Peer Review of Department of State Lands' (DSL)
Elliott State Research Forest (ESRF) Forest Management Plan (FMP) Draft

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Executive Summary

The Department of State Lands (DSL) released and asked for comments on a 365-page Forest Management Plan (FMP) for the Elliott State Research Forest ("the Elliott"). In response, this peer review considers the scientific research proposed in the FMP. This review was suggested by Oregon Websites and Watersheds Project, Inc (ORWW) Board member, Dr. Dave Sullivan, and has been developed with his assistance. Several other scientists and forestry professionals also contributed to portions of this review with suggestions and commentary and are listed in the Acknowledgements and/or cited in the text.

This review is being conducted transparently, and as described in Zybach and Alverts (2013: 6, 14, 20) in regard to scientific independence, reviewer qualifications, and review objectives. Constraints involving time and resources have limited the scope of this review to some degree but have not been greatly limiting factors.

The principal conclusion of this review is the ESRF FMP proposal is fundamentally misdirected and likely to fail on both economic and scientific fronts if it is adopted in its present form. This analysis suggests this misdirection will continue to cost Oregon schools hundreds of millions of dollars, cost local communities hundreds of needed blue-collar jobs, significantly increase the risk of catastrophic wildfire to local people and wildlife, and will be unlikely to produce scientific information of particular value to Oregon landowners, resource managers, students, and taxpayers.

The review is organized in eight sections, with each focused on a key topic in the FMP:

1. Economic Values (p. 3): The DSL appraised value of the Elliott is substantially less than its market value, resulting in a significant loss to the Common School Fund and Oregon taxpayers. The FMP's arbitrary limit of only 17 mmbf of timber sales per year is not enough to cover basic management costs, and leaves nothing for funding proposed research projects.

2. Income: Carbon Credits (p. 5): The FMP promotes the sale of carbon credits as an alternative revenue source to timber sales. However, this market is volatile, based on unproven scientific assumptions, and presents documented financial risks. The economic feasibility and long-term sustainability of relying on carbon credits are questionable. Issues related to the

transparency and accuracy of financial projections, as well as past hidden financial details, further complicate this strategy.

3. Triad Research Design (p. 8): The proposed triad research design lacks practical value for other forested lands, particularly private ones. The design's complexity, long timeframe, and high costs raise concerns about its applicability and utility in real-world forest management scenarios.

4. HCP Modeling (p. 11): The 2012 ODF Elliott plan had 15 subbasin polygons; the 2017 ORWW Giesy Plan had 25 named creek polygons; in 2019 OSU subdivided these into 125 polygons, but with only three acronyms; 2024 and USFW currently has over 9000 polygons in its HCP analysis. The Giesy plan scientifically tests HCPs, and literature review suggests fish prefer sun. The FMP relies almost entirely on untested modeling and assumptions (Zybach 1993) without field validation.

5. Cultural Landscapes (p. 13): The FMP overlooks the historical and cultural significance of the Elliott's 550 miles of roads and trails, as well as the impact of plantations on biodiversity. The absence of old-growth and the historical context of these plantations are not adequately addressed or accurately described.

6. Wildlife Habitat (p. 17): The FMP prioritizes superficial modeling and politicized regulations over actual population data, species adaptability, and historical demographics. Spotted owl populations are declining, while barred owls are a better ecological fit, but are being considered for systematic removal. Coho production is adequate, and marbled murrelet use is very limited and seasonal.

7. Wildfire Risk (p. 21): The FMP fails to address the increasing risk of catastrophic wildfires due to fuel accumulation. The creation of passively managed reserves and the retention of snags increase this risk, threatening surrounding communities to the west.

8. Climate Change (p. 25): The FMP's focus on climate change and carbon sequestration lacks scientific basis and practical relevance for the Elliott's coastal environment. The emphasis on selling carbon credits and conducting climate-adapted forestry research is not justified by the forest's historical climate stability.

Acknowledgements and References (p. 27).

1. Economic Values

The FMP lacks basic economic information that is critical to most forest management plans. Although a detailed budget is suggested for operating the forest and for funding research projects, there is a striking lack of consideration of the Elliott's basic and proven assets regarding timber volumes, annual productivity, potential for improved yields, and current market values. These numbers are significant for several reasons and their absence in the planning process is concerning.

When the Oregon legislature approved creation of an Elliott State Research Forest, it was on the basis of six criteria being met by January 1, 2024: I) payment to the Common School Fund of $220.8 million in exchange for ending the Elliott's legal obligation to create income on behalf of Oregon schools ; 2) the State Land Board voted to "decouple" (sell) the Elliott from its historical obligation to Oregon schools: 3) a final HCP was published; 4) a third party was hired to conduct an independent analysis of financial viability: 5) the State Land Board approved an Elliott forest management plan, and 6) the OSU Board Trustees authorized the university to participate in the ESRF's management (Zybach 2024a: 16).

Despite spending millions of dollars and nearly five years on these tasks, SB 1546 was sunsetted on January 1, 2024 because an HCP was not completed by that date, an Elliott forest management plan had not been accepted by the Land Board; and plans for selling carbon credits were still moving forward. As a result, OSU President Jayathi Murthy sent a letter to DSL and the State Land Board saying a vote to accept management responsibilities would not be taken at the next Board of Trustees meeting (Murthy 2023). It is unknown at this time if the failure of SB 1546 also meant the proposed ESRF name would reinstate its original Elliott State Forest title.

The sections in this review on HCPs and carbon credits will add more details to these concerns. Two key concerns are the appraisal methods and loss of School Fund income associated with the $220.8 million sales price, and the arbitrary establishment of a 17 mmbf annual timber sales restriction.

In 2016 Wayne Giesy and I were requested by State Senator Ted Ferrioli to develope an alternative strategy for managing the Elliott, rather than selling it. This proposal was also requested by Governor Kate Brown personally, and again in a public meeting in December of that year (Giesy and Zybach 2017a). The 2024 FMP described the appraised value and sale process in this manner (DSL 2024: 1-51):

> "The total $221M payment to the Common School Fund was derived from underlying property appraisal work on the Elliott (and subsequent verification). At the time the State Land Board and DSL voted to decouple the Elliott from its constitutional obligations to the Fund in 2022, this sum represented an exceedance of the verified appraised value. The Land Board's December 2022 decoupling vote (and related actual payments as compensation into the Common School Fund) marked a major milestone in the forest's history and significant step in enabling the creation of the ESRF."

More than seven years earlier, in February 2017, Giesy and I formally presented the requested proposal to the Governor and DSL, which included this analysis (Giesy & Zybach 2017a: 3):

> "It is estimated that existing timber on the Elliott State Forest is worth "at least" $600 million. Other estimates place the market value of combined land and timber at over $1 billion. The existing sales price — based on arbitrary evaluation restrictions by the State Lands Board — is only $220 million. If this sales amount is accepted, there will be an apparent and permanent loss in value to the Oregon School Fund of at least $380,000,000, and possibly much more over time."

The Elliott contains about 3.5 billion board feet of timber, grows an estimated 75 mmbf more a year, has 550 miles of road, and more than two dozen fish-bearing streams, but has done no timber harvesting for the past 10 years while spending millions of dollars on consultants and lawyers to develop an FMP and an HCP. In the meantime, it has not developed an operating income the entire time. According to Walker (2023):

> "The forest also must be financially self-sustaining. DSL is continuing with an independent analysis of financial information submitted by OSU. This will help inform our path forward and ensure the research forest is managed within the means available."

The "independent analysis" of the Elliott's ability was performed by Newton Forestry, LLC in 2022 and then reconsidered in 2023 (Newton 2022; 2023). In 2017, Ferrioli had Christine Broniak an Oregon Legislature economist, project Elliott income if the "Giesy Plan Alternative" management proposal was followed. Broniak used a 2017 timber value of $367.50/mbf and a 50 mmbf/year sales figure, to estimate the Elliott would produce an income of approximately $20 million/year for 10 years, and about $25 million/year for the following 10 years (Giesy and Zybach 2017b).

Newton used a figure of $675/mbf in 2022 (Newton 2022: 1), however, the 2024 FMP calls for an annual harvest of only 17 mmbf/year (DSL 2024: 6-4), leading him to conclude: "An evaluation of the accumulated cashflow using the OSU 2023 financial information does not paint a good financial future under the current plan for managing the ESRF" (Newton 2023: 2).

These reduced evaluations and funding strategies are what caused Murthy to conclude:

> "OSU continues to have significant concerns with the State's intent to limit variations in annual harvest volumes in the ESRF, and to move forward with a carbon project on the ESRF. The October 13, 2023, email from the State Land Board Assistants . . . made clear that harvests on the ESRF would be subject to a set annual timber volume with minimal year-to-year variation . . . the notion that the research forest managers could maintain a near static timber volume in annual harvest within the research goals and management commitments of the ESRF fails to (1) support the health and resiliency of the forest, (2) recognize the dynamic nature of both forest ecosystems and adaptive management, and (3) support the integrity of a functional, replicated research design as described in the ESRF Research Proposal."

2. Carbon Credits

When OSU and DSL signed a Memorandum of Understanding (MOU) in February 2019 (Walker and Huntington 2019), a key component of the agreement was to produce a research and management plan for the Elliott by the end of the year in which "key conservation values" would be identified. The second "key value" listed was "a carbon sequestration program" (ibid.: 2).

Nearly five years later, in November 2023, OSU President Murthy informed DSL that the University would be terminating its agreements regarding research and management on the ESRF, other than submitting a formal management plan within the following month (Murthy 2023). A key reason for this decision was OSU's "significant concerns" regarding DSL's "intent" to "move forward with a carbon project on the ESRF" (ibid.: 1).

Three days prior to Murthy's decision the DSL-OSU Advisory Board on the Elliott had received a confidential report from a contractor hired to analyze the economic potential of a 100-year carbon sequestration plan (Elder 2023). The bottom line to the plan -- and assuming the Elliott could even be "certified" to sell carbon credits -- is that DSL would receive less than $1 million per year for the first 10 years by putting most of the Elliott off-limits to timber sales (ibid.: 6). Of this amount, the sponsoring company would get 20% for assessment, verification, sales, and 5-year monitoring inspections -- unless the sequestered carbon was affected by wildfire, windstorm, landslides, or other causes, in which money would have to be repaid.

This was not a new development, but rather an ongoing concern regarding OSU's participation in the management planning process. In OSU Forestry Dean Deluca's August 2022 Memorandum to the State Land Board, for example (DeLuca 2022), "several reasons" are given why OSU "has consistently resisted selling offset credits in the regulatory compliance market" (ibid.: 1).

Among the reasons given by OSU regarding these concerns and resulting decision included: 1) a carbon credit sale would "consistently restrain" research activities on the forest -- instead, carbon sequestration should be a significant "research opportunity"; 2) a "non-viable" 100-year commitment against entering "alternative carbon markets" in a dynamic world; 3) costly carbon credit management and compliance obligations; 4) serious financial risks; and 5) a sale would compromise the options and authority of ESRF managers (ibid.: 1-2).

Despite these legitimate and well-documented concerns, DSL has continued to fund and pursue efforts to market carbon credits to generate income in lieu of timber sales on the Elliott. This commitment included a "foundational" ESRF "Mission and Management Policies" statement submitted to, and approved by, the State Land Board that: "(1) Advances and supports forest health, climate resistance, carbon sequestration . . ." (DSL 2024: 2-3).

This Mission Policy is further detailed in the Introduction to the FMP with a more precise commitment to carbon credit purchases, and the related legislation and rationale for doing so (ibid.: 1-6):

> "The FMP connects to the State’s Climate Change and Carbon Plan and related policies advanced by the State’s Board of Forestry, including through increased

> carbon sequestration on the forest, related demonstrations and research on climate-adapted forestry, carbon and forest-management dynamics, wildfire and disturbance dynamics, and integration with a voluntary project for the sale of carbon credits."

This commitment to the sale of carbon credits on the Elliott had been initiated and supported by Huntington from the beginning of the signing of the MOU while representing OSU College of Forestry, throughout his tenure at DSL, and continuing to his present position as an environmental advisor to Oregon Governor Kotek. As a result, a significant portion of the Elliott's startup costs are claimed to be dependent on the sale of credits and a principal reason that OSU defected from the project. The few specific mentions of this strategy are deeply buried in the FMP and asterisks are even used to further shield these efforts (e.g., ibid.: 2-21, **emphasis added**):

> **"DSL intends**, based on this FMP's approach, **that the ESRF participate in** available ecosystem services or **forest carbon programs and markets** consistent with the State Land Board's adopted Management Policies as well as Oversight Structure for the ESRF **(see ***Appx / Oversight Structure**)."**

Further, the selling of carbon offsets in the compliance market comes with long-term obligations, including both management responsibilities, such as reporting and compliance costs, and monetary obligations, such as those resulting from potential reversals (i.e., re-release of stored carbon through wind, fire, landslide, or disease).

McAfee (2021) has argued that offsetting carbon emissions through the sale of carbon credits has had little or no effects -- as advertised -- on Global warming, in part because it does nothing to reduce the emissions in the first place. Further, because forests are dynamic, even if offsets were effective in the short term (with no indication they are), the purchased offsets would be compromised when forests die or begin dying (ibid.: 172).

An example of the ephemeral nature of carbon sequestration related to the sale of carbon credits is shown by the active Shelly Fire in northern California. A July 19 report includes a map of the fire, and clearly outlines 11,000 acres of burned forest that is owned by Ecotrust Forest Management (EFM) and used to sell carbon offset credits (Pera 2024). EFM was recently sold to its "management team" by its parent registered-nonprofit company, Ecotrust, who founded EFM in 2004 and contracted the first carbon analysis on the Elliott in 2011 (Davies, et al. 2011).

McAfee also points out that, on a global scale, there is often an adverse effect on poor communities adjacent to carbon offset forests through the banning of cattle grazing, mining, or harvesting of traditional forest crops (McAfee 2021: 174). The reduction in local jobs can be illustrated on the Elliott itself. Jerry Phillips (personal communications) expressed concerns on many occasions that "critical habitat" reserves on the Elliott had cost hundreds of local jobs related to selling, logging, trucking, and processing wood products, and the creation of 100-year set-asides would only prolong these problems and make them worse.

In sum, the promoted sale of carbon credits on the Elliott has already resulted in a significant amount of time and cost to Oregon taxpayers without any indication as to whether a stable market even exists, much less whether the Elliott is even qualified to make sales or not. And even if credits can be sold, their value is so low in comparison to traditional timber sales and at the cost of hundreds of local jobs that it is difficult to justify this effort on either economic (jobs and income) or biological grounds for any dynamic forested area, including the Elliott.

3. Triad Research Design

This research design for the Elliott was developed by OSU as a proposal and accepted by the State Land Board in April 2021 (OSU 2021: 16-22); after slight modifications, it was formally adopted by the Board in December 2023 (OSU 2023: 84-120). This approach involved the creation of 5,735 GIS polygons (ibid.: 491), reduced to four acronyms and 14 color-coded replications (ibid.: 94), and scheduled to last at least 100 years (ibid.: 141). Start-up was estimated to take three years' time and cost nearly $35 million (OSU 2021: 31-32).

When OSU formally declined to accept management of the Elliott in November 2023, DSL was granted management responsibilities by the Land Board and adopted the OSU triad research design as written (DSL 2024: 1-6), but with one provision: "Landscape-scale research would be advanced across both the CRW and MRW (and in RCAs), and while research may be conducted based on OSU's triad experimental design, this FMP does not require it" (ibid: 4-4).

Although DSL has given itself this loophole to possibly avoid implementing the triad design -- and offers no evidence of an alternative approach -- the proposed revisions that it advances are intended: ". . . to address the most pressing problem facing humanity: how to provide for the carbon, timber, ecosystem services needs of a global population of nearly 8 billion people without compromising the conservation of biological diversity and ecosystem health" (OSU 2021: 116).

Rather than consider whether the vision for research on the Elliott is too broad, general, or misdirected by this global research approach, our concerns have been more focused on the cost, scale, timeframe, and practical utility of any potential findings.

When OSU first proposed this research design in 2020, they had six established scientists conduct a transparent peer review of their proposal: two from the University of Washington (UW); two from Australia; one from Canada; and one from London (OSU 2021: 112). Of these reviews, our opinions of the triad design are most closely aligned with those of Jerry Franklin (Franklin and Spies 1983; Franklin and Dyrness 1988) from UW.

In a recent email exchange (July 4, 2024), Franklin confirmed that his initial concerns regarding the proposed research remain unchanged to the present, including the issues of time, scale, and utility: "There is no way that any of us can possibly anticipate the critical forest conservation issues that we are going to be needing to address one, two, or three decades from now" (OSU 2021: 115).

The triad research design for the ESRF is intended to last for 100 years. The large number of research polygons makes that timeframe impossible, no matter economics, changing social values, or ownership patterns. The documented history of mass landslides (Benda 1990; Phillips 1998: 271), windstorms (ibid.: 248), and catastrophic wildfires (ibid.: 7), all but guarantee the destruction of hundreds or thousands of the nearly 6,000 research polygons at a time. These changes take place in a matter of a few hours or days, and such events typically occur several times on the Elliott during the course of a century. A research design based on thousands of polygons cannot persist, given this history and likely future.

In addition to the impractical timeframe, the triad concept is being tested at the scale of small watersheds, whereas in Pacific Northwest (PNW) forests it is typically applied at the level of large landscapes. This scale mismatch can undermine the credibility of the results, as the production, integrated, and conservation elements of the triad are usually represented by large-scale land uses such as fiber farms, federal forests, and large reserved forest areas .

A third concern is practical utility of the research findings. The triad design was mostly constructed by OSU on the basis of "Six Guiding Principles," of which Principle 5 states (DSL 2024: 4-2):

> "The scope and relevance of the research program are intended to contribute scientific knowledge about forest ecosystems and management of value to practices and policy at local, statewide, national, and global levels. While the ESRF is located on state public land along the Oregon Coast, it is capable of advancing management and research of much wider public interest and value."

Franklin's critique highlights the lack of practical value for other forested lands, particularly private ones, in the triad research design proposed in the OSU FMP (OSU 2021: 117):

> ". . . the whole notion that you are doing a meaningful test of the TRIAD concept is nonsense. You are trying to test it at the wrong scale. TRIAD in the PNW forests is occurring at the level of large landscapes, not small watersheds . . .
>
> "Personally, I think you need to start all over beginning with a truly long-term perspective on the potential of the property and an examination of what research will benefit the people (and forests) of the PNW both in the short and long term."

In a sentence, DSL -- working with an OSU theoretical research design intended to be implemented by a Land Grant University created for the purpose of conducting applied research for the use of Oregon residents and agencies -- decided the highest and best use for Oregon's first State Forest -- which was specifically created solely for the purpose of funding Oregon public schools -- was to instead focus on the "most pressing problems to face humanity." These problems somehow includes carbon sequestration, "biodiversity," and "ecosystem services" among those pressing needs (OSU 2021: 116).

Finally, in addition to a debatable research design unlikely to persist over time and of little apparent practical value to Oregon's state and private forestland managers, there is the issue of cost. This topic is not addressed in the DSL FMP but was spelled out in the OSU proposal -- which gives the total start-up cost as being $34.8 million over three years' time, including: Research Facilities ($17 million); Working Capital ($10 million); Research Plots and Inventory ($3 million); Monitoring Equipment for carbon, streams, wildlife, and recreation ($4.3 million); and 15 vehicles at $34,000 each (OSU 2021: 31-32).

Based on the 2021 proposal, the total annual cost to maintain the triad research design is approximately $7.8 million (ibid.: 4), covering both forest management and research operations. The DSL FMP emphasizes the need for ongoing financial evaluations and startup funding but

doesn't provide a single total annual cost figure; instead, asterisks are substituted in place of actual dollar amounts for generating the needed budget (e.g., DSL 2024: 2-20): "Revenue modeled from the ESRF's approach to timber harvest is anticipated to be *** / year after costs have been netted out."

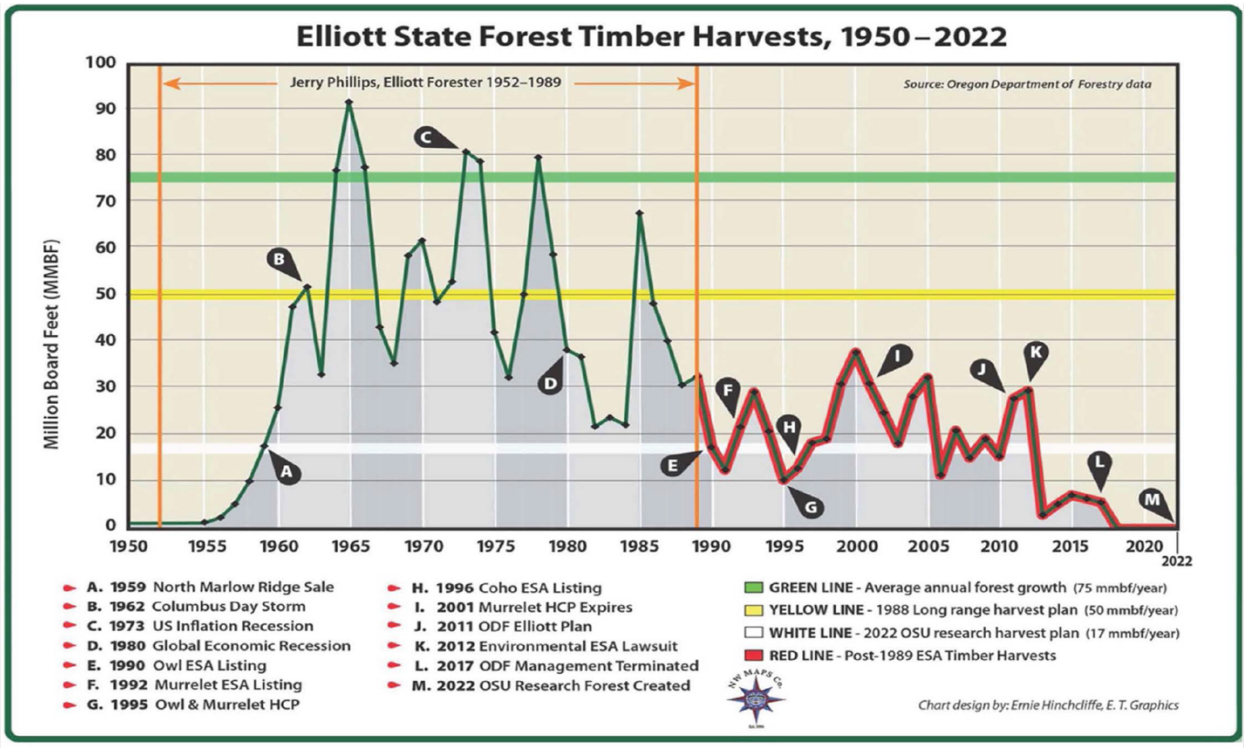
In sum, according to Franklin (ibid.: 116-117):

> "We are going to be surprised . . . taking what will be your major research property and committing it all to an experiment of any kind along with committing all of the financial resources necessary to sustain it is not – to use a kind word – prudent.
>
> ". . . And, as I noted initially, I don't consider an experiment about how to divide forest landscapes at any scale among production and conservation goals to be a high priority in our current world . . . . There are so many important things to be done and this is not one of them.
>
> ". . . I have probably said more than I needed to at this point. It is your proposal. I do not think that it does credit to the institution or yourselves; you can do much better than this."

4. Habitat Conservation Plans (HCP) Modeling

The first HCP (Habitat Conservation Plan) on the Elliott was adopted in 1995. It had taken more than four years to develop and was in response to threats of anti-logging lawsuits by environmental organizations based on federal listings of spotted owls and marbled murrelets by the Endangered Species Act (Phillips 1998: 354-364).

The stated purpose of the HCP was to allow continued timber sales on the State Forest to benefit the Common School Fund, as required by law, and to provide needed jobs and income for local communities while providing "critical habitat" for targeted ESA species. This chart, compiled directly from official Oregon Department of Forestry (ODF) annual reports, shows that the ESA listings and subsequent HCP adoption resulted in a reduction of nearly half of the Elliott's historical 50 mmbf/year sales to only 25 mmbf/year. For the 20-year period from 1990 to 2010 this resulted in a loss of most profits earmarked for the Common School Fund and an estimated reduction of more than 200 local jobs (Zybach 2024a: 67-72; 97-119).



The Green Line represents average annual amount of growth of Elliott State Forest trees;
The Yellow Line represents average allowable cut for the Elliott in the 1988 harvest plan;
The White Line represents OSU's planned annual harvest of the Elliott w/ no snag salvage;
The Area between the Green Line and Red Line represents Elliott fuel increases since 1989.

The spotted owl was listed as "threatened" by the ESA in 1990 and the Elliott took immediate steps to reduce timber harvest levels (Phillips 1998: 348-351). In 1992, the marbled murrelet was also listed (Marshall 1998), and in 1995 the Elliott had its first HCP approved for the two birds (Phillips 1998: 359). In 1996, coho were added to the list (Zybach and Ice 1997: 281), and in 2001 the HCP on murrelets expired and ODF began planning for a new HCP (EcoTrust 2011: 12).

In 2011, ODF completed a forest management plan (ODF 2010) for the Elliott that was immediately challenged in court by Portland Audubon Society, Cascadia Wildlands, and the Center for Biological Diversity as being potentially harmful to marbled murrelets (Kruse, et al. 2012). By 2014 all logging was stopped on 28 different ODF sales, including more than 900 acres on the Elliott, and the environmental organizations received a settlement for an unknown amount and their lawyers were also paid.

The DSL draft FMP documents this loss of jobs and income and current efforts to obtain an HCP (DSL 2024: 1-6):

> "The ESRF Habitat Conservation Plan provides programmatic permit coverage under the Endangered Species Act for covered management and research activities over an 80-year term. This programmatic permit coverage is an intentional part of addressing federal legal compliance that has idled active management on the forest since roughly 2013."

Forsman (1976) studied spotted owls for his Masters degree under Chuck Meslow at OSU and Nelson (1986) studied marbled murrelets for her Masters degree under Chuck Meslow, also at OSU. These original findings were then combined with Franklin's study of old-growth Douglas fir (Franklin and Spies 1983) to create legal "critical habitat" definitions for the two birds, and thereby set the criteria for designing HCPs for the Elliott. These circumstances were referenced and discussed regarding the 1993 Elliott draft forest plan by Zybach (1994: 9):

> "Today's populations of native coastal birds have all descended from thousands of generations of animals that had to periodically adapt to vastly changed conditions time and time again. Their environment was never a sea of "steady-state" "climax stage", old-growth trees [ODF, 1993: ill-31], and never can be. Perhaps it was the process of adapting to periodic fire or wind-caused deforestations over the landscape that helped permit owls and murrelets to survive to the present."

Coho were first listed in 1996, but there is discussion as to whether these fish benefit more from sunlight (Zybach 1994: 3; Zybach 2024a: 14-17; 109-13), as with most fish, or are "very much affected by forest cover," along with steelhead (Zybach and Ice 1997: 295).

These animals have been written about extensively in both the academic press and in popular publications. Much of what has been written about spotted owls (Zybach 2024 a: 9-13, 73-78), marbled murrelets (ibid.: 44-49), and coho (ibid.: 14-17, 109-113) is specific to the Elliott. These findings strongly challenge the assertions regarding the need -- or even value -- of HCPs without some form of scientific assessment that is generated in the field, rather than on a computer.

5. Cultural Landscapes

A cultural landscape is defined as the visible appearance of the land as it has been affected by human activity over time. In precontact times, the present-day Elliott State Forest would have included tidewater fishing weirs (Byram 2002), riparian meadows and campsites (Rickard 1982: photos; Zybach 1994: 7), huckleberry fields (Minore 1972; Kronsberg et al. 2018: 41-43), and Indian foot trails along ridgelines and streams (Etzwiler et al. 2019: 4; Allen et al. 2020: 6-10).

During historical times, the dominant human changes to the Elliott's landscape have been the creation of 550 miles of roads and more than 40,000 acres of plantations. These developments and their histories have largely been documented by Phillips (1998) and Zybach (2024a). They are among the most valuable assets, both economically and culturally, across the Elliott's visible and visited landscapes. The roads and trails provide excellent management, recreational, research, safe, and educational access to all parts of the Elliott for all age groups (Allen et al. 2020). The industrial-style plantations, since 1962, were created specifically to achieve the greatest timber-based income for Oregon's Common School Fund (Phillips 1998: 27).

Significant cultural resources have been defined by the National Park Service as having potential historical significance at the age of 50 years (USDI 1995: 2). Therefore, using this measure, all of the Elliott's roads, trails, and plantations in existence before 1974 (Phillips 1998: 310) should be considered for active maintenance based on both their practical and potential historical and cultural values. As Phillips (ibid.: 27) noted when timber sales first began in the 1950s: "But the Elliott Forest had no road access -- only trails. Also, it was full of large, tall rotten snags -- a serious fire risk. So access roads were needed both for fire protection and for management use as a top priority."

The routes of Indian trails and pack trails that became transformed into logging roads were documented in early land surveys. Roads constructed by the Civilian Conservation Corps (CCC) in the 1930s are still in use, and cat roads on steep hillsides from the 1960s are likely never to be replicated again (Allen et al. 2020).

The Oregon Department of Forestry (ODF) contracted a literature review of potential significant cultural sites in 1997, in which four possible precontact sites were identified (Stepp 1998), along with nearly 50 historical sites already documented by Phillips (1998: 37-42). At present, no precontact sites and only two "European settler cemeteries" are being protected as "heritage sites" on the Elliott (DSL 2024: 1-44).

The DSL FMP makes no mention of restoring precontact landscapes or ethnobotanical vegetation patterns (Phillips 2016), maintaining historical logging roads or cat trails, or developing the four historic fire lookouts (Phillips 1998). However, there are multiple references to "restoration treatments" of plantations in the contiguous 27,000 acres of "Conservation Research Watersheds" (CRW) and other locations (DSL 2024: 7-20).

The term "restoration treatment" is used throughout the document but never clearly defined. It is unclear how that term is being used, but it seems unlikely the intent is to actually "restore" a past landscape condition. Conifer plantations were mostly established after the 1950s and were

unprecedented on the landscape before that time. Actual "restoration" to a previous condition would necessitate a clearcut or other stand-replacement event in order to return to -- or "restore" -- a desired condition that existed in precontact or early historical times (Zybach 1994: 3).

Rather than clearly defining terms such as "restoration treatment," "Indigenous Knowledge," or "decolonization," DSL uses them throughout the FMP with the apparent assumption that the reader understands those terms as the planners had intended. The absence of a Glossary* or clear definition of such terms in the text makes much of the document undecipherable or open to a wide number of possible interpretations. For example (DSL 2024: 6-31):

> "In this section, traditional definitions of restoration and conservation of ecological systems are framed through a sustainability lens and broadened to include the restoration of a whole socio-ecological system that coalesces conservation of habitat with conservation of cultural values and cultural resources."

Another problem with this type of writing is that it can conceal fabricated information and provide a false sense of support and observation that doesn't exist, possibly except for theoretical planning purposes. An example of invented cultural uses and values is provided by this statement (ibid.: 1-46):

> "Despite its recent history of clearcutting and conversion to timber plantations, the present-day members of these tribes continue to rely on the Elliott as a source of traditional foods and medicines. They continue to practice their culture and lifeways on these lands as best they can. They continue to possess and work to actively apply valuable Indigenous Knowledge related to the management of the Elliott that is built on millennia of experience practicing ecologically sustainable stewardship of these lands."

None of this is true. For the previous seven years, the authors have worked directly with Southwestern Oregon Community College (SWOCC) forestry students on the Elliott, including consultations with the CTCLUSI Tribal botanist (Phillips 2016) and use of her father's comprehensive Tribal history (Whereat 2010). These have been our best references to local Tribal occupation and uses of the Forest, and at no time has a single Tribal member been encountered on the Elliott or any claim made by any Tribal member of these assertions of cultural plant uses, spiritual visits, or special knowledge due to their ancestry.

Such blatant falsehoods seem odd at best and racially divisive at worst. After more than five years of "research" at the cost of millions of taxpayer dollars and hundreds of local jobs, OSU forest scientists and DSL reviewers have somehow substituted complete fabrications and a series of purposefully vague political terms as meaningful content in a supposed forest management plan (ibid.: 3-3):

> "The intent is to work closely with Tribal Nations, Indigenous Knowledge holders, and other sanctioned individuals or entities to decolonize research

> practices, co-steward forest resources, and co-generate applied research and educational opportunities on the Elliott State Research Forest.
>
> "Principle 1. Acknowledge the historical context of past injustice: genocide, ethnocide, and ecocide. Indigenous people, Nations, and Lands continue to suffer trauma from the violent legacy of colonization – we need to acknowledge this as part of our history and collective stories."

These references to local Tribes in the FMP have been shared with Wayne Knauf, a retired Berkeley-educated forester and registered Colville Tribal member who spent part of his childhood with relatives in western Oregon, as well as much of his successful career in forestry. His reaction to these types of statements is openly negative, both for reasons of forest management and the need for actual Tribal participation (personal correspondence July 2024):

> "If these people were serious about co-managing the Elliott with a local Tribe, they should share management decisions, financial information, and a portion of any profits with members. In addition, job training and employment opportunities should be extended to the Tribe, with the understanding that many of them have generations of ancestors who logged, fought fires, worked in sawmills, drove trucks, and planted trees. These skills and such employment should be promoted rather than discounted or avoided."

*Note: After this was written, and the absence of a Glossary also noted during a public meeting, a link was provided by DSL that attached to the OSU FMP Glossary (2023: 343-360) and a request made to offer suggestions for improvements. The three examples given in the text are listed below in bold with OSU definitions in italics and subsequent comments in standard type.

Decolonization: Neither this word nor "colonization" are listed in the Glossary.

Indigenous Knowledge (ibid.: 352):

> "Indigenous Knowledge (IK, which encompasses Traditional Ecological Knowledge and Indigenous Ecological Knowledge) is knowledge and practices passed from generation to generation informed by cultural memories, sensitivity to change, and values that include reciprocity (defined as taking with the moral responsibility of giving back in equal measure). IK observations are qualitative and quantitative and illustrate that objectivity/subjectivity is a false dichotomy in knowledge generation."

This definition was shared with Knauf, who said he had "no idea" what this definition is intended to say; that his experiences of being "informed by cultural memories" included scare stories of "Bigfoot" by his grandmother when he was a child on the Colville Reservation and stories his uncles told him while working on their four cattle ranches as a young man. Otherwise, his practical knowledge of forestry was gained as a student in Berkeley and his experiences working in the woods and with other foresters throughout his career (personal communication: July 30, 2024).

Another problem seems to be the assumption that people with Native American ancestry somehow share a universal belief and practices involving the concepts of "reciprocity" and "sensitivity." There is no reason to accept this idea, and there is no indication of what it means exactly or why -- or how -- this concept needs to be "braided with western science" for forest management purposes.

A more valuable perspective, to our way of thinking, is to substitute "local living memory" for "Indigenous Knowledge." On the Warm Springs and Colville Reservations, this would largely come from Tribal members who may have lived there for many generations. For the Elliott, this knowledge and expertise might best come from long-time residents and frequent visitors familiar with the landscape from Charleston to Florence and inland to the Coast Range crest. It is our opinion that these are likely the most knowledgeable and experienced forest workers, managers, and visitors to the Elliott and should be most involved in the planning process.

Restoration Treatment: Neither this phrase nor even the word "restoration" is in the Glossary. However, in the body of the DSL FMP (2024: 6-31), the following definition is given*:*

> "A diversity of seral stages will be sought through restoration that reflect emerging fire history data on the Elliott (see Appendix J) and support culturally important flora and fauna, Indigenous Knowledge, and educational accessibility."

"Appendix J" is discussed in the Wildfire Risk section of this review and Indigenous Knowledge is discussed above. "Seral stages" typically don't exist in the Douglas Fir Region (Heilman, et al. 1981), including the Elliott, where vegetation patterns are best described in terms of primary species, age classes, and volumes (Zybach 2018: 33). Such forested areas are dynamic and typically respond with even-aged populations of the principal species present prior to stand replacement events such as fire, windstorms, and clearcuts. The term "seral stages" has been derided for many years by knowledgeable forest scientists as existing "only because they are easy to teach" (Benjamin Stout, personal communications: 1994-2004).

6. Wildlife Habitat

Wildlife populations and habitats are dynamic and constantly changing. As a forested area burns, is buffeted by wind, snow, or ice storms, or subjected to landslides and flooding, logging or harvesting, hunting or fishing, and animal populations either adapt, relocate, or die. That process is well known and has been documented throughout historical time.

In the Elliott, principal changes during historical time have included catastrophic wildfires, windstorms, ice storms, landslides, snowstorms, hunting, fishing, trapping, logging, roadbuilding, and tree planting, among other changes. Another significant change has involved government regulations, the listing of spotted owls, marbled murrelets, and coho as "endangered species," and the related efforts to file lawsuits and create HCPs and "critical habitat" reserves (Phillips 1998; Zybach 2024a).

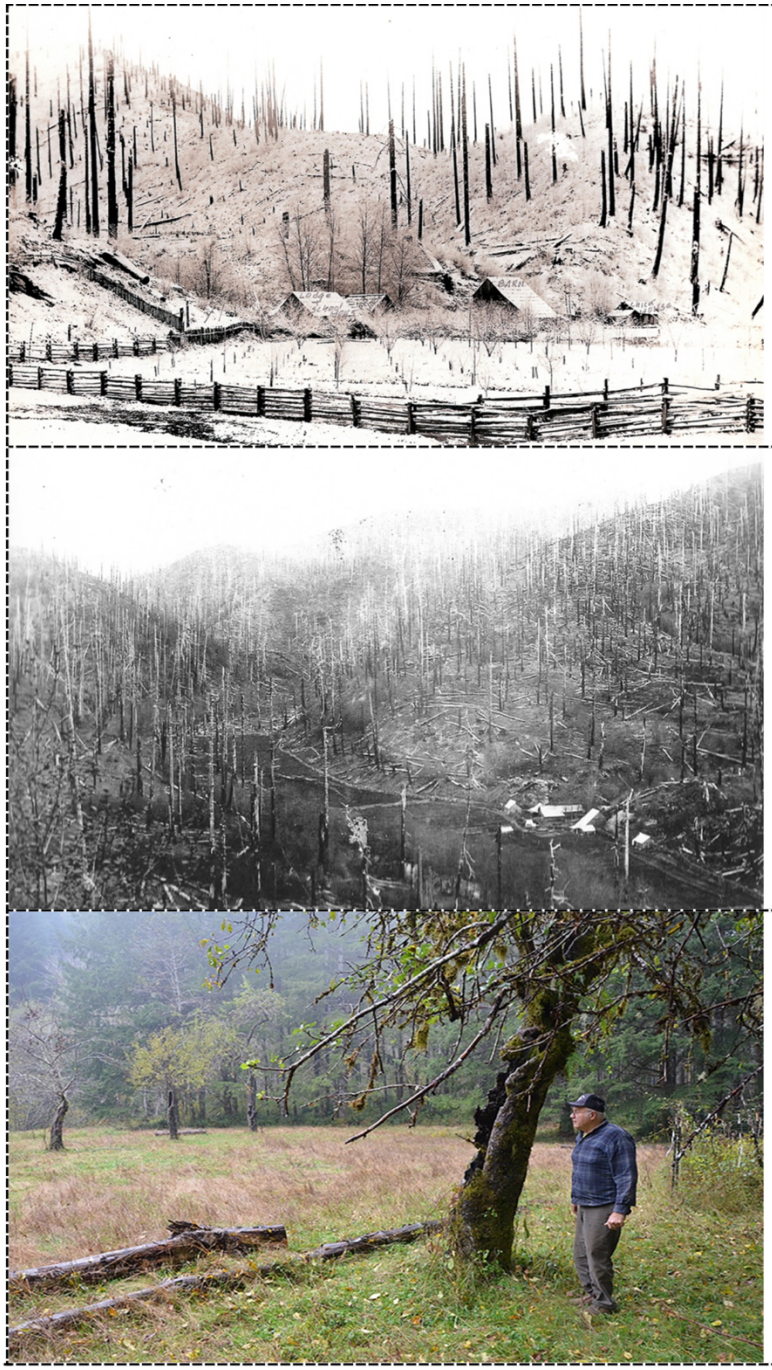
The primary problem with attempting to manage forest vegetation and animal populations with regulations that include 80-year and 100-year timeframes is that they can never be successfully completed. This is because of the dynamic nature of both forests and politics. Both have always continuously changed over time, and both will always continue to do so for as long as they exist. In our opinion, annual and decadal planning timeframes should first be considered for their more practical likelihoods and more successful histories.

In 1993 ODF attempted to implement a draft management plan that intended to do the same thing as the current FMP draft -- to dictate long-term static conditions for the Elliott with the rationale that researchers and planners knew what was best for targeted animals. This was the coordinated public response from professional forest managers (Zybach 1994: 9):

> "Today's populations of native coastal birds have all descended from thousands of generations of animals that had to periodically adapt to vastly changed conditions time and time again. Their environment was never a sea of "steady-state" "climax stage", old-growth trees (ODF, 1993: III-31), and never can be. Perhaps it was the process of adapting to periodic fire or wind-caused deforestations over the landscape that helped permit owls and murrelets to survive to the present. Should we then again adopt these processes into the environment? Perhaps even exaggerate their occurrence, in hopes of increasing depleted populations? Or can these effects be simply mimicked, with trees being cut and processed into human products, instead of simply burned and turned into hazardous events and mass air pollution?"

The proposed triad research design is discussed in greater detail in another section of this review, but it's 100-year timeframe is supposedly being adopted for wildlife habitat creations such as described here (DSL 2024: 9-43):

> "The Triad research design for the ESRF will allow researchers to test the current hypothesis posed in literature that creating “spatial-temporal heterogeneity in forest age and structure at landscape scales and retain mature forest trees with cavities are likely to benefit bats” (Frick et al. 2019)."

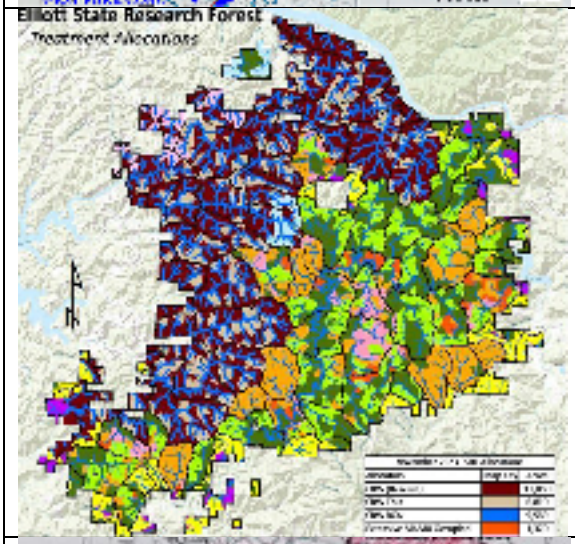
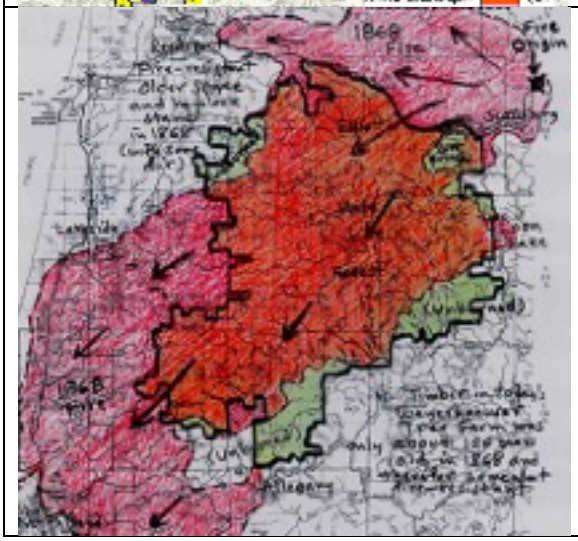


The Elkhorn Ranch, 1890-2017. [top] The Gould-McClay family ranch ca. 1890. It was located along the West Fork Millicoma River in the center of present-day Elliott State Forest. The fenced orchard was planted on an old Indian prairie. Notice the relative sizes and spacing of old-growth snags on the bench and in the draw with the second-growth snags and burned stobs along the hill and ridgeline. All show evidence of at least two fires, likely 1868 and 1879.

[middle] The Elkhorn Ranch, ca. 1890, from the southwest. At that time, about 140 years ago, most of the rest of the Oregon Coast Range was also covered with snags and young even-aged Douglas fir trees --and most flat and sloping riparian areas were still open, sunny meadows, lawns, and pastures that had been created and maintained by people for thousands of years. Coho were documented in great numbers, but whether owls or seabirds had adapted or relocated is unknown.

[bottom] David Gould and apple tree from his great-grandparents' orchard. The fenced rose behind him was near the front porch of the family home. A few trees remain from their 1880s planting, and the Indian prairie is still in strong evidence. (November 8, 2017 photo by Bob Zybach)

The photos and maps that illustrate this section of the review document the dynamic nature of the Elliott's history in comparison to the 100+ arbitrary polygons that have been integrated into the current FMP draft. The codependent HCP proposal has added another 9000 polygons to this mix, as stated during public hearings and meetings. However, of the approximately 83,000 acres of the Elliott, about 50% of the land, or 42,000 acres, has been transformed into conifer plantations following logging operations. This form of habitat is unprecedented in the history of the Elliott, as it is throughout much of the Douglas Fir Region following WW II clearcuts and reforestation.

	**The 2017 ORWW "Giesy Plan Alternative" proposal for the Elliott divided the landscape into 25 discrete polygons that are based on named creek subbasins. Each subbasin is distinctly different from the others, with entirely different soils, plants, animals, slopes, aspects, and vegetation patterns. For that reason alone it is impossible to establish statistically significant "controls" or to use random sampling in a research proposal. A "paired watershed" research design is preferred as a field tested and proven alternative (Giesy and Zybach 2017a: 5).**
	**OSU planners subdivided the 25 named subbasins into more than 120 sub-subbasin polygons but assigned them into only three different acronyms and then color-coded the results into four or five basic groups. Despite the apparent complexity of this process, management options were then reduced from 25 separate approaches to just five or six options. The purple block to the left, for example, was largely developed from old Indian prairies, pastures, failed and successful conifer plantations, and will pose an increasing wildfire risk to homes and towns to its west (DSL 2024: 4-23).**
	**Jerry Phillips used 1950s tree ring surveys to map the paths of the 1868 and 1879 Elliott wildfires, using a single red polygon to represent the 100,000-acre "Big Burn" in which the Elkhorn Ranch was located in the 1880s. This wildfire history is typical of the entire Douglas Fir Region: occasional catastrophic-scale fires that repeatedly burn through the snags and large woody debris from previous fires until replaced by even-aged stands of Douglas fir over about 90% of the area. These fires have taken place for thousands of years and wildlife has always had to adapt (Phillips 1998: 7).**

Most conifer plantations in the Elliott have resulted from planting thousands of Douglas fir seedlings throughout a logging or alder conversion unit on a grid, using typical 8-, 10-, or 12-foot spacing intervals and including preexisting pastures, meadows, and berry patches. The purpose of the plantations is to produce as much commercial fiber as possible for future harvests and income.

Successful plantations result in a contiguous canopy of Douglas fir saplings, which can greatly increase risk of stand replacement crown fires (Zybach 2024b: 98-100). Unsuccessful plantations have openings in the canopy created by poor quality stock or workmanship, dense shade created by competing native vegetation, or animal damage primarily created by people, elk, deer, bugs, rabbits, or mountain beaver ("boomer"); the latter of which were trapped by the thousands in order to stop them from eating Douglas fir seedlings (Phillips 1998: 278, 326, 345).

The result of a successful plantation is that all competing vegetation, including wildflowers, huckleberries, hazel, myrtle, and other food plants, are shaded out, providing little or no sustenance for native animals. A young, successful plantation soon becomes a very dark and quiet area in the absence of direct sunlight, songbirds, and most mammals. To "restore" a plantation to an earlier condition it is first necessary to remove the plantation, whether to recreate berry patches, campsites, skunk cabbage meadows, and open ridgelines and riparian meadows, or to mimic desired "wildlife habitat" conditions of past centuries.

The Elliott has more than 40,000 acres of failed and successful plantations that have attained, or will soon attain, commercial size and that can be economically transformed into desired conditions for future generations. This approach would create hundreds of long-term local jobs and hundreds of millions of dollars for Oregon schools and local communities -- and for the significant advantage of most local wildlife populations, including fish, owls, murrelets, game animals, and boomers. This option should be a primary consideration of any management plan, in our opinion, but is not included in the draft FMP.

7. Wildfire Risk

The history of the Elliott State Forest, apart from human use and occupation, has been largely shaped by catastrophic wildfires, landslides, and windstorms. These predictable events should be a significant focus of any long-term management plan: namely, "How to best respond following an event resulting in widespread deforestation and/or wildlife mortality?"

Windstorms and landslides (Benda 1990) are impossible to predict more than a few days in advance due to their weather-based nature. However, wildfires, which are mostly fuel-based, human-caused, and seasonal, can be moderated with vegetation management strategies that impact their predictability (Zybach 1994: 12). This has been observed and documented numerous times in western Oregon, where wildfires bordered by ridgeline or riparian roads, recent logging operations, or thinned stands drop from deadly crown fires to mostly beneficial ground fires (e.g., Phillips 1998: 27; Zybach 2024b: 116-118).

The FMP does not address practical responses to these types of events or mitigating strategies. Instead, it outlines a policy to not salvage highly flammable snags that develop through the forest (DSL 2024: 12-35) and proposes creating a 27,000-acre, 100-year "CRW" (Conservation Research Watersheds) along the ESRF's western boundary (ibid.: 4-11). These approaches will likely lead to massive fuel build-ups, increasing the likelihood of wildfires driven by east winds that could threaten homes and communities between Coos Bay and Reedsport (Phillips 1998: 92; Zybach 2024a: 102-108).

Additionally, the FMP calls for the artificial creation of more snags despite their recognized flammability and historical role in worsening wildfires: "Create snags and downed wood of various sizes and decay classes to encourage habitat heterogeneity and wildlife diversity" (DSL 2024: 6-36). These creations, coupled with other naturally occurring snags, further elevate wildfire risk and severity (ibid.: 12-35):

> "Under the longer (100-year average) return intervals in Extensive research treatments, native tree insects and diseases can be expected to infest a percentage of trees, which could then decline and eventually die to become snags. This will provide opportunities to increase diversity in stand structure and wildlife habitat during harvests by leaving such trees in place."

Despite these fuel accumulation strategies, the FMP states that: "wildfire is the principal disturbance process that shapes the structure, composition, and dynamics of forest landscapes over time in temperate forests in the Pacific Northwest," and therefore, "understanding fire and forest dynamics is thus critical to long-term management and conservation planning" (ibid.: 12-3). The FMP description further notes:

> "However, datasets that describe the size, frequency, and severity of historical wildfires and how these fires influenced forest conditions and dynamics across landscapes are lacking. Thus, our understanding of the historical fire regime, which includes traditional burning by Indigenous Peoples, is still evolving in the Coast Range and in other Douglas- fir forests in the PNW."

This statement is a complete fabrication. The fact that it continues to be used despite the FMP authors having been presented clear evidence to the contrary on several occasion is very concerning. Millions of dollars and more than five years have been spent on this draft plan by DSL and by forest scientists employed by OSU College of Forestry, yet this misleading rationale for poor scholarship somehow persists.

A simple Google Search would have addressed this serious shortcoming and revealed the apparent anti-management political bias of the FMP; but rather than doing an actual literature review or consulting directly with known experts on this topic, OSU and DSL elected to use an outdated and disproven computer model and a student tree ring study instead (ibid.: 4-31). The reasoning behind this continued misdirection can only be considered for political reasons and directly undermines the claims and public promotions of conducting objective "research" of value to other forest managers and ownerships (e.g., ibid.: 1-6, 6-16).

For the past 40 years Phillips (1998) and Zybach (1994; 2018; 2024b) have been widely recognized as experts on the fire history of the Elliott. For nearly seven years before Phillips' death in 2022 (Zybach 2024a: 96-101), the two coordinated with ORWW and other local experts to work directly with Southwestern Oregon Community College (SWOCC) forestry students to document the history and conduct recreational research on the Elliott (ibid.: 56-61; e.g., Kronsberg, et al. 2018).

These collaborative efforts resulted in approximately 30 documented field trips, more than a dozen educational YouTube videos, two comprehensive ORWW Elliott websites, 25 hours of recorded and transcribed on-site oral histories, hundreds of relevant PDF files, and more than two dozen student reports—all of which are not mentioned in the FMP and all of which readily illustrate the seriously inadequate fire history research and analysis that has gone into this draft plan.

In 1993, ODF used a wildfire computer model to inform its Elliott management draft plan at that time (ODF 1993). The theoretical "fire cycle" model used by ODF showed a "fire interval" of 150 years on the Elliott, which was subsequently thoroughly discredited by documentary evidence (Zybach 1994: 7-8). Despite the proven lack of historical accuracy and related relevance of such perspectives, 30 years later, the 2024 DSL FMP employed additional theoretical statistics to drive an even more inaccurate "FSim Large Fire Simulator," which then predicted a highly unrealistic "558-year fire return interval" for the Elliott (DSL 2024: 12-5):

> "However, it should be noted that accurately predicting wildfire probability for the coastal Oregon ecoregion is challenging because fires have been infrequent since the late 19th century, so data on past occurrence is sparse. Dye et al. (2023) projected future burn probabilities for western Oregon using the FSim Large Fire Simulator (USDA Forest Service 2023a) to simulate wildfire ignition and spread under projected future climates. Simulation is driven with future projections of energy release component (ERC) for the mid-21st century (2035-2064) under RCP8.5 emissions scenario derived from downscaled global climate models (GCM). To build the projections, the FSim model simulates thousands of

> plausible fire seasons. For each day in each year ignitions are stochastically generated, and the growth and behavior of resulting wildfires are simulated as they burn across the landscape. Output is compared to a historical baseline to show how fire activity may change in the future as climate change effects intensify.
>
> "For the ESRF, annual burn probability is projected to almost double by mid-century. Specifically, the chance in any given year of a large wildfire burning across the ESRF would increase from 0.179% during the historical baseline (1992- 2020; 558-year fire return interval) to a projected 0.339% by mid-century (2035-2064; 295-year fire return interval)."

This appears to be little more than academic gobbledygook and should have no place in a useful forest management plan or an FMP draft and could have reasonably been removed before being included in a public document. The actual history of major wildfires in the Oregon Coast Range (e.g., Impara 1997) -- including the Elliott, -- is that they are almost entirely caused by people. This is because lightning is very rare in the Coast Range and is almost always accompanied by drenching rains when it does occur (Kirkpatrick 1952: 33; Zybach 2018: 20-23).

Tree ring studies by Graumlich (1987), Fritts, and Shao (Bradley and Jones 1995: 269-295) were used in combination with The Palmer Drought Index for "Oregon Zone 1" to derive a common pattern of drought for the region, including the Elliott, for the specific years of 1717, 1721, 1739, 1839, 1899, 1929, and 1973 (Zybach 2018: 209). Prolonged regional droughts were recorded for at least two decades per century during the 1760s, 1790s, 1840s, 1860s, 1920s, and 1930; with the latter two decades being the driest of the past 300+ years (ibid.: 209).

Detailed tree ring studies were also used by Smyth (2000) and Phillips (1998) in combination with oral histories (Gould 2019) to determine the age classes and fire histories of the Elliott and the adjacent Weyerhaeuser "Millicoma Tree Farm" in the 1940s and '50s. More than 200,000 acres of contiguous native Douglas fir forests were systematically cored and analyzed by trained foresters; 125,000+ acres on Weyerhaeuser lands (Smyth 2000) and about 75,000 acres on the Elliott (Phillips 1998). Neither forest had ever been logged by that time, and about 90% of both were covered with even-aged stands of native Douglas fir (Morris 1934: 314; Munger 1940: 451; Zybach 2024a: 39-43).

About 35,000 acres (less than 20%) of these lands were considered "old-growth," averaging 225 years-old and documenting at least three major fires from 1565, when the oldest trees were measured, to 1755; more than 60,000 acres were considered "mature second-growth" and dating at least two major fires from 1755 to 1790; about 75,000 acres -- mostly on the Elliott -- were 40 to 60-year old even-aged immature second-growth, dating to major fires in the 1770s, 1840s, 1868, and 1879; and the remaining "very lightly timbered" 35,000 acres -- mostly on Weyerhaeuser -- with even-aged stands 10-40-years-old, dating from the 1902 fires through 1936 (ibid.: 39-43).

These 200,000+ acres of virgin Douglas fir forestland during WW II reflected a minimum of 10—and likely more—major wildfires from 1565 to 1936, or on average, a major wildfire every 35-40 years. These lands were subsequently actively managed, have supported more than three

generations of hundreds of local families, and haven't had a major fire in more than 80 years (Gould 2019: 1-5; Zybach 2024a: 79-84).

Due to the Elliott's proximity to the ocean and its climate of coastal fogs, frequent showers, cool temperatures, and heavy seasonal precipitation, almost every major fire on record has started in the hot summer months of July or August and continued until heavy fall rains in late September or October. The other eight or nine months of the year are usually too wet for fires to go wild (Zybach 2018: 23-25). An exception is an east wind, which has driven all of the catastrophic-scale coastal wildfires in the past 200+ years and can occasionally drive wildfires during any month in which they occur for sustained periods of time (ibid.: 32, 189, 277).

These facts were not clearly recognized in the FMP and not addressed as a result. In our opinion, the failure of the FMP to accurately present or consider the documented fire history of the Elliott is a strong indication of the inability of this proposed plan to be successfully implemented, consistently funded, and/or completed.

There are several citations of an "Appendix J" throughout the text of the FMP, particularly in the portions related to wildfire, but no actual Appendix. This is an apparent reference to Appendix J in the 2023 OSU ESRF FMP, which primarily constitutes a single tree ring study, a summary of regional fire history theories, and the "LANDFIRE 2023" computerized "fire return interval" model (OSU 2023: 418, 420):

> "The application of an infrequent, high-severity fire regime to moist Douglas-fir forests was influenced by extensive high-severity fires in the 19th and early 20th century in Oregon and Washington (Tepley 2010) including the 1868 fire on the ESRF (Phillips 1997). Aside from some limited evidence of at least one other fire between 1881 to 1893, it has been tacitly assumed by western science that fire has otherwise not played a significant role in stand development on the ESRF (Biosystems et al. 2003, Oregon DSL, and ODF 2011) . . .
>
> "An infrequent 350-year fire return interval is estimated for most of the ESRF (LANDFIRE 2023), but this estimate is not based on direct and annually precise evidence of historical fires."

The Appendix J tree ring study included 14 sample sites inside of clearcuts in close proximity to the Elliott, including four locations within the Elliott, "but 3 sites had to be shifted due to limited road access or to limit disturbances to marbled murrelets" (ibid.: 421). No indication is provided as to why a bird that lives in the ocean and is said to only need "old-growth habitat" for the few weeks it nests in early summer would be disturbed by someone counting tree rings in a clearcut, but this is one more indication of the superficial and cursory research methods that have gone into the portions of the FMP dealing with wildfire risk and mitigation.

Given the significant time and financial investments, these examples do not inspire confidence in the FMP or its proponents' ability to conduct meaningful research beneficial to others.

9. Climate Change

The phrase "climate change" appears more than 100 times in the FMP and is promoted as a significant and dangerous reality that needs to be addressed from both a management perspective and a research approach that can inform others. One problem with this concern is the Elliott's position adjacent to the Pacific Ocean, which greatly modifies the local climate and is not representative of most of the Douglas Fir Region (Taylor and Hannan 1999: ix, 7-41; Taylor and Hatton: xii, 7-37).

Another problem is that many scientists do not think the climate is actually changing in an abnormal or adverse way. And even if it does, most plants and animals -- especially people -- will either adjust, migrate, or else go extinct, like always. The large majority of scientists in both camps (e.g., CO2 Coalition; Climate Etc.) seem to agree that 1) CO2 emissions and forest carbon sequestration have no measurable effect on global temperature estimates or climate; and 2) additional CO2 in the atmosphere is probably beneficial in terms of food production and forestland expansion.

The Elliott is located along the central Oregon Coast, which has among the mildest temperatures and foggiest, windiest, rainiest, and cloudiest climates in both Oregon and all of the western US, and mostly because of its proximity to the Pacific. According to Hansen (1947: 47):

> "That part of the area lying west of the Cascades has a milder climate than that of any other section of the continent in the same latitude. Some localities on the west slope of the Coast Range and Olympic Mountains have the heaviest annual precipitation in the country . . ."

Hansen's pioneer regional pollen studies included at least two key research sites a few miles west of the Elliott, between Coos Bay and Florence. These sites show evidence of local Douglas fir presence for at least 13,000 years (Hansen 1941; 1943; Zybach 2018: 30-33; 49-51). This finding is in contrast to the more dynamic regional research and revealed this climate pattern (Hansen 1947: 116):

> "On the coastal strip adjacent to the Pacific Ocean there is little indication of a climate drier and warmer than the present at any time during the Postglacial. The marine influence has moderated the climate and the available moisture has probably never been a limiting factor."

In the face of this long-established and accepted research regarding the historical and current weather and climate of the western Coast Range, the FMP has adopted a political decision to manage the Elliott for "increased carbon sequestration," and conduct research on topics named "climate-adapted forestry" and “carbon and forest-management dynamics." This work would be funded, at least in part, by selling "carbon credits" (DSL 2024: 1-6):

> "In addition, this FMP intentionally addresses forest management in the context of growing pressures related to climate change and disturbance. The FMP connects to the State’s Climate Change and Carbon Plan and related policies

> advanced by the State's Board of Forestry, including through increased carbon sequestration on the forest, related demonstrations and research on climate-adapted forestry, carbon and forest-management dynamics, wildfire and disturbance dynamics, and integration with a voluntary project for the sale of carbon credits."

It is not surprising that this intention to sell carbon credits in lieu of selling timber is touted as important research that is "not only atypical of plans for managed forests, it may be unprecedented," as if that were a positive consideration. And further: "unlike typical plans . . . these activities will occur in the context of scientific research relevant not just to current western science, but the future shape of that science as informed by Indigenous Knowledge and other ways of knowing" (ibid.: 1-7).

In sum, the climate of the Elliott State Forest is atypical for almost all of the US in that it has been generally stable and predictable for thousands of years; and during which times lodgepole pine, Douglas fir, hemlock, and spruce have all been the dominant form of forest vegetation. There is no indication that these circumstances will change in the foreseeable future, and yet DSL plans to sell carbon credits and conduct costly carbon sequestration research because of "climate change."

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