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Shifting Public Perception: Climate Change Means Living with Fire and Smoke

*Robert Froembling**

ABSTRACT

The urgency to prepare for the climate crisis has never been greater. The wildfire phenomenon presents merely one climate threat as one million species now face extinction,¹ sea levels rise at least three feet and displace or affect 680 million people living in low-lying coastal zones in the next 80 years, and small glaciers in the United States, Europe, and Andes mountains are projected to lose more than 80% of their current ice and snow by the end of the century.² We are currently living in the sixth mass extinction and the effects are only going to accelerate. We will inherit more wildfires, larger wildfires, and more frequent wildfires.

* Robert graduates from Seattle University School of Law in May 2020. Robert would like to thank the countless experts, professors, lawyers, scientists, congressional officers, and colleagues who helped him with this piece and have dedicated their careers to science and legal advocacy to advance social change.

¹ Darryl Fears, *One Million Species Face Extinction, U.N. Report Says. And Humans Will Suffer as a Result*, WASH. POST (May 6, 2019), <https://www.washingtonpost.com/climate-environment/2019/05/06/one-million-species-face-extinction-un-panel-says-humans-will-suffer-result/> [https://perma.cc/RX6V-2FHJ].

² Aylin Woodward, *Sea Levels are Projected to Rise 3 feet Within 80 Years According to a New UN Report. Hundreds of Millions of People Could be Displaced*, BUS. INSIDER (Sept. 25, 2019), <https://www.businessinsider.com/sea-level-rise-3-feet-in-80-years-un-report-2019-9> [https://perma.cc/4MX6-DK66].

Over the past 50 years, wildfire season out west has already grown by 2.5 months.³ With the ten years with the most wildfire activity on record, nine have taken place since the year 2000, and wildfires in the United States burn twice as much land as they did in 1970.⁴ Destruction from wildfires is expected to double by 2050.⁵ At three degrees of warming by the end of the century, which is less than the U.N.'s prediction of 4.5 degrees of warming,⁶ the United States will have 16 times as much destruction from wildfire out west as we do currently.⁷ In fact, four degrees of warming means hundreds of drowned cities, five degrees means many regions would be unsurvivable for human life, and six degrees would eliminate summer work in the Mississippi Valley, everyone east of the Rocky Mountains would suffer more from heat than anywhere in the world today, and New York City would be hotter than Bahrain is today.⁸

In 2018, in British Columbia, more than three million acres of land burned and sent smoke all the way to Europe across the Atlantic Ocean.⁹ Every single year, 260,000 to 600,000 people die globally from wildfire smoke.¹⁰ In 2014, Canada's Northwest Territories had so much wildfire smoke that hospital visits for respiratory ailments skyrocketed by 42%.¹¹ Unfortunately, wildfire only presents one climate threat, and hunger, freshwater drainage, drowning, and increased natural disasters and pandemics will only create more daunting challenges. The United States has been fortunate to escape the majority of climate change devastation that has plagued the less-developed world and, as a result, we are just coming around to the seriousness of wildfires, in large part because summers do not look as pretty when we want to go to the ball game or go golfing.

This piece is not meant to stoke fear in its readers or be depressing, but to shift public perception on what our future holds by evaluating the laws and science presented to us. This piece will look at regional and federal regulations and assess the increased rate of forest fires and the grave public health concerns from stagnant smoke specifically in the Pacific Northwest. It will analyze how Washington State is still reactive instead of proactive to fires, which in turn creates unhealthier forests and longer-lasting fires over a larger area, creating more and more smoke. Additionally, it will

³ DAVID WALLAS-WELLS, *THE UNHINABITABLE EARTH: LIFE AFTER WARMING* 74 (2019).

⁴ *Id.*

⁵ *Id.*

⁶ *Id.* at 14.

⁷ *Id.* at 74.

⁸ *Id.* 39-40.

⁹ *Id.* at 72.

¹⁰ *Id.* at 75.

¹¹ *Id.*

address and propose solutions to problems created by the Fire Funding Fix section of the 2018 Omnibus Bill. The Fire Funding Fix section of the Bill passed in March of 2018 attempted to alleviate pressure on agency and forest management funds; however, it does not remedy the issues of unhealthy forests and actually creates loopholes for environmental regulations. Among other things, Washington State should shift its policy towards more regulations and funding of projects that educate and prepare the public for climate change and its increasing impact from fires. This requires changing the public's perception and expectations through scientific studies and policies that promote prescribed fires and proper preparation for smoke-filled skies to deter health concerns. The Fire Funding Fix Bill ought to be modified to both require people to take preventative measures around their homes and provide people with proper masks before larger smoke clouds set in for longer periods. These issues are particularly timely in the Pacific Northwest, a region home to more expansive and frequent forest fires. As climate change continues to intensify, we will inherit larger and more frequent forest fires west of the Cascade mountain range.¹²

I. INTRODUCTION

To best handle the issue of forest fires and hanging smoke in Western Washington over the next century, the State's response must shift from fire suppression to fire adaptation. The State's historic response and the U.S. Forest Service's (USFS) policy towards wildfires have resulted in dense vegetative overcrowding, which has provided higher fuel loads leading to more intense fires. Further, due to climate change, scientists are predicting increased drought and fires at a more frequent rate along with higher intensity.¹³

A history of fire suppression in Washington State has created a public expectation of smoke-free skies. This expectation is an unrealistic one. It is time for the State to start shifting the public expectation from "if smoke comes" to "when smoke comes." Because air deregulation and funding for prescribed burns are already on their way, the attention must shift towards how to properly mitigate smoke and public health risks and change the

¹² Hal Bernton, *Forests West of the Cascades Will See More Fires, Bigger Fires With Climate Change*, SEATTLE TIMES (Sept. 9, 2017)

<https://www.seattletimes.com/seattle-news/environment/pacific-northwest-forests-west-of-the-cascades-will-see-more-fires-bigger-fires-with-climate-change/> [<https://perma.cc/M4VW-PDPF>].

¹³ *Id.*

public perception to understand how to properly live with fire and smoke in an era of intensifying climate change.

The U.S. Forest Services and the State of Washington must do more than is required by current federal law. The bipartisan \$1.3 trillion federal spending package was signed into law by President Donald Trump in March of 2018.¹⁴ It included a long-sought funding fix spearheaded by Senator Maria Cantwell (WA) and Senator Ron Wyden (OR) for wildfire response.¹⁵ Starting in 2020, the USFS will be able to access over \$2 billion a year outside of its regular fire suppression budget.¹⁶ The bill provides much-needed funding, but it is a disaster in providing excessive exemptions to key environmental reviews like the National Environmental Policy Act (NEPA), which requires all Federal agencies to evaluate environmental impacts from their actions. Additionally, it does not address the issue of smoke, and provides a backdoor to large-scale logging projects.

Congress must ensure the Fire Funding Fix actually benefits forests and communities. In Washington, the State must take on much more responsibility for funding projects that educate people on the reality of increased fire and smoke, must track data on how smoke affects communities, and must institute programs that provide suggestions and mechanisms to become “fire-wise.”¹⁷ Congress must modify the Fire Funding Fix to require homeowners to take measures to prepare and protect their homes, or if not, to choose to face a steeper property tax or accept when the local government steps in to treat the homes instead.

As the region deals with an impending temperature increase, the population must be educated that while fires are a threat to homes, they also benefit wildlife, water supplies, and overall biodiversity. Forest fires can be a defense for forests to survive.¹⁸ Additionally, while they are often destructive to humans and surrounding wildlife, naturally occurring wildfires play a crucial role in nature because the burning of dead brush and branches offers nutrients a chance at replenishing. Burning thick matter and unnecessary undergrowth means increased sunlight to

¹⁴ Consolidated Appropriations Act, Pub. L. No. 115-141, 132 Stat. 348 (2018).

¹⁵ Timothy Cama, *Spending Bill Includes Major Wildfire Overhaul*, THE HILL (Mar. 22, 2018), <https://thehill.com/policy/energy-environment/379736-spending-bill-includes-major-wildfire-overhaul> [<https://perma.cc/8JDC-U9CM>].

¹⁶ Consolidated Appropriations Act, *supra* note 14.

¹⁷ S.M. STEIN, WILDFIRE, WILDLANDS, AND PEOPLE: UNDERSTANDING AND PREPARING FOR WILDFIRE IN THE WILDLAND-URBAN INTERFACE – A FORESTS ON THE EDGE REPORT, U.S. DEP’T OF AGRIC., FOREST SERV. 25 (2013), <https://www.fs.fed.us/openspace/fote/reports/GTR-299.pdf> [<https://perma.cc/4LAR-U9CK>].

¹⁸ *The Future of Fire*, OUTSIDE (Sept. 11, 2018), <https://www.outsideonline.com/2343636/future-fire> [<https://perma.cc/5UJR-ARHD>].

the forest floor, which provides for healthier nutrients in the soil that creates healthier and more sustainable forests.¹⁹ In the face of climate change, urgent steps are critical for all those living with the reality of more fire and smoke.

II. BACKGROUND

A. Fires In Washington State

About three-hundred years ago, somewhere between three and ten million acres of forest burned down in Western Washington; this was to be expected.²⁰ Trees such as the Douglas-fir or hemlock in this part of the country go through a life cycle between two-hundred and six-hundred years.²¹ Major fires, like the one around the year 1700, are considered a sort of restart button for the new forests to be born.²² The lush forests in the Cascade Mountains were all born from fire. Land that has burned is land that will not have to burn again for a long time. Burned land also allows for seedlings to grow and create a new generation of forests. One scientist at the Washington Department of Natural Resources, Daniel Donato, warns that major and historic fires will strike Western Washington again, but that nobody knows when and nobody is prepared.²³ This could be due in part to the bad habits of fire suppression formed during the past century.

The last major forest fire to hit the Western part of the state was the 1902 “Yacolt Burn” in northern Clark County near the Gifford Pinchot National Forest (GPNF) in Southwest Washington.²⁴ The Yacolt Burn covered about 240,000 acres, which is an area 70% larger than the blast zone from the Mt. Saint Helens eruption in 1980.²⁵ Uproar from the public led to congressional pressure to push the agencies, such as the USFS, to develop policies and plans that would put out all of the fires on national forest lands.²⁶

¹⁹ Claire Wolters, *Learning More About Wildfires*, NAT’L GEOGRAPHIC (Oct. 25, 2019), <https://www.nationalgeographic.com/environment/natural-disasters/wildfires/> [<https://perma.cc/37V3-XTW3>].

²⁰ Jackson Hogan, *DNR Scientist Warns of Massive Western Washington Fire In Future*, DAILY NEWS (May 4, 2018), https://tdn.com/news/local/dnr-scientist-warns-of-massive-western-washington-fire-in-future/article_02d26cd5-2371-5f81-b017-8eda735bc233.html [<https://perma.cc/3QPB-HX6E>].

²¹ *Id.*

²² *Id.*

²³ Hogan, *supra* note 20.

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Fire Policy*, CASCADE FOREST CONSERVANCY, <https://cascadeforest.org/our-work/fire-policy/> [<https://perma.cc/HN77-K3GB>] [hereinafter *Fire Policy*].

The highest priority for the people and the government was to put out the fires as quickly as possible. During that time, it was thought that fires were exclusively destructive and did not have any benefits. The USFS implemented the “10 o’clock” rule to mandate all fires be put out at 10:00 am the day after the burning was discovered.²⁷ The plan to suppress, suppress, and suppress has drastically harmed overall forest health.

1. History of suppression tactics

Fires provide nutrients to soil and watersheds. Suppressing fires completely bypasses these natural benefits.²⁸ Fire suppression tactics used over the last century have left many areas in the western national forests with dangerously increased fuel loads²⁹ that present increased dangers. This means that there is now an issue of overcrowded vegetation and stressed trees, exposed to insects and disease, which will burn more often and more intensely.³⁰ High-intensity fires negatively impact vegetation, wildlife, soil, and watershed health. To think that the revelation of past mistakes would lead to new tactics is unfortunately not the case; despite the science, the USFS and State have not changed their approaches. In the moment of impending disaster, the natural response is to put the fire out. Unfortunately, the policy of suppression over the past century has birthed a public expectation of a smoke-free environment.

By the 1990s, scientists began to realize that management tactics were not working and fires were getting larger and lasting longer.³¹ In the GPNF and other national forests from the 1950s to the 1980s, policies focused on suppression through timber harvesting.³² Most large old growth trees, like ponderosa pines and Douglas-firs, were removed at the time to maximize timber harvests for the housing market.³³ The removal of these trees changed the fuel load, as the large old growth trees had thick bark that was particularly resistant to fire. While national forest timber management policies were given little thought in the twentieth century, it now appears to have been a grave mistake to do so.

²⁷ *Id.*

²⁸ *Id.*

²⁹ Fuel load is the amount of flammable material that surrounds a fire and is measured by the amount of available fuel per unit area, usually tons per acre. For example, a small fuel load will cause a fire to burn and spread slowly, with a low intensity.

³⁰ *Id.*

³¹ Never seen before, the 1988 Yellowstone fire created the largest wildfire in the recorded history of Yellowstone National Park. A total of 793,880 acres and 36% of the park was affected, while the National Park Service were inadequate for the situation and required more than 9,000 firefighters and 4,000 military personnel.

³² *Fire Policy, supra* note 26.

³³ *Id.*

The policy mistakes of the past are now recognized by the Department of Natural Resources (DNR). Hilary Franz, the head of DNR, recognizes that "in many of our forests, especially on our federal lands, there has really been no treatment" to remove fuel or create spaces among the trees.³⁴ She adds that there is "not a lot of ability for sunlight to get in, [and there are] more trees competing for water and sunlight."³⁵ All of the trees, she says, are 'struggling and dying' and once insects kill or weaken enough of them, they're ready to go up in smoke."³⁶

Overcrowded and diseased Ponderosa forests have raised concerns over the build-up of "ladder fuels."³⁷ In areas prone to wildfires, creating a separation in vegetation by removing ladder fuels³⁸ is an essential task. For over a century people have cut the largest and most valuable fire-resistant Ponderosa pines.³⁹ This tactic created light and space for smaller trees and brush to grow, but forest managers would suppress low-intensity fires that had historically gotten rid of ladder fuels, thus exacerbating build-up of dead wood and needles on the forest floor.⁴⁰

Stand replacing fires⁴¹ usually have a pattern of occurring over 200 years at a time.⁴² In the GPNF, historical fires have been positioned for a pattern of diverse burn severity, with larger areas considered of a low severity.⁴³ Recently though, fires in the large areas are considered high burn severity levels with stand replacing conditions. In the Mt. Adams area fires have re-burned three times in the past decade, along with the 2015 Cougar Creek Fire⁴⁴ re-burning almost 5,000 acres of the same land from the 2008 Cold

³⁴ Daniel J. Chasan, *Washington Lawmakers Hope To Fight Forest Fires With Fire*, CROSSCUT (July 30, 2018), <https://crosscut.com/2018/07/washington-lawmakers-hope-fight-forest-fires-fire> [<https://perma.cc/X56U-CNBH>].

³⁵ *Id.*

³⁶ *Id.*

³⁷ *Id.*

³⁸ Ladder fuel is fuel that can carry a fire burning in low-growing vegetation to taller vegetation, and includes low-lying tree branches and shrubs and trees under the canopy of a large tree.

³⁹ Chasan, *supra* note 34.

⁴⁰ *Id.*

⁴¹ Fire which kill all or most of the living trees in a forest and initiates forest succession or regrowth. Can also be when a patch of adjacent trees are top-killed by fire.

⁴² *Fire Policy*, *supra* note 26.

⁴³ Chasan, *supra* note 34.

⁴⁴ Darryl Lloyd, *The Cougar Creek Fire of 2015: An Overview*, YKFP.ORG (Apr. 19, 2016), http://www.ykfp.org/klickitat/SciCon/SciCon16/sciCon2016PDFs/10_Cougar_Creek_Fire_Overview_2016.pdf [<https://perma.cc/39LS-25VC>].

Springs Fire⁴⁵ and into parts of the 2012 Cascade Creek Fire.⁴⁶ Fires are intensifying and they are repeating in the same areas much more often. Several experts and scientists point not only to the mistakes of the past, but also to the reality of climate change producing hotter temperatures and more rapid wildfires.

While suppressing a fire is at times the correct response in order to protect human lives and property, Washington's default strategy to suppress all fires is only going to create more long-term damage. The legacy of twentieth-century fire suppression across national forests in Washington, and much of the western United States, contributed to increased fuel loads and fire potential in many locations, potentially increasing the sensitivity of area burned to climate variability.⁴⁷ As I will later discuss, unless there are policy incentives for proactive uses of ecologically beneficial prescribed burns, and a switch of public expectations fostered by politicians, future policy will rely on its same old suppression tactics.

As of 2018, Washington State is still relying on suppression. There is little sign of Washington creating frequent enough small fires year-round. Those that manage fires are still heavily influenced by politicians who are in turn pressured by the public's expectation that fires will not escape into residential areas, that the skies will be smoke-free, and that all fires will be put out as soon as possible. Without immediate and intense re-introduction of natural fires to the landscape, it is very possible that massive and destructive fires that impact air quality over the most populated parts of Washington, such as the 2012 Cascade Creek fire or 2015 Cougar Creek fire, will become the new norm.

B. Climate Change Concerns

The likely effect that climate change has had, and will continue to have, on Washington has been extensively studied and documented. Climate change is the trend of a warming planet proceeding at an unprecedented rate, caused largely by human activity since the mid-twentieth-century.⁴⁸ According to the

⁴⁵ NORTHWEST INTERAGENCY COORDINATION CENTER, GEOGRAPHIC AREA COORDINATION CENTER, COLD SPRINGS FIRE LONG TERM SUPPRESSION STRATEGY AND IMPLEMENTATION PLAN 4 (July 22, 2008), https://gacc.nifc.gov/nwcc/content/products/fwx/LongTermAssessments/2008/Cold%20Springs%20_WAGPF2008.pdf [https://perma.cc/ZU3J-LEKQ].

⁴⁶ *Cascade Creek Fire in Washington*, NASA (Oct. 2, 2012), <https://earthobservatory.nasa.gov/images/79330/cascade-creek-fire-in-washington> [https://perma.cc/MB3Y-BGCT]; *Fire Policy*, *supra* note 26.

⁴⁷ John T. Abatzoglou & A. Park Williams, *Impact of Anthropogenic Climate Change on Wildfire Across Western US Forests*, 113 PROC. NAT'L ACAD. SCI. U.S.A. 11770, 11770-11775 (2016).

⁴⁸ *Climate Change: How Do We Know?*, NASA, <https://climate.nasa.gov/evidence/> [https://perma.cc/UM8F-JWL2].

Intergovernmental Panel on Climate Change (IPCC), people should anticipate higher global temperatures due primarily to greenhouse gas emissions that have increased since pre-industrial times and skyrocketed by 70% from 1970 to 2004.⁴⁹ The IPCC has shown “very high confidence” that wildfires in North America are increasing and are going to become more intense with a warmer future.⁵⁰ The United State’s 2017 Climate Assessment concluded that “[r]ecent decades have seen a profound increase in forest fire activity over the Western United States and Alaska.”⁵¹ These facts highlight the urgency for people to acknowledge the direction the Pacific Northwest is headed with climate change.

1. More fires are on the way

Several experts and researchers concur that the increasing number, and sheer magnitude, of fires correlate to rising spring and summer temperatures over the past thirty-five years.⁵² One study shows that in the last 30 years or so, wildfire season in the western United States has already increased by 78 days, while the duration of larger burning fires has gone from an average of 7.5 days to 37.1 days.⁵³ Most scientists concur the rise in catastrophic fires is linked to climate change, and as temperatures continue to rise, fire-prone

⁴⁹ INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT 5 (2008), https://www.ipcc.ch/site/assets/uploads/2018/02/ar4_syr_full_report.pdf [<https://perma.cc/7FKL-DN7E>].

⁵⁰ *Id.* These general findings closely track those reached by the IPCC in its Third Assessment Report, which predicted the fire season was likely to lengthen and the area burned was likely to increase significantly.

⁵¹ U.S. GLOBAL CHANGE RESEARCH PROGRAM, *Chapter 8: Droughts, Floods, and Wildfire*, CLIMATE SCIENCE SPECIAL REPORT (2017), <https://science2017.globalchange.gov/chapter/8/> [<https://perma.cc/J2T2-7942>].

⁵² See *Climate Change on Wildfire Activity: Hearing on Consider Scientific Assessments of the Impacts of Global Climate Change on Wildfire Activity in the United States Before the S. Comm. Energy Nat. Res.*, 110th Cong. 22 (2007) (statement of Thomas W. Swetnam, Director, Laboratory of Tree-Ring Research, and Professor of Dendrochronology, University of Arizona, Tucson, AZ).

⁵³ CLIMATE CENTRAL, THE AGE OF WESTERN WILDFIRES 4 (2012), <https://www.climatecentral.org/wgts/wildfires/Wildfires2012.pdf> [<https://perma.cc/W6B4-5QSV>]. See also B.J. Stocks et al., *Large Forest Fires in Canada*, 108 J. GEOPHYSICAL RES. 8149 (2002) (noting a similar annual increase in Canadian burned area since 1990); E.S. Kasischke & M.R. Turetsky, *Recent Changes in Fire Regime Across the North American Boreal Region-Spatial and Temporal Patterns of Burning across Canada and Alaska*, 33 GEOPHYSICAL RES. LETT. L09703 (2006) (finding that burned area in the North American boreal region increased from 6500 square kilometers annually during the 1960s to 29,700 square kilometers annually during the 1990s).

conditions will only become more dangerous.⁵⁴ Leroy Westerling, a scientist who studies management of wildfires, says climate change will only make wildfire systems more complex:

That intersection [between the climate system, the ecosystem, and how we manage our land use] is very complex, and even more difficult to predict. When I say there's no new normal, I mean it. The climate will be changing with probably an accelerating pace for the rest of the lives of everyone who is alive today.⁵⁵

There is no new normal. As temperatures increase and a complex combination of natural and human factors intermingle, wind patterns change, which makes fire spread more quickly and somewhat randomly. Temperature increases bring dry air, heavy precipitation followed by abundant vegetation, and then droughts that create dead vegetation and dried tinder.⁵⁶

The State must prioritize educating its people that climate change contributes to an uptick in fire activity, total area burned, and overall fire-season length.⁵⁷ The results of a 2016 study showed the area burned by forest fires more than doubled from 1984 to 2005 in the Western United States.⁵⁸ This increase contributed to an additional 4.2 million hectares (ha) of forest fire area.⁵⁹ Studies completed by the Proceedings of the National Academy of Sciences of the United States of America (PNAS) reveal that anthropogenic increases in temperature are the cause of increased fuel aridity across the Western United States and its forests.⁶⁰ Accordingly, this fuel aridity in the forests between 2000 and 2015 led to an increase of 75% more forested area seeing an uptick in about nine additional

⁵⁴ Anthony L. Westerling et al., *Warming and Earlier Spring Increase Western U.S. Forest Wildfire Activity*, 313 SCI. 940, 940-43 (2006); See Steven W. Running, *Is Global Warming Causing More, Larger Wildfires?*, 313 SCI. 927 (2006).

⁵⁵ Adam Rogers, *Fire Scientists Know One Thing For Sure: This Will Get Worse*, GRIST (Aug. 1, 2018), <https://grist.org/article/fire-scientists-know-one-thing-for-sure-this-will-get-worse/> [<https://perma.cc/J7DK-54XD>].

⁵⁶ Dan Faber, *Burning in the Heat*, LEGAL PLANET (Oct. 4, 2018), <http://legal-planet.org/2018/10/04/burning-in-the-heat/> [<https://perma.cc/R3HM-N4FH>].

⁵⁷ Alton P. Williams & John T. Abatzoglou, *Recent Advances and Remaining Uncertainties in Resolving Past and Future Climate Effects on Global Fire Activity*, 2 CURR. CLIMATE CHANGE REPORTS 1, 1-14 (2016); See Philip E. Dennison et al., *Large Wildfire Trends in the Western United States*, 41 GEOPHYSICAL RES. LETTERS 2928 (2014); Westerling et al., *supra* note 54.

⁵⁸ Abatzoglou & Williams, *supra* note 57.

⁵⁹ *Id.*

⁶⁰ *Id.*

days per year of high fire potential.⁶¹ Ecoregions with increasing trends in the number of large fires and total fire area contribute to an increase in droughts. Studies by the Monitoring Trends in Burn Severity Project (MTBS) determine trends of wildfires within nine different ecoregions in the western United States and depict climate change as the cause for changing fire activity in the western United States.⁶²

Several conclusions about forest fires can be drawn as a result of climate change. A changing climate has created longer fire seasons, reduced snowmelt and earlier spring snowmelt, and increased wildfires in mid-elevation forests.⁶³ The sudden transition in the mid-1980s from infrequent large wildfires of short (average of one week) duration to more frequent and longer (five weeks) burning fires are happening because the springtime is abnormally warmer, summer dry seasons are prolonged, and vegetation is drier.⁶⁴ Scientists credit climate change for drastic impacts on ecological conditions across the western United States forests. Additionally, climate change creates a greater challenge for fire management. Washington State must institute significant policy changes that address climate change in its forest management plans.

2. Climate Change in Washington State

David Peterson and his colleagues at the School of Environmental and Forest Sciences at the University of Washington published a thorough report summarizing the effects of climate change on fire regimes and vegetation in the Pacific Northwest.⁶⁵ They anticipate increased temperatures, decreased snowpack, and earlier snowmelt, which leads to longer fire seasons, higher chances of larger fires, and greater area burned by fires.⁶⁶ Changes to climate will affect vegetation conditions in forests, which have already been affected by a century's worth of ill-advised tree harvesting and fire

⁶¹ *Id.*

⁶² Dennison et al., *supra* note 57. The MTBS uses satellite remote sensing data to map burn area boundaries in the U.S. Its goal is to map all fires larger than 405 ha (1000 acres) in the continental U.S. west of 97 degrees longitude.

⁶³ *Id.*

⁶⁴ Westerling et al., *supra* note 54.

⁶⁵ See Jessica Halofsky et al., *Changing Wildfire, Changing Forests: The Effects of Climate Change on Fire Regimes and Vegetation in the Pacific Northwest, USA*, 16 FIRE ECOLOGY 4 (2020).

⁶⁶ *Id.* Conclusions from paleoecological, tree-ring, and fire records on the history of fire frequency and area burned annually in the Pacific Northwest.

suppression tactics, and lead to further risks and unpredictable fire regimes.⁶⁷

Future climates in the Pacific Northwest are likely to be hotter and drier in the summer months and warmer and wetter in the winter months. Global climate models anticipate an increase in mean annual temperature in the Pacific Northwest of 2.0-8.5°F (1.1-4.7 °C) between 2040 and 2070.⁶⁸ These are alarming numbers. Warming is anticipated to take place during every season of the year, with most models projecting the largest increases in the summer, and future increases in heat extremes as well – resulting in more days of temperatures above 90°F (32°C).⁶⁹ A majority of studies project a decrease in precipitation during the summer months, while models of precipitation patterns for the other seasons vary. Additionally, studies agree that intense precipitation events, such as the number of days with precipitation being greater than an inch of rainfall, will likely increase.⁷⁰ A negative impact on fire regimes is expected with future increases in temperature and more extreme hydrologic events associated with the amount, timing, and types of precipitation.⁷¹ This will increase the likelihood of landslides in the Pacific Northwest.⁷²

David Peterson and his colleagues also focused their studies on the effects of changing disturbance regimes on forest structure; concluding that a warming climate will benefit fire-tolerant and drought-tolerant trees in the Northwest.⁷³ Without management intervention, evolving fire regimes are likely to affect forest regeneration processes and alter the makeup of forest ecosystems in the future.⁷⁴

Peterson documented that the combination of wildfires and hydrology (movement and distribution of water in relation to the land) are likely to be agents of severe change in the Pacific Northwest, and will create complex changes to the ecosystems.⁷⁵

⁶⁷ See Jon E. Keeley & Alexandra D. Syphard, *Climate Change and Future Fire Regimes: Examples from California*, 6 GEOSCIENCES 37 (2016).

⁶⁸ PHILIP W. MOTE ET AL., CHAPTER 2: CLIMATE – VARIABILITY AND CHANGE IN THE PAST AND THE FUTURE, IN CLIMATE CHANGE IN THE NORTHWEST: IMPLICATIONS FOR OUR LANDSCAPES, WATERS, AND COMMUNITIES 25 (Meghan M. Dalton et al. eds., 2013).

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ Alan F. Hamlet et al., *An Overview of the Columbia Basin Climate Change Scenarios Project: Approach, Methods, and Summary of Key Results*, 1319 ATMOSPHERE-OCEAN 51, 392–415 (2013).

⁷² *Id.*

⁷³ See Halofsky et al., *supra* note 65.

⁷⁴ See Daniel C. Donato et al., *Regeneration of Montane Forests 24 Years After the 1988 Yellowstone Fires: A Fire-catalyzed Shift In Lower Treelines?*, 7 ECOSPHERE 1 (2016).

⁷⁵ See Halofsky et al., *supra* note 65.

Warmer winter temperatures and loss of forest canopies cause increased flood risks. With stream flow decreasing in areas due to less snowpack, but increasing in areas from more wildfires, the red flags once again point to climate change.⁷⁶ These detailed studies must be at the forefront of State education programs, and the backbone of fire funding bills in Congress.

C. *Smoke in Washington State*

The cause for concern is no longer whether wildfires will occur. There will be more fires. The question has now become whether or not the State is prepared to face the consequences of damage to property and overall public health. What has been felt by most over the last few years in the Pacific Northwest is more smoke. While the issue of healthy forests is an important one, a greater issue is wildfire's negative impact on air quality and public health concerns.⁷⁷ In addition to climate change creating a warmer planet with larger and longer lasting fires, the smoke from wildfires adds to a polluted ozone, which only intensifies the issue of a changing climate. Some critics might argue that suppressing and putting out fires faster is the means to preventing smoke-filled summers. However, this attitude only perpetuates the cycle of creating unhealthier forests, which leads to more high-intensity fires. Education and proper preparation year round are the solutions, not suppression.

In August of 2018, Professor Cliff Mass, who specializes in atmospheric sciences, declared the worst 24 hours of air quality on record in the Puget Sound region.⁷⁸ At one point, the Puget Sound Clean Air Agency, joined by the health departments in King, Pierce, Snohomish, and Kitsap Counties in Washington State, urged even the healthiest of adults to stay indoors.⁷⁹ The National Weather Service issued an air quality alert for much of central and eastern

⁷⁶ Alan F. Hamlet & Dennis P. Lettenmaier, *Effects of 20th Century Warming and Climate Variability on Flood Risk in the Western U.S.*, 43 WATER RESOURCES RES. 1 (2007).

⁷⁷ See Laura Sweedo, *Where There is Fire, There is Smoke: Prescribed Burning in Idaho's Forests*, 8 DICK. J. ENVTL. L. & POL'Y 121 (1999).

⁷⁸ *Seattle – Tacoma Air Quality Officially the Worst on Record*, Q13FOX, <https://q13fox.com/2018/08/15/seattle-tacoma-air-quality-officially-the-worst-on-record/> [<https://perma.cc/8UMB-Q44>] (Cliff Mass said the record is based on pollution measurements from the Puget Sound Clean Air Agency, dating back for two decades).

⁷⁹ *Poor Air-quality, Even Healthy Adults Advised to Stay Indoors, Avoid Walking Outside*, Q13FOX (Aug. 15, 2018), <https://q13fox.com/2018/08/15/poor-air-quality-even-healthy-adults-advised-to-stay-indoors-avoid-walking-outside/> [<https://perma.cc/95EX-HA2Z>].

Washington.⁸⁰ The smoke and haze from local and regional wildfires would go on to last for weeks on end. It is likely that most summers will look and feel the same as 2018 from here on out.

Professor Don McKenzie, at the University of Washington School of Environmental and Forest Sciences, attributes the frequency of fires and high-pressure systems to the air remaining fairly stagnant and locked over Western Washington.⁸¹ Professor McKenzie acknowledges the likelihood of more fires, and he worries that the wind patterns in 2017 and 2018, while abnormal, are becoming more unpredictable because of climate change.⁸² He said even if Washington had fewer fires in a certain year, wildfire smoke from Oregon or British Columbia leaves Seattle with “regional haze” which, given the wrong conditions, can remain stagnant for several weeks.⁸³ Predicting or relying on what was once more typical eastward wind patterns coming off the Pacific Ocean is becoming harder to count on or predict because of climate change.⁸⁴

1. Public Health Concerns

The effects of smoke range from minor problems of nuisance to serious issues of air pollution and degraded human health. Wildfire smoke is comprised of toxic pollutants in amounts similar to sources also regulated under air and water pollution statutes that are seriously potent to human health.⁸⁵ The pollutants from wildfires are particulate matter – coarse (PM10) and fine (PM2.5) – and ozone precursors.⁸⁶ Fine particulate matter accounts for about 80 - 90% of total particulate matter from wildfires. This type of particulate matter is the most hazardous to human health because it can be inhaled into the lungs and is often tied to increased mortality rates, heart disease, and agitation of chronic diseases like asthma.⁸⁷ Forest

⁸⁰ *Id.*

⁸¹ *Is August Smoke the New Normal for the Northwest?*, Q13FOX (Aug. 14, 2018), <https://q13fox.com/2018/08/14/is-august-smoke-the-new-normal-for-the-northwest/> [<https://perma.cc/24HM-WK5D>].

⁸² Telephone Interview with Don McKenzie, Professor, Univ. of Wash. Sch. of Envtl. and Forest Services (Nov. 9, 2018) [hereinafter Interview with Don McKenzie].

⁸³ *Id.*

⁸⁴ *Id.*

⁸⁵ Kristen H. Engel, *Perverse Incentives: The Case of Wildfire Smoke Regulation*, 40 *ECOLOGY L.Q.* 623, 633 (2013).

⁸⁶ SMOKE MANAGEMENT GUIDE FOR PRESCRIBED AND WILDLAND FIRE, NATIONAL WILDFIRE COORDINATION GROUP 63 (2001), <https://www.fs.fed.us/pnw/pubs/ottmar-smoke-management-guide.pdf> [<https://perma.cc/HME9-4NK4>].

⁸⁷ *Id.* at 98; Douglas W. Dockery et al., *An Association Between Air Pollution and Mortality in Six US. Cities*, 329 *NEW. ENG. J. MED.* 1753, 1753-59 (1993).

fires are, in turn, a source of ozone precursors⁸⁸ that add to already elevated ozone levels; as many people in this region of the world have come to realize, impacts are often felt even thousands of miles away from the main concentration of pollutants.⁸⁹ Professor McKenzie says wildfire smoke is much worse for human health than regular air pollution.⁹⁰

For most healthy adults, exposure to wildfire smoke is simply a nuisance causing itchy eyes, scratchy throats, or even uncomfortable chest pressure that all seemingly dissipates when the smoke clears. However, Sarah Coefield, an air quality specialist in Montana's Missoula County, says that children's lungs are particularly vulnerable to the kind of toxic air pollution that results from intense burning forests.⁹¹ The elderly, people with chronic health conditions, and pregnant women are also more at risk of contracting health defects from smoke.⁹² Short-term exposure to wildfire smoke can worsen existing asthma and lung disease, which can lead to an uptick in emergency room treatments and hospitalizations. In 2017, visits to the emergency room for respiratory-related symptoms in Missoula County more than doubled from the previous year, and most of the visits came after about a month of stagnant smoke from fires.⁹³

In November of 2018, California experienced its deadliest wildfire on record;⁹⁴ the Northern California Camp Fire (Camp Fire) resulted in 85 deaths.⁹⁵ The number reported missing was over 1,000

⁸⁸ According to the U.S. Department of Agriculture, ozone precursors are made up of nitrogen (NOx) and volatile organic compounds (VOCs), which can emit and produce ground-level ozone that can impact plants and animals.

⁸⁹ Haganoush K. Preisler et al., *Estimating Contribution of Wildland Fires to Ambient Ozone Levels in National Parks in the Sierra Nevada*, 158 ENVTL. POLLUTION 778, 786 (2010) (Detecting a "small but significant effect of fires on ozone variation.").

⁹⁰ Interview with Don McKenzie, *supra* note 82.

⁹¹ Sophie Yeo, *The Mysterious Long-Term Effects of Inhaling Smoke From Forest Fires*, PAC. STANDARD (May 7, 2018), <https://psmag.com/environment/what-is-smoke-from-forest-fires-doing-to-your-lungs> [<https://perma.cc/JN6F-JTXV>].

⁹² *Id.* Sarah Coefield says that short-term health impacts are easily studied and tracked, but that chronic and long-term effects from smoke on an individual person or community are difficult to track. Chronic chest pain, lung cancer, problems associated with vision, and chronic asthma could all be connected to inhaling more smoke, but extensive studies on the topic are currently insufficient to make a determination.

⁹³ *Id.*

⁹⁴ Nicole Chavez, *Number of Missing Grows to More Than 1,000 in California's Camp Fire*, CNN (Nov. 17, 2018), <https://www.cnn.com/2018/11/16/us/california-fires/index.html> [<https://perma.cc/AST7-UGFX>].

⁹⁵ Stella Chan & Joe Sterling, *Death Toll in Camp Fire Revised Down by One to 85*, CNN (Feb. 8, 2019), <https://www.cnn.com/2019/02/08/us/camp-fire-deaths/index.html> [<https://perma.cc/WV84-44Y2>].

at one point, and the many more impacted by the particulate matter in stagnant smoke will likely be unrecognized.⁹⁶ Air in California became some of the dirtiest in the world, exceeding the pollution levels in cities in China and India that normally rank among the worst.⁹⁷ Even 200 miles from the Camp Fire, smoke was so intense that health warnings lead to widespread school closures, downtown cable car shutdowns, and a cancellation of the California versus Stanford football game.⁹⁸ The state public health department recommended anyone who needed to go outside wear a P100 mask and N95 respirator, which are approved and recommended by the National Institute of Occupational Safety and Health for firefighters.⁹⁹

Research shows that inhalation of miniscule particles from wood fires can nestle in one's lung tissue and harm the immune system.¹⁰⁰ Decreased lung function has also been found in firefighters during the fire season.¹⁰¹ While getting a better understanding of long-term health defects is important, conducting survey responses of hundreds or thousands of people living in or near wildfire boundaries presents additional challenges because approaching people who have been traumatized by disasters such as the Camp Fire may cause them to relive horrifying experiences.

III. CURRENT APPROACHES ARE INSUFFICIENT

A. Washington State's Plans in Place

Hilary Franz, the head of Washington's DNR, says that smoke-filled skies do not need to be a summer norm, and a future

⁹⁶ Kristin Lam, *Camp Fire: At Least 196 people Still on Missing List; Death Toll Remains at 88*, USA TODAY (Nov. 29, 2018), <https://www.usatoday.com/story/news/2018/11/28/camp-fire-death-toll-holds-steady-88-california/2146081002/> [<https://perma.cc/D6AQ-HAMF>].

⁹⁷ *Purple Air Map*, PURPLE AIR, <https://www.purpleair.com/map#2.03/14.87/-100.45> [<https://perma.cc/F9RD-KVUV>].

⁹⁸ Julie Turkewitz & Matt Richtel, *Air Quality in California: Devastating Fires Lead to a New Danger*, N.Y. TIMES (Nov. 16, 2018), <https://www.nytimes.com/2018/11/16/us/air-quality-california.html> [<https://perma.cc/2R5B-UE48>]. Studies have linked heart attacks and cancer with long-term exposure to air pollution in California, but whether exposure to wildfire smoke carries the same risk is uncertain because of the difficulty in studying populations years after a wildfire. Such studies are more difficult as people have often had to relocate and the smoke has spread hundreds of miles away.

⁹⁹ *Id.*

¹⁰⁰ Michael Guarnieri & John Balmes, *Outdoor Air Pollution and Asthma*, 383 LANCET 9928, 1581-1592 (2014), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4465283/> [<https://perma.cc/MK6D-DKTS>].

¹⁰¹ Lindsey Tanner, *Smoke Spreading From California Fires Sparks Health Concerns*, SEATTLE TIMES (Nov. 15, 2018), <https://www.seattletimes.com/nation-world/ferocious-fires-spark-concern-over-major-health-consequences/>.

of clean summertime air is possible.¹⁰² The DNR seems fairly aware of past mistakes the State has made regarding a century of suppression tactics. In 2018, Franz wrote, “Historically, natural wildfires burned grass, brush, and debris, but left resilient trees unharmed and created less smoke. Last century, we began emphasizing fire suppression, and we were successful. Too much so.”¹⁰³ Franz recognizes that the fires now are burning entire forests and do not resemble “historic” wildfires. She seems to acknowledge climate change for exacerbating the problem: “A changing climate has thrown fuel on the literal fire. Ninety-six percent of our state is experiencing drought conditions. With hotter temperatures and reduced rain, our fire seasons have grown longer.”¹⁰⁴

Despite realizing past mistakes and the new dangers climate change creates, the altered strategies she offers may, or may not, help bring a future of clean summertime air. Franz suggests using air assets to get to fires faster, being more prepared in higher-risk areas, and providing more training at the DNR with federal and local leaders.¹⁰⁵ These are useful tactics. All of this kept 96% of fires under a ten-acre spread in 2017, and DNR expects a similar success rate moving forward.¹⁰⁶ But, these new statistics could reveal a strategy that, in actuality, still remains reliant upon suppression. Suppression may be necessary when fires are creeping in on communities and homes, but the decision to use prescribed fires throughout the year to promote healthier forests appears to have remained on the back burner.

Ms. Franz also appears to recognize the fact that 2.7 million acres of Washington forestland are unhealthy, dense, and prone to burns with greater intensity. In 2017, DNR presented a 20-year Forest Health Strategic Plan (The Plan) for eastern Washington.¹⁰⁷ The Plan for Eastern Washington calls for forest management practices with a vision towards forests that are “ecologically functioning” and in tougher condition to withstand economic and social pressures now and in the future.¹⁰⁸ These practices include a combination of mechanical treatments and prescribed fire across large landscapes and watersheds.¹⁰⁹ The DNR is also committed to

¹⁰² Hilary Franz, *Smokey Skies Don't Beed to be a Summer Norm*, THE OLYMPIAN (Aug. 28, 2018), <https://www.theolympian.com/latest-news/article/217487075.html>

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *20-Year Forest Health Strategic Plan: Eastern Washington*, WASH. ST. DEP'T OF NAT. RES. 7 (2017) [hereinafter *20-Year Forest Health Strategic Plan*].

¹⁰⁸ *Id.* at 15.

¹⁰⁹ *Id.* at 14.

evaluating the need to study forest health conditions in western Washington and engaging with local leaders to address forest health conditions in that part of the state.¹¹⁰ The Plan provided a year ago outlines five total goals to promote healthier forests, which include:

- (1) Conduct 1.25 million acres of scientifically sound, landscape-scale, cross-boundary management and restoration treatments in priority watersheds to increase forest and watershed resilience by 2037;
- (2) Reduce risk of uncharacteristic wildfire and other disturbances to help protect lives, communities, property, ecosystems, assets and working forests.¹¹¹

These goals, along with Franz's intentions, are a step in the right direction to promote and create healthier forests. Although, with concerns that climate change is expected to make conditions worse and less predictable moving forward, it is hard to see a future where clear summer skies are possible unless all the forests burn down.

Washington State is one state that is proactive in adopting measures to protect air quality. The Washington State Clean Air Act (CAA) currently provides that

...[p]ermitted burning shall not cause damage to public health or the environment. All permits issued under this section shall be subject to all applicable fees, permitting, penalty, and enforcement provisions of this chapter. The department of natural resources shall set forth smoke dispersal objectives designed consistent with this section to minimize any air pollution from such burning and the procedures necessary to meet those objectives.¹¹²

The problem with DNR's desire to meet CAA standards is that it encourages suppressing any fires that emit particulate matter. As mentioned in several parts of Washington's CAA, the Department of Ecology plays a role in consulting over burn permits. The Department of Ecology and Washington State Department of Health both provide helpful smoke and fire management "toolkits" for the

¹¹⁰ *Id.* at 11.

¹¹¹ *Id.* at 17-29.

¹¹² WASH. REV. CODE § 70.94.6538 (2009).

public at large.¹¹³ Concerns over the Washington State CAA's statewide emissions reduction and monitoring plan are also provided in the Revised Code of Washington:

The department determines that the proposed silvicultural burning operation is being conducted to restore forest health or prevent additional deterioration to forest health; meets the requirements of the state smoke management plan to protect public health, visibility, and the environment.¹¹⁴

Silviculture is the practice of controlling the establishment, growth, composition, health, and quality of forests to meet different ecological needs—typically accomplished by implementing different treatments such as thinning, harvesting, planting, pruning, prescribed burning and site preparation.¹¹⁵ Despite the valid clean air and health concerns, appropriate emissions from silvicultural burning are exempt from certain reduction targets in eastern Washington for the purposes of restoring forest health.¹¹⁶

The Smoke Management Plan,¹¹⁷ which went into effect in 1969, was revised in 1975, 1995, and 1998.¹¹⁸ Its purpose is to provide regulatory direction, operating standards, and information regarding the management of smoke and fuel loads from the prescribed burns on land protected by DNR, unimproved forestlands, and participating tribal lands.¹¹⁹ The Smoke Management Plan has not had a significant revision since 1998.¹²⁰ Given the increase of wildfires and stagnant smoke creating serious

¹¹³ *Smoke From Fires*, WASH. ST. DEP'T OF HEALTH, <https://www.doh.wa.gov/CommunityandEnvironment/AirQuality/SmokeFromFires> [<https://perma.cc/RQ3U-7FUY>] (Answering several questions to different health problems associated with smoke from fires); *Smoke & fire management*, DEP'T OF ECOLOGY ST. OF WASH., <https://ecology.wa.gov/Air-Climate/Air-quality/Smoke-fire> [<https://perma.cc/5S5G-G83R>] (Providing instructions for applying for a burn permit, finding local clean air agency, and more information about burn bans in certain areas of the state).

¹¹⁴ WASH. REV. CODE. § 70.94.6536(4)(b) (1995).

¹¹⁵ *Silviculture*, U.S. FOREST SERVICE, <https://www.fs.fed.us/forestmanagement/vegetation-management/silviculture/index.shtml> [<https://perma.cc/8CCV-L3KA>].

¹¹⁶ WASH. REV. CODE. § 70.94.6536(4) (1995).

¹¹⁷ *Smoke Management Plan*, WASH. ST. DEP'T OF NAT. RES. 3 (1998) (The Plan is designed to meet the requirements of the Washington CAA (RCW 70.94), Forest Protection laws (RCW 76.04), and the United States Clean Air Act (42 USC 7401 et seq.)).

¹¹⁸ *Id.*

¹¹⁹ *Id.* at 4.

¹²⁰ *Smoke Management Plan*, *supra* note 117.

public health concerns over the last few years, an update is long overdue.

Regardless of any plan to reduce smoke in Washington, Professor McKenzie's concerns of more fires and unique wind patterns resulting from climate change cannot be ignored. The intense public expectation to have clear air during the summer months will continue to pressure lawmakers and forest managers to suppress every fire to mitigate any potential smoke, resulting in funds being diverted away from the forest management. Every year, major cities like Seattle are breaking air quality records for worse quality, which indicates that the public's frustration will continue.¹²¹

Given the recent uptick in larger and longer lasting forest fires during the summer months, funds for forest health management have been reallocated to forest suppression. The State Legislature has also allocated \$13 million towards implementing the "20-year Forest Health Strategic Plan."¹²² Franz added 30 new full-time wildland firefighters and forest health specialists in early 2020, where she told them in an orientation that Washington is "making it a top priority for this state to address our catastrophic wildfires" because "[w]e are finding ourselves fighting those fires from as early as March to well into November."¹²³ The State of Washington and several lawmakers were also relieved to see a major wildfire overhaul included in Congress's 2018 spending bill.¹²⁴ All of these steps are important, but otherwise useless if not put into practice.

B. Fire Funding Fix Bill

At the Federal Government level, the omnibus appropriations bill passed in March of 2018 included a \$1.3 trillion spending package and apparent solution to the way the government pays to fight wildfires.¹²⁵ The new funding is from Fiscal Year (FY) 2020 through FY2027. Beginning in FY2020, \$2.25 billion of new budget authority is available to the U.S. Department of Agriculture, which includes the USFS, as well as the Department of the Interior, which includes the Bureau of Land Management

¹²¹ *Wildfire Smoke About to Inundate Western Washington Once Again*, KOMONEWS (Aug. 18, 2018), <https://komonews.com/news/local/wildfire-smoke-about-to-inundate-western-washington-once-again>.

¹²² Franz, *supra* note 102.

¹²³ Karl Holappa, *Washington State Department of Natural Resources Adds 30 New Full-time Wildland Firefighters, Forest Health Specialists*, DAILY REC. NEWS (Mar. 4, 2020), https://www.dailyrecordnews.com/news/washington-state-department-of-natural-resources-adds-new-full-time/article_4ec2d9c7-9775-5364-816e-ac7ce8211bf5.html [<https://perma.cc/ML5H-EZC7>].

¹²⁴ Consolidated Appropriations Act, *supra* note 14.

¹²⁵ *Id.*

(BLM).¹²⁶ The budget authority increases \$100 million each year, with \$2.95 billion allocated during FY2027.¹²⁷ Before this funding, the fire suppression portion of the USFS budget was based on a rolling ten-year average of appropriations. With fire seasons lasting longer and more intensely, the ten-year rolling budget skyrocketed and took up a massive portion of the USFS budget. Wildland fire suppression costs were beyond \$2.5 billion in 2017, which was the most expensive year on record.¹²⁸ In 1995, the USFS spent about 16% of its budget on fire, and in 2017, wildfire suppression costs were over half of the USFS's budget.¹²⁹ As with most bills in Congress, there are pros and cons.

1. Benefits

The bill is considered a tremendous bipartisan feat. The fire funding provision in the omnibus bill is meant to cut back on “fire borrowing,” where agencies like the USFS and BLM move money from fire management pots to fire suppression funds as fire seasons last longer and agencies are depleted of resources. Senator Maria Cantwell of Washington State, the top Democrat on the Energy and Natural Resources Committee, is proud because “Pacific Northwest lawmakers have worked together to force Congress to finally address the persistent shortfalls in our nation's wildland firefighting budgets.”¹³⁰ Representative Mike Simpson of Idaho says, “The FY18 Omnibus spending bill might be one of the most critical pieces of legislation for western members I have seen since coming to Congress.”¹³¹

Professor Peterson at the University of Washington, and Jessica Halofsky, a member of the USFS and a researcher at the University of Washington, would tend to agree with proponents of the bill in that it provides stability in the budget. Professor Peterson says that there will now be enough money by September of any year

¹²⁶ *Secretary Perdue Applauds Fire Funding Fix in Omnibus*, U.S. DEP'T OF AGRIC. (Mar. 23, 2018), <https://www.usda.gov/media/press-releases/2018/03/23/secretary-perdue-applauds-fire-funding-fix-omnibus> [<https://perma.cc/7KSR-ZRUU>].

¹²⁷ *Id.*

¹²⁸ *Id.*

¹²⁹ Jessica Kutz, *Fire Funding Fix Comes with Environmental Rollbacks*, HIGH COUNTRY NEWS (Mar. 29, 2018), <https://www.hcn.org/articles/wildfire-ing-fix-includes-environmental-rollbacks> [<https://perma.cc/7CBH-8Z6Z>].

¹³⁰ Timothy Cama, *Spending Bill includes major wildfire overhaul*, THE HILL (Mar. 22, 2018), <https://thehill.com/policy/energy-environment/379736-spending-bill-includes-major-wildfire-overhaul> [<https://perma.cc/4VCS-EQVZ>].

¹³¹ *Id.*

to perform much needed forest research projects.¹³² He says that in recent memory the tendency has been to pull money from such projects in June and July because of the massive fires.¹³³ Jessica Halofsky says that the bill will alleviate the funding problem because it gives more money for agencies to perform fuel treatment and prescribed burns.¹³⁴

In addition to the Congressmen and Congresswomen, the bill received praise from both conservationists and the forest industry. Collin O'Mara, the president of the National Wildlife Foundation, says, "In the wake of last year's [2017] devastating megafires, today's agreement is an absolutely essential step towards reducing fire threats and improving the safety of local communities by restoring the health of America's forests."¹³⁵ Tom Martin, president of the American Forest Foundation adds, "[t]his bi-partisan fix will address both the budgetary erosion that has been occurring for the past ten years, as well as the 'fire borrowing' from other programs when funds have been exhausted."¹³⁶

2. Shortcomings

There is still cause for concern when the budget is not nearly large enough to fund the total acreage of forest that Washington State needs to treat. Jessica Halofsky would argue that there is just not nearly enough money to do the necessary fuel treatment.¹³⁷ Representative Rob Bishop of Utah, chairman of the House of Natural Resources Committee, is not a proponent of the bill, claiming it simply pours more money into suppression funds and does not increase removal of brush and trees from federal land that increase fires.¹³⁸ Bishop blamed Democrats from eastern states, "who don't know what a forest looks like," and that the bill, "doesn't solve the problem."¹³⁹ Solving the problem is stopping the damn fires, not spending more money to put them out once they get started."¹⁴⁰ Senator Maria Cantwell's response, optimistic in nature, is that "[t]his funding boost will allow the Forest Service to

¹³² Telephone Interview with David Peterson, Professor, Univ. of Wash. (Nov. 9, 2018) [hereinafter Interview with David Peterson].

¹³³ *Id.*

¹³⁴ Telephone Interview with Jessica Halofsky, Researcher, U.S. Forest Services & Univ. of Wash. (Nov. 16, 2018) [hereinafter Interview with Jessica Halofsky].

¹³⁵ Timothy Cama, *Spending Bill Includes Major Wildfire Overhaul*, THE HILL (Mar. 22, 2018), <https://thehill.com/policy/energy-environment/379736-spending-bill-includes-major-wildfire-overhaul> [<https://perma.cc/UJ5Q-MHC6>].

¹³⁶ *Id.*

¹³⁷ Interview with David Peterson, *supra* note 132; Interview with Jessica Halofsky, *supra* note 134.

¹³⁸ Cama, *supra* note 135.

¹³⁹ *Id.*

¹⁴⁰ *Id.*

prioritize work in areas closest to communities, in order to save lives and reduce the risk of property damage, while still protecting essential public lands and existing environmental laws.”¹⁴¹

Other conservation groups have doubts about whether or not the funding fix was worth the compromises included in the bill. The fix could end this “fire borrowing” practice, but there may be little incentive to stop using half of the increased annual budget on fire suppression. There appears to be more tradeoffs with important exemptions from reviews under NEPA that lead to more logging projects and waive key Endangered Species Act (ESA) regulations. Peter Nelson, the director of federal lands at the Defenders of Wildlife, is a supporter of the fix, but says it feels “like one step forward and one step back.”¹⁴²

While the fix appears to free up more money for the Forest Service to spend on forest restoration projects, there is no change to the underlying incentives to over-rely on wildfire suppression. Essentially, the fix provides a disaster fund to treat the wildfires like other natural disasters, such as floods and hurricanes.¹⁴³ However, this fund could result in increasing wildfire costs because there are no limits on federal emergency-related disaster spending.¹⁴⁴ The government seemingly can spend as much as it wants on wildfire suppression without any budgetary consequences. With the number of homes in the fire-prone wildland-urban interface (WUI)¹⁴⁵ growing by 40% between 1990 and 2010, and no investments of pre-fire risk mitigation or incentives in the bill to live “fire-wise,”¹⁴⁶ the political and social pressure to rely on suppression tactics will only continue.¹⁴⁷ The population growth in fire-prone regions only highlights the urgency of more resources and innovative solutions.

The disaster fund is also joined by apparent compromises, as seen in NEPA, which provides exemptions from environmental reviews. Under NEPA, logging projects less than 3,000 acres can proceed with little review so long as the project’s goal revolves around reducing fuel loads that increase fire risk.¹⁴⁸ This would

¹⁴¹ *Id.*

¹⁴² Kutz, *supra* note 129.

¹⁴³ Shawn Regan, *Wildfire Budget ‘Fix’ Won’t Solve Fire Problem*, PROP. & ENVTL. RES. CTR. (Apr. 6, 2018), <https://www.perc.org/2018/04/06/wildfire-budget-fix-wont-solve-fire-problem/> [<https://perma.cc/RYN8-A2VU>].

¹⁴⁴ *Id.*

¹⁴⁵ The area where structures and other human development meet or intermingle with undeveloped wildland. It is where wildfires have their greatest impact on people.

¹⁴⁶ The concept that homeowners should collaborate with their own communities to reduce wildfire risks and prepare their homes with fire-proof structures.

¹⁴⁷ Regan, *supra* note 143.

¹⁴⁸ Consolidated Appropriations Act, *supra* note 14, at Section 605(c).

apply to 50 million acres of national forests, including those in Washington State, and those that fall within the WUI. Additionally, forests that have not burned within a historically expected timeframe can avoid environmental review as long as the logging project is established through a collaborative process.¹⁴⁹ These exemptions can avoid public comment, review processes, and be implemented without any guarantee of a public benefit. While the effects of logging projects will be considered on a case-by-case basis, many small projects will likely be approved without adding up their total impact. This hall pass to cut down forests and avoid environmental reviews is absurd.

Another compromise includes waivers to the ESA and delays to habitat protections for newly listed threatened or endangered species.¹⁵⁰ This compromise appears to undermine a recent decision by the Ninth Circuit Court, which upheld ESA regulations that require the USFS to consult with the FWS on the impacts of forest plans when a new species or habitat is listed or designated to the ESA.¹⁵¹ Now, agencies have a five-year period before they have to alter their forest plans to account for new information even if it is revealed that plans threaten the survival of a species or habitat.¹⁵² Brett Hartl, the government affairs director at the Center for Biological Diversity, alludes to the compromises in the fix: “I never think it is a good deal when the Democrats get money and Republicans get to change the underlying environmental laws.”¹⁵³ Hart says that one of those things is temporary, while the other is not.¹⁵⁴

3. Congressional Offices

In 2019, Senior Congressional staff members generously took the time to answer some of my questions, and asked to remain anonymous.¹⁵⁵ According to these sources, there are three things that have led to hotter and more rampant fires in the Northwest: climate change, history of suppression tactics, and more homes

¹⁴⁹ *Resource Advisory Committees (RACs)*, U.S. FOREST SERVICES, <https://www.fs.usda.gov/main/pts/specialprojects/racs> [<https://perma.cc/J4MF-24Z7>].

¹⁵⁰ Consolidated Appropriations Act, *supra* note 14, at Section 208.

¹⁵¹ *Cottonwood Environmental Law Center v. U.S. Forest Service*, 789 F.3d 1075, 1080 (9th Cir. 2015).

¹⁵² Ryan Richards, *Defining Success for the Wildfire Funding Fix*, CTR. FOR AM. PROGRESS (June 13, 2018), <https://www.americanprogress.org/issues/green/reports/2018/06/13/451901/defining-success-wildfire-funding-fix/> [<https://perma.cc/HA5K-JTAW>].

¹⁵³ Kutz, *supra* note 129.

¹⁵⁴ *Id.*

¹⁵⁵ Telephone Interview with Senior Professional Staff Member, Anonymous, U.S. Senate (March 3, 2019) [hereinafter Interview with Congressional Staff Members].

built in the woods today.¹⁵⁶ Congressional offices would need to change all the three drivers to assess the problem, and the Fire Funding Fix does not specifically address any of them.¹⁵⁷ This of course is not surprising, but still disappointing.

With the fix providing more money to USFS, there needs to be oversight to ensure that it is being spent prudently.¹⁵⁸ One form of oversight is holding hearings with agencies to ensure that money for firefighting is used for other things like forest management and research, which is much needed. It would be encouraging to see more smoke coming in the spring and fall from prescribed burns. How much this will actually happen is to be determined. Another thing included in the fix¹⁵⁹ is authority for USFS to loosen NEPA regulations to allow local authorities to treat three times the amount of land and reintroduce fires to unhealthy trees.¹⁶⁰ Diligent oversight will be critical for both the State and USFS to ensure that lightened NEPA regulations will be used beneficially for land and fuel treatment, and not for logging projects to slip through the cracks.

Not all congressional staff sound optimistic about shifting public perception on these matters.¹⁶¹ There is concern that Washington State has not seen the worst of it, and that fires will likely get two or three times worse before anything equalizes.¹⁶² One congressional staffer cautioned against full-force education of living with fire.¹⁶³ They claim that it is a bit of a fallacy because social science reveals that people usually do not make changes or move when they are warned of the risks their homes face.¹⁶⁴ Section 210 of the fix required the Forest Service to produce a map of every neighborhood in the county to show a scale from one to five on how vulnerable each one is to fire.¹⁶⁵ The intention was that local governments in Okanogan, for instance, would review the severity of its areas on the new map before developing on certain land. They then could require developers adhere to the Wild-

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ Consolidated Appropriations Act, *supra* note 14.

¹⁶⁰ Interview with Congressional Staff Members, *supra* note 155.

¹⁶¹ *Id.*

¹⁶² *Id.*

¹⁶³ *Id.*

¹⁶⁴ *Id.*

¹⁶⁵ Consolidated Appropriations Act, *supra* note 14.

Interurban Interface Code¹⁶⁶ in certain areas. This is a smart move in practice.

According to a congressional staff member, government and nonprofit out-reach groups have done a fairly good job of educating the public, but the real challenge is getting people to actually care more or finding ways to force homeowners to take preventative measures before forest fire conditions get worse.¹⁶⁷ If climate change is going to make conditions worse in the near future, any messages that Washingtonians can live again with smoke-free summers are reckless and only perpetuate an unrealistic and unhealthy public expectation.

IV. RECOMMENDATIONS

A. Modify the Fire Funding Fix Bill

With respect to the issue of climate change and an increasing amount of fire and smoke, the Fire Funding Fix is not actually helpful. While the fix resolves one concern over USFS funds needed later on in a given calendar year, it does not prepare vulnerable communities for a future of larger and longer lasting fires. The fix must be modified to re-allocate funds for more fuel treatments, which include thinning dense forests and prescribed burns. The fix must also implement climate change research into policy and education mandates to begin informing the public and changing their perception so individuals will become proactive and use treatment techniques on their homes and neighborhoods.

1. Re-allocate funding for fuel treatments

As previously mentioned, the new disaster fund allows for liberal spending on fire suppression by the government. To avoid this problem, Congress should work to allocate specific funds suitable for forest management and fuel treatments. The USFS piloted a new budgeting approach in three regions, called the Integrated Resource Restoration, which takes a comprehensive approach to addressing forest restoration work by putting it all under one-budget line item.¹⁶⁸ Reflective of the pilot program, forest management funds ought to be allocated proportionately amongst vegetation management, habitat restoration, and road or

¹⁶⁶ *Wildland-Urban Interface Code (WUI Code)*, PLAN. FOR HAZARDS: LAND USE SOLUTIONS FOR COLO. (Mar. 28, 2016), <https://planningforhazards.com/wildland-urban-interface-code-wui-code> [<https://perma.cc/7MHV-7YXS>].

¹⁶⁷ Interview with Congressional Staff Members, *supra* note 157.

¹⁶⁸ *Integrated Resource Restoration Overview*, U.S. FOREST SERVICES, <https://www.fs.fed.us/restoration/IRR/overview.shtml> [<https://perma.cc/RM6Z-5RDB>].

trail maintenance. All of these projects pursue ecological health.¹⁶⁹ Unfortunately, the piloted program received no funding in 2018 and was cut from the president's 2019 fiscal year budget.¹⁷⁰ In order to prioritize forest resilience and public safety, Congress should promote this sort of policy to promote accountability, and instruct that a certain allocation of such funds for these types of projects be strictly designated.

Professor Peterson knows that sufficient fuel treatment at a large enough scale to reduce fire intensity must be prioritized.¹⁷¹ The reduction of surface fuels is a great solution that is currently impossible to implement given to the lack of funding. If a certain amount of funding were set aside or required for fuel treatment, this could begin to put a dent in the problem.

2. Implement more climate change research into policy

Scientific understanding of wildland fire and fire regimes are consistently evolving as climate change becomes a reality, but existing policies are not always detailed with this information. Agencies should invest in more accurate data on wildfire potential and the impact of climate change on watersheds and ecosystems of each region and state. The Trump Administration has promoted an era of de-regulation, as well as cuts to the research programs that are essential to forest managers and the overall public.¹⁷² This is extremely detrimental. Congress should be pushing for research and development programs to be implemented into the "fix" and mandate frequent updates because of ever-evolving climate change data.

Professor Don McKenzie says one of the biggest obstacles to implementing more climate change research and studies into the nation's policies of forest management is in fact the Trump Administration.¹⁷³ Unfortunately, much of this is out of the control of the USFS and local municipalities. This means that individual states must take it upon themselves to include more climate change data into the policies surrounding forest management.

Professor Peterson makes it a point to discuss that the science on climate change in the Northwest is extensive, but that it needs to be more prevalent in State and national policies.¹⁷⁴ Jessica

¹⁶⁹ *Id.*

¹⁷⁰ *Id.*

¹⁷¹ Interview with David Peterson, *supra* note 132.

¹⁷² THE WHITE HOUSE, AN AMERICAN BUDGET (2018), <https://www.whitehouse.gov/wp-content/uploads/2018/02/budget-fy2019.pdf> [<https://perma.cc/25TG-LGSU>].

¹⁷³ Interview with Don McKenzie, *supra* note 82.

¹⁷⁴ Interview with David Peterson, *supra* note 132; Halofsky et al., *supra* note 65.

Halofsky recognizes the positive gains in Eastern Washington where, by the efforts of DNR and Good Neighbor Authority, climate change is now being discussed alongside fuel treatment by the government and local leaders.¹⁷⁵ The Good Neighbor Authority (GNA),¹⁷⁶ which comes from the 2014 Federal Farm Bill, was implemented via agreement between the USFS to partner with Washington's DNR for watershed restoration and forest management services on National Forest System lands, which accounts for 9.3 million acres of forests in Washington – approximately 44% of the overall state.¹⁷⁷

Once climate change is at the forefront of all policy surrounding Washington State's management of forests, as modeled after the GNA's collaboration with local leaders for non-federal forest lands, citizens can shift their expectations and general preparedness for future fires. People will begin to understand that more fires and smoke is indeed Washington's form of climate change. In turn, if public frustration is alleviated, more forest management tools like prescribed burns can be implemented year-round and more people will begin to live "fire-wise."

3. Provide tools to live with fire & smoke

Funding suppression through a disaster fund is undoubtedly a relief for agencies, but aside from the risk of overreliance on this one tactic and the need for re-allocating such funds, the fix should implement smarter development and treatment, which requires greater considerations of climate change at different county and local levels. An increasing number of people desire to live in and around forests, grasslands, and other natural areas and a proper fix should ensure that communities are living "fire-wise."¹⁷⁸ There should be incentives such as insurance or technical assistance programs, so people are encouraged to adapt and be prepared for fire.¹⁷⁹

If a person chooses to live in a fire-prone area, they must change their lifestyles and psychology to properly prepare for dangerous conditions. According to Professor Peterson, "living with

¹⁷⁵ Interview with Jessica Halofsky, *supra* note 134.

¹⁷⁶ *Good Neighbor Authority*, U.S. FOREST SERV., <https://www.fs.fed.us/managing-land/farm-bill/gna> [<https://perma.cc/8LXQ-NLL6>] (The GNA promotes collaboration with state, USFS, and local partners to restore and enhance forests on a landscape level, rather than within jurisdictional or regulatory limitations.).

¹⁷⁷ *Good Neighbor Authority: A Faster Path to Healthier Washington Forests*, WASH. ST. DEP'T OF NAT. RES., <https://www.dnr.wa.gov/GNA> [<https://perma.cc/88NG-E342>].

¹⁷⁸ STEIN, *supra* note 17.

¹⁷⁹ Richards, *supra* note 152.

fire” or being “fire-wise” is no different than becoming accustomed to or prepared for acts of terrorism, hurricanes, or earthquakes.¹⁸⁰ Changing one’s mindset and lifestyle to prepare for the real dangers of fire would be the best approach an individual could take to benefit themselves, their family, and their community. Peterson recognizes that even some of the politically conservative parts of the state that have been impacted by fires have, somewhat forcefully, become more educated and responsive to this new reality.¹⁸¹ Once this societal shift begins, pressure on fire managers and politicians can be alleviated.

Firewise Communities is a program of the National Fire Protection Association (NFPA) and is supported by the USFS, the Department of the Interior, and the National Association of State Foresters.¹⁸² The program encourages community solutions for wildfire safety by instructing homeowners, community leaders, developers, and firefighters on how to create fire-adapted communities.¹⁸³ The main goal of Firewise is to develop wildfire hazard mitigation plans and create defensible homes and neighborhoods. The NFPA has several recommendations for living fire-wise, including steps to make one’s home safer during wildfires.¹⁸⁴ The NFPA also suggests limiting the amount of flammable vegetation by choosing fire-resistant building materials and construction techniques, as well as performing exterior maintenance in three different ignition zones (Immediate, Intermediate, and Extended).¹⁸⁵

Homeowners must be diligent in protecting their homes and their surrounding community. To reduce ember ignitions and fire spread, homeowners should trim and prune any tree branches that overhang the home, porch, and deck.¹⁸⁶ Living fire-wise also means developing and discussing an emergency action plan so everyone in the home understands when and how to evacuate the neighborhood.

In terms of living with smoke, the State must fund portable particulate respirators for healthier breathing and educate people on where to retrieve such devices and when to wear them. If advanced fire warning notice does reach people, then the State must ensure physical notices are placed at each door during the worst summer months.

¹⁸⁰ Interview with David Peterson, *supra* note 132.

¹⁸¹ *Id.*

¹⁸² STEIN, *supra* note 17.

¹⁸³ *Id.*

¹⁸⁴ *How to Prepare Your Home For Wildfires*, NAT’L FIRE PROT. ASS’N, <https://www.nfpa.org/-/media/Files/Firewise/Fact-sheets/FirewiseHowToPrepareYourHomeForWildfires.pdf> [<https://perma.cc/P3QT-SQ6H>].

¹⁸⁵ *Id.*

¹⁸⁶ *Id.*

4. Education

A massive step towards shifting public perception on the importance of living with fire is increasing education. Wildfire prevention education is a very cost-effective approach in limiting the threat of wildfires. The State of Florida spent on average \$500,000 every year between 2002 and 2007 to educate on wildfire prevention.¹⁸⁷ This type of education included media efforts, homeowner visits, informational flyers, and community presentations. The number of accidental fires decreased during this period, as did the costs of suppression and damage compensation.¹⁸⁸ This revamped education should be implemented in the Northwest, as the states can use the saved suppression costs to re-allocate funds to forest management.

Shifting public perception on the importance of fuel treatment and prescribed burns should be also done through education. Florida is again a prime example, as its Forest Service oversees one of the most active prescribed burn programs in the United States.¹⁸⁹ The Florida Forest Service will issue about 88,000 authorizations each year to allow different agencies and landowners to perform prescribed burns of over 2.1 million acres each year.¹⁹⁰ The success is attributed to the wide array of groups applying for prescribed burn permits and the state approving such tactics. The parties in Florida seeking to perform prescribed burns have created Prescribed Fire Councils across the state, which bring together different outreach groups and local governments to share knowledge and skills.¹⁹¹ The successes of these programs are also associated to the social and cultural support of the public at large.

Alleviating public pressure is essential. The use of education in Florida has created a public acceptance of living fire-wise and prioritizing prescribed burns so less money is spent putting out fires on the backend.¹⁹² Jessica Halofsky says that there is a cultural element. Millions of prescribed burns take place in the Southeast because residents are willing to put up with it for healthier forests.¹⁹³

As of 2020, that cultural understanding does not exist in the Northwest. By having people live fire-wise, with more knowledge of climate change and the inevitable increase of fires and smoky

¹⁸⁷ STEIN, *supra* note 17, at 19.

¹⁸⁸ *Id.*

¹⁸⁹ *Prescribed Fire in Florida*, FLA. DEP'T OF AGRIC. & CONSUMER SERVICES, <https://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Prescribed-Fire> [<https://perma.cc/869V-TEDB>].

¹⁹⁰ *Id.*

¹⁹¹ *Id.*

¹⁹² Interview with Jessica Halofsky, *supra* note 134.

¹⁹³ *Id.*

skies, it can be easier for the State to take necessary steps to perform serious fuel treatment through prescribed burns and thinning forests. Once these critical steps are taken, larger and longer lasting fires can dwindle and the sheer smoke volume can decrease.

V. CONCLUSION

Many issues surrounding fire and smoke are interconnected. As climate change ramps up, there are still many unknown effects. Until now, Washington State has only been reactive. Without aggressive fuel treatment and year-round prescribed burns in Washington, high intensity fires will only continue to worsen, thereby impacting the air quality over heavily populated areas. Smoke filled summers will continue to be the new normal in the Pacific Northwest and people's health will be compromised.

The Fire Funding Fix must be modified immediately and Washington has to become more proactive than ever before. Educating the public on long-term positive outcomes from ecologically beneficial fire may be difficult because of an immediate desire for smoke free skies, but shifting the public perception will be critical. Being informed and accepting what climate change means to this region is essential for forest managers to effectively do their job. The public must get on board with living with fire and smoke today, so the health of future generations and forests can be preserved tomorrow.