

OREGON **Fish & Wildlife** JOURNAL

Federal Land Management Policies Look Like This.

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What's INSIDE...

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OUR COVER

Federal Land Management Policies Look Like This.



View of destroyed Mount Scott fire lookout, August 2021. Photograph courtesy of Melvin Thornton, Douglas Forest Protective Association. See article on page 33.

PUBLISHER
EDITOR-IN-CHIEF
Cristy Rein

FORESTRY EDITOR
Mickey Bellman

ADVERTISING SALES/ADMINISTRATION
Amy Stucks

CONTENT CONTRIBUTORS

Cristy Rein, Dr. Bob Zybach, Mickey Bellman, OregonWatchdog.com, Karen Budd-Falen, Jeff Plew, Nick Smith, Healthy Forests, Healthy Communities, Tresa Finchum, Tom Sharp, Oregon Cattlemen's Association and Cam Ghostkeeper

We can be reached at (503) 657-6962
FAX (503) 657-3410 • P.O. Box 1325
Clackamas, Oregon 97015
email: RZPublish@aol.com

www.OregonFishAndWildlifeJournal.com

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The Snags of the North Umpqua: Part 1. Future Risks

By Bob Zybach, Ph.D

A snag is a dead, standing tree. When it falls to the ground it becomes a log. Snags can be created from living trees struck by lightning, killed by bugs or disease, purposefully girdled or poisoned by people, or burned in a fire. Once a snag is created, the question becomes whether to leave it standing, or turn it into a log.

In western Oregon the most common tree is a Douglas fir. It typically grows in vast stands of even-aged trees numbering dozens or hundreds per acre. Individual trees can grow and survive for centuries, even when the surrounding stands have been decimated by windstorms, floods, landslides, spot fires or other means. However, when a "crown fire" goes through a stand of Douglas fir, nearly all (or all) of the trees are killed and instantly become snags.

When they are living, Douglas fir are among the largest trees in the world and typically include massive amounts of water in their trunks, limbs, and needles.

When they die, the water evaporates and the great amount of pitch in these trees -- without water -- becomes far more flammable.

One result is that Douglas fir, when dried, makes great firewood: easy to start, burns hot and bright, but throws sparks. Another result is that large Douglas fir snags quickly become great, tall tubes of pitchy air-dried firewood, often capable of casting firebrands, cinders, sparks and smoldering duff a mile or more when being burned during a wildfire.

2020 Archie Creek Fire

The September 8, 2020 Labor Day Fires in western

Oregon burned nearly a million acres of land in a three-day period, killed 11 people, destroyed more than 4,000 homes,

polluted the air with toxic smoke for nearly two weeks and killed millions of native wildlife.

Of this amount, the Archie Creek Fire, along the North Umpqua River in Douglas County, was responsible for one human death, more than 150 people losing their homes, and over 131,000 acres, mostly forested, being burned. Due to its large size and rapid spread, mortality of native plants and animals approached 100% within much of the fire's perimeter (see Figures 1 and 2).

The Labor Day Fires exploded on strong east winds in western Oregon and took place from the California border to the Columbia River. Fuels included millions of snags from earlier fires, crowded mobile homes and trailer parks, Endangered Species Act (ESA) "critical habitat" designations, regulated streamside "buffers," roadless areas, industrial plantations, even-aged stands

of conifer old-growth (trees older than 200 years) and 2nd-growth (trees less than 200 years). The "even-aged" conifers, including snags and plantations, were mostly Douglas fir.

These fires, including the Archie Creek Fire, were typical of catastrophic-scale western US wildfires of the past 35 years in that they predictably began in, and grew from, federal lands (see Map 1 and Table 1), including: Wildernesses, National Forests, and Bureau of Land Management (BLM) range and timberlands.

They were atypical in that they also spread rapidly through thousands of acres of industrial timberlands, family



Photograph by Jeff McEnroe, Bureau of Land Management.

farms, recreational developments and rural communities (see Map 2).

Figure 3 is the view east and southeast of the historic Mount Scott Lookout, taken in August 1933. This lookout had been in operation since 1914 but was destroyed in the Archie Creek Fire. Figure 4 shows the same directional view from the same location, as taken by a “detection camera” in August 2021, magnified 1.5 times.

It is interesting to note that the second-growth trees in the 1933 photo that block the view of Chimney Rock, may have formed the old-growth snags in the 2021 photo, due to the poor growing conditions for Douglas fir on the east slope of Mount Scott. Of additional interest is the fact that these snags likely pose little future risk due to their remote setting, small size and wide spacing.

Risk of snags remaining on the landscape.

The risk of snags in the environment is well documented. Depending on their size, age, species and distribution, they pose a constant danger of burning in a wildfire. They can also cause death and serious injury when they fall, damage roads and buildings, host harmful insects and diseases and, to many people, are unsightly blemishes on the landscape.

Their greatest danger, though, is their flammability in a wildfire and the deadly and costly destruction that can directly result.

The “Six-Year Jinx” of 1933, 1939, 1945 and 1951 Tillamook Fires demonstrated how catastrophic-scale reburns can take place in western Oregon Douglas fir forests when snags



Figure 1. Satellite imagery of North Umpqua River basin and Local communities before Archie Creek Fire, August 2020. Image courtesy Mason, Bruce & Girard.

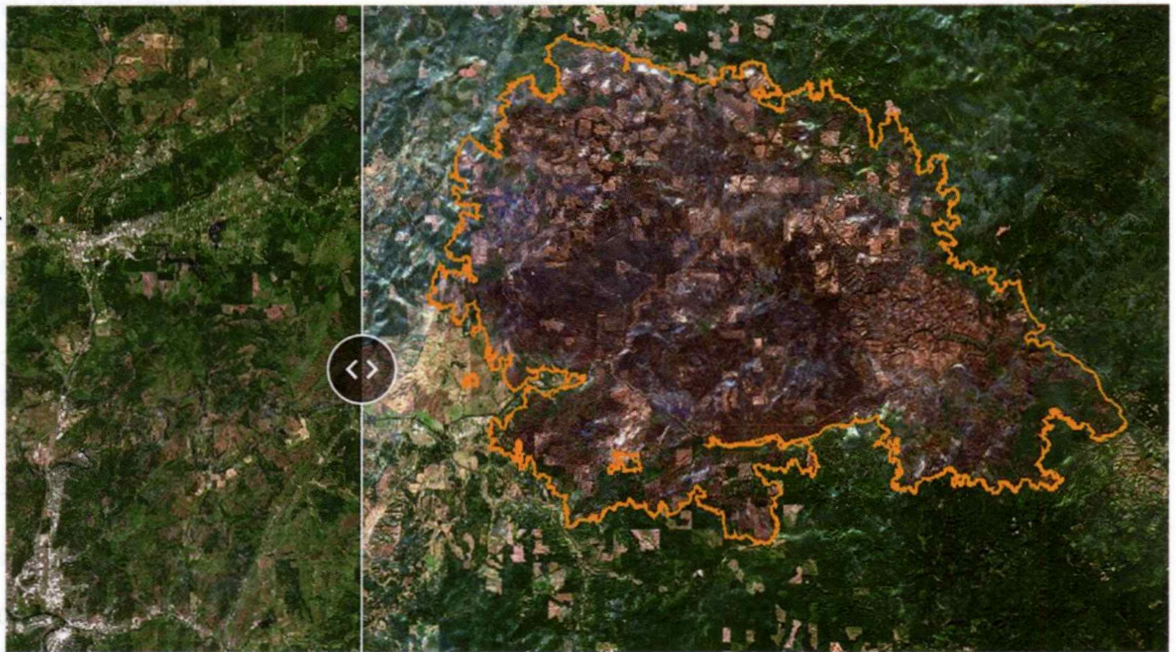


Figure 2. Satellite imagery of North Umpqua River basin following Archie Creek Fire, September 2020. Image courtesy Mason, Bruce & Girard.

are left in place. It wasn't until the resulting great “Tillamook Burn” had been salvage logged, systematic firebreaks created, and reforested with the help of Oregon schoolchildren that the fires stopped. The salvage logged and planted land is now a State Forest and hasn't burned in more than 70 years.

Another example is the Kalmiopsis Wilderness, in which

no harvesting, road maintenance, or reforestation has taken place for more than 50 years, and which burned and reburned in the 1987 Silver Complex, 2002 Biscuit, 2017 Chetco Bar and 2018 Klondike Fires. It remains to be seen if it will burn again, and when.

In Douglas fir forests the lesson is clear: if widespread snags are not removed or otherwise treated (typically by being felled and broadcast burned), they are almost certain to burn again -- and often hotter and over a larger area than the fires that initially created them.

Prior to the 2009 Williams Creek Fire, the area of the Archie Creek Fire was virtually snag-free. Highly detailed Osborne photographs taken from six separate fire lookouts in 1933 showed a vast landscape of mostly even-aged stands of old-growth and second-growth Douglas fir. Only the Mace Mountain Lookout photos showed a significant number of snags, and they were mostly gone by the 1950s.

Pat Skrip, District Manager, Douglas Forest Protective Association, has estimated it “might take 40 or 50 years” and “about four reburns or other events” for the Archie Creek snags to disappear from the landscape.

Jim Petersen, Evergreen Magazine, has phrased it this way: “Do we cut down our dead and dying trees and put them to good use or do we let Nature burn them down?”

Risk of snags starting and spreading wildfires.

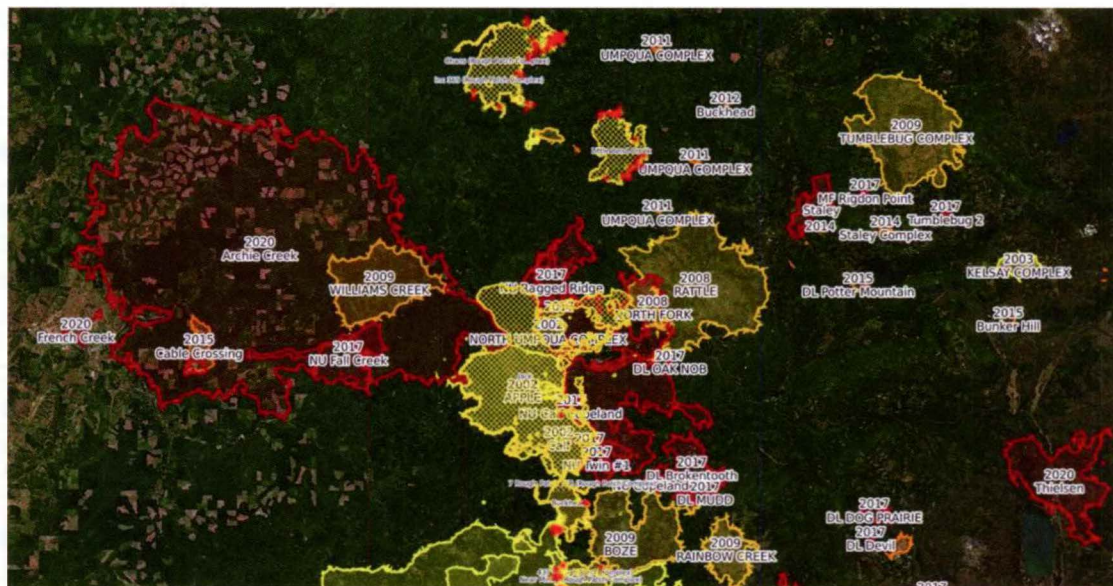
During historical time, virtually every major wildfire in western Oregon has been caused by people or by lightning. Dry lightning strikes typically occur on a seasonal basis in specific locations that can be predicted, but people use fire on a daily basis and fires can be set by careless smokers, campfires, motors, powerlines, arsonists or by other means, nearly everywhere on a year-round basis.

Due to the unusually heavy east winds, massive amounts of dry, pitchy fuels on public lands -- both snags and logs -- and several sources of human ignition, the Labor Day Fires (including Archie Creek) burned westward through the river valleys of the western Cascades like a blowtorch, even moving through the night and killing nearly everything in their paths. The presence of snags in this environment was almost invisible -- everything burned, snags included.

On the North Umpqua, heavy concentrations of snags remained from the 2009 Williams Creek, 2015 Cable Crossing, and 2017 Fall Creek Fires. The Williams Creek snags, in

particular, may have contributed to both the initial ignition of the Archie Creek Fire, and also to its rapid spread and intensity (see Map 2).

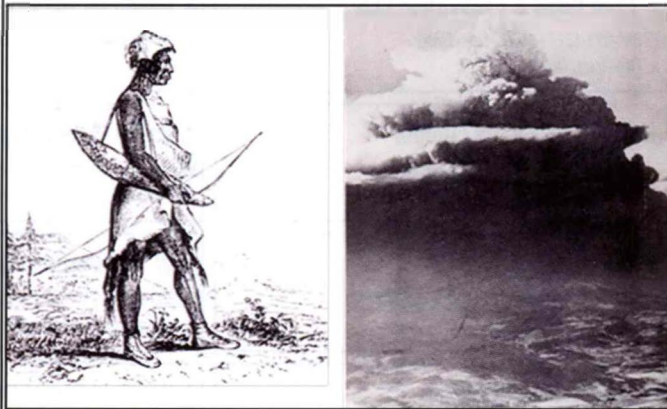
Burning snags can greatly increase the heat, spread and severity of a fire due to their height and flammability. Such



Map 1. Historical North Umpqua River Wildfires, 2002-2021.

fires can also create and increase their own weather patterns, including high winds, cumulus clouds, lightning, and even rain. Due to their height and with associated winds, firebrands from snags can spread more than a mile in advance of flames,

The Great Fires



Indian Burning and Catastrophic Forest Fire Patterns of the Oregon Coast Range 1491-1951

By Dr. Bob Zybach

Reprinting of Dr. Zybach's 2003 PhD dissertation. Includes: 364 pages, full text; 60 maps (47 color); 38 figures (17 color), and 26 tables.

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often creating spot fires where they land.

Melvin Thornton has reported “10-foot-long burning limbs” being carried 2,000 feet into the air by wildfire updrafts in western Oregon. He also reports that the 2017 Stouts Creek Fire in the South Umpqua River basin burned so hot and rapidly that its updrafts formed cumulus clouds and lightning -- which strikes were observed starting at least two additional wildfires.

Risk of snags to firefighters.

Attempts to manage or extinguish a wildfire are made many times more dangerous by the presence of burning snags. For this article I conferred with several experts on the topic, a number of whom, including Thornton and Skrip, have had significant professional experience working on the North Umpqua wildfires of the past 20 years.

Why many of these fires were not directly attacked from

Table 1. Historical North Umpqua River Wildfires, 2002-2021.

Year	Date	Wildfire Name	Acres	Snags	Ownerships	X
2002	0816	Apple	17,600	Yes	USDA NF	A
2008	0813	Rattle	19,800	Yes	USDA Wilderness	L
2009	0912	Boze	10,600	Yes	USDA NF	L
2009	0912	Rainbow	6,100	Yes	USDA NF	L
2009	0728	Williams Creek	8,400	Yes/No	USDA NF/Private	?
2015	0728	Cable Crossing	1,900	Yes/No	USDI BLM/Private	?
2017	0808	Fall Creek	4,800	Yes	USDA NF/USDI BLM	L
2017	0808	Happy Dog	31,400	Yes	USDA NF	L
2017	0808	Twin #1	1,400	Yes	USDA NF	L
2017	0808	Broketooth	3,700	Yes	USDA NF	L
2020	0908	Thielsen	9,800	Yes	USDA NF	P
2020	0908	Archie Creek	131,500	Yes/No	USDA/USDI/Private	P
2021	0705	Jack Creek	24,000 (+)	Yes/No	USDA NF	P
2021	0730	Chaos	25,400 (+)	Yes	USDA NF	L
2021	0730	Near Minky	4,900 (+)	Yes	USDA NF	L
2021	0730	Buckehead	6,900 (+)	Yes	USDA NF	L
2021	0730	Little Bend Creek	9,000 (+)	Yes	USDA Umpqua NF	L

Acres "(+)" = 2021 wildfires still burning as of September 15, 2021: final acreages unknown.

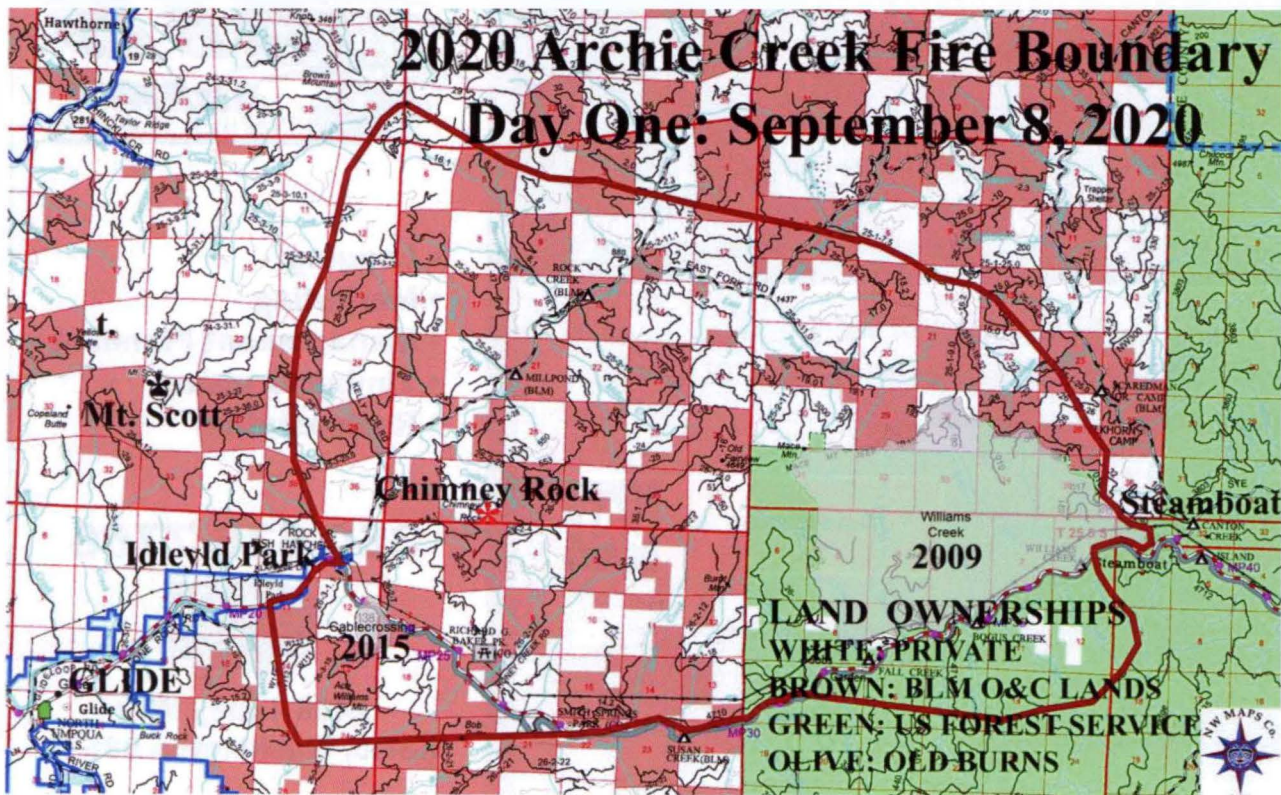
Snags: "Yes" = Fire starts and/or still remain; "No" = Pre-fire or post-fire salvage and/or felled.

X = Cause: "A" = Arson; "L" = Lightning; "P" = People; "?" = Unknown.

the air while they were still small has been a point of discussion in recent years. There have been instances in which personnel were too widespread to effectively administer to all fires at one time; others in which seemingly poor decisions were made not to jump; and others in which conditions were simply too dangerous -- including the presence of snags.

According to Chuck Sheley, retired smokejumper and

Map 2. Land Ownerships (private, BLM, US Forest Service) and snag concentrations burned during the first 24 hours of the Archie Creek Fire, September 8, 2020.



long-time editor of Smokejumper magazine: “Areas with dead snags are not jumped any more. They were definitely dangers during my era. Once you are on the ground and building fire-line, snags are very dangerous.”

Fire-fighting,

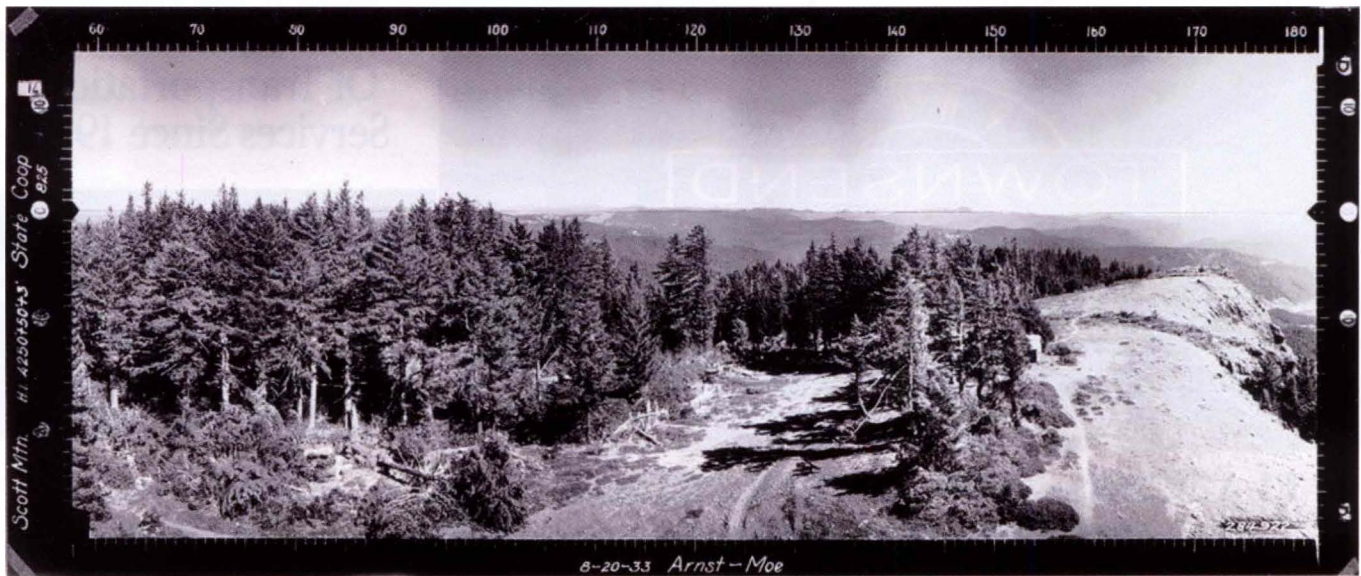


Figure 3. Osborne photograph, view east and southeast from Mount Scott fire lookout, by Albert Arnst and Lester Moe, August 20, 1933.

road clearance, hazard tree removal and other tasks associated with wildfire management and immediate post-fire repair are made significantly more hazardous in the presence of burning snags.

Figure 5 shows the older (and reburned) 2015 Cable Crossing Fire snags have mostly shed all of the limbs, twigs,

the next year or two they will likely shower burning limbs and embers into the winds, onto other fuels on the ground, and on anyone caught or working beneath them.

Risk of snags to residents.

The 2020 Labor Day Fires illustrated the real risk to rural residents and communities posed by the increasing numbers



Figure 4. View east and southeast from location of destroyed Mount Scott fire lookout. August 19, 2021. Photograph courtesy of Melvin Thornton, Douglas Forest Protective Association fire detection camera, 1.5x magnification.

tops, and needles that are still clearly evident on the more recent 2020 Archie Creek snags. If these latter snags burn in

and expansions of wildfires in western Oregon. More than 4,000 families lost their homes, 11 people died, and everyone

breathed toxic smoke for days and weeks.

The 2020 Archie Creek and 2021 Jack Fire evacuations clearly affected the communities of Glide, Idleld Park, Rock Creek and Steamboat. Snags remaining in these locations pose the greatest continuing threats to residents and their properties, both by burning and by falling. The smoke and ash from these fires created serious problems along the I-5 corridor, and particularly the greater communities of Roseburg and Sutherlin.

Risk of snags to travel and power corridors.

Following the direct threat to people and homes, wildfire risks must be considered in terms of safe evacuations, maintenance of highway transportation, and powerlines needed for water pumps and lights.

“Hazard tree” removals are well-recognized management



Figure 5. Snags remaining from the 2015 Cable Crossing Fire, December 2020. Within the red circle, note blackened trunks and missing bark, limbs, and fine fuels on the reburned snags in the foreground; and the evidence of salvaged snags (bare land) on private property in the background. Also note fine fuels on trees burned in Archie Creek Fire. Drone video-clip by Matt Hill, Douglas Timber Operators.

actions designed to remove dead or dying trees from major travel corridors and electrical lines -- but a more subtle threat



Figure 6. Streamside buffer snags following salvage logging on Rock Creek tributary, July 19, 2021. Video-clip by McKenzie Peters, NW Maps Co.

is posed by relatively recent regulations regarding “buffer strips” of untouched vegetation along our rivers and their

tributaries.

Figure 6, for example, shows a tributary to Rock Creek from a concrete bridge downstream from the “streamside buffer” that remains along its banks. This type of vegetation pattern has been shown to allow wildfire to readily cross streams; to easily uproot, as in the photo, causing siltation; and eventually fall and float downstream toward culverts, railways, bridges and highways.

Figure 5 illustrates the same problem as Figure 6, but at a different scale. What will happen to these large snags along the North Umpqua over the next few years? Will they be removed, and possibly sold, or will they be allowed to fall into the river and float downstream during winter floods? Or will they stand long enough to burn again?

Risk of snags to private properties.

Private properties are shown as White on Map 2. Most of these properties are industrial timberlands that have already -- within this first year -- been salvage logged and/or even planted, depending on their condition when they burned. Historically, industrial tree plantations have been mostly safe from wildfire, but tree farms in the Rock Creek basin are checkerboarded with square-mile, 640-acre (Brown) BLM Lands which may continue to contain large amounts of snags. In many cases BLM snags will likely fall or spread wildfire on to the adjacent private lands or access roads, which will remain a principal risk to these properties.

Risk of snags to wildlife.

Because snags have largely been salvaged from private lands or are in the process of being treated for reforestation purposes, snags will pose little risk to wildlife on those lands. Rather, the greatest risk to wildlife is on federal lands in which snags and other flammable materials -- such as fallen branches and trees, leaf litter, and exotic weeds -- are allowed to develop and remain (see Figure 7).

Risk of snags to recreation.

The large majority of campsites, trails, and other recreational developments affected by the Archie Creek Fire are on federal lands. Local residents and other visitors to these locations are threatened directly when dead limbs and trees or snags fall, and certainly during times of wildfire. One exception to this general circumstance are the public roads that connect the various O&C Lands. People traveling these routes for recreational purposes -- such as sight-seeing, hunting, camping, or fishing -- may also be endangered or inconvenienced by falling snags or during a wildfire.



Figure 7. Deer hunting was a major recreational use of public forestlands burned in the Archie Creek Fire. These photos were taken by Brook Pfaff, a faller for Lone Rock Timber Co. in September 2020 while clearing right-of-way to company lands in the Rock Creek Basin as the fire was dying down. Sadly, these tragic, painful deaths represent only a fraction of the millions of wild animals and hundreds of species killed in the first 48 hours of the Labor Day Fires on September 8-9, 2020. Animals able to fly or swim to deeper water mostly survived, but mortality of mammals, reptiles, amphibians, insects and fish in shallow waters was nearly 100%. Populations will rebound, but this result could have been prevented.

Part 1 Summary.

Beginning in 1987, and accelerating after 2002, the number of large-scale fires have increased dramatically on the North Umpqua, and particularly on Umpqua National Forest Land. Following the Archie Creek Fire, the USDA Rapid Assessment Team (RAT) noted:

“Over the past 20 years, 28% of the Umpqua has burned in wildfires, with the total acreage being higher due to several areas being burned two to three times over the past 20 years. Less than 1% of these past fires in total have been salvaged, with the majority of snag loss occurring along roadsides as danger tree mitigation to keep open public access. Therefore, snag abundance at the landscape level will likely be above the 80% tolerance level on the North Umpqua and Diamond Lake Ranger Districts for quite some time.”

The important statement in this quote is that “several areas . . . burned two or three times over the past 20 years.” Since the RAT report, the North Umpqua 2021 Jack Fire, Chaos Fire and Rough Patch Complex have burned more than 70,000 additional acres on Umpqua National Forest lands and remain un-contained at the time (September 15) of this article.

NEXT ISSUE: The Snags of the North Umpqua: Part 2. Recommendations. NOTE: This article is derived from a report contracted by Douglas Timber Operators with Dr. Zybach and NW Maps Co.

