has selected and is implementing a model of timberland management that is much closer to minimizing, rather than maximizing, the permanent value of these lands. This model involves a variety of industrial forest practices discussed in the AOPs which include clearcutting, short rotations, timber plantations, dense networks of logging roads and application of chemical pesticides and fertilizers. Clearcutting, as specified by AOPs, is planned for 5,932 acres in FY 2021. Rotation age is the number of years between clearcut logging of a site. Rotation age on ODF's suitable timberland base is roughly 50 years for forests that can grow for nearly 1,000 years.[3] The density of logging roads on ODF lands has been a longstanding concern for Oregon's Department of Fish and Wildlife and other agencies.

14. Such practices, which mimic practices on industrial forestlands, have been well documented by decades of research and monitoring data to degrade rather than maximize the value of forestlands for a wide range of resource values and functions related to climate stability, water quality, habitat for a diversity of fish and wildlife species, outdoor recreation, scenery, and both timber and non-timber forest products and are putting state forestlands

[3] According to the State Forests Performance Measures Report (page 18): "[t]he asset value is based on the Net Present Value (NPV; see Table 2.2) of short-rotation (50-year) forestry under Forest Practices Act regulations and sustained yield." Rotation age being implemented by the AOPs can also be determined by dividing the acreage in the suitable timberland base by the clearcut acres planned each year. So, for example, within the NW Plan area, ODF has identified the suitable timber base as 312,166 acres. Total clearcut acres proposed by the Astoria, Tillamook, Forest Grove, Western Lane and North Cascade districts (all covered by the NW Plan) by the FY 2021 AOPs is 6,766, which translates into a rotation length of 53 years. This does not include many additional acres treated with partial cuts.

and their resources at greater risk as climate change unfolds. I have personally directed several research projects on industrial forest practices in western Oregon and found that (1) such practices are the number one source of greenhouse gas emissions in the state, and (2) such practices reduce the ability of forestlands to provide timber, water, and other goods and services in the future by making forestlands less productive and more susceptible to climate change.[4] (include low flow study)

15. For example, industrial forest practices such as those proposed in the AOPs have been shown to reduce water supplies with summer streamflow in industrial tree plantations running 50% lower than century old forests[5]. Clearcut-plantation style management also makes forest water supplies more vulnerable to harmful algal blooms (HABs) by raising water temperatures and introducing chemicals such as glyphosate and urea that accelerate HAB growth. As another example, industrial forest practices produce highly flammable landscapes that pose far more danger as climate change unfolds than more complex, natural forests. Two recent court decisions have supported the connections between clearcut-style logging and increased fire hazard, and further underscored the need for thorough scientific analysis of fire risk as a result of clearcut style management on public lands.[6] Native forests are not

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[4] See, e.g. Talberth, J., 2017. Oregon Forest Carbon Policy: Scientific and technical brief to guide legislative intervention. West Linn, OR: Center for Sustainable Economy. Available online at: https://sustainable-economy.org/wp-content/uploads/2017/12/Oregon-Forest-Carbon-Policy-Technical-Brief-1.pdf.

[5] Segura, Catalina & Bladon, Kevin & Hatten, Jeff & Jones, Julia & Hale, V. & Ice, George. (2020). Long-term effects of forest harvesting on summer low flow deficits in the Coast Range of Oregon. Journal of Hydrology. 124749. 10.1016/j.jhydrol.2020.124749.

[6] Cascadia Wildlands; and Oregon Wild v. Bureau of Land Management; and Seneca Sawmill Company 6:19-cv-00247-MC. United States District Court of Oregon. 2019; and Bark; et al. v. United

only more resilient to fire, but are also better at withstanding not only wildfire but droughts, insects, and disease. As recognized by the Attorney General Opinion, the state has a duty to avoid creating conditions that undermine state forestlands ability to yield economic benefits in the future even if it means sacrificing short term income opportunities. By extending the industrial forest practice model through FY 2021, the AOPs will continue to limit the state's ability to generate economic benefits for Oregonians.

16. For example, industrial forest practices authorized by the AOPs will continue to raise water supply and treatment costs to the state, thereby reducing net income it receives from state forestlands. As another example, these practices maintain much of the state forestland base in young to mid-age plantation forest conditions that do not provide habitat for over 1,000 species of fish, wildlife, and plants that use or require late successional and old growth forests (LSOG) and thereby limit the state's ability to earn income streams from hunting, fishing, wildlife watching, non-timber forest products, carbon payments or other income streams that are maximized in LSOG forests. These practices also minimize the value of state forestlands for timber production because both the volume and value of wood produced is significantly less than what can be produced by longer rotations. Longer rotations also have the advantage of maximizing co-benefits, or joint production of other ecosystem goods and services such as carbon, water supply, recreation, wildlife and fish. This can be illustrated

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Stated Forest Service; and High Cascade Inc. No. 19-35665 D.C. No. 3:18-cv-01645-MO. United States Court of Appeals, Ninth Circuit. 2020.

with respect to a GPV analysis I directed with colleagues in 2015 for lands managed under the direction of the NW Plan.

17. That analysis, summarized in testimony submitted to the Board of Forestry at a meeting of the Subcommittee on Alternative Forest Management Plans on October 19th, 2015, was an analysis that was consistent with the type of analysis recommended by the Board of Forestry to gauge compliance with the GPV standard on state forestlands: return on asset value (ROAV) (Exhibits A and B). That analysis compared the asset value and associated net income streams that could be generated by ODF under different rotation ages for lands in the NW Plan area with respect to three components of GPV: timber, carbon, and conservation.

18. For timber, the analysis considered how the standing value of timber and the state's annual net income earned from the sale of timber varied with rotation ages that ranged from 40 to 240 years. Standard growth and yield tables were used, as well as market prices for various types and grades of timber. State timber sale program costs were based on detailed cost accounting figures that appear in AOPs and other documents. The model demonstrated that, as rotation age increases, the standing timber asset becomes more valuable as volume on the land increases and the state's costs of preparing timber sales falls because less acres need to be logged each year to produce the same volume. In addition, the model shows that the income earned from timber sales increases because the stumpage value of product harvested increases as the composition of wood offered for sale transitions from poles and pulpwood, to small sawtimber, to large sawtimber and finally to prime veneer logs, which command the highest prices.

19. As shown on page 3 of Exhibit B, in our model net income from timber increases dramatically from a loss of nearly $12 million a year at a 40-year rotation to a peak of $52.5 million for a 200-year rotation length. In addition, by extending rotation age from 40 to 240 years the state can boost the asset value of the timber resource maintained from $39 million to nearly $8.6 billion. Thus, in terms of both income and asset value of the timber resource, long rotations are far superior in achieving GPV than the state's continuing management of rotation age at 50 years or less.

20. For carbon, the model calculated the standing value of the carbon stock as rotation age increases using carbon density figures per acre and age class from Woods Hole Institute and the USDA Forest Inventory and Analysis program. Following Bureau of Land Management methods, the stock was valued at the 2015 social cost of carbon of $40 per metric ton carbon dioxide. As shown on page 4 of Exhibit B the carbon stock value increases from roughly $3 billion to over $10 billion as rotation age increases from 40 to 240 years. In terms of income generation, payments for carbon storage and sequestration to private and public landowners are emerging markets in Oregon and long rotations are one of the key strategies for generating such payments. And so, by implementing short rather than long rotations the AOPs will limit the state's ability to earn income streams from these carbon payments.

21. The analysis also considered the effects of rotation age on conservation values. Conservation values were determined by applying per-acre figures from market transactions involving conservation purchases of land or easements in Oregon. These transactions demonstrate that the value of the land increases as ecological conditions improve and reach

their peak in old growth forests. Our model showed that as rotation age was increased from 40 to 240 years, the conservation value of the state's holdings in the NW Plan area increased from $883 million to nearly $2 billion. The state has already experimented with small sales of state forestland to private purchasers to generate income, so it reasonable to include conservation value as a component of GPV from both an asset value and income generation perspective.

22. There are many other resource values that increase with rotation age, such as water, fish, and wildlife. But even with the limited analysis we completed for three resource values – timber, carbon, and conservation - it is clear that by implementing short rotation clearcutting and other industrial forest practices ODF is more likely to be minimizing the permanent value of state forestlands on which the agency harvests timber rather than achieving GPV.

23. I have presented this information to ODF on numerous occasions and have received no written or oral response from ODF staff or Board of Forestry members.

24. I hereby declare that the above statement is true to the best of my knowledge and belief, and that I understand it is made for use as evidence in court and is subject to penalty for perjury.

/s/

H. John Talberth
President and Senior Economist
Center for Sustainable Economy
P.O. Box 393
West Linn, Oregon 97068

Attachments:

Exhibit A: Talberth BOF testimony 10-19-15
Exhibit B: GPV analysis of long rotations

BEFORE THE OREGON DEPARTMENT OF FORESTRY
IN THE MATTER OF FY 2020 ANNUAL OPERATING PLANS FOR STATE FORESTS

DECLARATION OF MARK WIGG

1. I, Mark Wigg, make this declaration pursuant to the Oregon Rules of Civil Procedure at ORCP 7 D(3)(a)(iv)(A):

2. I am an Oregon resident. I am an environmental consultant working for the Center for Sustainable Economy. I have worked in forestry and environmental consulting for over 40 years. I have worked on five different National Forests in the Northwest over ten years, including serving as certified silviculturist for four years on the Umatilla National Forest. After leaving the Forest Service, I worked as a forestry/environmental consultant producing environmental reports for timber harvests, transportation, and mining operations. I also published recreation maps of National Forests. I have published articles and given lectures on forest management in Oregon. I led the Salem Chapter of the Society of American Foresters for several years while also serving as president of the Salem Audubon Society. I have been an expert witness in federal court on forestry issues.

3. I went back to public service when given the opportunity to be an environmental project manager for the Oregon Department of Transportation, where for ten years I guided Oregon's largest transportation projects through federal, state, and local environmental permitting. I left ODOT and worked as an environmental consultant on transportation, mining, and forestry projects for a few years before I was hired by the Oregon Department of Forestry to manage the development and successful deployment of its E-notification system.

4. My bachelor's degree is from the University of Montana. I did my graduate work at Oregon State, Portland State, the University of Minnesota and the University of Washington with a focus on silviculture, forest economics, and ecosystem management.

5. I have reviewed the proposed FY 2020 Annual Operating Plans (AOPs) for the Astoria, Forest Grove, North Cascades, Tillamook, West Oregon and Western Lane Districts, Implementation Plans for these districts, the Northwest Oregon State Forest Management Plan, the Forest Management Assessment Report for the Northwest and Southwest Forest Management Plans and the State Forests Monitoring Program Strategic Plan for compliance with legal standards contained in Oregon's constitution as well as other laws and rules governing management of state forestlands and have the following conclusions to offer:

6. Both Common School and Board of Forestry (BOF) lands managed by the Oregon Department of Forestry (ODF) must be managed in a manner that achieves greatest permanent value (GPV) and maximum benefit of the land for multiple ecosystem goods and services (ORS 530.490; ORS 530.050; OAR 629-035-000 et seq.).

7. My chief concern with the AOPs and underlying forest management plans is the increasing emphasis on low-value, small diameter trees managed on short rotations. Managing state forests in this way reduces the long-term value of these lands for wood products that Oregon has a competitive advantage in producing.

8. Oregon has a well-deserved reputation for having high quality timber that produces lumber and other wood products with highly valued properties. When large old trees were being harvested, the clear straight grain of the wood allowed hundreds of specialty mills to thrive producing beautiful, strong, highly valued wood products. The variety and quality of

wood coming from Oregon's forests created thriving small towns across the state. Until the 1960's, wood chips and smaller diameter trees were burned, but their low cost allowed industries to develop to produce fiber and chip board and paper products. The cost of this lower valued wood was subsidized by the large old trees being harvested. The large diameter trees paid for the roads and bridges to access the forests.

9. Timber sales in some parts of the state have no bidders if the sale does not have enough large old trees. For some areas of the state, small diameter trees are not worth logging.

10. Now that the price for wood fiber is high enough, industrial forests are being managed on rotations as low as 25 years where possible and the state forests are also moving toward shorter rotations. This is concerning because shorter rotations mean more lower quality, lower value wood.

11. Juvenile wood is the inner 15-20 years of growth on a tree. As trees get older the trees produce a higher percentage of mature wood. Mature wood has longer wood fibers that are more closely aligned than juvenile wood. This gives mature wood greater strength and stiffness, and less tendency to warp. The superior characteristics of mature wood give it a higher value for lumber, plywood, and other wood products. Large, old Douglas-fir and other NW species have a much higher percentage of mature wood than small, younger trees.

12. Oregon is a leader in developing highly engineered, structural wood products. Mature wood with straight knot-free grain provides strength and beauty to these products. The highest value of timberlands in Oregon is in provision of these kinds of wood products, not products that use small diameter trees.

13. Mills that rely on large, older trees to make their higher valued products will not survive if only younger, mostly juvenile wood trees are being harvested. In particular, a predominance of low-quality wood coming from Oregon's forests will not provide the small local wood product industries with the quality wood products they need to produce their doors, trim, cabinets, and other products.

14. Clearcutting, as specified by AOPs, is planned for over 6,766 acres in FY 2020 and is the primary harvest technique on state lands in Western Oregon. As stated in planning documents and as evidenced by the annual acres proposed for clearcutting in the AOPs, ODF is implementing a rotation age of about 50 years on these lands.[7]

15. The State won't get the highest value from state forests if they are managing to 50-year rotations. The industrial landowners want to compete with Brazil in the low-value world fiber markets; however, the greatest value for Oregonians will come from managing state forests to allow the forests to grow the highly valued, "engineered" wood that has prized structural and visual properties. This means stop clearcutting and follow the lead of the BLM and manage forests on 100-year and longer rotations.

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[7] According to the State Forests Performance Measures Report (page 18): "[t]he asset value is based on the Net Present Value (NPV; see Table 2.2) of short-rotation (50-year) forestry under Forest Practices Act regulations and sustained yield." Rotation age being implemented by the AOPs can also be determined by dividing the acreage in the suitable timberland base by the clearcut acres planned each year. So, for example, within the NW Plan area, ODF has identified the suitable timber base as 312,166 acres. Total clearcut acres proposed by the Astoria, Tillamook, Forest Grove, Western Lane and North Cascade districts (all covered by the NW Plan) by the FY 2021 AOPs is 6,766, which translates into a rotation length of 46 years. This does not include many additional acres treated with partial cuts.

16. The BLM is managing many of their forest on 100-year and greater rotations. They commercially thin Douglas-fir stands 80 years old and younger, and under plant with cedar, hemlock and other species. When the BLM returns for another thinning in 25-50 years, the trees will have much higher value. Mimicking BLM forest management will produce the variety and quality of timber that will not need to compete on the world market for chips, pulp, and small diameter logs.

17. Long rotations also have benefits for carbon storage, biological diversity, scenery and recreation values. By thinning instead of clearcutting, the state can sequester and store more carbon than is sequestered and stored by clearcutting these stands on short rotations. Mimicking BLM forest management will provide better habitat for a wider variety of species on state lands, especially where state forests abut industrial forest lands that have been clearcut recently.

18. Mimicking BLM forest management will allow forests to act like forests not bare land in the watershed, tempering storms and reducing temperatures on the land and in the streams on state lands. Mimicking BLM forest management will provide visitors to state lands with views of forests, not bare hillsides.

19. Managing state forests for long rotations will also help pay for infrastructure. The roads and bridges that provide access to the forests were constructed when large old trees were being harvested. The roads and bridges will need to be repaired and replaced. The increase in high intensity storms and resulting damage due to climate change will increase the cost of maintaining this infrastructure. Small diameter trees may not provide the revenue

to pay for the infrastructure and transportation costs and is already happening in some areas of Oregon.

20. I hereby declare that the above statement is true to the best of my knowledge and belief, and that I understand it is made for use as evidence in court and is subject to penalty for perjury.

/s/

Mark Wigg
Environmental Consultant
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Salem, OR 97308

Center for
Sustainable
Economy
Analysis • Solutions • Advocacy

BEFORE THE OREGON BOARD OF FORESTRY
Subcommittee on Alternative Forest Management Plans for Northwest State Forests

Testimony of Dr. John Talberth
October 19 h, 2015

1. A plain reading of the statutory language associated with the greatest permanent value (GPV) standard for state forests affirms the necessity of using the basic approach used by the business community, economists and investors. That approach requires modeling of two basic bookkeeping entries as alternative management regimes are considered: (1) the value of the asset, and (2) the annual income or benefit streams that can be generated from that asset. For example, the basic challenge in retirement planning is to walk a fine line between maximizing the value of the investment portfolio and simultaneously maximizing the annual payments from that portfolio. Maximizing GPV here is analogous, but in this case we are talking about state forests as a natural capital asset and not a financial one.

2. There is nothing in the record to suggest that this committee and the GPV model in use is taking into consideration how several key values of state forestlands change as alternatives are considered. For instance, there is nothing in the model that tracks the value of standing timber, stocks of carbon, or the value of state forests to potential conservation purchasers. The question of asset value comes down to willingness to pay for those assets in open markets, and there are formal markets for each of these uses now and so it is essential to think of value in these terms.

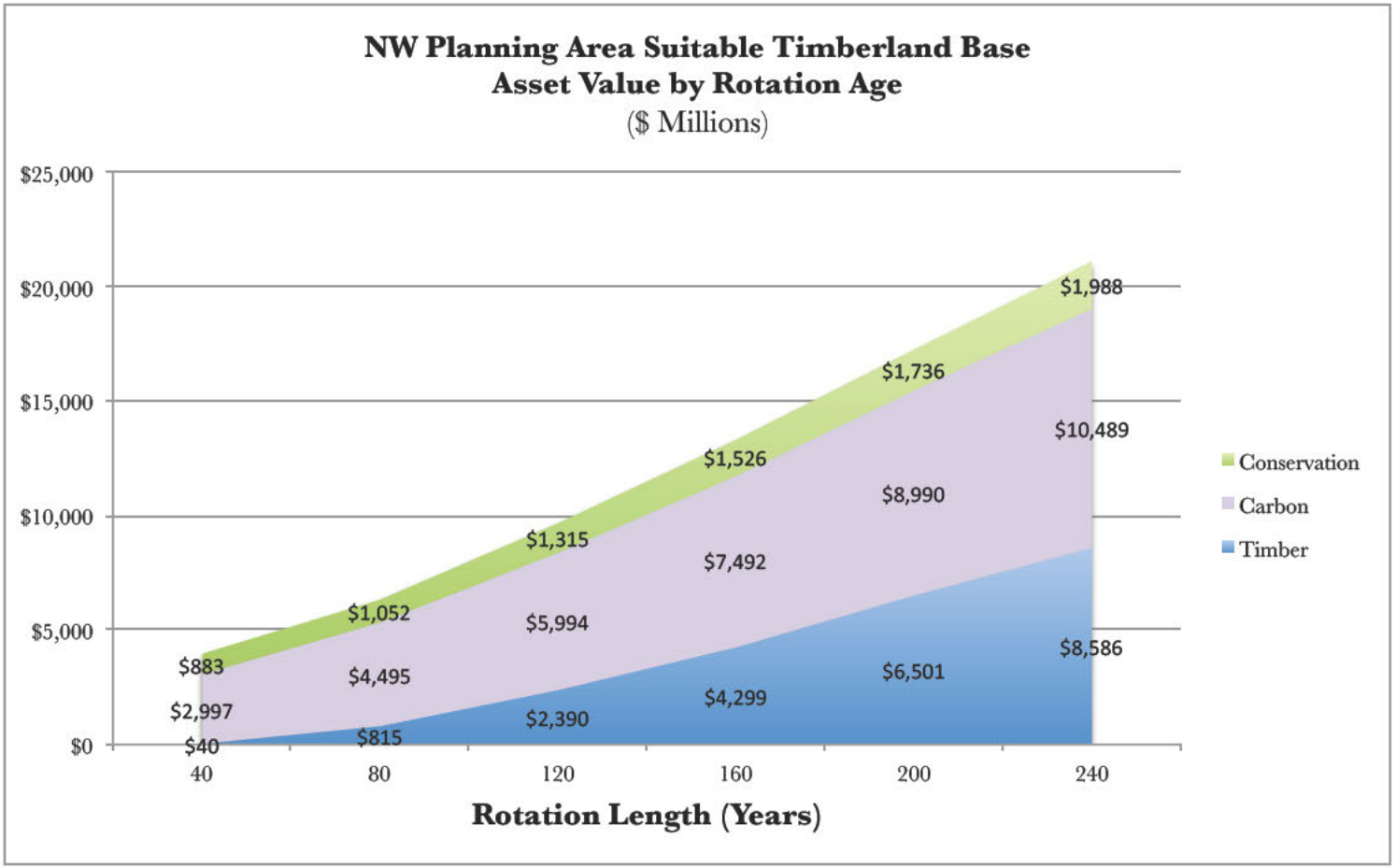
3. To demonstrate the importance of modeling asset value and income streams, CSE conducted a preliminary analysis of rotation length on the roughly 312,000 available acres in

the timber base. As shown on pages 1, 3 and 4 of the attachment, asset value increases for all three categories as rotation age increases because the standing timber stock has more volume and more valuable timber, because stored carbon dramatically increases, and because habitat values for conservation purchasers are significantly higher for late successional/old growth forests than they are for young plantations. For example, by extending rotation age from 40 to 240 years the state can boost the permanent value of the timber resource maintained from $39 million to nearly $8.6 billion.

4. These big jumps in asset value correspond to similarly big jumps in the value of potential income streams. Take timber revenues as an example, although the effect is similar for recreation, carbon payments, and other ecosystem services. As rotation length increases, fewer acres are cut meaning lower Board of Forestry costs while stumpage value increases due to changes in the composition of the product harvested from poles and pulpwood, to small sawtimber, to large sawtimber and finally to prime veneer logs. As shown on page 2 of the attachment, in our model net income from timber increases dramatically from a loss of nearly $12 million a year at a 40-year rotation to a peak of $52.5 million for a 200-year rotation length.

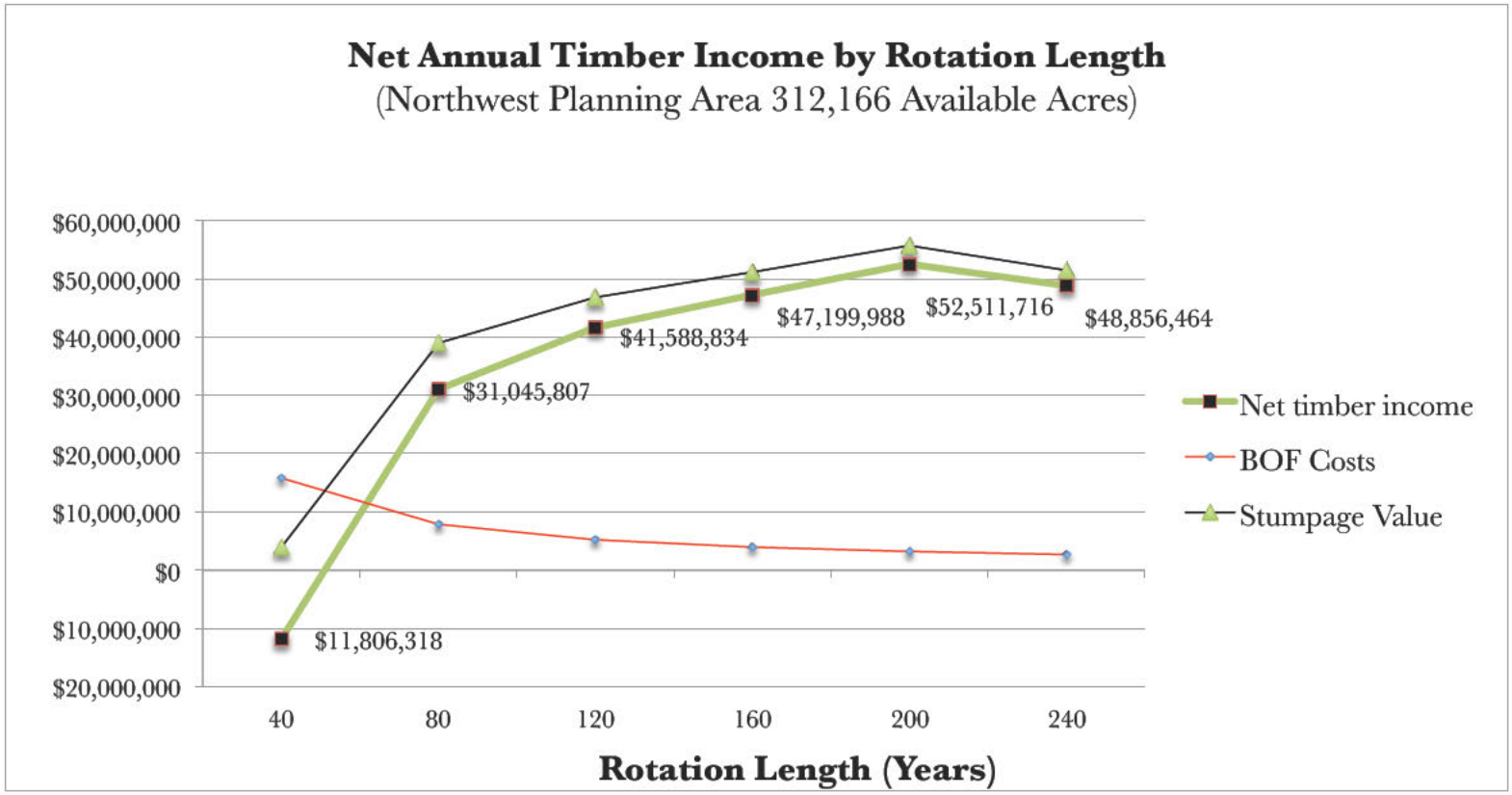
5. The bottom line is that longer rotations must be considered in meeting the greatest permanent value standard not only because standing timber is more valuable but because longer rotations produce harvests with more volume, more value, and lower costs. We hope the Board can work with us in taking a closer look at this overall model of asset value and income streams and the benefits of longer rotations in the weeks ahead.

John Talberth, Ph.D
President and Senior Economist
Center for Sustainable Economy
jtalberth[redacted]



Key assumptions:

- Conservation values from historical land purchase agreements. Values represent roughly 10 times ODR's 2015 bare land specially assessed forestland values and range from $2,830 per acre for young stands to $10,410 for late successional/old growth forest.
- Carbon density in metric tons carbon per acre increases from 60 to 360 based on data from Woods Hole Institute and the USDA Forest Inventory and Analysis. Following BLM, stock is valued at the current $40/mt CO2-e social cost of carbon dioxide emissions.
- Stumpage values per million board feet increase across five product types: poles and pulpwood, small sawtimber, median sawtimber, large sawtimber, and prime veneer logs. Stumpage range of $300-$378 per MBF taken from Forest Service research and ODF bid sheets.
- Mean annual increment (MAI) figures taken from Wigg (1989). MAI by age group is as follows: 0-39 (21.1 bf/acre), 40-79 (254), 80-119 (424.1), 120-159 (459.4), 160-199 (489.1), 200-239 (453.9).



Key assumptions:

- Stumpage values per thousand board feet increase across five product types: poles and pulpwood, small sawtimber, median sawtimber, large sawtimber, and prime veneer logs. Stumpage range of $300-$378 per MBF taken from Forest Service research and ODF bid sheets.
- Board of Forestry (BOF) costs taken from annual reports for the Northwest Planning Area districts. Includes costs for reforestation, young stand management and roads converted into per acre figures. Per acre estimates are $1,828 per acre for projects and roads and $191 per acre for reforestation and young stand management.
- Mean annual increment (MAI) figures taken from Wigg (1989). MAI by age group is as follows: 0-39 (21.1 bf/acre), 40-79 (254), 80-119 (424.1), 120-159 (459.4), 160-199 (489.1), 200-239 (453.9).
- Acres harvested falls with rotation length. Rotation length in years and corresponding (acres harvested) are as follows: 40(7804); 80(3902); 120(2601); 160(1951); 200(1561) and 240(1301).

Greatest Permanent Value (GPV) Model
Oregon State Forests

1. Asset value: timber						
Suitable timberland base (acres)	312,166	312,166	312,166	312,166	312,166	312,166
Age groups	1	2	3	4	5	6
Rotation length	40	80	120	160	200	240
Rotation midpoint	20	60	100	140	180	220
Acreage 0-39 years	312,166	156,083	104,055	78,042	62,433	52,028
Acreage 40-79 years	0	156,083	104,055	78,042	62,433	52,028
Acreage 80-119 years	0	0	104,055	78,042	62,433	52,028
Acreage 120-159 years	0	0	0	78,042	62,433	52,028
Acreage 160-199 years	0	0	0	0	62,433	52,028
Acreage 200-239 years	0	0	0	0	0	52,028
Mean annual increment 0-39 years (bf)	21.10	21.10	21.10	21.10	21.10	21.10
Mean annual increment 40-79 years (bf)	254.00	254.00	254.00	254.00	254.00	254.00
Mean annual increment 80-119 years (bf)	424.10	424.10	424.10	424.10	424.10	424.10
Mean annual increment 120-159 years (bf)	459.40	459.40	459.40	459.40	459.40	459.40
Mean annual increment 160-199 years (bf)	489.10	489.10	489.10	489.10	489.10	489.10
Mean annual increment 200-239 years (bf)	453.90	453.90	453.90	453.90	453.90	453.90
Total standing volume (bf)	131,734,052	2,576,305,998	7,275,548,907	12,658,643,466	18,516,813,055	24,055,095,739
Timber volume poles-pulpwood (bf)	131,734,052	197,601,078	219,556,753	230,534,591	237,121,294	241,512,429
Timber volume small sawtimber (bf)	0	2,378,704,920	2,643,005,467	2,775,155,740	2,854,445,904	2,907,306,013
Timber volume medium sawtimber (bf)	0	0	4,412,986,687	4,633,636,021	4,766,025,622	4,854,285,355
Timber volume large sawtimber (veneer log) (bf)	0	0	0	5,019,317,114	5,162,726,174	5,258,332,215
Timber volume large sawtimber (prime veneer log) (bf)	0	0	0	0	5,496,494,062	10,793,659,727
Total standing timber value	$39,520,216	$814,777,835	$2,390,026,827	$4,299,413,218	$6,500,935,685	$8,586,128,694

Assumptions:

Stumpage value poles-pulpwood ($/mbf)	$300
Stumpage value small sawtimber ($/mbf)	$318
Stumpage value medium sawtimber ($/mbf)	$336
Stumpage value large sawtimber (veneer log) ($/mbf)	$357
Stumpage value large sawtimber (prime veneer log) ($/mbf)	$378

2. Income stream: timber						
Suitable timberland base (acres)	312,166	312,166	312,166	312,166	312,166	312,166
Rotation length	40	80	120	160	200	240
Annual acreage cut	7804	3902	2601	1951	1561	1301
Volume per acre (bf)	1688	31408	53520	73504	94300	104712
Stumpage value of harvest ($/mbf)	$300	$318	$336	$357	$378	$378
Annual harvest revenue	$3,952,022	$38,924,977	$46,841,614	$51,139,573	$55,663,384	$51,482,854
BOF costs - projects and roads	$14,265,047	$7,132,524	$4,755,016	$3,566,262	$2,853,009	$2,377,508
BOF costs - reforestation and young stand management	$1,493,292	$746,646	$497,764	$373,323	$298,658	$248,882
Net income	-$11,806,318	$31,045,807	$41,588,834	$47,199,988	$52,511,716	$48,856,464

Assumptions:

Average costs projects and roads ($/acre)	$1,828
Average costs reforestation/young stands ($/acre)	$191

3. Asset value: carbon storage

Rotation length	40	80	120	160	200	240
Storage 0-39 years	18,729,960	9,364,980	6,243,320	4,682,490	3,745,992	3,121,660
Storage 40-79 years	0	18,729,960	12,486,640	9,364,980	7,491,984	6,243,320
Storage 80-119 years	0	0	18,729,960	14,047,470	11,237,976	9,364,980
Storage 120-159 years	0	0	0	18,729,960	14,983,968	12,486,640
Storage 160-199 years	0	0	0	0	18,729,960	15,608,300
Storage 200-239 years	0	0	0	0	0	18,729,960
Total stored carbon	18,730,000	28,095,020	37,460,040	46,825,060	56,190,080	65,555,100
Total stored carbon dioxide equivalent	74,920,000	112,380,080	149,840,160	187,300,240	224,760,320	262,220,400
Total stored carbon dioxide value @ $40/Tco2-e	$2,996,800,000	$4,495,203,200	$5,993,606,400	$7,492,009,600	$8,990,412,800	$10,488,816,000

Assmptions

Carbon density 0-39 years (t/ac)	60
Carbon density 40-79 years (t/ac)	120
Carbon density 80-119 years (t/ac)	180
Carbon density 120-159 years (t/ac)	240
Carbon density 160-199 years (t/ac)	300
Carbon density 200-239 years (t/ac)	360

4. Asset value: conservation

Rotation length	40	80	120	160	200	240
Value 0-39 years	$883,429,780	$441,714,890	$294,476,593	$220,857,445	$176,685,956	$147,238,297
Value 40-79 years	$0	$610,284,530	$406,856,353	$305,142,265	$244,113,812	$203,428,177
Value 80-119 years	$0	$0	$613,926,467	$460,444,850	$368,355,880	$306,963,233
Value 120-159 years	$0	$0	$0	$540,047,180	$432,037,744	$360,031,453
Value 160-199 years	$0	$0	$0	$0	$515,073,900	$429,228,250
Value 200-239 years	$0	$0	$0	$0	$0	$541,608,010
Total conservation value	$883,429,780	$1,051,999,420	$1,315,259,413	$1,526,491,740	$1,736,267,292	$1,988,497,420

Assmptions

Conservation value $/acre 0-39 years	$2,830
Conservation value $/acre 40-79 years	$3,910
Conservation value $/acre 80-119 years	$5,900
Conservation value $/acre 120-159 years	$6,920
Conservation value $/acre 160-199 years	$8,250
Conservation value $/acre 200-239 years	$10,410