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Forests Up in Smoke: An Analysis of the Washington State Legislatures 2016-2021 Actions to Combat and Reduce Wildfires

McKaylin Hughes

“Our forests provide the air that sustains us, the materials that shelter us and the jobs that feed us. But these life-sustaining forests we depend on for so much are in trouble.”

– Washington State Commissioner of Public Lands, Hilary Franz

I. INTRODUCTION

Wildfires have been a devastating problem across the Pacific Northwest for centuries.¹ “Wildfires are unplanned fires, including lightning-caused fires, unauthorized human-caused fires, and escaped prescribed fire projects.”² “Over the last decade, forestland and rangeland wildfires have grown larger and increased in intensity and destructiveness throughout Washington State.”³ According to the Washington Department of Ecology, “because of climate change, more frequent and intense wildfires are likely to become the new normal across the state.”⁴ “Rising temperatures, a key indicator of climate change, evaporate more moisture from the ground, drying out the soil, and making vegetation more flammable.”⁵ Several other effects of climate change contribute to increases in wildfire risks including earlier snowmelt, more frequent and longer heat waves, and drier summers.⁶

“The increase in these uncharacteristic wildfires are the result of a combination of climate change-driven drought, hotter temperature, and windstorms; human development patterns and land use planning and activities.”⁷ A normal fire season in Washington State “usually begins in early July and typically culminates in late September, when regular rain

¹ Knute Berger, *Wildfires are Burned into Washington’s History - and our Headlines*, CROSSCUT (Sept. 12, 2019), <https://crosscut.com/2019/09/wildfires-are-burned-washingtons-history-and-our-headlines> [<https://perma.cc/QLE7-AHH7>].

² CONG. RSCH. SERV., *Wildfire Statistics* (October 3, 2022), <https://sgp.fas.org/crs/misc/IF10244.pdf> [<https://perma.cc/WRP4-6T6W>].

³ H.B. 1168, 67th Leg. Sess., Pg. 1 (WA, 2021) (enacted). <https://lawfilesexternal.wa.gov/biennium/2021-22/Pdf/Bills/Session%20Laws/House/1168-S2.SL.pdf?q=20221003183423> [<https://perma.cc/878J-TPWB>].

⁴ DEP’T OF ECOLOGY STATE OF WASH., *Climate Change Increases Wildfire Risk* (last visited Oct. 29, 2022), <https://ecology.wa.gov/Air-Climate/Climate-change/Climate-change-the-environment/Wildfire-risks> [<https://perma.cc/J4PX-5MUK>].

⁵ ENVIRONMENTAL DEF. FUND, *Here’s How Climate Change Affects Wildfires* (last visited Oct. 29, 2022), <https://www.edf.org/climate/heres-how-climate-change-affects-wildfires> [<https://perma.cc/D5BQ-XH2Q>].

⁶ DEP’T OF ECOLOGY STATE OF WASH., *supra* note 4.

⁷ H.B. 1168, *supra* note 3, at 2.

returns to the Northwest... however, wildland fires have occurred in every month of the year.”⁸ From 2014 to 2021, Washington State has experienced several of the worst wildfire seasons in the state’s history. For example, in 2015 Washington experienced the worst fire season on record with over 2,013 reported wildfires burning more than 1.13 million acres across Washington State.⁹ “Over the last five years”¹⁰, wildfires have taken five lives, including four firefighters and the life of a one-year-old boy.”¹¹

The Washington State Department of Natural Resources (DNR), headed by Commissioner Hilary Franz, is an agency of the State of Washington whose mission is to manage, sustain, and protect the health and productivity of Washington’s lands and waters to meet the needs of present and future generations.¹² The DNR manages approximately three million acres of federally granted and state forest land across Washington State.¹³

DNR is Washington State’s largest firefighting force, with more than 1,300 employees trained and available to fight fires as needed. This includes more than 800 permanent DNR employees, 550 seasonal employees, about 120 wildland fire engines, nine helicopters and six single engine air tankers, which are under contract with DNR.¹⁴

Over the past decade, the Washington State Legislature (Legislature) has passed several pieces of legislation attempting to address the growing severity of wildfires. The most comprehensive and key pieces of recent legislation to address wildfires were passed in 2016, 2017, 2019 and 2021. While each piece of legislation attempts to provide solutions and funding to help combat wildfires across the state, none of it goes far enough to sufficiently address the serious and imminent threat that wildfires pose to Washington State’s forests and citizens. The Legislature needs to take drastic action and implement policies, procedures, and programs that will confront the growing presence of wildfires here and now.

Section II begins by giving a brief overview and background of the Washington State Legislature’s efforts to create legislation to combat wildfires. The section continues by discussing how and why climate change is a continuous factor that the Legislature must consider in creating

⁸ EMERGENCY MGMT. DIV., *Wildfires*, WASH. MIL. DEPT. (last visited Oct. 29, 2022), <https://mil.wa.gov/wildfire> [https://perma.cc/9Z2N-9AB9].

⁹ INS. INFO. INST., *Wildfires by State* (last visited May 10, 2022), <https://www.iii.org/table-archive/23284> [https://perma.cc/4R6P-885G] (2015 table).

¹⁰ 2016-2021.

¹¹ H.B. 1168, *supra* note 3, at 3.

¹² WASH. STATE. DEP’T OF NAT. RES., *Commissioner of Public Lands Hilary Franz* (last visited Oct. 29, 2022), <https://www.dnr.wa.gov/commissioner> [https://perma.cc/7PLJ-PRW8].

¹³ WASH. STATE. DEP’T OF NAT. RES., *Forest and Trust Lands* (last visited Oct. 3, 2022), <https://www.dnr.wa.gov/managed-lands/forest-and-trust-lands> [https://perma.cc/L58T-3A3E].

¹⁴ WASH. STATE. DEP’T OF NAT. RES., *Fighting Fire* (last visited May 10, 2022), <https://www.dnr.wa.gov/FightingFire> [https://perma.cc/7SUA-XMSB].

effective and impactful wildfire legislation and concludes by discussing alternative solutions for fighting wildfires. Section III provides a comprehensive discussion about all wildfire legislation passed and implemented by the Washington State Legislature between 2016 and 2021 and plans created by the DNR to combat wildfires. Section IV builds off section III by reviewing the various reporting requirements that have been designed to track and monitor the progress of the various pieces of legislation and DNR plans, and their effects on combatting wildfires across Washington State. Section V analyzes components of the most recent legislation from the 2021 legislative session and scrutinizes the legislation for failing to bolster the use of biomass and biochar technologies. Lastly, Section VI discusses the 2021 legislation's shortcomings related to inmate firefighters and further explores the use of inmate fire crews as an additional force for combatting forest wildfires.

II. BACKGROUND: WASHINGTON STATE WILDFIRE LEGISLATION AND CLIMATE CHANGE

A. Washington State Wildfire Statistics and Legislation

Washington State has a total land area of 42.6 million acres¹⁵ and has “nine national forests covering over 20 million acres, making nearly half of the state forestland.”¹⁶ The Insurance Information Institute provides an annual summary of the number of wildfires started and the number of acres burned in each state. Below is a summary of the Insurance Information Institute's wildfire information for Washington State:¹⁷

| Year | Number of Fires Started | Number of Acres Burned |
|------|-------------------------|------------------------|
| 2013 | 1,527 | 152,603 |
| 2014 | 1,480 | 386,972 |
| 2015 | 2,013 | 1,137,664 |
| 2016 | 1,272 | 293,717 |
| 2017 | 1,346 | 404,223 |
| 2018 | 1,743 | 438,834 |
| 2019 | 1,394 | 169,742 |
| 2020 | 1,646 | 842,370 |
| 2021 | 1,863 | 674,222 |

In most Washington State Legislative sessions from 2016 through 2021, the Legislature put forth new wildfire legislation with the goal of combatting wildfires across the state. Several pieces of legislation have

¹⁵ WASH. FOREST PROT. ASSOC., *Forest Facts and Figures* (last visited Oct. 29, 2022), <https://www.wfpa.org/wp-content/uploads/2017/11/forestfacts-and-figures10.pdf> [<https://perma.cc/YY8D-GD2M>].

¹⁶ Brendan Baptiste, *Incarcerated Give Back by Fighting Fires*, DEP'T OF CORR. WASH. STATE (June 1, 2022), <https://www.doc.wa.gov/news/2022/06012022.htm> [<https://perma.cc/4B7E-8X2C>].

¹⁷ INS. INFO. INST., *supra* note 9.

built upon one another to create longer-term plans focused on forest restoration, treatment plans for damaged forestland, and new plans for fighting wildfires across Washington State.

In 2016, the Washington State Legislature passed House Bill 2376 (HB 2376) which provided funds to the DNR to develop a 20-Year Forest Health Strategic Plan (20-Year Plan). Its goal was to “treat areas of state forestland that have been identified by the Department as being in poor health.”¹⁸ In 2017, the Legislature passed Senate Bill 5546 (SB 5546) which directed the DNR to “establish a forest health treatment framework to proactively and systematically address forest health issues facing the state.”¹⁹ This framework was designed to achieve the initial goal of assessing and treating one million acres of forestland by 2033.²⁰ Also in 2017, the Legislature passed House Bill 1711 (HB 1711) which directed the DNR to develop a plan for the prioritization of land to receive forest health treatments.²¹ This required the DNR to go beyond identifying forestland in poor health and identify high, medium, and low priority landscapes for forest health treatments over a specified number of years. In RCW 79.10.520, the Legislature defines forest health treatments as:

[A]ctions taken by the department to restore forest health including, but not limited to, sublandscape assessment and project planning, site preparation, reforestation, mechanical treatments including timber harvest, road realignment for fire protection and aquatic improvements, and prescribed burning.²²

In early 2019, the DNR and Commissioner Hilary Franz announced the Washington State 10-Year Strategic Plan (10-Year Plan). This plan, developed by the DNR, sets out high priorities for 2019-2020 including: (1) suppression priorities, (2) preparedness priorities, and (3) prevention priorities.²³ In addition to these three high priority items, the 10-Year Plan lays out four strategies to accomplish four key long-term goals, including: (1) achieving a fully capable wildfire preparedness, response, and

¹⁸ WASH. STATE. DEP’T OF NAT. RES., *20-Year Forest Health Strategic Plan*, at 10 (last visited May 10, 2022), https://www.dnr.wa.gov/publications/rp_forest_health_20_year_strategic_plan.pdf [https://perma.cc/DFE7-ECC4] [hereinafter “20-Year Forest Health Strategic Plan”].

¹⁹ S.B. 5546, 67th Leg. Sess. Pg. 1 (WA, 2021) (enacted). <https://lawfilesexet.leg.wa.gov/biennium/2017-18/Pdf/Bills/Session%20Laws/Senate/5546-S2.SL.pdf?q=20221003183806> [https://perma.cc/5PQ8-Y7TW].

²⁰ *Id.*
²¹ H.B. 1711 Report, 65th Leg. Sess. Pg. 1 (WA, 2017) (enacted). <https://lawfilesexet.leg.wa.gov/biennium/2017-18/Pdf/Bills/Session%20Laws/House/1711-S2.SL.pdf?q=20221003183552> [https://perma.cc/XV93-M4BL].

²² WASH. STATE. DEP’T OF NAT. RES., *Forest Health Treatment Prioritization and Implementation - A Report to the Washington State Legislature* (last visited Oct. 29, 2022), https://www.dnr.wa.gov/sites/default/files/publications/rp_2020_hb1711_report.pdf [https://perma.cc/TDL9-EJAM].

²³ WASH. STATE. DEP’T OF NAT. RES., *Washington State Wildland Fire Protection 10-Year Strategic Plan Summary* 4 (last visited Oct. 29, 2022), https://www.dnr.wa.gov/publications/rp_wildfire_plan_summary.pdf [https://perma.cc/3J44-9Y2J] [hereinafter “10-Year Strategic Plan Summary”].

recovery system; (2) the creation of resilient landscapes; (3) increasing community preparedness and adaptability; and (4) safe and effective responses to wildfires.²⁴

Also in 2019, the Washington State Legislature passed House Bill 1784 (HB 1784), a bill aimed at combatting wildfires, while encouraging wildfire prevention across the state of Washington.²⁵ HB 1784 amended several Washington State statutes to utilize and build upon the 10-Year Plan, by prioritizing forest health treatments that are specified in the 20-Year Plan.

Finally, in July 2021 the Washington State Legislature passed House Bill 1168 (HB 1168), a first-of-its-kind piece of legislation passed to combat wildfires in Washington State.²⁶ Unlike other legislation, HB 1168 references both the 10-Year Plan and 20-Year Plan and provides additional support for the DNR and the two plans.²⁷ Additionally, HB 1168 amends various existing Washington State statutes and creates several new sections with the intent to increase preventative actions relating to long-term forest health and reducing wildfire dangers.²⁸ The first amendment discusses the use of woody biomass technology as an environmentally friendly alternative method of wildfire prevention. The second expands on Washington State's existing use of inmate fire suppression crews and adds reasonable pay rates for these volunteer inmates fighting wildfires.²⁹ Since this legislation recently went into effect on July 25, 2021, it is too early to determine whether the legislation is achieving its intended purpose to address long-term forest health and the reduction of wildfire dangers.

Taken altogether, the legislation enacted by the Washington State Legislature and the plans created by the DNR seem to set clear, comprehensive goals for combatting wildfires across Washington State. And while HB 1168 is certainly some of the most extensive and far-reaching wildfire prevention legislation to date, this legislation does not go far enough to adequately address the imminent threat wildfires pose in Washington State.

B. How Wildfires Affect Climate Change and How Climate Change is Imbedded in Washington State's Wildfire Legislation

HB 1168 section 7 declares that, unless Washington State “significantly increases active forest management across land ownership to reduce the risk and intensity of wildfires, wildfire emissions will erode

²⁴ *Id.* at 5-7.

²⁵ H.B. 1784, 66th Leg. Sess. Pg. 1 (WA, 2017) (enacted).
<https://lawfilesexternal.wa.gov/biennium/2019-20/Pdf/Bills/Session%20Laws/House/1784-S2.SL.pdf?q=20221003184000> [https://perma.cc/CXJ9-B55F].

²⁶ THE NATURE CONSERVANCY, *Thank You for Supporting Fire Funding* (May 18, 2021),
<https://www.washingtonnature.org/fieldnotes/2021/3/9/designated-fire-funding-clears-a-legislative-hurdle> [https://perma.cc/U83M-FJCQ].

²⁷ H.B. 1168, *supra* note 3, at 2 and 5.

²⁸ *Id.* at 13 and 20.

²⁹ *Id.*

efforts to achieve our state's greenhouse gas reduction goals.”³⁰ This should be a wakeup call and immediate call to action to all Washingtonians. Here, the Legislature writes that unless Washington State takes immediate action to tackle wildfires across the state, every action the state takes to combat climate change and reduce greenhouse gas emissions will be minimized because of the inevitable wildfire smoke that contaminates the air during the summer months.³¹

“Historical forest management, legacy wildfire suppression responses, and a rapidly changing climate have increased the risk of catastrophic wildfires throughout the state.”³² According to the United States Department of Agriculture, “climate change will result in longer wildfire seasons, increased wildfire frequency, size, and total area burned, and possibly increased wildfire severity.”³³ “Climate change causes forest fuels (the trees and plants that burn and spread wildfire) to be drier and more easily ignited, leading to a doubling in the number of large fires between 1984 and 2015 in the western United States.”³⁴ Further, wildfires are one of the continuous drivers of climate change.³⁵ “When it comes to climate, wildfires occupy an unusual space: they are driven by climate change and they help drive it. As this vicious cycle plays out and predictions of extreme future fire seasons continue, the need for human intervention to interrupt this cycle has never been more clear.”³⁶ “As fires burn, carbon stored in trees and other vegetation combusts, releasing carbon dioxide and other potent greenhouse gases such as methane and nitrous oxide into the atmosphere. This means that as fires increase, so do emissions.”³⁷

So, while climate change contributes to the number and severity of wildfires, wildfires also add to the increasing amount of greenhouse emissions, that inevitably affect the earth's changing climate.³⁸ “Robust projections indicate that the risk of wildfires will continue to increase in most areas of the world as climate change worsens.”³⁹

³⁰ *Id.* at 2.

³¹ *Id.*

³² *Id.* at 4.

³³ Welcome to the USDA Northwest Climate Hub, *Climate Change and Wildfire in Idaho, Oregon, and Washington*, U.S. Dept. of Agriculture (last accessed Nov. 5, 2022), <https://www.climatehubs.usda.gov/hubs/northwest/topic/climate-change-and-wildfire-idaho-oregon-and-washington#:~:text=Climate%20change%20will%20result%20in,Warmer%20springs> [https://perma.cc/6A87-5VY7].

³⁴ DEP'T OF ECOLOGY STATE OF WASH., *supra* note 4.

³⁵ Carly Phillips, *How Wildfires Affect Climate Change - and Vice Versa*, THE CONVERSATION (May 18, 2021), <https://theconversation.com/how-wildfires-affect-climate-change-and-vice-versa-158688> [https://perma.cc/E6G9-MN53].

³⁶ *Id.*

³⁷ Nancy Harris, Thailynn Munroe & Kelly Levin, *6 Graphics Explain the Climate Feedback Loop Fueling US Fires*, WORLD RES. INST. (Sept. 16, 2020), <https://www.wri.org/insights/6-graphics-explain-climate-feedback-loop-fueling-us-fires> [https://perma.cc/ND8W-6R7S].

³⁸ *See id.*

³⁹ Rongbin Xu, Pei Yu, Michael J. Abramson, Fay H. Johnston, Jonathan M. Samet, Michelle L. Bell, Andy Haines, Kristie L. Ebi, Shanshan Li, & Yuming Guo, *Wildfires, Global Climate Change, and Human Health*, NEW ENG. J. OF MED., 2173 (2020) [https://perma.cc/WM2P-QYVM].

Woody biomass “is one component of the larger biomass category that includes organic plant and animal materials, products derived from them, and the residues generated from their growth, manufacturing, and use.”⁴⁴ More specifically, “woody biomass represents a potential source of raw material to produce small wood products, energy in the forms of heat, fuel or electricity, and other useful products.”⁴⁵ Both woody biomass and biochar are renewable resources that can contribute to the fight against climate change.⁴⁶

Forest residuals and woody biomass are forest products that are collected and converted into a source of renewable energy through specific heating methods and technologies.⁴⁷ Through specifically designed furnaces with limited oxygen at high temperatures, biomass is converted into biochar, a charcoal-like material that is produced from plant materials.⁴⁸ Biochar is rich in carbon and other nutrients, and “when added to soil, biochar improves plant growth and enhances crop yields, increasing food production and sustainability in areas with depleted soils.”⁴⁹

While methods of burning woody biomass to create biochar are not carbon neutral, they produce less greenhouse gas emissions than traditional open burning, which contributes to the fight against climate change and the fight against wildfires across Washington State. Currently, the Center for Sustaining Agriculture and Natural Resources (CSANR) at Washington State University is evaluating the potential for a biochar market in the Pacific Northwest.⁵⁰ “The Pacific Northwest is particularly suited for supporting a thriving biochar industry . . . because of the ubiquity of woody biomass as a biochar production feedstock and the extensive agricultural acreage that could benefit from biochar application.”⁵¹ Biochar also has the potential to be utilized in various industries. “One of the key materials for a sustainable future of the planet, biochar has many other uses that can be integrated into new organic systems for farming, building, clothing, electronics and a whole range of

⁴⁴ John R. Shelley, *Woody Biomass Factsheet – WBI*, UNIV. OF BERKELEY (last visited Oct. 29, 2022), <https://www.pelletheat.org/assets/docs/industry-data/infoguides43284.pdf> [<https://perma.cc/3ZFE-G8CK>].

⁴⁵ FOREST AND RANGELANDS, U.S. DEP’T OF AGRIC., *Woody Biomass Utilization and the WBUG* (last visited May 10, 2022), <https://www.forestsandrangelands.gov/woody-biomass/overview.shtml> [<https://perma.cc/RJE5-QNZE>].

⁴⁶ *Id.*

⁴⁷ WASH. FOREST PROT. ASSOC., *Biomass: A Key Source of Renewable Energy* (last visited May 10, 2022), <https://www.wfpa.org/sustainable-forestry/biomass/> [<https://perma.cc/E4DN-W4SD>].

⁴⁸ U.S. BIOCHAR INITIATIVE, *Biochar and Renewable Energy from Biomass* (last visited Oct. 3, 2022), <https://biochar-us.org/biochar-and-renewable-energy-biomass#:~:text=Thermal%20Conversion%20of%20Biomass%E2%80%94%20Biochar,all%20of%20the%20emissions%20produced> [<https://perma.cc/MA9A-3J37>].

⁴⁹ U.S. BIOCHAR INITIATIVE, *Soil & Water Benefits of Biochar* (last visited Nov. 5, 2022), <https://biochar-us.org/soil-water-benefits-biochar> [<https://perma.cc/9RHH-VXD6>].

⁵⁰ Embrey Bronstad, *Developing Biochar Markets in the Pacific Northwest*, WASHINGTON STATE UNIVERSITY COLLEGE OF AGRICULTURAL, HUMAN, AND NATURAL RESOURCE SCIENCES (Jan. 29, 2021), <https://csanr.wsu.edu/developing-biochar-markets-in-the-pacific-northwest/> [<https://perma.cc/SC2H-TTEK>].

⁵¹ *Id.*

consumer products.”⁵² While CSANR seeks to implement biochar technologies on a greater scale, biochar technology is currently being utilized on a smaller, local scale in Washington State. In a small, fire-prone town in north central Washington, one non-profit company has purchased the necessary technology to turn biomass into biochar as a way to locally combat the catastrophic impacts and damage caused by wildfires.⁵³

The Washington State Legislature clearly recognizes the need for developing forest biomass and biochar markets in HB 1168, but that is simply all they do. Instead of merely commanding that the DNR “must explore opportunities and developing markets,” the Legislature should have done more to facilitate the creation of a biomass market in Washington State.⁵⁴ Further, Washington State and the Legislature should actively seek opportunities to create a biomass market in the Pacific Northwest region and invest in and develop revolutionary biomass technologies to assist the DNR in creating a market for woody biomass in the Pacific Northwest.

The Washington State Legislature must do more to encourage the use of clean, renewable, alternative methods to combat climate change and wildfires, like woody biomass and biochar technologies. By implementing forest residual biomass and biochar technologies, Washington State would be employing technologies that would utilize the dry, flammable, plant-based material that lies on the forest floor and would be repurposing it in a way that aids in the fight against climate change and the battle against wildfires in Washington State.

Although there are many environmental benefits to converting biomass into biochar, there are also several drawbacks. Writing for the Biochar Journal, Hans-Peter Schmidt and Kelpie Wilson stated, “the biggest drawback to the application of biochar in soil is the cost. Making biochar is either a technical highly elaborate and capital-intensive process or a low-tech, slow and labor-intensive process; both paths are rather expensive.”⁵⁵ With that, if you consider the high costs that wildfires annually inflict on Washington State’s budget, investing in new technologies to utilize biomass and biochar may be a worthwhile investment and help reduce these high costs in the future. HB 1168 declares that “from 2014-2019, agencies in Washington annually spent nearly \$150,000,000 fighting wildfires. In 2015, firefighting costs were more than \$342,000,000.”⁵⁶ There are various types of biochar technology that are available for purchase, most of which are priced between

⁵² Hans-Peter Schmidt and Kelpie Wilson, *The 55 uses of biochar*, THE BIOCHAR JOURNAL (last updated May 12, 2014), www.biochar-journal.org/en/ct/2 [https://perma.cc/F3R5-DNNK].

⁵³ Mandy Godwin, *Biochar ambassadors hope to save Washington’s fire-ravaged Methow*, THE SEATTLE TIMES (Sept. 12, 2021), <https://www.seattletimes.com/seattle-news/environment/biochar-ambassadors-hope-to-save-washingtons-fire-ravaged-methow/> [https://perma.cc/7CS3-QMRG].

⁵⁴ HB 1168, *supra* note 3, at 13.

⁵⁵ SCHMIDT AND WILSON, *supra* note 52.

⁵⁶ H.B. 1168, *supra* note 3, at 3.

\$200,000 and \$2,000,000 per unit.⁵⁷ When comparing the relatively low cost of biochar technologies to Washington State's high annual wildfire costs, Washington could make a much-needed investment in biochar technologies that could result in lower annual costs for combating wildfires across Washington State.

D. Inmate Forest Fire Suppression Crews

The Washington State Department of Corrections (DOC) has established contracts with the DNR for approved incarcerated persons to assist in forest firefighting, fire suppression, and other incidents and significant events.⁵⁸ The incarcerated persons volunteer as crew members for the program.⁵⁹ This program provides a workforce of over 300 crew members during fire season, which is comprised of approximately thirty crews of ten incarcerated crew members and their supervisors.⁶⁰ Furthermore, this program provides these incarcerated persons with an opportunity to develop job skills and experience a sense of pride from accomplishing something of value and impact, while also providing a low-cost, critical service to fight against wildfires across Washington State.⁶¹

In 1991, the Washington State Legislature implemented RCW 72.64.160, which states that "inmate forest fire suppression crews may be classified as a class I free venture industry."⁶² A class I free venture industry, as applied to incarcerated persons, means that the individual shall work in the free venture industry at their own choice.⁶³ HB 1168 added a new section to RCW 72.64.160, which mandates that inmate forest fire suppression crews, acting of their own volition, must receive no less than the minimum hourly wage in the specific jurisdiction where they are fighting fires.⁶⁴

The incarcerated individuals "who work on the DNR fire crews receive training and job skills in firefighting, chainsaw operation, silviculture practices, sew shop skills, as well as machine and auto mechanics."⁶⁵ While employed in these fire crew programs, incarcerated individuals learn various skills related to fire prevention and firefighting, while also being educated about careers in fighting wildfires by working alongside the DNR and their various firefighting work crews. Many of the incarcerated persons working on fire crews across the United States enjoy

⁵⁷ BIOCHAR INT'L, *Choosing a Biochar Reactor to Meet Your Needs* (last visited May 10, 2022), <https://biochar.international/guides/biochar-reactor-to-meet-needs/> [<https://perma.cc/H4ZV-7GQF>].

⁵⁸ DEP'T OF CORR., *Work Crews*, WASH. STATE (last visited May 10, 2022), <https://www.doc.wa.gov/corrections/programs/work-crews.htm> [<https://perma.cc/3QVH-UCGE>] [hereinafter "DOC Work Crews"].

⁵⁹ WASH. STATE. DEP'T OF NAT. RES., *Correctional Camps Program* (last visited Dec. 5, 2022), <https://www.dnr.wa.gov/CorrectionalCamps> [<https://perma.cc/V3P3-B8A2>] [hereinafter, "C.C. Program"].

⁶⁰ *Id.*

⁶¹ See generally, BAPTISTE, *supra* note 16 and WILSON, *supra* note 156.

⁶² WASH. REV. CODE § 72.64.160(1) (2021) [<https://perma.cc/8MK2-VFHL>].

⁶³ WASH. ADMIN. CODE § 137-80-031(5) (2020) [<https://perma.cc/5KEN-R57Q>].

⁶⁴ WASH. REV. CODE § 72.64.160(2) (2021) [<https://perma.cc/QTG8-95XD>].

⁶⁵ DOC WORK CREWS, *supra* note 58.

or find value in the work they perform and hope to continue this work upon release from detention.⁶⁶

While Washington State does not currently have any legislation or programs aimed at providing post-release training or employment for incarcerated persons who served on fire crews during their incarceration, Washington State would greatly benefit from increasing its firefighting work force. As fire seasons continues to intensify, Washington State will need more people on the ground fighting fires, especially if departments like the United States Forest Service (U.S. Forest Service) continue to experience a shortage of firefighters.⁶⁷ With that, as wildfires continue to grow in number and intensity across the state, the DNR and U.S. Forest Service could become more dependent on incarcerated fire crews to assist their professionally trained firefighters in combatting wildfires – especially during a time when fire departments are experiencing employment shortages.

III. WILDFIRE LEGISLATION IN WASHINGTON STATE

A. House Bill 2376 and the 20-Year Forest Health Strategic Plan

In 2016, the Washington State Legislature passed House Bill 2376 (HB 2376) and specifically section 308(11), which allocated \$215,000 to the DNR to develop the 20-Year Plan. According to the DNR Commissioner Hilary Franz:

[T]he goals and strategies outlined in the plan will reduce wildfire hazards to state trust lands and private forest owners, leverage additional funding, increase confidences for businesses, and accelerate the development of resilient forest ecosystems for the benefit of current and future generations.⁶⁸

Another stated goal of the 20-Year Plan is to “treat areas of state forestland that have been identified by the department as being in poor health.”⁶⁹

B. Senate Bill 5546 and the 20-Year Forest Health Strategic Plan

On July 23, 2017, the Washington State Legislature passed and implemented additional legislation that built upon the 20-Year Plan framework in HB 2376, by providing additional direction to the DNR to create a forest health treatment assessment and framework to address

⁶⁶ Stacy Selby, *Inmate fire crews, essential to WA fire fighting, deserve better*, CROSSCUT (Sept. 17, 2020), <https://crosscut.com/opinion/2020/09/inmate-fire-crews-essential-wa-fire-fighting-deserve-better> [<https://perma.cc/WA26-KGWW>].

⁶⁷ Nicole Blanchard, *Forest Service faces firefighter shortages in the West. How is Idaho impacted?* THE SPOKESMAN REVIEW (June 7, 2022), <https://www.spokesman.com/stories/2022/jun/07/forest-service-faces-firefighter-shortage-in-the-w/> [<https://perma.cc/3YCV-QFFZ>].

⁶⁸ 20-YEAR FOREST HEALTH STRATEGIC PLAN, *supra* note 18, at 6 and 7.

⁶⁹ *Id.* at 10.

forest health issues facing Washington State.⁷⁰ The new legislation, SB 5546, directed the DNR to develop an assessment and treatment framework designed to proactively and systematically address the forest health issues facing the state.⁷¹ The basic framework consists of three elements: assessment, treatment, and progress review and reporting.⁷²

Under SB 5546, the Commissioner will appoint a Forest Health Advisory Committee “to assist in developing and implementing”⁷³ the forest health assessment and the DNR will use the framework to “identify and assess two hundred thousand acres of fire prone lands and communities that are in need of forest health treatment,” each biennium.⁷⁴ Additionally, SB 5546(1)(3)(a) requires that, to the maximum extent practicable, the DNR should “promote the efficient use of resources.”⁷⁵

C. House Bill 1711

Also on July 23, 2017, the Washington State Legislature passed and implemented House Bill 1711 (HB 1711). This bill required the DNR to “develop and implement a policy for prioritizing forest health treatment investments on state lands to reduce wildfire hazards and losses; reduce disease and insect infestation; and achieve forest health and resilience at a landscape scale.”⁷⁶ The prioritization identifies high, medium, and low priority landscapes for forest health treatment to inform the treatment needs.⁷⁷

D. The Final 20-Year Forest Health Strategic Plan

Taken altogether, HB 2376 creates and provides the initial funding for the 20-Year Plan, while SB 5546 and HB 1711 provide an additional framework and expand the scope of the 20-Year Plan. The stated mission of the 20-Year Plan is to “restore and manage forested landscapes at a pace and scale that reduces the risk of uncharacteristic wildfires and increases the health and resilience of forest and aquatic ecosystems in a changing climate for rural communities and the people of Washington State.”⁷⁸

There are five major objectives the 20-Year Plan lays out to achieve the stated goal of restoring Washington State forestland: (1) accelerate the pace and scale of forest treatments; (2) strategically focus work to protect at risk communities; (3) promote rural economic development; (4) integration of diverse landowner objectives; and (5) monitor progress and adapt strategies over time to ensure treatment effectiveness.⁷⁹

⁷⁰ S.B. 5546, *supra* note 19, at 1-2.

⁷¹ *Id.* at 1.

⁷² *Id.*

⁷³ S.B. 5546, *supra* note 19, at 2-3.

⁷⁴ S.B. 5546, *supra* note 19, at 1-2.

⁷⁵ *Id.* at 2.

⁷⁶ 20-YEAR FOREST HEALTH STRATEGIC PLAN, *supra* note 18, at 11 and 12.

⁷⁷ *Id.* at 19.

⁷⁸ *Id.* at 15.

⁷⁹ *Id.*

E. House Bill 1784 and the 10-Year Strategic Plan

In 2017, Commissioner Hilary Franz passed and implemented the 10-Year Plan for wildland fire protection across Washington State. The 10-Year Plan is intended to be a companion to the 20-Year Plan, each of which are designed to combat and prevent wildfires in Washington State in various ways.⁸⁰ More specifically, several of the priorities listed in the 10-Year Plan include: establishing an interagency wildland fire training academy; accelerating the DNR's 20-Year Plan; expanding landowner assistance programs; and increasing existing wildfire prevention outreach efforts, among other priorities.⁸¹

The 10-Year Plan declared three high priorities specifically for 2019-2020, discussed below in the order listed in the 10-Year Plan.⁸² The first is fire suppression. "Suppression" is a wildland response strategy "to extinguish a wildfire, prevent or modify the movement of unwanted fire, or manage a fire when it provides benefits like fuel reduction or improved wildlife habitat."⁸³ The second priority is centered around wildfire preparedness. "Healthy and prepared landscapes are more resilient to, and better able to withstand wildfires."⁸⁴ The third priority of the 10-Year Plan is prevention of wildfires. This includes expanding existing wildfire prevention outreach efforts, developing and utilizing new community engagement methods, and creating the "capacity to engage with limited English proficiency communities" to inform them of wildfire dangers in their communities.⁸⁵ This final category of prevention includes many efforts to inform and educate the public about the increasing dangers of wildfires. This educational component is of critical importance. In 2020, 93% of wildfires in Washington State were human-caused.⁸⁶ Efforts to increase education and communication regarding wildfire prevention can, understandably, lead to a reduction in the number of human-caused wildfires in the foreseeable future.

The 10-Year Plan puts forth four strategies to help create a prepared, safe, and resilient Washington State. Each strategy is summarized as follows: (1) Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable; (2) landscapes are resilient - in the face of wildland fire, they resist damage and recover quickly; (3) communities are prepared and adapted for current and future wildland fire regimes; and (4) response is safe and effective.⁸⁷

These strategies provide cross-cutting solutions that enable system changes and respond to specific challenges facing Washington State

⁸⁰ See 10-YEAR STRATEGIC PLAN SUMMARY, *supra* note 23, at 8.

⁸¹ *Id.* at 4.

⁸² These three priorities are listed in the order presented in the 10-Year Plan. There is no indication that these priorities are ranked in any specific order of importance.

⁸³ Office of Wildland Fire, *Suppression*, U.S. DEPT. OF THE INTERIOR (last visited Nov. 5, 2022), <https://www.doi.gov/wildlandfire/suppression> [<https://perma.cc/VEU6-7WJL>].

⁸⁴ 10-YEAR STRATEGIC PLAN SUMMARY, *supra* note 23, at 4.

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.* at 5-7.

throughout the fire cycle. The plan also provides various timeframes for the implementation, development, and achievement of these goals and strategies.

IV. DEPARTMENT OF NATURAL RESOURCES: FOREST PLANS AND REPORTING REQUIREMENTS

A. 20-Year Plan: Forest Health Assessment and Treatment Framework, 2020

In SB 5546 and HB 1784, the Washington State Legislature added a reporting requirement for the 20-Year Plan, which requires the DNR to submit a report to the Legislature detailing their forest restoration progress on December 1st of every even-numbered calendar year.⁸⁸ The most recent report from December 1, 2020, titled *Forest Health Assessment and Treatment Framework 2020* (2020 Report), provides key information on the DNR's progress to create resilient forests in the face of challenges like insects, disease, wildfires, and climate change. The purpose of the 2020 Report is to "provide a progress review of the 20-Year Forest Health Strategic Plan."⁸⁹

The 2020 Report outlines the progress the DNR has made toward achieving their goal of treating one million acres of Washington State wildland by 2033.⁹⁰ In the 2020 Report, the DNR provides treatment need assessment results across thirty high priority, fire-prone areas, which encompass approximately 3.37 million acres.⁹¹ This assessment of over three million acres greatly exceeds the statutory requirement in RCW 76.06.200, which states that "each biennium, the DNR must identify and assess two hundred thousand acres of fire prone lands and communities that are in need of forest health treatment."⁹² "This report builds upon the 2018 SB 5546 legislative report, that describes the DNR's forest health prioritization process across all lands."⁹³

In the 2020 Report, the DNR outlines the six metrics used to create a wildfire response benefit map: (1) wildfire risk to homes; (2) wildfire risk to surface sources of drinking water; (3) wildfire risk to commercially managed lands; (4) wildfire transmission to homes; (5) crown fire potential; and (6) landscape treatment priority.⁹⁴

The first five factors are given a combined 75% total weight, while the sixth factor is given 25% weight when the DNR assigns a priority level

⁸⁸ 20-YEAR FOREST HEALTH STRATEGIC PLAN, *supra* note 18, at 37 and WASH. REV. CODE § 76.06.200(2)(c) (2021) [<https://perma.cc/PWG4-NDM6>].

⁸⁹ FOREST HEALTH ASSESSMENT AND TREATMENT FRAMEWORK, *supra* note 90, at 6.

⁹⁰ H.B. 1168, *supra* note 3, at 11 and WASH. STATE DEP'T OF NAT. RES., *Forest Health Assessment and Treatment Framework 2020* (last visited Nov. 5, 2022), <https://www.dnr.wa.gov/managed-lands/forest-and-trust-lands> [<https://perma.cc/9LFL-NPJK>] [hereinafter "Forest Health Assessment and Treatment Framework"].

⁹¹ FOREST HEALTH ASSESSMENT AND TREATMENT FRAMEWORK, *supra* note 90, at 7.

⁹² WASH. REV. CODE § 76.06.200(2)(a) [<https://perma.cc/NRX2-PGSY>].

⁹³ FOREST HEALTH ASSESSMENT AND TREATMENT FRAMEWORK, *supra* note 90, at 7.

⁹⁴ *Id.* at 112.

to a given area.⁹⁵ After reviewing and analyzing all six factors, the DNR determines which wildland areas should be given wildfire response benefit priority, and which can be deprioritized for the time being.

The figure below from the 2020 Report shows a visual breakdown of the individual priority levels assigned to various Washington lands:

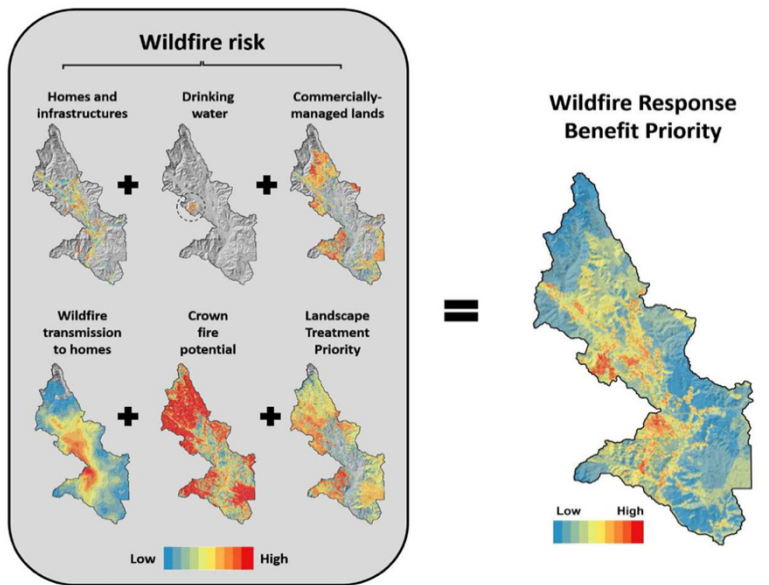


Figure 2. *Wildfire Response Benefit Priority Map from the DNR's Forest Health Assessment and Treatment Framework.*⁹⁶

Additionally, in the 2020 Report, the DNR made a commitment to analyze nine more high-priority fire-prone areas over the next biennium, which comprises an additional 1.06 million acres.⁹⁷ Between the 3.37 million acres already analyzed and the additional 1.06 million acres to be analyzed between 2021-2022,⁹⁸ the DNR will have analyzed and evaluated approximately 4.43 million acres of high-priority, fire-prone lands across Washington State. This will provide a powerful blueprint to continue implementing the 20-Year Plan in the years to come.⁹⁹

Lastly, the 2020 Report outlines the prioritization of “forest health treatments for the dual benefit of forest health and wildfire responses, as required by HB 1784.”¹⁰⁰ HB 1784 amends RCW 76.06.200 and adds section 1.3(b), which seeks to “prioritize, to the greatest extent practicable... forest health treatments that are strategically planned to serve the dual benefits of forest health optimization while providing

⁹⁵ *Id.*

⁹⁶ FOREST HEALTH ASSESSMENT AND TREATMENT FRAMEWORK, *supra* note 90, at 111.

⁹⁷ *Id.* at 4.

⁹⁸ *Id.*

⁹⁹ *See Id.*

¹⁰⁰ *Id.* at 5.

geographically planned tools for wildfire response.”¹⁰¹ “Dual benefit means that treatment in these prioritized areas will address forest health needs but also provide strategic locations for firefighters conducting suppression actions, prescribed burns, or managed wildfire.”¹⁰²

B. Purposes for Biennium Reporting

“To monitor forest conditions, assess progress, and reassess strategies over time, the DNR also developed a monitoring framework. Monitoring is essential for accountability and reporting, building shared understanding and trust across land ownerships, and increasing effectiveness of forest health treatments in the future.”¹⁰³ Per RCW 76.06.200, by December 1st of each even-numbered year, the DNR must provide the appropriate committees of the Legislature and the Office of Financial Management with:

- (i) A request for appropriations designed to implement the framework in the following biennium, including assessment work and conducting treatments identified in previously completed assessments;
- (ii) A prioritized list and brief summary of treatments planned to be conducted under the framework with the requested appropriations, including relevant information from the assessment; and
- (iii) A list and brief summary of treatments carried out under the framework in the preceding biennium, including total funding available, costs for completed treatment, and treatment outcomes. The summary must include any barriers to framework implementation and legislative or administrative recommendations to address those barriers.¹⁰⁴

C. House Bill 1168: Forest Health and Wildfires

The most recent wildfire legislation passed and implemented by the Washington State Legislature also builds upon the foundation of the 20-Year Plan and the 10-Year Plan. This legislation seeks to further protect Washington State from the growing number of wildfires.

Washington House Bill 1168 was introduced in the 2021 Regular Session of the 67th Legislature and creates additional avenues to fight wildfires across Washington State.¹⁰⁵ HB 1168, section 11 states that this act may be known and cited as the “*The Wildfire Response, Forest Restoration, and Community Resilience Act*.”¹⁰⁶ Further, HB 1168 is built

¹⁰¹ WASH. REV. CODE § 76.06.200(3)(b) (2021) [<https://perma.cc/NRX2-PGSY>].

¹⁰² FOREST HEALTH ASSESSMENT AND TREATMENT FRAMEWORK, *supra* note 90, at 23.

¹⁰³ *Id.* at 5.

¹⁰⁴ WASH. REV. CODE § 76.06.200(2)(c)(i)-(iii) (2021) [<https://perma.cc/NRX2-PGSY>].

¹⁰⁵ H.B. 1168, *supra* note 3, at 1.

¹⁰⁶ *Id.* at 20.

on the framework of previous legislation, including HB 1711 (2017), SB 5546 (2017), and HB 1784, which went into effect on July 28, 2019.

HB 1168 was passed with unanimous support from both the House and the Senate and went into effect on July 25, 2021.¹⁰⁷ The stated purpose of HB 1168 is to address long-term forest health and reduction of wildfires in Washington State.¹⁰⁸

HB 1168 section 1 addresses the growth and intensification of wildfires in Washington State. Moreover, HB 1168 specifically states that “over the last decade, forestland and rangeland wildfires have grown larger and increased in intensity and destructiveness throughout Washington State.”¹⁰⁹ HB 1168 illustrates that in the 1990s, an average of 86,000 acres burned annually in Washington State, whereas from 2016 through 2021, the state saw an increased average of approximately 488,000 acres burned per year.¹¹⁰ Section 1 discusses the harm and destruction wildfires have caused across Washington State:

Recent wildfires have . . . released greenhouse gases, destroyed critical fish and wildlife habitat, filled our skies with harmful smoke, polluted our waters, damaged our economy, increased the risk of flooding and landslides, created a critical need for reforestation, and threatened the natural resources needed for essential industries and rural economies.¹¹¹

In section 1 of HB 1168, the Legislature made clear its intention to take immediate action and to fully fund the wildland fire protection 10-Year Plan. “Strategies to accomplish these goals include, but are not limited to:

- (a) Upgrading our capability to attack wildfires with critical air and ground resources;
- (b) Providing needed wildfire resources to state wildfire response and local fire service districts;
- (c) Working with each state utility, local publicly owned electric utility, and electrical cooperative to reduce wildfire risk and develop consistent approaches and shared data related to fire prevention, safety, vegetation management, and energy distribution systems; and
- (d) Improving wildfire detection in areas at risk of wildfire through new technologies and equipment.”¹¹²

¹⁰⁷ *Id.*

¹⁰⁸ *Id.* at 1.

¹⁰⁹ *Id.*

¹¹⁰ *Id.*

¹¹¹ *Id.* at 1-2.

¹¹² *Id.* at 5-6.

HB 1168 further states the Legislature’s intent “to take immediate action to increase the pace and scale of forest management across different land ownerships and fully fund the 20-Year Forest Health Strategic Plan and activities developed to facilitate the implementation of the [plan].”¹¹³ Several strategies are included to accomplish the goals of the Legislature, including “restoring to health a minimum of 1,250,000 acres of forestland in need of immediate action”; “increasing prescribed fire and other fuel reduction projects”; and “establishing potential control lines and strategic fuel breaks around communities with high wildfire risk.”¹¹⁴

It is clear from the language of HB 1168 that the Washington State Legislature understands the increasing threat that wildfires pose to Washington State forests and citizens. HB 1168 acknowledges the various ways that wildfires affect our health, safety, environment, and economy. The Washington State Legislature’s decisions to fully fund the 10-Year Plan and 20-Year Plan demonstrate the Legislature’s commitment to combating and controlling wildfires across Washington State.

D. House Bill 1168: Shortcomings

While the most recent legislation put forth by the Washington State Legislature implements wide reaching measures to reduce the risks and impacts of wildfires across Washington, there remains two areas where the Legislature could have done more. One shortcoming is commanding that the DNR use and explore biomass and biochar markets, instead of taking action to help the DNR in creating a market that, as previously stated, does not exist in large scale in the Pacific Northwest. The other shortcoming is that while HB 1168 increases pay for inmate firefighters, it does not provide any avenues for these trained inmate firefighters to seek gainful employment fighting fires after they are released from detention.

V. WOODY BIOMASS, BIOCHAR, AND FOREST RESIDUAL TECHNOLOGIES

One critical measure added to HB 1168 that focuses on both wildfire prevention and combating climate change is the amendment of RCW 76.06.200 to include section 6. Section 6 states that the DNR “must explore opportunities and developing markets for the utilization of woody biomass residuals from forest treatments, including biochar.”¹¹⁵

A. Woody Biomass, Biomass Technology, and Biochar Explained

“Biomass is renewable organic material that comes from plants and animals.”¹¹⁶ “Woody biomass is often used to refer to any non-

¹¹³ *Id.* at 6.

¹¹⁴ *Id.*

¹¹⁵ *Id.* at 13 and WASH. REV. CODE § 76.06.200(6) (2021) [<https://perma.cc/NRX2-PGSY>].

¹¹⁶ U.S. ENERGY INFO. ADMIN., *Biomass Explained, Biomass – Renewable Energy from Plants and Animals* (last visited Oct. 19, 2022), <https://www.eia.gov/energyexplained/biomass/> [<https://perma.cc/G8AF-SJXZ>].

merchantable wood materials that do not have an existing local market. This could include live trees, forest and manufacturing residues, or consumer waste materials.”¹¹⁷ The U.S. Forest Service defines woody biomass as “trees and woody plants, including limbs, tops, needles, leaves, and other woody parts, grown in a forest, woodland, or rangeland environment, that are the by-products of forest management.”¹¹⁸

For clarity, with the use of woody biomass technology, the DNR and other agencies engaged in forest treatments could collect the dry, flammable trees, wood, and vegetation lying on the forest floor, and transport it to a biomass facility where it would be burned in a specific way that produces less carbon. “Biochar is also an excellent carbon sink. Carbon sinks are reservoirs for carbon-containing chemicals, including greenhouse gas.”¹¹⁹

“Through the exothermic combustion process, wood or woody biomass, is converted into the primary products of carbon dioxide, water, inorganic ash, and various other gaseous and particulate emissions.”¹²⁰ “Biochar” is defined as a form of charcoal that is produced by exposing organic waste matter (such as wood chips, crop residue, or manure) to thermochemical conversion in a low-oxygen environment, that is used especially as a soil amendment.¹²¹ Biochar is produced during the pyrolysis or gasification stage, which involves temperatures ranging from 350-700 degrees Celsius, or 662-1,292 degrees Fahrenheit.¹²² “Biochar is a carbon-rich solid that is particularly useful in agriculture. Biochar enriches soil and prevents it from leaching pesticides and other nutrients into runoff.”¹²³ “Sustainable biochar production uses crop residues, non-commercial wood and wood waste, manure, solid waste, non-food energy crops, construction scraps, yard trimmings, methane digester residues or grasses.”¹²⁴ In 2021, biomass provided nearly 5 quadrillion British thermal units (Btu) and about 5% of total primary energy use in the United States.¹²⁵

¹¹⁷ SHELLEY, *supra* note 44, at 1.

¹¹⁸ *Id.*

¹¹⁹ Elizabeth Morse and Andrew Turgeon, *Biomass Explained*, NATIONAL GEOGRAPHIC (last updated May 19, 2022) (last visited Dec. 4, 2022), <https://education.nationalgeographic.org/resource/biomass-energy> [<https://perma.cc/2EDW-NVYQ>] [hereinafter, “National Geographic”].

¹²⁰ SHELLEY, *supra* note 44, at 1.

¹²¹ See EMERGENT WASTE SOLUTIONS, *Biochar* (last visited Nov. 1, 2022), <https://www.ewscanada.com/biochar> [<https://perma.cc/3A9E-D2QC>]; and Rochester Inst. of Technology, *What is biochar and how is it made?* GOLISANO INSTITUTE FOR STABILITY BLOG (Jan. 20, 2021), <https://www.rit.edu/sustainabilityinstitute/blog/what-biochar-and-how-it-made> [<https://perma.cc/RZ5T-HLL3>] [hereinafter, “What is biochar and how is it made?”].

¹²² U.S. BIOCHAR INITIATIVE, *Biochar and Renewable Energy from Biomass* (last visited May 10, 2022), <https://biocharus.org/biocharandrenewableenergybiomass#:~:text=Biomass%20Converted%20to%20Renewable%20Energy,%2C%20leaving%20carbon%20enriched%20biochar.> [<https://perma.cc/59CC-5Z8K>].

¹²³ NATIONAL GEOGRAPHIC, *supra* note 119.

¹²⁴ *Id.*

¹²⁵ WHAT IS BIOCHAR AND HOW IS IT MADE?, *supra* note 121.

Biomass is an alternative energy source to fossil fuels.¹²⁶ Unlike other renewable energy sources, biomass can be converted directly into liquid fuels, called biofuels.¹²⁷ Biofuels are generally cleaner burning than petroleum fuels made from crude oil, like gasoline and diesel.¹²⁸

Burning either fossil fuels or biomass releases carbon dioxide (CO₂), a greenhouse gas. However, the plants that are the source of biomass for energy capture almost the same amount of CO₂ through photosynthesis while growing as is released when biomass is burned, which can make biomass a carbon-neutral energy source.

“Carbon dioxide (CO₂) is the primary greenhouse gas emitted through human activities. In 2020, CO₂ accounted for about 79% of all U.S. greenhouse gas emissions from human activities.”¹²⁹

One ton of biochar sequesters (stores) carbon that would have otherwise generated 3.6 tons of carbon dioxide if left to degrade by natural processes. As a form of thermochemical conversion, biochar not only valorizes waste, but it’s a very effective method for capturing carbon and storing it in a solid state that can remain stable for centuries.¹³⁰

A video by the National Renewable Energy Laboratory, titled *Biomass Energy Basics* explains the process of converting woody biomass into various renewable energies in simpler terms.¹³¹ To summarize, trees and plants absorb energy from the sun through photosynthesis and the energy is trapped inside until the organic material is converted into other products that are used as sources of energy and materials. There are several ways to convert biomass into usable bioenergy which can then be turned into fuels to power cars, trucks, and airplanes. To make fuels, wood is first converted into an intermediary gas or liquid, which can then be upgraded to make a final product, such as gas, diesel, or jet fuel.¹³²

¹²⁶ U.S. ENERGY INFO. ADMIN., *Biomass explained, Biomass and the Environment* (last updated Dec. 7, 2021), <https://www.eia.gov/energyexplained/biomass/biomass-and-the-environment.php> [<https://perma.cc/F8DQ-V4KP>].

¹²⁷ Office of Efficiency & Renewable Energy, *Biofuel Basics*, ENERGY.GOV (last visited Nov. 7, 2022), <https://www.energy.gov/eere/bioenergy/biofuel-basics> [<https://perma.cc/V88Q-3HC>].

¹²⁸ *Id.*

¹²⁹ U.S. ENV’T PROT. AGENCY, *Overview of Greenhouse Gases* (last visited Nov. 1, 2022), [https://www.epa.gov/ghgemissions/overview-greenhouse-gases#:~:text=Carbon%20Dioxide%20Emissions&text=Carbon%20dioxide%20\(CO2\)%20is,gas%20emissions%20from%20human%20activities](https://www.epa.gov/ghgemissions/overview-greenhouse-gases#:~:text=Carbon%20Dioxide%20Emissions&text=Carbon%20dioxide%20(CO2)%20is,gas%20emissions%20from%20human%20activities) [<https://perma.cc/8FY3-RZLK>].

¹³⁰ WHAT IS BIOCHAR AND HOW IS IT MADE?, *supra* note 121.

¹³¹ NAT’L RENEWABLE ENERGY LAB’Y., *Biomass Energy Basics* (last visited May 10, 2022), <https://www.nrel.gov/research/re-biomass.html> [<https://perma.cc/6SR9-XM8R>].

¹³² *Id.*

Biomass also includes waste; there are many types of processes that produce waste biomass, like animal waste, which can be used to make electricity.¹³³ For instance, manure from farm animals, mostly cows, is put into a big tank called a digester, which contains bacteria that eats waste and turns it into methane gas.¹³⁴ The methane gas is then burned to heat water, which produces steam and creates pressure that spins a rotor inside a turbine, powering a generator used to produce electricity.¹³⁵ The graphic below from Biomass Energy provides a visual look at this process:

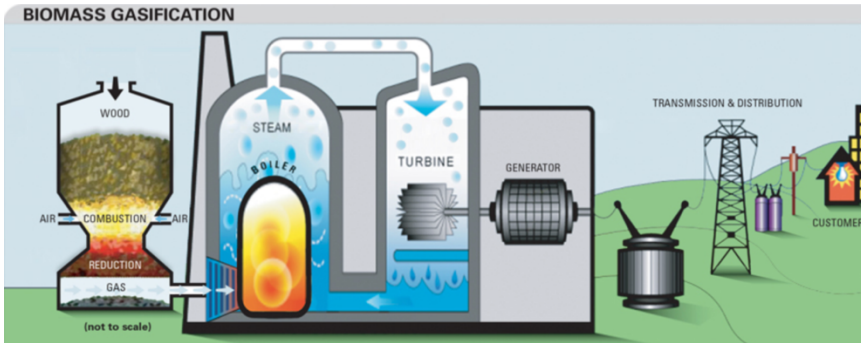


Figure 3. How Biomass Energy is Created and Used.¹³⁶

HB 1168 section 6 states that the DNR must explore opportunities to develop markets for woody biomass and biochar, however, currently there is no market for such products in the Pacific Northwest. Though, researchers from the Washington Department of Ecology and Washington State University are evaluating “the potential market for biochar in the Pacific Northwest using techno-economic analyses¹³⁷ that coupled both biochar production costs and agricultural returns for a number of crops.”¹³⁸ According to CSANR, the Pacific Northwest can support a thriving biochar industry because of (1) the areas heavy presence of woody biomass as a biochar production feedstock, and (2) the widespread agricultural land area that could benefit from adding biochar to the soil.¹³⁹

¹³³ *Id.*

¹³⁴ *Id.*

¹³⁵ *Id.*

¹³⁶ Shaun McCarthy, *Questions and Answers*, BIOMASS ENERGY (last visited Oct. 1, 2022), <http://biomassbess.weebly.com/scientist.html> [<https://perma.cc/2HJ8-5PWH>].

¹³⁷ Here, techno-economic analysis refers to the general process of evaluating and estimating the technical and economic performance of a future biochar market in the Pacific Northwest.

¹³⁸ BRONSTAD, *supra* note 50.

¹³⁹ *Id.*

B. Is Woody Biomass Technology a Viable Solution for Washington State?

1. C6 Forest to Farm

In some areas across Washington State, concerned citizens whose homes, communities, and surrounding wildlands are heavily affected by wildfires are taking forward-looking, local action to aid their local communities in the fight against wildfires. Tired of waiting for the Washington State Government to step up and take action to combat wildfires in their area, Gina and Tom McCoy decided to take matters into their own hands. In 2020, the McCoy's founded a non-profit called C6 Forest to Farm, where they make biochar.¹⁴⁰ "The McCoy's plan to accelerate forest restoration by creating a local market for the small-diameter trees that are a symptom of unhealthy forests and fuel for giant fires" in their community.¹⁴¹ The McCoy's also create biochar from organic matter using a pyrolyzer they purchased from the University of California – Merced. This method of pyrolysis involves "heating wood chips or sawdust in a low-oxygen environment to 750 to 1,100 degrees."¹⁴² The McCoy's "ultimate dream is to build a multimillion-dollar processing plant that would turn thousands of tons of woody material into biochar each year."¹⁴³ Another goal of the McCoy's involves producing 6,000 to 7,500 tons of biochar per year, which is the equivalent of a football field 20-30 feet deep.¹⁴⁴ The McCoy's next step will be to determine how to sell the biochar.¹⁴⁵ In the spring of 2021, the Washington Legislature granted the McCoy's \$160,000 to fund their pilot project.¹⁴⁶

The DNR "hopes to stimulate private investment in new products made from forest-thinning by-products, and biochar projects are just one of several possibilities."¹⁴⁷ Andrew Spaeth, a DNR environmental planner who helped write the 20-Year Plan said, "the more opportunity there is to create value-added products from what is right now essentially a waste material, the more it is going to improve conditions on the ground, reduce the risk of these catastrophic wildfires, and better prepare the forest for drought."¹⁴⁸

There are many advantages to using biochar technologies, for example, research suggests biochar can persist in soil for hundreds of years.¹⁴⁹ Once in the soil, biochar holds onto large amounts of carbon, which adds richness and nutrients to the soil for plant life. This is just one of the reasons that make biomass a potential tool in the fight against

¹⁴⁰ GODWIN, *supra* note 53.

¹⁴¹ *Id.*

¹⁴² *Id.*

¹⁴³ *Id.*

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

climate change.¹⁵⁰ Another advantage of biomass technology, and specifically the pyrolyzer the McCoy's use, is that the process releases approximately half the CO₂ as open burning.¹⁵¹ The result of the burning is biochar, which collects and stores the other half of the CO₂, which is then mixed with existing soil for added nutrients.¹⁵²

While the McCoy's sizable grant from the Washington State Legislature appears to be a sign that Washington State is interested in granting money to develop and fund biochar technologies and projects, without allocating further legislative funding to forest health treatments, the use of biochar technologies may not be worth the investment for local communities.

State and federal governments are enthusiastic about this — at least on paper. They call it “forest health treatment,” which typically involves leaving bigger trees while cutting and piling up the smaller ones into slash piles that are burned in the winter. But the rate of this thinning depends on government funding, and a ballooning portion of agency budgets are still directed toward firefighting, leaving little for restoration.¹⁵³

Other smaller communities, like the one the McCoy's live in, that are heavily affected by wildfires may also be interested in creating their own local market for biomass and biochar. The missing component is a lack of action from Washington State in producing these technologies and creating markets for woody biomass and biochar. Additionally, many communities may not be aware such technologies exist and may need education on this topic and the potential for biomass and biochar markets to become interested. These smaller communities are well situated for engagement in community discussions, collaboration, and investing in similar biochar technologies that would have a direct and immediate impact on their local communities and surrounding wildlands.

Washington State can encourage the use of biochar technology in local communities by offering grants, like the one provided to the McCoy's, or by offering other economic incentives such as tax breaks for individuals and communities who are taking preventative action to combat wildfires and climate change.

The McCoy's and their C6 non-profit are also exploring Washington State's carbon offset program, which began in 2021 as part of the cap-and-trade legislation.¹⁵⁴

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.*

Carbon offsets give monetary value to the carbon-storing abilities of something like a forest and allow people to buy credits that support it. Sometimes individuals or companies voluntarily buy offsets, but in states with carbon regulations, large polluters often purchase offset credits to compensate for their own emissions.¹⁵⁵

While the carbon offset program is just one option for individuals looking to invest in alternative biomass and biochar technologies, Washington State would benefit from offering more incentive programs for individuals, non-profits, businesses, and communities who are interested in taking preventative action, like the McCoy's C6 Forest to Farm non-profit.

VI. INMATE FIRE CREWS AND FIRE SUPPRESSION PROGRAMS

A. What is an Inmate Fire Crew?

In 1939, the DNR joined forces with the DOC to operate “correctional camp fire crews” out of four adult correctional facilities across Washington State with the goal of improving state lands and making public lands safer and healthier for Washingtonians.¹⁵⁶ Incarcerated adults serve as volunteer members of this program.¹⁵⁷ “The volunteer crews participate in fire fighting, chainsaw operation, forest maintenance services, and motor vehicle and machine maintenance.”¹⁵⁸ “Currently, 225 incarcerated persons take part in the fire suppression program. That number ranges up to 400 when the program is fully staffed.”¹⁵⁹ “One of the most tangible benefits is that DNR is working with DOC research and development to compare the program with [the] overall recidivism rate to show that program participants are less likely to reoffend.”¹⁶⁰

Despite the physical demands and inherent risks associated with wildfire response efforts, it was not until recently that incarcerated persons began earning a fair wage for this dangerous work.¹⁶¹ This needed change in the law surrounding camp fire crew wages, comes after a high wildfire year¹⁶², where over 300 Washington State inmates were employed to fight fires across the state.¹⁶³ In Washington, prior to the implementation of HB 1168 in July 2021, which entitles inmates to minimum wage in the jurisdiction they are fighting fires in, the average wage for imprisoned

¹⁵⁵ *Id.*

¹⁵⁶ Lawrence Wilson, *Washington inmates aid in fire suppression, gain employable skills*, THE CENTER SQUARE (June 7, 2022), https://www.thecentersquare.com/washington/washington-inmates-aid-in-fire-suppression-gain-employable-skills/article_c8a5ffbc-e6aa-11ec-8e21-a3848a0e2edf.html [https://perma.cc/2JD4-AGCE].

¹⁵⁷ C.C. PROGRAM, *supra* note 59.

¹⁵⁸ WILSON, *supra* note 156.

¹⁵⁹ *Id.*

¹⁶⁰ C.C. PROGRAM, *supra* note 59.

¹⁶¹ H.B. 1168, *supra* note 3, at 20.

¹⁶² 2020.

¹⁶³ SELBY, *supra* note 66.

firefighters in Washington State was 62 cents per hour.¹⁶⁴ While working on these fire suppression crews alongside the DNR, several participating inmates will develop the necessary skills to become firefighters and a desire to become firefighters upon their release from incarceration.¹⁶⁵

B. How Do Inmate Fire Crews Contribute to the Fight Against Wildfires?

Like Washington State over the past decade, wildfires have grown in both number and intensity across California. The State of California has heavily relied on its inmate firefighting crews to help fight fires across their state. In a Washington Post article by Matthew Hahn, he recounts his time as an incarcerated person working in a “fire camp” for the State of California:

I used to be one of the incarcerated people whom California employs to fight wildfires, and I was fortunate. During my nine years in prison for drug-related burglaries, ending in 2012, I never met a fellow prisoner who didn’t want to be in “fire camp,” as the program is known. Some dreamed of going but knew they would never be allowed to live in such a low-security facility. Others, like me, did everything in their capacity to ensure that they got there as soon as humanly possible.¹⁶⁶

“Incarcerated labor has been a part of wildland fire [fighting] for decades, yet only recently has controversy surfaced around its implementation.”¹⁶⁷ While “fire camp” programs are sought out among inmates, they are also controversial. Though the programs are voluntary, some well-meaning people on social media and in activist circles compare fire camp employment to slavery.¹⁶⁸ These activists raise issues with the program’s resemblance to chain gangs of the past, low wages, and the alleged exploitative nature of the incarcerated firefighting programs.¹⁶⁹ As of 2020, “about 20% of California’s fire crews are inmates.”¹⁷⁰ As wildfires continue to burn across California, the state will begin to rely more on inmate fire crews to combat the large wildfires that burden the state from year to year.

In 2020, California Governor Gavin Newsom signed AB 2147, a bill that eliminated the barriers that prevented persons formerly serving on

¹⁶⁴ *Id.* and H.B. 1168, *supra* note 3, at 20.

¹⁶⁵ DOC WORK CREWS, *supra* note 58.

¹⁶⁶ Matthew Hahn, *Sending us to fight fires was abusive. We preferred it to staying in prison*, THE WASHINGTON POST (Oct. 15, 2021), https://www.washingtonpost.com/outlook/prison-firefighter-california-exploit/2021/10/15/3310eccc-2c61-11ec-8ef6-3ca8fe943a92_story.html [https://perma.cc/7UXY-6XW7].

¹⁶⁷ SELBY, *supra* note 66.

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ Audrey McNamara, *California bill allows inmate firefighters to pursue careers in the field after incarceration*, CBS NEWS (Sept. 12, 2020), <https://www.cbsnews.com/news/california-bill-allows-inmate-firefighters-pursue-career-after-incarceration/> [https://perma.cc/BX44-LCJC].

inmate fire crews from pursuing a career as a firefighter once they have served their time.¹⁷¹ This new legislation will expunge the records of nonviolent offenders who have fought fires for the State of California while in prison, allowing them to pursue careers as firefighters and first responders upon release.¹⁷² With the passage of this bill, inmates who participated in firefighting programs while incarcerated will have a chance of getting a job in a profession that they have been trained in.¹⁷³ AB 2147(j), reads as follows:

Due to their service to the state of California in protecting lives and property, those incarcerated individual crew members that successfully complete their service in the conservation camps or successfully complete services as members of a county incarcerated individual hand crew, as determined by the appropriate county authority, and have been released from custody, should be granted special consideration relating to their underlying criminal conviction.¹⁷⁴

However, section 2 of AB 2147 declares that incarcerated persons who are convicted of certain crimes, such as murder, kidnapping, rape, lewd acts on a child under fourteen years of age, any felony punishable by death, escape of a secure perimeter within the previous ten years, and arson, are ineligible to have their criminal record expunged under AB 2147.¹⁷⁵

Although Washington State has not yet passed legislation that expunges the records of nonviolent offenders who have fought fires during their incarceration, Washington would benefit from doing so. Legislation like California's AB 2147 would help solve the current shortage of trained firefighters by enabling more inmates to enter into firefighting careers upon their release. "In 2019, on 92 occasions, the National Interagency Fire Center couldn't mobilize crews to wildfires upon request. In 2020, 339 crew mobilization orders couldn't be filled. And last year, 1,858 crew mobilization orders couldn't be filled."¹⁷⁶ With this current shortage of firefighters, Washington State could take progressive action like California that would increase the number of firefighters combatting

¹⁷¹ Off. of Governor Gavin Newsom, *Governor Newsom Signs Bill Eliminating Barriers that Block Former Inmate Fire Crews from Becoming Career Firefighters After Serving their Sentences*, STATE OF CA (Sept. 11, 2020), <https://www.gov.ca.gov/2020/09/11/governor-newsom-signs-bill-eliminating-barriers-that-block-former-inmate-fire-crews-from-becoming-career-firefighters-after-serving-their-sentences/> [https://perma.cc/HX2C-MM9R].

¹⁷² McNAMARA, *supra* note 170.

¹⁷³ *Id.*

¹⁷⁴ A.B. 2147, Ch. 60, (CA, 2020), https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=201920200AB2147 [https://perma.cc/VKJ3-6K6E].

¹⁷⁵ *Id.*

¹⁷⁶ Sam Metz, *As fire season sets in, labor shortage compounds firefighter staffing woes*, THE SEATTLE TIMES (June 22, 2022), <https://www.seattletimes.com/business/labor-shortage-compounds-federal-firefighters-staffing-woes/> [https://perma.cc/F8L9-GCXY].

wildfires across Washington. Further, “formerly incarcerated people face huge obstacles to finding stable employment,”¹⁷⁷ and by creating new opportunities for former inmates who have served on fire crews, Washington can provide an avenue for employment for these experienced inmate firefighters.

With Washington State’s fire season increasing from year to year, there is going to be an increasing need for additional trained persons on the ground to aid in the prevention of wildfires through forest treatment programs. During the Washington State Legislature’s next legislative session, lawmakers should consider implementing a program to expunge the records of nonviolent offenders who served on fire crews during their incarceration or create another program that would enable the same individuals to become employed in firefighting careers post-release. By having their criminal record expunged, these formerly incarcerated persons trained in this field can seek gainful employment on a firefighting crew, an opportunity that is not usually afforded to a person with a felony or prior criminal record.

VII. CONCLUSION

Over the past decade, the Washington State Legislature has passed several important pieces of legislation designed to prevent wildfires from occurring and developed strategic plans to fight wildfires as they arise. The DNR has been a key player in drafting and implementing the 10-Year and 20-Year Plans which provide wide ranging goals for forest management and restoration in the near future, and years down the line.

While current legislation does benefit Washingtonians, more can be done to combat wildfires. Washingtonians are continuously experiencing some of the worst wildfire seasons in Washington State history and are told to stay inside to avoid the harmful, smokey skies, or risk suffering adverse health effects from the heavily polluted air. By increasing the use of woody biomass and biochar technologies, Washington State would have a way to dispose of some of the dry forest vegetation that lives on the forest floor and heat it in a way that is safer for the environment, while simultaneously reducing wildfire risks. Removing just some of this dry vegetation from the forest would help aid in fire prevention, as flammable materials would no longer reside along the forest floor ready to explode into a forest fire.

Further, by creating legislation that is designed to expunge the criminal records of inmates who have served on fire crews, the Washington State Legislature can add needed numbers to the state’s firefighting force. Because incarcerated individuals who participate in Washington’s fire crew programs are trained in a variety of fire prevention

¹⁷⁷ Leah Wang and Wanda Bertram, *New data on formerly incarcerated people’s employment reveal labor market injustices*, PRISON POLICY INITIATIVE (February 8, 2022), <https://www.prisonpolicy.org/blog/2022/02/08/employment/> [https://perma.cc/NH9T-8R38].

and firefighting tactics, they are well equipped to succeed in a firefighting career upon their release from incarceration.

With additional action from the Washington State Legislature that is focused on forest health treatments and ways to prevent avoidable wildfires, Washington will be one step closer to having a comprehensive plan to reduce forest fires in the years to come.