

Oregon Board of Forestry – Virtual Public Meeting

Wednesday, November 4, 2020

10:00 a.m. to 5:45 p.m.

With the current public gathering restrictions, the Board of Forestry will hold its November meeting virtually to allow interested persons to view the meeting and participate statewide without having to travel or assemble indoors. The Board of Forestry public meeting will be conducted online and streamed live. There will not be an opportunity for the public to provide live testimony on the decision item during the meeting. Written testimony may be submitted for information items, before or up to two weeks after the meeting day to BoardofForestry@oregon.gov, and include the agenda item number with the submission.

Link to view Board of Forestry Meeting available at
<https://www.youtube.com/c/OregonDepartmentofForestry>

Prior meetings' audio and this meeting's written material available on the web www.oregon.gov/odf/board. The matters under the Consent Agenda will be considered in one block. Any board member may request removal of any item from the consent agenda. Items removed for separate discussion will be considered after approval of the consent agenda. Public comment will not be taken on consent agenda items.

Consent Agenda

10:00 – 10:01	A.	<u>September 9, 2020 Board of Forestry Meeting Minutes</u>	State Forester Peter Daugherty
10:00 – 10:01	B.	<u>Permanent Rulemaking for salmon, steelhead, and bull trout streams in Siskiyou Geographic Region</u>	Josh Barnard
10:00 – 10:01	C.	<u>ODF-DEQ Collaboration Quarterly Update</u>	Kyle Abraham
10:00 – 10:01	D.	<u>Financial Dashboard Update</u>	Bill Herber and James Short
10:00 – 10:01	E.	<u>*Proposed Final Order Review – Siskiyou Cascade Resources</u>	Greg Wagenblast
10:00 – 10:01	F.	<u>October 6, 2020 Board of Forestry Meeting Minutes</u>	Peter Daugherty

Action and Information

10:01 – 10:20	1.	<u>State Forester and Board Member Comments</u>	
10:20 – 10:45	2.	<u>*Hearings before the Board of Forestry</u>	Tim Holschbach <i>Landowner in Tillamook County have appealed their addition to the forest patrol assessment roll and have requested a hearing before the Board. This is a decision item for the Board.</i>
10:45 – 11:15	3.	<u>Fire Season Update</u>	Doug Grafe <i>The Department will provide a report to the Board on the 2020 fire season. This is an information item.</i>
11:15 – 12:00	4.	<u>DOJ Memorandum on Statutory Authority relating to Carbon and Climate</u>	Danny Norlander and Matt Devore <i>The Department and the Department of Justice (DOJ) will present an analysis on the Board's statutory authority regarding rulemaking and policymaking for carbon and climate. This is an information item.</i>
12:00 – 12:30		<u>LUNCH</u>	
12:30 – 12:45	5.	<u>Forest Trust Land Advisory Committee Testimony</u>	David Yamamoto <i>The FTLAC is a statutorily established committee that advises the Board on State Forests policy.</i>
12:45 – 12:50	6.	<u>Oregon Forest Carbon Accounting Framework</u>	Andrew Yost <i>Forest Ecologist with ODF will provide an overview and status of the forest carbon accounting framework and introduce four of the researchers that are primary contributors to each dimension of the framework.</i>
12:50 - 1:35	a)	<u>Forest Ecosystem Carbon Report and PNW Forest Carbon Initiative</u>	Glenn Christensen <i>Glenn Christensen, with PNW Forest Inventory and Analysis, will present to the Board on the results of the Oregon Forest Ecosystems Report that features the stocks and flux of carbon in Oregon's forested ecosystems. Glenn will also present the progress of the PNW Forest Carbon Initiative that includes regional forest ecosystem analyses, the social implications of forest carbon flux, and forest carbon modeling. This is an information item.</i>
1:35 – 2:20	b)	<u>Harvested Wood Product Report and Sawmill Energy Report</u>	Todd Morgan <i>Todd Morgan, Director of the Bureau of Business and Economic Research at the University of Montana will present to the Board on the Oregon Harvested Wood Products Carbon Report and the Oregon Sawmill Energy Report. This is an information item.</i>
2:20 – 2:30		Afternoon Break	

- 2:30 – 3:15 **c) Global Carbon Flux and Forest Considerations** Werner Kurz
Senior research scientist with Canada's Pacific Forestry Centre in Victoria, British Columbia. will present to the Board on the role of forests in the global carbon cycle, the potential for managing forests to mitigate rising levels of atmospheric greenhouse gases, and the development of the Carbon Budget Modeling framework. This is an information item.
- 3:15 – 4:00 **d). Forest Management Scenarios for Carbon Mitigation** Kendall DeLyser
Senior Manager of Forests and Climate with American Forests, will present to the Board on a collaborative project with ODF to simulate the carbon consequences of alternative forest management scenarios focused on mitigation of fossil fuel emissions. This is an information item.
- 4:00 – 5:00 **7. ODF Urban and Community Forestry Assistance Program** Kristin Ramstad, Dr. Vivek Shandas,
.....and Dr. Geoffrey Donovan
The Department's Urban and Community Forestry Assistance Program manager, Kristin Ramstad, will provide a brief update on the urban forestry program's achievements. Then, along with Dr. Vivek Shandas, with Portland State University's (PSU) Department of Urban Studies and Planning, and Dr. Geoffrey Donovan, with the USDA FS PNW Research Station, Kristin will offer an overview of current urban forestry research relating to human health and urban livability and its implications for future policies and actions. This is an information item.
- 5:00 – 5:30 **8. Oregon Global Warming Commission EO 20-04 Goal Setting** Danny Norlander and Catherine McDonald
The Department along with the Chair of the Oregon Global Warming Commission (OGWC) will present to the Board on Executive Order 20-04 requirements for the OGWC and its intersection with ODF and the forest sector. This is an information item.
- 5:30 – 5:45 **9. Board Closing Comments and Meeting Wrap Up** Chair Ineson and Board Members
Board Chair and members to summarize meeting's action items and provide closing comments.

Times listed on the agenda are approximate. At the discretion of the chair, the time and order of agenda items—including addition of an afternoon break—may change to maintain meeting flow. The board will hear public testimony [*excluding marked items] and engage in discussion before proceeding to the next item.* A single asterisk preceding the item number marks a work session, and public testimony/comment will not be accepted.

BOARD WORK PLANS: Board of Forestry (Board) Work Plans result from the board's identification of priority issues. Each item represents commitment of time by the Board of Forestry and Department of Forestry staff that needs to be fully understood and appropriately planned. Board Work Plans form the basis for establishing Board of Forestry meeting agendas. Latest versions of these plans can be found on the Board's website at: <https://www.oregon.gov/odf/Board/Pages/AboutBOF.aspx>

PUBLIC TESTIMONY: The Board of Forestry places great value on information received from the public. The Board will only hold public testimony at the meeting for decision items. The Board accepts written comments on all agenda items except consent agenda and Work Session items [see explanation below]. Those wishing to testify or present information to the Board are encouraged to:

- Provide written summaries of lengthy, detailed information.
- Remember that the value of your comments is in the substance, not length.
- For coordinated comments to the Board, endorse rather than repeat the testimony of others.
- To ensure the Board will have an opportunity to review and consider your testimony before the meeting, please send comments no later than 72 hours prior to the meeting date. If submitted after this window of time the testimony will be entered into the public record but may not be viewed by the Board until after the meeting.
- For in-person meetings, sign in at the information table in the meeting room when you arrive. For virtual meetings, follow the sign up instructions provided in the meeting agenda.

Written comments for public testimony provide a valuable reference and may be submitted before, during, or up to two weeks after the meeting for consideration by the Board. Please submit a copy to BoardofForestry@oregon.gov, and written comments received will be distributed to the Board. Oral or written comments may be summarized, audio-recorded, and filed as record. Audio files and video links of the Board's meetings are posted within one week after the meeting at <https://www.oregon.gov/odf/Board/Pages/BOFMeetings.aspx>

The Board cannot accept comments on consent agenda items or a topic for which a public hearing has been held, and the comment period has closed. No public comments can be submitted on hearings scheduled for individual persons or entities.

WORK SESSIONS: Certain agenda topics may be marked with an asterisk indicating a "Work Session" item. Work Sessions provide the Board opportunity to receive information and/or make decisions after considering previous public comment and staff recommendations. No new public comment will be taken. However, the Board may choose to ask questions of the audience to clarify issues raised.

- During consideration of contested civil penalty cases, the Board will entertain oral argument only if Board members have questions relating to the information presented.
- Relating to the adoption of Oregon Administrative Rules: Under Oregon's Administrative Procedures Act, the Board can only consider those comments received by the established deadline as listed on the Notice of Rulemaking form. Additional input can only be accepted if the comment period is formally extended (ORS 183.335).

GENERAL INFORMATION: For regularly scheduled meetings, the Board's agenda is posted on the web at www.oregonforestry.gov two weeks prior to the meeting date. During that time, circumstances may dictate a revision to the agenda, either in the sequence of items to be addressed, or in the time of day the item is to be presented. The Board will make every attempt to follow its published schedule, and requests your indulgence when that is not possible.

In order to provide the broadest range of services, lead-time is needed to make the necessary arrangements. If special materials, services, or assistance is required, such as a sign language interpreter, assistive listening device, or large print material, please contact our Public Affairs Office at least three working days prior to the meeting via telephone at 503-945-7200 or fax at 503-945-7212.

Use of all tobacco products in state-owned buildings and on adjacent grounds is prohibited.

DRAFT Board of Forestry Meeting Minutes

September 9, 2020

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Items listed in order heard.

Complete audio recordings from the meeting and attachments listed below are available on the web at www.oregonforestry.gov.

- (1) Presentation, [2020 Fire Season Update](#), Agenda Item 1

In accordance with the provisions of ORS 526.016, a meeting of the Oregon Board of Forestry was held virtually on September 9, 2020 and hosted at the Oregon Department of Forestry Headquarters on 2600 State Street, Salem, OR 97310.

All Board members joined online by 8:30 a.m. into Zoom webinar. Chair Imeson called the public meeting to order at 9:00 a.m.

Board Members Virtually Present:

- Nils Christoffersen
- Cindy Deacon Williams (joined at 9:05 a.m.)
- Jim Kelly
- Joe Justice
- Brenda McComb
- Mike Rose
- Tom Imeson

Board Members Absent:

None

CONSENT AGENDA:

- A. JULY 22, 2020 BOARD OF FORESTRY MEETING MINUTES
Approval of Board Meeting Minutes.

ACTION: The Board approved minutes from the July 22, 2020 meeting.

- B. REGIONAL FOREST PRACTICES COMMITTEE APPOINTMENTS AND REAPPOINTMENTS
Approval of the appointments and reappointments for the Regional Forest Practice Committees (RFPC) in Oregon, per ORS 527.650.

ACTION: The Board approved the following eight reappointments and one new appointment.

Northwest Oregon Region:

Wendell Locke	term expiring September 2023
Steve McNulty	term expiring September 2023
Randy Silbernagel (p)	term expiring September 2023

Southwest Oregon Region:

Dana Kjos (Chair)	term expiring September 2023
Dan Fugate	term expiring September 2023
Darin McMichael	term expiring September 2023

Eastern Oregon Region:

Vacant	term expiring September 2022
Bobby Douglas (New)	term expiring September 2022
Vacant	term expiring September 2023
Patrick Marolla	term expiring September 2023
Chris Johnson	term expiring September 2023

(p) Public Member

C. **FOREST PRACTICES MONITORING UNIT UPDATE**

Department update on Private Forests Monitoring activities since the last update to the Board of Forestry in September 2019. Update includes the implementation study, two monitoring projects assessing effectiveness of riparian protections, and other monitoring-related work.

INFORMATION ONLY.

D. **FOREST HEALTH UNIT UPDATE**

Department overview of the Oregon Department of Forestry (ODF) Forest Health Unit's work on major insect, disease, and other damaging agents affecting Oregon forests in 2019-2020, as required by Oregon Revised Statute (ORS) 527.335.

INFORMATION ONLY.

Mike Rose motioned for approval of the consent agenda items. Joe Justice seconded the motion. Voting in favor of the motion: Nils Christoffersen, Joe Justice, Jim Kelly, Brenda McComb, Mike Rose, and Tom Imeson. Against: none. With Board consensus consent agenda items were approved, and the motion carried. Cindy Deacon Williams absent for vote.

ACTION AND INFORMATION:

1. **STATE FORESTER AND BOARD MEMBER COMMENTS**

[Listen to audio](#) MP3 – (4 minutes and 28 seconds – 6.15 MB)

Chair Imeson commented on:

- Modification of the Board meeting agenda due to the fire state of emergency and the Department shift of priorities to respond.
- Outlined Board proceedings for Board members, presenters, and the public.

- Noted the public meeting will be live streamed, recorded, and posted online.
- Submitted written public testimony can be accepted through September 23, 2020, and included with the meeting record.

State Forester Daugherty commented on:

- Overview of the fire emergency across the state. Remarked on initial report findings, noted devastation of loss for homes and businesses, and offered condolences to the communities impacted. Explained how the Department is principally focused on life, safety, and point protection, as evacuations are in effect. Described how the Department staff are being impacted by the fires, and noted the loss of the Santiam Unit Office in Lyons, Oregon. Closed by introducing Travis Medema, Eastern Oregon Area Director as presenter for item one.

Board Member Comments: None

Public Testimony: No provision made for public testimony.

INFORMATION ONLY.

2. 2020 FIRE SEASON UPDATE

[Listen to audio](#) MP3 – (32 minutes and 2 seconds – 44 MB)
Presentation ([attachment 1](#))

Travis Medema, Eastern Oregon Area Director, opened by thanking all the emergency response personnel, the fire service, community leaders, and agency staff that have responded to the fires on the landscape. He explained the aftermath of large fires, as illustrated in California, is becoming a reality in Oregon and described the parallel impacts fire has on the terrain, communities, and resources. He reviewed the drought outlook for Oregon, noting the most problematic fires on the landscape are located in areas with abnormal or extreme drought conditions and listed the Oregon counties with drought declarations. Connected warm temperatures with drought persistence, reviewed the trending temperature and precipitation forecasted for fall 2020, and described how the forecasted conditions translate into wildfire potential for the state. He apologized the fire statistics to date were not updated with the latest Labor Day fires and acres burned, as these numbers are difficult to track in the current state of emergency.

Medema presented the fire briefing map, outlining the series of complexes and fires challenging the Department. He listed seven theaters of operation on the landscape, described the deployment of resources and incident command teams, estimated acres burned and communities impacted by the fires within each area. He explained the fires included in the briefing map were on the landscape before the Labor Day wind event. He listed the fires that received fire management assistant grants (FMAG) and described the potential of more FMAG's engaged as the fires continue to burn. He highlighted the main challenge to fighting these wildfires, as minimal to no resources available in the Pacific Northwest region or nationally, the growing magnitude of the wildfires, and the triage necessary to assess the loss of structure, property, and life. He described how the critical fire weather event developed, how the east winds have contributed to extreme fire danger, and the rapidly changing fire scenario on the landscape. He highlighted the strategic investment and utility of the night vision infrared technology in locating fires for successful initial attacks. Reviewed the 2020

safety statistics and five-year averages, as well as the COVID-19 module deployments organized for personnel responding to fire incidents.

Medema provided an overview of large wildfire cost, average acres burned, and fire season severity, but explained the graphs were outdated due to the catastrophic nature of the recent fire events and will be updated for the next Board meeting. He shared gratitude for Oregon's complete and coordinated fire protection system and the first responders actively responding across the state during these unprecedented times. He recognized the coordination and contribution of communities coming together to support one another in response and recovery. Medema closed by stating how the wildfire protection system in Oregon needs additional capacity and support, and how coordinated leadership by the Board, Executive Branch, and Legislative Branch will be crucial for Oregon to address this need.

Board members commented on the 2020 Fire Season Update Presentation.

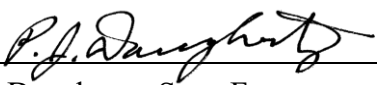
- Board Chair Imeson inquired about the weather forecast projected for the next several days and how it may affect the current fire situation. Medema outlined the last days of the east winds and warmer temperatures across the state. He noted the beginnings of an onshore push, which can bring moisture to the coastal region and the moderating east winds may provide fire operations opportunity to assess and establish control points over the weekend.
- Board Chair Imeson appreciated the fire report and grateful for the Department's expertise, dedication, and commitment in handling the challenges of this fire season.
- A Board member inquired about the Department's perspective on severity resources and initial attack resources with the current environment and fire conditions. Medema provided his perspective on the successful initial attack efforts, coordination of resources, and utilization of aviation assets for 2020. He mentioned during severe fire situations the importance of initial and extended attacks, as well as securing aviation resources and assets, but noted in the long-term how critical these assets will be.
- Board members echoed many of the sentiments and perspectives shared by the Department and the State Forester. One Board member shared a first-hand observation of the changing dynamic that Almeda and Obenchain fires presented for local communities in Rogue Valley. Noted how challenging the set of circumstances can be in any area of the landscape and thanked everyone for their remarkable response. Noted the difficulty with receiving up-to-date information as many in evacuated areas have limited to no power. Medema mentioned how the Board member's narrative highlighted the magnitude of the current fire situation.

Public Testimony: None

INFORMATION ONLY.

Board Chair Imeson adjourned the public meeting at 9:38 a.m.

Respectfully submitted,
/s/ Peter Daugherty


Peter Daugherty, State Forester and
Secretary to the Board

Agenda Item No.:	B
Work Plan:	Private Forests
Topic:	Water Quality
Presentation Title:	Rule language adoption for Salmon, Steelhead, and Bull Trout Streams in the Siskiyou Region.
Date of Presentation:	Nov 4, 2020
Contact Information:	Josh Barnard, Private Forests Deputy Division Chief 503-945-7493 Josh.W.BARNARD@oregon.gov

SUMMARY

This item implements direction from the 2020 1st Special Session of the Legislature through Senate Bill (SB) 1602 to create new rules within the Oregon Forest Practices Act. The legislation directed the Board of Forestry (Board) to adopt rules to make the 2017 board rules regarding salmon, steelhead, and bull trout applicable for the Siskiyou Geographic Region. These new rules shall be effective January 1, 2021. The purpose of this item is to provide the Board with a summary of the input received and a copy of the proposed final rules for adoption.

CONTEXT

The Board’s 2011 *Forestry Program for Oregon* states that the Board supports an effective, science-based, and adaptive Oregon Forest Practices Act (FPA) as a cornerstone of forest resource protection on private lands in Oregon (Objective A.2). The discussion of Goal A recognizes that the FPA includes a set of best management practices to ensure forest operations are conducted to meet state water quality standards adopted under the federal Clean Water Act. The Board’s guiding principles and philosophies includes a commitment to continuous learning, evaluating and appropriately adjusting forest management policies and programs based upon ongoing monitoring, assessment, and research (Value Statement 11).

The Board’s 2011 *Forestry Program for Oregon* also recognizes the dynamic nature of Oregon's forests, which are diverse, dynamic, and resilient ecosystems at a landscape scale (Value Statement 2). The Board supports actively managing these forests to maintain forest health, to conserve native plant and animal species, and to produce the products and benefits people value (Value Statement 4).

BACKGROUND

In February 2020, representatives of the forest industry and representatives of environmental interests announced their collaboration by reaching agreement on a memorandum of understanding (MOU). The MOU outlined several key elements for a collaborative approach to forest management decisions in Oregon. One of these elements was to enact legislation that would extend current rules for salmon, steelhead, and bull trout

streams to the Siskiyou Geographic Region. To support the MOU, the Board initiated a rulemaking process to adopt temporary rules for salmon, steelhead, and bull trout streams in the Siskiyou Geographic Region during their June meeting. SB 1602 was passed shortly thereafter during the 2020 legislative 1st special session directing the Board to make permanent rules regarding salmon, steelhead and bull trout applicable to the Siskiyou Geographic Region. In July 2020, the Board directed the Department to stop the temporary rule process, initiate permanent rule making under ORS 527.714 (1) (b), and adopt permanent rules for salmon, steelhead, and bull trout streams in the Siskiyou Geographic Region.

ANALYSIS

Based on the Board's decision in July, 2020 to initiate the permanent rule making process for salmon, steelhead, and bull trout streams in the Siskiyou Geographic Region the Department has completed the following work outlined ORS 183, the Administrative Procedures Act (APA).

The Department identified the existing Siskiyou Advisory Committee as the advisory committee for this rulemaking. On August 13, 2020 the Department met with the Committee to review the draft rule language along with the statement of need and fiscal impact statement. On August 18, the Department submitted a Notice of Proposed Rulemaking filing including the statement of need and fiscal impact statement with Secretary of State's office. The formal Notice was published in the Oregon Bulletin announcing a Public Comment period that remained open until September 28 and public hearing was held on September 23.

A summary of the public hearing and public comments received (Attachment 1) and a summary of Siskiyou Advisory Committee meeting (Attachment 2) are provided.

RECOMMENDATION

- (1) The Department recommends that the Board approve and adopt the Proposed Final Rule Language as submitted with an effective date of January 1, 2021. (Attachment 3).

NEXT STEPS

If approved, the Department will:

- (1) File the rules with Oregon Secretary of State before January 1, 2021.
- (2) Establish an SSBT regulatory layer in Siskiyou Geographic Region by January 1, 2021.
- (3) Conduct education and outreach for field staff and landowners by January 1, 2021.

ATTACHMENTS

- (1) Public Hearing Report and Public Comments Summary.
- (2) Siskiyou Advisory Committee Meeting Summary.
- (3) Proposed Final Rule Language.

Public Hearing Report and Public Comments Summary for Proposed Protection rules for Salmon, Steelhead and Bull Trout Streams in the Siskiyou Geographic Region

Date: November 4, 2020

To: Chair Imeson, State Board of Forestry

From: Greg Wagenblast, Policy Analyst and Civil Penalties Administrator,
Private Forests Division – Hearings officer for the Siskiyou SSBT Hearing

Subject: Protection Rules for Salmon, Steelhead and Bull Trout Streams in the Siskiyou
Geographic Region, Public Outreach, and Hearings

This hearings report contains a summary of agency outreach conducted to generate engagement in the public process and a summary of oral comments received. Submitted written comments were accepted up until 5:00 PM on September 28, 2020.

The proposed rule language was provided to the Board of Forestry (BOF) at the July 22, 2020 meeting. The Notice of Proposed Rulemaking, Statement of Need and Fiscal Impact was filed with the Secretary of State's Office on August 18, 2020. The formal Notice was published in the Oregon Bulletin announcing a public comment period that remained open until September 28. The Department scheduled a virtual public hearing in adherence to the state's social distancing requirements. The format of the public open house/public hearings was consistent with the Attorney General's Model Rules of Procedure under the Administrative Procedures Act.

The public hearing was held virtually with a call-in phone option on September 23, 2020. The hearing format opened at 5:15 PM, beginning with an information session, followed at 6:06 PM by an official hearing and opportunity to receive comments. At the hearing, staff provided a brief overview on the rule changes and rulemaking process. The open house continued with an informal opportunity for the public to ask questions about the proposed rules. After the proposed rule presentation and time for questions, the public hearing was officially opened for public testimony to the record. Attendees were provided an outline for the program and instructions on how to participate. In addition, an announcement was made at the start of the hearing that notified attendees the program was being recorded.

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Outreach

A host of outreach methods was used to garner public response for providing written comments and participating in meetings and hearings. An accounting of the different methods utilized are listed below:

Mandatory Notification to Legislators1 1
Mandatory Notification to Interested Parties2 1
Notification to potentially affected agencies 11
News Release 1
Information posted to ODF website 1
Regional Forest Practice Committee Meetings 1
Committee for Family Forestlands Meetings 1
Public Hearings schedule posted on ODF public pages 1
Public Hearings schedule posted in the Oregon Bulletin 1
Public Hearing – September 23, 2020 1
Utilized a Public Comment e-mail address (privateforests.publiccomment@oregon.gov) to receive public comments 1

1 As described in OAR 629-001-0000

2 As described in OAR 629-001-0000

Public Hearing
September 23, 2020, Hosted Virtually

Hearing Officer – Greg Wagenblast, Policy Analyst and Civil Penalties Administrator, Private Forests Division, ODF

Open house rule summary presenter/Hearings Assitant – Jay Walters, Forest Practices Field Coordinator, Private Forests Division, ODF

At 5:15 PM the program began with an open house presentation and Q&A by Jay Walters prior to the formal hearing. The hearing was held in accordance with the Administrative Procedures Act and OAR 137-001-0030. The rulemaking hearing for proposed protection rules for Salmon, Steelhead and Bull Trout Streams in the Siskiyou Geographic region was convened at 6:06 PM.

There were 7 members of the public present for the duration of the program. One individual offered to provide public comment (reading from their written comments mailed into the agency). The oral testimony for this individual is below:

Robyn Janssen: *Ya, Robyn Janssen, I am in Ashland Oregon. I am with Rogue RiverKeeper and we are for the proposed rule. I just want to start by thanking you Greg and the ODF staff for the opportunity to provide public comment today. I also want to begin by expressing gratitude to those fire fighters, first responders and everyone on the front lines protecting our local community recently from the Almeda, South Obenchain and Slater Fires that were recently impacted the Rogue Valley and its watersheds, so thank you to all of those folks, there are many of them.*

Again my name is Robyn Janssen and I am the director of Rogue RiverKeeper based in Jackson County in the Siskiyou Geo-region. And Rogue Riverkeeper is a non-profit organization based in Jackson County within the Siskiyou Region that works to protect and restore clean water, native fish, and healthy communities in the Rogue River Basin. And On behalf of our members and supports we support the proposed rulemaking to apply Salmon, Steelhead and Bull Trout or SSBT stream buffer standards adopted in 2017 Western Oregon to the Siskiyou region.

First, we want to be clear that, although this rule change is an improvement to current protections that apply in the Siskiyou, neither the Board nor the legislature has made any associated findings that the current stream buffer standards for the Siskiyou are sufficient to meet water quality standards for temperature. Further, no findings were made regarding the sufficiency of current standards to meet any other water quality standards, for any TMDL, or as the basis for an approvable Habitat Conservation Plan under the Endangered Species Act. The proposed rulemaking to apply the SSBT standards to the Siskiyou is a direct result of Senate Bill 1602, and does not reflect any decision or finding regarding whether or not the current standards are sufficient to protect water quality under the Clean Water Act.

Second, we want to reiterate that the science is clear that only 120-foot buffers will achieve compliance with the Protecting Cold Water (PCW) criterion to the maximum extent, or nearly 100% of the time. Even the final "Siskiyou Streamside Protections Review" released in the September 9th Board packet reiterates this point. A 100-foot buffer is expected to meet the PCW 80-85% of the time. A 90-foot buffer is expected to meet the PCW 50% of the time. The SSBT buffer standards require 60-

foot and 80-foot buffers respectively on small and medium streams. As a result, the SSBT standard creates a high degree of risk that the PCW will not be met.

Further, we would emphasize that there are six temperature TMDLs within the Siskiyou region and five of those have a Human Use Allowance of 0 degrees Celsius. The Rogue Basin TMDL has an HUA of 0.04 degrees Celsius.

As a result, we expect that riparian protections on small and medium SSBT streams will be on the table for future policy development as part of the statewide Habitat Conservation Plan discussions. Thank you for the opportunity to provide to comment in support of the proposed rulemaking to apply the SSBT Standards to the Siskiyou Geo-region

The Hearing was closed at 6:24PM after all the other participants were queried for interest in providing testimony.

A copy of the transcript has also been placed on the Departments website: [Hearing transcript from the meeting on Sept. 23, 2020](#)

Response: Thank you for your comments. As noted, the proposed rules are a result of implementing legislative direction from SB 1602 and sufficiency of rules is not in the scope of this rule making. These comments will be included in the permanent record for future reference.

Public Comments Received: 5 Written Comments with attachments were submitted to the Agency. The comments are included below. For the full package of comments and the attachments as submitted, use this link to access the documents on the Departments website: [Submitted public comments](#)



Greg Wagenblast
Oregon Department of Forestry
2600 State Street, Building D
Salem, OR 97310

September 18, 2020

Re: Public Comment on Proposed Rulemaking to Apply Salmon, Steelhead, and Bull Trout (“SSBT”) Stream Buffer Standards to Siskiyou Georegion

Dear Mr. Wagenblast:

Thank you for the opportunity to provide public comment on the proposed rulemaking to apply the Salmon, Steelhead, and Bull Trout (“SSBT”) stream buffer standards to the Siskiyou Georegion. Rogue Riverkeeper is a non-profit organization based in Jackson County within the Siskiyou Region that works to protect and restore clean water, native fish, and healthy communities in the Rogue River Basin. The Wild Salmon Center is a non-profit organization that works to strengthen local stewardship and ensure long term salmon conservation.

Following the Board of Forestry’s November 2015 decision to exclude the Siskiyou region from the new SSBT stream buffer rule, Rogue Riverkeeper and the Wild Salmon Center have consistently advocated for the Board to review and update the existing stream buffer standards for the region. Leaving small and medium streams that support salmon and steelhead in the Siskiyou region with significantly less protections than the rest of western Oregon is a serious concern given the compelling evidence that current rules are inadequate to prevent logging that warms water temperatures in violation of the Protecting Coldwater Criterion (“PCW”), a fundamental component of the state’s water quality standard for stream temperature.¹

On behalf of our members and supporters, we support the proposed rulemaking to apply the SSBT stream buffer standards adopted in 2017 for western Oregon to the Siskiyou region. This represents a modest improvement and a first step to bring stream buffer standards in the Siskiyou up to the same level as the rest of western Oregon. However, we would like to emphasize the following points:

- 1. Neither the Board of Forestry nor the Oregon Legislature made any associated findings that the current stream buffer standards for the Siskiyou are sufficient to meet water quality standards, any TMDL, or to be used as the basis for an approval HCP.**

¹ Groom et al. 2011. *Response of Western Oregon (USA) stream temperature to contemporary forest management*, *Forest Ecology and Management*, 262: 1618-1629.

First, we want to be clear that, although this rule change is an improvement to current protections that apply in the Siskiyou, neither the Board nor the legislature has made any associated findings that the current stream buffer standards for the Siskiyou are sufficient to meet water quality standards for temperature. Further, no findings were made regarding the sufficiency of current standards to meet any other water quality standards, for any TMDL, or as the basis for an approvable Habitat Conservation Plan under the Endangered Species Act. The proposed rulemaking to apply the SSBT standards to the Siskiyou is a direct result of Senate Bill 1602, and does not reflect any decision or finding regarding whether or not the current standards are sufficient to protect water quality under the Clean Water Act.

2. The science is clear that only 120-foot buffers will achieve compliance with the PCW to the maximum extent.

Second, we want to reiterate that the science is clear that only 120-foot buffers will achieve compliance with the Protecting Cold Water (PCW) criterion to the maximum extent, or nearly 100% of the time. Even the final "Siskiyou Streamside Protections Review" released in the September 9th Board packet reiterates this point. A 100-foot buffer is expected to meet the PCW 80-85% of the time. A 90-foot buffer is expected to meet the PCW 50% of the time. The SSBT buffer standards require 60-foot and 80-foot buffers respectively on small and medium streams. As a result, the SSBT standard creates a high degree of risk that the PCW will not be met.

Additionally, we would emphasize that there are six temperature TMDLs within the Siskiyou region and five of those have a Human Use Allowance of 0 degrees Celsius. The Rogue Basin TMDL has an HUA of 0.04 degrees Celsius.

We incorporate by reference all of our previous comments and those submitted by the Oregon Stream Protection Coalition regarding the RipStream study and the resulting development of the 2017 stream buffer standard.

3. Conclusions

In conclusion, we support the proposed rulemaking to apply the SSBT stream buffer standards adopted in 2017 for western Oregon to the Siskiyou region. We also want to emphasize that no findings regarding the sufficiency of existing stream buffer standards in the Siskiyou were made as part of this process. Further, the science is clear that only 120-foot stream buffers will be likely to achieve maximum compliance with the PCW. The 2017 SSBT stream buffer standards create a high degree of risk that the PCW will not be met. As a result, we expect that riparian protections on small and medium SSBT streams will be on the table for future policy development as part of the statewide Habitat Conservation Plan discussions.

Thank you for the opportunity to provide public comments.

Sincerely

Stacey Detwiler
Conservation Director
Rogue Riverkeeper

Bob Van Dyk
Policy Director for Oregon and California
Wild Salmon Center



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
OREGON OPERATIONS OFFICE
805 Southwest Broadway, Suite 500
Portland, Oregon 97205

September 24, 2020

Mr. Greg Wagenblast
Oregon Department of Forestry
2600 State Street Bldg. D
Salem, OR 97310
(sent via email to privateforests.publiccomment@oregon.gov)

RE: Proposed Siskiyou Georegion salmon, steelhead, and bull trout stream protection rules

Dear Mr. Wagenblast,

We thank the Oregon Department of Forestry for the opportunity to provide comments on the proposed Siskiyou Georegion salmon, steelhead, and bull trout (SSBT) stream protection rule. We understand ODF is proposing the rulemaking in accordance with Senate Bill 1602, passed in the June 2020 special session of the Oregon Legislature.

We applaud Oregon's legislators for recognizing the need for stream protections in the Siskiyou and we're grateful for ODF's expediency in proposing to extend current SSBT protection into the Siskiyou. While the proposed rule meets the intent of SB 1602, EPA is suggesting ODF consider wider riparian buffers to protect water quality in the Siskiyou Georegion.

The attached February 22, 2017 letter from EPA to ODF transmitting comments on the originally proposed SSBT rules provides the rationale for wider riparian buffers. Specifically, EPA found the SSBT riparian buffers to be less protective than what scientific data and modeling concluded was necessary to attain water quality standards and protect beneficial uses. We believe the more protective options outlined in our 2017 comments should be considered for adoption.

We also note that SB 1602, Section 1 requires the Governor to facilitate mediation sessions between the representatives of the forest industry and environmental interests that signed the Memorandum of Understanding announced by the Governor on February 10, 2020. According to SB 1602, the purpose of the mediation sessions is to develop an approach to evaluate and jointly recommend substantive and procedural changes to Oregon Forest Practices Act laws and regulations to advance the attainment of federal regulatory assurances for aquatic and riparian-dependent species.

While the mediation process is independent of the currently proposed rulemaking, it may offer an additional opportunity to address options for improving the SSBT rules. In addition to EPA's 2017 SSBT comments, the attached January 30, 2015 EPA and NOAA disapproval of Oregon's Coastal Nonpoint Pollution Control Program identified the needed protections for all small and medium fish-bearing and non-fish-bearing streams in Oregon. Together these two attachments should prove useful in identifying gaps for the mediation process to address.

Again, we thank you for the opportunity to provide comments and look forward to the results of this rulemaking and the recommendations from the mediation process. If you have any question or concerns please contact Dan Brown of my staff at 503-326-6832, or brown.dan@epa.gov.

Sincerely,

ANTHONY
BARBER

Digitally signed by
ANTHONY BARBER
Date: 2020.09.22 10:46:26
-07'00'

Anthony L. Barber, PE
Regional Forestry Executive Lead
Director, Oregon Operations Office

Attachments

cc: Kyle Abrahms, ODF
Jennifer Wigal, ODEQ

From: Karen Mitzner <co-create@comcast.net>
Sent: Sunday, September 27, 2020 4:48 PM
To: PUBLICCOMMENT PRIVATEFORESTS * ODF <PRIVATEFORESTS.PUBLICCOMMENT@oregon.gov>
Subject: Private Forest Siskiyou SSBT Rulemaking

To: Greg Wagenblast, Oregon Department of Forestry

From: Karen Mitzner

Re: Stream Protection Rules

Please consider the following comments to be related to **stream protection generally**, and not specifically to the issue of Wildlife Food Plots.

As you are well aware, our streams are best protected with forest management practices and rules that insure that wildfires are kept to a minimum.

I ask that Oregon consider the value of using indigenous stewardship practices as pivotal in aiding conservation and management of resources.

Please consult with experts, such as Professor Don Hankins who is an indigenous climate scientist at the University of California, Chico, to develop strategies for Oregon on forest management in a time of critical climate change.

Professor Hankins has been involved in various aspects of land management and conservation. Indigenous practices include controlled burns to help develop resilience in the landscape and to prevent large wildfires. Professor Hankins could advise on how to use fire in the scale it needs to be to create good outcomes.

Many thanks,

Karen Mitzner, 136 SE 63rd Ave., Portland OR 97215
Phone: 971-221-2456



By Electronic Mail

September 28, 2020

Greg Wagenblast, Hearings Officer
Private Forest Siskiyou SSBT Rulemaking
Oregon Department of Forestry
2600 State Street
Salem, OR 97310
Greg.WAGENBLAST@oregon.gov

Re: Public Comment on Proposed Amendment to OAR Chapter 629: Expanding water rules on small and medium salmon, steelhead, and bull trout Siskiyou Georegion streams

Dear Mr. Wagenblast:

I am the coordinator of the Oregon Stream Protection Coalition (OSPC), an ad hoc coalition of 26 non-profit organizations in Oregon and Washington united around the promotion of increased protection for freshwater aquatic ecosystems on nonfederal lands in Oregon. Thank you for the opportunity to provide public comment on the proposed rulemaking to apply the Salmon, Steelhead, and Bull Trout ("SSBT") stream buffer standards to the Siskiyou Georegion.

As a signatory of the Memorandum of Agreement implemented by SB 1602, I support the proposed rule change as part of a larger policy change package that includes future collaboration with private forest landowning entities to develop the framework for a statewide forest practices aquatic habitat conservation plan. Incorporation of the SSBT rule expansion to the Siskiyou into legislation helped expedite and streamline what could have been a lengthy and contentious rulemaking. This action effectively reverses a 2015 Board of Forestry decision to exclude small and medium streams that support salmon and steelhead in the Siskiyou region from stream protection requirements that became effective in July 2017 for the balance of western Oregon. OSPC has consistently advocated for inclusion of the Siskiyou in the SSBT rule since 2015. This rule change represents a modest improvement that brings stream buffer standards in the Siskiyou up to the same level as the rest of western Oregon.

I would like to take this opportunity to clarify that in adopting this rule the Board was not required to make a specific finding about the adequacy of either the existing or proposed rules to meet water quality standards under the Clean Water Act or restoration targets under any of the six applicable Total Maximum Daily Load plans (TMDLs) for impaired water bodies in the Siskiyou region. Nor did the Legislature or the Environmental Quality Commission make such findings.

Likewise, this rulemaking is not accompanied by analysis that indicates it renders the Oregon Forest Practices rules to be an adequate foundation for the federally approvable Endangered Species Act habitat conservation plan aspired to by the parties to the MOU implemented by SB1602. As noted in the comments dated September 18, 2020 already submitted into this proceeding by Rogue Riverkeeper and Wild Salmon Center, which we endorse, additional protection of the small and

1

medium fish-bearing streams covered by this rule will be an important consideration in planned future collaborative policy discussions.

Therefore, we are submitting for this record as separate electronic files:

1. Comments submitted by OSPC to ODF on the original SSBT rule change

These comments argued that none of the four buffer designs provided under the western Oregon SSBT rule (no cut, partial cut, North-South or equity relief) are adequate to meet the Protecting Coldwater Criterion or the watershed-specific targets established by applicable temperature TMDLs. OSPC continues to find that available information supports the contention that larger buffers applied to more of the stream network are needed to achieve compliance with the Protecting Coldwater Standard and applicable TMDL/Human Use Allowance requirements.

2. The final ODF report entitled “Siskiyou Streamside Protections Review: Summary of Literature Review” by Adam Coble, W. Terry Frueth, John Hawksworth and Ariel Cowan

This report, provided in its final form to the Board of Forestry as an informational item at its September 6, 2020 meeting, generally informs policy considerations regarding attainment of DEQ water quality standards for temperature for small and medium fish-bearing streams in the Siskiyou geographic region.

This document includes a summary of available information relevant to the Siskiyou region about the adequacy of current forest practices water protection rules to meet stream temperature goals and relationships between riparian buffer width and basal area and prevention of stream temperature increases due to shade reduction. A primary finding is that: “[r]elevant literature (12 studies) suggests implementation of current FPA rules will not ensure maintenance of Protecting Cold Water standard or the Human Use Allowance.” Siskiyou Review at iv. The review is notable for its discussion of the policy implications of applicable TMDLs for forest practices and for its evaluation of how these analyses may inform our understanding of riparian buffer design as it relates to effective stream shading.

Sincerely,



Mary Scurlock, Coordinator
Oregon Stream Protection Coalition

Attachment 1: March 2017 OSPC Comments on SSBT Rule (24 pp)

Attachment 2: Attachments to March 2017 OSPC Comments on SSBT Rule (78 pp)

Attachment 3: Siskiyou Streamside Protections Literature Review Summary from 9/9/20 Board packet (30 pp)



Oregon

Kate Brown, Governor

Department of Environmental Quality
Agency Headquarters
700 NE Multnomah Street, Suite 600
Portland, OR 97232
(503) 229-5696
FAX (503) 229-6124
TTY 711

September 28, 2020

Sent via email to privateforests.publiccomment@oregon.gov

Greg Wagenblast
Private Forests
Oregon Department of Forestry
2600 State Street
Salem, OR 97301

Re: Comments on Proposed rulemaking hearing for Siskiyou SSBT stream protection rules

Dear Mr. Wagenblast:

Thank you for the opportunity to comment on the Oregon Department of Forestry (ODF) proposed permanent rules for expanding water quality protections on small and medium size salmon, steelhead, and bull trout (SSBT) streams in the Siskiyou Georegion.

These rules are proposed in response to Senate Bill 1602 (2020), which directs the Board of Forestry (Board) to “adopt rules to make 2017 board rules regarding salmon, steelhead and bull trout applicable for the Siskiyou Georegion”. These rules will replace the temporary rules adopted by the Board earlier this year, and become effective on Jan. 1, 2021.

DEQ supports the extension of the SSBT rules to the Siskiyou Georegion. This action will improve the level of water quality protection for these streams. However, for the record, ODF and the Board should be aware that DEQ’s existing Total Maximum Daily Loads (TMDLs) for watersheds in the Rogue and Applegate generally indicate that even with this action many watersheds are unlikely to achieve the conditions (and load allocations) needed to improve stream temperatures in watersheds that are currently already too warm to meet applicable water quality standards. What this means is that there is additional and ongoing work to be done between the Department of Environmental Quality (DEQ) and ODF, above and beyond this rulemaking, to detail the management measures that will ultimately achieve Oregon’s federally-approved water quality standards for temperature. DEQ and ODF are working together to specify how we will complete this work, just as DEQ is working with other partners with responsibilities for TMDL implementation on other (non-forest lands) to do the same.

The SSBT rules that ODF is proposing to extend to the Siskiyou Georegion were analyzed in an ODF staff report to the BOF for agenda item two, at the Board’s meeting on July 23rd, 2015. Using the data and information from the Ripstream study, and working with ODF and ODFW, DEQ also analyzed various scenarios during the SSBT rule development process. Based on those analyses, DEQ has some continuing concerns about the adequacy of the SSBT rules to

meet the protecting cold water component of Oregon's water quality standard for temperature. These concerns focus on predicted outcomes from individual forest operations, and are distinct from the watershed-scale TMDL issues described above. As ODF and DEQ work through TMDL implementation issues in the Rogue/Applegate and elsewhere, we also will continue to work with ODF assuring that the outcome is consistent with the requirements embodied in the protecting cold water standard. [In EPA's recently established Columbia and Lower Snake Rivers Temperature TMDL, EPA found a strong link between regional air temperature and Columbia River water temperature. EPA's TMDL showed long-term increases in regional air temperature and Columbia River water temperature since the 1960's. In the TMDL EPA states, "A growing body of research has produced and is continuing to produce evidence that changes to regional climate are contributing to an increase of stream temperatures in the Columbia and Snake Rivers". DEQ expects that these same effects may be occurring in the Siskiyou Georegion, along with other climate-related changes including changes in forest vegetation, stream flows, and wildfire return intervals. As DEQ and the Environmental Quality Commission assess these changes in future TMDLs and TMDL updates, there may be further implications for management measures necessary to meet both the PCW standard and load allocations in TMDLs.

Finally, ODF's Fiscal Impact Analysis for the proposed rules should consider economic benefits from additional riparian protections, not just the negative economic impacts to the industry and landowners. The economic value of fisheries, drinking water provision, stormwater and erosion control, and other ecosystem services should be considered. For example, additional recruitment of large woody debris over time and retained shade can be compared to the cost to replicate or restore those services.

We appreciate the opportunity to comment on this important water quality issue and look forward to continuing our collaboration with the Oregon Department of Forestry.

Sincerely,



Jennifer Wigal
Deputy Water Quality Administrator

Summary of Written Comments Received

Overall the comments received supported the proposed Salmon, Steelhead and Bull Trout stream protection for the Siskiyou Geographic Region. Several of the commenters indicated that they support these proposed protections as a good first step but do have concerns that these rules are not sufficient to meet existing Total Maximum Daily Loads (TMDLs) and water quality standards. They indicated science demonstrates that additional protection measures should be considered by the Board of Forestry for greater opportunity at achieving water protection standards involving TMDL and Protecting Coldwater Criterion (“PCW”). These comments did acknowledge SB1602 and the efforts by the Governors mediation sessions between the representatives of the forest industry and environmental interests that signed the Memorandum of Understanding announced by the Governor on February 10, 2020. As well, several of these commenters had provided comments during the 2017 Western Oregon SSBT rulemaking and included them as part of their comments for the Siskiyou Geographic Region SSBT rules. There were also comments indicating that ODF’s fiscal impact statement should include the economic benefits from the additional riparian protections.

Response to all the Written Comments listed above: Thank you for your comments. As noted in much of the testimony, the proposed rules are a result of implementing legislative direction from SB 1602 and sufficiency of rules is not in the scope of this rule making. With regard to the statement of fiscal impact the Department was not aware of any existing economic data showing a benefit to small business owners to draw from and none was suggested by the Siskiyou Advisory Committee which served as the advisory group for the fiscal impact statement. The comments above will be included in the permanent record for future reference.

Appendix 1 – Notice of Proposed Rulemaking and Fiscal Impact

OFFICE OF THE SECRETARY OF STATE
BEV CLARNO
SECRETARY OF STATE
JEFF MORGAN
INTERIM DEPUTY SECRETARY OF STATE



ARCHIVES DIVISION
STEPHANIE CLARK
DIRECTOR
800 SUMMER STREET NE
SALEM, OR 97310
503-373-0701

NOTICE OF PROPOSED RULEMAKING INCLUDING STATEMENT OF NEED & FISCAL IMPACT

CHAPTER 629
DEPARTMENT OF FORESTRY

FILED

08/18/2020 10:31 AM
ARCHIVES DIVISION
SECRETARY OF STATE

FILING CAPTION: Expanding water rules on small and medium salmon, steelhead, and bull trout Siskiyou Georegion streams.

LAST DAY AND TIME TO OFFER COMMENT TO AGENCY: 09/28/2020 5:00 PM

The Agency requests public comment on whether other options should be considered for achieving the rule's substantive goals while reducing negative economic impact of the rule on business.

CONTACT: Greg Wagenblast
541-525-6462
Greg.Wagenblast@oregon.gov

2600 STATE ST BLDG D
SALEM, OR 97310

Filed By:
Hillary Olivos-Rood
Rules Coordinator

HEARING(S)

Auxiliary aids for persons with disabilities are available upon advance request. Notify the contact listed above.

DATE: 09/23/2020

TIME: 5:15 PM

OFFICER: Private Forests
Representative

ADDRESS: Virtual Public Hearing
Hosted by Oregon Department
Forestry
2600 State St
Salem, OR 97210

SPECIAL INSTRUCTIONS:

ODF is holding a virtual hearing through Zoom for interested persons to participate and follow social distancing measures during COVID-19. To access this public hearing, visit the ODF web page for registration at, <https://www.oregon.gov/odf/aboutodf/Pages/proposedlawsrules.aspx>. Anyone requesting special accommodation to participate in the meeting or require technical assistance, please contact staff at least 72 hours before the meeting, either by email,

NEED FOR THE RULE(S):

Senate Bill 1602, passed in the June 2020 special session of the Oregon Legislature, put into law components of a memorandum of understanding between environmental groups and forest landowners that includes changes to the Oregon Forest Practices Act.

SB 1602 includes several significant changes to protection requirements for non-federal forestlands in Oregon. The bill directs the Board of Forestry to adopt permanent rules in the Siskiyou area of southwest Oregon similar to those already in place in western Oregon for salmon, steelhead, and bull trout streams. These rules are to go into effect Jan. 1, 2021.

DOCUMENTS RELIED UPON, AND WHERE THEY ARE AVAILABLE:

- 80th Oregon Legislative Assembly – 2020 Special Session, Enrolled Senate Bill 1602, <https://oils.oregonlegislature.gov/liz/2020S1/Downloads/MeasureDocument/SB1602/Enrolled>
 - January 4, 2017 Economic Impact Analysis conducted by Oregon Department of Forestry, available on ODF web page, <https://www.oregon.gov/odf/aboutodf/Pages/proposedlawsrules.aspx>.
 - Koolstra, Chad M., Cassandra Moseley, Heidi Huber-Stearns, and Stacy Rosenberg, "Western Oregon Forest Landowner Beliefs About the Outcomes of Mandatory Riparian Buffer Regulations." *Journal of Sustainable Forestry*, 37(1):56-76, 2017. Available on ODF web page, <https://www.oregon.gov/odf/aboutodf/Pages/proposedlawsrules.aspx>.
 - July 22, 2020, Board of Forestry Public Meeting, Item G - Permanent Rulemaking for Salmon, Steelhead, and Bull trout streams in Siskiyou Region, <https://www.oregon.gov/odf/board/bof/bof-20200722-agenda.pdf#page72>
-

FISCAL AND ECONOMIC IMPACT:

The proposed rule changes will result in increased protection measures for small and medium fish bearing streams adjacent to timber harvesting operations in the Siskiyou Georegion. These protection measures increase buffer distances on approximately 370 miles of the small and medium streams in the Siskiyou Georegion. The buffer width increase on these streams would be 35 feet. There is approximately one-tenth of the estimated miles of salmon, steelhead, and bull trout (SSBT) streams in the Siskiyou Geo-region compared to the estimated miles for the other Georegions west of the Cascades, for which a full economic analysis was conducted for the 2017 SSBT streams rulemaking. Based on the estimates of the previous rule making the department estimates that over the next 20 years .7 to .98 million board feet per year (mmbf/year) could become unavailable for harvest.

It is estimated that 72 miles of the small and medium SSBT streams will be on private industrial owned lands, 294 miles will be on private non-industrial owned lands, three miles on County owned lands and one mile of state owned lands. The magnitude of the economic impact will vary by the landowner based on their management objectives and how they choose to manage their property. The potential negative economic impact comes from the loss of the ability to harvest some or all of the trees in this additional 35 feet of buffer. Therefore, the overall, impact, positive or negative, and the magnitude of the impact will vary based on the landowner's goals and objectives for the property.

For landowners who are disproportionately impacted, greater than eight percent of the forested acreage of the parcel impacted by this buffer, the landowner can apply for a reduced set of prescriptions to limit the impact.

COST OF COMPLIANCE:

(1) Identify any state agencies, units of local government, and members of the public likely to be economically affected by the rule(s). (2) Effect on Small Businesses: (a) Estimate the number and type of small businesses subject to the rule(s); (b) Describe the expected reporting, recordkeeping and administrative activities and cost required to comply with the rule(s); (c) Estimate the cost of professional services, equipment supplies, labor and increased administration required to comply with the rule(s).

(1) There will be a slight increase in administrative costs for the Oregon Department of Forestry to implement the new rules. Local government and the public should not see an increase in the cost of compliance.

(2)(a) There are approximately 191 small businesses associated with forestry, logging, wood product supply and forestry support activities that may be subject to these rule changes. However, identifying small businesses that may be directly tied to the extension of the riparian management area rule changes is difficult. Additionally, there are approximately 17,500 family forestland owners (small businesses), who own between two and 5000 acres in the region where this rule applies. 1,919 (or 11 percent) of these owners are affected by the rule. There may be some overlap in the number of small businesses accounted for in these two groups.

(2)(b) Reporting, record keeping and other administrative activities (including professional services) required for compliance with these revised rules are expected to be unchanged. This rulemaking effort will not change any administrative activities associated, other than clearly identifying where the new rules apply.

(2)(c) While the new rules follow the approach of previous rules, there will be an increase in rule complexity that potentially could create a small increase in the costs of compliance. There will be a small increase in costs for the small businesses administration related to compliance when the buffers are actively managed. However, compliance should improve for all rules associated with water protection.

DESCRIBE HOW SMALL BUSINESSES WERE INVOLVED IN THE DEVELOPMENT OF THESE RULE(S):

Several members of the Siskiyou Advisory Committee represented small business interests to provide evaluation and input on the analysis of these proposed rules.

WAS AN ADMINISTRATIVE RULE ADVISORY COMMITTEE CONSULTED? YES

RULES PROPOSED:

629-642-0105, 629-642-0110

AMEND: 629-642-0105

RULE SUMMARY: The purpose of this proposed rule amendment adds the Siskiyou Georegion to the existing OAR 629-642-0105(2) that provides for streamside shade buffers with Salmon, Steelhead or Bull Trout streams.

*Note: the proposed rule amendments that were filed with the Oregon Secretary of States as part of the Notice of Proposed Rulemaking are included as attachment 3 for this agenda item in the BOF November 4th meeting packet.

Siskiyou Advisory Committee Meeting Summary

08/13/2020

<i>Present:</i>	<i>Not present:</i>
Mary Scurlock Ashley Coble Chandra Ferrai Dan Brown Rex Storm Dave Erickson Gene Foster Jim James Rod Krahmer Stacey Detwiler Seth Barnes	Matt Bennette Eugene Weir Craig Harper

The purpose of this meeting was to have the Siskiyou Advisory Committee review the draft rule language and the Fiscal and Economic Impact and Cost of Compliance sections of the Notice of Proposed Rulemaking and provide input.

Draft rule language review:

The committee reviewed the draft rule language. Clarifying questions were asked regarding ongoing monitoring work, riparian prescriptions available under the new rules, and if regulatory maps would be ready by the implementation date of January 1, 2021.

The committee did not offer any changes to the proposed rules.

Fiscal and Economic Impact and Cost of Compliance review:

The committee reviewed and discussed the Fiscal and Economic Impact and Cost of Compliance sections in the Notice of Proposed Rulemaking filing.

Based on committee discussion the following change was made to Section (2)(c) under Cost of Compliance: “There ~~may be~~ will be a small increase in costs for the small businesses administration related to compliance when the buffers are actively managed.” Deleted strikethrough language and added underlined language.

Proposed Final Rule Language

Rule Text Showing Proposed Revisions Example: ~~Deleted Language~~ Added Language

Rule Language, Addition of the Siskiyou Geographic Region for Type SSBT protection.

629-642-0105 (2) The vegetation retention requirements for Type SSBT streams apply to harvest type 2 or harvest type 3 units in the following Geographic Regions as described in OAR 629-635-0220: Coast Range, South Coast, Interior, ~~and Western Cascades,~~ and Siskiyou. Use rules in OAR 629-642-0100 for Type 1 harvests along SSBT streams.

Table 5. Type SSBT Prescription 2. Vegetation Prescription for Type SSBT Streams: Streamside Tree Retention for Harvest Type 2 or Type 3 Units (OAR 629-642-0105(11))

	BASAL AREA TARGET: Square feet of basal area per each 500-foot stream segment, each side of the stream (any combination of conifers and hardwoods 6 inches or greater DBH)		LIVE CONIFER TREES (8 inches or greater DBH) per each 500-foot stream segment, each side of the stream	
Geographic Region	Medium Type SSBT RMA = 80 feet	Small Type SSBT RMA = 60 feet	Medium Type SSBT RMA = 80 feet	Small Type SSBT RMA = 60 feet
Coast Range, South Coast, Interior, Western Cascades, <u>and Siskiyou</u>	0 to 20 feet = Retain all trees. Trees in this area do not count toward meeting the basal area or live conifer tree requirements in this table.			
	20 to 50 feet: minimum 18 sq. ft.	20 to 40 feet: minimum 10 sq. ft.	20 to 50 feet: minimum 7 trees	20 to 40 feet: minimum 4 trees
	50 to 80 feet: minimum 18 sq. ft.	40 to 60 feet: minimum 10 sq. ft.	50 to 80 feet: minimum 7 trees	40 to 60 feet: minimum 4 trees
	RMA Total (20 to 80 feet) = 69 sq. ft.	RMA Total (20 to 60 feet) = 37 sq. ft.	RMA Total (20 to 80 feet) = 15 trees	RMA Total (20 to 60 feet) = 8 trees
Notes for Table 5				
1. Distances are measured from the high water level of the Type SSBT stream.				
2. Up to 10% of the basal area requirement may be comprised of sound conifer snags six inches or greater DBH and at least 30 feet tall.				

Table 6. Type SSBT Relief Prescription 2. Vegetation Retention for Type SSBT Streams: Streamside Tree Retention for Harvest Type 2 or Type 3 Units (OAR 629-642-0110)

	BASAL AREA TARGET: Square feet of basal area per each 500-foot stream segment, each side of the stream (any combination of conifers and hardwoods 6 inches or greater DBH)		LIVE CONIFER TREES (8 inches or greater DBH) per each 500-foot stream segment, each side of the stream	
Geographic Region	Medium Type SSBT RMA = 70 feet	Small Type SSBT RMA = 50 feet	Medium Type SSBT RMA = 70 feet	Small Type SSBT RMA = 50 feet
Coast Range, South Coast, Interior, Western Cascades, and Siskiyou	0 to 20 feet = Retain all trees. Trees in this area do not count toward meeting the basal area or live conifer tree requirements in this table.			
	20 to 45 feet: minimum 15 sq. ft.	20 to 35 feet: minimum 7 sq. ft.	20 to 45 feet: minimum 6 trees	20 to 35 feet: minimum 3 trees
	45 to 70 feet: minimum 15 sq. ft.	35 to 50 feet: minimum 7 sq. ft.	45 to 70 feet: minimum 6 trees	35 to 50 feet: minimum 3 trees
	RMA Total (20 to 70 feet) = 58 sq. ft.	RMA Total (20 to 50 feet) = 28 sq. ft.	RMA Total (20 to 70 feet) = 13 trees	RMA Total (20 to 50 Feet) = 6 trees
Notes for Table 6				
1. Distances are measured from the high water level of the Type SSBT stream.				
2. Up to 10% of the basal area requirement may be comprised of sound conifer snags six inches or greater DBH and at least 30 feet tall.				

Agenda Item No.:	C
Work Plan:	Private Forests
Topic:	Water Quality
Presentation Title:	Department of Forestry and Department of Environmental Quality Collaboration Quarterly Update
Date of Presentation:	November 4, 2020
Contact Information:	Kyle Abraham, Chief, Private Forests Division, 503-945-7482, Kyle.Abraham@Oregon.gov Jennifer Wigal, Deputy Water Quality Administrator Oregon Department of Environmental Quality

SUMMARY

The Department of Forestry (ODF) and the Department of Environmental Quality (DEQ) are working toward better understanding and alignment of their respective water quality programs using a collaborative effort. This agenda item is informational only.

CONTEXT

The Board of Forestry’s (Board) 2011 *Forestry Program for Oregon* supports an effective, science-based, and adaptive Oregon Forest Practices Act (FPA) as a cornerstone of forest resource protection on private lands in Oregon (Objective A.2). The discussion of Goal A recognizes that the FPA includes a set of best management practices designed to ensure that forest operations would meet state water quality standards adopted under the federal Clean Water Act. Similarly, the discussion of Goal D recognizes that the FPA is designed to protect soil and water resources, including aquatic and wildlife habitat (Objective D.6). The Board’s guiding principles and philosophies includes a commitment to continuous learning, evaluating and appropriately adjusting forest management policies and programs based upon ongoing monitoring, assessment, and research (Value Statement 11).

BACKGROUND AND ANALYSIS

The Board directed the department to conduct a review of streamside protections on small and medium fish-bearing streams in the Siskiyou region focusing on stream temperature, shade, and riparian desired future conditions, starting with a literature review. In September, the Board received the final summary of the literature review on stream temperature and shade. In addition, the Board requested the Department to work closely with DEQ on the relationship of Total Maximum Daily Loads (TMDLs) and how the information and analysis can be used in determining sufficiency of forest practice rules.

With support from a facilitator, ODF and DEQ have embarked on an interagency collaboration with the objective of aligning water quality efforts and processes to meet water quality goals. As part of this effort, the agencies have agreed to develop mutually-acceptable processes between DEQ and ODF.

We formed an interagency group of technical specialists to refine the analysis conducted for the Siskiyou streamside protections literature review, review load allocations for private forestlands, and develop a framework for using TMDL information to inform future ODF sufficiency reviews of FPA rules.

The Oregon Department of Justice has completed a memo to clarify the departments' respective policy and legal frameworks. The Board held an Executive Session at their July 2020 meeting to discuss this memo.

In February 2020, a governor-convened group of environmental and forest industry stakeholders signed a Memorandum of Understanding (MOU) to collaborate on potential changes to Oregon forest policy on private lands. Resulting legislation, passed in the June 2020 first special session directed the Board of Forestry to extend the Salmon, Steelhead, and Bull Trout (SSBT) rules to the Siskiyou Geographic Region. DEQ participated in and provided input into the Siskiyou Streamside Protection Review and expanded literature review summary that was included in the September 9th Board materials.

The two agencies are currently working on documenting respective agency practices/policy that may cause either conflicting or redundant analyses or processes. We are working with the facilitator to prioritize these items. Finally, work has begun on drafting a high-level view of a revised memorandum between ODF and DEQ.

RECOMMENDATION

This agenda item is informational only.

NEXT STEPS

The department will provide approximately quarterly updates on this interagency effort.

ATTACHMENTS

None

Agenda Item No:	D
Work Plan:	Administration
Topic:	Department Financial Report
Presentation Title:	Department Financial Report for October 2020
Date of Presentation:	November 4, 2020
Contact Information:	Bill Herber, Administrative Services Division Chief (503) 945-7203, bill.herber@oregon.gov

SUMMARY AND CONTEXT

An executive financial report and summary will be submitted monthly to ensure the Board of Forestry (Board) has up-to-date information for oversight of the Department's financial condition. This report will include the financial and budgetary status of the Department as well as other ancillary topics as appropriate.

BACKGROUND AND ANALYSIS

This consent item marks the beginning of a continual monthly financial report to the Board of Forestry from the Department. While executive-level in nature, this report will additionally delve into various topics that are either germane, directly impacts the financial status, or other administrative functions of the organization during any given month.

While this initial report provides a baseline of information for the Board, it is a starting point of a work-in-progress. As the Department's ability develops and insights into its operational and administrative work improve, this report will reflect those improvements. These improvements could be through operational or process improvements or the introduction of new systems and technologies that enhance the Department's administrative capabilities. In addition, Board input will be factored in as the report evolves.

NEXT STEPS

The Board will receive the Department Financial Report the third week of every month, whether a Board meeting is occurring or not. This will allow the Department to report on the previous month while allowing for the fiscal month closing process to conclude.

ATTACHMENT

- 1) Department Financial Report for October 2020



Memorandum

Oregon Department of Forestry

Date: October 23, 2020
To: Board of Forestry Members
From: Bill Herber, Deputy Director for Administration
Subject: Department Financial Report

Department Financial Report

While Oregon and the department has experienced a fire season of historic proportions, the manner in which the fires occurred from an administrative stand point have proven less catastrophic to the department's financial resources than they have on the landscape, but only in the short term. Our federal partners were the paying agent on most of the large fires this season, which has minimized our up-front costs so far this season. However, the department does have immediate cost exposure with the fires it is responsible for as well as for local resources it provides to statewide suppression efforts and these costs are beginning to enter our accounts payables processes as our payment teams begin their work.

The department entered into fire season with a modest cash balance and a nearly exhausted General Fund balance in the Fire Protection appropriation. With indications of an above-average fire season, the department worked with the Oregon State Treasury to make available a \$55 million loan backed by current account receivables to support suppression efforts and maintain operations through fire season. Through this summer, the department has continued to receive revenue from timber products, albeit these amounts are always lower through the fire season, as well as recovering nearly \$34 million in large fire cost recoveries. These revenues, as well as the lower than expected accounts payables, have allowed the department to maintain a somewhat stable cash balance. In addition, through emergency board action, the legislative branch appropriated General Fund for the state's share of 2019 fire costs, which provided immediate relief to the Fire Protection Division's General Fund appropriation.

However, through all of the projections, October was always going to be a difficult month in regards to cash flow, not only owing to large fire costs but also due to a quarterly county disbursement of timber revenue occurring at the end of the month and these initial projections factored in an above-average fire season of \$70 million. To date, current cost estimates of the 2020 fire season are at \$128.7 million, well above the amount projected. As the department's payment teams undertake the work of processing these large fire bills throughout the state, it is clear the department's expenditures will outpace its revenue and financial resources. In order for the department to continue normal operations and meet its financial obligations, the Treasury loan was exercised on October 15 and \$55 million was made available to the department the following day. Tracking

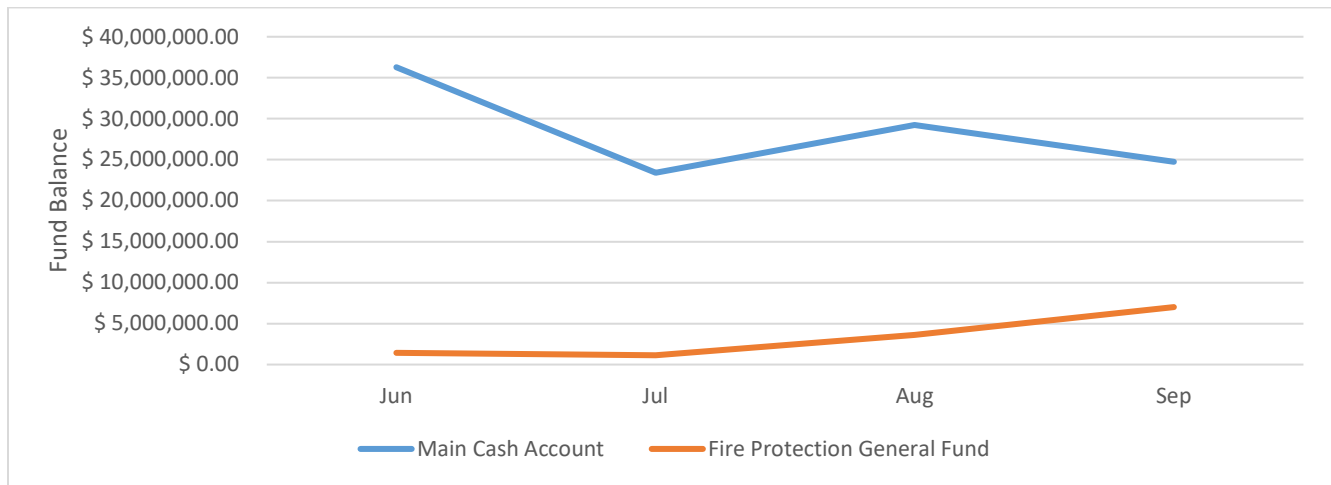
and processing of receivables and payables generated by the fire season will be high priority for the department over the next few months to ensure sufficient financial resources are available.

Overall, the department is closely tracking its biennial budget across all fund types, with the exception of Fire Protection (Appendix A).

Main Cash Account and Fire Protection General Fund Balances

The department’s main cash balance has been averaging around \$25 million, but is starting to show indications of falling below that amount (Figure 1). The increase in Fire Protection’s General Fund balance is due to appropriation of \$10 million in General Fund for the 2019 Fire Season.

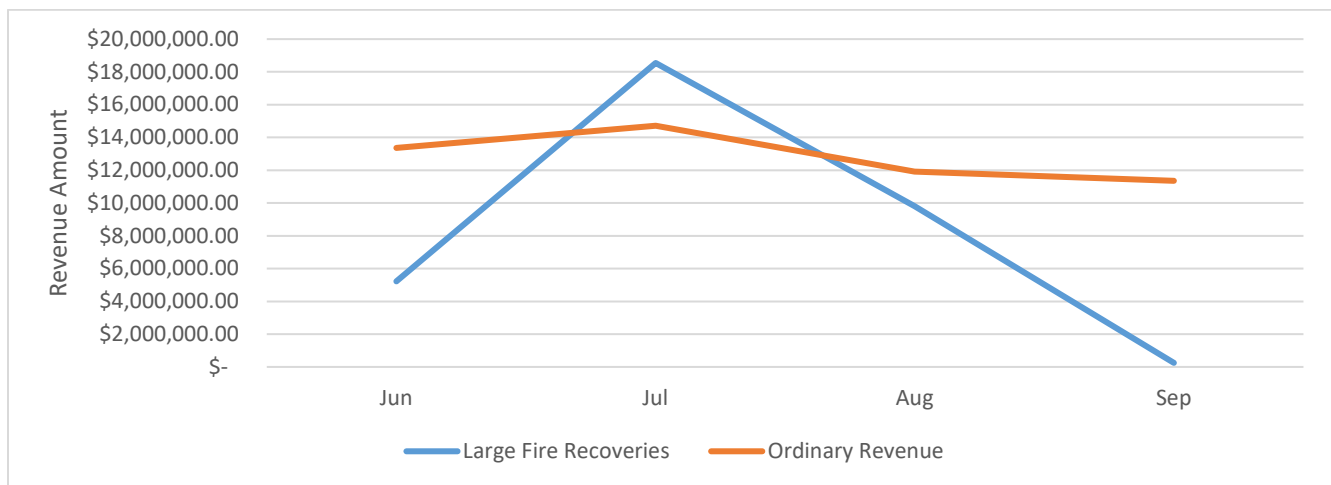
Figure 1, Monthly Balance for Main Cash Account and Fire Protection General Fund, Jun through Sep 2020



Accounts Receivables

Normal department revenues have been lower than average, but steady through the fire season, which is often the case. Our federal partners paid nearly \$34 million in outstanding large fire costs, the most significant payment being in July for nearly \$14 million from FEMA for the 2018 Garner Complex fire (Figure 2).

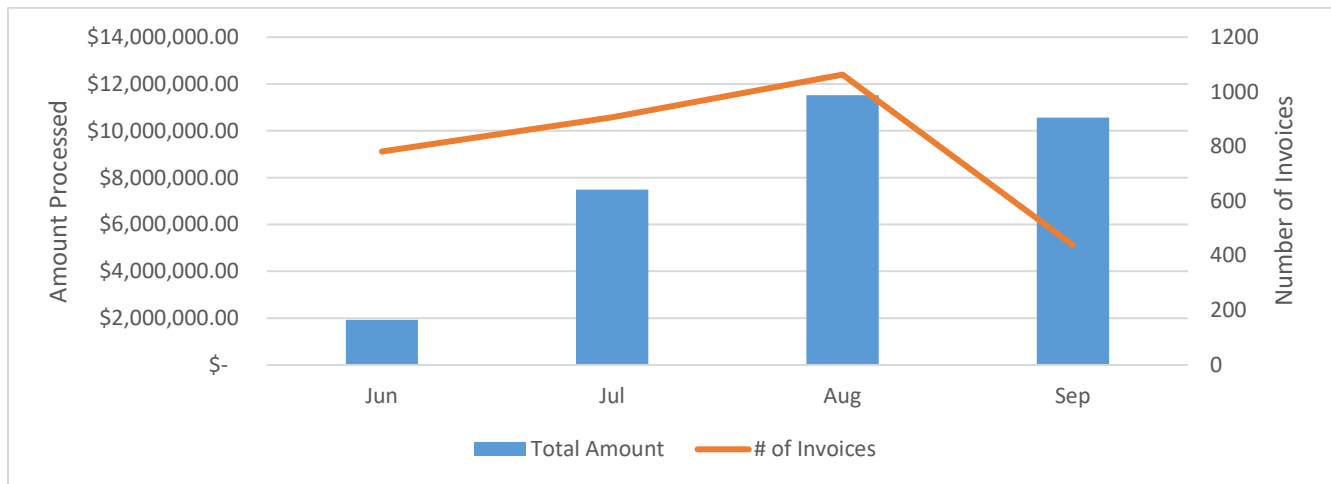
Figure 2, Department Revenue from Ordinary Sources and Large Fire Recoveries, Jun through Sep 2020



Accounts Payable

The lower than anticipated accounts payables to-date for this fire season has not yet put extreme pressure on our processing systems. Staff have been exceptional at processing invoices, with an average of 25 days for payment of an invoice. This processing has also been helped with the availability of financial resources, in both cash and limitation, which have been problematic for the department before during large fire seasons. The triaging, or delaying of payments, has only occurred for select state and federal invoices in order to maximize cash and limitation availability. The sharp decline of the number of invoices in September is due to the large amount of administrative personnel that must forgo their normal duties to support fire operations (Figure 3). This amount will significantly rise as our payment teams complete the invoicing of our current resource obligations.

Figure 3, Total Amount of Accounts Payable Processed and Total Number of Invoices, June through Sep 2020



OREGON DEPARTMENT OF FORESTRY
AGENCY-WIDE EXPENDITURES BY PROGRAM AND APPROPRIATION
2019-2021 BIENNIUM TO DATE THROUGH August 2020

Appendix A

		Percentage of Biennium Elapsed 58%			
Program Title	Appropriation # / Title	Legislatively Approved Budget	Actuals as of 08/31/2020	Budget Balance	Percentage of Budget Spent
AGENCY ADMINISTRATION	89008 - FEDERAL FOREST HEALTH - General Fund	3,257,943	1,333,780	1,924,164	41%
	30208 - AGENCY ADMINISTRATION - Other Funds	35,424,716	20,144,636	15,280,080	57%
	30528 - ELLIOT STATE FOREST				
	30218 - OTHER DEBT RELATED COST				
	60208 - AGENCY ADMINISTRATION -- Federal Funds	2,799,114	2,463,584	335,530	88%
	AGENCY ADMINISTRATION TOTAL	41,481,773	23,942,000	17,539,773	58%
PROTECTION FROM FIRE	89920 - PUBLIC SHARE FIRE FUND - General Fund	57,701,898	54,289,452	3,412,446	94%
	30201 - FOREST PATROL (FIRE) - Other Funds	99,956,633	83,903,694	16,052,939	84%
	60201 - PROTECTION FROM FIRE - Federal Funds	17,711,687	5,114,223	12,597,464	29%
	PROTECTION FROM FIRE TOTAL	175,370,218	143,307,370	32,062,848	82%
EQUIPMENT POOL	30202 - EQUIPMENT POOL	17,723,926	7,782,589	9,941,337	44%
STATE FOREST LANDS	30203 - STATE FORESTS - Other Funds	106,513,000	50,391,377	56,121,623	47%
	60203 - STATE FORESTS -- Federal Funds	909,381	388,669	520,712	43%
	89903 - SANTIAM FOREST LAND	200,000	5,000	195,000	3%
	STATE FOREST LANDS TOTAL	107,622,381	50,785,046	56,837,335	47%
PRIVATE FORESTS	89905 - PRIVATE & COMMUNITY FORESTS - General Fund	17,254,601	8,890,621	8,363,980	52%
	30205 - PRIVATE & COMMUNITY FORESTS - Other Funds	12,942,779	5,681,651	7,261,128	44%
	30235 - FERNS EXPANSION	70,362			
	60205 - PRIVATE & COMMUNITY FORESTS - Federal Funds	14,063,094	7,017,411	7,045,683	50%
	89915 - SUDDEN OAK DEATH	1,700,000	1,397,562	302,438	82%
	89935 - FERNS EXPANSION	844,545	0	844,545	0%
	PRIVATE FORESTS TOTAL	46,875,381	22,987,245	23,817,774	49%
FACILITIES MAINTENANCE & DEV	30209 - FACILITIES MANAGEMENT - Other Funds	5,642,619	1,196,017	4,446,602	21%
CAPITAL IMPROVEMENT	30238 - CAPITAL IMPROVEMENT - Other Funds	4,783,787	453,409	4,330,378	9%
CAPITAL CONSTRUCTION	38910 - TOLEDO FACILITY REPLACEMENT	0	0	0	0%
DEBT SERVICE	89917 - DEBT SERVICE - General Fund	16,489,822	8,464,995	8,024,827	51%
	40217 - DEBT SERVICE - Lottery Funds	2,543,451	1,322,577	1,220,874	52%
	30217 - DEBT SERVICE - Other Funds	668,774	411,171	257,603	61%
	DEBT SERVICE TOTAL	19,702,047	10,198,744	9,503,303	52%
AGENCY-WIDE	All General Funds	97,448,809	74,381,410	23,067,399	75%
	All Other Funds	283,726,596	169,964,545	113,691,689	60%
	All Lottery Funds	2,543,451	1,322,577	1,220,874	52%
	All Federal Funds	35,483,276	14,983,887	20,499,389	42%
	Total All Fund Types / Programs	419,202,132	260,652,419	158,479,351	62%

AGENDA ITEM D

Attachment 1

Page 4 of 4

Agenda Item No.:	E
Work Plan:	Private Forests
Topic:	Final Orders
Presentation Title:	Final Order – Siskiyou Cascade Resources LLC Three cases: 19-SW002, 19-SW003 and 19-SW007
Date of Presentation:	November 4, 2020
Contact Information:	Greg Wagenblast, Civil Penalties Administrator, Private Forests Division 503-945-7382 greg.wagenblast@oregon.gov Scott Swearingen, Field Support Manager, Private Forests

SUMMARY

The purpose of this agenda item is to consider the hearing record for contested orders of the state forester (repair orders) involving three forest practices violations by Siskiyou Cascade Resources LLC, and to make a decision on the final order regarding the matter.

CONTEXT

The *Forestry Program for Oregon’s Strategy A* recognizes the importance of promoting a sound and effective legal system as well as ensuring that Oregon’s forests continue to provide a diverse suite of social and economic outputs and benefits (Strategy B). Citations and repair orders for violations of forest regulations are part of an effective enforcement program that meets these objectives by changing behaviors to comply with best management practices designed to promote a multitude of forest outputs and benefits.

SUMMARY OF THE CASES

ODF Case No. 19-SW002 & 19-SW003 (See Attachment 2 for details)

On August 7, 2019, the Oregon Department of Forestry (the Department/ODF) issued a Notice of Violation/Citation, an Order to Cease Further Violation, and an Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation (Repair Order) on both case numbers 19-SW002 (Murphy Creek) and 19-SW003 (Spencer Creek) to Siskiyou Cascade Resources ABN of Siskiyou Cascade Resources LLC (Respondent). That same day, the Department issued an Amended Repair Order for both cases, to correct the date that all repairs must be completed by. On September 6, 2019, Respondent requested a hearing.

Administrative Law Judge (ALJ) Triana held a hearing on July 9 and 10, 2020, by video conference. Attorney Zachary Light represented Respondent at hearing. Joel Caswell also appeared on behalf of Respondent and testified at hearing. AAG Matthew DeVore represented the Department. Greg Wagenblast appeared on behalf of the Department. Douglas Thackery, Department Stewardship Forester; Jay Walters, Department Forest Practices Field Coordinator; Dave Larson, Department Unit District Forester for Medford; Daren Cone, Department State Forest Engineer; and Pete Samarin, Oregon Department of Fish and Wildlife Fish Biologist, testified on behalf of the Department. The record closed at the conclusion of the July 10, 2020 hearing.

ALJ Triana made the following Conclusion of Law:

1. Respondent failed to design and construct a stream crossing over Murphy Creek that allowed migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).

2. Respondent failed to design and construct a stream crossing over Spencer Creek that allowed migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).

3. The Department may require Respondent to cease further violations of OAR 629-625-0320(2)(b).

4. The Department may order Respondent to repair damage or correct unsatisfactory condition(s) caused by violation(s) of OAR 629-625-0320(2)(b).

ALJ Triana's proposed order was served on July 29, 2020. It proposed that the Agency (ODF) positions and the Notices of Violation/Citation and the Amended Orders to Cease Further Violation and Repair Damage or Correct Unsatisfactory Condition Caused By Violation (#19-SW002 and #19-SW003), issued on August 7, 2019, are AFFIRMED.

The Proposed Order issued by ALJ Triana, stated the following requirements for filing of exceptions:

If this proposed order is adverse to you or to the agency, you or the agency may file exceptions within seven days after the date of the filing of the proposed order. See OAR 629-001-0040 to 0045 and OAR 137-003-0650 to 0655. Exceptions must be filed with the Board of Forestry, through the agency contact:

Greg Wagenblast, Civil Penalties Administrator
Department of Forestry, Private Forests Division
2600 State Street
Salem, OR 97310

The deadline for filing exceptions by mail would be August 5, 2020, counting seven calendar days after July 29. The proposed order did not offer an alternative for filing exceptions by email. Siskiyou Cascade Resources LLC attorney filed exceptions that were received via email by the Agency on Aug 10, 2020 and by hardcopy US Mail on August 14, 2020 (Attachment 1). On August 26, 2020, Siskiyou Cascade Resources requested the opportunity to provide testimony and/or present oral arguments before the Board. The record of the hearing and exhibits are available for Board members to review by contacting Greg Wagenblast at (503) 945-7382.

ODF Case No. 19-SW007 (See Attachment 5 for details)

On July 23, 2019, the Oregon Department of Forestry, Private Forests (the Department/ODF) issued a Notice of Violation/Citation, an Order to Cease Further Violation, and an Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation to Siskiyou Cascade Resources ABN of Siskiyou Cascade Resources LLC (Respondent). On August 21, 2019, Respondent requested a hearing.

ALJ Triana held a hearing on August 6, 2020, by video conference. Mr. Light represented Respondent at hearing. Joel Caswell appeared on behalf of Respondent. AAG DeVore represented the Department. Greg Wagenblast appeared as the authorized representative for the Department. Doug Thackery, Department Stewardship Forester, and Jay Walters, Department Forest Practices Field Coordinator, testified on behalf of the Department. The record closed at the conclusion of the hearing on August 6, 2020.

ALJ Triana made the following Conclusion of Law:

1. Respondent failed to drain skid trails by water barring or other effective means immediately following completing of the operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state, in violation of OAR 629-630-0300(3).

2. The Department may require Respondent to cease further violation of OAR 629-630-0300(3).

3. The Department may order Respondent to repair damage or correct unsatisfactory condition caused by the violation of OAR 629-630-0300(3).

ALJ Triana's proposed order was served on August 21, 2020. It proposed that the Agency (ODF) positions and the Notices of Violation/Citation and Orders to Cease Further Violation and Repair Damage or Correct Unsatisfactory Condition Caused By Violation (#19-SW007), issued on July 23, 2019, are AFFIRMED.

The Proposed Order issued by ALJ Triana, stated the the same requirements for filing of exceptions as described above.

The deadline for filing exceptions by mail would be August 28, 2020, counting seven calendar days after August 21. The proposed order did not offer an alternative for filing exceptions by email. Siskiyou Cascade Resources LLC attorney filed exceptions that were received via email by the Agency on Aug 28, 2020 and by hardcopy US Mail on August 31, 2020 (Attachment 4). On August 26, 2020, Siskiyou Cascade Resources requested the opportunity to provide testimony and/or present oral arguments before the Board. The record of the hearing and exhibits are available for Board members to review by contacting Greg Wagenblast at (503)945-7382.

ALTERNATIVES CONSIDERED

There are two primary decisions for the Board:

- 1) In consideration of whether the exceptions filed by Siskiyou Cascade Resources were timely, the Board may:
 - a) Find that the exceptions were timely and should be considered by the Board.
 - b) Find that the exceptions were not timely and will not be considered by the Board.
 - c) Find that the exceptions were not timely and the Board is not obligated to consider the exceptions. However, the Board agrees to consider the exceptions in the event that the Board's conclusion as to timeliness is overturned on appeal.

- 2) After reviewing and considering the proposed order and record and exceptions if applicable, the board may do any of the following:
 - a) Schedule written or oral argument from the State Forester and any party that filed exceptions to the proposed order. The board chairperson shall determine whether oral argument, written argument, or both will be permitted after consulting with the board members. Oral argument shall be allowed only if the board determines it is necessary or appropriate to assist in the proper disposition of the case. Oral argument shall be limited to matters raised in written exceptions and conducted under such time limits as the board chairperson determines are appropriate.
 - b) Remand the matter to the administrative law judge for further hearing on such issues as the board specifies, and to prepare a revised proposed order as appropriate, under OAR 137-003-0655(2).
 - c) Enter a final order adopting the recommendation of the administrative law judge.
 - d) Enter an amended proposed order or final order that modifies or rejects the recommendation of the administrative law judge. If the board decides to modify or reject the proposed order, the board must comply with OAR 137-003-0655 and 137-003-0665.

RECOMMENDATIONS

For ODF Case No. 19-SW002 & 19-SW003

The Department supports alternatives 1(c) and 2(d) finding that the exceptions were not timely but would be considered and adopting a Final Order (Attachment 3) which incorporates and modifies the ALJ's proposed order (Attachment 2) to modify the timeline for making repairs to comply with the next instream work period. The modification complies with OAR 137-003-0655 and 0665 as it does not change the ALJ's proposed order in any substantial manner, nor does it change any finding of fact made by the ALJ.

- 1) Find that the exceptions filed by Siskiyou Cascade Resources were not timely, but were considered on their merits in the event that the Board's conclusion as to timeliness is overturned on appeal.

- 2) Issue a Final Order that incorporates and modifies the ALJ's proposed order with a new time period to comply with the next instream work period.

For ODF Case No. 19-SW007

The Department supports alternatives 1(a) and 2(c) finding that it is reasonable to accept an email copy of the exceptions filed by the deadline in light of the current constraints on handling physical documents under the pandemic, and adopting a Final Order (Attachment 6) which adopts the recommendation of the ALJ's proposed order (Attachment 5).

- 3) Find that the exceptions filed by Siskiyou Cascade Resources were timely and that it is reasonable to accept an email copy of the exceptions filed by the deadline in light of the current constraints on handling physical documents under the pandemic.
- 4) Issue a Final Order that adopts the recommendation of the ALJ's proposed order.

ATTACHMENTS

- (1) Exceptions for ODF Case No. 19-SW002 & 19-SW003 filed by Siskiyou Cascade Resources LLC attorney
- (2) ALJ Proposed Order for ODF Case No. 19-SW002 & 19-SW003
- (3) Draft Final Order for ODF Case No. 19-SW002 & 19-SW003
- (4) Exceptions for ODF Case No. 19-SW007 filed by Siskiyou Cascade Resources LLC attorney
- (5) ALJ Proposed Order for ODF Case No. 19-SW007
- (6) Final Order for ODF Case No. 19-SW007

MARY W. LIGHT, P.C.
N. Central Suite 101
Medford, Or 97501

MEDFORD OR 975
10 AUG 2020 PM 1 T



Greg Wagenblast, Civil Penalties Administrator
Department of Forestry, Private Forest Division
2600 State Street
Salem, OR. 97310

RECEIVED
AUG 13 2020
ODF MAIL ROOM



AGENDA ITEM E
Attachment 1
Page 1 of 6

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BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS
STATE OF OREGON
for the
OREGON DEPARTMENT OF FORESTRY
PRIVATE FORESTS

IN THE MATTER OF:) EXCEPTIONS TO PROPOSED
) ORDER
SISKIYOU CASCADE RESOURCES,)
ABN OF SISKIYOU CASCADE) OAH Reference No.:
RESOURCES LLC) 2019-ABC-03105
) Agency Case Nos.:
) 19-SW002 & 19-SW003
)

COMES NOW Siskiyou Cascade Resource, LLC, by and through their attorney Zachary W. Light, and hereby submits the following exceptions to the proposed order.

TIMING OF THE EXCEPTIONS

The Proposed Order in this matter was mailed Siskiyou Cascade Resources, LLC., (Siskiyou Cascade) representative Joel Caswell and his attorney Zachary W. Light on July 29, 2020 according to the accompanying certificate of service. The Proposed Order was emailed to Oregon Department of Forestry representative Greg Wagenblast and AAG Matthew Devore on July 29, 2020 according to the same certificate of service. It should be noted that the Proposed Order was not dated. Also of note the exception language included with the proposed order that was provided by the State misstates the timing standard by requiring exceptions to be filed within “seven days of the filing of the proposed order”. OAR 621-001-0040 states differently that it requires exceptions be filed “within seven days after the proposed order is issued”. “Issue” is defined by Merriam Webster in this context as “to put forth or distribute, usually officially”. The past tense of the word “issue” leads to the reasonable conclusion that the distribution of the proposed order has already happened, and

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Ph.: 541-494-0355 / 541-494-0354

1 that it has been received by the party. Counsel for Siskiyou Cascade received the opinion in
2 my office mailbox on Monday, August 3, 2020 because I do not have weekend mail delivery
3 in my building. Although there are no rules on point defining the word “issued”, other rules
4 governing service and notice toll 3 days for mail within Oregon and toll weekend days (see
5 UTCR 5.100(1)(a) and ORCP Rule 10). If the interpretation of this rule is strict, the time
6 begins to toll while the proposed opinion is in transit and held by the post office over the
7 weekend. Furthermore, if the exceptions need to be received by Mr. Wagenblast within 7
8 days of the order being generated, a party may have less than 1 business day to formulate a
9 reply and get it in the mail to Mr. Wagenblast. This flies in the face of fundamental fairness
10 concerns. Therefore, under the reasonable interpretation of the seven day exception
11 timeframe under related trial and civil procedural rules and the reasonable definition of the
12 correct OAR statement, the deadline should be seven days from legal and actual receipt of the
13 proposed order, or August 10, 2020, for the exceptions to be formulated and sent to Mr.
14 Wagenblast. The exceptions are being emailed and mailed on August 10, 2020 to Mr.
15 Wagenblast and AAG Devore and are therefore timely.

EXCEPTIONS

16 This matter was focused on OAR 629-625-0320(2)(a) & (b) requirements that allow them to
17 “pass a peak flow that at least corresponds to the 50 year return interval” and “allow
18 migration of adult and juvenile fish upstream and downstream during conditions when fish
19 movement in that stream normally occurs.”

20 **Exception #1:** The ALJ found that fish movement in the stream occurs year-round.

21 However, this finding is erroneous or not based on evidence reasonably relied on. The
22 Department provided no evidence other than conjecture from Mr. Samarin that there are fish
23

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1 in the stream moving at all times. The standard requires testimony about the particular
2 stream, not opinions based upon general knowledge of how certain species of fish that may be
3 present in the stream normally behave, otherwise the requirement that the Department show
4 “fish movement in *that* stream normally occurs” (emphasis added) is superfluous language,
5 which is unlikely. Furthermore the testimony that the fish movement up and down the system
6 occurs at all times contradicts other testimony from Mr. Cone that there are times when the
7 conditions in the stream are so low or the flood is so great that movement within the natural
8 stream channel upstream and downstream would be difficult or impossible. His focus on flow
9 through the culvert at 95% and 5% flows are misguided if during those times of low and high
10 flow the depths and velocities in the natural channel would also not allow for fish passage and
11 therefore are measurements during times when movement may not occur. Unfortunately, his
12 testimony was that he could not testify to passage during high and low flows, just what the
13 flows during these times would look like through the culverts.

14 **Exception #2:** The ALJ found that the culverts were undersized for for fish passage because
15 they were not as wide as the active channel width (ACW) and this could cause increased
16 velocity within the culverts. She further finds that Mr. Thackery’s measurements and Mr.
17 Samarin’s measurements were “consistent” which I presume to mean “similar”. This finding
18 is erroneous because evidence in the record shows that both Mr. Thackery and Mr. Samarin
19 did not follow the procedure in Technical Note #4 for the proper way to measure the active
20 channel width. This makes both of their measurements unreliable and calls into question the
21 significance of their assertions that the pipe is undersized to the degree that it is a barrier to
22 fish passage. Furthermore, this conflates the ACW to a new standard that all culverts should
23 be at least as wide as the ACW. This cannot be the standard where the Department could
24

1 have adopted it in their rulemaking and did not. Additionally, this also improperly burden
2 shifts from a presumption that the culvert allows fish passage if it is as wide as the ACW to
3 one where it is presumed not to allow fish passage if it is not the width of the ACW. Again
4 we do not have reliable measurements per Technical Note #4 but if we did and the culvert was
5 still narrower than the ACW this does not per se create a barrier to fish passage.

6 **Exception #3:** The ALJ further finds that the culverts were inadequately sunk into the
7 streambeds resulting in the culverts not filling with stream material and resulting in water
8 flowing under the culverts and blocking fish passage. This finding is erroneous where the
9 picture taken the day Mr. Thackery inspected the culverts and granted his approval of their
10 installation he took pictures of the culverts where the culvert bottoms were clearly below the
11 natural stream bed (Exhibit A27, pgs. 4,5, 6, 7 and A29, pgs. 4,5,6,9,10,11). The testimony
12 confirmed that on both streams the culverts were on a lower gradient than the natural stream
13 beds and the pictures further showed rock and pebble material in the culverts (Exhibit A27,
14 pgs. 11, 12, 13 (where there is pooling behind rock and gravel in the culvert), 14, 15, 16 and
15 Exhibit A29, pgs. 5, 9, 10, 12). Further testimony confirmed that the substrate of the creeks
16 consisted of larger material which may make retaining material within the culverts through
17 high flows difficult. Further the evidence that the flows under the culverts were significant
18 were challenged on cross examination of Mr. Samarin and he admitted he did not know how
19 much was flowing under versus through the culverts.

20 **Exception #4:** The ALJ found that the Equitable Estoppel argument failed because Siskiyou
21 Cascade cannot reasonably rely on the approval of the plans where ORS 527.670(10)(a) states
22 they are merely advisory and do not constitute approval. This legal conclusion is erroneous
23 and fails to address the different but related assertion made in my memo and in argument that
24

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1 the approval of the culverts by Mr. Thackery post inspection (Exhibit A16) are what
2 constituted approval and triggered reasonable reliance, not the submission of the plan and
3 reply comments. Furthermore, evidence showed that the Department changed course the
4 following month and required the culverts be the width of the active channel without giving
5 reasoning other than the conclusion that “failing to design and install culverts that have an
6 effective width equal to or greater than the active width of the stream has created a barrier to
7 fish movement” (Exhibit A15).

8 Respectfully submitted.

9 Dated this 10th day of August, 2020.

10
11 By: Zachary W. Light
12 Zachary W. Light, OSB No. 035702
13 Attorney for Siskiyou Cascade Resources, LLC
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**BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS
STATE OF OREGON
for the
OREGON DEPARTMENT OF FORESTRY
PRIVATE FORESTS**

IN THE MATTER OF:)	PROPOSED ORDER
)	
SISKIYOU CASCADE RESOURCES,)	OAH Case No. 2019-ABC-03105
ABN OF SISKIYOU CASCADE)	Agency Case No. 19-SW002 & 19-SW003
RESOURCES LLC)	
)	

HISTORY OF THE CASE

On August 7, 2019, the Oregon Department of Forestry (the Department/ODF) issued a Notice of Violation/Citation, an Order to Cease Further Violation, and an Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation (Repair Order) on both case numbers 19-SW002 (Murphy Creek) and 19-SW003 (Spencer Creek) to Siskiyou Cascade Resources ABN of Siskiyou Cascade Resources LLC (Respondent). That same day, the Department issued an Amended Repair Order for both cases, to correct the date that all repairs must be completed by. On September 6, 2019, Respondent requested a hearing.

On September 9, 2019, the Department referred the hearing request to the Office of Administrative Hearings (OAH). Respondent and the Department waived the 14-day hearing deadline and 28-day Final Order deadline under ORS 527.700. Administrative Law Judge (ALJ) Kate Triana was assigned to preside at hearing. Senior ALJ Alison Webster, on behalf of ALJ Kate Triana, convened prehearing conference on November 15, 2019. Assistant Attorney General (AAG) Matthew DeVore and Greg Wagenblast appeared on behalf of the Department; Attorney Zachary Light appeared on behalf of Respondent. A hearing was scheduled for March 10 and 11, 2020, in Grants Pass, Oregon.

On March 6, 2020, Respondent requested a postponement of the March 10 and 11, 2020 hearing. On March 9, 2020, ALJ Kate Triana held a telephone status conference and granted the request to postpone the hearing. AAG DeVore and Mr. Wagenblast appeared on behalf of the Department; Mr. Light appeared on behalf of Respondent. The hearing was rescheduled for June 2 and 3, 2020, in Grants Pass, Oregon.

On March 17, 2020, the Department moved to reschedule the hearing to June 4 and 5, 2020. Respondent did not object. ALJ Triana granted the motion.

On May 15, 2020, the OAH notified the parties that, due to health and safety concerns, it would not be holding the June 4 and June 5, 2020 hearing in-person, and proposed to convert the hearing to a phone or video conference hearing. The Department requested to postpone the hearing to allow for an in-person hearing. On May 29, 2020, ALJ Triana held another status conference and granted the request to postpone the hearing. The parties rescheduled the hearing for July 9 and 10, 2020, in Grants Pass Oregon.

On June 16, 2016, with the consent of the parties, the hearing was converted to a video conference hearing.

ALJ Triana held a hearing on July 9 and 10, 2020, by video conference. Attorney Zachary Light represented Respondent at hearing. Joel Caswell also appeared on behalf of Respondent and testified at hearing. AAG Matthew DeVore represented the Department. Greg Wagenblast appeared on behalf of the Department. Douglas Thackery, Department Stewardship Forester; Jay Walters, Department Forest Practices Field Coordinator; Dave Larson, Department Unit District Forester for Medford; Daren Cone, Department State Forest Engineer; and Pete Samarin, Oregon Department of Fish and Wildlife Fish Biologist, testified on behalf of the Department. The record closed at the conclusion of the July 10, 2020 hearing.

ISSUES

1. Whether Respondent failed to design and construct a stream crossing over Murphy Creek to allow migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).
2. Whether Respondent failed to design and construct a stream crossing over Spencer Creek to allow migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).
3. Whether the Department may require Respondent to cease further violations of OAR 629-625-0320(2)(b). ORS 527.680(2).
4. Whether the Department may order Respondent to repair damage or correct unsatisfactory condition(s) caused by violation(s) of OAR 629-625-0320(2)(b).

EVIDENTIARY RULING

Exhibits A1 through A69, offered by Oregon Department, were admitted into evidence without objection. Respondent's attorney offered no exhibits for hearing, did not provide a list of witnesses, and stated that Respondent would not be calling any witnesses to testify. Before the close of the record, Respondent requested to have Caswell testify regarding the condition of the installed culverts. The Department objected to allowing Caswell to testify. The ALJ allowed Caswell to testify, but withheld ruling on the admissibility of the testimony. Because the possible

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deterioration of the culvert is not relevant to the outcome of this matter, Caswell's testimony is excluded and will not be considered in making this decision.

FINDINGS OF FACT

1. On June 12, 2017, Joel Caswell, of Siskiyou Cascade Resources, submitted a Notification of Operations/Permit to Operate Power-Driven Machinery (NOAP) #2017-712-07527C to the Department. The NOAP was associated with Respondent's intent to harvest timber on 260.5 acres of forest, located at Township 38 South, Range 6 West, Sections 2, 3, 10, and 11, in Josephine County (the subject property). The land included two Medium Type F Streams (fish bearing) - Murphy Creek and Spencer Creek. (Ex. A4 at 1, 4.) The subject property is habitat for the Northern Spotted Owl and Coho Salmon, both protected species. (Test. of Thackery.)

2. On July 20, 2017, Respondent submitted a Written Plan to the Department. (Ex. A6 at 1; test. of Thackery.) The written plan proposed three temporary crossings for access to logging (one across Murphy Creek and two across Spencer Creek). (Ex. A6 at 2.) The Written Plan identified the topography of the streams as being "gentle in gradient 3 to 5%, with occasional sharp drops to pools." (*Id.* at 3.) It also proposed maintaining a 70 foot Riparian Management Area along both sides of each stream. (*Id.*) The temporary crossings proposed were a ford or low water crossing, with the approaches into and out of the ford being rocked for a distance of 100 feet using "clean 4 inch minus jaw run rock (angular in shape)." (*Id.* at 5-6.)

3. In July of 2017, Doug Thackery, Department Stewardship Forester, spoke with Randy Brown, Forester for Respondent, regarding the proposed ford crossings. Thackery notified Brown that after September 15, 2017, Respondent could no longer use the fords for the year, as the in-water work period would be closed. Thackery notified Brown that if Respondent installed some type of approved crossing (such as a culvert or bridge), logging could continue after September 15. (Test. of Thackery.)

4. On July 24, 2017, Respondent submitted an addendum to its Written Plan, proposing to build two permanent crossings across Murphy and Spencer Creeks. The addendum provided:

The watershed associated with this plan is comprised of the Spencer Creek and Murphy Creek watersheds. Both streams have been classified as medium fish within the plan area (figure 1). The interpolated 50 year peak flow for the drainage is 125 cfs per square mile (figure 2) the Murphy Creek drainage contains approximately 2120 acres (3.31 sq. mi.) and has a calculated 50 year flow of 414 cfs. The Spencer Creek drainage contains approximately 1980 acres (3.09 sq. mi.) with a calculated 50 year flow of 386 cfs. Do [*sic*] to the shallowness of the crossings pipe arches will be used.

Calculated pipe size: 128" x 83" x 46', Aluminum 12 gauge.

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Installation will consist of removal of boulders and shaping of the stream bed to allow the pipe arches to be countersunk 18 inches. Culverts will be backfilled with clean native material to a minimum compacted depth of 24 inches. Inlets will be armored with rip rap material; outlets will be stabilized by seeding and mulching or by rip rapping.

Pipe installation will occur during the in stream work period defined as July 15th thru September 15th.

(*Id.* at 2.) Figure 1 of the addendum included a watershed assessment map with figures regarding the steams' drainage acreage and projected 50 year flows. Figure 2 included a 50 Year Peak Flow Runoff Map for Southern Oregon. (Ex. A69 at 1-2.)

5. On August 8, 2017, in response to the NOAP and Written Plan (addendum), Thackery provided the following formal comments:

The information and advice is intended to assist you in complying with Oregon forest resource protection regulations.

* * * * *

After reviewing your written plan, I offer you the following comments:

Fully implementing this written plan is likely to achieve the resource protection standards. This operation will be evaluated on the basis of how well required practices are applied and how well required resource protection is achieved.

(Ex. A4 at 2, *see also* Ex. A8 at 1.)

6. On September 11, 2017, David Haight, a Fisheries Biologist with the Oregon Department of Fish and Wildlife (ODFW), emailed the Department regarding some complaints ODFW received about a logging operation near the head of Murphy Creek. The Oregon State Police had responded to another complaint and reported to ODFW that there were "steelhead or coho" in a pool above the crossing at Murphy Creek. (Ex. A31 at 3.)

7. On September 14, 2017, Thackery performed an inspection of the ford crossings at Murphy and Spencer Creeks and found Respondent not in compliance at that time. He completed a Forest Activity Inspection Report, notifying Respondent that that the "[o]perations observed were **NOT in compliance** at the time of this inspection." (Ex. A13 at 1.) (Emphasis in original.) It included the following:

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Written Statement of Unsatisfactory Condition

Warning! This operation is not in compliance with the Oregon Forest Practices Act. Further enforcement action (up to and including a citation) will result if damage occurs or if you do not comply with the instructions shown below by the indicated completion date(s).

Applicable Statute or Rule: OAR 629-625-0320(1)(c)

Areas of Violation: Written Plan, Roads

Instruction

No log hauling until the crossings are brought up to the standard described in the written plan (apron of 4" minus rock for 100' on each side of the crossings) or the culverts are installed as described in the written plan. No log hauling after 9/15/2017 across the low water crossings.

Instruction must be complied with by: 9/15/2017

(Id. at 2.) (Emphasis in original.)

8. Between September 14 and 18, 2017, Respondent installed a pipe arch culvert on Murphy Creek and a pipe arch culvert on Spencer Creek. During installation, they hit large boulders which could not be removed due to their size. (Test. of Thackery; Exs. A30 at 1, A31 at 1.) As a result, the culverts were placed on the streambeds without sinking them 18 inches. (Test. of Thackery; Ex. A30 at 1.)

9. On September 18, 2017, Thackery performed another inspect of the crossings and found Respondent to be "in compliance" at that time. He noted in the Forest Activity Inspection Report that "[c]ulverts have been installed according to the written plan. One culvert on Murphy Creek and a second large culvert on Spencer Creek." (Ex. A14 at 1.)

10. On September 18, 2017, Respondent submitted a second addendum to their Written Plan, to include the possibility of a temporary bridge across Spencer Creek. (Ex. A10 at 1.)

11. On October 4, 2017, Thackery and Haight met at the subject property to assess the culverts. Haight notified Thackery that, in his professional opinion, the culvert crossings did not meet fish passage criteria because they were not properly embedded, they did not meet or exceed the active channel width of the streams, and there was a water "drop" out of the outlets into the stream. The drop could scour out a deep pool over time and could prevent juvenile fish from jumping and traveling upstream. (Test. of Thackery.)

12. On October 5, 2017, Thackery performed an inspection of the crossings and took

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multiple measurements from the site. At Murphy Creek, the culvert diameter was 117 inches by 92 inches, the culvert was 46 feet 6 inches long, with a 2-percent gradient, and 43 degree skew from the stream channel. The water flow rate averaged 1.43 feet per second. The stream gradient was 6-percent above the culvert and 4-percent below the culvert. He took ten active channel width (ACW) measurements¹ above the culvert with an average ACW of 15 feet 4 inches (measurements were: 12', 16'6", 14'4", 18'7", 13', 13'7", 22', 13', 20', and 11'). He also took ten ACW measurements below the culvert with an average ACW of 22 feet 5 inches (measurements were: 26'6", 18', 16', 25', 33', 23', 26', 18'7", 20', 19'). There was a 4.5 inch drop off the outlet. The stream channel was composed of 70-percent boulders, 20-percent cobbles, 5-percent gravel, and 5-percent sand. (Ex. A24 at 2.) There was a small amount of sediment in the culvert, but no gravel or rocks. (Test. of Thackery.) At Spencer Creek, the culvert diameter and length was the same as Murphy Creek. The culvert gradient was 6-percent and was aligned 40 degrees skew of the upstream flow and 4 degrees skew of the downstream flow. The stream gradient was 8-percent above and 3-percent below the culvert. The average ACW above the culvert was 20 feet 4 inches (measurements were: 14', 30', 17', 19', 19', 22', 25', 19', 17', and 21'). The average ACW below the culvert was 23 feet 3 inches (measurements were: 24', 21', 18', 18', 25', 30', 27', 21', 24', and 26'). There was a 4 inch drop off the outlet. The stream channel was composed of 40-percent boulders, 40-percent cobbles, 15-percent gravel, and 5-percent sand. (Ex. A25 at 2.) There was no embedding of sediment, gravel, or rocks in the culvert. (Test. of Thackery.)

13. On October 5, 2017, following the inspection, Thackery found Respondent "NOT in compliance." (Ex. A15 at 1.) (Emphasis in original.) In the Forest Activity Inspection Report he noted that:

The installation of culverts in Murphy Creek and Spencer Creek did not meet the criteria as described in the written plan associated with NOAP 2017-712-07527. The improper design and installation of both culverts has violated OAR 629-625-0320(2)(b) by failing to "allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs." By failing to design and install culverts that have "an effective width equal-to or greater-than the active width of the stream" has created a barrier to fish movement.

Because this is a temporary crossing, waterbars will need to be installed on either side of the crossings to divert water from the streams. Removed fill must be placed in a location where it will not wash back into the stream, especially during high water events. Stabilize the exposed soils with seed and mulch to prevent erosion into the stream.

¹ Thackery measured the ACW by looking for a "scour line" where the water appeared to have stripped away all vegetation during average high flow periods and measuring between that scour line on each side. He followed his training and guidance of Technical Note #4 (discussed in detail below) when taking the measurements. (Test. of Thackery.)

(*Id.* at 2.) The inspection report required the work to be completed by October 25, 2017. (*Id.*)

14. On or around October 11, 2017, Thackery spoke with Haight to get ODFW's opinion on whether it would be better to require that Respondent reinstall the culverts as specified in the Written Plan (sinking it 18 inches) or require that Respondent remove the culverts and only use them during the in-stream work period as temporary crossings. Haight notified the Department that ODFW would prefer that the culverts be removed and used only temporarily because:

The main reason that ODFW prefers Alternative 2 – removing the two culverts and only placing them seasonally as needed – as opposed to Alternative 1 – reinstalling the existing culverts so they are imbedded – is that the width of the culverts is significantly less than the active channel width. Both culverts are 9'9" wide while the average ACW for Murphy Creek is just under 19' and for Spencer Creek is just under 22'. While both culverts may pass a 50-year event without failing, we are concerned that the significant restrictions in channel widths will increase water velocities to a point that would make passage difficult. High velocities through the culverts could also make it difficult to maintain substrate in the culverts and could cause erosion below the culverts further hindering passage.

Since installing and removing the culverts multiple times could result in negative impacts to the streams, the Oregon Department of Fish and Wildlife would prefer that the recently installed culverts be replaced with bridges or with culverts that are wide enough to accommodate the ACW, are placed at the appropriate slope, are imbedded at least 20% of the culvert height, and have native streambed material, including the large rocks, placed within them.

(Ex. A33 at 1.)

15. On October 18, 2017, the Department (Thackery, Walters, and Thackery's supervisor), ODFW (Haight), and two of Respondent's employees met onsite to discuss the culverts. Thackery reviewed the measurements he took and the concerns the Department and ODFW had regarding the culverts not being embedded. Respondent's representatives indicated that when they had been installing the culverts they had encountered large boulders that could not be removed with the equipment they had onsite, so they were forced to lay the culverts on top of the boulders. (Test. of Thackery.)

16. On December 1, 2017, Rod Kraemer, Forest Protection Coordinator with ODFW, emailed the Department a summary of ODFW's position regarding the culverts. It provided, in relevant part:

Fish passage for state and federally listed fish species have been impacted by

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the installation of culverts at Spencer and Murphy Creeks. Spencer Creek has approximately one mile of habitat above the culvert. Murphy Creek has approximately 2.5 miles of habitat upstream of the culvert. Fish present and expected to utilize the habitat include coho salmon, steelhead, and cutthroat trout.

These two culverts were installed mid-September 2017. Both culverts were undersized and not embedded in the streambed. Active channel width of the streams ranged from 15-20 feet. The culverts are D-shaped and 9'9" wide. Both culverts had a 3-4 inch drop at the outlet.

Undersized culverts can restrict fish passage through increased stream velocity within the culvert, increased jump height into the culvert due to scour at the outlet, and prevent sediment from accumulating within the culvert.

New and replacement culverts are required to address fish passage when located in waters inhabited by native migratory fish. * * * Culverts are frequently installed using a streambed simulation strategy. This strategy results in a culvert that allows the waterway to function in many ways, similar to a stream with no culvert impacts, at most flows. Fish passage is maintained at all but extreme high and low flows. Proper sizing of the culvert is important to ensure there is enough capacity for the stream to flow through the culvert at most flows without being restricted through a bottleneck that artificially increases stream velocities.

(Ex. A35 at 1.)

17. On December 4, 2017, Thackery performed an inspection of the crossings and noted that "Murphy Cr. Culvert is starting to accumulate gravels in the bottom and the lip is non-existent. Spencer Cr. Culvert has not accumulated any material, does not appear that flows have been heavy enough to transport gravel." (Ex. A16 at 1-2.) Thackery mistakenly noted in the Forest Activity Inspection Report that Respondent was "in compliance" at that time. (*Id.*; test. of Thackery.)

18. On June 21, 2018, Thackery performed an inspection of the crossings and noted that the Murphy Creek culvert "has approximately half of the length of pipe covered with gravel and the outlet is starting to imbed," but that the Spencer Creek had "no accumulation of gravel in the pipe and future efforts to bring the culvert into compliance with the written plan will need to be considered." (*Id.* at 2.) Thackery noted in the Forest Activity Inspection Report that Respondent was "in compliance." (*Id.* at 1.)

19. On August 2, 2018, Pete Samarin, Fish Biologist with ODFW, visited the culverts at Murphy and Spencer Creeks. He found the Murphy Creek culvert partially dry with water

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flowing under the culvert at the upstream end. He also observed more than 50 young of the year salmonids (salmon less than one year old) downstream from Murphy Creek and some “within the lower watered section of the culvert.” (Ex. A39 at 4.) He also noted that “[b]ased on conservative active channel (OAR-635-412-0005) measurements taken downstream of this culvert, the approximately 3.3 meter culvert installed is undersized. Three measurements taken downstream ranged between 5.5-7 meters. Upstream measurements were not taken as it was obvious the culvert was not as wide as the active channel * * *.” (*Id.*) The Spencer Creek culvert was placed at an “approximate slope of 2-3% gradient” which he concluded would “continue undermining the culvert.” (*Id.* at 5.) About half of the streamflow was running under the culvert. Samarin also found one young of the year salmonid inside the culvert. He noted that it was “unknown whether or not this fish or others are able to currently pass this culvert as there is no hydraulic refuge within the culvert and the fish observed were approximately 50mm. Many more young of the year salmonids were observed downstream similar to the Murphy Creek culvert.” (*Id.* at 5.) Voids from water erosion were noted adjacent to the sides of the culvert, which Samarin feared could increase in size and erode around the culvert in a high water event. The ACW of Spencer Creek measured at 4 to 6 meters both upstream and downstream of the culvert. At that time, Spencer Creek had a wetted width of 2 to 3 meters. (*Id.* at 7.)

20. On March 11, 2019, Thackery performed an inspection of the crossings and found Respondent “not in compliance” because:

Neither culvert has gravel deposits sufficient to simulate a stream channel. The improper design and installation of both culverts has violated OAR 629-625-0320(2)(b) by failing to “allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement is that stream normally occurs.”

(Ex. A18 at 1-2.) The accumulation of rocks and gravel that had been present the previous year had been washed out by winter flows. (Test. of Thackery.)

21. On February 19, 2019, Caswell submitted a NOAP and a Written Plan to the Department, on behalf of Respondent for timber harvesting on the subject property. (Ex. A5 at 1, 4.) Thackery provided the same formal comments he provided on the 2017 NOAP and Written Plan. (*Id.* at 2.)

22. On April 24, 2019, Daren Cone, State Forests Engineer with the Department, visited the site to take measurements of Murphy Creek culvert. Because the size of the two culverts were the same, he only measured the Murphy Creek culvert. The water was flowing higher than it had been during prior site visits. Cone noticed a “head differential” between the water upstream and the water in the culvert, causing the water in the culvert to increase in velocity. (Test. of Cone.)

23. On April 24, 2019, Cone calculated the stream velocities and depth of flow for the

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Murphy and Spencer Creek culverts at the 5 percent duration and 95 percent duration flows.² He used measurements he took on site (on April 4, 2019), along with data from StreamStats (an online system that provides stream statistics to users), ODF and ODFW administrative rules, and Forest Practices Technical note Number 4. Later, he received the culvert measurements as designed and calculated the velocities and depth of flow³ using those measurements. His calculations were as follows:

Murphy Creek

	Minimum/Maximum Allowable ⁴	As Measured	As Designed
Velocity	Maximum for Juvenile fish: 2 feet per second (ft/sec)	5 th Percentile: 4.574 ft/sec 95 th Percentile: 0.045 ft/sec	5 th Percentile: 4.46 ft/sec 95 th Percentile: 0.47 ft/sec
Depth of Flow	Minimum for juvenile: 6” Minimum for adult: 12”	5 th Percentile: 11.38” 95 th Percentile: 0.386”	5 th Percentile: 11.44” 95 th Percentile: 0.386”

Spencer Creek

	Minimum/Maximum Allowable	As Measured	As Designed
Velocity	Maximum for Juvenile fish: 2 feet per second (ft/sec)	5 th Percentile: 6.05 ft/sec 95 th Percentile: 1.10 ft/sec	5 th Percentile: 5.94 ft/sec 95 th Percentile: 1.33 ft/sec
Depth of Flow	Minimum for juvenile: 6” Minimum for adult: 12”	5 th Percentile: 7.735” 95 th Percentile: 0.638”	5 th Percentile: 7.915” 95 th Percentile: 0.667”

(Exs. A45 at 1-2, A46 at 1-2; test. of Cone.)

24. On May 2, 2019, a meeting occurred at the subject property with Larson, McCarty, Thackery (all with the Department), Caswell (landowner/Respondent representative), and Samarin (ODFW). Some rocks had accumulated in Murphy Creek over the winter, but the culvert was “nowhere near * * * imbedded.” (Ex. A43 at 1.) Samarin noticed “huge voids” to the sides of the Murphy Creek culverts which could trap and kill juvenile fish. Samarin believed these voids were the result of water not being able to pass through the culvert during higher

² The 5th percentile duration is the stream flow rate which you would expect to exceed only 5 percent of the time. That is, 95 percent of the time, the flow rate would be below that number. Similarly, the 95th percentile is the stream flow rate which you would expect to exceed 95 percent of the time. That is, 5 percent of the time, the flow rate would be above that number. (Test. of Cone.)

³ Depth of flow is depth of water that would be present in the middle of the culvert. (Test. of Cone.)

⁴ Minimum/maximum velocities and depth of flow are found in Technical Note #4, described below.
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winter flow events. (Test. of Samarin.) Water was still flowing under the Spencer Creek culvert. (*Id.*)

25. On June 10, 2019, Larson wrote a letter to Caswell, advising him that the culvert crossings at Murphy and Spencer Creeks “will need to be removed or replaced with a fish passage-compliant crossing to allow for compliance with OAR 629-625-0320(2)(b)” by July 31, 2019. (Ex. A47 at 1.) The letter further notified Caswell that failure to comply with the request would result in the Department taking enforcement action via a citation. (*Id.*)

26. On July 31, 2019, Caswell wrote a letter to the Department in response to Larson’s June 10, 2019 letter. It provided, in part:

In your letter, you indicate that after extensive review, the Oregon Department of Forestry and the Oregon Department of Fish and Wildlife have concluded that the culverts on Spencer Creek and Murphy Creek need to be removed or replaced. This review is intended to take place during the comment/review period **prior** to the implementation of the written plan.

Your letter attempts an improper use of authority to remove capital improvements – which were installed to the satisfaction of ODF and will have a fiscal cost to the landowner in excess of \$50,000. This letter should serve as sufficient evidence and reason to suspend any enforcement action considered by the Oregon Department of Forestry.

(Ex. A48 at 1.) (Emphasis in original.)

27. The Department’s Forest Practice Rule Guidance provides that evaluating a culvert to determine if it allows passage as required by OAR 629-625-0320(2)(b), is guided by Forest Practices Technical Note Number 4, “Fish Passage Guidelines for New and Replacement Stream Crossing Structures” Version 1.0 (Technical Note #4). (Ex. A61 at 30.)

28. Technical Note #4, effective May 10, 2002, was developed by ODF in collaboration with ODFW to “provide the essential information that will enable landowners and operators to install stream-crossing structures that have a high likelihood of providing fish passage.” (Ex. A63 at 1.) Technical Note #4 is available to the public online or at a Department office. (Test. of Walters.) It provides, in relevant part:

Requirements for fish passage design in Oregon is based on the weakest species or life stage present that requires upstream access and should accommodate the weakest group within that species. In most cases this will mean providing passage for juvenile fish that are about two inches in length or greater. For juvenile fish, ODFW guidelines specify a maximum jump height of six inches and an average water velocity no greater than two feet per

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second to ensure that passage will be provided.

* * * * *

Before it is possible to decide on the appropriate strategy for providing fish passage, the following specific information on the stream characteristics in and around the crossing should be collected:

1. STREAMBED GRADIENT

* * * * *

2. STREAMBED MATERIAL

The type of streambed material that is present is critical, especially for strategies that depend on culvert sinking. For the streambed simulation strategy to be successful there should be an ample supply and diversity of sediment * * * that will embed the culvert and remain stable over time. * * *

3. DEPTH OF STREAMBED MATERIAL

It is also important to estimate the depth of streambed material outside of the influence of the existing culvert installation. * * * If little fill is present, then culvert sinking/embedding strategies become impractical because of the difficulty of sinking into bedrock. * * *

[4.] ACTIVE CHANNEL WIDTH

New and replacement stream crossing structures should have an effective width equal-to or greater-than the active width (also sometimes referred to as the 'bankfull width') of the stream. This will prevent abrupt changes in stream velocities at the inlet and outlet that create fish passage barriers (inlet and outlet drops; bed scour; higher stream velocities through the crossing that prevent sediment from depositing in the culvert; etc.). The active channel width corresponds to a peak streamflow that occurs on average once every one to two years. Locating the active width, while generally based on scientific principles, requires judgement when making a determination in the field. * * *

Abrupt changes in vegetation are good clues to help determine the active channel width. Abrupt changes in texture of the bank material may also be clues. The active channel width is measured from one stream bank mark to the other. * * * The active width is determined by taking the average of at least 10 cross-section measurements, spaced one to two channel widths apart,

upstream of the location where the crossing is being installed. Start taking measurements upstream of the crossing, beyond the point where the old crossing has influenced channel characteristics.

Fish Passage Design Strategies

* * * * *

Along with stream slope, the degree of valley fill material over bedrock is extremely important in deciding between strategies. For instance, a streambed simulation design can easily be used for a crossing with a 5% stream slope. However[,] if bedrock is present, the culvert can no longer be easily buried into the streambed and a channel-spanning structure becomes a preferred option. Stream size is another critical factor along with slope and valley fill depth[.] * * * Small streams with active channel widths less than 10 feet can often be accommodated with culverts at a lower expense than bridges. But as active channel width increases, culvert installations become more costly and problematic. When culvert dimensions begin to require multi plate designs in excess of 10 feet in diameter (for round culverts) or 12 feet in span (for pipe-arches) the cost can approach that of a bridge, making a channel-spanning structure a more preferred design.

(Ex. A63 at 2-6.) (Emphasis in original.) Technical Note #4 also provides six basic types of designs/strategies for creating fish passage in a stream, including removing/abandoning a stream crossing, channel-spanning structure, fords, streambed simulation, bare culvert placed at a zero grade, or hydraulic design. (*Id.* at 6.) It provides that the streambed simulation:

[C]alls for sinking the culvert^[5] into the existing streambed at both the inlet and outlet, in streams with gradients up to 8% that are dominated by valley fill substrates several feet deep. * * * The effective culvert width (i.e. inlet width after sinking and embedding) should be equal-to or greater-than the active stream width. This design will not work if the stream is predominately bedrock or has extremely large boulders hampering culvert sinking into the streambed, unless measures are undertaken to properly embed the pipe. This strategy requires sinking the culvert to the same depth at the inlet and outlet so that the stream and culvert gradients are the same.

For stream gradients between 4% and 8%, consideration should be given to countersinking the culvert (the inlet buried deeper than the outlet), so that the

⁵ “Sinking a culvert refers to putting the bottom of the culvert in at a lower elevation than the exiting streambed. * * * Countersinking a culvert refers to when the inlet is sunk into the streambed to a greater degree than the outlet. * * * Embedding a culvert is to fill a culvert with larger and smaller sediment in a contiguous interlocking manner.” (Ex. A63 at 13.)

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resulting culvert gradient is 1.5 % less-than the stream gradient[.] * * *
Countersinking can help the culvert to recruit and maintain a simulated streambed for higher gradient streams where it can be more difficult to retain sediment in the culvert. Countersinking can also help where the channel is dominated by fine materials that are more difficult to maintain in the culvert-bottom, as compared to an assortment of gravel and cobble of various sizes.

* * * * *

For pipe-arch culverts, the sinking depth should be the greater-of 20% of the rise or 18 inches.^[6] There are two main reasons for the need to sink culverts to these depths when using this strategy. One is to ensure that after the culvert becomes embedded with streambed material, the effective channel width is similar to the widest part of the culvert. The second reason is so that as the channel elevation naturally fluctuates over time (rises and falls), the embedded depth is great enough to allow for this fluctuation without scouring down to the culvert bottom and resulting in a fish passage barrier.

* * * * *

When properly installed, the resulting streambed characteristics in terms of sedimentation sizes and distribution should be the same above, within, and below the culvert. For a migrating fish this would impose no changes or stress, and no delay in upstream migration. From a stream morphology perspective, the culvert will have a minimal effect on sediment transport dynamics, and there would be no sediment buildup upstream or deprivation downstream. Because the effective culvert width is the same as the active channel width, there is no flow constriction at the inlet and no flow concentration at the outlet. This will result in no increase in scouring or damage at the outlet.

(*Id.* at 7-9.) In regards to hydraulic design, Technical Note #4 provides, in part:

This strategy involves culverts with various types and configurations of weirs, or other flow obstructions, installed inside the culvert to either increase roughness or to create a series of pools with drops to increase depths and decrease velocity to aid fish passage. This design requires considerably more hydraulic engineering expertise than the other methods and may require outside consulting. **These designs need to have hydraulic calculations that indicate backwatering, velocities, and energy reductions are such that**

⁶ If a culvert is countersunk (where the inlet is sunk deeper than the outlet), the outlet should be sunk to a depth of 18 inches and the inlet side should be sunk deeper than 18 inches. (Test. of Walters.)

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juvenile fish passage will occur. All hydraulic designs except those prepared by a licensed professional engineer require further review by the ODF staff hydrologist.

* * * * *

Because of cost and maintenance considerations this choice should only be used as a last resort.

* * * * *

To ensure fish passage with this design there are several checks that should be preformed [*sic*] which include depth of flow calculations for low and high design flows (must meet Oregon Department of Fish and Wildlife fish passage guidelines) and energy dissipation at high design flow.

(*Id.* at 9-10.) (Emphasis in original.) Technical Note #4 provides guidance on what information should be included in a written plan for fish passage strategies. For a streambed simulation, the written plan should include the following: the strategy that is being attempted, legal location, active channel width, stream gradient, streambed material, depth of streambed material, length of crossing, elevation change over length of crossing, resulting culvert gradient, depth of inlet sinking, depth of outlet sinking, and 50-year peak flow calculation(s). (*Id.* at 11.)

29. Both Murphy Creek and Spencer Creek are perennial streams (water flows in them year-round). Fish found in the streams include Coho Salmon, Fall Chinook Salmon, Steelhead Salmon, Costal Cutthroat Trout, and non-game fish such as Sculpin. Around the end of December through March, summer Steelhead ascend the streams. Around April, winter Steelhead ascend the streams. In October and November, Chinook Salmon ascend the stream if there is a heavy streamflow. From November through January, adult Coho Salmon ascend the streams and tributaries. Juvenile fish of all species are moving and up down the streams year-round, in search of cool water. Costal Cutthroat Trout also migrate up and down the streams year-round. If fish do not have access to the full habitable stream, they can become overcrowded and die due to insufficient food or warm water. (Test. of Samarin.)

30. The fish found in Murphy and Spencer Creeks cannot swim through gravel or rocks. They cannot swim under culverts. Fish have difficulty swimming through culverts that do not have properly embedded rocks and gravel to simulate the natural streambed due to water flows in the culverts and the lack of aquatic refuge inside a culvert. (Test. of Samarin.)

CONCLUSIONS OF LAW

1. Respondent failed to design and construct a stream crossing over Murphy Creek that allowed migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).
2. Respondent failed to design and construct a stream crossing over Spencer Creek that allowed migration of fish upstream and downstream during conditions when fish movement in the stream normally occurs, in violation of OAR 629-625-0320(2)(b).
3. The Department may require Respondent to cease further violations of OAR 629-625-0320(2)(b).
4. The Department may order Respondent to repair damage or correct unsatisfactory condition(s) caused by violation(s) of OAR 629-625-0320(2)(b).

OPINION

Burden of Proof

The Department bears the burden of establishing by a preponderance of the evidence that the violations alleged in the two Notices of Violation/Citation occurred, that Respondent may be ordered to cease further violation(s), and that Respondent may be ordered to repair damage or correct unsatisfactory condition(s) caused by the violation(s). ORS 183.450(2) (“The burden of presenting evidence to support a fact or position in a contested case rests on the proponent of the fact or position”); *Harris v. SAIF*, 292 Or 683, 690 (1982) (general rule regarding allocation of burden of proof is that the burden is on the proponent of the fact or position); *Dixon v. Board of Nursing*, 291 Or App 207, 213 (2018) (in administrative proceedings, the preponderance standard generally applies). Proof by a preponderance of the evidence means that the fact finder is persuaded that the facts asserted are more likely than not true. *Riley Hill General Contractor v. Tandy Corp.*, 303 Or 390, 402 (1987).

Applicable Laws and Rules

The Oregon Forest Practices Act (FPA) is found in ORS 527.610 to ORS 527.770, ORS 527.990(1), and ORS 527.992. The purpose of the FPA is as follows:

Forests make a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance

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of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 and to ensure the continuous benefits of those resources for future generations of Oregonians.

ORS 527.630(1). In addition, ORS 527.630(3) gives the State Board of Forestry the “exclusive authority to develop and enforce statewide and regional rules pursuant to ORS 527.710 and to coordinate with other state agencies and local governments which are concerned with the forest environment.” ORS 527.710 provides, in relevant part:

(1) In carrying out the purposes of * * * [the FPA], the State Board of Forestry shall adopt, in accordance with applicable provisions of ORS chapter 183, rules to be administered by the State Forester establishing standards for forest practices in each region or subregion.

(2) The rules shall ensure the continuous growing and harvesting of forest tree species. Consistent with ORS 527.630, the rules shall provide for the overall maintenance of the following resources:

(a) Air quality;

(b) Water resources, including but not limited to sources of domestic drinking water;

(c) Soil productivity; and

(d) Fish and wildlife.

ORS 527.670 provides, in relevant part:

(10) If an operator, timber owner or landowner is required to submit a written plan of operations to the State Forester under subsection (3) of this section:

(a) The State Forester shall review a written plan and may provide comments to the person who submitted the written plan;

(b) The State Forester may not provide any comments concerning the written plan earlier than 14 calendar days following the date that the written plan was filed with the State Forester nor later than 21 calendar days following the date that the written plan was filed; and

(c) Provided that notice has been provided as required by subsection (6) of this section, the operation may commence on the date that the State Forester provides comments or, if no comments are provided within the time period established in paragraph (b) of this subsection, at any time after 21 calendar days following the date that the written plan was filed.

(11)(a) Comments provided by the State Forester, or by the board under ORS 527.700 (6), to the person who submitted the written plan are for the sole purpose of providing advice to the operator, timber owner or landowner regarding whether the operation described in the written plan is likely to comply with ORS 527.610 to 527.770 and rules adopted thereunder. Comments provided by the State Forester or the board do not constitute an approval of the written plan or operation.

(b) If the State Forester or the board does not comment on a written plan, the failure to comment does not mean that an operation carried out in conformance with the written plan complies with ORS 527.610 to 527.770 or rules adopted thereunder nor does the failure to comment constitute a rejection of the written plan or operation.

(c) If the State Forester or board determines that an enforcement action may be appropriate concerning the compliance of a particular operation with ORS 527.610 to 527.770 or rules adopted under ORS 527.610 to 527.770, the State Forester or board shall consider, but are not bound by, comments that the State Forester provided under this section or comments that the board provided under ORS 527.700.

ORS 527.680 provides:

(1) Whenever the State Forester determines that an operator has committed a violation under ORS 527.990(1), the State Forester may issue and serve a citation upon the operator or authorized representative. The State Forester shall cause a copy of the citation to be mailed or delivered to the timber owner and landowner. Whenever the State Forester determines that the landowner has failed to comply with the reforestation rules under ORS 527.710, the State Forester may issue and serve a citation upon the landowner or authorized representative. Each citation issued under this section shall specify the nature of the violation charged and any damage or unsatisfactory condition that has occurred as the result of such violation.

(2) Whenever a citation is served pursuant to subsection (1) of this section, the State Forester:

(a) Shall issue and serve upon the landowner or operator or authorized representative an order directing that the landowner or operator cease further violation. If the order is served upon an operator, the State Forester shall cause a copy of such order to be mailed or delivered to the timber owner and landowner; and

(b) May issue and serve an order upon the landowner or operator and shall cause a copy of such order to be mailed or delivered to the timber owner and landowner, directing the landowner or operator, where practical and economically feasible, to make reasonable efforts to repair the damage or correct the unsatisfactory condition specified in the citation within a period specified by the State Forester.

(3) In the event the order issued under subsection (2)(a) of this section has not been complied with, and the violation specified in such order is resulting in continuing damage, the State Forester by temporary order, may direct the landowner or operator to cease any further activity in that portion of the operation that is resulting in such damage. Such temporary order shall be in effect until the date of the expiration of the period as prescribed in subsection (4) of this section or until the date that the violation ceases, whichever date occurs first.

(4) A temporary order issued under subsection (3) of this section shall be served upon the landowner or operator or authorized representative, and the State Forester shall cause a copy of such temporary order to be mailed or delivered to the operator, timber owner and landowner. If requested by the operator, timber owner or landowner, the State Board of Forestry, following the appeal procedures of ORS 527.700, must hold a hearing on the temporary order within five working days after the receipt by the board of the request. A temporary order issued and served pursuant to subsection (3) of this section shall remain in effect not more than five working days after such hearing unless the order is sooner affirmed, modified or revoked by the board.

(5) If a landowner or operator fails to comply with a final order issued under subsection (2)(b) of this section within the time specified in the order, or if the landowner or operator fails to comply with a final order imposing civil penalties for violation of any provision of the Oregon Forest Practices Act, the State Forester may issue an order that prohibits the affected landowner or operator from conducting any new operations on any forestland in this state until the landowner or operator has complied with the order to correct an unsatisfactory condition, make repair or pay the civil penalty, as the case may be, to the satisfaction of the State Forester.

ORS 527.990(1) provides:

(1) Subject to ORS 153.022, violation of * * * any rule promulgated under ORS 527.710 is a Class A misdemeanor. Each day of operation in violation of an order issued under ORS 527.680(3) shall be deemed to be a separate offense.

OAR 629-625-0320(2) provides:

(2) Operators shall design and construct stream crossings (culverts, bridges, and fords) to:

(a) Pass a peak flow that at least corresponds to the 50-year return interval. When determining the size of culvert needed to pass a peak flow corresponding to the 50-year return interval, operators shall select a size that is adequate to preclude ponding of water higher than the top of the culvert; and

(b) Allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs.

Fish Passage through Culverts

Pursuant to the ORS 527.630(3) and the FPA, the State Board of Forestry adopted OAR 629-625-0320, requiring operators to design and construct stream crossings that allow for passage of a 50-year peak flow and allow for migration of fish. In the August 7, 2019 Citations, the Department alleges that Respondent failed to design and install culverts that allowed migration of fish. Specifically, the Department alleges that the culverts installed on Murphy and Spencer Creeks were not as wide as the ACW of the creeks and that the culverts were not adequately sunk in the streambed to allow for fish passage or accumulation of streambed material. Respondent argues that the Department has failed to show that the culverts prevent fish passage. Respondent argues further that, even if the Department does show that the culverts prevent fish passage, that the Department is estopped from requiring removal of the culverts because the Department approved Respondent's Written Plan and found Respondent to be in compliance.

Both Murphy and Spencer Creeks are perennial streams that provide year-round habitat for several species of fish. Juvenile fish are present in both streams year-round, constantly moving up and down the streams in search of food and cold water. Adult Coastal Cutthroat Trout also migrate up and downstream year-round. Adult fish of the other species migrate upstream at various periods throughout the year, including January through April and October through December. Respondent argued at hearing that the Department failed to show that there were fish at or above the culvert. This argument is factually incorrect; the Department presented reliable

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and persuasive testimony that small young of the year fish were found right below both culverts and one fish was found inside a culvert. Additionally, the Department provided evidence that there is habitable stream above both culverts and that fish would be swimming up and downstream in search of cold water and food year-round. Therefore, the Department has shown that the culverts on both Murphy Creek and Spencer Creek are in locations where fish would be present and moving up and downstream year-round.

Because both culverts are in areas where fish would swim upstream and downstream year-round, they must allow for fish passage any time of year when fish would be able to pass if the culverts were not present. There are no laws or rules which specify exactly how a culvert must be designed or installed to allow for fish passage. The Department has issued Technical Note #4, which was created in collaboration with ODFW, to provide guidance on this issue. While compliance with the guidance in Technical Note #4 is not legally required of operators, it is designed to guide operators in designing and installing crossing that have a high likelihood of allowing fish passage.

As found in Technical Note #4, culverts should be as wide as the active channel width of the stream. This allows water to flow freely through the culverts during high water events without bottlenecking or creating a head differential, which can result in increased water velocity inside the culvert. Respondent argued that the ACW measurements taken by Thackery were improperly done and thus inaccurate. However, Thackery's measurements were consistent with those taken by Samarin and supported by evidence in the record that the culverts were unable to fully pass water during higher flow events, such as Cone noting a head differential at Murphy Creek and Samarin observing voids next to the culverts. Additionally, Respondent presented no alternative evidence regarding the ACW or evidence that would refute Thackery's calculations. Thus, the Department has shown by a preponderance of the evidence that the culverts on both Murphy and Spencer Creeks are smaller than the ACW of the streams.

While a finding that a culvert is narrower than the ACW of the streams is insufficient alone to support a finding that fish cannot pass through a culvert, in this case there is sufficient evidence showing that because the culverts on both Murphy and Spencer Creeks were undersized, they were preventing fish passage. When Cone visited the site during a higher flow time, he observed a head differential between the water above the culvert and the water in the culvert, causing the velocity of the water in the culvert to increase. Samarin observed voids next to culverts after winter when water flows would have been higher, indicating that the culverts did not have the capacity to move all the water through them and some water was diverted around the culverts. Cone's calculations of the potential velocity of water flowing through the pipes during a high flow event showed that Murphy Creek flows could reach 4.46 feet per second and that Spencer Creek could reach 5.94 feet per second, velocities that greatly exceed the 2 feet per second standard needed for juvenile fish to pass through the culverts. Therefore, because the culverts were undersized for both streams, resulting in increased stream velocities during periods of high flow, they failed to provide for fish passage upstream and downstream during conditions when fish movement in those streams normally occurs.

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Not only were the culverts undersized, they were also inadequately sunk in the streambed resulting in the culverts not properly embedding with stream material and resulting in water flowing under the culverts and blocking fish passage. Juvenile fish require the refuge that large boulders provide in water to allow them to rest when attempting to swim upstream. Because the culverts were not fully embedded with stream materials, any juvenile fish that were able to get into the culvert could become stressed or die due to conditions inside the culvert. Additionally, when stream flows were low and a majority of the water was flowing under the culverts, the fish could likewise not swim upstream. Thus, the improper installation of the culverts resulted in a failure to provide for fish passage upstream and downstream during conditions when fish movement in those streams normally occurs.

The culverts for Murphy and Spencer Creeks were designed in such a way that they failed to provide for fish passage upstream and downstream during conditions when fish movement in those streams normally occurs. Additionally, Respondent failed to follow their design when installing the culverts (Respondent did not sink, countersink, or embed one or both ends of either culvert 18 inches when installed). The culverts were undersized and not properly sunk or embedded with stream materials. The Department established that Respondent violated OAR 629-625-0320(2)(b) for both the Murphy Creek culvert and the Spencer Creek culvert.

Equitable Estoppel

Respondent argues that even if it did violate OAR 629-625-0320(2)(b), the Department is estopped from citing Respondent for the violations and further estopped from requiring Respondent to cease further violations and repair damage or correct unsatisfactory conditions caused by the violations. Respondent argues that when Respondent submitted its NOAP in 2017, the Department “did not object and agreed that they met all related requirements.” Respondent’s Hearing Memorandum at 4. Respondent goes on to argue that the Department “could have required changes similar to those they are now requesting and subsequently approved the culverts with these requirements.” Respondent’s Hearing Memorandum at 4.

Equitable estoppel may apply to government agencies under certain circumstances, but those circumstances are “rare and should be applied cautiously.” *Mannelin v. DMV*, 176 Or App 9, 13 (2001) (citing *Employment Div. v. Western Graphics Corp.*, 76 Or App 608 (1985)). As the court noted in *Wilkinson v. PERB*, 188 Or App 97, 102 (2003), the theory of equitable estoppel “requires proof of a false representation, (1) of which the other party was ignorant, (2) made with the knowledge of the facts, (3) made with the intention that it would induce action by the other party, and (4) that induced the other party to act upon it.” In addition, to “establish estoppel against a state agency, a party must have relied on the agency’s representations and the party’s reliance must have been reasonable.” *Id.* (citing *State ex rel SOSCF v. Dennis*, 173 Or App 604, 611 *rev den*, 332 Or 558 (2001)).

In *Mannelin*, the court explained that the agency’s false or misleading statement must be one of “existing material fact and not of intention, nor may it be a conclusion from facts or conclusion of law.” *Id.* (citing *Coos County v. State of Oregon*, 303 Or 173, 180-81 (1987)). Furthermore, “statements made by a state agency ‘may not bind the state to any arrangement that contravenes the statutes.’” *Id.* (citing *Does 1-7 v. State of Oregon*, 165 Or App 543, *rev den* 330 Or 138 (2000)). In *Wilkinson*, the court recognized that “to establish reasonable reliance, the petitioner must show that the representations made by the agency were within its lawful power to make.” 180 Or App at 103. Moreover, a party’s reliance on a state officer’s alleged false or misleading representation cannot be reasonable where there is a law published in the public domain to the contrary. *See Arken v. City of Portland*, 351 Or 113 (2011) (“the existence of a law in the public domain makes reliance on a contrary representation patently unreasonable, precluding estoppel.”); *Committee in Opposition v. Oregon Emergency Corrections Facility Siting Authority*, 309 Or 678 (1990) (stating same.)

Compliance with the FPA is ultimately the responsibility of the operator, not the Department. While ORS 527.670(10)(a) requires that the State Forester reviews all written plans, section (11)(a) of that same rule makes clear that comments provided by the State Forester are “for the sole purpose of providing advice to the operator [and] * * * do not constitute an approval of the written plan or operation.” Respondent’s argument that Thackery should have reviewed the Written Plan, noticed the deficiencies, and pointed them out to Respondent impermissibly shifts the burden of plan development, design, and compliance with the FPA from Respondent to the Department. Thus, any comments Thackery made on Respondent’s Written Plan were simply advisory and cannot be the basis for an estoppel claim.

Additionally, Technical Note #4 was available to Respondent online and provided sufficient guidance regarding culvert installation design which would make Respondent’s Written Plan and subsequent installation of culverts likely comply with the FPA. Given the availability of information regarding proper culvert design and installation in Technical Note #4, Respondent’s sole reliance on Thackery’s advisory comment was not reasonable. For the foregoing reasons, Respondent has failed to show that equitable estoppel is applicable in this case.

Order to Cease Further Violation(s) & Order to Repair Damage or Correct Unsatisfactory Condition(s) Caused By Violation(s)

As discussed above, Respondent violated OAR 629-625-0320(2)(b) by failing to design and install stream crossings to allow for migration of fish upstream and downstream during conditions when fish movement in the streams normally occur on Murphy Creek, and Respondent violated OAR 629-625-0320(2)(b) by failing to design and install stream crossings to allow for migration of fish upstream and downstream during conditions when fish movement in the streams normally occur on Spencer Creek. Pursuant to ORS 527.680(2), the Department may order Respondent to cease further violations of OAR 629-625-0320(2)(b).

In the Amended Orders to Repair Damage or Correct Unsatisfactory Condition Caused by Violation, the Department gave Respondent two options:

Option A: Remove the existing stream crossing structure, do not install a replacement structure.

The crossing area may be left without a crossing structure after removal of the existing culvert. However, if trucks or equipment will cross at the crossing location, a suitable crossing structure (as described in Option B below) will be needed. To use Option A, the following requirements must be met:

- Remove the existing culvert.
- Remove all artificially-placed material from the stream channel to allow natural flow conditions.
- Pull back stream banks to a stable angle.
- Stabilize exposed material to prevent sediment delivery to waters of the state.
- Provide effective cross-drainage on approaches to the crossing area.
- Minimize the potential for erosion of the channel.

Option B: Remove the existing stream crossing structure, install a replacement stream crossing structure.

- Remove the existing culvert.
- Install a replacement crossing structure per Forest Practice Technical Note Number 4 that will allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs (provide fish passage).
- Any replacement crossing structures must also meet 50-year peak flow requirements as outlined in Forest Practices Technical Note Number 5^[7].
- Stabilize exposed material to prevent sediment delivery to waters of the state, provide effective cross-drainage on approaches to the crossing, and minimize the potential for erosion of the channel.

Amended Repair Order and Tech Notes for Forest Practices Violation at 4 and 6.

Pursuant to ORS 527.680(2)(b), the Department has the authority to issue an Order to Repair Damage or Correct Unsatisfactory Condition. In addition, the Repair Orders are reasonable and necessary to repair the damage done to Murphy and Spencer Creeks by Respondent.

ORDER

I propose the Oregon Department of Forestry, Private Forests issue the following order:

⁷ Technical Note #5 was promulgated by the Department regarding the 50-year peak flow requirements of OAR 629-625-0320(2)(a).

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The Notices of Violation/Citation and the Amended Orders to Cease Further Violation and Repair Damage or Correct Unsatisfactory Condition Caused By Violation (#19-SW002 and #19-SW003), issued on August 7, 2019, are AFFIRMED. For the established violations herein (the violation related to Murphy Creek and the violation related to Spencer Creeek), Respondent must cease further violations of OAR 629-625-0320(2)(b). In addition, Respondent must repair or correct unsatisfactory damage caused by the violation at Murphy Creek and repair or correct unsatisfactory damage caused by the violation at Spencer Creek. For both violations, Respondent must take the following action to repair damage or correct the unsatisfactory conditions resulting from the violations of OAR 629-625-0320(2)(b):

Remove the existing stream crossing structure, and complete either Option A or Option B shown below. For either option, all of the following apply:

- File a notification with the State Forester at least 15 days before starting any work to remove or replace the existing stream crossing structure.
- As required in OAR 629-605-0170, file a statutory written plan with the State Forester before starting any work to remove or replace the stream crossing structure. There is a waiting period of up to 21 days from the time a complete plan is submitted to the time the work may begin.
- To protect fish that may be present in the stream, conduct all in-water work during the period of July 1 through September 15.

Option A: Remove the existing stream crossing structure, do not install a replacement structure.

The crossing area may be left without a crossing structure after removal of the exiting culvert. However, if trucks or equipment will cross at the crossing location, a suitable crossing structure (as described in Option B below) will be needed. To use Option A, the following requirements must be met:

- Remove the existing culvert.
- Remove all artificially-placed material from the stream channel to allow natural flow conditions.
- Pull back stream banks to a stable angle.
- Stabilize exposed material to prevent sediment delivery to waters of the state.
- Provide effective cross-drainage on approaches to the crossing area.
- Minimize the potential for erosion of the channel.

Option B: Remove the existing stream crossing structure, install a replacement stream crossing structure.

- Remove the existing culvert.
- Install a replacement crossing structure per Forest Practice Technical Note Number 4 that will allow migration of adult and juvenile fish upstream and downstream during conditions when fish movement in that stream normally occurs (provide fish passage).

- Any replacement crossing structures must also meet 50-year peak flow requirements as outlined in Forest Practices Technical Note Number 5.
- Stabilize exposed material to prevent sediment delivery to waters of the state, provide effective cross-drainage on approaches to the crossing, and minimize the potential for erosion of the channel.

Such action must be completed on or before September 15, 2020.

Kate Triana

Administrative Law Judge
Office of Administrative Hearings

**OREGON DEPARTMENT OF FORESTRY
EXCEPTIONS TO PROPOSED ORDER**

If this proposed order is adverse to you or to the agency, you or the agency may file exceptions within seven days after the date of the filing of the proposed order. See OAR 629-001-0040 to

0045 and OAR 137-003-0650 to 0655. Exceptions must be filed with the Board of Forestry, through the agency contact:

Greg Wagenblast, Civil Penalties Administrator
Department of Forestry, Private Forests Division
2600 State Street
Salem, OR 97310

The exceptions shall be confined to factual and legal issues that are essential to the ultimate and just determination of the proceeding, and shall be based only on grounds that:

1. A necessary finding of fact is omitted, erroneous, or unsupported by the preponderance of the evidence on the record;
2. A necessary legal conclusion is omitted or is contrary to law or the Board's policy; or
3. Prejudicial procedural error occurred.

The exceptions shall be numbered and shall specify the disputed finding, opinions or conclusions. The nature of the suggested error shall be specified and the alternative or corrective language provided.

The Board of Forestry will issue a final order on this matter, whether or not exceptions are filed. After the Board has received and reviewed the proposed order and the exceptions, if any, the Board may:

1. Entertain written and/or oral argument if the Board determines it is necessary or appropriate to assist the Board in the proper disposition of the case. If allowed, oral argument will be limited to matters raised in written exceptions and shall be presented under time limits determined by the Board chair;
2. Remand the matter to the ALJ for further proceedings on any issues the Board specifies, and to prepare a revised proposed order as appropriate, under OAR 137-003-0655(2);
3. Enter a final order adopting the recommendations of the ALJ; or
4. Enter an amended proposed order or final order that modifies or rejects the recommendations of the ALJ. If the Board decides to modify or reject the proposed order, it will comply with OAR 137-003-0655 and 137-003-0665.

CERTIFICATE OF MAILING

On July 29, 2020, I mailed the foregoing Proposed Order issued on this date in OAH Case No. 2019-ABC-03105.

By: First Class Mail

Siskiyou Cascade Resources
Joel Caswell
16 N. Riverside Ave Suite 214 Box 4
Medford OR 97501

Zachary Light
Zachary W. Light, P.C.
14 N Central Ave Suite 101
Medford OR 97501

By: Electronic Mail

Greg Wagenblast, Agency Representative
Department of Forestry, Private Forests
2600 State St Bldg D
Salem OR 97310

Matthew B Devore, Assistant Attorney General
Department of Justice
1162 Court St NE
Salem OR 97301

Lucy M Garcia
Hearing Coordinator

**BEFORE THE BOARD OF FORESTRY
STATE OF OREGON**

IN THE MATTER OF:

**SISKIYOU CASCADE RESOURCES,
ABN OF SISKIYOU CASCADE
RESOURCES LLC**

Respondent.

FINAL ORDER

OAH Case No. 2019-ABC-03105
Agency Case No. 19-SW002 & 19-SW003

The Board of Forestry, at a meeting in Salem on November 4, 2020, by consensus affirms the Citations 19-SW002 and 19-SW003, issued by Douglas Thackery, Stewardship Forester, and adopts and incorporates by reference the attached proposed order issued by Administrative Law Judge Kate Triana, on July 29, 2020, as amended below. Siskiyou Cascade Resources LLC submitted exceptions to the proposed final order, but the exceptions were not timely and the Board was not obligated to consider the exceptions. However, the Board considered the exceptions in the event that the Board's conclusion as to timeliness is overturned on appeal. The Board did not find that the exceptions justified any changes to the proposed order.

The proposed order, page 24 is amended to read (deleted text with strikethrough and added text with underline):

-

Such action must be completed ~~on or before September 15, 2020~~ Prior to July 15, 2021 as long as consistent with the instream work period requirements.

Dated this _____ day of November, 2020

By: _____
Peter Daugherty
State Forester and
Secretary to the Board of Forestry

RIGHT TO JUDICIAL REVIEW

If you are dissatisfied with the Order, you may request rehearing or reconsideration by the Board. To do so, you must file a petition for rehearing or reconsideration pursuant to OAR 137-003-0675 and OAR 629-001-0050 within 60 days from the day this Order was served on you. If this Order was personally delivered to you, the date of service is the day you received the Order. If this Order was mailed to you, the date of service is the day it was *mailed*, not the day you received it. A petition for rehearing or reconsideration must state with specificity the grounds for objection to the order, and the remedy sought. If you do not file a petition for rehearing or reconsideration within the time limits provided, you will lose your opportunity for rehearing or reconsideration and you will lose your right to appeal to the Oregon Court of Appeals. (OAR 137-003-0675 and OAR 629-001-0050).

If, after you have filed a petition for rehearing or reconsideration, the Board issues an Order you are dissatisfied with, you have the right to appeal that Order to the Oregon Court of Appeals pursuant to ORS 183.482. To appeal, you must file a petition for judicial review with the Court of Appeals within 60 days from the day the Order was served on you.

If, 60 days after you have filed a petition for rehearing or reconsideration, the Board has not issued an order, your petition will be considered denied and at that time you will have the right to appeal the original Order to the Court of Appeals pursuant to ORS 183.480 and ORS 183.482. To appeal, you must file a petition for judicial review with the Court of Appeals within 60 days from the day that your petition is deemed denied. If you do not file a petition for judicial review within the 60-day time period, you will lose your right to appeal.

1 The past tense of the word “issue” leads to the reasonable conclusion that the distribution of
2 the proposed order has already happened, and that it has been received by the party. Counsel
3 for Siskiyou Cascade received the opinion in my office mailbox on Monday, August 24, 2020
4 because I do not have weekend mail delivery in my building. Although there are no rules on
5 point defining the word “issued”, other rules governing service and notice toll 3 days for mail
6 within Oregon and toll weekend days (see UTCR 5.100(1)(a) and ORCP Rule 10). If the
7 interpretation of this rule is strict, the time begins to toll while the proposed opinion is in
8 transit and held by the post office over the weekend. Furthermore, if the exceptions need to
9 be received by Mr. Wagenblast within 7 days of the order being generated, a party may have
10 less than 1 business day to formulate a reply and get it in the mail to Mr. Wagenblast. This
11 flies in the face of fundamental fairness concerns. Therefore, under the reasonable
12 interpretation of the seven day exception timeframe under related trial and civil procedural
13 rules and the reasonable definition of the correct OAR statement, the deadline should be seven
14 days from legal and actual receipt of the proposed order, or August 24, 2020, for the
15 exceptions to be formulated and sent to Mr. Wagenblast. The exceptions are being emailed
16 and mailed on August 28, 2020 to Mr. Wagenblast and AAG Devore and are therefore timely.

EXCEPTIONS

17 This matter derives from a citation alleging violation of OAR 629-625-0300(3) that requires
18 operators to “drain skid trails by water barring or other effective means immediately
19 following completion of the operation and at all times during the operation when runoff is
20 likely.”

21 **Exception #1:** The Proposed Order, under the Opinion section, subsection 1, entitled
22 “Adequacy of the July 23, 2019 Notice of Violation/Citation” misstates or misconstrues the
23

24
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1 arguments put forth by Siskiyou Cascade. Testimony was elicited, and several of the
2 Inspection Reports note, that this area was popular with recreational all terrain vehicles that
3 were tearing up the roadway and skid trails and damaging the water diversion structures
4 installed by Siskiyou Cascade in the late Fall and Winter of 2018-2019. A statement of
5 unsatisfactory condition was issued on November 28, 2018 requiring Siskiyou Cascade to
6 drain all skid trails by water barring or other effective means by December 31, 2018. (Exhibit
7 A10). Our contention and argument is that, under the law, there are two obligations upon
8 operators. One, the operator shall construct structures to drain skid trails “when runoff is
9 likely.” This requirement requires the operator to construct and maintain structures that will
10 mitigate runoff during the operation if the operation continues through the wet months. Two,
11 the operator shall construct structures that will continue to prevent erosion and improper
12 runoff when the operation is completed. (See Exhibit A42, page 37 of 96, Forest Practice
13 Rule Guidance relating to Drainage Systems). ALJ Triana fails to note in the opinion of her
14 proposed order that in the December 6, 2018 Forest Activity Inspection Report, Siskiyou
15 Cascade was found to be “in compliance” because the “main line road (had been) water
16 barred.” (Exhibit A11). This was at a time when there was an active forestry operation and
17 regular rainfall events causing runoff. On December 18, 2018, a Forest Activity Inspection
18 Report found the operator not in compliance where “OHV’s and other vehicle traffic have all
19 but wiped out the recently installed water bars, sediment is continuing to be delivered to
20 Quartz Creek with each significant rain event. SCR (Siskiyou Cascade Resources) should
21 design a blockage to deter OHV and pick up traffic.” (Exhibit A12). The paramount issue in
22 this matter is the meaning of the notations in the Forest Activity Inspection Report dated
23 January 3, 2019. (Exhibit A13). Siskiyou Cascade is found to be “not in compliance”,
24

1 however, in the inspection notes Mr. Thackery states that “the previous UC (statement of
2 unsatisfactory condition) has been temporarily complied with.” Our contention and argument
3 is that this is a statement acknowledging that my client had fulfilled their obligation under the
4 rule requiring effective means to drain skid trails “when runoff is likely” during an ongoing
5 operation as well as an acknowledgment of two additional facts. Clearly Mr. Thackery was
6 concerned about the feasibility of constructing water bars during the winter and was
7 acknowledging that logging operations in the area were ongoing. He states “[a]ll skid trails
8 will need to have water bars installed when the conditions are more appropriate for operating
9 on the ground.” (Exhibit A13). Furthermore, when read in context, the statement in the Forest
10 Activity Inspection Report that Siskiyou Cascade was “not in compliance”, refers to Mr.
11 Thackery’s assertion that Siskiyou Cascade would not be in compliance with their obligations
12 under OAR 629-625-0300(3) until all skid trails had water bars installed sufficient to
13 overcome the OHV traffic. This is simply not within the clear meaning of the rule. Mr.
14 Thackery gave a deadline of June 15, 2019 for the “install[ation of] water bars or other water
15 diverting structures on ALL skid trails.” (Exhibit A13, page 2 of 2). This is the crux of our
16 argument. Mr. Thackery and the Department are incorrect in their assertion that an operator
17 should be required to immediately construct water bars throughout an ongoing operation
18 where damage has been mitigated through other effective means, especially where they admit
19 it is not feasible (a requirement under the Forest Practice Rule Guidance cited above). The
20 Department is also incorrect in determining that Siskiyou Cascade is “not in compliance” but
21 essentially admit elsewhere in the Forest Activity Inspection Report that the operator *is* in
22 compliance.
23
24

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1 We contend that the relation back of the citation to the violations alleged in the January 3,
2 2019 Forest Activity Inspection Report are improper because Siskiyou Cascade was in
3 compliance at that time. Furthermore, requiring installation of the water bars by a certain date
4 is improper during an ongoing operation in that unit- especially during a time of year where
5 there is no immediate risk of erosion. If the erosion issue has been addressed by other means,
6 substantial water barring is the second obligation to create permanent erosion control as the
7 operator withdraws from the area post harvest. Essentially, Siskiyou Cascade met all of their
8 obligations under the rule but did not meet the deadline given by the Department requiring
9 water barring of all skid trails. Failing to meet a deadline cannot be the sole basis for the
10 issuance of the citation.

11 Respectfully submitted.

12 Dated this 28th day of August, 2020.

13
14 By: Zachary W. Light
15 Zachary W. Light, OSB No. 035702
16 Attorney for Siskiyou Cascade Resources, LLC
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**BEFORE THE OFFICE OF ADMINISTRATIVE HEARINGS
STATE OF OREGON
for the
OREGON DEPARTMENT OF FORESTRY
PRIVATE FORESTS**

IN THE MATTER OF:) **PROPOSED ORDER**
)
 SISKIYOU CASCADE RESOURCES)
 ABN OF SISKIYOU CASCADE) OAH Case No. 2019-ABC-03047
 RESOURCES LLC) Agency Case No. 19-SW007

HISTORY OF THE CASE

On July 23, 2019, the Oregon Department of Forestry, Private Forests (the Department/ODF) issued a Notice of Violation/Citation, an Order to Cease Further Violation, and an Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation to Siskiyou Cascade Resources ABN of Siskiyou Cascade Resources LLC (Respondent). On August 21, 2019, Respondent requested a hearing.

On August 22, 2019, the Department referred the hearing request to the Office of Administrative Hearings (OAH). Respondent and the Department waived the 14-day hearing deadline and 28-day Final Order deadline under ORS 527.700. The OAH assigned Administrative Law Judge (ALJ) Kate Triana to preside at hearing. Senior ALJ Alison Webster, on behalf of ALJ Triana, convened a prehearing conference on November 15, 2019. Assistant Attorney General (AAG) Matthew DeVore and Greg Wagenblast appeared on behalf of the Department; Attorney Zachary Light appeared on behalf of Respondent. A hearing was scheduled for March 12, 2020, in Grants Pass, Oregon.

On March 6, 2020, Respondent requested a postponement of the March 12, 2020 hearing. On March 9, 2020, ALJ Triana held a telephone status conference and granted the request to postpone the hearing. AAG DeVore and Mr. Wagenblast appeared on behalf of the Department; Mr. Light appeared on behalf of Respondent. ALJ Triana rescheduled the hearing for June 4, 2020, in Grants Pass, Oregon.

On March 17, 2020, the Department moved to reschedule the hearing. Respondent did not object. ALJ Triana granted the motion. On April 29, 2020, ALJ Triana held a telephone status conference. The hearing was rescheduled for July 9, 2020.

On May 29, 2020, during a prehearing conference on a related case with the same parties,

In the Matter of Siskiyou Cascade Resources ABN of Siskiyou Cascade Resources LLC - OAH Case No. 2019-ABC-03047

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the Department requested to postpone the July 9, 2020 hearing to August 6, 2020. Respondent did not object. ALJ Triana granted the motion.

A hearing was held on August 6, 2020, by video conference. Mr. Light represented Respondent at hearing. Joel Caswell appeared on behalf of Respondent. AAG DeVore represented the Department. Greg Wagenblast appeared as the authorized representative for the Department. Doug Thackery, Department Stewardship Forester, and Jay Walters, Department Forest Practices Field Coordinator, testified on behalf of the Department. The record closed at the conclusion of the hearing on August 6, 2020.

ISSUES

1. Whether Respondent failed to drain skid trails by water barring or other effective means immediately following completion of the timber harvest operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state, in violation of OAR 629-630-0300(3).
2. Whether the Department may require Respondent to cease further violations of OAR 629-630-0300(3). ORS 527.680(2).
3. Whether the Department may order Respondent to repair damage or correct unsatisfactory conditions caused by the violation of OAR 629-630-0300(3). ORS 527.680(2).

EVIDENTIARY RULING

Exhibits A1 through A47, offered by the Department, were admitted into the record without objection. During the hearing, the Department offered Exhibit A48, consisting of 31 pages, including 20 photos and a citation. Respondent objected to admission of Exhibit A48. Exhibit A48 was excluded because it was not timely offered by the Department prior to the hearing and it was repetitive to testimony already in the record.

FINDINGS OF FACT

1. On December 14, 2017, Joel Caswell, on behalf of Respondent, submitted a Notification of Operations/Permit to Operate Power-Driven Machinery (NOAP) #2017-712-14031C to the Department. (Ex. A2 at 1.) The NOAP was associated with Respondent's intent to harvest timber (including commercial thinning and selective cutting) on two units of property. Unit 1 consisted of 157.4 acres of forest, located at Township 34 South, Range 6 West, Section 25, in Josephine County; Unit 2 consisted of 81.2 acres of forest, located at Township 34 South, Range 7 West, Section 25, and Range 6 West, Section 19, in Josephine County (Unit 1 and 2 are collectively referred to as "the subject property"). (*Id.* at 4-5.) Two Small Type F (fish bearing) streams ran through Unit 1: Quartz Creek and an unnamed tributary to Quartz Creek. Quartz

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Creek ran through Unit 2. (*Id.*) The NOAP listed Caswell Thompson, LLC as the landowner and Joel Caswell of Siskiyou Cascade Resources as the timber owner. (*Id.* at 1.)

2. On December 15, 2017, Doug Thackery, ODF Stewardship Forester, provided the following comments in response to Respondent’s NOAP:

- 1) Quartz Creek and 1 tributary are classified Small Type F (fish-bearing) streams, no operations within 100’ without a reviewed statutory written plan on file.
- 2) No conflict with other protected resources.
- 3) Request to waive 15-day waiting period granted with the exception of those areas within 100’ of the Type F streams.

(Ex. A2 at 2.)

3. On December 22, 2017, Respondent submitted a written plan to the Department. (Ex. A3 at 1.) The written plan identified Quartz Creek and an unnamed tributary to Quartz creek as two fish-bearing streams in the plan area. Additionally, it provided the following information:

Section III Specific Site Characteristics

- 1) Seasonal Restrictions for Protection of Resources (Road Construction/Logging):

In order to minimize the risk of sedimentation entering any watercourse and lessen the impacts on fish habitat, the following restrictions apply[:]

* * * * *

- 3) Road renovation, road maintenance and logging operations, including log haul on any natural surfaced road will be suspended during periods of heavy precipitation.

* * * * *

Section IV Tree and Vegetative Retention/Vegetative Buffers

* * * * *

Reduction of soil loss: Areas of mineral soil exceeding 800 continuous square feet within the RMA [riparian management area] of type “F” streams that were exposed by logging operations will be treated for

reduction of soil loss. Stabilization measures shall be selected that will prevent significant movement of soil into the protected watercourse. These may include but are not limited to seeding, mulching or rip rapping. Stabilization measures shall be completed prior to September 15th. Areas exposed after September 15th will be treated within 15 days.

* * * * *

Section V Harvesting Practices

* * * * *

2) Yarding Operations:

The following measures will be taken to minimize sediments from entering waters of the state.

* * * * *

Existing skid roads will be used whenever possible. New skid roads will be located so that sidecast is held to a minimum. Upon completion of skidding all skid roads will be waterbarred. Soils within the plan area will be treated as normal forest soils for waterbar spacing. Spacing will be as follows[:]

Maximum Distance between Waterbars (Normal)

Slope:	5 to 15%	16 to 35%	36 to 50%	Over 50%
	300 ft.	200 ft.	100 ft.	50 ft.

Skid roads will be located as far from stream channels as possible, including all type “N” streams in order to lessen the possibility of sediments entering watercourses. The following table provides minimum adequate setback distances for skid roads for all stream courses.

Soil	Slope in Percent		
	0 to 35%	36 to 50%	51% to 65%
Normal	20 feet	35 feet	100 feet
Erodible	25 feet	100 feet	rule violation

Skid Trail Closures[:] Major collector skid roads that are accessible to

four wheel drive vehicles will be barricaded upon completion of logging operations. Barricades may include earth and log berms, tank traps or brush piles.

* * * * *

6) Road Closures:

Upon completion of timber operations for the year or prior to November 15th whichever comes first, the following specifications shall be met[:]

* * * * *

- 4) All natural surfaced roads opened for logging purposes shall be barricaded.
- 5) All natural surfaced roads will be graded and shaped to provide for the even dispersal of water. This includes outsloping, pulling back berms and providing permanent maintenance free waterbars or dips.

(*Id.* at 2 – 7.) (Emphasis in original.)

4. On January 8, 2018, Thackery provided the following comments in response to Respondent’s written plan:

Fully implementing this written plan is likely to achieve the resource protection standards. This operation will be evaluated on the basis of how well required practices are applied and how well required resource protection is achieved.

(Ex. A2 at 2.)

5. On January 9, 2018, Thackery met with Randy Brown, Respondent’s Forester, to discuss a section of a haul road which had “washed out.” (Test. of Thackery.) He also performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the Forest Practices Act (FPA) at the time of the inspection. (Ex. A6 at 1.)

6. On January 12, 2018, Respondent submitted “Amendment #1” to the written plan to address a small fill slope failure on a portion of a haul road near Quartz Creek. (Ex. A4 at 1.)

7. On February 15, 2018, Thackery performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the FPA at the time of the inspection. (Ex. A7 at 1.)

8. On May 1, 2018, Thackery performed another inspection of the subject property. He again prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the FPA at the time of the inspection. (Ex. A8 at 1.) In the report, Thackery noted that he inspected Quartz Creek for fish barriers and found none. He noted that Respondent could treat Quartz Creek as a Small Type N (non-fish bearing) stream in Unit 2. (*Id.*)

9. On November 27, 2018, Thackery performed an inspection of the subject property. (Ex. A9 at 1.) Thackery observed approximately 15 to 20 skid trails on the subject property. (Test. of Thackery.) He noted that all skid trails were not properly water barred and water was flowing down the skid trails, onto a haul road (a natural surface road), and then into Quartz Creek. Quartz Creek was brown and resembled a “peanut-butter milkshake” as a result of the sediment following into the stream. (*Id.*) No logging activity was occurring at the subject property at that time. (*Id.*) Thackery prepared a Forest Activity Inspection Report, finding Respondent “not in compliance” with the FPA. (Ex. A9 at 1.) He noted that:

Natural surface roads not waterbarred and delivering sediment to Quartz Creek. Road needs waterbarred [*sic*] ASAP with aggressive water diverting structures. Skid trails not waterbarred or insufficiently waterbarred, one skid trail in particular that runs from the top of the hill down to the creek needs cross drainage ASAP.

(*Id.*) ODF issued a Notice of Violation/Citation associated with the sediment delivery from the haul road into Quartz Creek. (Test. of Thackery.)

10. On November 28, 2018, Thackery returned to the subject property and performed another inspection. (Ex. A10 at 1.) He took several photographs of the site and observed a channel cut by water running down a skid trail located on the spine of a steep ridge. (Test. of Thackery; Ex. A25 at 7-8.) He noted that:

The haul road that was delivering sediment to Quartz Creek has been water barred and sediment delivery has been halted for now. Further work will need to occur to stabilize the sediment delivered to the bottom of the vertical curve of the road, every time water ponds up sediment will be delivered to the stream. Straw will be delivered to the site and spread as mulch tomorrow according to Randy Brown.

(Ex. A10 at 1.) Thackery also issued a written statement of unsatisfactory condition to Respondent which stated:

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Warning! This operation is not in compliance with the Oregon Forest Practices Act. Further enforcement action (up to and including a citation) will result if damage occurs or if you do not comply with the instructions shown below by the indicated completion date(s).

Applicable Statute or Rule: OAR 629-630-0300(3)

Areas of Violation: Harvesting

Instruction: Operator shall drain skid trails by water barring or other effective method. All skid trails on operation will need proper drainage.

Instruction must be complied with by: 12/31/2018

(*Id.* at 2.) (Emphasis in original.)

11. On December 6, 2018, Thackery performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the FPA at the time of the inspection. (Ex. A11 at 1.) He noted that the “[m]ain line road water barred, OHV [off highway vehicle] traffic has beaten some of the shallow water bars flat already. Should be reinforced/rebuilt when you go into [*sic*] water bar the skid trails.” (*Id.*) When noting that Respondent was “in compliance,” Thackery was referring to the concerns regarding sediment delivery into Quartz Creek via the haul road. Thackery was not evaluating the compliance of the skid road water barring since the December 31, 2018 deadline had not yet passed. (Test. of Thackery.)

12. On December 18, 2018, Thackery again performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent was not in compliance at the time of the inspection. (Ex. A12 at 1.) He noted that:

OHV’s and other vehicle traffic have all but wiped out the recently installed water bars, sediment is continuing to be delivered to Quartz Creek with each significant rain event. SCR [Respondent] should design a blockage to deter OHV and pickup traffic.

(*Id.*) On that date, Thackery again observed water flowing from skid roads onto the main haul road and then delivering sediment into Quartz Creek. (Test. of Thackery.)

13. On December 31, 2018, the 2017 NOAP expired. (Test. of Thackery.)

14. On January 3, 2019, Thackery performed an inspection of the subject property. He

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prepared a Forest Activity Inspection Report, finding Respondent not in compliance with the FPA at the time of the inspection. (Ex. A13 at 1.) He noted that:

The previous UC [unsatisfactory condition] has been temporarily complied with. The immediate threat of sediment delivery to the stream has been minimized with the installation of substantial well built water bars and the placement of shale in the bottom of the vertical curve to minimize ponding. The haul road and landing above the stream crossing have been water barred and should divert surface water into areas with natural filtering. There has been some recreational traffic on the road already but the water bars were constructed well enough to maintain functionality even when driven over.

The previous UC called for all skid trails to be water barred and this has not happened yet. Some of the trails could not be water barred due to the steepness of the trail while others were ignored. All skid trails will need to have water bars installed when the conditions are more appropriate for operating on the ground.

(*Id.*) Thackery also issued a written statement of unsatisfactory condition to Respondent which stated:

Warning! This operation is not in compliance with the Oregon Forest Practices Act. Further enforcement action (up to and including a citation) will result if damage occurs or if you do not comply with the instructions shown below by the indicated completion date(s).

Applicable Statute or Rule: OAR 629-630-0300(3)

Areas of Violation: Harvesting

Instruction: Install water bars or other water diverting structure on ALL skid trails.

Instruction must be complied with by: 6/15/2019

(*Id.* at 2.) (Emphasis in original.) Thackery picked the June 15, 2019 completion date to give Respondent sufficient time complete the water barring after the wet season ended. (Test. of Thackery.)

15. On February 12, 2019, Caswell submitted NOAP #2019-712-02412 to the Department. (Ex. A19 at 1.) The NOAP was associated with Respondent's intent to harvest timber (including commercial thinning and selective cutting) on Unit 1 and Unit 2 of the subject

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property. (*Id.* at 3-4.) Unit 1 in the 2019 NOAP was referred to as Unit 2 in the 2017 NOAP; Unit 2 in the 2019 NOAP was referred to as Unit 1 in the 2017 NOAP.¹ (*Id.*; Ex. A2 at 4-5.) The NOAP listed Caswell Thompson, LLC as the landowner and Joel Caswell of Siskiyou Cascade Resources as the timber owner. (*Id.* at 1.)

16. On June 3, 2019, Thackery performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the FPA at the time of the inspection. (Ex. A14 at 1.) He noted that there were no FPA concerns at that time. (*Id.*)

17. On June 3, 2019, Thackery sent an email to Caswell reminding him of the June 15, 2019 repair deadline for water barring the skid trails. (Ex. A29 at 1.) On June 17, 2019, Caswell responded to Thackery’s email, stating “We have timber cut in that unit that we will be logging this week. The water barring will be done as they are finishing up this week.” (*Id.*)

18. On June 26, 2019, Thackery performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “not in compliance” with the FPA at the time of the inspection. (Ex. A15 at 1.) He noted that:

Mr. Caswell sent an email June 16 stating that logging would be done by the end of the week and water barring would commence. That has not occurred yet.

Operator/Landowner chose to continue harvest activity beyond the area described in the WSUC [written statement of unsatisfactory condition] instead of completing the repair.

Failed to do the repairs required in the Written Statement of Unsatisfactory Condition dated January 3, 2019 which required all skid trails used during 2017 – [20]18 operating seasons be adequately water barred by June 15, 2019.

(*Id.*)

19. On July 26, 2019, Thackery performed an inspection of the subject property. (Ex. A16 at 1.) He noticed two skid trails had no water bars installed. He prepared a Forest Activity Inspection Report, finding Respondent to be “not in compliance” with the FPA at the time of the inspection. (Ex. A16 at 1.) He noted that:

The rest of the unit appears to be adequately water barred.

¹ For the purpose of this order and to avoid confusion, the terms “Unit 1” and “Unit 2” refer to the locations identified in the 2017 NOAP.

One more water bar is recommended just above the tank trap on the haul road leading to Unit 2.

Randy Brown was called and message was left on voicemail that water barring is incomplete and to call for details.

Randy Brown called 7/24 informing that SCR had completed water barring the unit in order to complete the repair that was required by 6/15.

The steep skid trail coming down the spine of the ridge DID NOT get touched and neither did the main skid trail that branches off the spine trail.

(Id.) (Emphasis in original. Line spacing added between last two sentences for clarity.)

20. On August 12, 2019, Thackery performed an inspection of the subject property. He prepared a Forest Activity Inspection Report, finding Respondent to be “in compliance” with the FPA at the time of the inspection. (Ex. A17 at 1.) He noted that:

More pit run shale rock was added to the reverse curve to armor the crossing and to capture any sediment that makes it to the bottom of the hill. This should greatly reduce the chances of and the amount of sediment delivered to Quartz Creek.

The main skid trail down the ridge has been water barred with an excavator. The water bars are robust enough that they should withstand OHV traffic for a long time.

(Id.)

21. Skid trails are unimproved roads used by heavy equipment to haul logs down to the haul road for processing. Haul roads are improved roads that allow for log truck traffic to haul logs off the worksite. Water bars are typically trenches cut at an angle into a road with a bulldozer, creating a berm of hard-packed material. When water flows down the skid trail or haul road it will get caught in the trench and divert off the side of the road into natural soils, allowing it to dissipate and filter before entering waterways. (Test. of Thackery.)

CONCLUSIONS OF LAW

1. Respondent failed to drain skid trails by water barring or other effective means immediately following completing of the operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state, in violation of OAR 629-630-0300(3).

2. The Department may require Respondent to cease further violation of OAR 629-630-0300(3).

3. The Department may order Respondent to repair damage or correct unsatisfactory condition caused by the violation of OAR 629-630-0300(3).

OPINION

Burden of Proof

The Department bears the burden of establishing by a preponderance of the evidence that the violation alleged in the Notices of Violation/Citation occurred, that Respondent may be ordered to cease further violation, and that Respondent may be ordered to repair damage or correct unsatisfactory condition caused by the violation. ORS 183.450(2) (“The burden of presenting evidence to support a fact or position in a contested case rests on the proponent of the fact or position”); *Harris v. SAIF*, 292 Or 683, 690 (1982) (general rule regarding allocation of burden of proof is that the burden is on the proponent of the fact or position); *Dixon v. Board of Nursing*, 291 Or App 207, 213 (2018) (in administrative proceedings, the preponderance standard generally applies). Proof by a preponderance of the evidence means that the fact finder is persuaded that the facts asserted are more likely than not true. *Riley Hill General Contractor v. Tandy Corp.*, 303 Or 390, 402 (1987).

Applicable Laws and Rules

The FPA is found in ORS 527.610 to ORS 527.770, ORS 527.990(1), and ORS 527.992. The purpose of the FPA is as follows:

Forests make a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 and to ensure the continuous benefits of those resources for future generations of Oregonians.

ORS 527.630(1). In addition, ORS 527.630(3) gives the State Board of Forestry the “exclusive authority to develop and enforce statewide and regional rules pursuant to ORS 527.710 and to coordinate with other state agencies and local governments which are concerned with the forest

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environment.” ORS 527.710 identifies the State Board of Forestry’s authority to promulgate rules to carry out the purposes of the FPA and provides, in relevant part:

(1) In carrying out the purposes of * * * [the FPA], the State Board of Forestry shall adopt, in accordance with applicable provisions of ORS chapter 183, rules to be administered by the State Forester establishing standards for forest practices in each region or subregion.

(2) The rules shall ensure the continuous growing and harvesting of forest tree species. Consistent with ORS 527.630, the rules shall provide for the overall maintenance of the following resources:

(a) Air quality;

(b) Water resources, including but not limited to sources of domestic drinking water;

(c) Soil productivity; and

(d) Fish and wildlife.

ORS 527.680 identifies the State Forester’s authority to address violations of the FPA and provides:

(1) Whenever the State Forester determines that an operator has committed a violation under ORS 527.990(1), the State Forester may issue and serve a citation upon the operator or authorized representative. The State Forester shall cause a copy of the citation to be mailed or delivered to the timber owner and landowner. Whenever the State Forester determines that the landowner has failed to comply with the reforestation rules under ORS 527.710, the State Forester may issue and serve a citation upon the landowner or authorized representative. Each citation issued under this section shall specify the nature of the violation charged and any damage or unsatisfactory condition that has occurred as the result of such violation.

(2) Whenever a citation is served pursuant to subsection (1) of this section, the State Forester:

(a) Shall issue and serve upon the landowner or operator or authorized representative an order directing that the landowner or operator cease further violation. If the order is served upon an operator, the State Forester shall cause

a copy of such order to be mailed or delivered to the timber owner and landowner; and

(b) May issue and serve an order upon the landowner or operator and shall cause a copy of such order to be mailed or delivered to the timber owner and landowner, directing the landowner or operator, where practical and economically feasible, to make reasonable efforts to repair the damage or correct the unsatisfactory condition specified in the citation within a period specified by the State Forester.

(3) In the event the order issued under subsection (2)(a) of this section has not been complied with, and the violation specified in such order is resulting in continuing damage, the State Forester by temporary order, may direct the landowner or operator to cease any further activity in that portion of the operation that is resulting in such damage. Such temporary order shall be in effect until the date of the expiration of the period as prescribed in subsection (4) of this section or until the date that the violation ceases, whichever date occurs first.

(4) A temporary order issued under subsection (3) of this section shall be served upon the landowner or operator or authorized representative, and the State Forester shall cause a copy of such temporary order to be mailed or delivered to the operator, timber owner and landowner. If requested by the operator, timber owner or landowner, the State Board of Forestry, following the appeal procedures of ORS 527.700, must hold a hearing on the temporary order within five working days after the receipt by the board of the request. A temporary order issued and served pursuant to subsection (3) of this section shall remain in effect not more than five working days after such hearing unless the order is sooner affirmed, modified or revoked by the board.

(5) If a landowner or operator fails to comply with a final order issued under subsection (2)(b) of this section within the time specified in the order, or if the landowner or operator fails to comply with a final order imposing civil penalties for violation of any provision of the Oregon Forest Practices Act, the State Forester may issue an order that prohibits the affected landowner or operator from conducting any new operations on any forestland in this state until the landowner or operator has complied with the order to correct an unsatisfactory condition, make repair or pay the civil penalty, as the case may be, to the satisfaction of the State Forester.

ORS 527.990 identifies certain violations of the FPA as criminal conduct and provides, in part:

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(1) Subject to ORS 153.022, violation of * * * any rule promulgated under ORS 527.710 is a Class A misdemeanor. Each day of operation in violation of an order issued under ORS 527.680(3) shall be deemed to be a separate offense.

OAR 629-630-0100, titled “Skidding and Yarding Practices,” provides, in part:

(1) For each harvesting operation, operators shall select a logging method and type of equipment appropriate to the given slope, landscape, and soil properties in order to minimize soil deterioration and to protect water quality.

(2) Operators shall avoid ground-based yarding on unstable, wet, or easily compacted soils unless operations can be conducted without damaging soil productivity through soil disturbance, compaction or erosion.

* * * * *

(4) Operators shall locate skid trails on stable areas so as to minimize the risk of material entering waters of the state.

OAR 629-630-0300, titled “Drainage Systems,” provides:

(1) The purpose of this rule is to provide and maintain a drainage system for each landing, skid trail, and fire trail that will control and disperse surface runoff to minimize sediment entering waters of the state.

(2) Operators shall construct dips, grade reversals or other effective water diversions in skid trails and fire trails as necessary to minimize soil displacement and to ensure runoff water is filtered before entering waters of the state.

(3) Operators shall drain skid trails by water barring or other effective means immediately following completion of the operation and at all times during the operation when runoff is likely.

(4) Operators shall establish effective drainage on landings during and after use.

OAR 629-600-0100(89) defines “water bar” as, “a diversion ditch and/or hump in a trail or road for the purpose of carrying surface water runoff into the vegetation and duff so that it does not gain the volume and velocity which causes soil movement or erosion.”

OAR 629-670-0130, titled “Issuing a Citation and an Order to Cease Further Violation,” provides:

(1) When the State Forester determines a violation exists, enforcement action may be initiated by issuing and serving a citation to the responsible persons or corporations in accordance with ORS 527.680.

(2) The State Forester shall also issue an order to cease further violation and determine whether it is practical and economically feasible for the operator to take corrective action to repair the damage or correct the unsatisfactory condition. The State Forester may then issue and serve an order directing the operator to make reasonable efforts to repair the damage or correct the unsatisfactory condition in accordance with ORS 527.680(2)(b).

The Parties’ Arguments

In the July 23, 2019 Notice of Violation/Citation, the Department alleged that Respondent failed to drain skid tails by water barring or other effective means immediately following completion of the operation and that this failure resulted in significant down-slope erosion and delivery of excessive sediment to waters of the state. Respondent acknowledged in closing arguments that the skid trails required water barring, but argued that the June 23, 2019 Notice of Violation/Citation was invalid because it cited to an incorrect statute. Respondent also argued that the Notice of Violation/Citation was moot because Respondent complied with the requirements at some point after the Notice of Violation/Citation was issued and before the hearing in this matter.

1. Adequacy of the July 23, 2019 Notice of Violation/Citation

The Administrative Procedures Act (APA) requires that a party be fully informed about a case affecting its interests. *Spray v. Board of Medical Examiners*, 50 Or App 311, *modified on recons*, 51 Or App 773, *rev den*, 291 Or 117 (1981). ORS 183.415 sets forth the requirements for adequate notice under the APA and requires, among other things, that a notice contains a “reference to the particular sections of the statutes and rules involved[.]” ORS 183.415(3)(c).

As discussed above, Respondent argues that the Department erred when issuing the Notice of Violation/Citation by citing to OAR 629-630-0300(3) as the rule allegedly violated. Specifically, Respondent argues that the alleged violation was not OAR 629-630-0300(3), but rather some other, unidentified, rule which requires operators to comply within certain

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timeframes given by the Department following the issuance of a written statement of unsatisfactory condition. Respondent offered no alternate rule or statute which the Department should have cited to. Respondent's argument is without merit.

On November 28, 2018, ODF issued a written statement of unsatisfactory condition requiring Respondent to drain all skid trails by water barring or other effective means by December 31, 2018. At that time (as discussed in more detail below), Respondent was in violation of OAR 629-630-0300(3). Under OAR 629-670-0110², ODF had the authority to issue either a written statement of unsatisfactory condition or a citation. As of January 3, 2019, Respondent had not complied with the written statement of unsatisfactory condition and was still in violation of OAR 629-360-0300(3). ODF again had the option to issue another written statement of unsatisfactory condition or a citation, pursuant to OAR 629-670-0110. On January 3, 2019, ODF issued another written statement of unsatisfactory condition, requiring Respondent to drain all skid trails by June 15, 2019. Finally, on June 26, 2019, Respondent had still not complied with the January 3, 2019 written statement of unsatisfactory condition by draining the skid trails and therefore remained in violation of OAR 629-360-0300(3). ODF again had the option, under OAR 629-670-0110, to issue either another written statement of unsatisfactory condition or a citation. ODF opted to issue a Notice of Violation/Citation. At the time ODF issued the Notice of Violation/Citation, Respondent was in violation of OAR 629-360-0300(3) and the Notice of Violation/Citation correctly referenced that rule section. Respondent failed to identify any statutory or regulatory authority requiring the Department to give Respondent time to correct a violation *prior* to issuing a Notice of Violation/Citation. Therefore, the Notice contained a reference to the particular section of the rule involved (OAR 629-360-0300(3)) and Respondent's argument that the Notice of Violation/Citation was inadequate is without merit.

2. Drainage of the Skid Trails

Pursuant to the ORS 527.630(3) and the FPA, ODF adopted OAR 629-630-0300, requiring operators to drain all skid trails by water barring or other effective means, immediately following completion of the operation and at all times when runoff is likely. The July 23, 2019 Notice of Violation/Citation alleged that Respondent failed to drain skid trails by water barring or other effective means immediately following completion of the operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state.

² OAR 629-670-0110 provides:

The State Forester may initiate enforcement action by issuing and serving to the responsible person, persons, or corporation either a:

(1) Written statement of unsatisfactory condition under OAR 629-670-0115, 629-670-0120, or 629-670-0125; or

(2) Citation under OAR 629-670-0130 and ORS 527.680.

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Respondent submitted a NOAP in 2017 and subsequently conducted harvesting operations on the subject property. As such, Respondent was subject to the rules and regulations of the FPA. Additionally, Respondent had approximately 15 to 20 skid trails on the subject property while performing harvesting activities. As such, Respondent was required by OAR 629-630-0300(3) to drain all skid trails by water barring or other effective means at all times during the operation when runoff was likely, and immediately following completion of the operation. In closing argument, Respondent acknowledged that water barring was required on the skid trails on the subject property.

The 2017 NOAP expired on December 31, 2018. OAR 629-600-0100(13) defines “completion of the operation” as occurring when “harvest activities have been completed to the extent that the operation area will not be further disturbed by those activities.” Thus, the “completion of the operation” would have occurred when Respondent completed harvest activities to the extent that the operation area (Unit 1 and Unit 2) would not be further disturbed pursuant to that 2017 NOAP. This would have occurred either in late summer or fall of 2018 (when the wet season began), or, at the latest, December 31, 2018, when Respondent’s 2017 NOAP expired. Therefore, Respondent was required to have drainage installed on all skid trails by at least December 31, 2018. On June 26, 2019, when Thackery inspected the site, Respondent had not installed water bars to drain all skid trails used under the 2017 NOAP. Thus, Respondent was in violation of OAR 629-630-0300(3). The evidence also shows that, because Respondent did not have water bars installed on all skid trails, significant down-slope erosion and delivery of excessive sediment to waters of the state occurred.

3. Order to Cease Further Violation & Order to Repair Damage or Correct Unsatisfactory Condition Caused By Violation

As discussed above, Respondent violated OAR 629-630-0300(3), by failing to drain skid tails by water barring or other effective means immediately following completion of the operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state. Pursuant to ORS 527.680(2), at the time the Department issued the July 23, 2019 Notice of Violation/Citation, the Department had the authority to also issue the Order to Cease Further Violation of OAR 629-630-0300(3). The Department also had the authority, pursuant to ORS 527.680(2), to issue the Order to Repair Damage or Correct Unsatisfactory Condition Caused by the Violation.

4. Whether the Notice and Orders are Moot Because Respondent Complied Before September 1, 2019

At hearing, Respondent argued that the Notice of Violation/Citation, Order to cease Further Violation, and Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation were moot because, as of August 12, 2019, Respondent had installed the required

water bars to all skid trails. Respondent also argued that the Department did not treat Respondent fairly because it represented that installing water bars by mid-June 2019 would be sufficient and Respondent completed that requirement around that time. Respondent also questioned the basis of the proceeding because, at the time of the hearing, Respondent had already complied with the Notice and Orders.

It should be noted that the hearing in this matter was held at Respondent's request. Had Respondent planned to comply with the Notice and Orders, it could have simply done so and not requested a hearing. Rather, Respondent exercised its right to request a hearing, which was held to determine the validity of the Department's Notice and Orders.

Respondent's argument that the Department treated Respondent unfairly by issuing the Notice of Violation/Citation strains credulity. ODF issued two Written Statements of Unsatisfactory Condition, giving Respondent first until December 15, 2018, and then until June 15, 2019 to install water bars or other effective drainage. Respondent failed to comply with either due date. Only after the second deadline passed did Caswell reach out to the Department to inform it that Respondent would install the water bars that week (of June 17, 2019). Thackery then waited until June 26, 2019, giving Respondent another nine days to comply with the requirements, before inspecting the property. There is no basis for finding that the Department treated Respondent unfairly by issuing the July 23, 2019 Notice of Violation/Citation.

Finally, while Respondent may have complied with the Order to Cease Further Violation and Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation, a preponderance of the evidence shows that Respondent's compliance occurred after the Notice and Orders were issued in this case. The issues for this contested case hearing is whether, at the time the Department issued the notice (July 23, 2019), Respondent had failed to drain skid trails by water barring or other effective means immediately following completing of the operation, resulting in significant down-slope erosion and delivery of excessive sediment to waters of the state and whether the Department could, at that time, issue an Order to Cease Further Violation and Order to Repair Damage or Correct Unsatisfactory Condition Caused by Violation. As discussed above, the preponderant weight of the evidence showed that Respondent failed to drain skid trails by water barring or other effective means following the completion of the operation, and thus the Department had the authority to issue a Notice of Violation/Citation and Orders to Cease Further Violation and Repair Damage or Correct Unsatisfactory Condition Caused by Violation. The timing of Respondent's compliance with the Notice and Orders may be relevant if the Department chooses to pursue civil penalties or take further action in the future. Nonetheless, because Respondent's compliance occurred well after the deadline established by ODF, and after issuance of the Notice of Violation, it is not relevant to this proceeding.

ORDER

I propose the Oregon Department of Forestry, Private Forests issue the following order:

The Notice of Violation/Citation, issued on July 23, 2019, is AFFIRMED. Respondent must cease further violations of OAR 629-630-0300(3). In addition, Respondent must repair or correct unsatisfactory damage caused by the violation by constructing and maintaining water bars or other effective drainage structures to prevent down-slope erosion that delivers sediment to waters of the state. Such action must be completed within 15 days following the issuance of the Final Order.

Kate Triana

Administrative Law Judge
Office of Administrative Hearings

OREGON DEPARTMENT OF FORESTRY EXCEPTIONS TO PROPOSED ORDER

If this proposed order is adverse to you or to the agency, you or the agency may file exceptions within seven calendar days after the date of the filing of the proposed order. See OAR

629-001-0040 to 0045 and OAR 137-003-0650 to 0655. Exceptions must be filed with the Board of Forestry, through the agency contact:

Greg Wagenblast, Civil Penalties Administrator
Department of Forestry, Private Forests Division
2600 State Street
Salem, OR 97310

The exceptions shall be confined to factual and legal issues that are essential to the ultimate and just determination of the proceeding, and shall be based only on grounds that:

1. A necessary finding of fact is omitted, erroneous, or unsupported by the preponderance of the evidence on the record;
2. A necessary legal conclusion is omitted or is contrary to law or the Board's policy; or
3. Prejudicial procedural error occurred.

The exceptions shall be numbered and shall specify the disputed finding, opinions or conclusions. The nature of the suggested error shall be specified and the alternative or corrective language provided.

The Board of Forestry will issue a final order on this matter, whether or not exceptions are filed. After the Board has received and reviewed the proposed order and the exceptions, if any, the Board may:

1. Entertain written and/or oral argument if the Board determines it is necessary or appropriate to assist the Board in the proper disposition of the case. If allowed, oral argument will be limited to matters raised in written exceptions and shall be presented under time limits determined by the Board chair;
2. Remand the matter to the ALJ for further proceedings on any issues the Board specifies, and to prepare a revised proposed order as appropriate, under OAR 137-003-0655(2);
3. Enter a final order adopting the recommendations of the ALJ; or
4. Enter an amended proposed order or final order that modifies or rejects the recommendations of the ALJ. If the Board decides to modify or reject the proposed order, it will comply with OAR 137-003-0655 and 137-003-0665.

RECONSIDERATION AND REHEARING

Under the provisions of OAR 137-003-0675, you may file a petition for reconsideration or rehearing of the final order with the board within 60 calendar days after this order is served. Any such petition shall set forth the specific grounds for reconsideration or rehearing and the remedy sought. The petition may be supported by a written argument. Under OAR 629-001-0050, you must file a petition for reconsideration as a condition for further appeal.

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Attachment 5
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APPEAL

You may appeal by filing a petition for judicial review with the Oregon Court of Appeals within 60 days following the date the final order on reconsideration or rehearing is issued, or within 60 days following denial of the request for reconsideration or rehearing. *See Oregon Revised Statutes 183.480 et seq.*

CERTIFICATE OF MAILING

On August 21, 2020, I mailed the foregoing PROPOSED ORDER issued on this date in OAH Case No. 2019-ABC-03047.

By: First Class Mail

Siskiyou Cascade Resources
ABN of Siskiyou Cascade Resources LLC
Joel Caswell
16 N Riverside Ave
Medford OR 97501

Zachary W Light
Attorney at Law
14 N Central Ave, Suite 101
Medford OR 97501

By: Electronic Mail

Greg Wagenblast
Agency Representative
Department of Forestry, Private Forests
2600 State St Bldg D
Salem OR 97310

Matthew B Devore
Assistant Attorney General
Department of Justice
1162 Court St NE
Salem OR 97301

Anesia Valihov for Lucy M Garcia
Hearing Coordinator

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AGENDA ITEM E
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**BEFORE THE BOARD OF FORESTRY
STATE OF OREGON**

IN THE MATTER OF:

**SISKIYOU CASCADE RESOURCES,
ABN OF SISKIYOU CASCADE
RESOURCES LLC**

Respondent.

FINAL ORDER

OAH Case No. 2019-ABC-03047
Agency Case No. 19-SW007

The Board of Forestry, at a meeting in Salem on November 4, 2020, by consensus affirms the Citations 19-SW007, issued by Douglas Thackery, Stewardship Forester, and adopts and incorporates by reference the attached proposed order issued by Administrative Law Judge Kate Triana, on August 21, 2020. Siskiyou Cascade Resources LLC submitted exceptions to the proposed which were considered by the Board, but did not justify any changes to the proposed order.

Dated this _____ day of November, 2020

By: _____
Peter Daugherty
State Forester and
Secretary to the Board of Forestry

RIGHT TO JUDICIAL REVIEW

If you are dissatisfied with the Order, you may request rehearing or reconsideration by the Board. To do so, you must file a petition for rehearing or reconsideration pursuant to OAR 137-003-0675 and OAR 629-001-0050 within 60 days from the day this Order was served on you. If this Order was personally delivered to you, the date of service is the day you received the Order. If this Order was mailed to you, the date of service is the day it was *mailed*, not the day you received it. A petition for rehearing or reconsideration must state with specificity the grounds for objection to the order, and the remedy sought. If you do not file a petition for rehearing or reconsideration within the time limits provided, you will lose your opportunity for rehearing or reconsideration and you will lose your right to appeal to the Oregon Court of Appeals. (OAR 137-003-0675 and OAR 629-001-0050).

If, after you have filed a petition for rehearing or reconsideration, the Board issues an Order you are dissatisfied with, you have the right to appeal that Order to the Oregon Court of Appeals pursuant to ORS 183.482. To appeal, you must file a petition for judicial review with the Court of Appeals within 60 days from the day the Order was served on you.

If, 60 days after you have filed a petition for rehearing or reconsideration, the Board has not issued an order, your petition will be considered denied and at that time you will have the right to appeal the original Order to the Court of Appeals pursuant to ORS 183.480 and ORS 183.482. To appeal, you must file a petition for judicial review with the Court of Appeals within 60 days from the day that your petition is deemed denied. If you do not file a petition for judicial review within the 60-day time period, you will lose your right to appeal.

The October 6, 2020 Board of Forestry meeting minutes are in production.
The final draft version will be made available online a week before the meeting.
Board website: <https://www.oregon.gov/ODF/Board/Pages/BOFMeetings.aspx>

State Forester and Board Member Comments

Agenda Item No.:	2
Work Plan:	Fire Protection
Topic:	Ongoing Topic; Forest Patrol Assessment
Presentation Title:	Requests for Hearings Before the Board and Proposed Final Orders
Date of Presentation:	November 4, 2020
Contact Information:	Tim Holschbach, Fire Prevention & Policy Manager 503-945-7434 tim.j.holschbach@oregon.gov

SUMMARY

The purpose of this agenda item is to address a request for a hearing under ORS 477.260(2) and OAR 629-041-0035(4) by a landowner in Tillamook County regarding the addition of certain properties to the forest patrol assessment roll. This staff report informs the Board of the process undertaken thus far, describes the issues raised by the forestland owner and proposes final resolutions of the matters. In addition, the Department requests that the Board hear briefly from the parties and then issue a final order that either revises or accepts the proposed final orders attached to this report.

CONTEXT

As required by ORS 477.250(2), written notices were sent by mail to specific landowners in Tillamook County that they were going to be added to their county forest patrol assessment roll. The same law also requires that the notice inform the landowners of the procedures for appeals and hearings prescribed in ORS 477.205 to 477.281. Those procedures were included in the mailings.

The Department of Forestry (ODF) received objections to being added to the assessment roll from two landowners in Tillamook County. One landowner's classification status was an obvious error, and was corrected under the authorities granted to the Department in OAR 629-045-0055(2)(b). The Department, as required by OAR 629-041-0035(5), attempted to contact the second landowner by letter June 19, 2020 to schedule a time that the forester and landowner might further review the matter. No response was received. The landowner's letter requesting the hearing is provided in Attachment 1.

BACKGROUND AND ANALYSIS

ORS 477.210(1) states that it is the responsibility of each owner of forestland to "provide adequate protection against the starting or spread of fire thereon or therefrom..." The same statute, in subsection (4), states that when a landowner fails to provide that protection, "...then the forester under the direction of the Board shall provide forest protection..."

The principal funding source provided by law for ODF's fire protection system is a pro rata acreage assessment against classified forestland within each forest protection district. The land classifications are determined by a county forestland classification committee that examines and then classifies all forestland within a county and the forest protection district. The lands classified as "forestland," if not otherwise protected by individual plan or membership in a forest protective association, are then included in the county forest patrol assessment roll and assessed their pro rata

share of the district's fire protection costs. The fire protection costs are collected by the county assessor in the same manner as ad valorem taxes.

The Tillamook County Forestland Classification Committees completed their work and filed their final order with the Tillamook County Clerk in December 2019. Any landowner who was aggrieved by the classification had the right to appeal the decision under ORS 526.332, by filing an appeal to circuit court within 30 days of the decision. There were no appeals of the forestland classification final orders filed with the Tillamook County Circuit Court.

As a result of the forestland classification final orders, properties that were newly classified as forestland and which were otherwise subject to the forest patrol assessment were added to the county forest patrol assessment roll. Written notices were mailed to each landowner notifying them of the addition and the process for appeals and hearings before the Board.

Based on the language in ORS 477.260(2), landowners subject to ORS 477.205 to 477.281 may discuss at the hearing, "... any subject pertaining to the activities of the forester or board affecting the land." In these specific hearings, the issue before the Board is the addition of tax lots to the forest patrol assessment roll, The Department outlined four issues of fact that went into the decision of whether to assess the properties in question. Those four items are:

1. Has the land been classified as forestland by a county classification committee?
2. Is the owner of the land correctly identified?
3. Are the acres and tax lot number correctly identified?
4. Has the owner provided protection through a plan approved by the Board on their own or through membership in a forest protective association?

The Department conducted the necessary research and review, and confirmed that the landowner's tax lot in question was properly assessed, they are the owners of the lot in question, the lands had been classified as forestland by the appropriate County Forestland Classification Committee, their names, tax lot and acreage were all correct as noted in the County Assessor's records, and this tax lot is not protected under a protection plan approved by the Board of Forestry, nor does the owner belong to a forest protective association.

As further described in the proposed order (Attachment 2), the Department has determined that the properties in question were properly assessed pursuant to the applicable law.

ALTERNATIVES CONSIDERED

Upon review of the letter from the landowner, additional testimony during the Board meeting, and the facts described above and presented in the proposed final order (Attachment 2), the Board may:

1. Remand the matter to Department staff for further review on such issues as the Board specifies and to prepare a revised proposed order as appropriate;
2. Reject the proposed order and direct the Department to prepare a different final order;
or
3. Adopt the proposed order as the Board's final order.

RECOMMENDATION

The Department recommends that the Board adopt the proposed final order as written for Mr. Bruce Gray.

ATTACHMENTS

- (1) Letter Requesting a hearing before the Board of Forestry
- (2) Proposed Final Order

Bruce Gray
PO Box 314
Oceanside, OR 97134
bg-oregon@outlook.com

March 3, 2020

Peter Daugherty
State Forester
2600 State Street
Salem, OR 97310

RE: Timberland Assessment Appeal
1S1030-BD-00100

Dear Mr. Daugherty,

I am requesting a hearing by the State Board of Forestry to contest the designation of my property as forestland and the assessment of additional taxes to my property. I am seeking to have this designation changed. My property is supplied and protected by public utilities, infrastructure and emergency services. My property is within a named residential development in an incorporated area of Tillamook County and city of Oceanside.

Sincerely,



Bruce Gray

BEFORE THE OREGON BOARD OF FORESTRY

In the Matter of:

**Forest Patrol Assessment
Owned by Bruce Gray**

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FINAL ORDER

Introduction

On February 12, 2020, Bruce Gray was sent a notice from the Department of Forestry as required by ORS 477.250(2), that property Mr. Gray owns, Tax Lot Number 1S1030BD00100 in Tillamook County, will be added to the forest patrol assessment roll beginning July 1, 2020. Along with that notice, Mr. Gray was provided information regarding procedures for hearings and appeals prescribed in ORS 477.260(2). On March 3, 2020, Mr. Gray timely requested a hearing by the Board of Forestry under ORS 477.260(2) and OAR 629-041-0035(4).

This is the Board of Forestry’s final order in this matter.

In his letter, Mr. Gray asked for a hearing “...to request a formal appeal ...”. In his letter, Mr. Gray expressed the following points, in summary:

1. This property is supplied and protected by public utilities, infrastructure and emergency services.
2. Property is within a named residential development in an incorporated area of Tillamook County and the City of Oceanside.

Background Information

In July, 2016, Tillamook County convened a forestland classification committee as described in ORS 526.310 to 526.320, and OAR 629-045-0020 to 0065 to investigate and determine which lands in the county should be classified as forestland as defined in ORS 526.005(5). Upon completion of their investigation, notice was published and public hearings were held as required by ORS 526.324 and 526.328. After considering the information received at the public hearings, the Tillamook County Forestland Classification Committee, in accordance with ORS 526.328(2) filed its formal written order, delineating which parcels of land in Tillamook County are forestlands, with the Tillamook County Clerk on December 9, 2019.

ORS 526.332 provides for appeals of forestland classification to the circuit court within 30 days of filing of the written order discussed above. The Department of Forestry is not aware of any appeals of the Tillamook County Forestland Classification Committee order, timely or otherwise, that have been filed with the court. Neither the State Forester nor a county assessor is authorized to change the classification of forestland applied to a parcel of land, except under narrow circumstances found in OAR 629-045-0055(2).

The State Forester may classify forestlands under ORS 526.340 and OAR 629-045-0060 if a county fails to appoint a committee or the committee fails to act or act in accordance with applicable law. No authority is granted to the State Forester or the Board by the Legislature to override the determinations of a forestland classification committee.

Following the forestland classification committee’s final determination of forestland in Tillamook County, ODF personnel of the Tillamook District compared the classified forestland against the existing forest patrol assessment roll and the district boundaries. Within the district boundaries, most forestlands in the county were affirmed as properly assessed. The committee determined that approximately 1,846 lots were no longer forestland and were removed from the assessment roll. The committee also determined that an additional 1,761 lots are considered forestland and should be added to the assessment roll. These lots consist mostly of smaller parcels that had been subdivided from lots that had previously been assessed, but were not added to the roll at the time of subdivision.

The definition of “Forestland” is found in ORS 526.005(6)(a): *“Forestland” means any woodland, brushland, timberland, grazing land or clearing that, during any time of the year, contains enough forest growth, slashing or vegetation to constitute, in the judgement of the forester, a fire hazard, regardless of how the land is zoned or taxed.* This definition is very broad and is meant to be inclusive of lands regardless of how they are zoned, taxed, or defined in a land use plan.

The addition of several or even hundreds of parcels to the assessment roll does not increase the overall amount of revenue collected for support of the forest protection district. Annually, the local budget advisory committee recommends a budget that estimates the actual cost of protection for the upcoming fiscal year, and then calculates (taking into account the number of minimum lots) the rate per acre that will be assessed to recover those costs. For the same protection budget, the more acres that are properly assessed, the lower the rate, but the same amount of revenue is collected. If the actual costs for fire protection for a given year are less than budgeted, the surplus is carried forward as a credit, which usually lowers the rate the following year if projected costs otherwise remain the same.

Though the State Forester is clearly providing a service to assessment payers when protecting their forestlands from fire, that service is not solely intended to benefit the individual forestland owner’s property. Under long established Oregon law, uncontrolled fire is “declared a public nuisance by reason of its menace to life, forest resources or property” (ORS 477.064). Accordingly, under ORS 477.066 and 47.210, each owner of forestland is required to provide adequate protection against the starting or spread of fire on or from their property. Though a given individual may not mind if their property might burn, Oregon law requires that they protect their neighbors from nuisance of fire spreading to the neighbor’s property. If an owner does not provide protection by following a plan approved by the Board of Forestry, or through membership in a forest protective association, pursuant to ORS 477.210(4), the State Forester must provide protection and the owner must be assessed their share of the actual costs of that protection under ORS 477.270.

Findings of Fact

The State Board of Forestry finds:

1. Bruce Gray is the owner of Tax Lot 1S1030BD00100 in Tillamook County as shown in the records of the Tillamook County Assessor.
2. The Tillamook County Forestland Classification Committee classified Tax Lot 1S1030BD00100 as Class 1 Forestland in its final order, as filed with the County Clerk December 9, 2019.
3. The Department of Forestry is not aware of any appeals of the Tillamook County Forestland Classification Committee final order, timely or otherwise, that have been filed with the court.

4. The Department of Forestry believes that the Tillamook County Forestland Classification Committee classified Tax Lot 1S1030BD00100 in a manner consistent with law, and that Tax Lot 1S1030BD00100 is forestland.
5. Once Tax Lot 1S1030BD00100 was classified as forestland, the State Forester is obligated to ensure that the land has adequate protection from fire. Pursuant to ORS 477.210, Bruce Gray may provide adequate protection from fire by filing a bona fide forest protection plan with the Board or by becoming a member in good standing with the forest protective association.
6. Bruce Gray has not provided a bona fide forest protection plan approved by the Board.
7. Bruce Gray is not a member in good standing with a forest protective association. Tax Lot 1S1030BD00100 in Tillamook County is within the boundary of the Tillamook Forest Protection District. The only forest protective association operating in that District with an approved forest protection plan, through a cooperative agreement with the State Forester, is the Northwest Oregon Forest Protective Association. Bruce Gray is not a member of that association.
8. Since Tax Lot 1S1030BD00100 is not adequately protected by a bona fide forest protection plan or membership with a forest protective association, the State Forester, under direction from the Board, is obligated to provide forest protection pursuant to ORS 477.205 to 477.281.
9. Costs for fire protection of Tax Lot 1S1030BD00100 provided by the State Forester are apportioned among all forestland at a pro rata cost per acre, pursuant to ORS 477.230, or at a minimum assessment under ORS 477.295.
10. The State Forester notified Bruce Gray of the proposed addition of Tax Lot 1S1030BD00100 to the forest protection assessment roll in Tillamook County, as required by ORS 477.250.
11. Bruce Gray requested a hearing regarding the assessment, pursuant to OAR 629-041-0035. That rule allows for a hearing by the Board pursuant to ORS 477.260(2) “on any subject pertaining to the activities of the forester or board affecting the land.” Any dispute about the classification of forestland is beyond the scope of this hearing request.
12. The State Forester attempted to contact Bruce Gray through a letter to address the concerns raised in the hearing request. No response was received from Mr. Gray. The State Forester is obligated to protect forestland under ORS 477.210.

Conclusions of Law

ORS 477.210 requires the State Forester to provide fire protection to the forestland owned by Bruce Gray in Tillamook County and the County Assessor must collect the cost of that protection under ORS 477.270.

Ultimate Conclusion

The Board of Forestry affirms the determination of the State Forester that Tax Lot 1S1030BD00100 in Tillamook County, owned by Bruce Gray shall be added to the Tillamook County forest patrol assessment roll and be assessed annually for the costs of forest fire protection under applicable laws.

Appeal Rights

You have the right to seek judicial review of this Order by filing a petition in Circuit Court pursuant to ORS 183.484. To seek judicial review, you must file a petition with the Marion County Circuit Court, or the circuit court for the county in which you reside or have a principal business office, within 60 days from the day this Order was served on you. If this Order was personally delivered to you, the date of service is the day you received the Order. If this Order was mailed to you, the date of service is the day it was *mailed*, not the day you received it. The petition shall state the nature of your interests, the facts showing how you are adversely affected or aggrieved by the agency order and the ground or grounds upon which you contend the order should be reversed or remanded. If you do not file a petition for judicial review within the 60-day time period, you will lose your right to appeal.

Dated this 4th day of November, 2020,

Thomas J. Imeson, Chair

Oregon Department of Forestry

STAFF REPORT

Agenda Item No.:	3
Work Plan:	Fire Protection
Topic:	Ongoing Topic; Fire Season Outlook and Readiness
Presentation Title:	2020 Fire Season Update
Date of Presentation:	November 4, 2020
Contact Information:	Doug Grafe, Chief, Fire Protection Division 503-945-7204 Doug.Grafe@oregon.gov

SUMMARY

Oregon revised statutes define the Department's Fire Protection policy, which requires a completed and coordinated system. This system relies on the partnership between the Department and forest landowners and a commitment to ongoing communication and collaboration with many other state and federal agencies. Fire management leaders from the Department will provide a briefing on some of the ongoing coordination and an up to date fire season status report during this agenda item.

Agenda Item No.:	4
Work Plan:	Climate Change and Forest Carbon
Topic:	Board Statutory Authority
Presentation Title:	DOJ Memorandum on Statutory Authority relating to Carbon and Climate
Date of Presentation:	November 4, 2020
Contact Information:	Danny Norlander, Forest Carbon and Forest Health Policy Analyst

SUMMARY

The Department provided the Department of Justice (DOJ) with Board of Forestry (Board) approved questions relating to the Board’s statutory authority, relating to climate change and the interest in the regulatory function of the Forest Practices Act (FPA) in climate change mitigation and adaptation. The DOJ will provide the completed public memo and a presentation on the results of their research in the statutes and legislative history related to the topic.

This information will provide the Board guidance on the statutory sideboards as they work on the revision of the Forestry Plan for Oregon, Goal G: Climate Change.

CONTEXT

Ongoing work on the climate change work plan and a pending revision of the Forestry Plan for Oregon: Goal G requires that there is an assessment of the statutory authorities available to the Board in considering current and future rule making work.

BACKGROUND AND ANALYSIS

Beginning in 2019, the Board reviewed prior Board work dating back to 2015 on climate policy, including how departmental Divisions incorporated climate change into operations. Throughout the last year and half, Board members identified several specific topics of interest.

At its January and March 2020 meetings, the Board discussed work plan topics related to climate change and forest carbon as part of the Overarching Issues work plan. In response, Department staff offered to develop a specific work plan to house various elements of the Board’s work on Climate Change, rather than include specific items within division work plans.

This agenda item is a product of ongoing staff work identified under the Climate Change work plan. One of the specific, ongoing parts of that work plan is an update and revision of the FPFO Goal G and general interest in the Boards statutory authority related to climate change.

At the June 2020 meeting, the Board identified questions to pose to the Department of Justice (DOJ) around their statutory authorities and climate change. The DOJ has begun to work on providing feedback and answering the questions outlined during the June Board meeting. This information will feed into the further refinement of Goal G based on the analysis by the DOJ.

NEXT STEPS

1. Staff will continue to work with the Board and Department leadership to refine the scope and scale of a revision to Goal G, including development of a Department Climate Change Plan for the Board's review.
2. Staff will continue the work identified in the Climate Change work plan that will provide information and data for a revision of Goal G. Staff will work towards designing a presentation for the Board with these materials.
3. With the Board and Department leadership, staff will determine the public input process for the revision of Goal G.

ATTACHMENTS

- (1) DOJ Memo providing answers to Board questions (available one week before meeting)



DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

MEMORANDUM

DATE: November 4, 2020

TO: Oregon Board of Forestry

CC: State Forester Peter Daugherty

FROM: Matt DeVore, Assistant Attorney General, Natural Resources Section

SUBJECT: Board of Forestry Authority to Address Issues Related to Climate Change

The Board of Forestry (“Board”) has asked a series of specific questions regarding its authority to consider climate change as it adopts rules affecting forest policy and management and in providing policy direction to the State Forester and the Department of Forestry (“Department”).¹ This memorandum addresses those specific questions, in turn.²

Question #1

Does the Board of Forestry’s authority to “supervise all matters of forest policy and management” include establishing climate change and forest carbon goals? (ORS 526.016)

Answer #1

Yes, to the extent that the goals directly relate to supervision of forest policy or management under the jurisdiction of the state. The legislature, in ORS 526.016, authorizes the Board to supervise all matters of forest policy or management. The Board’s authority from this statute is broad and comprehensive. This authority, combined with the rulemaking authority in ORS 526.016(4) and ORS 527.715, support the conclusion that the Board has authority to determine the goals for supervision of forest policy and management, including establishing forest carbon and climate change-related goals, if the Board determines that is appropriate as a matter of forest policy and management.

¹ Public disclosure of this Memorandum is not intended to operate as a waiver of the attorney-client privilege.

² The Attorney General provides advice and representation to the Governor, any officer, agency, department, board or commission of the state or any member of the legislature. The Attorney General may not render opinions or give legal advice to persons other than the state officers listed above. Any opinions or conclusions in this memo are not intended to be advice, except as provided in ORS 180.060.

Question #2

Is net carbon storage and sequestration included in "management of all forestlands in Oregon should be encouraged to provide continuous production of all forest benefits?" (ORS 526.460)

Answer #2

Probably yes, as to the legislative policy statement in ORS 526.450 to ORS 526.475, though the policy statements in ORS 526.460 do not constitute operative authority to act. The quoted language is a statement of state policy, and not a grant of authority to the Board. The legislature passed ORS 526.460 as part of the Woodlands Management Act of 1979. Legislative hearings on the bill focused on increasing timber productivity on private forestlands and providing financial incentives to small woodland owners. The legislature also recognized that forestlands provided environmental benefits. The legislature expressed a policy decision that management of all forestlands should be encouraged to provide continuous production of all forest benefits, including air resources.

Although the Woodlands Management Act includes the broad policy statements in ORS 526.460, it does not provide an opportunity for the Board to set policy. Rather, ORS 526.470 and ORS 526.472 authorize the Board and the Forester to implement the policies of ORS 526.460 through two very specific activities: operation of a state forest tree seed bank and a state forest tree seed orchard.

However, the Board does have broad authority under ORS 526.016 to supervise all matters of forest policy and management under the jurisdiction of the state. Consistent with this authority, the Board could consider net carbon storage and sequestration in developing rules related to forest policy and management, to the extent that the focus remains on forest policy and management.

Question #3

Does the Board have the authority to include harvested wood products in policy development related to climate change and forest carbon? (ORS 526.016)

Answer #3

Probably not, depending on the details of what policy is contemplated. As stated in response to Question #1, the Board has authority under ORS 526.016 to supervise all matters of forest policy and management under the jurisdiction of the state. If a policy applicable to harvested wood products directly relates to supervision of forest policy or management, then ORS 526.016 would provide broad authority for Board action. However, the farther that the wood products become separated from the scope of "forest policy and management," i.e. from management of the *forest* as opposed to management of wood that is removed from the forest, the more tenuous the authority becomes.³

³ A 1982 ballot initiative proposed to amend ORS 526.016 so that it expressly excluded the sale of forest products from the Board's authority. However, this ballot initiative did not pass. *Christie v. Paulis*, 292 Or. 344 (1982).

While regulation of wood products may not be within the scope of the Board's authority to regulate forest practices, this does not preclude the Board from considering the carbon storage potential of harvested wood products as part of its evaluation of the impact of forest practices and management on net carbon storage. Information about the ability of those products to store carbon could help to inform the Board's decisions on how best to supervise forest policy and management and provide for the overall maintenance of resources, including air resources.

Question #4

Must the board consider climate change in setting policy related to maximizing forest benefits? Can those include the carbon costs of harvest and processing timber removed from forestlands? (ORS 526.460)

Answer #4

As discussed in response to Question #2, the Woodlands Management Act of 1979 sets forth a broad policy statement in ORS 526.460, but does not authorize the Board to set policy. Rather, ORS 526.470 and 526.472 authorize the Board and the Forester to implement the policies of ORS 526.460 through operating a state forest tree seed bank and a state forest tree seed orchard. The Board does have broad authority under ORS 526.016 to supervise all matters of forest policy and management, and it could (but is not obligated to) consider climate change in developing rules pursuant to this authority.

Question #5

Does the Board have the authority to regulate forest carbon under the Forest Practices Act? (ORS 527.710)

Answer #5

Yes, to the extent that such regulations are necessary to provide for the overall maintenance of resources listed in statute. These resources include air quality, water resources, soil productivity and fish and wildlife. ORS 527.710 obligates the Board to establish standards for forest practices that provide for the overall maintenance of air quality, water resources, soil productivity and fish and wildlife. During committee hearings, legislators deliberated on the phrase "overall maintenance" and consistently heard that the intent was to acknowledge that forest operations may have a temporary adverse effect on the listed resources during some forest operations, but that the integrity of the resources would be generally maintained over the life of the forest stand. The Board has authority to regulate forest carbon to the extent that such regulations apply to forest practices and provide for the overall maintenance of air quality.

Question #6

Can the Board adopt forest practices rules based on or including future climate projections and/or climate models, or does there need to be a measurable degradation currently? (ORS 527.714)

Answer #6

The Board may rely on projections and models of future impacts, so long as there is evidence to support the Board's conclusions. To establish the standards required in ORS 527.710, the Board must follow the process outlined in ORS 527.714. Such standards would likely fall under the scope of ORS 527.714(5), which requires that specific facts exist and standards be met prior to adopting forest practice rules. The two criteria most relevant to this question include subsection (a) (monitoring or research evidence that documents that degradation of resources is likely) and subsection (c) (rule reflects available scientific information, the results of relevant monitoring and, as appropriate, adequate field evaluation). These criteria provide the Board with authority to proceed with rulemaking that relies on projections and models, so long as the rules are based on the evidentiary standards outlined. Whether the evidence is sufficiently reliable to support the projections and models is a policy decision that the Board must resolve.

Question #7

The Good Neighbor Authority (GNA) policy, ORS 526.275(2), authorizes pursuing projects related to a list of specific outcomes. Does this specificity limit applications to climate change? (ORS 526.274 and 526.275(2))

Answer #7

The activities that the Forester may engage in under ORS 526.274 and 526.275 are limited to those activities that are specifically listed in statute. However, the Board has broad and general authority to determine the policies and goals that the Forester and Department should implement as they enter into stewardship contract agreements to engage in those activities. The Board may decide that addressing climate change is one of the policies and goals that the Forester should attempt to achieve through the stewardship contract agreements.

Question #8

Does the Board have authority to identify and establish rules related to climate refugia, to include mitigation and/or adaptation for climate change? (ORS chapters 526 and 527)

Answer #8

Yes, to the extent that the rules fit within the scope of the Board's legislative authority. The Board has authority under ORS 526.016 to supervise all matters of forest policy or management under the jurisdiction of the state. The Board has authority to adopt rules to implement the policy direction in ORS 526.630, which is to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of forestland as the leading use on privately owned land while also expressing that such forest practices must be consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources, and to ensure the continuous benefits of those resources for future generations of Oregonians. Further, under ORS 527.710, the Board is charged with adopting rules that provide for the overall maintenance of air quality, water resources, soil productivity and fish and wildlife. The Board has broad authority to adopt rules to implement the policy directions contained in these statutes.

Further analysis on this question would require more details of the proposed regulation. Also, though not specifically mentioned in this question, the Board must also consider the conditions and criteria in ORS 527.714 when exercising its authority.

Attachment: Appendix 1 - Excerpts of Legislative History

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Appendix 1: Excerpts of Legislative History

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ORS 526.016

a) Text

ORS 526.016

(1) The State Board of Forestry shall supervise all matters of forest policy and management under the jurisdiction of this state and approve claims for expenses incurred under the statutes administered by the board except as otherwise provided by law. Advisory committees may be appointed by the board to make recommendations concerning any function vested by law in the board. Notwithstanding any other provisions of law, the board shall not supervise or direct the State Forester in matters relating to the geographic scheduling, annual volume and species allocation, appraisals and competitive timber sale techniques used in the sale of forest products from lands managed under the provisions of ORS chapter 530.

* * * * *

(4) In accordance with the applicable provisions of ORS chapter 183, the board shall adopt rules to perform the functions defined by statute.

b) Legislative History

The authority to “supervise all matters of forest policy and management under the jurisdiction of this state” appears to have been first enacted in 1925.¹ Unfortunately, there is no legislative history available from 1925 to draw upon for the intent of the legislature at that time. Though the statute has been amended many times, the legislative direction to “supervise all matters of forest policy and management under the jurisdiction of this State” has remained unchanged since 1925.²

¹ 1925 Oregon Laws Chapter 281, Section 1, at page 514-515 (HB 209).

² Amendments include: 1935 c. 115 sec. 1, p. 166-167 (SB 270); 1937 c. 381 sec 9, p. 554 (HB 339); 1943 c. 32 sec 1, p. 39 (HB 128); 1943 c. 138 sec 1, p. 156-157; 1953 c. 68, sec. 19 (HB 53); 1953 c. 372, sec. 22, p. 641-647 (HB 238); 1957 c 654 §1; 1959 c 571 §1; 1965 c.253 §6; 1969 c.314 §62; 1973 c.230 §3; 1983 c.759 §8; 1987 c.919 §8.

ORS 526.274

a) Text

ORS 526.274

Authority to participate in federal forest management. In furtherance of the policy established in ORS 526.271, the State Board of Forestry, in consultation with the Governor, may:

(1) In conformance with federal law, including Public Law 108-7, direct the State Forester to facilitate the development of stewardship contracts utilizing private contractors and, when appropriate, to seek and enter into a stewardship contract agreement with federal agencies to carry out forest management activities on federal lands. The State Forester may, under the stewardship contract agreements:

- (a) Perform road and trail maintenance;
- (b) Set prescribed fires to improve forest health, composition, structure and condition;
- (c) Manage vegetation;
- (d) Perform watershed restoration and maintenance;
- (e) Restore wildlife habitat;
- (f) Control exotic weeds and species; and
- (g) Perform other activities related to stewardship.

(2) Create a forum for interagency cooperation and collaborative public involvement regarding federal forest management issues that may include, at the discretion of the board, the appointment of advisory committees, the use of existing advisory committees and procedures for holding public hearings.

(3) Provide guidelines for the State Forestry Department and State Forester to follow that contain directions regarding the management of federal lands and that specify the goals and objectives of the board regarding the management of federal lands.

(4) Participate, to the extent allowed by federal law, in the development of federal forest policies and the forest management planning processes of federal agencies.

(5) Provide guidelines for the department to follow in implementing this section.

(6) Coordinate with Oregon State University, the State Department of Fish and Wildlife, the Oregon Forest Resources Institute, the Department of Environmental Quality, the Oregon Business Development Department, the State Department of Energy and other agencies of the executive department, as defined in ORS 174.112, to assist the State Forestry Department in carrying out the provisions of this section. [2005 c.772 §2]

ORS 526.275

* * * * *

(2) It is the policy of the state to pursue projects under the Good Neighbor Authority Agreement that increase timber harvest volume, contribute to job creation, reduce wildfire risks to all lands, improve wildlife habitat and watershed health and stimulate local economies. To the extent allowed by the agreement, state agencies that are signatories to the agreement shall work with federal land management agencies to give priority to projects that:

- (a) Consist of additive activities;
- (b) Maximize economic benefit to this state; and
- (c) Recover the state agency costs of implementing the projects. [2018 c.96 §1]

b) Legislative History

In 2005, the legislature passed SB 1072 to provide direction and encouragement to the State Forester to work with federal partners in management of federal lands.³ State Forester Marvin Brown wrote that the bill would help to create a “unified vision for broadening Oregon's economic base and improving the health of our federal forestlands.”⁴

Even though federal forests are extremely important to Oregon, state government has not been proactive on federal land management issues in the recent past. This bill establishes a policy of active state involvement in federal forest policies that are critical to the state's future. * * * The bill is also consistent with the strategic policies of the Board of Forestry which call for the environmentally, economically, and socially, sustainable management of all Oregon forest resources. With its experience and expertise in forest matters, and with broad public input and support of other agencies, the Department of Forestry is well positioned to lead the state's engagement with federal issues.

³ 2005 c.772 §2 (SB 1072).

⁴ Letter from State Forester Marvin Brown to Chair Kate Brown, Senate Rules Committee, dated June 20, 2005.

ORS 526.460

a) Text

ORS 526.460

(1) The State of Oregon recognizes that the forest makes a vital contribution to Oregon. Economic benefits provided include a large tax base, substantial employment and wood products for a world market. The environmental benefits include maintenance of a forest cover and soil, air and water resources. Other benefits provided are habitats for wildlife and aquatic life, recreation and forest range. Management of all forestlands in Oregon should be encouraged to provide continuous production of all forest benefits.

(2) Nonindustrial private forestlands are an important part of Oregon's forest resource base. They can make major contributions to Oregon's economy and provide many other social benefits. Therefore, it is the policy of the State of Oregon to provide conditions favorable for long term forestry investments that lead to increased management of and harvest from these lands.

b) Legislative History

In 1979, the legislature passed the Woodlands Management Act.⁵ Legislative hearings on the bill focused on increasing timber productivity of private woodlands and providing financial incentives to small woodland owners to reforest and maintain forestland. The legislature also recognized that forestlands provided environmental benefits. The legislature expressed a policy decision that management of all forestlands should be encouraged to provide continuous production of all forest benefits, including air resources.⁶

To accomplish these goals, the legislature obligated the Forester to provide a certification of forest establishment in order for the owner to receive reforestation tax credits.⁷ The Act authorized the Board and the State Forester to operate a state forest tree seed bank to provide forest tree seeds for the raising of seedlings suitable for reforestation.⁸ The Act also authorized the Board and the State Forester to operate a state forest tree seed orchard.⁹ The policy statement in ORS 526.460 has not been amended since the original enactment in 1979.

⁵ 1979 c.578 §3 (HB 2131), codified in ORS 315.104, 318.031 and 526.450 to 526.475.

⁶ Staff Measure Analysis of House Bill 2131 by House Revenue Committee, 5/2, 5/4/1979 ("The bill is intended to provide incentives for owners of underproductive forest land to plant more trees."); LFO summary of House Bill 2131 dated 6/26/1979 ("This measure provides a tax incentive to owners of small woodland, 10 to 500 acres, to provide reforestation on understocked commercial forest land. * * * [S]mall non-industrial woodlands were identified as producing far less than their potential. The reason for this underproductivity is the diversified ownership goals, the high capital costs of reforestation, and the long-term investment required for payout."). Ways and Means Committee notes, page 257, June 26, 1979 ("tax incentive program for small woodland owners").

⁷ ORS 315.104 – 108.

⁸ ORS 526.470.

⁹ ORS 526.472.

ORS 526.630

a) Text

ORS 526.630

(1) Forests make a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. Therefore, it is declared to be the public policy of the State of Oregon to encourage economically efficient forest practices that ensure the continuous growing and harvesting of forest tree species and the maintenance of forestland for such purposes as the leading use on privately owned land, consistent with sound management of soil, air, water, fish and wildlife resources and scenic resources within visually sensitive corridors as provided in ORS 527.755 and to ensure the continuous benefits of those resources for future generations of Oregonians.

* * *

(3) To encourage forest practices implementing the policy of ORS 527.610 to 527.770 and 527.990 and 527.992, it is declared to be in the public interest to vest in the State Board of Forestry exclusive authority to develop and enforce statewide and regional rules pursuant to ORS 527.710 and to coordinate with other state agencies and local governments which are concerned with the forest environment.

b) Legislative History

1971 by HB 1624

The legislative pre-cursor for current ORS 527.630 was initially passed in 1971 as part of the Oregon Forest Practices Act.¹⁰ The 1971 legislation was the result of a joint request from the industry and the Board of Forestry. There is substantial legislative history available to help determine the legislative intent.

In June 1968, the Legislative Committee of the Board of Forestry considered revisions to the existing Oregon Forest Conservation Act. The Committee and Forester concluded that the existing statutes needed modernization and that a more positive effort would be required in the future to provide adequate safeguards to protect other natural resources related to forests.¹¹ The Board of Forestry adopted the Committee's findings, including:

“That the early accomplishments of the Conservation Act and its provision of leadership in forest management be recognized, but that it is now necessary to update the Act in keeping with broader public interests and increasing knowledge of the effect of forest conditions on the various forest benefits.”

¹⁰ 1971 c.316 §4 (HB 1624), codified in ORS 527.620 to 527.770.

¹¹ Letter from State Forester JE Schroeder dated March 9, 1970, Exhibit to House Committee hearing on HB 1624.

The Board also recommended the appointment of a study committee to work with the department staff in drafting a general policy statement for legislative consideration. The proposal would provide the Board with authority to develop regulations that would delineate forest conditions satisfactory to providing a future supply of timber and the proper procedures for harvesting considering the effect on water purity, air purity, and fish and wildlife habitat. The 1971 legislation was the result of this Board-driven process.¹²

During the 1971 legislative committee hearings, State Forester J. E. Schroeder testified in support of HB 1624 on several occasions. He stated the philosophy of the act is based on the forest landowner and forest land managers moving to take action to face a responsibility they must take toward the preservation and the impact of their operation on the environment.¹³ In his Digest to the bill, he also described the policy in section 4 of the legislation as intended to recognize “the importance of forests to various social and economic values, timber, soil, air and water resources, and fish and wildlife. The policy is to encourage forest practices that "maintain and enhance" benefits and resources.”¹⁴

Carl Stoltenberg, representing the State Board of Forestry, also testified in support of HB 1624. He stated a committee, appointed by the Board of Forestry, worked with the department staff to draft a general policy statement, with authority vested in the Board of Forestry to develop regulations that would delineate forest conditions that would provide a future supply of timber and establish the proper procedures for harvesting considering the effect on water purity, air quality, and fish & wildlife habitat.¹⁵ He also stated that HB 1624 was a very significant update that would protect the concerns of the public for both economic values and environmental values.¹⁶ Ultimately, the 1971 Legislature passed HB 1624 with Section 4:

- (1) Recognizing that the forest makes a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life, it is hereby declared to be the public policy of the State of Oregon to encourage forest practices that maintain and enhance such benefits and such resources, and that recognize varying forest conditions.
- (2) It is recognized that operations on forest land are already subject to other laws and to regulations of other agencies which deal primarily with consequences of such operations rather than the manner in which operations are conducted. It is further recognized that it is essential to avoid uncertainty and confusion in enforcement and implementation of such laws and regulations and in planning and carrying out operations on forest lands.

¹² *Id.*

¹³ House Subcommittee on Natural Resources minutes, March 10, 1971.

¹⁴ Digest of HB 1624 – Oregon Forest Practices Act, by J.E. Schroeder, State Forester, March 10 and May 5, 1971.

¹⁵ House Subcommittee on Natural Resources minutes, March 10, 1971.

¹⁶ Senate Committee on State and Federal Affairs minutes, May 5, 1971.

- (3) To encourage forest practices implementing the policy of this 1971 Act and to provide a mechanism for harmonizing, and helping to implement and enforce laws and regulations relating to forest land, it is declared to be in the public interest to vest in the board authority to develop and enforce regional rules:
 - (a) Designed to assure the continuous growing and harvesting of forest tree species and to protect the soil, air and water resources, including but not limited to streams, lakes and estuaries; and
 - (b) To achieve coordination among state agencies which are concerned with the forest environment.

1987 by HB 3396

In 1987, the Legislature undertook a significant update to the Forest Practices Act.¹⁷ The House Bill was the result of a work group lead by Gail Achterman (Assistant to the Governor on Natural Resources) to develop consensus on issues raised in two earlier bills (HB 2154 and HB 2370). Ms. Achterman reported that the working group reached consensus on nearly all points. The group's proposal became HB 3396. Ms. Achterman explained to the legislature that the objective and key points of HB 3396, as intended by the working group, were:

Objective. All members of the working group agreed that the real objective of any new bill should be to simplify regulation of forest practices on commercial forest land by placing full responsibility for such regulation with the Board of Forestry, while assuring consideration of other natural resource values.

Key Points. To achieve the objective, the following issues were addressed:

* * * * *

- d. Amendment of the Forest Practices Act to assure consideration of other natural resource values and coordination with other agencies and local government.¹⁸

The amendments to ORS 527.630 went through various iterations, which can help to explain the intent of the legislature in the language that was ultimately passed.¹⁹ As introduced, Section 10 of the bill amended ORS 527.630 to focus on the economics of forest management, while also providing more direction on which benefits and resources should be maintained and enhanced.²⁰

¹⁷ 1987 c.919 §10 (HB 3396).

¹⁸ House Environment and Energy Summary of Draft Legislation HB 3396, dated June 10, 1987.

¹⁹ Memo from Senator Bill Bradbury, Senate Majority Leader and Chairman of Senate Agricultural and Natural Resources Committee, dated June 24, 1987 (describing the scope of the Senate amendments to the House Bill).

²⁰ HB 3396, dated June 8, 1987.

The text initially proposed in Section 10 was (with new text in bold and underline, removed text in brackets and strikethrough):

- (1) [~~Recognizing that the forest makes~~] **Forests make** a vital contribution to Oregon by providing jobs, products, tax base and other social and economic benefits, by helping to maintain forest tree species, soil, air and water resources and by providing a habitat for wildlife and aquatic life. **Therefore**, it is [~~hereby~~] declared to be the public policy of the State of Oregon to encourage **economically efficient** forest practices that [~~maintain and enhance such benefits and such resources, and that recognize varying forest conditions~~] **assure the continuous growing and harvesting of forest tree species and maintenance of forest land for such purposes, consistent with sound natural resource management.**

* * * * *

- (3) To encourage forest practices implementing the policy of ORS 527.610 to 527.730 and 527.990 [~~and to provide a mechanism for harmonizing, and helping to implement and enforce laws and regulations relating to forest land~~], it is declared to be in the public interest to vest in the board **exclusive** authority to develop and enforce **state-wide and** regional rules [:] **pursuant to ORS 527.710 and to achieve coordination among state agencies and local governments which are concerned with the forest environment.**
- [~~(a) Designed to assure the continuous growing and harvesting of forest tree species and to protect the soil, air and water resources, including but not limited to streams, lakes and estuaries; and~~]
[~~(b) to achieve coordination among state agencies which are concerned with the forest environment.~~]

Ms. Achterman provided a summary report and testimony to the House Environment & Energy Committee on June 10, 1987.²¹ In that report, she stepped through each section of the bill. Relevant to ORS 527.630 was section 10 in which the report stated:

Subsection (1) amends the policy statement in the Forest Practices Act to state that Oregon's public policy is to encourage economically efficient forest practices that assure the continuous growing and harvesting of forest tree species and the maintenance of forest land for such purposes consistent with sound natural resource management. This eliminates the inconsistency in the current statute between ORS 527.630 which states that state policy is to "maintain and enhance such benefits" and ORS 527.710 which directs the board to adopt rules establishing minimum standards for certain specified forest practices.

²¹ Summary of Draft Legislation to Amend Land Use Laws, Board of Forestry Composition and Forest Practices Act, by Gail Achterman, dated June 10, 1987; Statement of Intent for House Bill 3396 to Amend Land Use Laws, Board of Forestry Composition, and Forest Practices Act, by Gail Achterman, June 18, 1987.

After passage in the House, the Senate took up the bill and spent time considering the phrase “consistent with sound natural resource management.” Senate Majority Leader Bill Bradbury stated that the phrase needed some clarification.²² One option, which was supported by the timber industry, was to provide that growing and harvesting forest tree species and maintenance of forestlands was the “priority” use on private land. Chair Bradbury expressed concern with the word “priority” and wanted to find another word that expressed a similar sentiment, but also acknowledged that maintenance of forestlands for growing and harvesting must be done in a manner that was consistent with the sound management of public resources. Chair Bradbury suggested the phrase “leading use” as an alternative. The summary notes from the committee deliberation further attributes to Chair Bradbury the statement:

“It is important that the policy statement express the creative tension that does, in fact, exist between timber harvest and resource maintenance. It's clear that a tree farm does not exist for the sole purpose of feeding deer, but the tension comes from the fact that deer are one of the public benefits that depend on that timberland.”

Ms. Achterman responded that the House Committee had been concerned about any further changes in the policy statement, but she felt that they could concur if “leading” were substituted for “priority.”²³ The language that was ultimately adopted by the conference committee and passed by the Legislature provided:

“...assure the continuous growing and harvesting of forest tree species and maintenance of forest land for such purposes, [~~consistent with sound natural resource management~~] as the leading use on privately owned land, consistent with sound management of soil, and, water and fish and wildlife resources that assures the continuous benefits of those resources for future generations of Oregonians.”²⁴

This amendment incorporated the language that previously existed in ORS 527.630(3)(a) (regarding protection of “soil, air and water resources”) and deleted in the introduced bill.

In a report to the House Energy and Environment Committee, Senate Majority Leader Bradbury wrote that the intent of the amendments to Section 10 was to clarify that forest management is the “leading use” but that it must be done while assuring the overall maintenance of the benefits of natural resources.²⁵ The language in ORS 527.630(1) and (3) has changed little since the 1987 rewrite.²⁶

²² Chair Bradbury’s “Proposed Peace Plan” and comments during June 22, 1987 Senate Committee on Agriculture and Natural Resources Committee hearing; memo from Senator Bradbury to Sue Hanna, Legislative Counsel “RE Amendments to HB 3396”, undated.

²³ Senate Committee on Agriculture and Natural Resources hearing notes, dated June 22, 1987.

²⁴ HB 3396A, amendment -48, on June 23, 1987.

²⁵ Memo from Senator Bill Bradbury, dated June 24, 1987.

²⁶ 1991 c. 919 §10 (SB 1125) (incorporating scenic resources to the list of management considerations); 1991 c.634. §4; 1995 s.s. c.3 §39L; 1996 c.9 §14; 1999 c.1103 §11; 2003 c.740 §9.

ORS 527.710

a) Text

ORS 527.710

(1) In carrying out the purposes of ORS 527.610 to 527.770, 527.990 (1) and 527.992, the State Board of Forestry shall adopt * * * rules to be administered by the State Forester establishing standards for forest practices in each region or subregion.

(2) The rules shall ensure the continuous growing and harvesting of forest tree species. Consistent with ORS 527.630, the rules shall provide for the overall maintenance of the following resources:

- (a) Air quality;
- (b) Water resources, including but not limited to sources of domestic drinking water;
- (c) Soil productivity; and
- (d) Fish and wildlife.

* * * * *

(5) In carrying out the provisions of subsection (4) of this section, the board shall consider and accommodate the rules and programs of other agencies to the extent deemed by the board to be appropriate and consistent with the purposes of ORS 527.630.

(6) The board shall adopt rules to meet the purposes of another agency's regulatory program where it is the intent of the board to administer the other agency's program on forestland and where the other agency concurs by rule. An operation performed in compliance with the board's rules shall be deemed to comply with the other agency's program.

* * * * *

(8) If, based upon the study completed pursuant to section 15 (2)(f), chapter 919, Oregon Laws 1991, the board determines that additional rules are necessary to protect forest resources pursuant to ORS 527.630, the board shall adopt forest practice rules that reduce to the degree practicable the adverse impacts of cumulative effects of forest practices on air and water quality, soil productivity, fish and wildlife resources and watersheds. Such rules shall include a process for determining areas where adverse impacts from cumulative effects have occurred or are likely to occur, and may require that a written plan be submitted for harvests in such areas.

b) Legislative History

1971 by HB 1624

The language that served as the foundation for current ORS 527.710 was originally adopted in 1971 as part of the Oregon Forest Practices Act.²⁷ The history leading up to passage of the 1971 Forest Practices Act is discussed in detail above, in the history of ORS 527.630. Relevant to ORS 527.710 was Section 5 of the 1971 HB 1624, which provided:

The board, in carrying out the purpose of ORS 527.010, 527.240, subsection (1) of 527.990 and sections 3 to 12 of this 1971 Act:

(1) Where necessary to accomplish the purpose specified in section 4 of this 1971 Act, shall promulgate * * * rules to be administered by the State Forester establishing minimum standards for forest practices in each region or subregion, relating to the following:

- (a) Reforestation of forest land economically suitable therefor;
- (b) Road construction and maintenance operations on forest land;
- (c) Harvesting of forest tree species;
- (d) Application of chemicals on forest land; and
- (e) Disposal of slashing on forest land.

(2) Before promulgating such rules, shall consult with other agencies of this state or any of its political subdivisions that have functions with respect to the purposes specified in section 4 of this 1971 Act; and

(3) May enter into cooperative agreements or contracts necessary in carrying out the purposes specified in section 4 of this 1971 Act.

The 1971 legislature was focused on providing the Board with authority to regulate forest practices so as to maintain the economic benefits of forestry. State Forester Schroeder summarized that Section 5 directs the “board of forestry to promulgate rules to be administered by the State Forester, establishing minimum standards for forest practices. Specific areas of concern for which rules would be mandatory are cited in the section.”²⁸ There is little additional legislative history from the 1971 bill that could be found to further explain the legislative intent of Section 5.

²⁷ 1971 c.316 §5 (HB 1624).

²⁸ Digest of HB 1624 – Oregon Forest Practices Act, by State Forester J.E. Schroeder, dated March 10, 1971; May 5, 1971.

1987 by HB 3396

In 1987, as part of the significant rewrite to the Forest Practices Act, the legislature also made changes to ORS 527.710.²⁹ As introduced, section 14 of HB 3396 would have amended ORS 527.710 to specifically address resources that the forest practice rules shall maintain:

(1) [~~The board,~~] In carrying out the [~~purpose~~] **purposes** of ORS 527.610 to 527.730 and 527.990(1)[:] [(1) Where necessary to accomplish the purpose specified in ORS 527.630, shall promulgate], **the board shall adopt**, * * * rules to be administered by the State Forester establishing minimum standards for forest practices in each region or subregion. [~~relating to the following:~~]

- ~~[(a) Reforestation of forest land economically suitable therefor;]~~
- ~~[(b) Road construction and maintenance operations on forest land;]~~
- ~~[(c) Harvesting of forest tree species;]~~
- ~~[(d) Application of chemicals on forest land; and]~~
- ~~[(e) Disposal of slashing on forest land.]~~

(2) The rules shall assure the continuous growing and harvesting of forest tree species. Consistent with ORS 526.630, the rules shall generally maintain the following resource values:

- (a) Air quality;**
- (b) Water resources, including but not limited to sources of domestic drinking water;**
- (c) Soil productivity; and**
- (d) Fish and wildlife.**³⁰

In her report to the legislature, Ms. Achterman wrote that one of the key points agreed upon by the workgroup was that new legislation should "...assure consideration of other natural resources values..."³¹ Her report also specifically addressed Section 14:

SECTION 14: Forest Practice Rules. This is the key section of the bill. It directs the Board to adopt rules in accordance with certain procedures and to assure certain forest management objectives.

* * * * *

²⁹ 1987 c. 919 §14 (HB 3396).

³⁰ HB 3396, draft dated June 8, 1987.

³¹ Summary of Draft Legislation to Amend Land Use Laws, Board of Forestry Composition and Forest Practices Act, by Gail Achterman, dated June 10, 1987; Statement of Intent for House Bill 3396 to Amend Land Use Laws, Board of Forestry Composition, and Forest Practices Act, by Gail Achterman, June 18, 1987.

Subsection (2) requires that the Board's rules assure the continuous growing and harvesting of forest tree species and, consistent with the forest policy set forth in ORS 526.630, generally maintain certain widespread resources. These include air quality; water resources, including but not limited to, sources of domestic drinking water; soil productivity; and fish and wildlife.

The intent of this subsection is for the Board's rules to generally maintain the listed widespread resources, as opposed to maintaining them without any change or disturbance. This recognizes that forest operations may adversely affect these resources but that the integrity of the resources overall should be maintained. It is also intended to continue the long-standing policy that forest landowners are not required to provide "drinkable" domestic water, but rather to provide "treatable" water consistent with the federal and state water quality laws.

Subsequent legislative deliberations focused on changing the phrase "generally maintain" to the alternative of "overall maintenance." At the June 20, 1987 Senate Committee on Agriculture and Natural Resources, in response to a question from Senator Cohen about the term "generally maintain," Ms. Achterman said "this language has been discussed at length, and numerous alternative phrasings considered. There is a recognition that temporary negative effects on water, air, soil and fish and wildlife are unavoidable during some forest operations. The intention is that operators will not be required to maintain those values at all times under all circumstances."³²

Later in that same hearing, Senator Bradbury asked about the term "generally maintain." The witnesses at that time included four members of the working group: Ms. Achterman, Wade Armstrong (Oregon Forest Industry Council), Kelly Conover (Weyerhaeuser), and John Charles (Consortium of Conservation Organizations). The committee notes summarized the exchange:

CHAIR BRADBURY asked what the term "generally maintain", as it is used in Section 14, means.

MR. ARMSTRONG said that operations on forest lands are on a continuum over the life of the stand. There will be changes on a given acre so that there will be times when the general resources are not maintained. However, over the life of the stand, air and water quality, soil and fish and wildlife will be maintained and not diminished.

* * * * *

MR. ARMSTRONG added that the term "general" is not meant to be loose; it is used to allow for temporary disruptions within the total time frame.

³² Senate Committee on Agriculture and Natural Resources notes, dated June 20, 1987.

MS. ACHTERMAN said that it is important to note that there were lengthy discussions on how best to phrase this concept; there was consensus that there would be temporary disturbances, and that "generally maintain" captured the intent.

CHAIR BRADBURY asked whether the phrase "The rules shall maintain over time the following resources..." would also capture the intent.

MR. CONOVER said that one word that almost made it through the debate was "overall".

MS. ACHTERMAN said that the problem with "over time" or "overall" is that it doesn't capture the recognition that every single element or resource will not be maintained all the time.

MR. CHARLES said that air and water quality protection is driven by federal statutes. Soil productivity is something that everyone cares about, and presumably the landowner will do whatever is necessary to preserve it. Fish and wildlife resources, however, may suffer from the new language, which omits the directive to "enhance", which is in the existing policy statement on natural resources.

CHAIR BRADBURY asked why the working group changed the existing policy statement.

MS. ACHTERMAN said that when she drafted this section, she tried to reconcile the policy statement with the existing directives on rulemaking. The policy statement specifies that certain natural resources should be maintained and enhanced, but the Board is only directed to make rules regarding reforestation, road construction, harvesting, chemical application and slash disposal. It was unclear whether the Board had any rulemaking authority relating to a number of items present in the policy statement.³³

The last exchange during this hearing is noteworthy. Ms. Achterman expressed an opinion that existing statutes provided the legislature's policy statement to maintain and enhance certain natural resources, but the existing statutory rulemaking authority was limited to issues such as reforestation, road construction, harvesting, chemical application and slash disposal. Ms. Achterman stated that one of the purposes of Section 14 of HB 3396 was to clarify that the Board also has authority to enact rules that implement the policy decision to maintain the listed natural resources: air quality; water resources; soil productivity; and fish and wildlife.

The committee, and Chair Bradbury in particular, continued to consider alternatives to the phrase "generally maintain." In a letter to legislative counsel, Chair Bradbury requested help in drafting an amendment to this phrase:

1) Some change to the "generally maintain" language on page 9, line 22. Options include "generally shall maintain" or "shall maintain generally" and I am sure you have come up

³³ Senate Committee on Agriculture and Natural Resources notes, dated June 20, 1987.

with other options. It is clear timber is not upset with changing this language as long as we reflect an understanding that there will be temporary disturbances of any or all of the resources listed. Other words mentioned include "overall" and that might be ok - "the rules shall maintain overall the following resources:" (Actually, that last one with overall sounds best to me right now).³⁴

A slight variation of the Chair's proposed language was incorporated into an amendment that was passed by the committee and provided that "the rules shall provide for the overall maintenance of the following resources..."³⁵ After passage in the Senate, Chair Bradbury offered the following summary of section 14:

SECTION 14(2): The bill passed by the House required the board to adopt rules which "generally maintain" certain widespread resources. The Senate Committee felt this phrase was unclear and amended it to require instead that the board's rules "provide for the overall maintenance" of the same resources. The Senate Committee believed that this language more accurately expressed the intent of this subsection as explained in Gail Achterman's Memorandum of June 18, 1987.³⁶

Though the legislature's choice of language differed slightly from the language that Ms. Achterman proposed, Chair Bradbury's summary indicates a legislative intent to adopt the general purpose of the amendment as described by Ms. Achterman.³⁷ The intent, as written by Ms. Achterman:

The intent of this subsection is for the Board's rules to generally maintain the listed widespread resources, as opposed to maintaining them without any change or disturbance. This recognizes that forest operations may adversely affect these resources but that the integrity of the resources overall should be maintained."³⁸

1991 by SB 1125

In 1991, the legislature undertook another significant revision to the Oregon Forest Practices Act. A legislative staff report for SB 1125 summarized: "Since [1987,] public concern about the impacts of timber harvest has increased significantly. Issues such as the cumulative effects of timber harvest and its impact on fish and wildlife habitat have been topics of public discussion."³⁹

³⁴ Memo from Sen. Bradbury to Sue Hanna, Legislative Counsel, RE Amendments to HB 3396, undated.

³⁵ HB 3396 -44 amendment, dated June 22, 1987.

³⁶ Memo from Senator Bradbury to Rep. Ron Cease, RE Senate Amendments to HB 3396, dated June 24, 1987.

³⁷ *Id.*

³⁸ Summary of Draft Legislation to Amend Land Use Laws, Board of Forestry Composition and Forest Practices Act, by Gail Achterman, dated June 10, 1987; Statement of Intent for House Bill 3396 to Amend Land Use Laws, Board of Forestry Composition, and Forest Practices Act, by Gail Achterman, June 18, 1987.

³⁹ Conference Committee on SB 1125, Staff Measure Summary, meeting dates 6/26, 6/27, 6/28.

The Senate Committee on Agriculture and Natural Resources adopted the -14 amendment with section 12 proposing a couple of relevant changes to ORS 527.710.⁴⁰ First, it proposed to add “restoration” to the mandate in subsection 2:

- (2) The rules shall assure the continuous growing and harvesting of forest tree species. Consistent with ORS 527.630, the rules shall provide for the overall maintenance **or restoration** of the following resources:
- (a) Air quality;
 - (b) Water resources, including but not limited to sources of domestic drinking water;
 - (c) Soil productivity; and
 - (d) Fish and wildlife **populations and appropriate habitat.**

Second, it proposed to add a new section to ORS 527.710 regarding “cumulative effects”:

- (4) The board shall adopt forest practices rules that:**
- (a) Minimize adverse impacts of cumulative effects of forest practices on air and water quality, soil productivity, fish and wildlife resources and watersheds. The rules shall include a process for determining areas where adverse impacts from cumulative effects have occurred or are likely to occur, and shall require that a written plan be submitted for harvests in such areas; and**
 - (b) Provide the State Forester with authority to condition the approval of written plans required under ORS 527.670 (2) and (3) by limiting rate, timing and extent of harvest when the forester determines such limitations are necessary to achieve the objectives of ORS 527.630.**

The -14 amendments also added a definition of “cumulative effects”:

“Cumulative effects” means the impact on the environment which results from the incremental impact of the forest practice when added to other past, present and reasonably foreseeable future forest practices regardless of what governmental agency or person undertakes such other actions.

The first two revisions mentioned above (those related to “restoration” and those related to “cumulative effects”) were further revised by the House committee and were ultimately resolved by a conference committee, as discussed in more detail below.

⁴⁰ SB 1125 – 14 amendment, Section 12, dated May 28, 1991.

Restoration

The mandate for Board to pass rules that provided for the “restoration” of resources was removed by the House Committee on Agriculture, Forestry and Natural Resources. During a House committee hearing, Jeff Curtis from the Department of Fish and Wildlife testified in favor of the new provision.⁴¹ Committee notes indicated that Mr. Curtis stated:

We're concerned with habitat that has been degraded over time. The way "overall maintenance" should be interpreted is that as long as there was no additional damage it would be within the meaning of the act. In areas where habitat has been damaged, we'd like to see additional protection that would allow the habitat to restore itself. The current language allows degraded habitat to remain the way it is without being further depressed.

Jill Zarnowitz, also with the Department of Fish and Wildlife further explained:

The combination of minimum standards in the original Forest Practices Act and overall maintenance would allow conditions to be maintained at a much lower level. The A-Engrossed bill would allow restoration of habitat.

Chair Schroeder and Representative Dwyer expressed concern about the obligation to enact rules for restoring resources. The committee notes indicate that Rep. Dwyer stated: “restoration as it applies to streams is appropriate. As it applies to the land base and streams it creates a problem.” Following this comment, Chair Schroeder and Mr. Curtis shared the following exchange:

CHAIR SCHROEDER: If we clear cut an area of old growth where elk and deer live would we have to restore the old growth immediately?

CURTIS: Does not think so.

CHAIR SCHROEDER: If "restoration" is left in it appears it would have to be restored immediately.

ZARNOWITZ: That's an option, not a mandate.

CHAIR SCHROEDER: The way it is written that could be required.

The House removed the obligation to pass rules for restoration of the listed resources.⁴² The bill then went to a conference committee for reconciliation. The committee found a compromise that took a slightly different approach, narrowing the scope so that the focus was on

⁴¹ House Committee on Agriculture, Forestry and Natural Resources notes, dated June 6, 1991.

⁴² House Committee on Agriculture, Forestry & Natural Resources, Staff Measure Summary of SB 1125 B-Engrossed, meeting dates 6/4/91 (PH), 6/6/91 (PH/WS), 6/7/91 (WS).

restoring aquatic habitat.⁴³ It added a new section to ORS 527.710, which rather than obligating the Board to provide for restoration of the listed natural resources as passed by the Senate, the compromise language placed some obligations on the Forester, and some obligations on the Board. The Forester was required to identify and prioritize streams for restoration efforts, and then to encourage landowners to conduct the restoration.⁴⁴ The Board was required to undertake further studies for methods of restoring or enhancing fish and wildlife populations, then to adopt rules to implement the Board's findings.⁴⁵ The agreed upon language was described by legislative staff as:

Modifies Board rulemaking mandate by requiring that rules provide for identification of streams in which restoration of habitat would be environmentally beneficial, to identify methods of restoration, to encourage landowners to enter into cooperative agreements to restore, and to adopt rules to implement the findings.⁴⁶

Cumulative Effects

The House Committee on Agriculture, Forestry and Natural Resources also spent time analyzing the scope of "cumulative effects" incorporated into the Senate version of the bill. Assistant State Forester Fred Robinson addressed the Board's perspective on cumulative effects:

The issues addressed in SB 1125 and in the Board of Forestry's "Forum Report" are many and varied. Nonetheless, they can be summed up in large part as the public's concern for the overall or cumulative effect of wide-spread forest operations, particularly clearcut harvests, on the public resource benefits of water quality, and fish and wildlife.

Many have suggested that cumulative effects be examined and regulated on a broad scale, basin or landscape basis. While such an approach could conceivably produce optimal resource management benefits someday, the Board of Forestry has concluded that the scientific data, affordable technology, and compatibility of individual landowner objectives do not exist today to make such an approach feasible.

The Board favors instead, a component approach to minimizing cumulative effects. Utilizing what we do know about the discrete and direct effects of forest operations on resource benefits, practices have been and can be designed to minimize adverse effects. If the discrete effects are minimized, it is logical that cumulative effects will also be reduced. Further, where there is general agreement as to likely cumulative effects, practices can be tried, and monitored for results. Where knowledge is lacking, or where theories are not widely accepted, ongoing and planned research and the compilation of information in a format useful to decision makers will allow orderly progress in resource protection.

⁴³ Conference Committee on SB 1125 notes, dated June 26, 1991.

⁴⁴ ORS 527.710(9)(a)-(b).

⁴⁵ ORS 527.710(9)(c)-(d).

⁴⁶ Conference Committee on SB 1125, State Measure Summary, meeting dates 6/26, 6/27, 6/28/1991.

SB 1125 contains several elements of a component approach to minimizing cumulative effects. Placing limits on clearcut harvest unit size and distribution; requiring snag, live tree and downed log retention in uplands; decreasing time allowances for stand establishment and requiring stand maintenance to a free-to-grow status; developing additional stream classifications and protection measures; and tightening reforestation exemption criteria for changes in land use are all components that will decrease cumulative effects of forest operations.⁴⁷

The Senate version of SB 1125 would have required the Board to adopt forest practice rules to minimize adverse impacts of cumulative effects of forest practices. The House, instead, adopted language that would require the Board to conduct a study of cumulative effects, and then initiate rulemaking after that study is completed. The issue was deliberated by the Conference Committee, which ultimately resolved the disagreement by authorizing the Board to undertake further analysis before rulemaking occurs, rather than providing legislative mandates to proceed to rulemaking.

The compromise regarding cumulative effects was addressed in two different sections of the bill.⁴⁸ Section 15 obligates the Forester to conduct a study of harvest rates and cumulative effects related to forest practices on forestland in Oregon.⁴⁹ Should the analysis in Section 15 determine that additional rules are necessary, then Section 13 would obligate the Board to adopt forest practice rules that reduce to the degree practicable the adverse impacts of cumulative effects of forest practices on air and water quality, soil productivity, fish and wildlife resources and watersheds.⁵⁰ The definition of “cumulative effects” in Section 1 was also passed by the Conference Committee.⁵¹

⁴⁷ Letter from Assistant State Forester Fred Robinson to the House Committee Chair Schroeder, dated June 4, 1991.

⁴⁸ Conference Committee on SB 1125 notes, dated June 26, 1991.

⁴⁹ Enrolled Senate Bill 1125, Section 15.

⁵⁰ ORS 527.710(8).

⁵¹ ORS 527.620(2).

ORS 527.714

a) Text

ORS 527.714

(1) The rulemaking authority of the State Board of Forestry under ORS 527.610 to 527.770 consists generally of the following three types of rules:

(a) Rules adopted to implement administration, procedures or enforcement of ORS 527.610 to 527.770 that support but do not directly regulate standards of forest practices.

(b) Rules adopted to provide definitions or procedures for forest practices where the standards are set in statute.

(c) Rules adopted to implement the provisions of ORS 527.710 (2), (3), (6), (8), (9) and (10) that grant broad discretion to the board and that set standards for forest practices not specifically addressed in statute.

* * * * *

(5) If the board determines that a proposed rule is of the type described in subsection (1)(c) of this section, including a proposed amendment to an existing rule not qualifying under subsection (3) of this section, and the proposed rule would provide new or increased standards for forest practices, the board may adopt such a rule only after determining that the following facts exist and standards are met:

(a) If forest practices continue to be conducted under existing regulations, there is monitoring or research evidence that documents that degradation of resources maintained under ORS 527.710 (2) or (3) is likely, or in the case of rules proposed under ORS 527.710 (10), that there is a substantial risk of serious bodily injury or death;

(b) If the resource to be protected is a wildlife species, the scientific or biological status of a species or resource site to be protected by the proposed rule has been documented using best available information;

(c) The proposed rule reflects available scientific information, the results of relevant monitoring and, as appropriate, adequate field evaluation at representative locations in Oregon;

(d) The objectives of the proposed rule are clearly defined, and the restrictions placed on forest practices as a result of adoption of the proposed rule:

(A) Are to prevent harm or provide benefits to the resource or resource site for which protection is sought, or in the case of rules proposed under ORS 527.710 (10), to reduce risk of serious bodily injury or death; and
(B) Are directly related to the objective of the proposed rule and substantially advance its purpose;

(e) The availability, effectiveness and feasibility of alternatives to the proposed rule, including nonregulatory alternatives, were considered, and the alternative chosen is the least burdensome to landowners and timber owners, in the aggregate, while still achieving the desired level of protection; and

(f) The benefits to the resource, or in the case of rules proposed under ORS 527.710 (10), the benefits in reduction of risk of serious bodily injury or death, that would be achieved by adopting the rule are in proportion to the degree that existing practices of the landowners and timber owners, in the aggregate, are contributing to the overall resource concern that the proposed rule is intended to address.

b) Legislative History

1995 by SB 1156

In a 1995 special session, the legislature took up SB 1156.⁵² The bill combined several different legislative concepts. Section 39n of the bill addressed the Board's authority to adopt rules for forest practices and set very specific guidelines on the Board's efforts. The House Committee on Legislative Rules Staff Measure summary described the changes proposed:

Requires the Board of Forestry to apply a series of rulemaking standards when considering new resource protection rules. The Board can adopt a new rule only if it finds that these standards are met.⁵³

Similarly, the Fiscal Analysis of Proposed Legislation prepared by Legislative Fiscal Office on 8/3/95 described the bill as:

Harvesting and Reforestation: The measure also modifies the harvesting and reforestation requirements under the Forest Practices Act. Provisions expand the rule-making process to require scientific determinations and economic impact analysis. The Board of Forestry is to appoint a task force to identify ways of avoiding increased regulatory burdens.⁵⁴

⁵² 1995 s.s. c.3 §39n, codified initially in ORS 527.713, but moved to ORS 527.714 in 1996 by HB 3485 (1996 c.9 §16)

⁵³ House Committee on Legislative Rules, Staff Measure Summary, meeting dates 7/31/95, 8/1/95, 8/3/95.

⁵⁴ Fiscal Analysis of Proposed Legislation prepared by Legislative Fiscal Office, dated August 3, 1995.

ORS 527.715

a) Text

ORS 527.715

The State Board of Forestry shall establish, by rule, the standards and procedures to implement the provisions of ORS 197.180, 197.270, 197.825, 215.050, 477.440, 477.455, 477.460, 526.009, 526.016, 526.156, 527.620, 527.630, 527.660, 527.670, 527.683 to 527.724, 527.736 to 527.760 and 527.992.

d) Legislative History

In 1987 the legislature enacted HB 3396 as part of the effort to clarify the Board's rulemaking authority under the Forest Practices Act (see discussion above related to legislative history of ORS 527.630).⁵⁵

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⁵⁵ 1987 c.919 §10 (HB 3396).

STAFF REPORT

Agenda Item No.:	5
Topic:	Forest Trust Land Advisory Committee
Presentation Title:	FTLAC Testimony to the Board of Forestry
Date of Presentation:	November 4, 2020
Contact Information:	David Yamamoto, Tillamook County Commissioner

On behalf of the Forest Trust Land Advisory Committee (FTLAC), comments and additional information provided on State Forest Lands business.

Agenda Item No.:	6, a through d
Work Plan:	Climate Change and Forest Carbon
Topic:	Forest Carbon
Presentation Title:	Oregon Forest Carbon Accounting Framework
Date of Presentation:	November 4, 2020
Contact Information:	Andrew Yost PhD, Forest Ecologist 503-945-7410, andrew.yost@oregon.gov

SUMMARY

- The Board of Forestry (Board) will hear from four of our external partners who are contributing to the development of a forest carbon accounting framework for Oregon.
- The presentations are information items only.

BACKGROUND AND CONTEXT

For over a decade now, scientists on staff with Oregon Department of Forestry have been working closely with the Oregon Global Warming Commission and have taken the initiative to develop a forest carbon accounting framework that will meet the requirements mandated by Section 12(1) (i) of House Bill 3543 that was passed by the 2007 Legislature. That legislation directs the Commission to *track and evaluate the carbon sequestration potential of Oregon’s forests, alternative methods of forest management that can increase carbon sequestration and reduce the loss of carbon sequestration to wildfire, changes in the mortality and distribution of tree and other plant species and the extent to which carbon is stored in tree-based building materials;*

The efforts initiated by ODF’s scientists are directly related to the Board of Forestry’s Goal G in the Forestry Program for Oregon, which is “*improve carbon sequestration and storage and reduce carbon emissions in Oregon’s forests and forest products*”

ODF scientists have been assisting the Commission and Board of Forestry to achieve these goals and mandates through the following efforts:

To evaluate how climate change will impact carbon sequestration in forests from future wildfire ODF staff collaborated with the USFS Pacific Northwest Research Station to build predictive models of future threat of large forest wildfires. The research, Davis et al. (2017), demonstrated how the predictions for changes in temperature and precipitation from 30 climate models will increase the climatic suitability and frequency for large forest fires for all of Oregon’s ecoregions through the 21st century (Attachment 1).

To evaluate changes in mortality and distribution of tree and other plant species in the forests of Oregon, Washington and California, ODF scientists have established a partnership with the USFS Forest Inventory and Analysis (FIA) Program. This research involves analyzing over two decades of forest inventory data and will quantify the relationship between changes in geography of individual species and changes in climate.

The analytical methods for this research will follow those reported in Monleon and Lintz (2015) (Attachment 2) and the research is expected to be completed by June 2021.

To determine the rate of carbon sequestration and the amount of carbon stored in Oregon's forests, ODF partnered with the USFS FIA Program and Oregon's Office of Carbon Policy to produce the Oregon Forest Ecosystem Carbon Report (2019). This report provides estimates for the status and trends of carbon in Oregon's forest ecosystems and ownerships from 2001-2016 (Attachment 3). The information in this report is based on measurements conducted on 9,483 forested plots in Oregon by the Forest Inventory and Analysis Program (FIA) and remeasurement of the same plots and trees on 60% of those plots. The analysis will be updated when 100% of the FIA plots have been remeasured in 2021. Department staff presented results of this work to the Board at its April 2019 meeting. Selected highlights from this assessment include: i) for the 2016 reporting period the amount of carbon in Oregon's forests was approximately 3.2 billion metric tons and ii) the carbon in Oregon's forests increased by approximately 30.9 million metric tons of CO₂ equivalents per year between 2001-2016.

To determine the extent to which carbon is stored in tree-based building materials ODF established a collaborative partnership with FIA and the Bureau of Business and Economic Research to produce the Oregon Harvested Wood Products Carbon Report. This report provides estimates for the amount of carbon that has accumulated in wood products and landfills, as well as the amount of carbon released back to the atmosphere through burning and decomposition of wood products, from timber harvested in Oregon since 1906. The partnership, which includes the Temperate Forest MOU, is currently developing a Monte Carlo simulation to estimate the uncertainty of the analysis and in the final stage of writing the report expected to be released this year. This partnership will also produce a separate, Oregon Sawmill Energy Report that will also be released this year. The analysis is based on a survey for the amount and types of energy produced and consumed by sawmills in Oregon in 2017.

To determine the sequestration potential of Oregon's forests and explore alternative methods of forest management that can increase carbon sequestration, ODF staff are currently developing a forest carbon simulation project with American Forests. The project will involve a stakeholder process and will be based on using the Carbon Budget Model parameterized for the ecoregions, ownerships, and various types of forest in Oregon.

Taken together, the Forest Ecosystem Carbon Report, Harvested Wood Product Report, and Sawmill Energy Report provide a framework for assessing Oregon forest sequestration, flux, emissions, and wood product storage. These reports rely on data collection that is ongoing and will be iteratively updated which will provide timely and contemporary awareness and assessment of the changing dynamic of Oregon forest carbon. In addition, anticipated work with American Forests relative to forest management scenario modeling as well as complementary work with the temperate forest working group will provide alternative management and utilization scenarios to inform forest carbon probabilities and potential outcomes.

PRESENTATIONS TO THE BOARD: AGENDA ITEMS 6 a-d

- **6. Oregon Forest Carbon Accounting Framework.**
Dr. Andrew Yost will present progress that has been made toward developing the forest carbon accounting framework for Oregon. The framework consists of tracking the stocks and flux of carbon in forests, and harvested wood products, emissions associated with all aspects of forest management, wood products manufacturing, and simulation analyses of alternative forest and wood products management strategies.
- **6a. Forest Ecosystem Carbon Report and PNW Forest Carbon Initiative** Glenn Christiansen, with PNW Forest Inventory and Analysis, will present to the Board on the results of the Oregon Forest Ecosystems Report that features the stocks and flux of carbon in Oregon's forested ecosystems. Glenn will also present the progress of the PNW Forest Carbon Initiative that includes a proposal to measure and analyze the effects of the 2020 fires on carbon storage and sequestration, regional forest ecosystem analyses, the social implications of forest carbon flux, and forest carbon modeling. This is an information item only
- **6b. Harvested Wood Product Report and Sawmill Energy Report**
Todd Morgan, Director of the Bureau of Business and Economic Research at the University of Montana will present to the Board on the Oregon Harvested Wood Products Carbon Report and the Oregon Sawmill Energy Report. This is an information only.
- **6c. Global Carbon Flux and Forest Considerations**
Werner Kurz, senior research scientist with Canada's Pacific Forestry Centre in Victoria, British Columbia, will present to the Board on the role of forests in the global carbon cycle, the potential for managing forests to mitigate rising levels of atmospheric greenhouse gases, and the development of the Carbon Budget Modeling framework. Dr. Kurz is a primary developer of the Carbon Budget Model. This is an information item only.
- **6d. Forest Management Scenarios for Carbon Mitigation**
Kendall DeLyser, Senior Manager of Forests and Climate with American Forests, will present to the Board on a collaborative project with ODF to simulate the carbon consequences of alternative forest management scenarios focused on carbon mitigation with the Carbon Budget Model. This is an information item only.

NEXT STEPS

- Obtain external review of the Oregon Harvested Wood Products Carbon Report and external review of the Oregon Sawmill Energy Report 2017.
- Continue to update and improve the reporting of Forest Ecosystem Carbon, Harvested Wood Products Carbon, and Sawmill Energy to inform the forest carbon accounting in Oregon and associated policy.
- Complete scenario modeling with American Forests to evaluate alternative scenarios and practices.
- Continue to participate in the temperate forest group to broaden collection and utilization of regional forest carbon accounting and further inform analysis and assessment of forest carbon dynamics.
- Continue work with the review of the Forestry Program for Oregon and goals related to forest carbon and evaluation of policy and practices relative to carbon accounting and alternative scenario modeling.
- Engage and incorporate assembled accounting matrix and scenario modeling, with the Climate Change Carbon Plan called for by EO 20-04 to further inform and advance Board and agency climate and carbon policy along with addition of necessary staffing and resources to adequately address the substantive and broad subject matter.

ATTACHMENTS

- (1) Davis, Raymond; Yang, Zhiqiang; Yost, Andrew; Belongie, Cole; Cohen, Warren. 2017. The normal fire environment—Modeling environmental suitability for large forest wildfires using past, present, and future climate normals. *Forest Ecology and Management*. 390: 173-186. <https://doi.org/10.1016/j.foreco.2017.01.027>.
- (2) Monleon VJ, Lintz HE (2015) Evidence of Tree Species' Range Shifts in a Complex Landscape. *PLoS ONE* 10(1): e0118069. doi: 10.1371/journal.pone.0118069
- (3) Christensen, Glenn A.; Gray, Andrew N.; Kuegler, Olaf; Yost, Andrew C. 2018. Oregon Forest Ecosystem Carbon Inventory: 2001-2016. 347 p. Note: Executive Summary excerpt included in Board package; full report sent under separate cover.



The normal fire environment—Modeling environmental suitability for large forest wildfires using past, present, and future climate normals



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ABSTRACT

We modeled the normal fire environment for occurrence of large forest wildfires (>40 ha) for the Pacific Northwest Region of the United States. Large forest wildfire occurrence data from the recent climate normal period (1971–2000) was used as the response variable and fire season precipitation, maximum temperature, slope, and elevation were used as predictor variables. A projection of our model onto the 2001–2030 climate normal period showed strong agreement between model predictions and the area of forest burned by large wildfires from 2001 to 2015 (independent fire data). We then used downscaled climate projections for two greenhouse gas concentration scenarios and over 30 climate models to project changes in environmental suitability for large forest fires over the 21st century. Results indicated an increasing proportion of forested area with fire environments more suitable for the occurrence of large wildfires over the next century for all ecoregions but less pronounced for the Coast Range and Puget Lowlands. The largest increases occurred on federal lands, while private and state lands showed less. We calculated fire rotation periods for the recent historical and current climate and examined the relative differences between them and our modeled large wildfire suitability classes. By the end of the century, the models predicted shorter fire rotation periods, with cooler/moister forests experiencing larger magnitudes of change than warmer/drier forests. Modeling products, including a set of time series maps, can provide forest resource managers, fire protection agencies, and policy-makers empirical estimates of how much and where climate change might affect the geographic distribution of large wildfires and effect fire rotations.

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1. Introduction

Compared to the last three decades of the 20th century, large wildfires in the Pacific Northwest region of the United States have recently been making headlines with increasing frequency. Large forest wildfires account for most of the annual fire suppression expenditures in the western United States and each year cause significant social and economic impacts as well as ecological changes (Ellison et al., 2013; Moritz et al., 2014; USDA, 2015). These wildfires are products of their environment and the forested environments of the western US appear to be coming more suitable for their occurrence due to climate change (Abatzoglou and Williams, 2016; Westerling, 2016). Climate is one of the modifying forces of the fire environment that interacts with topography and

fuel (e.g., a layer of live and dead vegetation available for burning); each component conceptually forming a side of the “fire environment triangle” (Countryman, 1972: p. 5). This decades-old concept appeared a few years before the concept of the “ecoclimatic triangle” (Hustich, 1978: Fig. 1) that described the interaction between human activities, the climate, and the environment. We combined both concepts to extrapolate and contrast what we consider as today’s “normal” fire environment to what might be considered normal by the end of this century as a result of forecasted changes in climate. Here, the term “normal” implies the typical state based on averaged conditions from a geographic area over decades of time (Lutz et al., 2011; Trewin, 2007).

Empirical studies describing environmental gradients that influence geographic patterns of wildfire over broad landscapes and how climate change may affect those gradients are becoming more commonplace (Krawchuk et al., 2009; Krawchuk and Moritz, 2014; Liu and Wimberly, 2016; Moritz et al., 2012;

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Parisien and Moritz, 2009; Parisien et al., 2012). Such assessments help improve our understanding of the effects of changing environmental controls on the geography of fire. Mutual to all of these modeling efforts is the use of the aforementioned three environmental components. Temporally, of the three, topography is the most stable, taking centuries to millennia to change; whereas, burnable vegetation (fuel) is dynamic and can change from year to year in response to disturbance and growth processes. Climate normals change at a rate in between these two temporal frequencies (e.g., decades). Given recent observed changes in climate and projections of changes in the future, the climate component of the fire environment is a major focus of research.

It has long been known that climate largely determines “the nature of the wildfire problem” and the resulting fire management policies and resources needed (Reifsnnyder, 1960). Thus, a changing climate implies a need for a change in fire management policies and strategies (North et al., 2015). Understanding the conditions that produce suitable environments for large forest wildfires and how those conditions are expected to change with increasing concentrations of greenhouse gases in the atmosphere is critical for a better understanding of where large wildfires are likely to occur now and into the future (Parisien and Moritz, 2009). Reliable temporal and spatial predictions of large wildfire suitability in forested ecosystems are essential for correctly identifying and managing threats to valued resources, prioritizing forest management, and wildfire protection. The need for such assessments is vital in the socially, economically, and ecologically important coniferous forests of the Pacific Northwest (PNW) region of the United States where several studies have predicted large wildfires will occur more frequently and burn larger in the future (Flannigan et al.,

2000; Moritz et al., 2012; Rogers et al., 2011; Stavros et al., 2014). Indeed, an increasing frequency of large forest wildfire occurrence and area burned has already been observed in this region (Dennison et al., 2014; Littell et al., 2009). The objectives of this study were to: (1) characterize the most recent normal fire environment for the forests within Region 6 of the USDA Forest Service (Oregon and Washington); (2) to project this environmental relationship into the future under varying climate change scenarios and; (3) examine the differences between today’s normal fire environment and those of the possible futures.

2. Data and methods

2.1. Study area

Our study area covered 216,900 km² of forest land in Washington and Oregon. Slightly more than half (52%) is managed by the Federal Government. The United States Department of Agriculture Forest Service (USFS) manages about 91,200 km² on 16 National Forests, the United States Department of Interior (USDI) Bureau of Land Management (BLM) manages about 14,000 km², the USDI National Park Service (NPS) manages about 6700 km², and a mix of other federal agencies manage another 800 km². Privately owned forests comprise about 38% (~81,500 km²) while the remaining 10% is comprised of State and Local Government (~13,600 km²) and Tribal Lands (~9100 km²).

There are eight EPA Level III ecoregions (Omernik and Griffith, 2014) in the study area that contain large areas of forestland encompassing a wide range of floristic, physiographic and climatic variability (Fig. 1). Forests vary from the moist Sitka spruce (*Picea*

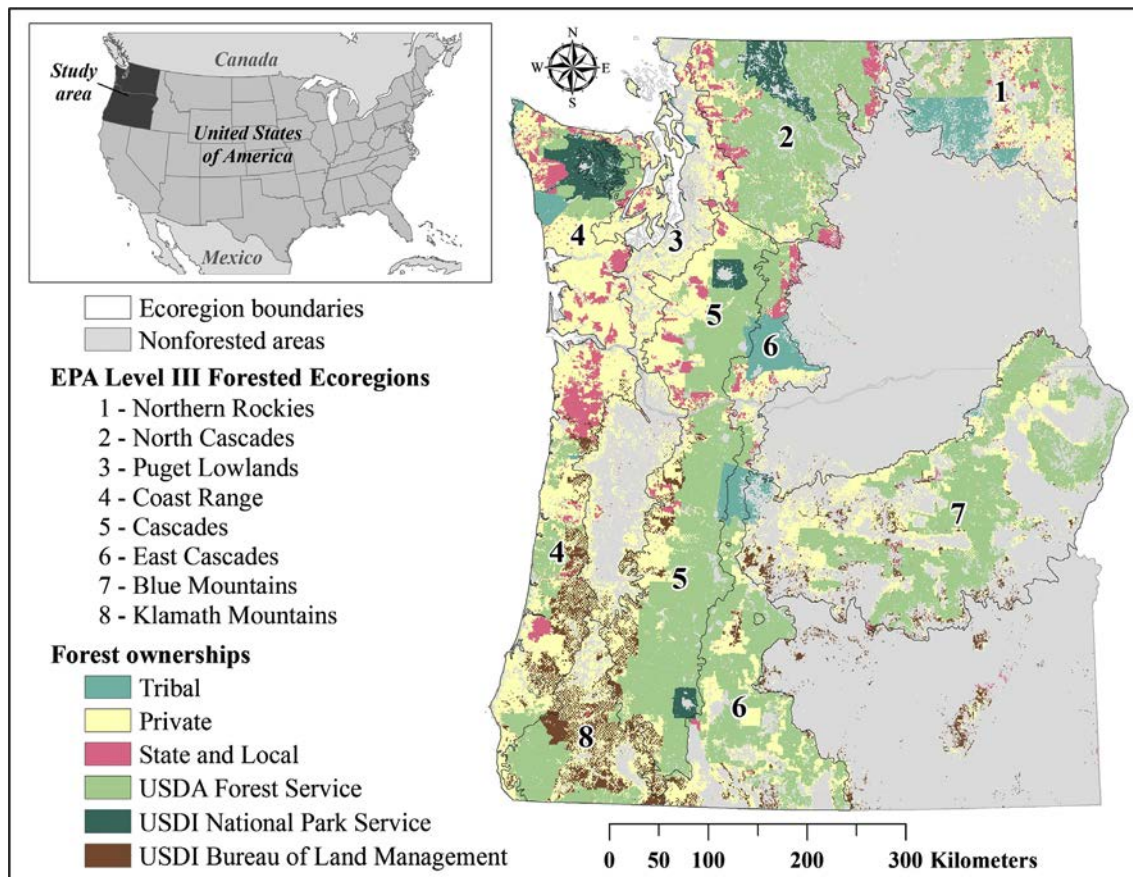


Fig. 1. Study area map showing the major forested ecoregions and major forest ownership patterns.

sitchensis) and western hemlock (*Tsuga heterophylla*) rain forests of the coastal region to mixed conifer, dry ponderosa pine (*Pinus ponderosa*) and western juniper (*Juniperus occidentalis*) east of the Cascades; and from lowland Douglas-fir (*Pseudotsuga menziesii*) forests to high elevation Pacific silver fir (*Abies amabilis*), mountain hemlock (*Tsuga mertensiana*), and subalpine fir (*Abies lasiocarpa*).

The current climate to the west of the Cascade Mountains is mostly temperate maritime grading to Mediterranean in south-western Oregon. Warmer and drier temperate conditions occur from west to east across the Cascade Mountains with vegetation transitioning from coniferous forests to large areas dominated by arid steppe/desert ecosystems. During the climate normal period from 1971 to 2000, mean monthly forest precipitation from May to September ranged from 12 to 201 mm (Table 1). This is the time of year when most large forest wildfires have occurred in this region (Barbero et al., 2014). The average monthly maximum temperature during the peak months of the wildfire season (July to August) ranged from 12 to 33 °C (Table 1).

The forests managed by the BLM had the warmest/driest fire season climate based on the 1971–2000 climate normal data, whereas the coolest/moistest fire season climate occurred on NPS forests (Table 2). State, local, and private forests occur at the lowest elevations on average, while forests managed by the NPS and USFS occur in the highest elevations on average. Forests on private and tribal-owned lands tended to have gentler slopes (Table 2).

2.2. Environmental variables

Our modeling focused on the intrinsic elements of the fire environment (Countryman, 1972); vegetation (fuel) available for burning, climate, and topography. Forested areas mapped by the USFS Forest Inventory and Analysis Program (Ruefenacht et al., 2008) represented the “fuel” side of the fire environment triangle. While considerable efforts have been made to map geographic patterns of

forest fuel models, it remains difficult at best (Arroyo et al., 2008; Keane, 2013) and their patterns are highly dynamic and constantly changing. Predicting fine scale future patterns of fuel accurately would include a very high amount of uncertainty and may not be feasible. For that matter, predicting the broader patterns of forest type dynamics under a changing climate also involves a great deal of uncertainty (Peterson et al., 2014; Purves and Pacala, 2008). Therefore, we assumed that the current forested areas will, on average, provide burnable fuels and a stable forest footprint over the course of this century.

Wildfire studies in Pacific Northwest forests have shown strong correlations between fire occurrence and area burned with summer temperature and precipitation (Davis et al., 2011; Littell et al., 2010; McKenzie et al., 2004). Our climate variables were temperature and precipitation climate normals that coincided with the most active months of the study area’s fire season, thus directly influencing fire behavior and suppression efforts which factor into a fire’s growth. Climate normals were based on 30-year weather averages and used as references of conditions likely to be experienced at a given location (Trewin, 2007). Precipitation (hereafter referred to as PPT) was calculated as the 30-yr mean for the months from May through September, and temperature (TMAX) was calculated as the 30-yr mean of the maximum temperature for July and August, which coincides with the peak months of the fire season. Information sources for PPT and TMAX representing the recent climate normal from 1971 to 2000 and the currently used climate normal 1981–2010 (hereafter; current climate normal) came from datasets (30 arc-sec, ~800 m spatial resolution) generated by the Parameter-elevation Regressions on Independent Slopes Model (Daly et al., 2008; PRISM, 2015). Future climate normals were derived from the NASA Earth Exchange downscaled climate projections (NEX-DCP30) dataset for the US, which used PRISM as its observational climate data to develop the model used in creating future climate datasets that also matched the spatial

Table 1

Summary of forest topography and fire season climate by forested ecoregion. Temperature and precipitation are seasonal norms (1971–2000), not annual. Topographic variables were resampled to match the 800 m² spatial resolution of the climate data. Ecoregions were ordered (top to bottom) from warmer/drier to cooler/moister fire season climates.

Forested ecoregion	Elevation (m)			Slope (%)			Temperature ^a (°C)			Precipitation ^b (mm)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
Klamath Mountains	64	2125	705	1	84	37	19	32	28	15	112	38
East Cascades	26	2456	1375	0	74	15	17	31	26	12	78	25
Blue Mountains	405	2854	1413	0	102	25	15	33	26	14	78	33
Northern Rockies	396	2048	1027	0	75	26	17	31	25	20	112	46
Puget Lowlands	0	1518	159	0	89	11	16	26	24	21	119	53
Cascades	19	2347	1004	0	108	31	15	32	24	19	142	66
Coast Range	0	1599	311	0	114	32	15	30	23	24	197	72
North Cascades	28	2388	1176	0	141	47	12	31	21	13	201	72

^a Mean monthly maximum temperature for July and August.

^b Mean monthly precipitation from May thru September.

Table 2

Summary of forest topography and fire season climate by major forest ownership. Temperature and precipitation are seasonal norms (1971–2000), not annual. Topographic variables were resampled to match the 800 m² spatial resolution of the climate data. Ownerships were ordered (top to bottom) from warmer/drier to cooler/moister fire season climates.

Forest ownership	Elevation (m)			Slope (%)			Temperature ^a (°C)			Precipitation ^b (mm)		
	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean
USDI Bureau of Land Management	0	2629	875	0	95	31	17	33	27	10	119	37
Tribal	0	2251	910	0	74	20	16	32	25	9	131	36
Private	0	2366	626	0	117	22	16	33	25	8	187	50
USDA Forest Service	0	2854	1283	0	137	33	14	32	24	12	201	53
State and Local	0	2222	608	0	122	30	15	32	24	9	190	68
USDI National Park Service	0	2294	1148	0	141	53	12	30	20	21	193	86

^a Mean monthly maximum temperature for July and August.

^b Mean monthly precipitation from May thru September.

resolution and attributes of PRISM (Nemani et al., 2011; Thrasher et al., 2013). The datasets we used included downscaled climate projections from 33 general circulation models (GCMs) for representative concentration pathway (RCP) 4.5 and 31 GCMs for RCP 8.5 (Van Vuuren et al., 2011) under the Coupled Model Intercomparison Project (CMIP) Phase 5 (Taylor et al., 2012). RCP 4.5 assumed moderate global mitigations to reduce greenhouse gas emissions and an increase in forested areas; where atmospheric concentrations peaked by mid-century then began to stabilize, but at higher than current levels (Thomson et al., 2011). RCP 8.5 assumed no mitigations and a decrease in global forested areas resulting in increasing greenhouse gas concentrations throughout the 21st century (Riahi et al., 2011). We did not use RCP 2.6 and 6.0, because the available NEX-DCP30 datasets for these two RCPs had only 17 of 33 GCMs in common, whereas RCP 4.5 and 8.5 had 31. Thus, making comparisons between RCPs more relevant to differences between the scenarios as opposed to differences due to the suite of GCMs used. Future climate normals for each GCM under each RCP were calculated in Google Earth Engine (Gorelick, 2013) (<https://earthengine.google.org/>).

Topographic variables included slope as percentage (SLP) and elevation in meters (ELEV), resampled to match the spatial resolution of our climate variables using bilinear interpolation from 30 × 30 m resolution digital elevation models. There was a moderate negative correlation between TMAX and PPT ($r = -0.6$); however, the variance inflation factors (VIF) for all four model variables ranged from 1.2 to 2.2. Both of these measures were lower than commonly used modeling thresholds ($r > 0.7$ and $VIF > 10$) where collinearity begins to confound model performance (Dormann et al., 2013).

There are a host of other factors that can help to explain the occurrence of wildfire, both environmental (e.g., historical lightning ignition density) and anthropogenic (e.g., distance to roads) (see Appendix G in Davis et al., 2011). Anthropogenic factors can have a noticeable influence on fire probability models (Mann et al., 2016), however assumptions on how these human factors will change into the future from patterns observed today is problematic. Here, we selected a simple set of environmental variables that not only fit the basic components of the fire environment triangle, but have also already been modeled and mapped into the future.

2.3. Large wildfire data

We used large forest wildfire occurrence data within our study area (Fig. 2) that was coincident with the climate normal from

1971 to 2000 to train and test our baseline fire environment model. We used large forest wildfires from 2001 to 2015 to further evaluate our models with data independent of the model training process. Following the standard established by the USDA Active Fire Mapping Program (<https://fsapps.nwcc.gov/afm/>) we considered forest wildfires at least 40 ha in size as a “large” wildfire. During the three decades of the baseline time period a total of 512 large wildfires burned a total area of 7400 km², of which about 4900 km² were forested. In half that time, 651 large wildfires burned slightly over 3 times the amount (16,100 km²) of forest between 2001 and 2015 (Fig. 2).

From the baseline data we generated point locations on the center of each 800 m × 800 m (64-ha) pixel within the perimeter of all wildfires that contained at least 5% forested area. To minimize spatial autocorrelation effects in our model training we randomly sampled from these center locations using an area-based algorithm where the number of points per wildfire was proportional to the square root of the ratio between the area burned to the area of the smallest wildfire. As a result, the smallest wildfire (40 ha) was represented by only one point, and the largest wildfire (56,726 ha) was represented by 37 random points separated by at least 800 m. This reduced our sample locations from 7724 to 1967.

2.4. Modeling the fire environment

We used MaxEnt version 3.3 (Phillips et al., 2006; Phillips and Dudík, 2008) to model the fire environment of the 1971–2000 climate normal period. MaxEnt uses a machine learning method and the principle of maximum entropy to fit mathematical functions of environmental predictor variables to presence locations (the response variable). It does so by maximizing the likelihood ratio of average presence values to average values from a large random sample of the background environment (Merow et al., 2013). Machine learning methods are increasingly being used to empirically model fire environment relationships (De Angelis et al., 2015; West et al., 2016). These approaches differ from process-based methods by allowing for model calibration and evaluation with actual fire observational data to enhance model accuracy, identify uncertainties, and build model credibility (Alexander and Cruz, 2013).

Our objective was to build a baseline model with an appropriate balance between simplicity and complexity to describe the general relationship between large wildfire occurrence and fire environment variables (Bell and Schlaepfer, 2016; Elith et al., 2011; Merow et al., 2014). Thus, we limited our model fitting options

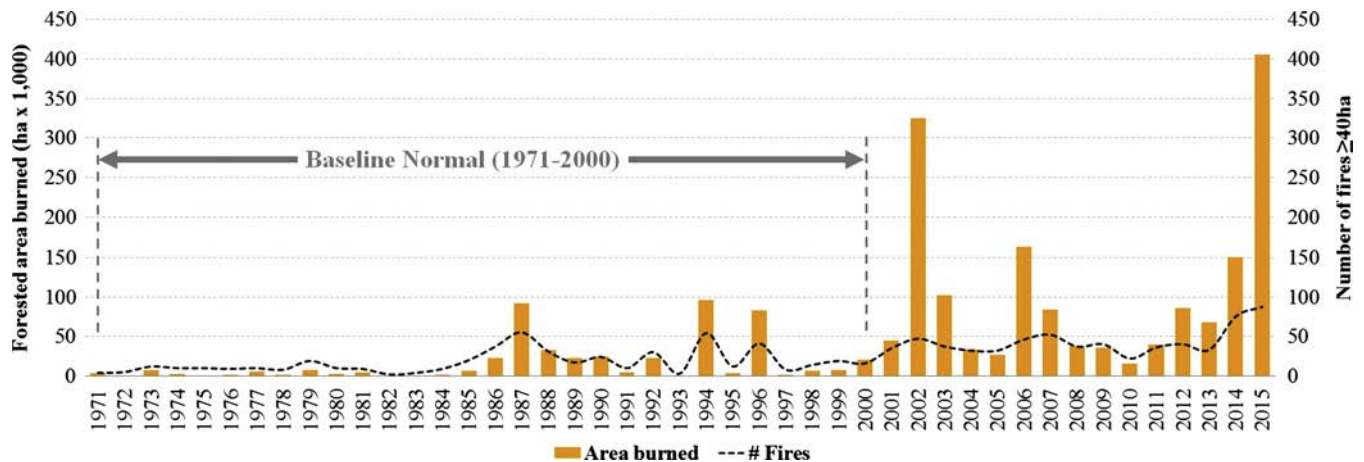


Fig. 2. Large (≥40 ha) forest wildfire history for the study area. The black dashed line for number of fires was smoothed.

to linear, product, or quadratic functions. This combination of functions is reflected in the model output predictor response curves that show the relationship between environmental suitability for large wildfire occurrence (y-axis) and the range of values for each predictor variable (x-axis). We expected that the relative environmental suitability for large wildfires would generally increase with increasing TMAX. We anticipated that suitability would increase with ELEV due to its relationship with lightning strike densities and ignitions (Dissing and Verbyla, 2003; Preisler et al., 2004; van Wagtenonk and Cayan, 2008). We expected to see a positive relationship with SLP and a negative relationship with PPT. Finally, to prevent model projections from assuming empirical relationships for future predictor variables values outside of the range used to train the baseline model we used variable clamping, which keeps the response function flat for values above or below the training data (Phillips et al., 2006). Clamping, however, may result in poorer representation of environmental relationships for climatic conditions outside of the model training dataset so further examination of response functions for this situation is warranted (Bell and Schlaepfer, 2016).

We generated 50 bootstrapped model replicates, each time randomly selecting half ($n = 984$) of the large wildfire data locations and 10,000 random locations from other forested 800 m pixels within the modeling region. The remaining half ($n = 983$) of the large wildfire data were used to evaluate model performance. The model was calibrated with stepwise incremental adjustments (0.5) of a regularization multiplier (RM). The RM is an algorithm coefficient based on a combination of likelihood with a complexity penalty, making it conceptually similar to AIC (Burnham and Anderson, 2002; Merow et al., 2014). For each RM increment, we examined model training and test gains that indicate model overfitting when test gains are significantly lower than training gains. We also examined the test area under the receiver operating characteristic curve (AUC) statistic (Swets, 1988) and the continuous Boyce index (CBI), both of which are used to evaluate model accuracy and fit to the testing data (Boyce et al., 2002; Fielding and Bell, 1997; Hirzel et al., 2006). We selected the model that achieved similar training and test gains, while maximizing test AUC and CBI statistics.

We projected the baseline model onto similar predictor data for the current climate normal (PRISM 1981–2010) and future climate normals using NEX-DCP30 data (1991–2020, 2001–2030 ... 2071–2100). We produced 33 future fire environment models for RCP 4.5 and 31 models for RCP 8.5 for each normal period. Each of these models was based on a different GCM. We used the median and absolute deviation maps from these various GCMs for each RCP as the basis for depicting and evaluating the spatial changes of the fire environment from current to the end of the century.

2.5. Mapping and validating large wildfire suitability

To facilitate model interpretation we used the predicted-to-expected (P/E) curve from the CBI analysis to reclassify our baseline model into three large wildfire suitability classes (Hirzel et al., 2006; Fig. 6). The P/E curve represents the ratio of the proportion of test locations (P) that occurred within a “moving window” width of 0.1 along the predicted suitability axis (x-axis) to the proportion of the model region available for fire occurrence (E) within that same window. A good model is indicated by a monotonically increasing P/E curve. Low suitability was classified as $P/E < 1$, indicating that the model predicted large wildfire occurrence less than would be expected by random chance. Moderate suitability was classified as $P/E > 1$ to the step of the curve where the P/E ratio begins to exhibit a noticeable positive increase (Hirzel et al., 2006). High suitability was classified as the area above this step threshold.

Using a method described in Moreira et al. (2001) we evaluated model performance for projecting the baseline model onto future climate normals. Specifically, using the 2001–2030 projected map we calculated the ratio of the proportion of the forest that was burned by large wildfires for each year from 2001 to 2015 to the proportion of the forested area that was available for burning in each large wildfire suitability class. The interpretation of this burned-to-available for burning (B/A) ratio is similar to the P/E ratio; a value of $B/A < 1$ indicates that the map class burned less than would have been expected by chance and a ratio $B/A > 1$ indicates it burned more than would be expected by chance. For each suitability class, B/A ratios were averaged across years and confidence intervals were constructed. The chi-square goodness of fit test (Byers et al., 1984) was used to test for significant B/A ratio differences between large wildfire suitability classes.

2.6. Estimating changes in fire rotation periods

We calculated the fire rotation period (FRP) for each large wildfire suitability map class for both the baseline and current climate normal periods using the burned area-based equation (eqn. 7) from Li (2002). These FRPs were estimated for 30-year time periods and not expected to represent natural fire cycles owing to fire suppression, especially in the low suitability class where large fires are rare for any given 30-yr period. Rather, they represent observed FRPs. Given that FRPs vary widely across time (Li, 2002) we calculated the relative difference between fire suitability classes for both time periods. We used the averaged class differences to estimate the relative magnitude of FRP change, based on class transitions (e.g., low to moderate) from the current climate normal to the climate normal period at the end of this century.

3. Results

3.1. Fire environment modeling

Our best model was produced using a RM setting of 2.0, with a CBI of 0.97 ± 0.02 and a test AUC of 0.77 ± 0.01 . All modeled RM versions had similar average training and test gains (0.48 ± 0.1 and 0.49 ± 0.1 , respectively; means and 95% confidence limits) indicating that model overfitting was not an issue. Predictor variable model average contributions were similar for all RM versions, with TMAX consistently being the strongest predictor ($41.0 \pm 1.2\%$), followed by ELEV ($28.1 \pm 0.5\%$), PPT ($20.1 \pm 1.4\%$), and SLP ($10.7 \pm 0.2\%$). There was little variation in area predicted as suitable ($39.9 \pm 0.7\%$) among RM settings, indicating a high level of model robustness.

Response curves were consistent with expected relationships for each of the predictor variables (Fig. 3). Relative environmental suitability for large wildfires increased with increasing TMAX and decreased with the increasing PPT. It was also positively related with ELEV and SLP, meaning that forests at higher elevations and on steeper slopes are more likely to experience large wildfires. However, suitability decreased on extremely steep slopes (>90%) perhaps in relationship to cliffs and other rocky features associated with steep terrain that lack fuel or may act as physical barriers to fire spread (Beatty and Taylor, 2001; Clarke, 2002).

3.2. Wildfire suitability map classes and validation

The final baseline model predicted relative occurrence of large wildfires accurately based on the monotonic increase of the P/E curve when plotted against the range of suitability values (Fig. 4). The P/E curve steadily increased from 0 to 1 for large wildfire suitability (LWS) values from 0 to 0.37 and continued to

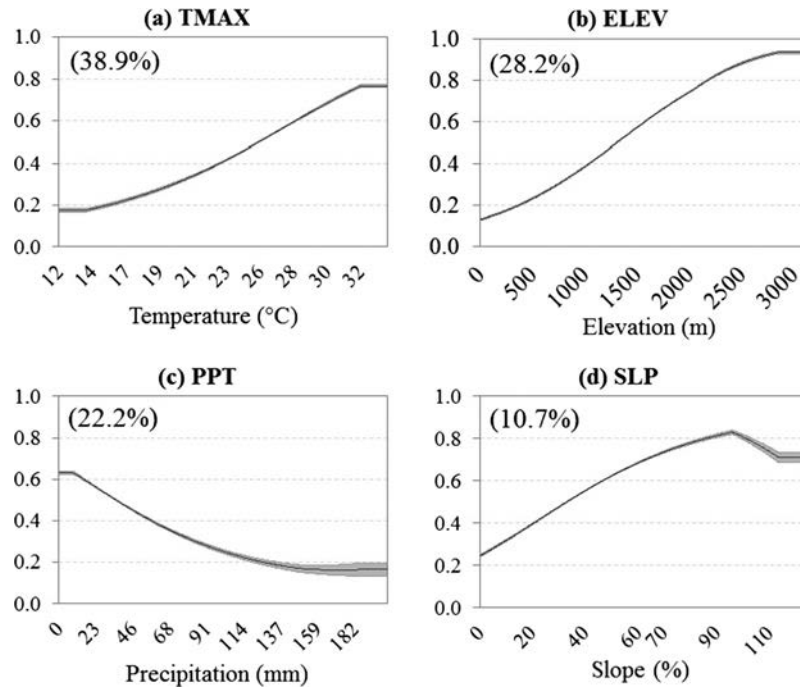


Fig. 3. Modeled fire environment variable response functions and percentage contributions in parentheses. July–August maximum temperature (a) was the strongest variable, followed by elevation (b), May–September precipitation (c), and slope (d). Solid lines are means and shaded areas are 95% confidence intervals from bootstrapped replicates (n = 50). Horizontal ends indicate variable clamping.

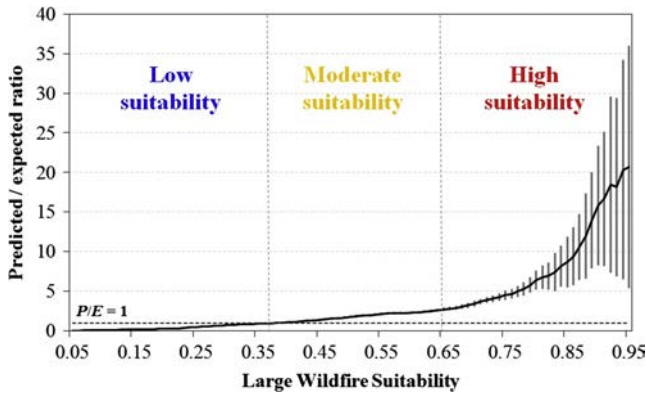


Fig. 4. The predicted versus expected (P/E) curve. Solid black line shows the mean from 50 replicates, vertical gray bars show 95% confidence intervals. The horizontal black dashed line represents the value expected if the model prediction were no better than random chance ($P/E = 1$). The vertical gray dashed lines show suitability map class thresholds.

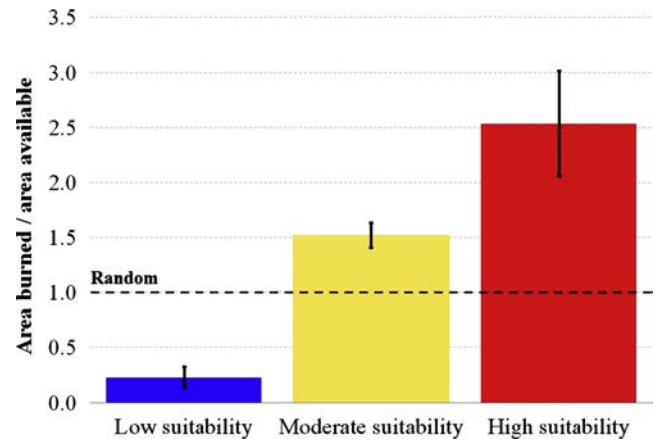


Fig. 5. Histogram of the burned-to-available for burning (B/A) ratios for forests burned from 2001 to 2015 (independent test data) using the 2001–2030 normal fire environment map. Bars represent map class averages with 95% confidence limits.

increase as LWS increased to 0.65. Above this point the P/E curve began to increase exponentially, reflecting better model discrimination. The final model was very robust with tight confidence intervals up to LWS = 0.8. The variation between bootstrapped replicates increased past this point, but confidence intervals never fell below the $P/E = 1$ threshold (Fig. 4).

Based on the chi-square goodness-of-fit test ($\chi^2 = 5069$; $P < 0.001$) the proportion of forest that burned on average for each year between 2001 and 2015 in each wildfire suitability class predicted by the model was significantly different than expected under the hypothesis that proportion of forest area burned was relative to the amount available. Forests mapped as low suitability burned on average five times less than would be expected by chance (0.2), moderately suitable forests burned about 1.5 times more than would be expected, and high suitability forests burned

about two to three times higher than would be expected by random chance (Fig. 5).

3.3. Climate change predictions

NASA Earth Exchange downscaled climate models (NEX-DCP30) predicted warmer and drier fire seasons for the forests of Oregon and Washington by the end of this century. Climate normals for TMAX increased on average across all forests within the study area by 3.5 and 6.2 °C under RCP 4.5 and 8.5, respectively (Fig. 6a). Climate normals for PPT decreased by 2.8 and 5.4 mm under RCP 4.5 and 8.5, respectively (Fig. 6b). Changes in the spatial extent of novel (outside of what has been observed within the study area in the PRISM data) future forest climate conditions occurred mainly for TMAX and exceeded 5% of the forested area by the

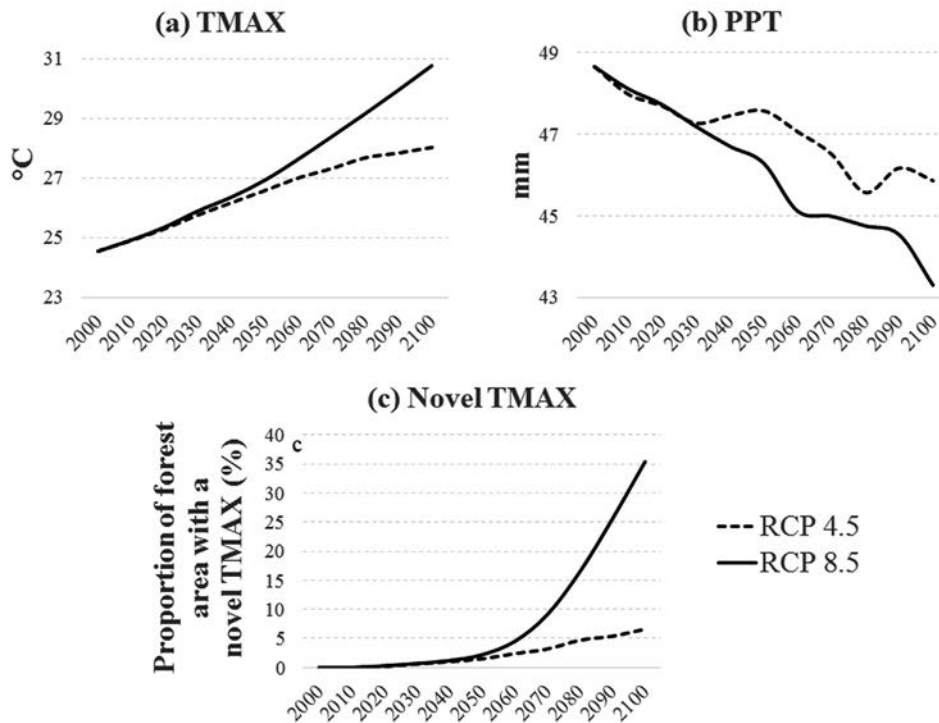


Fig. 6. Median NEX-DCP30 GCMs showed (a) varying patterns of increasing mean July-August temperature TMAX (b), decreasing mean May-September precipitation PPT, and (c) increasing areas with novel TMAX over time across the forests of Oregon and Washington under RCP 4.5 and 8.5, by the end of this century.

2041–2070 climate normal period (under RCP 8.5), when it begins to rapidly increase (Fig. 6c). Novel changes in PPT were discountable in spatial extent (<1% of forested area).

During the baseline climate normal (1971–2000), about 59% of the forests within the study area were classified as having a fire environment that was of low suitability, 36% as moderately suitable, and 5% as highly suitable for the occurrence of large wildfires. Projection of the model onto the current climate normal period (1981–2010) showed a 1.6% decrease of forested area classified as low suitability and a 1.6% increase in highly suitable forests while the area of moderately suitable forests remained constant. For future projections, a similar pattern emerged for both RCPs. As low suitable forests transitioned into moderate and moderate transitioned into high, the area of forests classified as low suitability shrank while forests classified as high expanded and moderately suited forest area remained more or less the same (Fig. 7). Under RCP 4.5 the percentage of forests classified as low suitably decreased from the current 57% to 38% by the end of the century and forests classified as highly suitable increased from 7% to 27%. Under RCP 8.5 the percentage of low suitability forests decreased from the current 57% to 37% and highly suitable forests increased from 7% to 31%. In general, median relative suitability increased through time under both RCPs and across all forest ecoregions. Uncertainty in model predictions varied geographically and generally increased with time. Median absolute deviations were highest in the Cascades and lowest in the Puget Lowlands ecoregion (Fig. 7).

3.4. Fire suitability trend by ecoregions

The proportion of forests predicted to transition from one large wildfire suitability class to another by the end of the century varied among ecoregions (Fig. 8). All ecoregions, with the exception of the Puget Lowlands, showed increases in the proportion of forests modeled as highly suitability for large wildfire occurrence by the

end of the century under both RCP scenarios. The largest increase was in the Blue Mountains ecoregion, where the proportion of high suitability forest increased from the current extent of 17% to 63–72% (RCP 4.5 and RCP 8.5, respectively). This was followed (in decreasing order of magnitude) by the Klamath Mountains; from 18% to 48–51%; the East Cascades, from 11% to 40–45%; the North Cascades, from 2% to 28–33%; the Northern Rockies, from <1% to 17–26%; the Cascades, from 1% to 13–18%; and the Coast Range, where it increased slightly from <1% to 2% under both RCPs.

The proportion of forests with low suitability fire environments decreased in all ecoregions. The largest decrease was in the Northern Rockies from the current extent of 67% to 20–14% (RCP 4.5 and RCP 8.5, respectively). This was followed (in decreasing order of magnitude) by the North Cascades, from 63% to 35–32%; the Cascades, from 71% to 47–44%; the East Cascades, from 21% to 5–4%; the Klamath Mountains, from 30% to 14% (both RCPs); the Coast Range, from 97% to 85% (both RCPs); the Blue Mountains, from 9% to <1% (both RCPs); and the Puget Lowlands, which decreased slightly from 100% to 99% under both RCPs (Fig. 8).

3.5. Fire suitability trend by ownership

Forests with fire environments highly suitable for large wildfire occurrence were projected to increase across all ownerships (Fig. 9). The largest increase was on forests managed by the USFS where the proportion of high suitability forest increased from the current extent (9%) to 39–44% (RCP 4.5 and RCP 8.5, respectively) by the end of this century. This was followed (in decreasing order of magnitude) by BLM, from 18% to 45–49%; Tribal-owned forests, from 2% to 22–25%; Private forests, from 4% to 17–20%; NPS, from 1% to 10–13%; and State forests; from 1% to 10–12% (Fig. 9).

Conversely, the geographic extent of low suitability forests was projected to decrease on all ownerships with extent of decrease larger for RCP 8.5. The largest decrease was in forests managed by the NPS, which currently has the highest proportion of low suit-

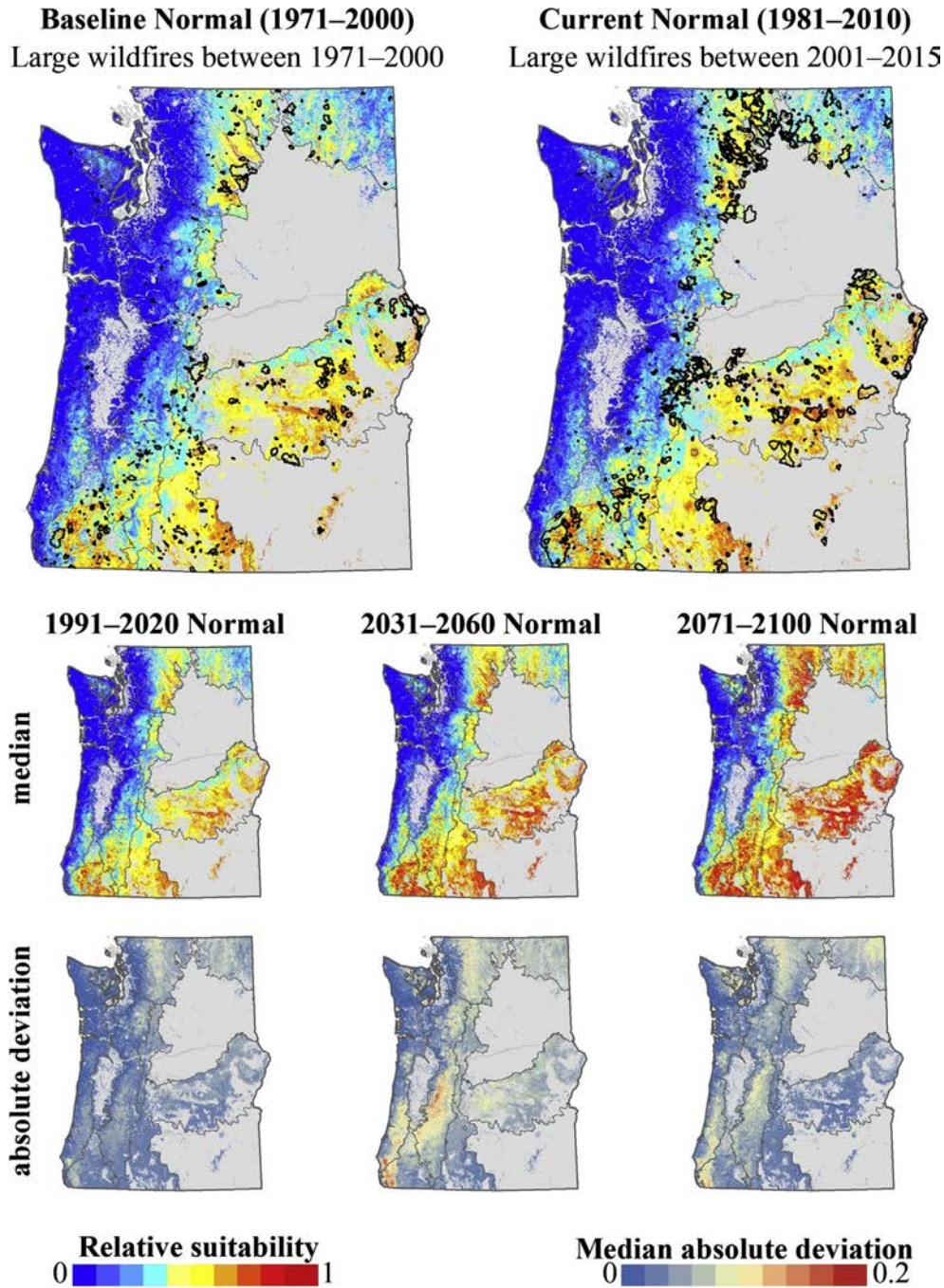


Fig. 7. Fire environment maps derived from PRISM data showing large wildfires from the baseline normal period (1971–2000) and current normal period (1981–2010) (top maps). Future fire environment time series maps (1991–2020, 2031–2060, and 2071–2100) derived from NEX-DCP30 data show predicted change under RCP 8.5. Median absolute deviation maps for each of these time periods provide information on how much and where model predictions varied.

ability forest. This extent was predicted to decline from 86% to 46–45% (RCP 4.5 and 8.5, respectively) by the end of the century. This was followed (in decreasing order of magnitude) by Tribal-owned forests, from 56% to 24–23%; forests managed by the USFS; from 42% to 20–19%; State forests; from 82% to 69–67%; BLM forests, from 38% to 21–18%; and Private forests, from 70% to 58–56%. By the end of the century, State and Private forests were predicted to have the highest proportions of low suitability forest.

3.6. Changes in fire rotation periods

Due to an increase in forest area burned in recent years, fire rotation periods have already decreased between the baseline

and current climate normal periods. FRPs were longest for the low suitability forests (5291 and 1894 years), intermediate for the moderate suitability forests (703 and 274 years), and shortest for high suitability forests (355 and 169 years) for the baseline and current normal periods, respectively. The averaged differences in FRPs for moderate suitability forests was 2-times shorter than in high suitability forests. In low suitability forests, it was 7-times shorter compared to moderately suitable forests, and 13-times shorter compared to highly suitable forests. Under both RCPs, about 19–20% of low suitability forests transitioned into moderately suitable forests, 20–24% from moderate to high, and less than 1% from low to high by the end of the century. About 55–61% of the forested area remained in their current suitability class (Fig. 10).

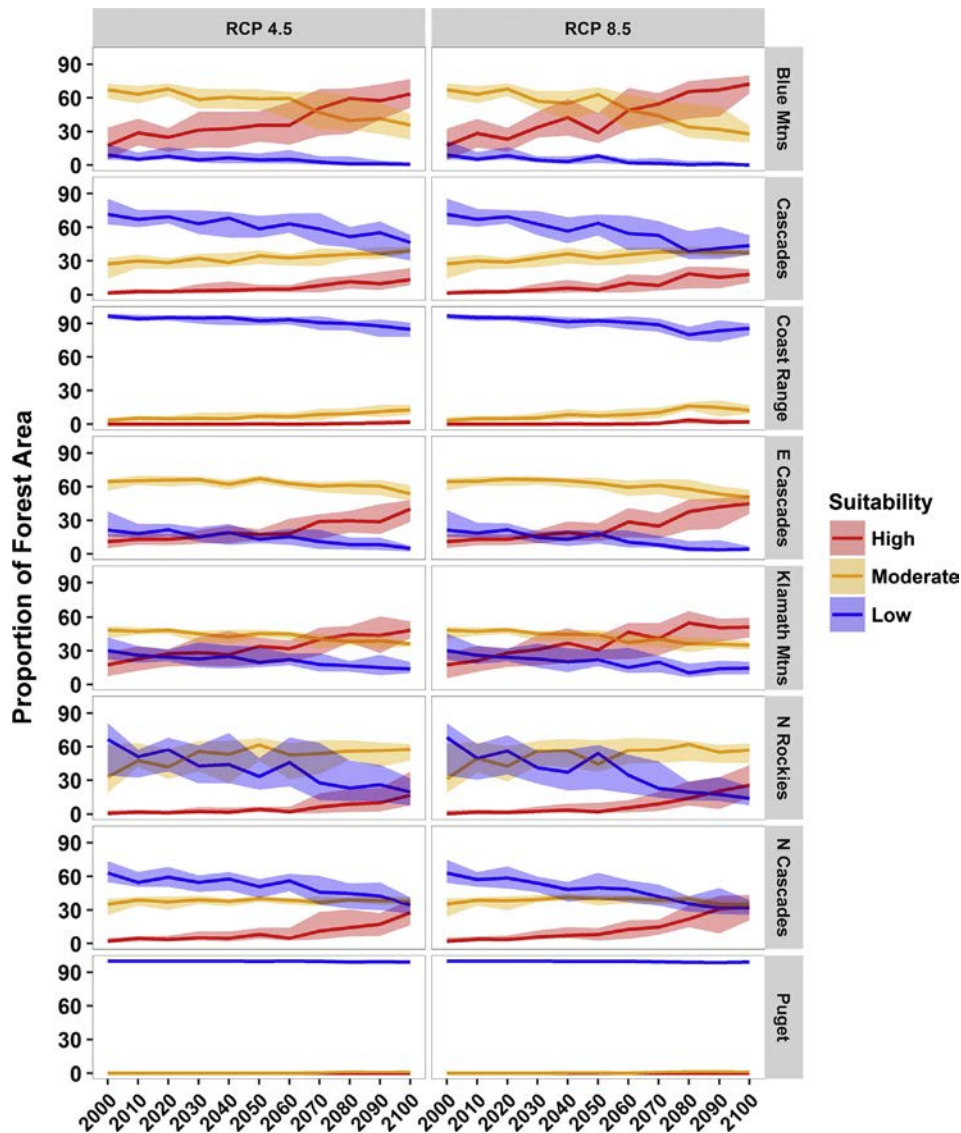


Fig. 8. Predicted trends in large wildfire suitability by forested ecoregion. Solid lines represent the median proportion from all GCM maps. Shaded areas represent the quartile range.

On average the FRP was shortened the most in the Northern Rockies ecoregion by a factor of 3.6 to 4.1(RCP 4.5 and 8.5, respectively) followed by a twofold decrease in the Cascades ecoregions (Table 3). Forests managed by the BLM and USFS showed a 3-fold decrease in FRPs by the end of the 21st century, while forests managed by the state and local government had the lowest decrease in FRP (Table 3). Across the entire study area, FRP decreased by a factor of 2.4–2.7 (RCP 4.5 and 8.5 respectively).

4. Discussion

4.1. Fire environments under climate change

The modeling described here combined new methods and old concepts to produce a time series of maps that showed how large wildfire environments might change within the forests of Oregon and Washington under differing climate change scenarios. We focused on fundamental environmental controls to represent the intrinsic nature of the fire environment. We utilized state-of-the-art empirical modeling methods to produce a simple, intuitive model. Three decades of large forest wildfire data from the last

century were used to train the model and large wildfire data from the first 15 years of this century were used to independently test it. The model predicted well where large forest wildfires are most likely to occur. Our modeling approach was similar to a recent conceptual model of the “fire regime triangle”, consisting of three components; (1) resources to burn, (2) conditions suitable for burning, and (3) an ignition agent (Krawchuk and Moritz, 2014). The “core” of the fire regime triangle is defined by long-term environmental norms or averages, but fire activity can be complemented by inter-annual environmental fluctuations (Krawchuk and Moritz, 2014). Under this concept, our normal fire environment model perhaps best represents the core of the fire regime triangle.

Climatic variables explained 61.1% of our baseline fire environment model. Peak fire season maximum temperature (TMAX) was the strongest variable and increased on average across the study area by 3.5 and 6.2 °C by the end of this century (under RCP 4.5 and 8.5, respectively). Fire season precipitation (PPT) was predicted to decrease on average by 2.8 and 5.4 mm. Regional novel future forest climate conditions occurred primarily for TMAX and were small and negligible for PPT, consistent with other studies

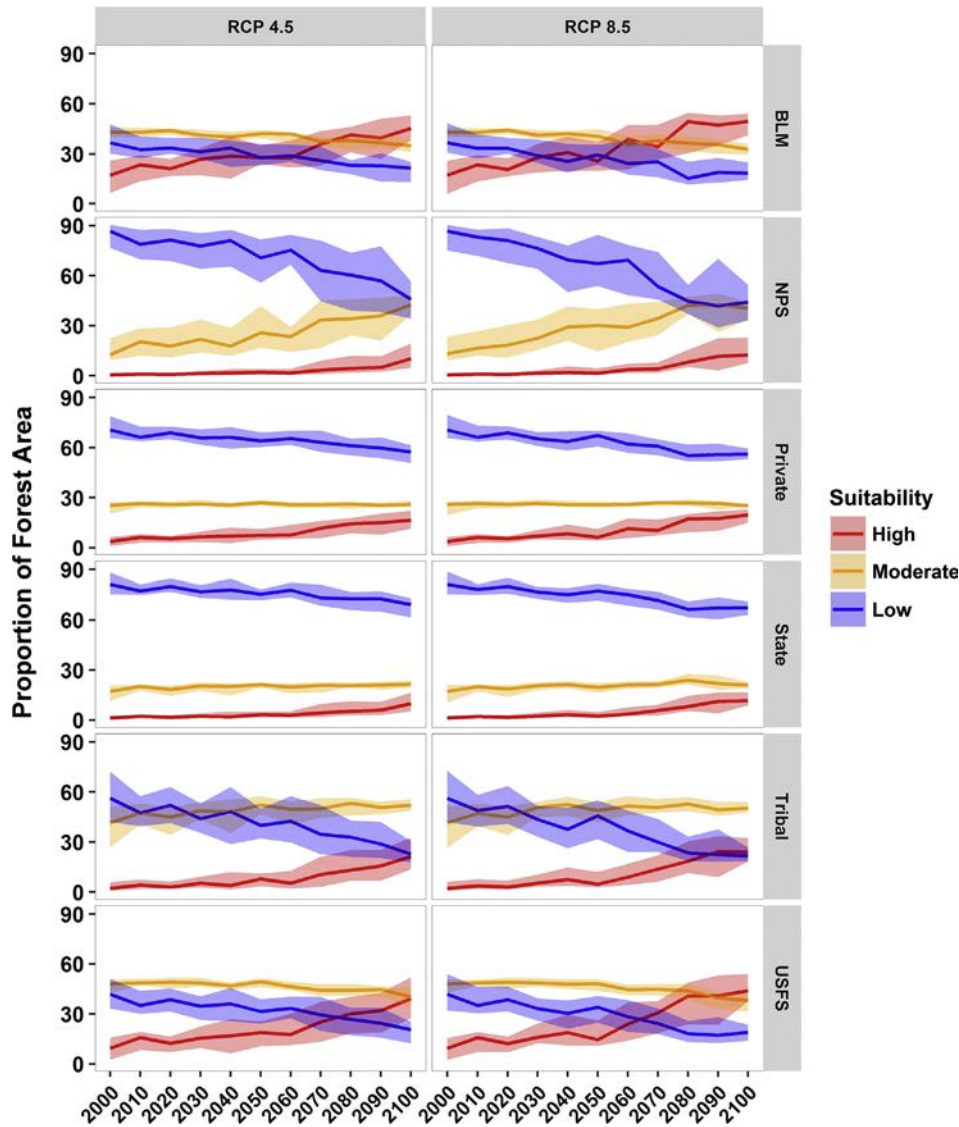


Fig. 9. Predicted trends in large wildfire suitability by forest ownership. Solid lines represent the median proportion from all GCM median maps. Shaded areas represent the quartile range.

(Mote and Salathe, 2010). The variation in percentage of forests predicted to transition from one large wildfire suitability class to another by the end of the century was large across ecoregions and ownerships. Percentages of forest predicted to transition to higher suitability classes in the coastal ecoregions were lowest for the Puget Lowlands with a slight increase in the moderate class and the Coast Range, where a relatively small amount of low suitability forests transitions to a high suitability. Under RCP 8.5 forests classified as low suitability were predicted to disappear from the Blue Mountains transitioning to moderate and high suitability classes. The area of forested land classified as highly suited for large wildfires was predicted to increase in the Klamath Mountains and North Cascades. Large percentages of forest also transitioned from low and moderate to higher suitability in the Northern Rockies and East Cascades.

4.2. Fire rotation periods under climate change

Fire rotation periods varied widely across the study area and through time. Given the recent increase in numbers of large forest wildfires and extent of area burned (Fig. 2) the FRPs of the current climate normal were less than they were for the baseline period.

However, the relative FRP differences between large wildfire suitability classes remained relatively stable between time periods. Using these relative class differences, the predicted relative magnitude of FRP shortening was greatest in the moister/cooler forested ecoregions and lesser, but still shortened, in the warmer/drier ecoregions by the end of this century. Given that FRP is inversely related to area burned, the results in Table 3 corroborate those by Littell et al. (2010) who modeled a two- or three-fold increase in annual area burned in Washington forests under various climate change scenarios. Similarly, a study by Rogers et al. (2011) showed a 0.8–3.1 increase in annual area burned for Oregon and Washington (including non-forested areas) by the end of the 21st century. Rogers et al. (2011) also modeled larger proportional increases in future percent area burned per year in moister forests west of the Cascade Crest in Oregon and Washington than in drier forests east of it. Our modeling indicated that the FRPs in forests of the coastal ecoregions will remain fairly stable to the end of this century, relative to other areas. We suspect this is likely due to a buffering of climate from the Pacific Ocean’s maritime influence. However, there were smaller geographic areas in other ecoregions where FRPs were estimated to remain relatively stable, likely do to topographic influences (Fig. 10).

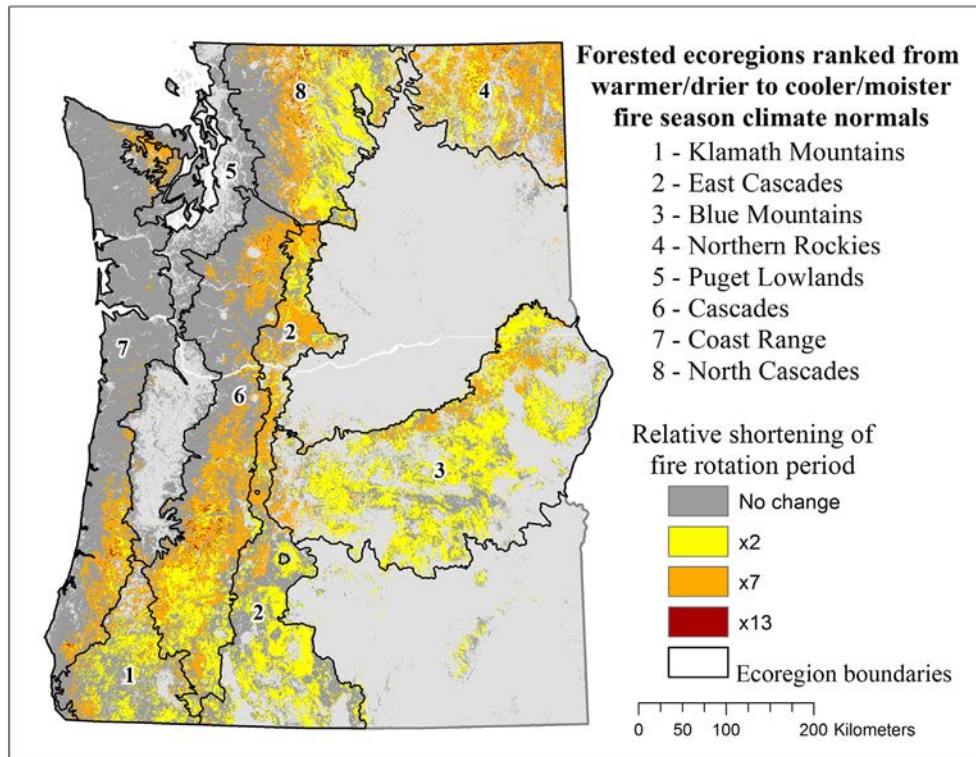


Fig. 10. Estimated changes in fire rotation periods by the end of this century.

There are several existing studies that have already shown or predicted increasing trends of wildfire as a result of climate change (Barbero et al., 2015; Dennison et al., 2014; Moritz et al., 2012; Rogers et al., 2011; Stavros et al., 2014; West et al., 2016; Westerling, 2016). This study adds to that list, but was confined specifically to the forested ecosystem to avoid confounding environmental factors that control large wildfires differently in non-forested ecosystems. Moreover, our results highlighted the divergent sensitivity of differing forested ecoregions and ownerships to climate-induced increases in forest wildfire suitability. This study also provided a finer scale regional focus and a time series of map products that illustrate how the changing geography of forest wildfire suitability might proceed through this century.

4.3. Model uncertainty and limitations

While climate is an important environmental control for large wildfires, other factors can and do modify the fire environment

Table 3
Mean fire rotation period (FRP) relative shortening factors by geographic area. Standard deviations in parenthesis.

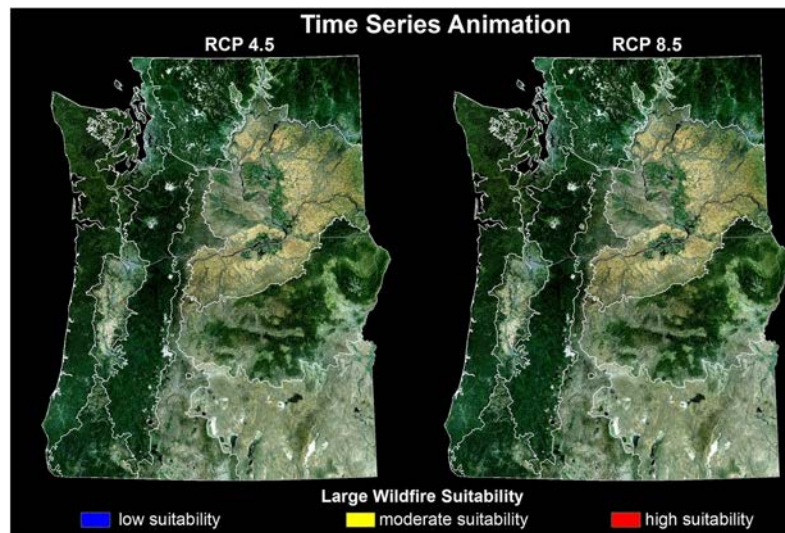
Geographic area	RCP 4.5	RCP 8.5
Forested ecoregion		
Northern Rockies	3.6 (3.3)	4.1 (3.2)
Cascades	2.3 (3.1)	2.5 (3.2)
North Cascades	2.2 (2.9)	2.5 (3.0)
East Cascades	2.0 (2.7)	2.2 (2.7)
Blue Mountains	1.7 (2.0)	1.9 (2.0)
Klamath Mountains	1.5 (2.4)	1.6 (2.4)
Coast Range	0.8 (2.3)	0.9 (2.4)
Puget Lowlands	0.1 (0.7)	0.1 (0.7)
Forest ownership		
USDI Bureau of Land Management	3.1 (1.7)	3.5 (1.8)
USDA Forest Service	2.9 (1.4)	3.3 (1.6)
Tribal	2.5 (1.2)	2.8 (1.5)
Private	2.0 (1.3)	2.2 (1.6)
USDI National Park Service	1.9 (1.1)	2.0 (1.3)
State and Local	1.6 (1.1)	1.8 (1.4)

at finer spatial and temporal scales (Krawchuk and Moritz, 2014; Littell et al., 2016; Mann et al., 2016). For example, wildfire effects that remove or reduce burnable forest fuels may modify large wildfire suitability for years following a fire. Likewise, so might fuels reduction programs that reduce fuels or break up their continuity prior to an ignition. These feedback mechanisms and human factors may serve to temporally dampen the environmental suitability for large wildfires for a period of time, and should be considered when using the maps produced here. Similarly, these models and maps are representations of 30-year weather averages that represent the conditions normally expected to occur and do not represent the annual variation between the cooler/moister and hotter/drier years—when most large wildfires in this region occur (Littell et al., 2009). Additionally, our modeling assumed that the forested area of today remains stable throughout this century. However, this may not be the case if post-disturbance forest diebacks occur in areas where the climate can no longer support forest redevelopment (Allen et al., 2015; Clark et al., 2016).

The use of clamping in our climate response functions indicated it could dampen relative fire suitability predictions when TMAX exceeds 32.4 °C (Fig. 6a). Given the high relative suitability where TMAX clamping occurs (0.76), we suspect our projected models may slightly under predict mostly the high suitability map class for later climate normals, especially under RCP 8.5. The spatial extent of this novel predicted future temperature condition did not exceed 5% of the forested areas until the 2041–2070 climate normal period (under RCP 8.5). It mostly occurred along the lower elevation forest/nonforest margins in southwest Oregon and east of the Cascades. We suspect that these forest margins may be the first areas to experience dieback. However, increased precipitation, changes in tree physiology due to increased levels of CO2, and other environmental factors will play a role in how this complex process unfolds (Allen et al., 2015). How these potential environmental changes will affect the overall geographic patterns of future forests and large wildfire suitability remains an area for active monitoring and research.

Finally, our models only relate to fire occurrence and not fire severity. Forests modeled as normally having low suitability for large wildfire occurrence contain fuel conditions predisposed for the relatively infrequent, yet extremely large and severe wildfire events that occur during conditions of very extreme drought and altered synoptic weather patterns as witnessed by past events such as the Tillamook Burn of 1933 (Agee, 1993). The modeling here,

the 21st century. These maps are easily interpreted and may prove useful for planning of short and long-term forest fire and fuels management (Millar et al., 2007; Thompson et al., 2013), informing urban planning and development in forest interfaces (Fernandes, 2013; Syphard et al., 2013), forest reserve network designs (Berry et al., 2015; Mackey et al., 2012), and forest carbon management (Fonseca et al., 2016).



Animation 1. LWS time series animation.

and the maps produced, only addressed normal intrinsic fire environments and not abnormal conditions and events.

5. Conclusion

In 2015 the US Northwest Climate Division and our study area had its warmest fire season on record in over a century (<http://www.ncdc.noaa.gov/>) and experienced its highest number of large wildfires and forests burned since 1971 (Fig. 2). Our modeling indicated that if the climate continues to change as predicted, it will likely result in an increase of Pacific Northwest forests with fire season environments more suitable for the occurrence of large forest wildfires. As low suitability forests shrink in area and high suitability forests expand, there will likely be a continued shortening of fire rotation periods in the study area and large forest wildfires will become more commonplace (or normal) in the future. The increase in forest vulnerability to large forest wildfires and shortening of fire rotations was more pronounced under the RCP 8.5 scenario.

Based on a recent study, our study area incurs the highest per fire suppression costs in the United States (Gebert et al., 2007). Most of these costs are spent on the large wildfires. Thus, as the frequency of large wildfires increases, the annual cost of suppression would also be expected to increase. However, shifts in fire suppression strategies might result in substantially lower annual suppression costs that could help offset those potential increases (Houtman et al., 2013).

Aside from wildfire suppression considerations, the time series maps produced herein (LWS Time Series) offer natural resource management agencies, fire protection districts, and policy-makers empirical and validated estimates and visualizations of how climate change might affect current geographic patterns of large wildfire within the forests of Oregon and Washington for

Fire was and remains a natural process in these forests (Agee, 1993), and these fire environment maps may contribute to our understanding of how (geographically) it normally fits into the ecosystem now, and into the near future. The leading edges of change, where one forest suitability class was predicted to transition into the next higher class, will likely be the areas where the effects of climate change on large wildfire occurrence may be observed first (Whitman et al., 2015). Increasing environmental suitability for large wildfire occurrence had differing effects on fire rotation periods, with moister/cooler forests experiencing larger FRP decreases than warmer/drier forests. Thus; the magnitude of change, in terms of forest area burned and the social, ecological, and economic ramifications that go with that, will likely be higher in low suitability forests that transition into moderate or high suitability. Low wildfire suitability areas that remained temporally constant in our modeling might serve as focal areas for fire refugia and reserves designed to maintain or restore older, denser, closed-canopy forests. Forest that are currently classified as moderate suitability or are predicted to transition into it may be places to focus active management to improve forest resilience to future wildfires. Where forests have or are predicted to transition into higher wildfire suitability classes and, due to their juxtaposition, also pose threats to infrastructure, valued forest resources, or areas of conservation concern and where fire has not been as common may need management attention to ameliorate fire risks.

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RESEARCH ARTICLE

Evidence of Tree Species' Range Shifts in a Complex Landscape

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Data Availability Statement: The databases are available at www.fs.fed.us/pnw/rma/fia-topics/inventory-data/. However, the Food Security Act of 1985 protects the confidentiality of the plot location to ensure the privacy of the landowners and protect the integrity of the sample. Users needing the exact plot coordinates may contact the FIA program directly at www.fia.fs.fed.us/tools-data/customer-service/. Obtaining the exact plot coordinates requires approval from the FIA program and a Confidentiality Agreement.

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Abstract

Climate change is expected to change the distribution of species. For long-lived, sessile species such as trees, tracking the warming climate depends on seedling colonization of newly favorable areas. We compare the distribution of seedlings and mature trees for all but the rarest tree species in California, Oregon and Washington, United States of America, a large, environmentally diverse region. Across 46 species, the mean annual temperature of the range of seedlings was 0.120°C colder than that of the range of trees (95% confidence interval from 0.096 to 0.144°C). The extremes of the seedling distributions also shifted towards colder temperature than those of mature trees, but the change was less pronounced. Although the mean elevation and mean latitude of the range of seedlings was higher than and north of those of the range of mature trees, elevational and latitudinal shifts run in opposite directions for the majority of the species, reflecting the lack of a direct biological relationship between species' distributions and those variables. The broad scale, environmental diversity and variety of disturbance regimes and land uses of the study area, the large number and exhaustive sampling of tree species, and the direct causal relationship between the temperature response and a warming climate, provide strong evidence to attribute the observed shifts to climate change.

Introduction

Climate change is predicted to cause systematic changes in the geographic distribution of species. A recent meta-analysis of 23 studies estimating shifts in latitude and 31 estimating shifts in elevation reported an overall migration rate of 16.9 km poleward and 11.0 m upward per decade [1]. While evidence supports that such changes are occurring, the estimation of the magnitude of change and the attribution of cause are challenging tasks, with the strength of evidence increasing as the geographic area, number of species, and length of time examined increases [2, 3]. Attribution can also be complicated because most studies examine shifts in either latitude or elevation, but those variables are surrogates for other environmental drivers, primarily temperature, and neither variable has much biological meaning per se [2, 4]. Further, because both latitude and elevation affect temperature, estimating the effect of each variable

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separately, without accounting for the other, may result in spurious relationships. Many studies, particularly those examining elevation shifts, are conducted in a single location [5, 6], effectively controlling for the effect of latitude on elevation. However, reducing the geographic extent to a single site also reduces the generality of the results and complicates attribution [3]. Observed changes could be caused by local effects that covary with elevation, such as disturbance, local drought or changes in land use, instead of by changes in temperature [7, 8]. For large-scale studies [9, 10], where both latitude and elevation vary, confounding between those variables can be very significant and mask effects of climate warming. For example, lack of northward change in the southern boundary of the range of many species in Europe can be explained because they reach their southern limit in mountain ranges. Therefore, species may have responded to climate warming by migrating upwards within the mountains, rather than northwards [11]. A species can track increasing temperatures by shifting its range upwards, polewards, or a combination of both. The relative magnitude, or even direction, of those changes may depend on a number of factors, including the species' ecological traits and the geographic distribution of suitable habitat in the region.

Estimating the magnitude of range shift is also complicated because most studies rely on haphazardly or purposively selected samples, often comparing contemporary data with historical datasets, rather than on a probability sample from a well-specified population. Inference from those samples requires strong assumptions about the representativeness of the sample or the behavior of the underlying population. Estimators may reflect the probability of unit selection into the sample instead of estimating the population parameters of interest [12]. The likelihood of spurious relationships would increase if the sampling intensity is correlated with a confounding variable, as would be the case, for example, if contemporary and historic samples are compared, but they differ in their latitude or elevation distribution. Thus, reported downhill shifts of plant species in California [10] have been questioned, because the contemporary sample was much north of the historic sample [13–15]. Many studies select samples to minimize direct anthropogenic impacts that could mask the climate change effects, for example selecting high elevation sites [16], protected or inaccessible areas [6], or discarding plots with signs of disturbance [9]. However, restricting the sample also limits the scope of inference of the study. Migration rates estimated from those samples may not reflect the actual species' response across its range, where other effects such as habitat change or fragmentation may limit their ability to track climate warming [11, 17, 18].

In this study, we estimate changes in the distribution of all but the rarest tree species across all forestlands of the U.S. Pacific coast states, a large, environmentally diverse and floristically rich region (Fig. 1). We base our estimates on a spatially balanced, probability sample of the entire population. This sampling design ensures that there is no sampling selection bias and allows for model free, approximately unbiased estimation of change in the mean and quantiles of the species' distributions [19]. The sampling design allows the joint examination of shifts in elevation and latitude, thus assessing the potential effects of confounding between those two variables.

Repeated measurements of the same plots at different point in time were not available. However, range shifts ultimately depend on changes in the rates of recruitment and mortality in different regions of the species' range. Thus, as a surrogate for range shift over time, we compare the current distribution of seedlings to that of mature trees. A warmer climate would drive seedling establishment towards colder areas relative to areas occupied by mature trees, which reflect past recruitment. The environmental requirements of seedling and mature trees may be somewhat different [20], but this approach has been used to study vegetation dynamics and succession (e.g., [21]) and the response of trees species to climate warming [22–26]. The presence of seedlings is certainly a necessary condition for the future presence of mature trees and,



Fig 1. Study area with the location of the 14,105 forested plots. The total area is 823,000 km², 42% forested.

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therefore, is at least an indicator of potential change. Further, for long lived, sessile species such as trees, mature individuals may persist in the landscape even when recruitment is limited or non-existent, delaying the manifestation of range shifts [27] and weakening the relationship between current species distribution and climate [26, 28]. We are, however, implicitly assuming that the distribution of mature trees has remained relatively stable in the recent past, an assumption that may not hold for a species that has suffered episodes of widespread mortality [29].

The specific objectives of this study are to estimate the difference in mean latitude, elevation and annual temperature of the range of seedlings and mature trees across all forestlands of California, Oregon and Washington, U.S.A.

Materials and Methods

Study Area

The study includes all forestlands in California, Oregon and Washington, USA, an environmentally diverse and floristically rich region. Latitude ranges from 32° 32' to 49° N, spanning 1,850 km. Elevation ranges from 86 m below to 4,421 m above sea level. Total land area is 823,091 km², of which an estimated 345,060 km² is forestland [30]. Forest land is broadly defined as an area greater than 4,050 m² with at least 10 percent potential stocking with tree species, and excluding urban and agricultural land uses [31, 32]. Trees are plant species able to reach a height of 5 m at maturity. The study area includes 19 ecoregions [33] and many distinct forest types, including warm and cold deserts, semi-arid woodlands, montane and high elevation forests, and temperate rain forests. Approximately 13% of the forest land is in reserved areas, with the remaining evenly divided between public and private ownership [30]. Management regimens vary widely, from wilderness areas to intensively managed, short-rotation plantations.

Sampling and Measurement Design

The study is based on datasets from the US National Forest Inventory. The field data was collected by the US Forest Service Forest Inventory and Analysis Program (FIA) and did not involve any field data collection by any of the authors. The databases are available at www.fs.fed.us/pnw/rma/fia-topics/inventory-data/. However, the Food Security Act of 1985 protects the confidentiality of the plot location to ensure the privacy of the landowners and protect the integrity of the sample. Users needing the exact plot coordinates may contact the FIA program directly at www.fia.fs.fed.us/tools-data/customer-service/. Obtaining the exact plot coordinates requires approval from the FIA program and a Confidentiality Agreement.

The sampling design consisted of a spatially balanced, probability sample of one ground plot every 24 km² in California and Oregon (measured between 2001 and 2010) and every 26.6 km² in Washington (measured between 2002 and 2010). The total sample size was 33,674 plots, of which 14,105 were forested and 1,684 could not be measured, either because the landowner denied access, or because the plot was unsafe to reach or occupy. Plots were a cluster of 4 points within a 1 ha circle. If a plot contained forest land, it was installed and measured. At each of the 4 points, trees with stem diameter greater than or equal to 12.7 cm were tallied in a 7.32 m radius circular subplot (total area 672.5 m²). Trees with stem diameter greater than or equal to 2.54 cm, but less than 12.7 cm, were tallied in a 2.07 m radius circular subplot (total area 54 m²). Seedlings, defined as trees with stem diameter less than 2.54 cm and length greater than or equal to 15.2 cm for conifers and 30.5 cm for hardwoods, were counted in the four, 2.07 m radius subplots. The minimum size for seedlings is intended to exclude first-year seedlings, which can have a very high mortality rate, and include only well-established individuals. For most species, stem diameter was measured at 1.37 m above the ground. However, for woodland species that frequently have multiple stems (*Pinus monophylla*, *Acer glabrum* and *Cercocarpus ledifolius*), the diameter of all stems was measured at the root collar and the quadratic mean diameter was recorded. Details of the plot design and measurement protocols are available in [34] and [35].

Tree age is difficult to assess and was not measured. Instead, tree size is typically used to define the seedling and mature tree cohorts. Other studies that followed a similar approach defined seedlings and mature trees as individuals with stem diameter smaller or greater than 2.54 cm [23, 24], individuals with diameter smaller 2.54 cm or greater than 12.7 cm [25], or individuals with height less than 50 cm or greater than 8 m [22], respectively. The first criterion does not allow for any temporal separation between the two life stages, so that seedlings and mature trees may actually be coetaneous, while the last two use the same size threshold for all species, regardless of the species' mature size. In our study, the inventory design determined the definition of seedlings to individuals with stem diameter less than 2.54 cm. However, because tree size and growth rate vary greatly among species, we defined the mature cohort as trees with diameter greater than or equal to the 75th percentile of the estimated species' diameter distribution in the study area. This threshold diameter ranged between 6.1 and 31.0 cm (median 17.8 cm, Table 1). This criterion should ensure that the mature trees were established well before the seedlings, reflecting recruitment during colder past temperatures.

The sample included 91 tree species, but 9 were non-native and at most occurred in 2 plots. The sample size for some native species was very small, because of their rarity, or because most of their range was outside the study region. Thus, we only included species that were tallied in at least 25 plots as mature trees and 25 plots as seedlings. In addition, *Prunus emarginata* has two varieties with different growth habits: a small tree in the lowlands of western Oregon and Washington (var. *mollis*) and a shrub, typically in higher elevations (var. *emarginata*) [36]. Because the inventory did not discriminate between the two varieties, this species was excluded

Table 1. List of species included in the study¹.

Species	Symbol	75th percentile diameter cutoff (cm)	Number of plots	
			Seedlings	Trees
<i>Abies amabilis</i>	ABAM	15.2	628	719
<i>Abies concolor</i>	ABCO	21.1	1256	1586
<i>Abies grandis</i>	ABGR	15.2	883	1044
<i>Abies lasiocarpa</i>	ABLA	14.7	450	459
<i>Abies magnifica</i>	ABMA	21.1	361	472
Abies procera	ABPR	24.4	86	163
<i>Callitropsis nootkatensis</i>	CANO4	13.0	94	92
<i>Calocedrus decurrens</i>	CADE27	16.8	861	1088
Chamaecyparis lawsoniana	CHLA	14.0	28	57
<i>Juniperus occidentalis</i>	JUOC	23.4	465	786
<i>Larix occidentalis</i>	LAOC	24.4	170	461
<i>Picea engelmannii</i>	PIEN	19.6	246	384
<i>Picea sitchensis</i>	PISI	28.7	76	168
<i>Pinus albicaulis</i>	PIAL	15.5	101	140
<i>Pinus contorta</i>	PICO	14.5	813	1403
<i>Pinus jeffreyi</i>	PIJE	30.7	178	484
<i>Pinus lambertiana</i>	PILA	26.7	437	559
<i>Pinus monophylla</i>	PIMO	26.4	111	217
<i>Pinus monticola</i>	PIMO3	17.5	275	358
<i>Pinus ponderosa</i>	PIPO	23.1	1402	2848
Pinus sabiniana	PISA2	31.0	75	171
<i>Pseudotsuga menziesii</i>	PSME	25.4	2945	5641
Sequoia sempervirens	SESE3	24.4	149	243
<i>Taxus brevifolia</i>	TABR2	8.6	186	157
<i>Thuja plicata</i>	THPL	14.7	580	989
<i>Tsuga heterophylla</i>	TSHE	18.5	1360	1884
<i>Tsuga mertensiana</i>	TSME	20.3	380	484
<i>Acer glabrum</i>	ACGL	7.6	204	200
<i>Acer macrophyllum</i>	ACMA3	17.8	273	746
Aesculus californica	AECA	11.4	64	110
<i>Alnus rubra</i>	ALRU2	20.3	221	1103
<i>Arbutus menziesii</i>	ARME	19.6	330	713
Chrysolepis chrysophylla	CHCHC4	11.4	288	261
<i>Cercocarpus ledifolius.</i>	CELE3	19.8	121	267
<i>Cornus nuttallii</i>	CONU4	6.1	190	126
Fraxinus latifolia	FRLA	12.2	40	75
Lithocarpus densiflorus	LIDE3	13.2	800	650
<i>Populus balsamifera</i>	POBAT	25.9	48	89
<i>Populus tremuloides</i>	POTR	8.9	110	93
<i>Quercus agrifolia</i>	QUAG	27.9	121	203
<i>Quercus chrysolepis.</i>	QUCH2	14.2	1003	923
Quercus douglasii	QUDO	22.1	86	417
<i>Quercus garryana</i>	QUGA4	15.7	203	362
Quercus kelloggii	QUKE	19.8	487	897
<i>Quercus wislizeni</i>	QUWI2	11.4	238	291

(Continued)

Table 1. (Continued)

Species	Symbol	75th percentile diameter cutoff (cm)	Number of plots	
			Seedlings	Trees
Umbellularia californica	UMCA	11.2	302	311

Bold names indicate that the entire range of the species is within the study region [37, 38]. Individuals with diameter greater than or equal to the 75th percentile diameter cutoff are considered trees.

¹Native species not included in the study were *Acer negundo*, *Alnus rhombifolia*, *Betula occidentalis*, *Betula papyrifera*, *Hesperocyparis bakeri*, *Hesperocyparis forbesii*, *Hesperocyparis macrocarpa*, *Hesperocyparis sargentii*, *Juniperus californica*, *Juniperus osteosperma*, *Juniperus scopulorum*, *Sequoiadendron giganteum*, *Olneya tesota*, *Prosopis glandulosa*, *Prosopis pubescens*, *Quercus engelmannii*, *Quercus lobata*, *Juglans californica*, *Juglans hindsii*, *Larix lyallii*, *Picea breweriana*, *Pinus attenuata*, *Pinus balfouriana*, *Pinus coulteri*, *Pinus flexilis*, *Pinus longaeva*, *Pinus muricata*, *Pinus radiata*, *Pinus washoensis*, *Pseudotsuga macrocarpa*, *Platanus racemosa*, *Malus fusca*, *Prunus emarginata*, *Prunus virginiana*, *Populus fremontii*, *Torreya californica*.

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from the analysis, leaving a total of 46 species (Table 1). The range of 11 species was entirely within the study area [37, 38]. Maps of the distribution of all species, within the study area, are included as supporting information (S1 Fig).

For each plot, we obtained the mean annual temperature from a spatially gridded (800 m) annual average for the climatological period 1971–2000, developed by the parameter-elevation regressions on independent slopes model (PRISM) [39].

Statistical Analysis

We followed standard survey sampling procedures [19], albeit from a continuous population perspective [40]. For each species, we computed an approximate design unbiased estimator of the mean elevation, latitude and annual temperature of the range of the seedlings or mature trees, using a weighted domain sample mean. The weights accounted for the different plot density in California and Oregon vs. Washington. We estimated the difference between the mean of the range of seedlings minus that of the range of mature trees as the difference between their respective domain ratio estimators. We estimated approximate variances using a Taylor linearization method and confidence intervals based on the asymptotic normal distribution of the estimators. To estimate changes in the boundary of the species’ temperature range, we compared the 5th and 95th percentiles of the seedling and tree temperature distributions. Estimating the extremes of a distribution requires a larger sample size than estimating the mean. Therefore, we only considered the 36 species present in at least 100 plots as seedlings and 100 plots as mature trees. We used the inverse of the empirical distribution function to estimate the 5th and 95th percentiles of the seedling and mature tree distributions, and the bootstrap to obtain confidence intervals. We estimated overall mean differences, across all species, as the average of the individual species’ differences, weighted by the inverse of the estimated covariance matrix. This approach accounts for both the lack of independence among the individual species’ estimators, because they are derived from the same set of plots, and the wide range of their variances, in part due to large differences in realized sample sizes (for details of the statistical analysis, see S1 Appendix).

Results and Discussion

The mean elevation and latitude of the range of seedlings was higher than or north of the mean of the range of mature trees for most species (32 and 34 out of 46 species, respectively, of which 21 and 16 were different from 0 at the 0.05 level, Fig. 2). Averaged across all species, the mean of the distribution of seedlings was 26.58 m (95% C.I. from 21.22 to 31.95 m) higher than and

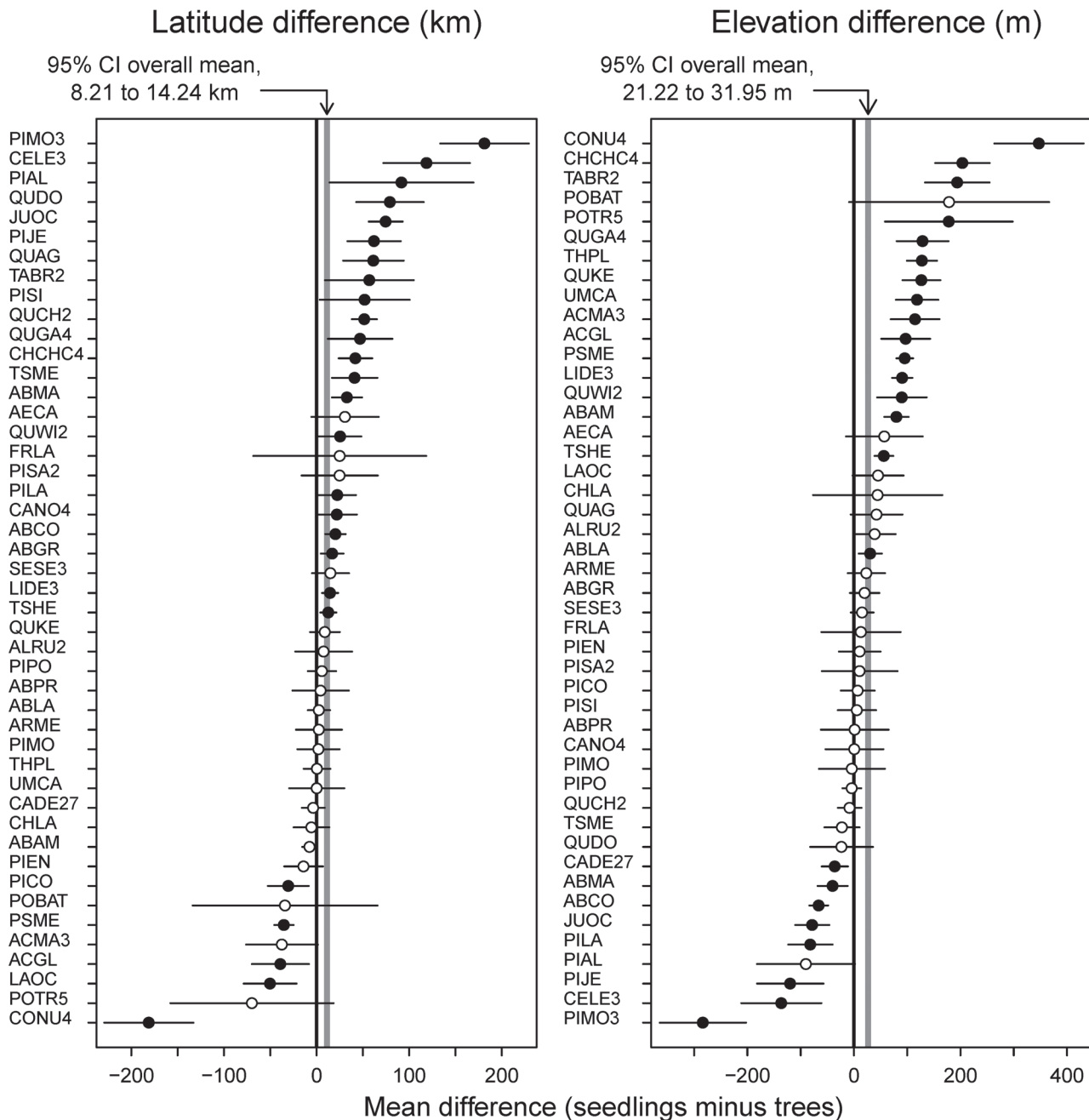


FIG 2. Difference between the mean latitude and elevation of the range of seedlings and mature trees. A positive number indicates that the mean of the seedling range is higher than or north of that of trees. The circles represent the estimated difference for each species and the horizontal lines represent 95% confidence intervals for the difference. Solid circles indicate that the 95% CI does not include 0 (difference significant at the 0.05 level), open circles indicate that the 95% CI includes 0. The gray band is a 95% confidence interval for the overall mean difference, across all species. Species name codes listed in [Table 1](#).

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11.22 km (95% C.I. from 8.21 to 14.24 km) north of that of mature trees. When changes in elevation and latitude were examined jointly ([Fig. 3](#)), the mean of the seedling distribution of 21 species was both higher than and north of that of mature trees, a response consistent with a warming climate. Seedlings of only one species, *Calocedrus decurrens*, showed the opposite

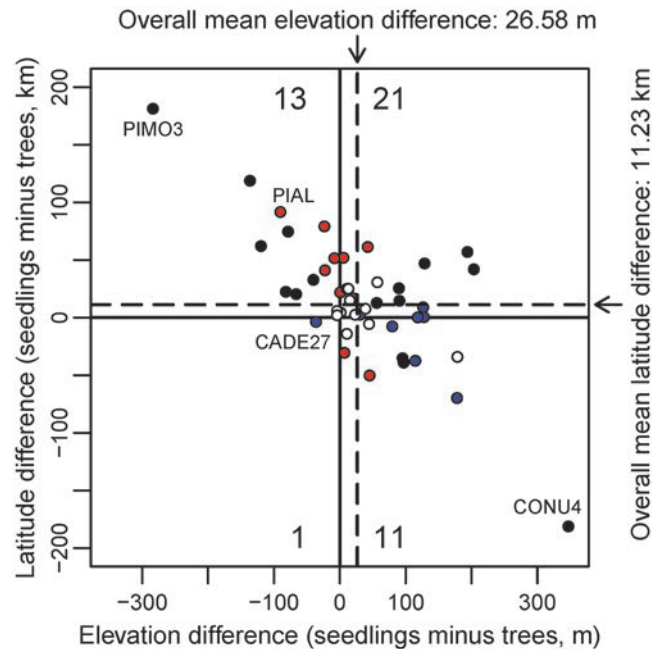


Fig 3. Latitudinal and elevational range shifts. A positive number indicates that the mean of the seedling range is higher than or to the north of that of trees. Dashed lines represent the overall mean difference across all species. White circles represent species for which neither the difference in elevation or latitude is significantly different from 0 at the 0.05 level; red circles represent species for which the difference in latitude is different from 0, but not that of elevation; blue circles represent species for which the difference in elevation is different from 0, but not that of latitude; black circles represent species for which the difference in both latitude and elevation is different from 0. The numbers in each quadrant represent the number of species in that quadrant. Species mentioned in the text are labeled: *Pinus monticola* (PIMO3), *Pinus albicaulis* (PIAL), *Calocedrus decurrens* (CADE27), *Cornus nuttallii* (CONU4).

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trend, i.e., a decrease in elevation and a southward shift in latitude, although the differences were small. However, for the remaining 24 species, the mean elevation and the mean latitude of the seedling range was either higher and more southern, or vice versa. The most extreme cases, *Pinus monticola* and *Cornus nuttallii*, show very large, opposing differences: seedlings for the former were 181 km north and 283 m lower than mature trees and, for the latter, 181 km south and 347 m higher (Fig. 3). For the 24 species that show opposing latitudinal and elevational trends, examining latitude or elevation change separately would lead to contradictory conclusions regarding their response to climate warming.

The apparent contradiction in the elevation and latitude response is likely the result of confounding between those two variables. For example, *Pinus albicaulis*, a high elevation, timberline pine, shows large, opposite changes in elevation and latitude. Across the region, the mean elevation of the range of seedlings is 90.0 m lower than that of the range of mature trees, while the mean latitude is 91.8 km north (Fig. 3). However, the elevation of the species' range decreases as the latitude increases: the mean elevation is 3,090 m in the California Sierras population (mean latitude 37.75° N) and 1,920 m in the Washington populations (mean latitude 48.19° N), while the mean annual temperature of the two populations remains similar (2.26 vs. 2.00°C, respectively) (Fig. 4). The greater seedling frequency in the northern population suggests that the species distribution is shifting northwards: the ratio of the number of plots with seedlings to plots with mature trees is 0.87 in Washington and 0.59 in the California Sierras. However, as the population distribution shifts northwards, its mean elevation also decreases.

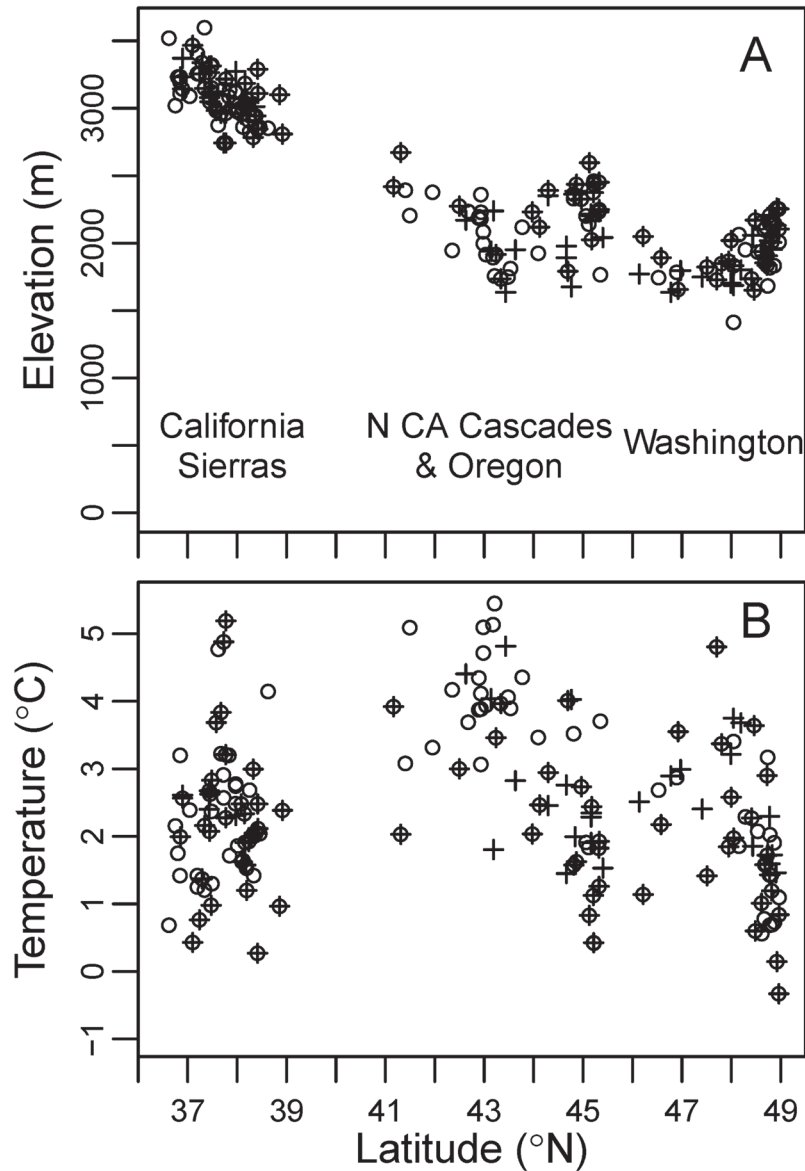


Fig 4. Distribution of plots with *Pinus albicaulis*. Open circles represent plots with trees, and crosses, plots with seedlings. (A) Elevation and (B) mean annual temperature, as a function of plot latitude.

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Global warming, and thus increased temperature, is assumed to be the direct cause of the poleward or upward shifts in species distributions. Therefore, rather than examine changes in surrogates that may be confounded, such as elevation or latitude, the hypothesis can be assessed directly by estimating whether the seedling distribution has shifted towards areas of colder temperature, relative to that of mature trees. Across all species, the mean annual temperature of the range of seedlings was 0.120°C lower than that of the range of trees (95% C.I. 0.096 to 0.144°C), consistent with a range shift caused by global warming. For 33 (16 statistically significant at the 0.05 level) out of 46 species, the mean annual temperature of the range of seedlings was colder than that of the range of trees (Fig. 5). The magnitude of the difference was very small for the majority of the 13 species that showed the opposite trend. A shift towards warmer areas was statistically significant (0.05 level) only for 4 species: *Pinus lambertiana*,

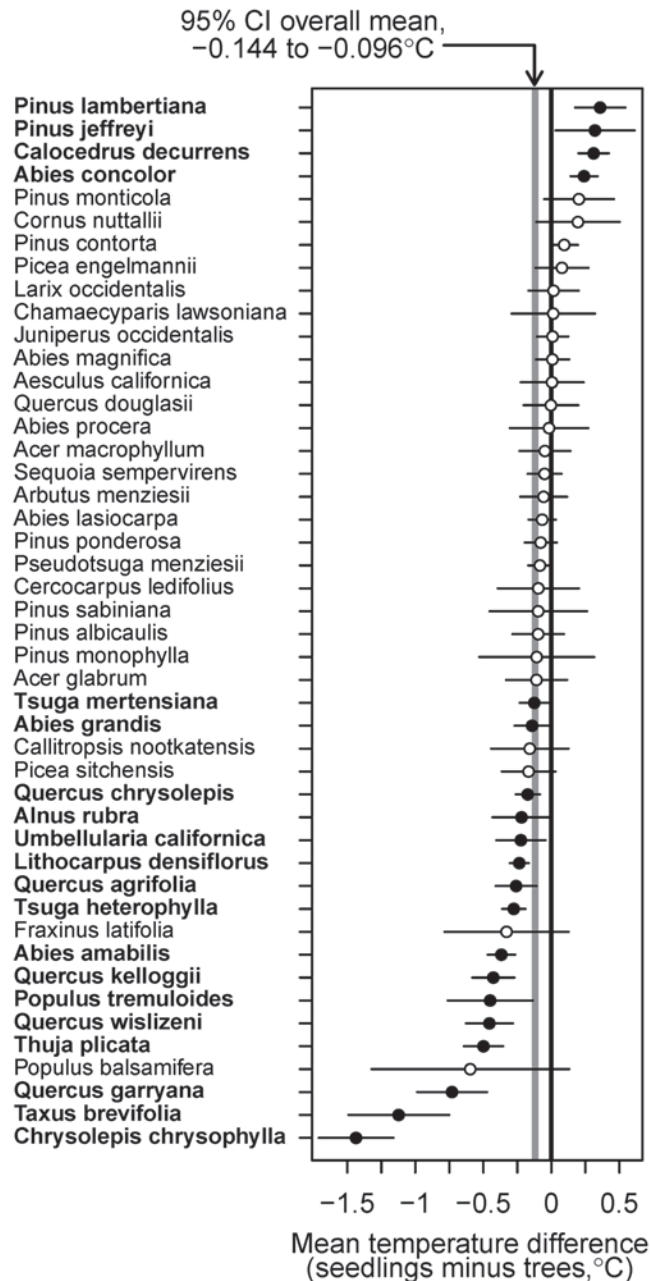


Fig 5. Difference between the mean temperature of the range of seedlings and that of mature trees. A positive number indicates that the mean temperature of the seedling range is warmer than that of trees. The circles represent the estimated difference for each species and the horizontal lines represent 95% confidence intervals for the difference. Solid circles and bold species' name indicate that the 95% C.I. does not include 0 (difference significant at the 0.05 level). The gray band is a 95% C.I. for the overall mean difference, across all species.

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Pinus jeffreyi, *Calocedrus decurrens* and *Abies concolor*, major components of the California mixed conifer forests. This forest type has shown widespread mature tree mortality, concentrated at the lower or drier end of its range, without a marked decrease in seedling recruitment [7, 29, 41].

We used the mean of the temperature distribution to assess shifts on the species' ranges because it incorporates information from the entire distribution, including the minimum and maximum; is commonly used in species distribution and climate prediction models; and is highly correlated with other temperature variables. However, the maximum and minimum temperature can be very important determining species range. The conclusions of the study did not change when using those metrics: across all species, the minimum and maximum annual temperatures of the range of seedlings were 0.143°C (95% C.I. -0.119 to -0.169°C) and 0.100°C (95% C.I. -0.072 to -0.129°C) lower than those of the range of trees. These results suggest that there is tendency for the range to shift towards areas where the winters are relatively colder than the summers, consistent with a shift towards the interior areas, with a more pronounced continental climate.

There are additional advantages of examining species' shifts in temperature, rather than in elevation or latitude. Species' elevation and latitudinal distributions are highly dependent on the peculiarities of geography, which may also condition the apparent response to climate warming. In contrast, the shape of the temperature distribution tends to be better behaved and less affected by idiosyncrasies of the study region (Fig. 6). For example, the elevation and latitude distributions of *Pinus albicaulis* are multimodal, matching the distribution of the highest mountain ranges, with the latter truncated at the limit of the study area, the Canadian border (Fig. 6A). The species is largely absent between the California Sierras and the northern California and southern Oregon Cascades, because this region lacks mountain ranges of sufficiently high elevation. For many species, the elevation distribution is truncated at sea level, where the mode may be located, or the latitudinal distribution at the study area boundaries or geographic barriers (e.g., *Tsuga heterophylla*, Fig. 6B). A species' geographic distribution may also reflect complex interactions with other factors such as pathogens, rather than response to climate change. The ranges of *Pinus monticola* and *Cornus nuttallii*, the two species with the greatest discrepancy in the latitude and elevation response (Fig. 2), have been significantly affected by introduced pathogens (white pine blister rust, *Cronartium ribicola* [42], and dogwood anthracnose, *Discula destructiva*, respectively). The distribution of *Pinus monticola* is multimodal and very complex, probably driven by the interaction between geographic factors and the impact of blister rust (Fig. 6C). Dogwood anthracnose is a relatively recent introduction and not much is known about its effects in the western US. However, studies in a similar tree species indicate high mortality, greatest among smaller size classes and in moister sites [43]. This pattern could explain the relative greater frequency of mature trees in the northern and lower areas of the range, corresponding to the populations of moist western Oregon and Washington, and the relatively greater abundance of seedlings south and higher, in the comparatively dry California Sierras (Fig. 6D). For those two species, however, the temperature distributions of the range of seedlings and mature trees are very similar, despite the large differences in the elevation and latitude distributions, suggesting that the elevation and altitude differences are caused by factors other than temperature change.

Averaged across the 36 species present in at least 100 plots, the 95th and 5th percentiles of the temperature distribution of seedlings were 0.047°C (95% C.I. -0.001 to 0.095°C) and 0.088°C (95% C.I. 0.045 to 0.131) colder than those of the distribution of mature trees (Fig. 7). The mean temperature difference estimated from those 36 species was almost identical to that estimated with the full set of 46 species: 0.123 vs. 0.120°C, respectively. While the change in both percentiles averaged across all species indicates a shift of entire distributions towards cooler areas, the magnitude of the difference of the range limits was less pronounced than that of the central tendency. The results are in accordance with studies in the Eastern United States, which found a lack of northward shifts in the boundary of individual species' latitudinal range [24]. Our results suggest a change in the shape of the frequency distribution, so that the range

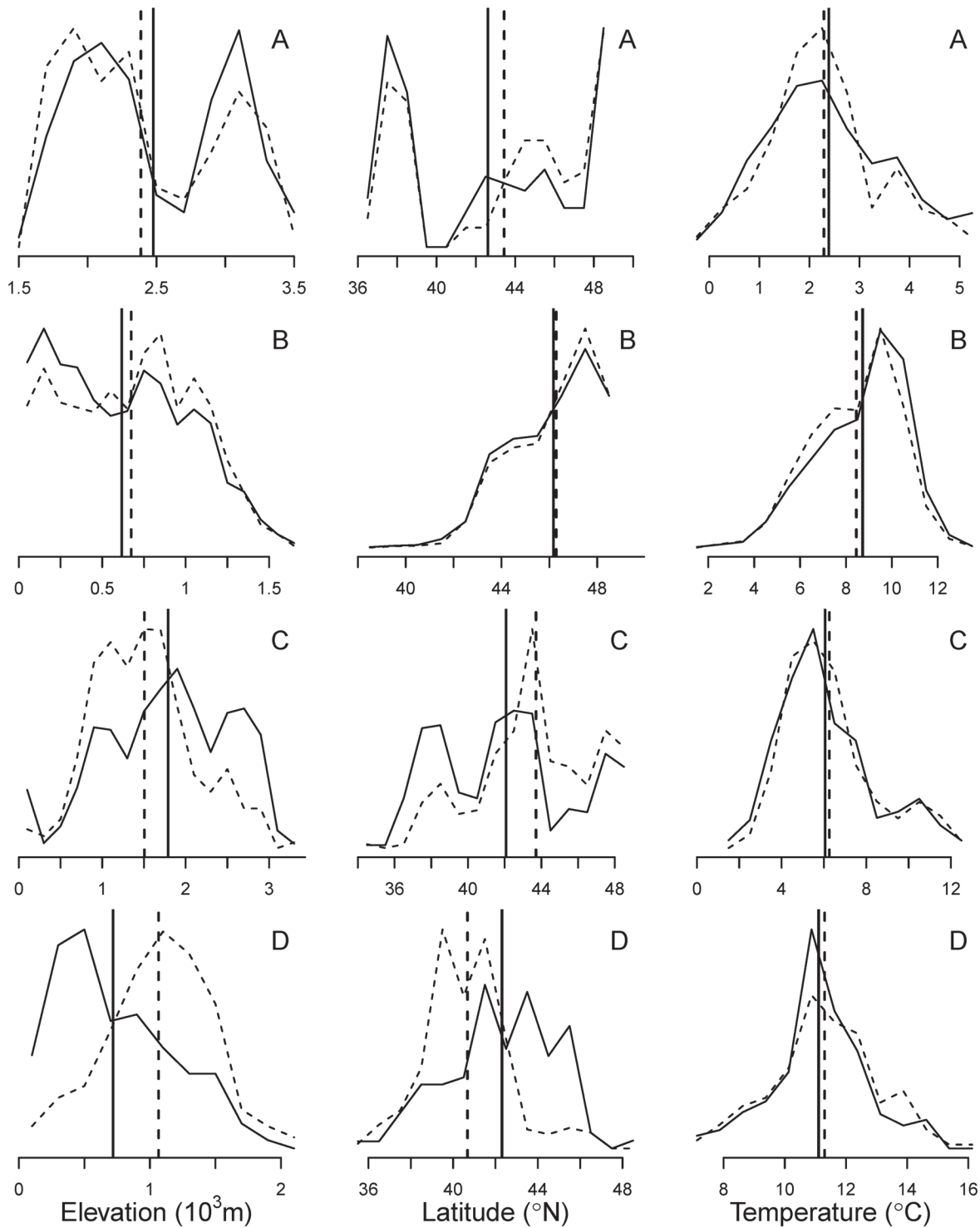


Fig 6. Estimated probability density functions of the elevation, latitude and temperature of the range of selected species. (A) *Pinus albicaulis*; (B) *Tsuga heterophylla*; (C) *Pinus monticola*; (D) *Cornus nuttallii*. The solid line represents the distribution of mature trees and the dashed line the distribution of seedlings. Vertical lines represent the estimated mean of the distribution. The first column shows the elevation, the second latitude, and the third mean annual temperature. Ordinates are not shown because the figures are scaled so that the area under the curves is 1.

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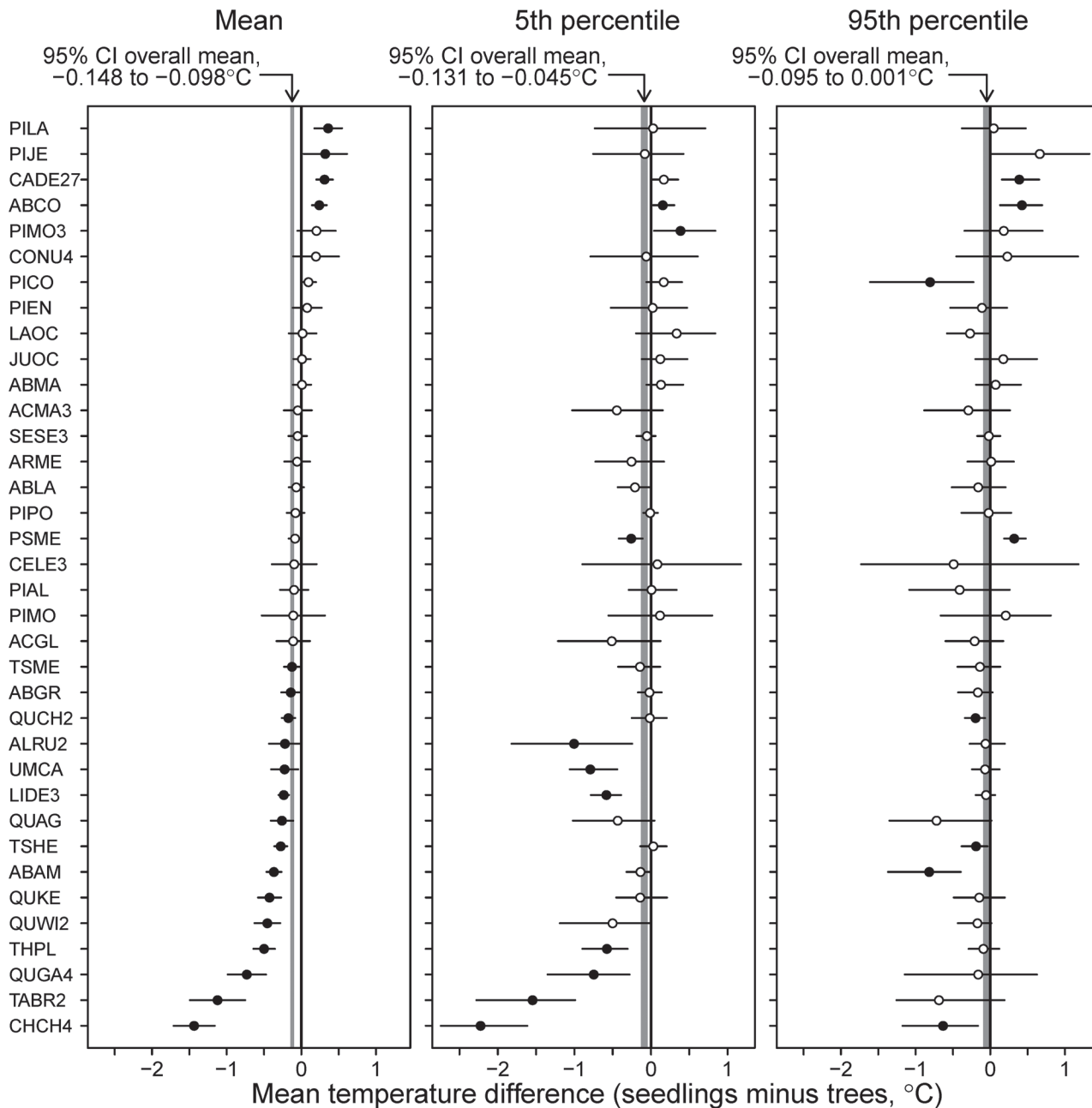


Fig 7. Difference between the mean and percentiles of the temperature distribution of seedlings and that of mature trees. A positive number indicates that the mean temperature of the seedling range is warmer than that of trees. The circles represent the estimated difference for each species and the horizontal lines represent 95% confidence intervals for the difference. Solid circles indicate that the 95% CI does not include 0 (difference significant at the 0.05 level), open circles indicate that the 95% CI includes 0. The gray band is a 95% confidence interval for the overall mean difference, across all species. Only species present at more than 100 plots as seedlings and as trees are included. Species name codes listed in [Table 1](#).

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footprint remains relatively stable but species' relative abundance within the range increases towards the colder end of their range [27, 44]. The warm end of the range changed the least, but tree longevity and the ability of established trees to withstand adverse environmental conditions may delay local extinction, even if the population is not sustainable [28, 45]. The presence of mature trees could provide a source of seedlings which may survive at least during periods

of favorable weather. On the colder end of the range, the long time required by many trees to reach reproductive maturity may slow species' expansion.

A large difference in temperature response was noted between the two main taxonomic groups: for angiosperms, the mean temperature of the range of seedlings was 0.246°C lower than that of the range of trees (95% C.I. 0.207 to 0.292°C), while for gymnosperms it was only 0.059°C (95% C.I. 0.030 to 0.089°C). The two groups differ in many ecological traits, including dispersal mechanisms, seed size and longevity, and in their geographical distribution. Angiosperms are more common in the southern, warmer and dryer end of the region, or restricted to special habitats, such as riparian forests. The different responses of angiosperms and gymnosperms are not easily explained and warrant further study.

The results of this study rely on the assumption that tree size is a surrogate for tree age. To assess the sensitivity of the results to the definition of mature tree, we repeated the analysis using the 60th and 85th percentiles of the tree diameter distribution as the threshold diameter. The median diameter of the 46 species changed from 18.2 cm when using the 75th percentile, to 11.4 and 24.9 cm for the 60th and 85th percentiles, respectively. The results, however, were very stable: the mean temperature of the range of seedlings was 0.124 and 0.121°C colder than that of trees for the 60th and 85th percentiles, respectively. A potentially more important effect is the link between small tree size and younger age. Most angiosperms, for example, tend to have a flexible growth habit and may sprout after disturbance or when stressed. Sprouting or developing a shrubby growth form could result in tallying the individual as a seedling, instead of a mature tree. Individuals at the edge of the species distribution may grow more slowly, thus spending more time as seedlings. However, there is no indication of a bias that would result from those processes affecting the colder, but not the warmer, end of the range.

Conclusions

Estimating differences in elevation or latitude to establish the impact of climate change may lead to spurious results, due to confounding effects and artifacts caused by geographic peculiarities of the study region. The majority of the tree species included in this study showed opposing elevational and latitudinal shifts which, if examined separately, would result in contradictory and possibly incorrect conclusions about their response to a warming climate. Spatially referenced climate observations and models allow estimation of shifts in the species' distributions along temperature gradients, a variable that has a direct causal interpretation in the context of climate change. Compared with the artifacts that afflict analysis of elevation and latitude, the influence of small errors in the temperature models is likely to be minor for broad-scale assessments with a large, spatially balanced sample.

Temperature change is one of the many factors that can drive shifts in tree species distributions in a complex landscape. Changes in disturbance regimen, land use, geographic idiosyncrasies, and other variables may affect range changes, masking the strength, and even direction, of the response to a warming climate. European settlement was relatively recent in the study region, resulting in large impacts in forested lands and large-scale changes of species distributions through fire suppression, the introduction of grazing and exotic pathogens, intensive forest management, and the expansion of agriculture and urbanization. However, the results of this study show that, across all species and despite individual species' idiosyncratic responses, there is a significant shift of the distribution of seedlings towards colder environments, relative to the distribution of mature trees. The large geographic scale and environmental diversity of our study area, the large number and exhaustive sampling of tree species, and the direct causal relationship between the response and the hypothesized cause, provide strong evidence to attribute those shifts to climate change.

Supporting Information

S1 Fig. Species range maps. Maps of the plots containing the species included in the study. Species name codes listed in [Table 1](#) (PDF)

S1 Appendix. Details of the statistical analysis. (PDF)

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Author Contributions

Conceived and designed the experiments: VM HEL. Analyzed the data: VM. Wrote the paper: VM HEL.

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Oregon Forest Ecosystem Carbon Inventory: 2001-2016

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Acronyms

AB – Assembly Bill

BLM – Bureau of Land Management

C – carbon

CF – cubic feet

CH₄ - methane

CI – confidence interval

CO - carbon monoxide

CO₂e – carbon dioxide equivalent

DBH – diameter at breast height

EPA – Environmental Protection Agency

FF – Forest Land Remaining Forest (IPCC terminology)

FIA – Forest Inventory and Analysis

FIADB – FIA database

FMRL – Forest Management Reference Level

GHG – greenhouse gas

GRM – Growth, Removals and Mortality

HA – hectares

HWP – harvested wood product

ICE – Image-based Change Estimation

IPCC – Intergovernmental Panel on Climate Change

LF – Forest Land Conversions (IPCC terminology)

mm – millimeter

MMT – million metric tons

MT – metric tons

NFS – National Forest System

NGHGI – National Greenhouse Gas Inventory

NMVOC – non-methane volatile organic compounds

N₂O – nitrous oxide

NO_x - nitrogen oxides

NRCS – Natural Resources Conservation Service

NRI – Natural Resources Inventory

ODF – Oregon Department of Forestry

PNW – Pacific Northwest Research Station

RPA – Resources Planning Act

SOC – soil organic carbon

µm – micrometer i.e., one millionth of a meter

UNFCCC – United Nations Framework Convention on Climate Change

USDA – United States Department of Agriculture

USFS – United States Forest Service

USGS – United States Geological Survey

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Appendix 1: Forest carbon stocks by forest by forest type and region

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All of Oregon (Table D1) and ecoregion (Tables D2-D8), 2007-2016
Aboveground dead tree pool:
All of Oregon (Table D9) and ecoregions (Tables D10-D16), 2007-2016
Aboveground live understory vegetation pool:
All of Oregon (Table D17) and ecoregion (Tables D18-D24), 2007-2016
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Belowground live tree pool:
All of Oregon (Table D33) and regions (Tables D34-D40), 2007-2016
Belowground dead tree pool:
All of Oregon (Table D41) and regions (Tables D42-D48), 2007-2016
Soil organic carbon pool:
All of Oregon (Table D49) and regions (Tables D50-D56), 2007-2016
Aboveground down dead wood pool:
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Aboveground forest floor pool:
All Oregon (Table D65) and regions (Tables D66-D72), 2007-2016

Appendix 2: 2007-2017 Oregon FIA forest carbon inventory tables

Area
Sampled area:
Sampled area by land status and Owner group for all of Oregon (Table A1) and by ecoregion (Tables A2-A8), 2007-2016
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Forest land area by land status and ownership group for all of Oregon (Table A9) and by ecoregion (Tables A10-A16), 2007-2016
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Net carbon flux for all pools by owner:
Annual net change in all forest pools by ownership group for all Oregon (Table B1) and for ecoregions (Tables B2-B8), 2007-2016
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All of Oregon (Table C1) and by ecoregion (Tables C2-C8)
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Aboveground live understory vegetation pool:
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Chapter 1. Executive summary and key findings

The pursuit of carbon mitigation with forest management policy in Oregon has consistently resulted in the recognition that a reliable forest carbon accounting framework is fundamental to the policy development and monitoring process. This report, based on an extensive field plot monitoring system, supplies the quantitative dimension of that forest carbon accounting framework by providing estimates for the status and trends of carbon in Oregon's forest ecosystems and ownerships since 2001. The information in this report is based on measurements conducted on 9,483 forested plots in Oregon by the Forest Inventory and Analysis Program (FIA) within the USDA Forest Service. This report includes a brief introduction to the pursuit of forest carbon accounting in Oregon and an overview of the forest carbon cycle (Chapter 2) followed by a description of the methods used to inventory Oregon's forests and estimate forest carbon (Chapter 3). The results of the analysis are presented in Chapter 4 and are based on a subset of the abundant tabular data this analysis provides. Estimates of forest carbon across five forest ownerships and seven ecoregions are first reported in terms of flux, which is the difference between the amount of carbon that enters, and the amount that leaves, one of seven different pools of carbon. Estimates are then reported in terms of the amount of carbon stored in each pool. The results are compared with estimates from other reports and research in Chapter 5 and strategies for improving the inventory and analytical methods are discussed in Chapter 6. In this analysis results of carbon physically present in the forest are given in metric tons (MT) of carbon (C). Results of carbon flux, the amount and rate of gaseous carbon being emitted or sequestered by the forest, are given in metric tons (MT) of carbon dioxide equivalent (CO₂e).

Forest Carbon Flux

One of the most important features of this report is that as of the 2016 reporting period, Oregon's forests have been functioning as a net sink of carbon. According to the estimates made from remeasured FIA plots, Oregon's recent statewide rate of carbon flux from all forest pools across all ownerships and ecoregions is approximately 30.9 ± 7.4 MMT CO₂e per year (Table 4.1). This estimate excludes net CO₂e contributions from other sources such as harvested wood products which will appear in a separate analysis for this reporting period. After accounting for forest land use conversions and non-CO₂ greenhouse gas emissions from wildfire, the 2016 statewide rate of carbon flux on all forest land is approximately 31.6 ± 7.5 MMT CO₂e per year (Table 4.2). The pools of live vegetation (trees, foliage, live roots, and understory vegetation) are accumulating carbon at a net rate of about 37.9 ± 5.8 MMT CO₂e per year (Table 4.3). However, the pools of dead vegetation (standing dead trees, dead roots, and down wood) have been losing CO₂e to the atmosphere and other forest ecosystem pools at a rate of about 7.3 ± 2.1 MMT CO₂e per year.

National forests alone account for approximately 19.1 ± 2.0 MMT CO₂e per year of the total carbon flux (Table 4.3) mostly from growth of live trees. The contribution of those pools on other federal forests is about 9.5 ± 1.4 MMT CO₂e per year. Tree mortality, especially from fire, is highest on productive forests owned by the USDA Forest Service that are withdrawn from harvest at a rate of 0.8 ± 0.4 metric tons of CO₂e annually per acre. Net tree growth on forests owned by private individuals contributes about 3.6 ± 2.3 MMT CO₂e per year. The variation in live tree growth and carbon flux in other pools on forests owned by local and state governments and corporations is too large in this reporting period to determine if the average annual rate of carbon sequestration is statistically different than zero. Nonetheless, on a per acre basis gross tree growth is highest for these two ownerships that contribute the most to the wood products pool (Table 4.4 and Table 4.5).

This report also provides estimates of forest flux from growth, harvest, and mortality of live trees for each ecoregion in Table 4.6. Two ecoregions account for about 58% of the annual net CO₂e sequestration in live trees, the forests of the Western Cascades (9.4 ± 3.0 MMT CO₂e/year) and the Oregon Coast Range (8.1 ± 4.3 MMT CO₂e/year) (Table 4.6). Although there is a large amount of uncertainty the importance of Coast Range forests to annual carbon flux is reflected in the estimate for gross growth of trees at 30.3 ± 2.4 MMT CO₂/year while the amount harvested from that growth each year is about 17.5 ± 3.8 MMT CO₂. Growth of trees in the Western Cascades ecoregion is also high at about 26.9 ± 1.7 MMT CO₂/year with much less transfer to harvest (8.0 ± 2.5 MMT CO₂e/year) than the Coast Range but experiencing a higher rate of mortality (9.5 ± 1.1 MMT CO₂e/year). The annual net change in live trees is less than 5 MMT CO₂e for the other ecoregions and less than 0.5 MMT CO₂e/year in forests of East Oregon outside of the Blue Mtns.

The carbon accumulation from growth of live trees has been approximately 90.2 ± 2.4 MMT CO₂e/year from all forests in Oregon (Table 4.7a). After accounting for the amount of carbon removed by harvest (-34.8 ± 4.7 MMT CO₂e/year) and mortality from all causes (-25.3 ± 1.7 MMT CO₂e/year) the net accumulation of carbon in live trees is approximately 30.1 ± 5.7 MMT CO₂e per year reflecting the state's high annual tree growth rate across all forest ownerships.

Estimates of carbon flux in live trees for each county from growth, harvest, and mortality can be found in Table 4.7b. Washington county is estimated to have a net loss of carbon (-2.3 ± 2.1 MMT CO₂e/ year) and Douglas County shows a high rate of live tree mortality (-3.5 ± 0.8 MMT CO₂e/year) mostly due to fire and natural causes, but is partially compensated for with a high rate of annual tree growth (12.1 ± 1.4 MMT CO₂e/year). The forests of Lane County lead the state in net carbon flux by sequestering approximately 7.6 ± 2.3 MMT of CO₂e/year.

For carbon flux on National Forests (Table 4.7c) the Deschutes National Forest is currently estimated to have a net loss of carbon based on all pools (-0.2 ± 0.6 MMT CO₂e/year) but this estimate is not statistically different than zero. Other National Forests where net carbon flux is not statistically different from zero include the Fremont, Ochoco, Columbia River Gorge

National Scenic Area, and the Crooked River National Grassland. All other National Forests are accumulating carbon with the highest rate of net flux for all pools on the Willamette with approximately 4.1 ± 0.9 MMT CO₂e/year. The Rogue River-Siskiyou National Forest is experiencing the highest rate of live tree mortality among national forests (-2.8 ± 0.6 MMT CO₂e/year). The causes of tree mortality on National Forests in terms of percent of carbon were fire (23%), disease (20%), insect (18%), and wind (13%). The rate of mortality in terms of percentages of live tree carbon was 0.7% per year for the state and ranged from 1.0% in the East Cascades to 0.4% in the Willamette Valley ecoregions.

Fire was estimated to affect 103 ± 16 thousand acres/year (95% CI), with an additional 16 ± 7 thousand acres/year affected by both fire and tree cutting. The total estimate of emissions from fire is approximately -3.6 ± 1.2 MMT CO₂e/year as CO₂ and -0.2 ± 0.05 MMT CO₂e/year for methane (CH₄) and nitrous oxide (N₂O) (Table 4.8).

Approximately 20 ± 7 thousand acres of forest land were converted to non-forest every year in Oregon while about 24 ± 7 thousand acres of non-forest land were converted to forest every year (Table 4.9). About 53% of the forest loss was conversion to grassland, 88% of which consisted of mechanical removal of juniper and 12% from lack of forest regeneration more than 30 years after a disturbance, primarily fire. Another 34% of the conversion was for powerlines and logging roads. Conversion of non-forest lands to forest is accounted for by regrowth on abandoned logging roads and tree encroachment on grasslands. However, the net change of 4.5 ± 9.3 thousand acres/year is not statistically significant. Consequently, the net gain of 0.9 ± 1.1 MMT CO₂e/year from forest land conversions was also not significant with most of the gains and losses occurring in the live tree pool (Table 4.10).

Forest Carbon Storage

In Section 4.2 of this report you will find estimates for the amount of forest area in each ecoregion, such as Table 4.11, and each forest type across productivity levels of each ownership, such as table 4.12. The heart of the forest carbon numbers for each pool across ownerships is in Table 4.13a where according to estimates made from the FIA plot measurements over the most recent 10-year reporting cycle (2007-2016) there are 3.2 ± 0.03 billion metric tons of carbon stocks (C) on forest land including forest floor and forest soils across all ownerships in Oregon. Approximately 70% of this C is found on public forest land with the National Forests containing over half of all C (52%). Just under half of all stored C is found belowground in forest soils (49%), and about a third is found aboveground in the live tree pool (32%). The remaining stored C is distributed among dead trees (2%), roots (7%), down wood (5%), forest floor (4%) and the understory vegetation pool (1%). Table 4.13a also reports the amount of forest area estimated for each ownership.

For each county Table 4.13b provides estimates of forest C storage for each forest pool and estimates for the amount of forest area. Douglas and Lane County have the largest amount of forest C storage with 380.1 ± 25.9 MMT C and 377.6 ± 25.3 MMT C, respectively. Counties east of the Cascade Mountains tend to have the largest amount of C stored in standing dead and down wood pools relative to other forest pools such as Jefferson County with 32% and Wheeler County with 26%. Similar estimates for each National Forest are found in Table 4.13c.

Forest land carbon stocks by specific pool on both public and private ownerships are reported in Tables 4.14 through Table 4.21 for all of Oregon and each ecoregion of the state. These tables show that two Westside regions account for over half of Oregon's forest C stocks (52%), the Western Cascades with 969.1 MMT C and the Oregon Coast Range with 717.7 MMT C. In the Oregon Coast Range public forests have on average 168.4 MT C/acre while privately managed forests have 111.8 MT of C/acre. The Willamette Valley has the lowest total forest carbon storage with about 106.3 MMT C.

Carbon stock estimates in each pool for the major forest types (Table 4.22 and Table 4.23) show that the Douglas-fir forest type contains about 47% of Oregon's C stocks ($1,511.1 \pm 42.0$ MMT C) (Table 4.22). The fir/spruce/mountain hemlock type stores over three times less at approximately 435.3 ± 24.8 MMT and the ponderosa pine forest type stores about 419.5 ± 17.9 MMT C. Of the hardwood forest types, the alder/maple forests are currently storing the most total forest carbon at 122.7 ± 15.5 MMT C.

Estimates of forest carbon stocks and flux for each ownership are reported in four pairs of tables for live trees and understory vegetation (Table 4.24 and 4.25), Roots (Table 4.26 and 4.27), standing dead trees and down woody material (Table 4.28 and 4.29), and forest floor and soil carbon (Table 4.30 and 4.31). Carbon storage for each forest pool based on 10 year averages are provided in Table 4.32 and for ownership and land status in Table 4.33 and 4.34.

Chapter 5 provides a comparison of the results in this report are with estimates of forest carbon reported in the National Greenhouse Gas Inventory (USDA OCE Climate Change Program Office 2016), the 2018 forest carbon report from the Oregon Global Warming Commission, and other research that contains comparable forest carbon information (Gray and Whittier 2014, Gray et al. 2014, Law et al. 2018, Campbell et al. 2007). Strategies to improve the inventory are described in Chapter 6 and include increasing the number of plots that are measured each year, improved estimation of non-sampled plots, increased use of remote sensing, better equations for calculating tree biomass, and ideas for improving forest carbon reporting.

Agenda Item No.:	7
Work Plan:	Private Forests
Topic:	Urban Forestry
Presentation Title:	Urban Forestry Program Update
Date of Presentation:	November 4, 2020
Contact Information:	Kristin Ramstad, Urban and Community Forestry Program Manager 503-945-7390, Kristin.Ramstad@oregon.gov Kyle Abraham, Division Chief Private Forests 503-945-7482

SUMMARY

The Department’s Urban and Community Forestry Assistance (U&CF) Program will turn 30 in 2021. Building on decades of successful engagement with Oregon cities, universities, nonprofits, and residents, the U&CF program continues to optimize its outreach and technical education. U&CF program procured and administers a statewide tree-mapping platform, cultivated relationships and supported the growth of Tree City USA communities in Oregon (Attachment 1). Nationwide, urban and community forestry is becoming the focus of high-level, broad, and nuanced attention for its potential roles in carbon drawdown, improving human health and equity, mitigating climate extremes, and providing pathways to employment.

At the November 4, 2020 Board of Forestry (Board) meeting, the U&CF program manager will provide a brief update of the program, reporting on the future trends and possibilities for urban forestry in Oregon. Dr. Vivek Shandas will discuss the relevant and historic reasons why parts of many cities do not have enough tree canopy and why it is important to improve the tree canopy in these areas. Drawing on his research in Portland and across the globe, Dr. Geoff Donovan will address how the quality of urban forests affects community health.

CONTEXT

The Board of Forestry’s (Board) 2011 *Forestry Program for Oregon* recognizes the value of Oregon’s urban and community forests, which are “major contributors to the health and well-being of its citizens.” Goal B states urban and community forests “provide numerous health and environmental benefits: they help purify our air and water, control stormwater runoff, provide shade, reduce soil erosion, create wildlife habitat, and improve the health of riparian areas.”

The Board also recognizes that in recent decades, as Oregon becomes more populated and urban, resources to manage the urban forests have lagged. The Oregon Legislature states, “Trees not only are important to the economic and environmental well-being of Oregon but also represent a significant component of the quality of life for urban residents. As a matter of policy, it is important to promote and protect the human habitat values that accrue from a healthy urban forest. Therefore, it is declared to be the public policy of the State of Oregon to encourage cities to plant and properly care for trees within the cities’ urban growth boundaries and develop management plans to protect and promote urban forests.”

The Department implements the Urban and Community Forestry Assistance Program under ORS 526.510 (1); the State Forestry Department shall provide technical assistance to cities, counties, other governmental units, nonprofit and civic organizations, and other groups interested in planting and caring for trees in communities. The mission of the Urban and Community Forestry Assistance Program is to help Oregonians improve their quality of life by promoting community investment in our urban forests (Attachment 2). The primary funding source for this program is federal funds through the USDA Forest Service, supplemented by State and Private Forestry funding. The U&CF program provides periodic updates to the Board on its activities, as well as trends and issues in urban forestry.

In 2012, the Oregon legislature rescinded ORS 336.015, which designated Oregon Arbor Week. ORS 336.015:

“The first full week in April shall be known as Arbor Week. In order that pupils in the public schools shall be made better aware of the benefits of the preservation and perpetuation of forests and the growing of timber and of the environment, the district school board shall cause to be conducted, during school hours, activities which tend to encourage the planting, protection, and preservation of trees and shrubs and a greater understanding of the environment and means for preserving and improving it.”

As Tree Communities of USA are required to proclaim and designate Arbor Week, it was a surprise when the U&CF program staff discovered Oregon no longer had an official Arbor Week in 2019. Working with OCT, the State Forester, and the Governor’s office, the U&CF program has advocated for the reinstatement of a statewide recognition of the benefit of trees. Starting in 2021, the State Forester will work with the Governor’s Office and OCT to recognize April as Oregon’s Arbor *Month* with a statewide proclamation.

BACKGROUND AND ANALYSIS

Program Manager, Kristin Ramstad (1.0 FTE, federally funded), serves as the point of contact for the federal-state partnership, coordinating all aspects of grant writing, grant administration, program delivery, performance accounting, and fiscal management. The Program Manager also serves as an ex-officio Director on Oregon Community Trees Board, as the ODF-representative on the Oregon Heritage Tree Committee, and contributes to educational program delivery, statewide program leadership, technical assistance, and volunteer coordination. Kristin has worked in the U&CF program since 1991.

The U&CF program has one field Community Assistance Forester. This position held by Katie Lompa (.75 FTE, federally funded) provides technical assistance, volunteer coordination, organizational assistance, and educational guidance to Oregon’s 241 incorporated cities, 36 counties, multiple state agencies, colleges, and universities, and non-profit organizations. The Community Assistance Forester also administers the Tree City USA program for the state. Katie has worked in the U&CF program since 1998.

Both U&CF program staff members have urban forestry-related university degrees. They have maintained their International Society of Arboriculture (ISA) arborist credentials, in addition to pursuing additional professional training for decades. The last U&CF program update provided to the Board was in November 2017. While small, the U&CF program has continued to optimize its

outreach and effectiveness in several ways. A summary of program accomplishments and activities for the past three years follows.

Grant Projects

1. Since 2017, the program has collaborated with Department staff, programs, and agencies, such as the Private Forests, Forest Health Program, the Oregon Department of Agriculture, and OSU Extension to provide training and support for Oregon Forest Pest Detectors. Through this collaboration, the U&CF program has also created the Emerald Ash Borer (EAB) Readiness and Response Plan and produced a webinar for cities on how to prepare for invasive pests, such as EAB and Asian Long-horned beetle (ALB). Neither EAB nor ALB have been found in Oregon, but maybe only an infested wood palette or a truckload of infested firewood away from arriving in the state. More importantly, these relationships and these projects have clarified a statewide response to invasive insects, trained a large cadre of pest detectors, and forged trust among the partners.
2. From 2016-2019, through a Landscape Scale Restoration (LSR) grant, the U&CF program worked with the West Multnomah Soil & Conservation District (WMSWCD) and the Forest Park Conservancy (FPC) to restore the greater Forest Park ecosystem in Portland. WMSWCD works primarily with landowners living adjacent to the Park creating plans to remove invasive plant species and establish native plants. FPC focuses its work on its Canopy Weeds program, removing English ivy from trees in targeted areas.

The U&CF Program, in response to Park-adjacent community members' concerns and in coordination with Portland Fire and Rescue, ODF's National Fire Plan coordinator, WMSWCD, and FPC worked with the community of Linnton to become a FireWise® Community. Linnton is located north of downtown Portland, adjacent to Hwy 30, and bordered on the west by Forest Park. Residents of the area are justifiably concerned about wildfire hazards with densely populated single-family housing on steep hillsides close to the highway, one-road access to several areas with no egress, and tremendously overgrown and unmanaged vegetation in the community. Before the Linnton project, the U&CF program had been involved with community fire preparedness training conferences and workshops in central Oregon and southern Oregon.

3. In 2018, the U&CF program received an LSR grant to procure an urban tree inventory and mapping platform that it makes available free to Oregon cities. Tree inventories are an essential component for developing urban and community forestry management plans. Many cities cannot afford to purchase proprietary software or spare the staff time to complete a tree inventory. By providing easy-to-use inventory software, the U&CF program is hoping to engage small and medium cities in conducting their inventories. Another attribute of this software is that it provides a "30,000-foot view" of the distribution of trees throughout Oregon in participating cities. This statewide tree database, which will be viewable by other Department programs, state agencies, and the public, will help the U&CF program anticipate invasive insect and disease outbreaks, understand the distribution of trees in underserved neighborhoods, track the performance of different tree cultivars, assist in interpreting trends in community forestry management around the state, and much more.

The [Tree Plotter Inventory® software](#), by Plan It Geo, was chosen by a committee, who planned to make a software kickoff in the spring of 2020, but nationwide pandemic concerns have eclipsed the software's launch. To date, the large data sets from Eugene and Portland's existing tree inventories have been uploaded. Grants Pass and Talent have started inventories using the software. The cities of Sweet Home, La Grande, Condon, Malin, Wood Village, Springfield, and Corvallis expressed interest in the software. The U&CF program offers a monthly "TPI Tuesday" videoconference for cities that have questions or desire to learn more about the Tree Plotter platform. To view a summary of the Oregon's Tree Plotter Inventory project, see the following link.

<https://www.oregon.gov/odf/forestbenefits/Documents/FAQ-Tree-Plotter-Inventory-Project.pdf>

Partnerships and Outreach

1. The U&CF program has continued to build and rely upon its relationship with Oregon's urban and community forestry council, the nonprofit Oregon Community Trees (OCT). OCT includes some of the most dedicated and well-trained urban forestry professionals and advocates in Oregon. The all-volunteer Board includes municipal foresters, private sector business owners, educators, arborists, nursery representatives, and others working in U&CF. For many of OCT's directors, serving on the Board is not only an opportunity to advise the state U&CF program but also to receive professional and experiential leadership training. The U&CF program provides annual cost-share scholarship grants to attend relevant training conferences to several OCT directors every year. The OCT directors assist the U&CF program by,
 - Advising, advocating for, and assisting the U&CF program in a variety of situations
 - Co-sponsoring the annual U&CF conference
 - Recognizing selected TCUSAs via their Arbor Day boost grants.
 - Leading technical Urban Forestry (UF) workshops for city staffs, enabling city staff to have more opportunities to learn about urban forestry and far-flung ISA-certified arborists to acquire the credits required for their continued certification
 - Acknowledging substantive Urban Forestry (UF) efforts throughout the state via the UF awards program
 - Increasing awareness of the UF profession by providing outreach to underserved communities and other Diversity, Equity, and Inclusion (DEI)-related activities
2. In 2019, OCT and U&CF program started working on The Green Legacy Hiroshima Peace Trees Project. OCT Director, Mike Oxendine, then working in Ashland, was contacted by Hideko Tamura-Snyder, founder of [One Sunny Day Initiatives \(OSDI\)](#), based in Medford. Founded in 2007, "OSDI educates the public about the consequences of the use of nuclear weapons and plants seeds of peace, hope, and reconciliation among people of the world, through educational presentations and cultural exchange programs." (From the OSDI website). Ms. Tamura-Snyder survived the Hiroshima bombing when she was ten. As an adult, she has devoted her life to creating a world without nuclear weapons. She contacted Oxendine because she had received several seeds harvested from old ginkgo and persimmon trees that had survived the atomic

blast from the Japanese Organization [Green Legacy Hiroshima](#), and requested his help in germinating and caring for them.

Oxendine germinated the seeds, and with Tamura-Sider's blessing, mobilized OCT and the U&CF program to distribute and plant the trees throughout the state, in time to recognize 2020 as the 75th anniversary of the Hiroshima bombing. Starting with 67 Oregon's Tree City USAs and seven Tree Campus USAs, the U&CF program found homes for these trees. Currently, 36 Oregon communities host 45 Peace trees.

These trees are to be planted in publically accessible [locations](#) and dedicated in a way that recognizes the years passed since the bombing of Hiroshima, envisioning peace in the world. Virtually all the recipient cities had made plans to hold spring ceremonies in 2020. When the pandemic hit, most cities were able to plant, establish, and protect the trees with one to two staff but had to postpone the tree dedication ceremonies.

3. Internal and external constraints have limited the U&CF Program staff from traveling around the state for onsite visits and community outreach. The Department implemented agency-wide austerity measures due to its financial issues in the second half of 2019, and the COVID-19 restrictions started mid-March in 2020, compounded these limitations. The ability to travel and meet with community staff is integral to the program's outreach success. However, the U&CF program is utilizing phone and email communications, a seasonal e-newsletter called [Community Tree Connections](#), and video conferencing as methods to stay connected with communities. During the summer of 2020, for example, the U&CF program offered a 6-week webinar series via Zoom that was attended by staff from 49 Oregon cities. Webinar topics ranged from "*Crafting a Great Street Tree List*" to "*The Basics of Tree Identification*" and "*Timelines to Market – Selecting Trees for Resilient Future Urban Forests.*" Presenters included U&CF staff, OCT directors, and nursery professionals.
4. Another of the U&CF program's key outreach mechanisms has been the Annual Oregon Urban and Community Forestry Conference, usually held at the World Forestry Center in early June. This all-day conference draws approximately 160 to 180 attendees from cities around the state and features nationally recognized speakers as well as local experts. The conference is hosted by the Department, OCT, and the USDA Forest Service, and is generously sponsored by the J Frank Schmidt nursery, PacifiCorp, Oregon State University, RDA equipment, and several others. The monies raised through the sponsorships are used to fund the OCT Arbor Day grant program, offset the Directors' travel and lodging expenses for quarterly meetings, and support the work of OCT. In March 2020, the conference committee decided to postpone the conference until June of 2021.
5. The U&CF program also administers the [Arbor Day Foundation programs](#) for Oregon, Tree City USA (TCUSA), TCUSA Growth Awards, Tree Campus USA, and Tree Line USA (for utilities). The TCUSA program, in particular, has provided an excellent incentive for Oregon cities to engage with urban and community forestry by meeting four standards.

- Standard 1 – demonstrate they have a city tree advisory board or UF department
- Standard 2 – show they have a tree ordinance that regulates public trees
- Standard 3 – spend at least \$2/capita on tree care
- Standard 4 – proclaim and celebrate Arbor Day

The number of Oregon’s TCUSAs increases by 1-3 cities almost every year. Currently, Oregon boasts 67 Tree Cities; over 80 percent of Oregon’s urban population lives in a TCUSA. The U&CF program and OCT incentivize communities to become TCUSAs in several ways, such as targeting them for OCT Arbor Day grants, offering registration discounts to the annual U&CF conference, and giving them the first chance to adopt a Green Legacy Hiroshima Peace Tree. While Oregon’s TCUSAs are the communities most engaged with urban forestry and the U&CF program, they are not the only cities that receive U&CF outreach.

6. The USDA Forest Service’s Urban & Community Forestry program funding supports state U&CF staff’s efforts to grow urban and community forestry programs in **four** specific attribute areas that are similar to, but not quite the same as, Tree City USA. For the federal U&CF database, the Forest Service tracks the number of cities that have,
 - Professionally credentialed UF staff,
 - A public tree care ordinance,
 - A tree board or UF advisory committee, and
 - An inventory-based management plan.

The federal UF funding allocation of Oregon’s U&CF’s program, is in part, based on the number of cities assisted and those that demonstrate the four attributes. The annual U&CF program allocation has ranged from \$250,000 to \$263,000 since 2017. The U&CF program contacts upwards to 200 Oregon cities annually with information about its services and resources. Additionally, the program assists approximately 110 to 130 cities and supports Oregon universities, U&CF-related nonprofits, businesses, and residents.

Leadership

- Several leadership opportunities have arisen for the U&CF program staff. In 2019, the Program Manager served on the committee, to revisit and clarify the definitions used in the federal database of urban forestry accomplishment reporting. In 2020, the Program Manager participated in an Arbor Day Foundation workgroup to expand and revamp the TCUSA Growth Award program. The Growth Award program recognizes cities’ urban forestry efforts above and beyond the usual TCUSA standards.

Both the U&CF program staff serve on key committees of Oregon Community Trees. Up until 2018, the Community Assistance Forester served on the board of the PNW Chapter-International Society of Arboriculture. The Program Manager serves on the [Oregon Heritage Tree Committee](#), part of Oregon’s Travel Information Council, serving as the chair of the committee for 2019 and 2020.

Current and Future U&CF Trends and Program Projects

A detailed staff report is being provided to ensure the time set aside for the presentation can focus on current and future trends in urban forestry, as well as highlight the relevant work of the two invited presenters, Dr. Geoff Donovan and Dr. Vivek Shandas (attachment three)

1. **Urban and Community Livability and Equity.** An increasing number of [studies](#) have correlated human well-being in cities with an increased tree canopy. Yet, all too often, due to historic urban development laws and disregard for underserved communities, the greater distribution of tree canopy is principally found in most cities' affluent areas. Similarly, the Oregon cities that have the broadest and most well funded urban forestry programs tend to be those with larger and more affluent neighborhoods. Smaller, rural communities, while they have always been a focus of U&CF program efforts, can benefit from additional outreach tailored to their specific needs. As Oregon confronts fluctuations in climate patterns, a key focus of future U&CF program efforts will be in promoting urban trees to promote human health, especially in areas where observed health outcomes could be improved by the presence of tree canopy.

Oregon U&CF program is in the process of creating a map that combines key human health indicators with the presence of urban canopy. Map development can help prioritize areas of increased and targeted UF outreach across Oregon. As an example of higher-level engagement, [American Forests](#) takes a leadership role in raising the moral imperative of urban forest equity.

2. **Carbon.** Seattle, California, and other states have carbon credit programs that include urban forests. At least one Oregon with significant city-owned forestlands, [Astoria](#), has demonstrated an ongoing carbon-offsetting partnership. Presently, the data is inconclusive as to whether urban forests can cost-effectively offset carbon as their sole purpose. The value of the environmental benefits urban trees provide (e.g., stormwater mitigation, shading, pollution cleansing, etc.) in combination with the carbon draw-down they may deliver, is significant enough to justify increased planting of urban trees in most US cities. See [Carbon Storage and Sequestration by Trees in Urban Areas](#).
3. **A Statewide Urban Forestry Strike Team.** [Urban Forestry Strike Teams](#) are comprised of individuals with arboriculture and disaster response backgrounds who can assess tree risk in towns that have been disaster-struck. In the last half-decade, UF Strike Teams have been mobilized in the US South and Midwest. Recent wildfires in Oregon have devastated communities, but before this, many towns have been damaged by hurricanes, ice, and flooding. Much of Oregon is also in an earthquake zone. One focus of the program is to develop a statewide, if not regional, UF Strike Team in Oregon.
4. **Coordinated Cross-Boundary Invasive Species response.** Washington State Department of Natural Resources, Urban Forestry program, and Oregon U&CF program are coordinating invasive insect species communication and collaboration. Both programs received federal grants to update and align our respective statewide tree databases, work with cities on preparedness, and provide training to city staff. See [Emerald Ash Borer](#)

[Readiness and Response Plan for Oregon](#) and [Washington's Urban Forest Pest Readiness Playbook](#).

5. **Urban Lumber.** The utilization of urban wood is a growing focus in some Oregon communities. Urban lumber comes from forests with high-risk factors, such as blowdown or removal for developments. Oddly, urban wood is viewed as a waste and valueless, with the cost of its disposal is borne by cities. Urban wood is becoming recognized as having value for building, cabinetry, or biofuel (i.e., biochar), and new city policies are needed to manage this under-utilized asset. The U&CF program participated in the ad hoc committee for the Clackamas Urban Lumber Program pilot study and is currently supporting efforts to establish an Oregon Urban Wood network. The [City of Corvallis](#) has been a leader in urban lumber salvage in Oregon.

6. **Building pathways into the arboriculture and urban forestry professions.** High school, college students, and underrepresented communities interested in arboriculture and urban forestry professions is a key concern and focus for the U&CF program, along with building the capacity for employment. The 2017 [Urban Forestry 2020](#) report summarized the urban forestry profession's needs in the coming decades. Key findings include:
 - Public awareness of urban forestry is low.
 - Networking and professional development at a national level are challenging because urban foresters and managers of urban greenspaces are found in many employment sectors and have a wide variety of disciplinary affiliations.
 - Hiring and recruitment links between employers of urban foresters and universities are inconsistent and insufficient to create a sustainable professional pipeline.
 - Students have low awareness of urban forestry as a career and do not readily visualize a career path for the profession.

Yet, increasingly, the need for green jobs – in urban forestry, in particular – has never been higher, especially in the PNW. Practitioners and researchers are joining forces to create better entry points into the urban forestry profession.

Conclusion

Urban Forestry is an exciting and growing field. Urban Foresters are focused on creating “better living through trees” by managing urban forests to improve urban livability and environmental equity, create multi-level jobs and provide stormwater-, carbon-, and climate change mitigation. Urban foresters of the future will be competent arborists, natural resource managers, communicators, and geospatial specialists. The work of the U&CF program and its partner, Oregon Community Trees, will continue to engage Oregon cities and communities in urban and community forestry. As an advocate for best management practices, encouraging cities to employ urban foresters and inventory their trees, and promoting the understanding that urban forests provide essential benefits we cannot live without.

RECOMMENDATION

This is an information item.

NEXT STEPS

The Department will provide updates on this topic as directed.

ATTACHMENTS

- (1) Tree City USA Map 2020
- (2) 2018-2021 Urban and Community Forestry Assistance Program goals, performance based-objectives, and implementation strategies
- (3) Urban Forestry Presenter Biographies



Oregon's Tree City USA Communities

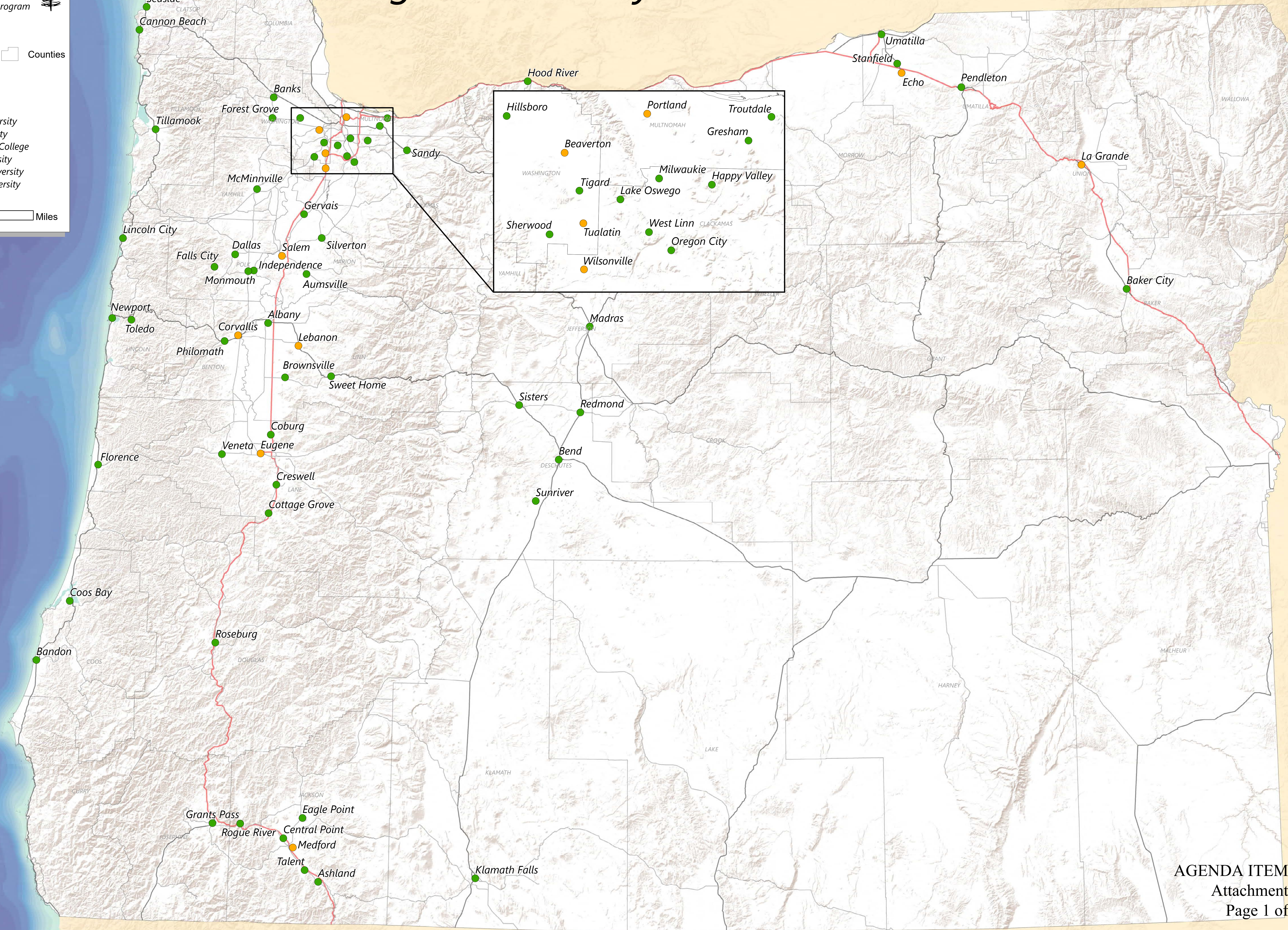
Legend

- Tree City USA
- Sterling Tree City USA
- Counties

Tree Campus USA

- Corban University
- Eastern Oregon University
- Oregon State University
- Portland Community College
- Portland State University
- Southern Oregon University
- Western Oregon University

50 Miles



2018-2021 URBAN AND COMMUNITY FORESTRY ASSISTANCE PROGRAM GOALS, PERFORMANCE-BASED OBJECTIVES, AND IMPLEMENTATION STRATEGIES

VISION - All of Oregon’s urban forests are sustained, healthy, and well managed; all Oregonians recognize urban forests as contributing to their community’s increased economic and environmental vitality and quality of life.

MISSION – To help Oregonians improve their quality of life by promoting community investment in our urban forests.

PROGRAM GOALS	PERFORMANCE MEASURE- BASED OBJECTIVES (CPG Narrative)	IMPLEMENTATION STRATEGIES	<u>10 Year NUCFAC Goals</u>
<p>Provide leadership and program management that is efficient, effective, and innovative in meeting client needs</p>	<p>Number of Cities With Tree Ordinances Increase the number of cities with functioning tree ordinances by 4% per year</p> <p>Number of Technical Assists Provided Per FTE Provide at least 85 technical assists per FTE each year</p> <p>Percent of Local Matching Funds Leveraged Leverage a 100% match for all urban forestry grant programs</p>	<p>PROGRAM MANAGEMENT AND LEADERSHIP</p> <ul style="list-style-type: none"> ◆ Strengthen internal and external support for a sustainable statewide U&CF program by maximizing resources, leverage partnerships and create opportunities. (NUCFAC G 6) <ul style="list-style-type: none"> ◆ Expand collaboration between ODF urban forestry and other ODF programs. ◆ Expand collaboration between related fields, groups, agencies, and sectors. ◆ Increase funding and grants for urban and community forestry. ◆ Participate in state, regional, and national leadership activities. (NUCFAC G 6) ◆ Foster continued staff training and professional development. 	<p>Goal 1. Integrate Urban and Community Forestry Into all Scales of Planning</p> <p>Goal 2. Promote the Role of Urban and Community Forestry in Human Health</p> <p>Goal 3. Cultivate Diversity, Equity, and Leadership within the Urban Forestry Community</p> <p>Goal 4. Strengthen Urban and Community Forest Health and Biodiversity for Long-Term Resilience</p>
<p>Provide technical services necessary to help cities manage their community forests to maximize economic, environmental, and social benefits</p>	<p>Number of Cities With Inventory Based Management Plans Increase the number of cities with inventory based management plans by 4% per year</p> <p>Percent of Cities and Organizations Receiving Assistance Assist at least 25 percent of the cities and organizations annually</p>	<p>TECHNICAL SERVICES</p> <ul style="list-style-type: none"> ◆ Increase community understanding, provide leadership, and help solve urban natural resource issues concerning: green infrastructure and ecosystem management; urban-rural interface issues such as forest practices, growth management, and wildland fire; hazard tree and tree risk management. (NUCFAC G 5) ◆ Support inclusion of trees and forests as elements of community comprehensive and master planning efforts. (NUCFAC G 1) ◆ Improve urban and community forest management, maintenance, and arboricultural practices. <ul style="list-style-type: none"> ◆ Develop comprehensive programs, policies, and resources for enhancing urban forestry stewardship. ◆ Promote better use of technology and tools in urban forestry. (NUCFAC G 5) ◆ Increase diversity, equity, and accessibility in urban and community forestry. (NUCFAC G 3) ◆ Encourage engagement of underserved communities in urban forestry establishment and stewardship. (NUCFAC G 3) 	<p>Goal 5. Improve Urban and Community Forest Management, Maintenance, and Stewardship</p> <p>Goal 6. Diversify, Leverage, and Increase Funding for Urban and Community Forestry</p> <p>Goal 7. Increase Public Awareness and Environmental Education to Promote Stewardship</p>
<p>Develop local capacity to achieve resilient community forestry programs</p>	<p>Number of Cities With Trained Staff Increase the number of cities with trained staff by 4% per year</p> <p>Number of Cities With Tree Boards or Groups Increase the number of cities with citizen based tree advisory or advocacy groups by 4% per year</p>	<p>RESILIENCE</p> <ul style="list-style-type: none"> ◆ Facilitate the development of resilient and comprehensive community forestry programs in Oregon communities through community forestry planning and municipal program development. (NUCFAC G 4) ◆ Increase the number of urban forestry volunteer groups and citizen tree boards, and strengthen existing groups or boards through facilitation and organizational development. (NUCFAC G 4) ◆ Promote biodiverse, healthy, restored and resilient urban and community forests in advance of and currently experiencing climate change challenges. (NUCFAC G 4) ◆ Plan, design and manage urban forests to improve human health and wellness and fire resilience. (NUCFAC G 2 and G4) ◆ Elevate recognition of the value of urban trees and urban forests ecosystems as essential contributors to community economic sustainability and resilience. (NUCFAC G 6) 	<p>MANDATE (ORS 526.510)</p> <p>(1) The State Forestry Department shall provide technical assistance to cities, counties, other governmental units, nonprofit and civic organizations and other groups interested in planting and caring for trees in communities. Technical assistance may include, but is not limited to, the following areas:</p> <p>(a) Establishing and maintaining local urban and community forestry programs;</p> <p>(b) Developing local tree management ordinances;</p> <p>(c) Developing public information programs to promote awareness of the values and benefits of the urban forest as a resource of the urban community;</p> <p>(d) Implementing appropriate tree management and care practices;</p> <p>(e) Performing street tree inventories; and</p> <p>(f) Planning and coordinating local tree planting projects.</p> <p>(2) The department shall make the fullest use of cooperative agreements, projects and resource sharing with local grassroots organizations, community action groups, businesses, local and state agencies, federal agencies, public and private schools, colleges and universities in designing, developing and implementing local programs, plans and activities. [1993 c.347 §4]</p>
<p>Inspire, and involve targeted groups in achieving the benefits achievable through stewardship of their community forests.</p>	<p>Number of Tree City USA Communities Increase the number of Oregon Tree City USA communities by 4% per year</p>	<p>INFORMATION, EDUCATION, AND PUBLIC AWARENESS</p> <ul style="list-style-type: none"> ◆ Transfer technical urban forestry knowledge to communities and provide educational opportunities. ◆ Reposition Arbor Week as a key environmental recognition opportunity, promote expansion of Tree City USA, and seek other opportunities to promote community forestry to the public. ◆ Develop tools to improve and highlight the relationship between improved public health, wellness, and urban and community forestry and green infrastructure. ◆ Create a statewide urban forestry public awareness and education campaign. ◆ Encourage communities to use urban trees and forestry in public spaces, infrastructure, and private development. (NUCFAC G1) 	

Key Messages and Talking Points

Urban forests – the trees right outside our doors - provide essential benefits we cannot live without.

- ◆ Managed urban forests provide a mix of benefits - environmental, economic & social. Trees help to filter air and water, control storm water, conserve energy, and provide animal habitat and shade. They add beauty, form, and structure to city design. By reducing noise and providing places to recreate, urban forests strengthen social connection, spur community revitalization, and add economic value to our communities.
- ◆ Over the next 50 years, urban areas are projected to increase substantially. The role of trees will become even more critical to ensure healthy and livable communities.

Urban forests and rural forests are connected; good management of one helps the other.

- ◆ Urban and rural forests are intrinsically linked; insects and disease, invasive species, and wildfires cross rural/urban boundaries.

A healthy urban forest doesn’t happen by chance – it is the result of proper planning, management, and community investment.

- ◆ Urban forest management is a cost-effective tool that communities can use to address a wide variety of community issues.
- ◆ Urban forests change constantly as a result of human & natural processes. Active management is essential, to successfully address problems arising from past practices, refining current practices, & understanding natural processes & their relationship with human activities.

Urban Forestry Presenter Biographies

Vivek Shandas is a Professor of Climate Adaptation and Director of the Sustaining Urban Places Research (SUPR) Lab at Portland State University. By examining the assumptions about our built environment, Dr. Shandas supports communities in improving their adaptation from climate stressors, including extreme events such as urban heat, air quality, and storms. He has published almost 100 articles, three books, and his research has been featured in the New York Times, National Geographic, Scientific American, and dozens of other national and local media. Dr. Shandas serves as Chair of the City of Portland's Urban Forestry Commission and serves on several local and national advisory boards.

A few links about this work:

<https://www.nytimes.com/interactive/2020/08/24/climate/racism-redlining-cities-global-warming.html>

<https://e360.yale.edu/features/can-we-turn-down-the-temperature-on-urban-heat-islands>

Dr. Geoff Donovan received his Ph.D. in forest economics from Colorado State University in 2001. He has worked as an economist for the US Department of Agriculture (USDA) Forest Service in Alaska and Oregon. His primary research focuses on quantifying the benefits of urban trees, ranging from intuitive benefits like reduced summertime cooling costs and increased home values to less intuitive benefits, such as crime reduction. He has worked extensively on the relationship between trees and public health, finding that mothers with trees around their homes are less likely to have underweight babies, or when an invasive pest kills trees, more people die from cardiovascular and lower-respiratory diseases. Currently, he is focusing on how exposure to plant diversity may protect against a range of immune diseases.

STAFF REPORT

Agenda Item No.:	8
Work Plan:	Climate Change and Forest Carbon
Topic:	OGWC Goal setting and EO 20-04
Presentation Title:	Oregon Global Warming Commission EO 20-04 Goal Setting
Date of Presentation:	November 4, 2020
Contact Information:	Danny Norlander, Forest Carbon and Forest Health Policy Analyst 503-945-7395, danny.norlander@oregon.gov

SUMMARY

Governor Brown signed Executive Order 20-04 in March of 2020. In the Order the Department was tasked with providing a report to the Governor's office on potential actions the agency could take to mitigate and adapt to climate change. Additional work has been requested as a follow up to the report.

Also contained in the executive order is direction to the Oregon Global Warming Commission to work with a variety of State agencies on developing goals related to natural and working lands. This agenda item provides the Chair of the Oregon Global Warming Commission, Catherine Macdonald an opportunity to present the process in the goal development work.

CONTEXT

The Department is one of the agencies identified to contribute to the Oregon Global Warming Commission's goal development task. The State Forester also sits on the Commission as an agency representative and non-voting seat.

BACKGROUND AND ANALYSIS

Governor Brown signed Executive Order 20-04 on climate change in March. The order directs the Department to complete several tasks. These tasks included providing a report to the Governor's office, participating in a work group focused on climate-impacted communities, and engaging with the Oregon Global Warming Commission on goal development in natural working lands.

The Department's EO 20-04 report garnered the most comments of the various agency reports submitted to the Governor's office. Most of these comments were copied to the Governor's office, Board and/or Global Warming Commission. The Governor's office sent a letter to the State Forester, providing guidance to ensure the agency's plans align with the Governor's expectations. The letter highlights that climate change is significantly impacting Oregon's forest resources and that Oregon's forests also play a significant role in mitigating climate change, by sequestering and storing carbon.

Governor Brown expects the Oregon Department of Forestry to become a regional leader in climate-smart forestry to ensure the health of our climate and the long-term vitality of our forest products industry. The Department should prioritize the goal of improving carbon sequestration and storage and reducing greenhouse gas emissions. This goal should be prominent in the agency's vision, culture, and presentation, and specific actions should be identified to more fully and ambitiously integrate climate change considerations into the agency's management plans and actions.

The Governor envisions that the Department will lead on climate-smart forestry both through its own work and in bringing leadership opportunities to the Board. The department should identify specific goals, develop systems for tracking and reporting outcomes, and incentivize climate-smart forestry practices and new markets for climate-smart wood products can be adopted. Greater energy efficiency and efforts to decarbonize the forestry sector can also yield additional benefits.

The Governor requested that the agency prepare a Climate Change Carbon Plan for the Board's review that builds on the agency's executive order implementation report and reflects a broader strategy for establishing Oregon's leadership in climate-smart forestry and greater accountability toward achievement of goals.

NEXT STEPS

- The Department will continue to participate and cooperate with the Oregon Global Warming Commission on developing natural working lands goals.

RECOMMENDATION

This is an information item only.

Board Closing Comments and Meeting Wrap Up