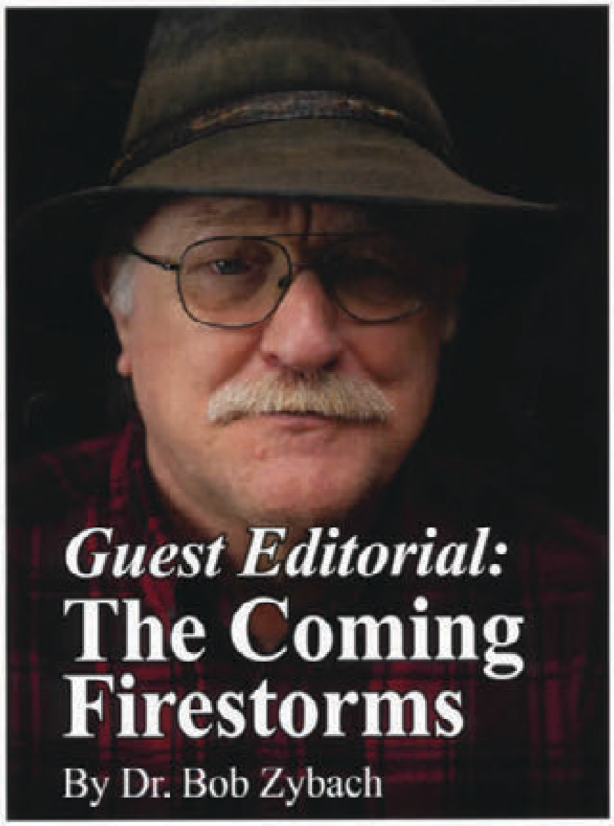

Guest Editorial: The Coming Firestorms

By Dr. Bob Zybach

The most deadly, destructive, and widespread catastrophic-scale forest fires in Oregon's history erupted on Labor Day 2020, driven by strong east winds.

Unless we change how our national and state forests are managed, these events will be just one more chapter in this age of predictable, increasing, and ever-greater firestorms.

I've spent my career studying forest fires and forest health. In a 2018 Daily Caller interview, a few weeks before the California Camp Fire destroyed the town of Paradise, I said: "You take away logging, grazing and maintenance, and you get firebombs." Then someone took my quote, put it on a forest fire photo, and posted it from the ruins of Paradise. The resulting meme quickly went viral on Facebook.

This September, Facebook began flagging this post as "partly false" because my quote, and related interview, didn't mention climate change. That is because my documented predictions, based on significant research and personal experience, do not consider changing climate, in order to be accurate.

The broad arc of Oregon's fire history explains why this year's catastrophic wildfires have converted our public forests into unprecedented firebombs. What were once green trees filled with water, have now become massive stands of pitchy, air-dried firewood.

For thousands of years ancestral Indian families kept ridgeline and riparian areas open for travel, hunting, fishing, and harvesting purposes. They cleared ground fuels by constant firewood gathering, root harvesting, and seasonal fires.

These actions created widespread systematic firebreaks in a beautiful landscape characterized by foot trails, grass prairies, southern balds, huckleberry fields, camas meadows, oak savannah, and islands of mostly even-aged conifers.

Following the historic 1910 firestorms, the US Forest Service established a nationwide network of fire lookouts and pack trails backed up by rapid response fire suppression. This system became remarkably effective over time.

From 1952 until 1987, for 35 years, only one forest fire in all of western Oregon was greater than 10,000 acres: the 1966 43,000-acre Oxbow Fire in Lane County.

But since 1987, the past 34 years, Oregon has had more than 30 such fires, with several larger than 100,000 acres.

The 2020 Labor Day Fires alone covered more than one million acres, destroyed over 4,000 homes, caused 40,000 emergency evacuations, killed millions of wild animals, and thickly blanketed the state with an acrid, unsightly and unhealthy smoke for nearly two weeks.

What changed to cause this dramatic increase in catastrophic wildfire frequency and severity?

The problems began in the 1960s, with apparently well-intentioned national efforts to create large untouchable wilderness areas and cleaner air and water on our public lands.

The single biggest turning point in how public forests are managed happened on December 22, 1969: about 50 lawyers in Washington, DC created the Environmental Law Institute, and a short distance away Congress simultaneously passed the National Environmental Protection Act (NEPA).

Next, the 1973 Endangered Species Act (ESA) and the 1980 Equal Access to Justice Act (EAJA) provided the growing environmental law industry with a way to be paid by the government for challenging nearly every attempt to log or actively manage public forests.

By the 1980s, the artificial creation of Habitat Conservation Plans ("HCPs") and the listing of spotted owls as an Endangered Species laid the groundwork for today's fires.

The 1994 Clinton Plan for Northwest Forests might have been the final nail in the coffin. The subsequent never-ending environmental lawsuits, new Wilderness areas and HCP creations, access road decommissionings, and fruitless public planning exercises have created tens of millions of acres of massive fuel build-ups and "let it burn" policies that have decimated our forests and wildlife.

A predicted result has been ever larger western Oregon forest fires. More than 90% of these large and catastrophic scale fires have taken place in federal forestlands, which represent almost 60% of all Oregon's forested areas.

Even if, like Facebook executives, you believe these fires were somehow sparked by climate change, you should be very concerned with what will happen next.

Lessons from the 1902-1929 Yacolt Fires, 1933-1951 "Six-Year Jinx" Tillamook Fires, and the 1987-2018 Kalmiopsis Wilderness Fires are clear: unless removed, the dead trees resulting from these fires will fuel even greater and more severe future fires.

The 2020 fire-killed trees should be strategically mapped, sold, and harvested ASAP, before they further deteriorate in value and increase in risk. Prices for Douglas fir logs are at record highs, and there is great current need for good-paying rural jobs and local building materials.

It will be interesting to see if we can learn from Oregon's fire history and take the prompt, decisive actions needed to avoid the clearly predictable coming firestorms.

Bob Zybach has been Program Manager for educational nonprofit www.ORWW.org since 1996. He is author of The Great Fires: Indian Burning and Catastrophic Forest Fire Patterns of the Oregon Coast Range, 1491-1951.

Use of Fire History in the Development of the 1993 Elliott State Forest Management Plan Draft

By
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February 14, 1994

Prepared For
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Oregon Forest Industries Council
Associated Oregon Industries
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Introduction

This review of the Elliott State Forest Draft Plan ("the plan") has been completed under written contract for the State Timber Purchasers Division of the Oregon Forest Industries Council (OFIC) at the request of its director, Greg Miller.

In particular, OFIC requested:

1. An analysis of Oregon Department of Forestry's (ODF) "use of *fire history* for developing their recommended alternative," Strategy 6;
2. A description of "how the *natural fire cycle* has shaped" the Elliott State Forest;
3. An assessment, based upon consideration of the plan's given fire cycles and fire history, of any *"potential for shorter rotations* to obtain the *same wildlife objectives* (owls and murrelets)" given in Strategy 6.

The following discussion outline was used to address the three OFIC requests:

A. Current forest structure and 300-year fire history of the Elliott State Forest.
B. Definition of "natural fire cycle."
C. Forest fires, human population rates, and wildlife habitat dynamics.
D. Historical environments, ESA strategies, and coastal bird populations.
E. Catastrophic fire history, forest productivity, and log income potentials.
F. Conclusions.

The text of the discussion outline is contained in the following pages. Based upon an interpretation of this material, a brief conclusion to each of the OFIC questions can be summarized:

———ODF apparently did not use the 1770 to 1951 fire history described by Phillips in its development of plan alternatives, including the preferred "Strategy 6." Rather, a 150-year fire cycle model— generally ascribed to Agee—seems to have been used, in part to help justify a recent change in management focus from timber production to maintenance and creation of older forest types and conditions. *A fire history perspective would have allowed for far greater latitude in the spatial and temporal designing of logging plans, wildlife habitat creation and maintenance strategies, fire control options, and net income production.*

———The "natural fire cycle" of the Elliott supposes a mathematical predictive model that is biased against human activity (including logging, burning, and road building) and toward "average" decadent stand conditions, numerous older trees, and random lightning strikes. The result of using fire cycle models for planning purposes remains controversial. The "shaping" of Elliott State Forest by fire can be better characterized *historically,* as *the result of a long-term series of botanical responses to constant human disturbances caused by daily and seasonal fires of varying degree and intensity.* This has resulted in an extensive stand of young, even-aged Douglas-fir trees that has persisted for over 120 years; it is quite possible similar vegetation patterns have existed for similar lengths of time in this area during the past few thousand years.

———If the "wildlife objectives" in Strategy 6 are interpreted to mean population maintenance or increase over time, *the mobility of owls and murrelets and their proven resiliency to catastrophic fires would indicate that historical rates of clearcutting can probably be maintained indefinitely* (but past fragmentation caused by this practice should probably be mitigated first); If the "wildlife objectives" are to simply create or maintain certain structural stand characteristics ("desired or required" habitat) within the forest, then these human definitions of desired future conditions would include (and require) a Strategy 6-type approach. The difference in these two positions is the difference between mathematical projections based upon perceived "averages" and interpretive projections based upon documented evidence of disturbance and resilient recovery.

A. Current forest structure and 300-year fire history of the Elliott State Forest.

The Elliott State Forest is approximately 93,000 acres in size, of which about 90% burned in the 1868 Millicoma Fire. This fire killed over 300,000 acres of trees in a few weeks, and is considered one of *the "Great Fires" of Oregon Coast Range history—catastrophic fires of great intensity that covered hundreds of thousands of acres of forestland at a time.* often in a matter of only a few hours or days [Zybach, 1988]. By 1900, most of the burn had reforested to stands of 10 to 30-year old Douglas-fir trees. By 1922, many of these stands were "eight to twelve inches in diameter on the stump" [ODF, 1993: I-5]. Today, the Elliott contains about two billion feet of mature timber, the majority of which is contained in the 100-120 year old stands resulting from the 1868 fire. In the past twenty years over one billion feet of timber has been logged from about 36,000 acres of these fire-established trees [ODF, 1993: I-7]; these last numbers represent about 40% of the forest's total area, but less than 33% of the commercial timber volume that has grown since 1900 (or maybe even 1925).

The fire history of the Elliott is well presented in the plan by the acknowledged expert on the topic, Jerry Phillips. *The question is: how that history was used (if at all) in the development of the preferred alternative.* A clear set of assumptions in the plan is that: 1) long-term school income; 2) general forest health; 3) native biodiversity; 4) spotted owl and marbled murrelet populations; and 5) anadromous fish runs; can all be maintained or improved by attempting to mimic *"natural patterns"* [ODF, 1993: III-28]. Because those patterns—as clearly described and mapped by Phillips [ODF, 1993: I-2-5]—*were primarily a function of forest fire history,* we can look there first for the information needed to best identify and describe the processes and populations considered to be "natural" and desirable to the planning area.

1694. 300 years ago the area that is now the Elliott State Forest was growing many of the fuels that were consumed in the 1770, 1840, and 1868 fires mapped by Phillips. Few of these trees were ever logged. This point in time was nearly four or five human generations before the first European influences began affecting local people, plants, and animal populations. *The forests at that time must have most nearly approximated the "naturally functioning ecosystems" envisioned by government wildlife biologists and old-growth ecologists today.*

What information is available to tell us of environmental conditions at that time? Probably the six best (cheap and accessable) sources are the stumps, snags, and trees remaining on the forest from seedlings established before 1694; the General Land Office (GLO) original land survey notes from the mid-1800s; the rings of bored trees and sound stumps and snags; the timber cruises of the State Forester and his staff between 1915 and 1955; living memory (especially focused oral histories); and photographs (both aerial and terrestrial). The diameter, distribution, and species of the forest's oldest known trees and stands (and their documented remains) can then be sytematically mapped using these sources of information. According to the plan [ODF, 1993: I-3], the 300,000 acre fire of 1868 included 10 to 100-year old stands created after the 1840 and 1770 fires, but "some of [the trees in the area of the fire were] estimated to have been about 300 years old." Were all of the snags measured for age created by the 1868 fire, or could they have resulted from the 1840 or 1770 fires? Or from some other event entirely? The variety and extent of those 300 year old trees need to be known before too strong a commitment is made toward managing for their perceived structural characteristics [ODF, 1993: III-31] over too large an area .

It is reasonable to assume that *most (perhaps as much as 90 or 95%) of the Elliott may have been even-aged stands of juvenile and second growth Douglas-fir 125 years of age and younger in 1694.* That would be very similar—with the exception of the "cookie cutter" design of many post-World War II clearcuts—to the structural and biological forest conditions that exist today. Such an assumtption could be based on the following facts:

1) the 1868 fire was able to burn 90% of the current area of the Elliott [ODF, 1993: I-3];

2) the oldest known stands were then apparently about 300 years old (i.e.; created about 1568);

3) the current land base supports 97% of the acreage in juvenile (also, "precommercial" or "reprod"—between one and about 30 years of age) and second growth (younger than 180 to 220 years of age) stands of Douglas-fir; and

4) portions of the 1770 and 1840 fires also occurred within the current planning bounds (it is possible—and even likely—that the primary fuels of the earlier fires also dated to about 1568, or later).

1770. *Phillip's discovery and mapping of the 1770 Coos fire is significant for the evidence it provides of Indian-caused forest fires that precede European and American contact* [Zybach, 1988: Appendix B: 15-21]. The boundaries of this fire are, due to age, only approximate. The fire seems to have been started by the harvesting and maintenance of an Indian prairie complex along the Umpqua and/or Coquille, Coos, and Millicoma Rivers, although Kalapuyan burning in the Umpqua basin seems the likeliest possibility. The significance of this fire is that it could not have been started by white explorers, settlers or loggers; and that it was probably not started "naturally," (by lightning, volcanic eruption, or some other non-human method) either. So far as currently possible, it seems to demonstrate the probability that the aboriginal human populations of the Oregon Coast Range—and particularly the Kalapuyan families that lived along the eastern rivers of the range— were capabable of starting forest fires that occasionally killed hundreds of thousands of acres of trees at a time.

The existence of this fire also indicates that the "natural pattern" of the western slope of the Oregon Coast Range may have been dominated by nearly solid canopies of even-aged stands of mostly Douglas-fir, stretching from the narrow Pacific fog belt of pine, spruce and hemlock on the west, to the vast oak and grass savannahs of the eastern part of the range. This cover would be mottled and bounded with strips and patches of even-aged alder (becoming more common along marshes, seeps, creeks, and landslides to the west), scattered prairie complexes (concentrated along the edges of estuaries, rivers, and large creeks), meadows (flats, ridgelines, and southern slopes), balds (peaks), and berry patches, and by large areas of snags, burned ground, and/or juvenile Douglas-fir trees (often located to the southwest of the prairies and meadows; a likely combination of seasonal fires and seasonal east winds).

1840. In 1840, missionary Gustavus Hines made an eyewitness account of a forest fire taking place to the immediate northeast of the Elliott, near present-day Elkton. His account is remarkable for four reasons: first, it seems to be the first historical record available regarding a forest fire in the Oregon Coast Range; second, it clearly demonstrates the potential for Indian campfires or prairie fires along the eastern boundary of the Coast Range to enter the forests to the west; third, *this event seems to herald the beginning of three decades of catastrophic forest fires in western Oregon, peaking in 1849-50, and again in 1867-68;* and finally, this account seems to confirm Phillip's research, including the general direction of the fire, which seems to have started west of present-day Eugene, and traveled southwesterly into the area of the Elliott. This is also the same basic pattern (northeast to the southwest) that is known for the other Great Fires of the Coast Range [Zybach, 1988: 26-28], precisely as Phillips has mapped the 1770 and 1868 events. Because the 1840 journals of Hines are not well-known today, and because they tie in so well with Phillip's research on the Elliott, I have included a somewhat more detailed account than might otherwise seem necessary:

Hines kept a journal of his entire stay as a Methodist missionary in Oregon, later turning the results into a popular and well-known book. In 1840 he travelled with a fellow missionary, Jason Lee, from their religious community near present-day Salem, to a community of Indian families near present-day Reedsport. They traveled south with pack animals, crossing the Willamette River after several miles and joining the established "California Trail" on a southwesterly course toward present-day Elkton. The California Trail was a pack animal and livestock route between British

Fort Vancouver and the beaver, cattle, and horses of the Mexican Sacramento Valley. It was constructed by the British Hudson's Bay Company (HBC) and the American Smith, Jackson, & Sublette Co. beaver hunting expeditions of 1826, 1828, 1829 and 1830. Portions of the route are still followed today by parts of I-5, Highway 99W, and Territorial Road.

> Friday August 21, 1840 After traveling about twenty miles over a rolling country, presenting almost every variety of scenery, we halted for dinner on a small stream called "Bridge river," [HBC name for Smith River since 1828, at least. The river was possibly the Siuslaw, rather than the Smith] on account of a log bridge having been thrown across it, by some California party. This stream runs in a deep cut, and, but for the bridge, would have been difficult to cross. In the afternoon we passed over the mountain "La Beache." [these are the 1826 Elk Mountains of David Douglas; French Canadian trappers employed by the HBC called elk "la biche," as in Lake LaBish, near present-day Salem. Today we call this mountainous divide between the southern Willamette and northern Umpqua Valleys the Calapooia Mountains] which consists of a vast assemblage of hills thrown together in a wild confusion, and covered with a heavy forest of fir and cedar trees. The latter is the most stately and majestic timber of the kind that I have ever seen. Some of the trees are from ten to fifteen feet in diameter, and towering to an incredible height. On beholding them, one is reminded of the scripture account of the cedars of Lebanon. It required three hours to cross this mountain, and as we descended it to the south, we found the fire making sad havoc with the fine timber with which its sides were adorned. In some places it rages so hard along the trail, that it was quite difficult for us to pass; but, urging our way along, we arrived at sun down at Elk river, and camped on a beautiful plain on its south bank [near present-day Drain, Oregon; according to local resident Gerald Bacon in 1987, this was possibly a grazing area known as "tin pot" to early stock drivers].

After a week of preaching and singing to the Indian families along the lower Umpqua (near present-day Reedsport), Hines and Lee made their return:

> Monday September 1, 1840. . . . In the afternoon, we again passed over the Elk mountain [see "La Beache" mountain note above], and found that the fire was still raging with increasing violence. A vast quantity of the large fir and cedar timber, had been burned down, and in some places the trail was so blockaded with fallen trees, that it was almost impossible to proceed; while now and then we passed a giant cedar, or a mammoth fir, through whose trunk the fire had made a passage, and was still flaming like an oven. Every few moments these majestic spars would come "cracking, crashing, and thundering" to the ground; but while the fire was thus robbing the mountain of its glory, we pushed on over its desolated ridges, and at sun-down arrived on a little prairie at its base, where we made our encampment. Several times during the night we were awakened by the crash of the falling timber, on the mountain, which sometimes produced a noise similar to that of distant thunder.

1868. Phillips has traced the original source of ignition of this event to a settler's clearing fire in the Greenacres area near Scottsburg. His assertion that the fire seems to have mostly occurred in 250 to 300 year old stands of Douglas-fir is based upon his personal identification and measurement of several representative snags and trees within the fire's boundary [personal communication: April 1, 1988]. *Fires were widespread throughout the Douglas-fir Region in 1868,* with an even larger fire complex, the 350,000 to 600,000 acre Yaquina Burn occuring a few miles to the north of the Coos Fire during the same fire season. There were several sources of ignition to the Yaquina Fire, all of them also believed to be human [Zybach, 1988: 100-121].

> . . . records of precipitation at the mouth of the Columbia show 1868 to have had the driest June, July, August, and September in a 58-year period of record for the station. Similarly these months at Vancouver, Washington, were second only to 1866 in having the least rainfall during a 72-year period. [Morris, 1934: 332]

1883. In addition to 1840, another fire year that is poorly documented is 1883. In his first Annual Report as Oregon State Forester, Lynn Cronemiller, describing a portion of the newly-named Elliott State Forest [1930: 20], wrote that: *"The fire of 1868 was undoubtedly extremely severe, for there are very few snags standing in the area,* indicating that practically all the trees were consumed." If it seems unlikely that large, green trees could have entirely vaporized in a single fire, no matter how hot, there is some support for Cronemiller's conjecture. In 1845, an early explorer and journalist named Joel Palmer [1983: 93], for instance, noted that:

> Along the coast from Cape Lookout to the 42d Parallel there is much land that can be cultivated; and even the mountains, when cleared of the heavy bodies of timber with which they are clothed, will be good farming land. There is so much pitch in the timber that it burns very freely; sometimes a green standing tree set on fire will all be consumed; so that it is altogether a mistaken idea that the timber lands of the country can never be cultivated.

At least three other possibilities would seem more likely to explain Cronemiller's observation:

1) that the area had been subjected to repeated cultural fires through time, and therefore did not have a stand of large trees at the time of the 1868 fire (probably the most likely);

2) that the area had burned earlier (possibly during the 1840 fire), and therefore dead, pitchy snags provided a highly—and almost completely—combustable fuel for the 1868 flames;

3) that the area had burned at least one additional time (with an effect similar to the second possibility) between 1868 and Cronemiller's report.

In support of the latter speculation, there are many contemporary references to fires along the Oregon Coast in the 1880's. During the 1883 U.S. Coast and Geodetic Survey that began on August 11 at the mouth of the Umpqua River (about 6 miles west of the Elliott), for instance, it was noted that: *"At the beginning of the season dense smoke from the many forest fires raging along the coast materially impeded the progress of the work . . ."* [1883: 58].

1896. In the 1890s the record of fire in the Elliott becomes much clearer, mostly due to the making and saving of photographs from that time. The photograph on the following page, for instance, shows an 1896 view of the Elkhorn Ranch hunting lodge, an important part of the cultural history of the Elliott. The lodge was owned by the Gould family, who gave this picture to Jerry Phillips sometime before the late 1980s. *The partial results of the 1868 fire are evident in this picture, as is evidence of the presettlelemnt forest and of the current forest.* The Goulds ran sheep, and this may have had the effect of preventing ladder fuels from developing around the base of these snags, and therefore helping to prevent a re-burning of the land, as occured in the 1868 Yaquina Fire, the 1902 Yacolt Fire, and the 1933, 1939, 1945, and 1951 Tillamook Fires.

Another important question: *Was the primary function of these snags in past times as wildlife habitat, or as ephemeral fuels?*

1910. Widespread and deadly catastrophic forest fires in 1902 and 1910 combined with a widespread national fear of an eminent "timber famine" to directly result in a number of local, statewide, and national efforts to "prevent forest fires." This effort initially resulted in the creation of several county fire districts and a focus for the newly-developed state and federal forester's budgets, culminating—at least symbolically—with the creation of Smokey the Bear in the late 1940s. These local and national efforts seem to have been effective (particularly when combined with earlier fire boundaries, clearcuting, broadcast burning, brush control, and road building efforts) in reducing the number and extent of forest fires in the Coast Range. *It could be argued that the advanced age of many of today's trees in the Elliott can trace their existence to grazing practices and fire suppression policies enacted between the late 1800s and the early 1950s.*

1896 view of the Elkhorn Ranch. The partial results of the 1868 fire are evident in this picture, as is evidence of the presettlelemnt forest and of the current forest: *Was the primary function of these snags in past times as wildlife habitat, or as ephemeral fuels?*

B. Definition of "natural fire cycle."

A basic conceptual difference separates two schools of forest history: those who think that only "natural" fires started by nonhuman methods (usually lightning—but also volcanic eruptions, spontaeous combustion, friction, etc.) help define our forests, and those who think that it is "only natural" that people set fires. Throughout the Douglas-fir Region, including Elliott State Forest, historical documentation strongly confirms the latter position and discounts the former. This evidence—in the forms of living memory, tree rings, photographs, maps, etc.— supports the idea that *we live in a forested environment that has been far more affected by human fires over the past several centuries (and probably millennia) than fires from all other causes combined.*

The plan clearly acknowledges that "fire is a basic element that shapes the forest ecosystem." Agee (1991) is quoted as saying that "there is no evidence that [Indians] purposely burned upland forests such as the Elliott," and it is thus concluded that *"wildfires started by lightning* have affected forests in the Elliott area for thousands of years" (ODF, 1993: III-50, emphasis added). Although this conclusion might have some merit, it is unlikely that lightning fires have had anywhere near the influence of human fires, or that "wildfires" even existed at all before European American settlement ("wildfire" in commercial forest areas is a European concept based upon fire suppression practices and, as such, could only exist since the arrival and imposition of European values—less than 200 years ago). Finally, there is no historical record of even a single significant forest fire in the Coast Range that was started by lightning [Zybach, 1988: 31-32]. All of the coast's historical "Great Fires" of the past few centuries have had documented—or highly suspected—human sources of ignition.

It is apparently assumed that because Agee thinks that "no evidence" exists to document local people *purposely burning upland forests*, therefore, lightning did. This reasoning is then extended further to arrive at the cyclic equation that "replacement fires burned through the Elliott area on the average of once every 150 years" (ODF, 1993:III-50; the actual quote says *"fire history studies* suggest that replacement fires burned . . . every 150 years," but Phillip's fire history research details fires through much of the area in 1770, 1840, and 1868—about *once every 50 years* in prehistoric and early historic times). In addition, there are lots of records of purposeful upland forest burning by indigenous people in southwest Oregon [Zybach, 1988: 33 -42]. Besides, whether a timber trespass, fire, or personal injury is "on purpose" or "by accident" is irrelevent—the result is the same and the cause is still "human."

In both prehistoric and historic times, families have existed and moved in systematic fashion across the western Oregon landscape. Thousands of cooking and heating fires have been used daily for thousands of years in the vicinity of Elliott State Forest. On a seasonal basis, people have burned brackenfern, cured tarweed, and cleared forest debris over thousands of acres annually during spring and fall burning seasons. Seasonal east winds, extended periods of drought, a rolling topography, and some of the fastest and largest growing fuels on the planet have combined with these widespread and constant sources of ignition to produce our current forests of fire-dependent and fire-resistant plants. These patterns of plants and cultural fires over time have formed the primary habitat for native wildlife in this region since the first arrival of human hunters and settlers, at least 11,000 years ago.

Because "fire cycle" models are based upon an assumption of random points of ignition and randomly spaced catastrophic events (while people use fire in regular, predictable, and systematic patterns), such models cannot be used to either predict a known past or plan a desired future—at least for most of the forests of the Douglas-fir Region. The historic intervention of people into this area meant that fire was introduced *periodically* (on both daily and seasonal schedules) into the environment for the first time. The difference for local forests was that, rather than evolving through possible *cycles* of predictable conditions (including catastrophic stand replacement fires and various "seral stages"), the tendency has been toward a resilient repopulation of areas periodically burned by fire. As conditions change (a constant series of interrelated processes), the size, shape, appearance, and populations of the forest changes. And, as the forest changes, the timing, size, shape, appearance, and intensity of the fires that periodically enter the forest bounds also change.

A similar, but somewhat different, viewpoint is shared by Pyne:

> The magnitude, character, and organization of these historical changes lead to the concept of a *fuel cyle*. And from this concept comes another, the *fire cycle*. As their names imply, for these concepts historical changes are considered to be regular and at least roughly periodic. In fact, they are neither. In general, only where humans intervene with fire and fuel management practices is there an approximate cycle or an apparent periodicity... The fuel cycle and fire cycle concepts are convenient ways to characterize the fact that fuels and fires have histories, but erroneous designations of how those histories evolve and interrelate. (Pyne 1984:103-106)

The significance of the differences between mathematical "fire cycles" and documented "forest histories" to the Elliott plan are critical. If endangered species populations have had to adapt to periodic catastrophic (100,000 acre and larger) forest fires in past centuries, will their long-term survival strategies require some form of return to those past conditions or processes? If so, clearcut logging, slashing, precommercial thinning, and broadcast burning should be considered as important tools in any effort to physically mimic known presettlement forest environments. If not, can "new forestry" practices (that define homogenized "presettlement landscapes" in statistical terms of 50-11-40 equations, snag recruitment strategies, coarse woody debris distribution patterns, and multilayered canopies on an ecosystem-scale basis) successfully mimic past conditions? Would such an effort necessarily result in larger populations of select bird and fish species (including ESA listings, game fish and animals, useful research species, and birds and insects favored for their grace, color, or beauty)? Or would the widespread adoption of these experimental practices create an increasingly volatile and deadly series of fire bombs, as some scientists and analysts suggest (Peterson, 1993: 2)?

The answers to these questions vary widely, depending upon how the historical record is interpreted, or whether statistical value-driven mathematical models are to be trusted. The lesson of history seems to be that we can clearcut, burn, and reforest with near impunity for long periods of time (consider the pasturing and plowing of Greece, Spain, China, or Switzerland). Computer-driven predictive models, on the other hand—based upon assumptions of fire cycles, seral stages, and climax vegetation—seem to say that if we continue clearcutting older trees we will accelerate the extinction process rate (with possible disastrous human consequences) for a number of "late -seral stage" wildlife populations.

C. Forest fires, human population rates, and wildlife habitat dynamics.

The history of catastrophic Oregon Coast Range forest fires is one of incredible, almost over-night changes to vast areas of the physical and biological environment. The Tillamook Fire of 1933, for instance, burned over 220,000 acres of forest in less than one day, sending a 43-mile wide mushroom cloud looming nine miles in the air over the Willamette valley [Zybach, 1982]. As with most other local forest fires of great size [including the 1840, 1868, and 1883 fires), the Tillamook fire occurred during the late summer/early fall east wind "fire season," long after the spring hatch of native birds had learned to fly and fend for themselves. How many birds were trapped in these fires? Or, did birds (and other predators, including humans) flock to the great burns that traced the aftermath of these events, picking off injured and starving rodents, insects, and other exposed prey by the millions? Did the survivors learn to adapt to second growth conditions, as current populations in the Elliott and Tillamook State Forests, and the Siuslaw National Forest,have learned to do? Or did they migrate to other areas and compete for mates and food and shelter with the populations already established in those places? The answers to these questions are very important if we expect to successfully manage for non-game coastal bird species in the years to come.

Today's populations of native coastal birds have all descended from thousands of generations of animals that had to periodically adapt to vastly changed condiiions 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?

It seems to be a matter of the most common sense that *the management of wildlife habitat and native species through time must be based upon established patterns of ecosystem dynamics if the management plan is to be successful.* This problem has been greatly exacerbated over the past several decades due to demands and changes brought about by great increases in local and global human populations. The demands of people upon all of the earth's resources must be seen as the fundamental problem challenging the future of the planet's wildlife populations at this time. The related roles of catastrophic fire, fire suppression activities, and clearcutting must be measured against the expanding *need* for forest products to meet the expanding number of human families being created daily. These human needs (fuel, water, food, shelter, recreation, etc.) are not only derived from forests, but by damming rivers for electricity, planting lawns and other exotic vegetation in our urban areas, growing food crops across great expanses of former prairie lands, and building great freeways of rapidly moving vehicles all across the former migration routes of buffalo, elk, grizzly bears, and antelope. Fire suppression and clearcutting actions have helped to support the increasing human constructions of the past century, but it is debateable how great their impact upon native wildlife habitat has been, compared to other impacts associated with human population growth. These factors need to be especially considered when dealing with flying, swimming, and migrating animals.

D. Historical environments, ESA strategies and coastal bird populations.

A primary concern of logging activities in the Elliott is the harm that might be done to spotted owl and marbled murrelet populations. It is worried that *"habitat removal may cause disturbance extensive enough to disrupt normal bahavior patterns," particularly as those actions might be interpreted through NEPA by the U.S. Fish and Wildlife Service* (USFW)[ODF, 1993: I -22]. The question then, is: What are the normal behavior patterns of these birds, given the Elliott forest's history of young second growth stands of Douglas-fir and over 30,000 acres of clearcutting in the past several decades? A second question is: how does the USFW "interpret" such "actions?" Would the conversion of these stands to an older condition that hasn't occurred for at least 120 years (several dozen bird generations) create an even greater "disruption of normal behavior patterns" than most other management options (including existing management trends)?

The 50-11-40 rule, snag recruitment strategies, and current riparian zone management guidelines all point toward the creation of an idealized, homogenized "old-growth characteristic" condition that has never occurred in the history of the Elliott. Even if the artificial creation of these conditions is physically possible (the 1770 and 1868 fires and the 1962 Columbus Day storm argue heavily against the possibility), *what evidence do we have that this effort will result in greater biodiversity or improve targeted bird populations?* And does any such "evidence" realistically reflect the proven mobility and adaptability of these animals?.

Assuming that the current information regarding the decline in spotted owl and marbled murrelet populations during the 1900s is accurate, how is it possible to tie this presumed decline to a decline in "old-growth?" particularly such "old-growth" conditions contained in the mature second growth stands of the Elliott? *In 1900 much of the current range of these animals consisted of hundreds of thousands of acres of burned snags and 10 to 50-year old even aged stands of Douglas-fir.* Animal grazing, agricultural fires, and federal fire suppression policies have resulted in many of the 1900-era stands continuing to exist to the present time. According to current popular wisdom, shouldn't the numbers of owls and murrelets and anadromous fish in these stands be measurably greater at this time?

In order to make effective long-term strategies for the maintenance of swimming and flying animal populations, it would seem that a regional consensus regarding the types and extent of such practices—and not just forestry practices— is needed. Even the most basic kinds of information is lacking: What is the record of these animals responses to catastrophic events in the past? Are these periodic "tests of rigor or viability" that these species need in order to retain their competitive advantage over other species? What role have introduced species played in this process? *What are the cumulative effects of human population growth, including industrial air pollution, urban lawn and park watering, highway construction, fencing, plowing, automobile use, and electrical power production on these animals?* How will riparian zone and tree age managment activities affect the over-all environment that these species exist in? The questions can't be answered by any one field of biology or any one forest plan.

Until we begin to better understand the complexity of what we're trying to do with our ESA strategies (apparently the goal is to stop the extinction process at virtually all costs), it would be safest—at least from an historical perspective—to not make sudden deviations from proven policies and activities: *These should be social decisions, not forestry decisions.* The costs of these decisions will be borne by millions of people not yet living: how will they view our (*society's*, not forestry's) decisions regarding these animals? Costly and quixotic? Or too little, too late?

E. Catastrophic fire history, forest productivity, and log income potentials.

It is important to remember that *the Elliott's contribution to coastal native wildlife habitat for the past 120 years has been a generally uniform, 80,000 acre, nearly even-aged, nearly pure, stand of young Douglas-fir trees.* This is a characteristic pattern for much of the western Coast Range, and one to which our animal populations have adapted over the past several thousand years.

The history of forest fires and reforestation in the Elliott portray an extremely productive and resilient environment for the growing of trees. The 1868 fire tells us, for instance, that *it should be possible to clearcut about 90% of the forest (over 80,000 acres) at one time—riparian zones and all—without an appreciable loss of productivity.* This claim is supported by the elimination of riparian vegetation thought to have occurred with the 1868 fire [ODF 1993: III-11], current timber production site class ratings [ODF, 1993: III-67], and the existence of current fish, owl, and murrelet populations. Such a clearcut, while unlikely to occur in a period of time less than several decades, might arguably result in measureable increases in native wildlife biodiversity, including birds, flowers, butterflies, and large mammals.

Because the primary goal of the Elliott Forest is to raise money for Oregon schools, it seems unnecessary that logging schedules be reduced so dramatically in a second growth forest at this time; a time when the state's public schools are reportedly suffering from Measure 5 cutbacks and our timber prices are at astronomically high levels (<u>over 500 times higher</u> than the first state timber sales of only forty years ago). At the least, it seems as if *"natural" conditions could be better obtained by integrating past clearcutting patterns into a better designed, more natural wind and fire-resistant pattern.* This type of planning could easily maintain the logging rates of the 1980s, take advantage of the sales prices of the 1990s, and rejuvenate the entire forest with a mosaic of wildlife habitat patterns that mimic the late 1500s and/or early 1700s.

F. Conclusions.

The outlined discussions on the previous pages were intended to provide a background to the more specific questions asked by OFIC. These questions are paraphrased below, followed by answers I believe can be supported by a current understanding of the Elliott's forest history.

1. How did the Oregon Department of Forestry use fire history for developing their recommended alternative?

ODF apparently did not use the 1770 to 1951 fire history described by Phillips in its development of plan alternatives, including Strategy 6. Rather, a 150-year *fire cycle model*—generally ascribed to Agee—seems to have been used to help justify a recent change in management focus from timber production to maintenance and creation of older forest conditions. If the available historical information had been used as the basis for regarding the Elliott's past and present, a much broader range of alternatives should have been developed for its possible and desired futures. *A fire history perspective would have allowed for far greater latitude in the spatial and temporal designing of logging plans, wildlife habitat creation and maintenance strategies, and net income production.* This conclusion is based upon a study of the general patterns and structural characteristics of forest wildlife habitat displayed over much of the western slope of the Oregon Coast Range during the past 300 years, by the demonstrated resiliency and productive capacity of the region's forest soils, and by the number and extent of its current wildlife populations.

2. How has the natural fire cycle shaped the Elliott State Forest?

The "natural fire cycle" of the Elliott supposes a mathematical predictive model that is biased against human activity (including logging, burning, and road building) and toward "average" decadent stand conditions, numerous older trees, and random lightning strikes. The principal problem with fire cycle models for planning uses is that they are based upon the faulty historical assumption that prehistoric families lived in an environment of big trees, uniformly-spaced snags, coarse woody debris, heavily shaded rivers and creeks, and randomly occuring forest fires. With fire cycle models, ecosystems function, snags are distributed, and random forest fires occur in an idealized, static, human-free environment in which homogenized mathematical patterns *(stages, averages, and cycles)* are used to represent past conditions, rather than the dynamic reality of documented fact *(history)*. The "shaping" of Elliott State Forest by fire can be better characterized *historically*, as *the result of a long-term series of botanical responses to constant human disturbances caused by daily and seasonal fires of varying degree and intensity.* The result has been an extensive stand of young, even-aged Douglas-fir trees that has persisted for over 120 years. Based upon a current understanding of the past three centuries of fire in the Elliott, it seems highly likely that a number of similar vegetation patterns have also existed for similar lengths of time in this same area during the past two to three thousand years.

3. Using an accepted fire history or fire cycle predictive model: What is the potential for shorter rotations to obtain the same wildlife objectives for spotted owls and marbled murrelets as given in the recommended alternative

If the "wildlife objectives" in Strategy 6 are interpreted to mean population maintenance or increase over time, *the mobility of owls and murrelets and their proven resiliency to catastrophic fires would indicate that historical rates of clearcutting can probably be maintained indefinitely* (but past fragmentation caused by this practice should probably be mitigated first); If the "wildlife objectives" are to simply create or maintain certain structural stand characteristics ("desired or required" habitat) within the forest, then these human definitions of desired future conditions would include (and require) a Strategy 6-type approach. Again, the difference in these two positions is the difference between *mathematical projections* based upon perceived *"averages"* and *interpretive projections* based upon documented *evidence* of disturbance and resilient recovery.

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