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ABSTRACT:

In this thesis, I develop a new approach to fire management allowing fire managers to implement fire when necessary to manage fire prone landscapes. This thesis examines the United States' history of fire management, the benefits of fire applications and the legal constraints associated with fire management. Then, I outline the considerations required when creating a new policy and the mechanism for implementation. Finally, I propose a new fire management policy, titled FLARE, for future fire management in the United States to promote ecosystem regeneration, reduce the overall portion of agencies' budgets associated with wildfire response, and create safety for those involved with forest fires.

SETTING FLARES:

CREATING THE FEDERAL LIABILITY AND FIRE RECOVERY ENHANCEMENT ACT (FLARE)

by

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DEDICATION PAGE

I would like to thank Temple Stoellinger for numerous and insightful suggestions when going through the drafting process. I would also like to thank Sam Kalen and Thomas Minckley for their vast understanding of environmental policy and fire ecology respectfully. Without all three of their help, this thesis would never have come together. Finally, I want to thank Sam King and Jada Garofalo for their help with the grammar and citations.

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I. Introduction

In 2018, more than 58,000 fires burned nearly nine million acres across the United States (U.S.). More than 25,000 structures were destroyed, including 18,137 residences and 229 commercial structures.[1] Since 1960, the five years with the most acreage lost to wildfire have come in the last fifteen years with the top two years coming in 2015 and 2017.[2] Wildfire frequency matches the trend for global temperature data from the National Ocean and Atmospheric Administration (NOAA). NOAA has reported that the last five years are the hottest years on record, with 2018 checking in at number four all time.[3]

In response to warmer temperatures and past fire management methods, including letting fires burn, fire regimes have changed drastically.[4] As a result, it is time for the United States Congress and the United States Forest Service (Forest Service) to assess current fire management statutes and fire management policies related to letting fires burn and using prescriptive fires to manage fuel loading and forest health. The biggest hurdle fire managers and legislatures will face with a new approach is the liability associated with prescriptive burning. Currently, there is conflicting case law on whether an agency can be held liable for a burn under state law. This provides confusion especially in areas that have forests that span multiple judicial districts.

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[1] Wildfire, NFPA, https://www.nfpa.org/Public-Education/By-topic/Wildfire (last visited Mar 9, 2019).

[2] CONGRESSIONAL RESEARCH SERVICE, FEDERAL ASSISTANCE FOR WILDFIRE RESPONSE AND RECOVERY, In Focus (2018).

[3] 2018 was 4th hottest year on record for the globe, 2018 was 4th hottest year on record for the globe | National Oceanic and Atmospheric Administration (2019) [herein after NOAA], *available at* https://www.noaa.gov/news/2018-was-4th-hottest-year-on-record-for-globe (last visited Mar 15, 2019).

[4] Anthony LeRoy Westerling, Wildfires in West Have Gotten Bigger, More Frequent and Longer Since The 1980s, The Conversation (2019), *available at* https://theconversation.com/wildfires-in-west-have-gotten-bigger-more-frequent-and-longer-since-the-1980s-42993 (last visited Apr 9, 2019).

This thesis provides an interdisciplinary analysis to forest management, and advocates for a prescriptive fire policy that shields fire managers from any liability for implementing prescribed burning, and further suggests a policy that can restore national forests to pre-settlement health.

Before diving into a prescriptive fire policy, it is important to look at current climate conditions and the troubling trends regarding climate and fire. Then I will examine the history of forest fire management and how the Forest Services' Fire Policy developed into what it is today. After looking to the historic record of fire management, this thesis will look to the benefits of fire to flora and fauna, and the societal benefit of fuel management. Then, I will address the legal constraints associated with fire. These constraints include: Multiple Use and Sustained Yield Act (MUSYA), The National Environmental Protection Act, The National Forest Management Act (NFMA), the Endangered Species Act (ESA), state air quality laws, The Federal Torts Claim Act (FTCA), and Public Law 107-203. Also included in the legal constraint analysis is a discussion on the three types of liability associated with fire both prescriptive and unintentional. The purpose of examining the legal constraints will provide an overview of the evolution of fire policy, and where it needs to go from here.

After looking at current climate conditions, current fire policy, benefits of fire, and legal constraints fire managers currently face, this paper will shift to a more forward-thinking approach and begin addressing what factors should be considered when creating a new policy forest management through prescriptive burning, and how federal legislation could be used to create uniformity for fire liability. Finally, this thesis will lay out the major elements of my proposed policy titled, the Federal Liability and Fire Recovery Enhancement Act (FLARE).

II. Changing Climate

Over the last century, global temperatures have risen.[5] As noted in figure one, annual temperatures in the Rockies, have risen by greater than 1.5 degrees Fahrenheit. As temperatures have risen, major weather events have increased.[6] One significant natural disaster on the rise is large scale fires. According to the Fourth National Climate Assessment prepared by U.S Global Change Research Program, large scale fires in conjunction with extended droughts is one of the largest threats to the United States.[7] Besides these weather events, there is also concern that the five hottest years on record have been the last five years.[8] Droughts conditions in particular in the Rocky Mountains have created fire conducive conditions.[9] The conditions created by drought include drier, flammable, timber, a higher susceptibility to burrowing insects which leads to increased down

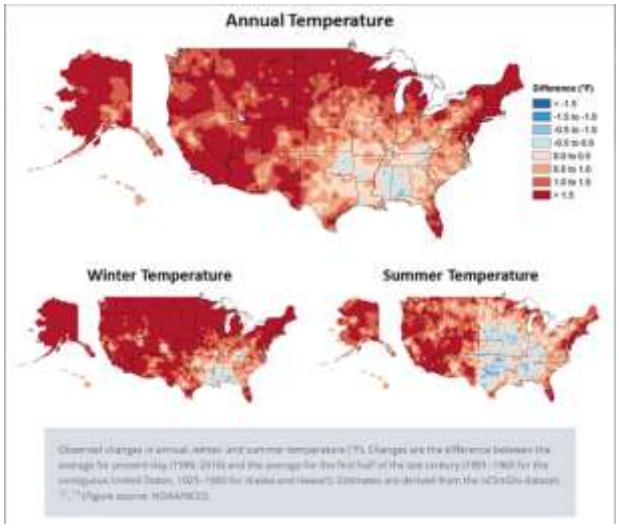

Figure 1 Annual Temperatures

[5] NOAA 2019, *Supra* Note 3.

[6] Extreme Weather, National Climate Assessment, https://nca2014.globalchange.gov/highlights/report-findings/extreme-weather (last visited Mar 16, 2019).

[7] M. F. Wehner, ET AL., Ch. 8 Droughts, floods, and wildfires. In: Climate Science Special Report: Fourth National Climate Assessment, U.S. Global Change Research Program, Washington, DC, USA 231-256 (D.J. Wuebbles, ET. ALL. eds.. Volume I), doi: 10.7930/J0CJ8BNN.

[8] Steve Cole, and Leslie McCarthy. "2014 Warmest Year in Modern Record." Climate Change: Vital Signs of the Planet. January 26, 2015. Accessed February 27, 2016.

[9] CLAIRE M. BELCHER, FIRE PHENOMENA AND THE EARTH SYSTEM: AN INTERDISCIPLINARY GUIDE TO FIRE SCIENCE 54 (2013).

and leaning timber.[10] Leaning timber can damage healthy trees and create ladder fuels allowing fire to move from the undergrowth in the crowns of trees.[11] Ladder fuels are fuels that allow a fire to move from the low undergrowth that is usually fire adapted to the crown, or top of the tree, which lacks fire adaptations.[12] Crown fires pose a substantial risk high intensity to the interlocked nature of neighboring trees.[13] This creates what is known as fuel continuity allowing a fire to move rapidly over a space.[14] Crown fires also increase the mortality of trees.[15] Coniferous species that experience intense crown burning have a much higher mortality rate; however, coniferous trees have a low mortality rate when the fire fails to reach their canopy.[16]

With the climate projected to continue warming and increasing dangerous fire conditions, it is time to be proactive in forest management to reduce fuel accumulation and create an effective forest management policy.

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[10] *Id*. at 56.

[11] *Id*. at 113

[12] *Id*.

[13] *Id*. at 101.

[14] *Id*.

[15] *Id*. at 108.

[16] *Id*.

The troubling trend for forest fires is that the global temperatures are projected to increase.[17] As noted in the table below, the largest temperature increases in the United States are expected to take place in northern the regions (the Northeast, Midwest, Northern Great Plains, and Northwest).[18] For instance, the coldest and warmest daily temperatures of the year are expected to increase at least 5°F (2.8°C) in the Northeast, Midwest and Great Plains by mid-century[19], rising to 10°F (5.5°C) or more by late-century.[20]

NCA Region	RCP4.5 Mid-Century (2036–2065)	RCP8.5 Mid-Century (2036–2065)	RCP4.5 Late-Century (2071–2100)	RCP8.5 Late-Century (2071–2100)
Northeast	3.98°F	5.09°F	5.27°F	9.11°F
Southeast	3.40°F	4.30°F	4.43°F	7.72°F
Midwest	4.21°F	5.29°F	5.57°F	9.49°F
Great Plains North	4.05°F	5.10°F	5.44°F	9.37°F
Great Plains South	3.62°F	4.61°F	4.78°F	8.44°F
Southwest	3.72°F	4.80°F	4.93°F	8.65°F
Northwest	3.66°F	4.67°F	4.99°F	8.51°F

Figure 2 Projected Temperature Increase

While temperatures are expected to increase, annual precipitation in the Rockies is expected to

[17] UNITED STATES DEPARTMENT OF AGRICULTURE, THE RISING COST OF WILDFIRE OPERATIONS: EFFECTS ON THE FOREST SERVICE'S NON-FIRE WORK [herein after The Rising Cost of Wildfire Operations], 1-16 (2015), *available at* https://www.fs.fed.us/sites/default/ files/2015-Fire-Budget-Report.pdf.

[18] Russel S. Vose, ET. AL., TEMPERATURE CHANGES IN THE UNITED STATES. In: *Climate Science Special Report: Fourth National Climate Assessment*, U.S. Global Change Research Program, 185-206 (D.J. Wuebbles., ET. AL., eds., Volume I, 2017).

[19] Ehrich M. Fischer, ET. AL., *Robust Spatially Aggregated Projections of Climate Extremes*, 3 NAT. CLIMATE CHANGE, 1033, 1033 (2013).

[20] *Id*.

decrease.[21] Reduced precipitation and warmer temperatures increase drought type conditions.[22] As drought type conditions rise, so too does the fire season and areas that are susceptible to burn.[23] The reason the fire season is increasing is due to fuel drying out quicker and moisture patterns changing.[24] These regions are receiving moisture earlier in the season, then there is a dry period followed by late season moisture.[25] The extended dry period is what is known as the fire season. The addition of at risk areas and the increased length of the fire season causes the fire budget to rise annually.[26] In 1995, wildland fire costs made up 16% of the Forest Service's budget.[27] In 2015, wildland fire costs made up 52% of the Forest Service budget and by 2025, 67% of the Forest Service's budget is projected to go to wildland fire costs.[28] Adapting fire policy to changing climates is

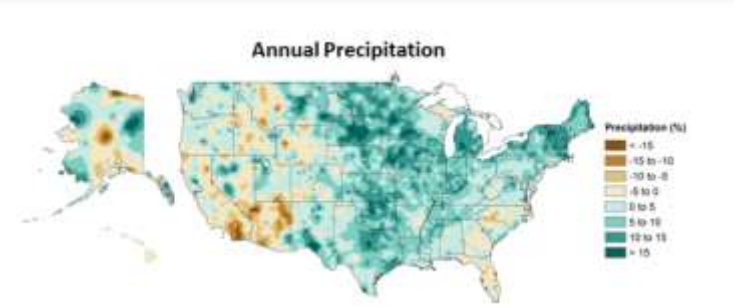

Figure 3 Annual Precipitation Projections

[21] David R. Easterling, ET. ALL., 2017: PRECIPITATION CHANGE IN THE UNITED STATES. In: *Climate Science Special Report: Fourth National Climate Assessment,* U.S. Global Change Research Program, 207-230 (D.J. Wuebbles, ET AL., eds., Volume I, 2017).

[22] *Id*. at 242.

[23] *Id*. at 237.

[24] *Id*.

[25] Rising Cost of Fire Operations, *supra* note 17, at 4.

[26] *Id*.

[27] *Id*.

[28] *Id*.

necessary to prevent damage to the natural ecosystems and rein in the amount expended on fire response systems.

Rising temperature and reduced precipitation will continue to worsen drought conditions nationally. As drought worsens, fire danger will continue to increase unless something is done to treat the amount of dry and combustible fuel present in the forests.

III. History of Forest Management in the West

In addition to the troubling temperature trends and the increased fire danger associated with them, forest management practices over the last 150-200 years have drastically changed the fuel available in forests and the time between burns.[29] This section will follow the fuel transition from pre-settlement (pre-1800's), to settlement (1800-1900), and the implementation of a full-scale suppression policy (1900 on), to a limited let it burn policy in 1995.

(a) Pre-Settlement

Prior to settlement in the 1800's, western forests in the Rocky Mountain Region experienced intense short burns every seven to twelve years.[30] These fires were the result of natural causes such as lightening, and helped trigger a reset in the ecosystem.[31] Young, un-adapted trees and old

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[29] Congressional Research Service, *supra* note 2, at 243.

[30] Cecil C. Frost, *Presettlement Fire Frequency Regimes of the United States: A First Approximation. Fire in Ecosystem Management: Shifting the Paradigm from Suppression to Prescription*, TALL TIMBERS FIRE ECOLOGY CONFERENCE PROCEEDINGS, 70, 77 (1998).

[31] Yvonne Baskin, *Yellowstone Fires: A Decade Later: Ecological Lessons Learned in the Wake of the Conflagration*, 49 OUP ACADEMIC 93, 97 (1999).

fallen trees were consumed by fire creating nutrient rich soil that allowed the forest to reseed and restart its growing cycle.[32] Fire also consumed alien and invasive plant species.[33] Often times, these invasive species lacked the ability to re-sprout due to a lack of fire adaptations.[34] This process helped create healthy forests that supported animal and plant life.

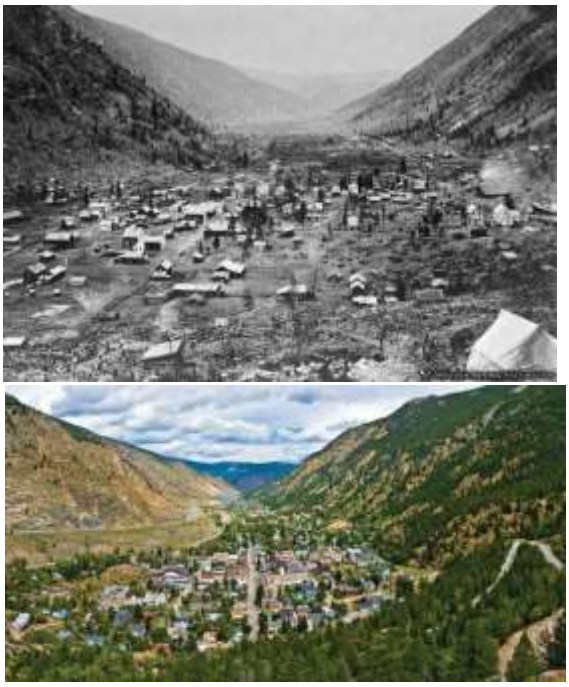

Figure 4 Georgetown, Colorado in the 1860's (above) and Georgetown, Colorado in the early 2000's (below).

(b) Settlement

The settlers arrived in the West, and drastically changed the ecosystem.[35] Settlers cleared entire stands of trees for settlement construction.[36] Eventually, the Nation became interested in linking the east to the west via a transcontinental railroad and to support the construction of the railroad, settlers clear cut large swaths of forest.[37] Once clearings had been established, towns and homes were built in

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[32] *Fire Ecology*, PACIFIC BIOLOGY INSTITUTE, *available at* http://www.pacificbio.org/initiatives/fire/fire_ecology.html (last visited Mar 9, 2019).

[33] *Id.*

[34] Matthew L. Brooks, ET. AL., *Effects of Invasive Alien Plants on Fire Regimes*, 54 BIOSCI. 677, 688, (2004).

[35] Whit Bronaugh, *North American Forests in the Age of Man*, AM. FORESTS, *available at* https://www.americanforests.org/magazine/article/north-american-forests-in-the-age-of-man/ (last visited at Apr. 15, 2019).

[36] *Id.*

[37] *Id.*

the clearings. In order to protect the developments, settlers would suppress any fire to prevent destruction. Between clearing the land for construction and agriculture, building for settlement and building the railroad, settlers began to change fire regimes.[38] Clear cutting changed the continuity of fuel by breaking up the area into subsections. Settlers also suppressed any fires that were started near settlements and along the railroad. Harvest and the need to protect homes and other structures changed fire return intervals (the time between fires in a defined area, usually at the scale of a point, stand or relatively small landscape area).[39] This change in interval altered the fire regime in areas that were used to burning at least once a year to every five years, to fifty to one hundred years between full burns.[40]

This shift caused a number of issues within the fire regime. Fuel levels increased to levels previously unseen in areas that had not been clear cut.[41] The increased fuel levels created areas that will burn hotter, and longer leading to higher amounts of soil damage[42] and increased crown damage.[43] Additionally, the composition of the forest changed as fire adapted species were

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[38] W. W. Covington & M.M. Moore, *Post Settlement Changes in Natural Fire Regimes and Forest Structure: Ecological Restoration of Old-Growth Ponderosa Pine Forests*, 2 J. SUSTAIN. FOR. 153, 181 (1994).

[39] William T. Sommers, ET. AL., *Synthesis of Knowledge: Fire History and Climate Change, Chapter 3: Fire Regimes, History and Climate Change* 27, 29, (2001).

[40] CCRS, *supra* note 2, at 243.

[41] Covington, *supra* note 39, at 154.

[42] USGS, FIRE-INDUCED WATER-REPELLENT SOILS: AN ANNOTATED BIBLIOGRAPHY, citing J.T. Cory., & R.J. Morris., *Factors Restricting Infiltration Rates on Decomposed Granitic Soils*, University of California, Riverside 149-161, (L.F. DeBano, & John Letey, John, eds. 1968).

[43] Belcher, *supra* note 9, at 101.

choked out by other plants.[44] Once the fire adapted species were choked out, the ability of the forest to recover after fire faltered.[45]

(c) Shift to Suppression

In 1910, fires raged throughout Northern Idaho.[46] Forest conditions across the West were dry due to drought conditions, and unhealthy with lots of dead fall as a result of the settlers suppression activities.[47] On the night of August 20, 1910, the Great Fire of 1910 was likely ignited by lightning.[48] Unhealthy forest conditions at the time and unseasonable drought allowed the fire to spread rapidly.[49] When the Great Fire of 1910 began, the fire found a tinder box ready to be consumed. And consume it did, the Great Fire burned over three million acres, nearly 4,600 sq. miles or roughly an area the size of Connecticut, across Idaho, Montana, Washington and British Columbia.[50] In addition to massive resource loss, the fire killed over seventy fire fighters who had arrived to fight the blaze.[51]

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[44] Jason Funk, ET AL., *Rocky Mountain Forests at Risk: Confronting Climate-driven Impacts from Insects, Wildfires, Heat, and Drought*, UNION OF CONCERNED SCIENTISTS 1, 6 (2014).

[45] *Id.*

[46] UNITED STATES FOREST SERVICE, THE GREAT FIRE OF 1910 1, 3, *available at* https://www.fs.usda.gov/Internet/ FSE_DOCUMENTS/stelprdb5444731.pdf.

[47] *Id.*

[48] TIMOTHY EGAN, THE BIG BURN: TEDDY ROOSEVELT AND THE FIRE THAT SAVED AMERICA 227 (1st ed. 2010).

[49] *Id.*

[50] USFS, *supra* note 47, at 4.

[51] *Id.*

While fire suppression had been the unofficial policy prior to the Great Fire, it now became the official policy of the Forest Service.[52] In 1935, the Forest Service issued the 10:00 a.m. Policy, a policy to suppress all fires before 10:00 a.m. the next day.[53] Following the implementation of the 10:00 a.m. Policy, the Forest Service modeled Smokey Bear after a bear cub found with burned paws following the Capitan Gap fire in 1950.[54] Smokey became the symbol of the damaging effects of forest fires and the official mascot of those pushing for suppression.[55] Smokey's famous slogan of "[o]nly you can prevent forest fires" has been well known since its implementation.[56]

The policy of suppression had widespread effects. As firefighting technologies became more advanced, the government's ability to suppress fire became more effective and the total acreage lost to forest fires continued to drop.[57] While effective at reducing the acreage lost to fire, the suppression policy created fuel loading in the forests.[58] Fuel loading is when the amount of fuel

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[52] U.S. FOREST SERVICE, *Fire Suppression*, FOREST HISTORY SOCIETY (2019), *available at* https://foresthistory.org/ research-explore/us-forest-service-history/policy-and-law/fire-u-s-forest-service/u-s-forest-service-fire-suppression/.

[53] *Id*.

[54] U.S. FOREST SERVICE, *The Story of Smokey Bear* (2019), *available at* https://smokeybear.com/en/ smokeys-history/story-of-smokey (last visited Mar 20, 2019).

[55] *Id*.

[56] *Id*.

[57] Kevin S. McKelvey, & Kelly K. Busse, *Twentieth-Century Fire Patterns on Forest Service Lands.* 41 FINAL REPORT TO CONGRESS 1119, 1138 (1996).

[58] Congressional Research Service, *supra* note 2, at 243.

for fires to burn begin to accumulate in a high quantity.[59] By increasing the amount of fuel available for a fire to consume, fuel loading provides continuity that allows a fire to move fast and hotter and in natural conditions.[60] Fuel loading as created the conditions currently present that are facilitating large scale fires.

1. The Leopold Report

In 1962, U.S. Secretary of the Interior Stewart Udall commissioned the development of a report to determine the impact of the governments forest management approach to wildlife in the National Parks.[61] Udall hired Aldo Starker Leopold, a professor of Zoology, Forestry and Conservation at the University of California-Berkeley, to develop the report.[62] Leopold spent the next year conducting his study and, in 1963, his report titled the "Wildlife Management in the National Parks," but it is more commonly referred to as the Leopold Report.[63] In his report, Leopold noted that the management of National Parks were adversely affecting wildlife habitat.[64] The report argued that shielding the Parks with unnatural protection from lightning fires, insect outbreaks, absence of natural controls of ungulates, and in some areas elimination of normal

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[59] *Id*.

[60] Belcher, *supra* note 9, at 101.

[61] NATIONAL PARK SERVICE, THE LEOPOLD REPORT 1, 2 (1963), *available at* http://npshistory.com/publications/leopold_report.pdf.

[62] Tom Persinger, *The Leopold Legacy*, AM. FORESTS MAGAZINE (2014).

[63] National Park Service, *supra* note 61, at 1.

[64] *Id*. at 5-6.

fluctuations in water levels, was causing damage.[65] The report argued that the National Park Service should seek to return the Parks as close as possible to natural conditions by allow the reintroduction of natural conditions.[66] Leopold's report laid out a brief overview of methods for habitat management, including, the "manipulation of vegetation which he noted was often exorbitantly expensive."[67] According to Leopold's report, "[c]ontrolled burning is the only method that may have extensive application."[68]

2. Aftermath of the Leopold Report

Leopold's report was met with both acclaim and backlash.[69] Leopold's biggest opponents selected portions of his report that reaffirmed their management practices, while ignoring or criticizing his point on the impacts of fire suppression.[70] While targeted to the NPS, the methods proposed in Leopold's report were also applicable to the Forest Service; however, the Forest Service was slow to implement Leopold's suggestions due to strained resources and concern over the effects of recent fires.[71] While the Forest Service was hesitant, the National Park Service embraced Leopold's report, but it was slow to actually implement his suggestion of on the

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[65] *Id*. at 4.

[66] *Id*. at 6.

[67] *Id.* at 7.

[68] *Id*. at 8.

[69] Stephan J. Pyne, *Vignettes of Primitive America*, FOREST HISTORY TODAY 12, 12 (2017).

[70] *Id*. at 13.

[71] *Id.* at 15.

ground burning techniques, including prescribed burning.[72] The Forest Service would not begin managing for fuel loads or attempt to return forests to pre-settlement state until the mid-1990's.

(d) Let it Burn Era

In 1995, after almost 60 years of suppression, the Forest Service finally begin to address fuel loads in the forest.[73] This change came about with the adoption of the 1995 Federal Wildland Fire Management Policy and Program Review.[74] The program review approved the use of mechanical thinning, and the reintroduction of fire to accomplish fuel reduction and improve the health of forests.[75]

Following the approval of mechanical thinning as a means to reduce fire danger, the Forest Service issued a Review and Update of the 1995 Federal Wildland Fire Management Policy in 2001 which recognized that "[f]ire is a critical natural process, and will be integrated into land and resource management plans."[76] In support of Forest Service efforts, Congress passed a series of laws to promote healthier forests; the Healthy Forest Initiative (HFI) in 2002;[77]

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[72] *Id.*

[73] Memorandum on Federal Wildland Fire Policy Review, Dan Glickman & Bruce Babbitt, Secretary of the Interior. (Dec. 20, 1995), *available at* https://www.doi.gov/sites/doi.gov/files/migrated/pmb/owf/upload/1995-Federal-Fire-Policy.pdf.

[74] *Id.* at 1.

[75] *Id.* at 19.

[76] NATIONAL INTERAGENCY FIRE CENTER, FIRE MANAGEMENT PLANNING: CHAPTER 9: INTERAGENCY STANDARDS FOR FIRE AND FIRE AVIATION OPERATIONS. 213, 213 (2018), *available at* https://www.nifc.gov/PUBLICATIONS/redbook/2018/Chapter09.pdf.

the Healthy Forest Restoration Act (HFRA) in 2003;[78] and the Federal Land Assistance, Management Act (FLAME) in 2009.[79]

HFI was established by President George W. Bush to improve the process to approve and implement fuel reduction projects and reduce the risk of catastrophic wildfires.[80] HFI established environmental assessment (EA) limits, two categorical exclusions for fuel management and one for post-fire rehabilitation efforts.[81] Under HFI, EA's were limited to 10-15 pages, and needed to address four elements: need for the proposed action, description of alternatives, description of alternatives, descriptions of the environmental impacts of the proposed and alternative actions, and a list of the agencies consulted.[82] Fuel reduction activities under 3,000 acres and mechanical activities under 1,000 acres were excluded.[83] These exclusions were limited to condition classes 2 or 3 in fire regime groups I, II, or III and outside of the wildland-urban interface.[84] The exclusions were further limited to not be in wilderness areas and could not include the use of herbicides or permeant infrastructure such as roads.[85] Rehabilitation efforts after a wildland fire

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[78] Healthy Forests Restoration Act of 2003, P.L. 108-148 (2019).

[79] 43 U.S. Code § 1748 *et.seq.* [herein after FLAME] (2019).

[80] Department of the Interior, National Forest Service, National Environmental Policy Act Documentation Needed for Fire Management Activities; Categorical Exclusions 68 Fed. Reg. 33,814, (June 5, 2003).

[81] *Id.*

[82] *Id.*

[83] *Id.*

[84] *Id.*

[85] *Id.*

were excluded if they were less than 4,200 acres consistent with agency procedures and must be completed within three years of a fire.[86]

HFRA was passed to address perceived difficulties in implementing fuels management projects.[87] HFRA authorizes the agency to review fewer alternatives under the National Environmental Protection Act (NEPA).[88] HFRA requires agencies to provide notice of the project and conduct a public meeting when proposing hazardous-fuel-reduction projects.[89] HFRA projects cannot take place in wilderness areas or wilderness study areas.[90] For areas in the wildland-urban interface and within 1 ½ miles of an at risk community, the Forest service and the Bureau of Land Management are not required to analyze any alternatives to location or methods of treatment unless the at-risk community has adopted a Community Wildfire Protection Plan and the proposed action is contrary to the recommendations of the community.[91] If the agency is required to analyze the alternative, they must evaluate the effects of failing to implement the plan and the community's alternative.[92] If the action is within the wildland-urban

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[86] *Id.*

[87] UNITED STATES FOREST SERVICE, ENVIRONMENTAL ANALYSIS REQUIREMENTS FOR HFI AND HFRA PROJECTS, HEALTHY FORESTS INITIATIVE AND HEALTHY FORESTS RESTORATION ACT, INTERIM FIELD GUIDE, *available at* https://www.fs.fed.us/projects/hfi/field-guide/web/page03.php.

[88] HFRA, *supra* note 79, at Sections 104(c) and (d).

[89] HFRA, *supra* note 79, at Section 104(e).

[90] *Id.*

[91] HFRA, *supra* note 79, at *Sections* 104(d)(2) and (3).

[92] *Id.*

interface, but farther than 1 ½ miles from the boundary of an at-risk community, the agency only has to review one alternative to the proposed action.[93]

The passage of FLAME aimed at restoring and maintaining fire resilient landscapes.[94] FLAME notably states that, "[t]o safely and effectively extinguish fire when needed; use fire where allowable; manage our natural resources; and as a nation, to live with wildland fire."[95] FLAME implements its goals by allowing the Forest Service manage and reduce hazardous fuels through a mix of methods such as prescribed fire, mechanical and chemical treatments, and active forest management.[96] FLAME also required The Secretary of the Interior and The Secretary of the United States Department of Agriculture (USDA) to develop a National Cohesive Wildland Fire Management Strategy, which the agencies completed in (2015).[97] The Joint agencies passed the National Cohesive Wildland Fire Management Strategy in 2015. While FLAME and the subsequent National Cohesive Wildland Fire Management Strategy start to address fuel loading and other problems associated with suppression over the last two centuries, they did not provide a sustainable framework to implement prescribed burns and as a result, agencies have not effectively implemented burning strategies.

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[93] HFRA, s*upra* note 79, at Section 104(c).

[94] FLAME, *supra* note 80, at 1.

[95] *Id.*

[96] *Id.* at 15.

[97] HFRA, *supra* note 79, at Section 104(f).

IV. Methods of Forest Management

In order to reduce the hazards of large-scale burns, there are a number of methods for a reducing fuel loading. These methods include mechanical thinning, timber harvest, and prescriptive fire. Each one of these methods have benefits and drawbacks and varying costs of implementation. No one method is effective in all situations, agencies will need to adapt management plans to fit the specific region that the agency is planning treatment for. In many cases, multiple treatment types used in connection with each other would be the best method.

(a) Mechanical thinning

Mechanical thinning is the thinning of trees in either even or uneven-aged stands involving removal of trees in rows, strips, or by using fixed spacing intervals.[98] The purpose of mechanical thinning is to reduce fuels loads and provide for more space for trees as they grow. This creates healthier and larger trees within the stands.

1. Benefits of Mechanical Thinning

    a. Ecological

Mechanical thinning's ecological benefits include creating space in over populated tree stands.[99] In areas that have been treated, the average diameter of trees on site is larger than

[98] David L. Adams et al., *Silviculture Terminology*, SILVICULTURE TERMINOLOGY (1994), *availible at* http://oak.snr.missouri.edu/silviculture/silviculture_terminology.htm.

[99] *Id.*

before treatment.[100] The benefits of larger trees is they have developed fire adaptations and are less susceptible to disease.[101]

Mechanical thinning also reduces the continuity of fuel and can remove ladder fuels.[102] The benefits of removing ladder fuel reduces the ability of a fire to move into the crowns of the trees.[103] Trees that experience crown scorch during a fire have a higher mortality rate.[104]

b. Societal

The societal benefits associated with healthier forests can be broken down into regional and national benefits. One major regional benefit is the reduction of danger to homes built in the Wildland Urban Interface (WUI). WUI is the area where homes are built in or near areas that on the forest edge. Over the last decade, the number of homes in WUI areas has risen significantly. By responsibly treating the WUI areas and reducing the fire risk, there will be a reduced danger to private property.

There are also national societal benefits of changing forest management strategies. When the size and intensity of fires are reduced, the agencies can utilize funds previously spent on fire fighting and use them for treatment and prevention such as prescribed burning. While prescriptive service can be expensive, the agency can plan and budget for this activity. Planning for burning allows the agency to be proactive in expending funds and in control of the fire as

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[100] Jolie Pollet & Philip N. Omi, *Effect of Thinning and Prescribed Burning on Crown Fire Severity in Ponderosa Pine Forests,* 11 INT. J. OF WILDLAND FIRE 1, 3 (2002).

[101] *Id*.

[102] *Id*. at 8.

[103] *Id*. at 2.

[104] *Id*. at 8.

opposed to being reactionary once a fire starts. Reducing the costs associated with fire response and creating budget stability also provides opportunities for agencies to conduct studies that promote the ecological health of the forests. Creating stability and predictability in the budget allows for more funds to be diverted towards forest maintenance and upkeep without the threat of a large fire draining the rest of the agencies' budget. Finally, and most importantly, reducing the fuels available reduces the size and the dangers of fires allowing fire managers to keep fire fighters on the periphery of dangerous fires. Managing fuel loads can help prevent tragedies like the nineteen (19) Granite Mountain Hotshots who were killed in the Yarnell Hill Fire in 2013.

2. Drawbacks of Mechanical Thinning

Mechanical thinning is the costliest fuel treatment method with estimates of $100-1000 per acre of treatment.[105] Mechanical thinning also leaves fibers and other flammable materials on the forest floor.[106] These materials can create similar conditions to fuel loading allowing fire to burn more intensely on the forest floor damaging the soil and other plants.[107] Another drawback of mechanical thinning is it fairs to create bare soil to establish seedling establishment.[108] Bare soil conditions like after a fire, create areas for shrubbery and other native grass species to seed

[105] Bob Rummer, et. al., *A Strategic Assessment of Forest Biomass and Fuel Reduction Treatments in Western States,* UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE 1, 11 (2003).

[106] *Id.*

[107] *Id*.

[108] Matt D. Busse, et. al., *Developing Resilient Ponderosa Pine Forests with Mechanical Thinning and Prescribed Fire in Central Oregon's Pumice Region,* 30 CAN. J. FOR. RES. 1171, 1181 (2009).

and recruit.[109] Mechanical thinning also fails to available nutrients from forest floor organics which stimulate growth.[110] Finally, mechanical thinning does not stimulate reseeding by fire adapted species.[111]

(b) Timber Harvesting

When it comes to harvesting timber, there are two different approaches.[112] Clear cutting, also known as even-aged forest management, which most closely resembles the passage of fire through the stand and allows the area to regenerate. The second method is thinning or diameter-limit cutting.[113]

1. Benefits of Timber Harvesting

a. Ecological

Timber harvesting has similar ecological effects as mechanical thinning. Timber harvest ecological benefits include creating space in over populated tree stands. In areas that have been manage using the diameter-limited method increases the average diameter of trees on site is larger than before treatment. The ecological benefits for larger trees is they have developed fire

[109] *Id*.

[110] *Id*.

[111] *Id*.

[112] YURIY M. BIHUN, ET. AL., FOREST STEWARDSHIP, TIMBER HARVESTING: AN ESSENTIAL MANAGEMENT TOOL, PENN STATE EXTENSION. file:///H:/forest-stewardship-timber-harvesting-an-essential.pdf

[113] *Id*.

adaptations and are less susceptible to disease. In areas using clear cutting methods, timber harvest creates bare soil which allows for plant seeding and recruitment.[114]

Timber harvest also reduces the continuity of fuel and can remove ladder fuels. The benefits of removing ladder fuel reduces the ability of a fire to move into the crowns of the trees.[115] Trees that experience crown scorch during a fire have a higher mortality rate.[116]

b. Societal

Timber harvest creates regional economic opportunities for local companies that receive harvesting contracts.[117] According to the United States Department of Agriculture, the timber industry employs nearly one million employees.[118] Forest products generate more than $200 billion in sales annually and $54 billion in payroll to employees.[119] These economic benefits are important to local communities. Timber harvest can also reduce the dangers of large fires in the WUI, reducing the potential damage to private homes and property located there.

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[114] Busse, *supra* note 108, at 1181.

[115] *Id*. at 1172.

[116] *Id*.

[117] Rummer, *supra* note 105, at 10.

[118] UNITED STATES DEPARTMENT OF AGRICULTURE, U.S. RESOURCE FACTS AND HISTORICAL TRENDS 1, 36 (2014).

[119] *Id*. at 37.

2. Drawbacks of Timber Harvest

Timber harvest is faced by a unique set of market condition drawbacks. Current timber processing does not have the capacity to process the volume of timber that would been necessary in a timber harvest only approach.[120] The current amount of fuel available in only class 3 fire areas would require timber processing facilities to operate at full capacity for 30 years to process it all.[121] There also is the issue of non-lumber diameter harvest. While there are non-conventional methods of processing for specialty operations such as rustic furniture and firewood, there is not enough national capacity to handle the quantity that would be harvested.[122] Additionally, flooding the market with the amount of timber would drive lumber prices down and disincentives operators from harvesting timber.[123]

Timber harvest administration is also a loss for the agency overseeing the permitting and administration of the harvest.[124] According to the last report by the Government Accounting Office (GAO) in 2001, the Forest Service experienced an $88.6 million loss for fiscal year 1997.[125] While the GAO noted difficulties with obtain all relevant information to conduct the report, it was likely that this deficit would increase rather than decrease from more accurate

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[120] Strategic Assessment, s*upra* note 106, at 10.

[121] *Id*.

[122] *Id*.

[123] *Id*. at 8.

[124] GAO, FINANCIAL MANAGEMENT: ANNUAL COSTS OF FOREST SERVICE'S TIMBER SALES PROGRAM ARE NOT DETERMINABLE, GAO-01-1101R 1, 1 (2001).

[125] *Id*. at 1.

reporting.[126] In another GAO report in 2003, the GAO noted the Forest Service could not accurately report on the actual costs of individual work activities.[127] In 2007, the GAO noted that many of the difficulties associated with gathering information for the 2001 report and 2003 reports were further exacerbated by the Forest Service's decision to aggregate data at the program rather than the sale level due to budget constraints.[128]

(c) Prescriptive Fire

As fire policy has advanced, so too has the national understanding of the benefits of fire. Fire benefits can be broken into two categories, ecological and societal. As stated in the National Cohesive Wildland Fire Management Strategy, "[m]any plant and animal communities have come to depend on wildfire of many different intensities to renew and reinvigorate them, processes that have been interrupted for a century or more following the onset of organized wildfire suppression."[129] There are local and national benefits to the application of fire including reduced damage to homes in the Wildland Urban Interface and reducing the overall drain on Forest Service budgets. This section will outline both the adaptations of the flora and fauna, as well as discuss the benefits of fire application the impacts on local communities.

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[126] *Id*.

[127] GAO, FOREST SERVICE: LITTLE PROGRESS ON PERFORMANCE ACCOUNTABILITY LIKELY UNLESS MANAGEMENT ADDRESSES KEY CHALLENGES, GAO-03-503 1, 13 (2003).

[128] GAO, FEDERAL TIMBER SALES: FOREST SERVICE COULD IMPROVE EFFICIENCY OF FIELD-LEVEL TIMBER SALES MANAGEMENT BY MAINTAINING MORE DETAILED DATA, GAO-07-764 1, 3 (2007).

[129]Sally Jewell, and Thomas J. Vilsack, *The National Strategy, The Final Phase in the Development of the National Cohesive Wildland Fire Management Strategy*. 1, 3 (2014).

A. Ecological Benefits

In the Rockies, flora and fauna species have adapted in several ways. A wide variety of Flora have specialized regrowth process facilitated by the presence of fire.[130] Some species have adapted by forming serotinous cones, fire-activated seeds, thick bark, or fire-induced sprouts.[131] Once fire at regular intervals was removed from the regional ecosystems, the adaptations have hindered native species ability to reseed and regrow.[132] Invasive species such as cheatgrass, Canada thistle, toad flax, and woolly mullein on the other hand have thrived and continue to encroach on local communities.[133] As fire adapted species are choked out by non-native species, that reseed and germinate easily without fire, fire adapted species have seen reduction in population.[134]

These invasive species can increase the risk of wildfire when they take over an area previously inhabited by a native species.[135] Cheatgrass dries out and becomes extremely flammable giving fire increased fuel continuity to spread rapidly. By reintroducing fire at more regular intervals, fire adapted species will be able to reduce mortality and reseed as adapted.[136]

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[130] Belcher, *supra* Nnte 9, at 127.

[131] *Id.*

[132] *Id*.

[133] NATIONAL PARKS SERVICE, *Invasive Exotic Plants* (2019), *available at* https://www.nps.gov/romo/learn/nature/invasive_exotic_plants.htm.

[134] *Id.*

[135] FLAME, *supra* note 80, at 21.

[136] *Id*.

1. Flora

Flora have made a number of adaptations to fire. First, serotinous cones have a thick waxy substance that covers the cones.[137] As a fire comes through, the wax in the cone is melted and it allows the seeds to release.[138] Lodgepole Pine are an example of a fire adapted species. Lodgepole Pine have serotinous cones.[139] Without the presence of fire in the ecosystem, Lodgepole Pine seeds are not released and as a result, stands of Lodgepole Pine have been replaced over time by species such as subalpine firs that seed without fire.[140]

Another type of adaptation is fire-activated seeds. Coffeeberry and Redberry shrubs have seeds with a thick coating that is melted with fire allowing the plants to re-germinate after the fire.[141] A third adaptation is thicker bark, such as that possessed by Ponderosa Pine, that protect it against fire allowing it withstand higher temperatures from fires. [142] Finally, some species have sprouts that are heat induced. When fire comes through a forest, Short Leaf Pine sprouts will open up and begin seeding.[143]

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[137] J. Lotan, *Cone Serotiny - Fire Relationships in Lodgepole Pine*, 14 TALL TIMBERS FIRE ECOLOGY CONFERENCE PROCEEDINGS 267, 267 (1976).

[138] *Id.* at 267.

[139] *Id*.

[140] Funk, *supra* note 44, at 12.

[141] Belcher, *supra* note 9, at 128.

[142] *Id*.

[143] *Id.*

In addition to the adaptations the plants have made, fire areas are also high in nitrogen post fire.[144] Nitrogen is an important element in plant growth because it is integral to metabolic activities.[145] Nitrogen is a major component of chlorophyll which is the compound plants use to process sunlight into sugars from water and carbon dioxide.[146] Post fire areas produce nitrogen rich plant regrowth beneficial for animal species which helps with digestion and energy.[147] Without fire to restore the nitrogen levels in the soils, forests can experience a degradation in the quality of forage and nutrients for plant growth.[148]

By restoring fire into these ecosystems, native fire-resistant plants will have the advantage to reseed over non-native, non-fire-resistant plants.[149] This will restore the balance to the ecosystem between fire adapted and non-fire adapted species and rid the area of invasive species.[150] Returning the balance is important for the overall health of the forest. By using prescriptive burning in areas with shorter fire intervals, forest managers can restore this balance while reducing fuel loads.

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[144] Jake Delwiche, *"After the Fire, Follow the Nitrogen"* JFSP Briefs 80 (2010).

[145] MUHAMMAD RAZAQ, ET. AL., *Influence of Nitrogen and Phosphorous on the Growth and Root Morphology of Acer Mono*. PLoS ONE 1, 2 (2017).

[146] *Id*.

[147] THOMAS A. HANLEY, *The Nutritional Basis for Food Selection by Ungulates*, J. OF RANGE MGMT. 146, 147 (1982).

[148] *Id*.

[149] Kristin Zouhar, ET. AL., Chapter 2 Effects of Fire on Native Invasive Plants and Invasibility of Fire Wildland Ecosystems. 42 USDA FOREST SERVICE GEN. TECH. REP. 6. 7, 8 (2008).

[150] *Id*.

2. Fauna

There are a number of benefits of fire for the fauna that inhabit the fire adapted regions. Ungulates, insects, woodpeckers and predators such as birds of prey and large predators all receive benefits following a fire event.[151] These benefits include increased access to quality forage, easier access to otherwise protected food sources, and easier identification of prey for predators.[152] The removal of regular fire from the ecosystem has negatively affected native fauna species. Fauna species' diets are based native plants.[153] The decrease in the native plants which have been reduced leaving invasive species, which have natural defenses that make them unpalatable to some ungulates.[154] By restoring fire to the national ecosystems, the flora and fauna will benefit by what Leopold called restoring the "biotic associations within each park."[155]

i. Ungulates

Ungulates such as bison, elk, deer (White tail and Mule), and pronghorn antelope are all native to the Rocky Mountain region.[156] Studies have shown that ungulates like to take

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[151] BRONWYN A. HRADSKY, ET. AL., *Responses of Invasive Predators and Native Prey to a Prescribed Forest Fire*, 98 J. OF MAMMOLOGY, 835, 836 (2017).

[152] *Id*.

[153] JANE KAPLER SMITH, *Wildland Fire in Ecosystems: Effects of Fire on Fauna*. 42 GEN. TECH. REP. 1. U.S. DEPARTMENT OF AGRICULTURE, FOREST SERVICE, 1, 57 (2000).

[154] MARTY VAVRA, ET. AL., *Biodiversity, Exotic Plant Species, and Herbivory: The Good, the Bad, and the Ungulate*. 246 FOREST ECOLOGY AND MGMT. 66, 67 (2007).

[155] Leopold, *supra* note 62, at 3.

[156] Vavra, *supra* note 155, at 23.

advantage of recently burned areas and consume the newly sprouted forage.[157] Ungulates are able to feed on high nitrogen regrowth and get more nutrients while consuming less food.[158] A recent study, found that fire events incentivize ungulates to stay out of cultivated crops and reduces human wildlife interactions.[159] Ungulates are also able to feed on char which helps their digestion system.[160]

ii. Insects

Insects also benefit from post-fire tree mortality. Insects, such as ips beetles, red turpentine beetles, and wood borers converge on areas that have been scarred by fire.[161] Following a fire, trees with thicker bark are often scarred, this exposes holes in the trees defenses that allow burrowing insects past the bark.[162] The fire weakened wood allows insects to burrow deeper into the trees since there are exposed areas in the bark.[163]

iii. Woodpeckers

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[157] *Id*.

[158] *Id*. at 28.

[159] *Id*. at 29.

[160] *Id*. at 17.

[161] JOSE F. NEGRON ET AL., *Variables Associated with the Occurrence of Ips Beetles, Red Turpentine Beetle and Wood Borers in Live and Dead Ponderosa Pines with Post-fire Injury*, 18 AGRICULTURAL AND FOREST ENTOMOLOGY 313, 326 (2016).

[162] *Id*. at 314.

[163] *Id*.

Woodpeckers are another animal that has adapted to fire. Native to the Rocky Mountains are the American Three-toed Woodpecker, Hairy Woodpecker, Williamson's Sapsucker, and Northern Flicker.[164] Woodpeckers flock to areas that have fire scars because fire creates scars in the thick bark on the trees and provides them easier access to insects that have burrowed into weakened trees.[165] Woodpeckers are also able to nest and create seed banks in the exposed wood, due to the scars on the trees.[166]

iv. Predators

Several predators use hunting techniques that enable them to more successfully capture prey in areas that have experienced fire. Birds of prey such as eagles, hawks, ospreys, falcons, kestrels, and vultures have been observed flying close to the front edge of fires, hunting prey that are escaping from the flames[167] and there is antidotal evidence of raptors actually starting fires.[168] Birds of prey also benefit from the changing color of the landscape following burns.[169] Prey such as grouse and

Figure 5 An owl hunting in the fire front (fire-foraging) at Aransas National Wildlife Refuge in Texas (Photo: Jeffrey Adams/USFWS; from www.fws.gov).

[164] National Parks Service, *Birds*, *available at* https://www.nps.gov/romo/learn/nature/birds.htm.

[165] VICTORIA SAAB ET AL., *Woodpecker Habitat After the Fire*, 143 JOINT FIRE SCIENCE PROGRAM, 1, 3 (2011).

[166] *Id*. at 4.

[167] U.S. FISH AND WILDLIFE SERVICE, *Wildlife and the Role of Prescribed Fire*, (2017), *available at*, https://medium.com/usfws/wildlife-and-the-role-of-prescribed-fire-bf80bdc1356f.

[168] Michael Greshko, *Why These Birds Carry Flames In Their Beaks*, NATIONAL GEOGRAPHIC, (2018),

[169] Kapler, *supra* note 154, at 25.

rodents are typically colored to match the greens and golds that make up the forest. When the landscape changes to barren black, they stand out against that backdrop.[170]

Black Bears, Grizzly Bears, Mountain Lions, Coyotes, Grey Wolves, Wolverines and Red Foxes are all native to the Rocky Mountains and benefit from fire.[171] Similar to birds of prey, these large predators benefit from the change landscape color.[172] Large ungulates and their young bed in areas that allow them to conceal themselves for protection.[173] When the landscape changes to barren black, large ungulates stand out against that backdrop and it reduces ungulates ability to camouflage; however, predators can also be disadvantaged by reduced coverage after a fire because they cannot sneak up on some of their prey.[174] Finally, predators also shift hunting habits to burned areas because of the presence of large mammals foraging on the recent regrowth.[175]

In conclusion, restoring the fire to the Rocky Mountain ecosystem provides nutrients, hunting opportunities, and increased nesting opportunities to the animals in the system. By using prescriptive burning in areas with shorter fire intervals, forest managers can restore this balance while reducing fuel loads.

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[170] *Id.* at 5.

[171] Animal Camouflage, National Parks Service, https://www.nps.gov/romo/animal_camouflage.htm.

[172] Feral H. W. McGregor ET AL., *Landscape Management of Fire and Grazing Regimes Alters the Fine-scale Habitat Utilization by Feral Cats*, 9 Plos One 1, 8 (2014).

[173] Kapler, *supra* note 154, at 23.

[174] *Id*.

[175] *Id.* at 29.

B. Societal benefits of Prescriptive Burning

The societal benefits associated of prescriptive fire closely mirror the societal benefits of mechanical thinning. Managing forest with prescriptive burning can reduce the dangers to homes in the WUI and open up areas of recreation previously unavailable. Prescriptive fire also reduces the available fuel for fires and allows for the agency to be proactive rather than reactionary. By giving forest managers this ability, they are able to have more control and plan for the placement of firefighters reducing their risk.

C. Draw backs of Prescriptive burning

Like any management method, there are drawbacks to implementing prescribed fire. Prescriptive fire poses the largest risk of escape of the three methods proposed. Escaped prescriptive fire has damaged private property and is weather dependent.[176] Prescriptive fire is also incredibly cost intensive in areas that have large amounts of fuel on site.[177] The average cost for prescriptive fire is $92 per acre with costs ranging from $35-$300 per acre.[178] Another issue with prescriptive burning is the smoke from the fire.[179] As a result, burning may not be appropriate in close proximity to a community.

V. Legal Structures Confining Forest Management

There are several legal structures that shape how a forest is managed and how liability is assigned following an escaped fire. This section provides an overview of the relevant legal

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[176] Fire Destroys Four Buildings. Casper Star Tribune. April 12, 2006 *available at* https://trib.com/news/top_story/fire-destroys-four-buildings/article_63d4e181-acff-5376-841f-cac65f5fbc5c.html

[177] Strategic Assessment, *supra* note 106, at 11.

[178] *Id*.

[179] *Id*.

statutes and their impacts on fire management. This section also outlines the three types of liability and how each negligent type affects liability for escaped fires. The legal structures in this section are important because they dictate how an agency will plan and implement a burn, and how the agency may be liable if that burn escapes.

(a) Multiple Use and Sustained Yield Act

In 1960, Congress passed the Multiple Use and Sustained Yield Act (MUSYA).[180] MUSYA states that, "it is the policy of the Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."[181] MUSYA requires that all Forest Service plans employ "sound and progressive principles of land conservation and multiple use.[182]" A forest plan "guides all natural resource management activities and establishes management standards and guidelines for the forest."[183]

The impact that MUSYA has on fire management is that forest managers must manage for a variety of uses. When planning for prescriptive fire, the Forest Service needs to also keep in mind the other multiple uses listed in MUSYA; however, case law has said not all uses have to

[180] Multiple Use-Sustained Yield Act of 1960 [herein after MUSYA] (75 Stat. 215).

[181] USDA FOREST SERVICE RANGELANDS, *Why Does the Forest Service Permit Livestock Grazing on National Forest System Lands?*, *available at,* https://www.fs.fed.us/rangeland-management/grazing/allow grazing.shtml.

[182] Eric Olson, *National Grasslands Management: A Primer* (Off. of Gen. Counsel. USDA, Working Paper) 1, 15, (1997). https://www.fs.fed.us/grasslands/documents/primer/NG_Primer.pdf

[183] MUSYA, *supra* note 183.

be present on every acre, just an overall balance within a forest.[184] Prescribed burning will have to address the uses required by MUSYA.

(b) National Environmental Protection Act

Another congressional act that governs federal agency's decision when it comes to fire policy is the National Environmental Policy Act (NEPA) of 1969.[185] NEPA is a procedural statute that outlines the methods for an agency to achieve protection, maintenance, and enhancement of the environment.[186] To accomplish these goals, NEPA requires federal agencies to undertake an assessment of the environmental effects of their proposed actions prior to making final decisions.[187] In order to be NEPA compliant, the agency has to prepare either an Environmental assessment (EA) or and Environmental Impact Statement (EIS).[188] An EA and EIS both have public notification and comment requirements and allow the public to access the science used to make the agency decision.[189] The EA is used to determine whether or not the federal action would "significantly affect the quality of the human environment."[190] If the answer is no, the agency issues a Finding of

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[184] *Vt. Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 98 S. Ct. 1197 (1978).

[185] National Environmental Policy Act of 1970 (42 U.S.C. §§ 4371 et seq.).

[186] *Id*.

[187] *Id*.

[188] 40 C.F.R. §§1502, 1502.3 (2019).

[189] *Id*.

[190] 42 U.S.C.S. § 4332 (2019).

No Significant Impact (FONSI). If the answer is yes, then the agency must conduct an EA. The NEPA works hand in hand with the MUSYA, with NEPA acting as the procedure to achieve the multiple use goals outlined in the MUSYA.[191]

Agency actions are not subject to NEPA requirements if they fall under either a non-discretionary action, or if the action falls under a categorical exclusion.[192] A non-discretionary action is any action the agency is required to take that does not allow the agency the option to not perform.[193] A categorical exclusion is an action or actions which do not have a significant effect on the human environment. These exclusions do not require an environmental assessment nor an environmental impact statement.[194] Most agencies have developed lists of actions that are categorically excluded from environmental evaluation under their NEPA regulations.[195]

The right of the Forest Service to use a categorical exclusion to cover prescriptive burning and timber harvest was challenged in *Wildlaw v. United States Forest Serv.*[196] In *Wildlaw*, a group of 18 environmental coalitions and nonprofit organizations brought suit against the Forest Service after the agency proposed two new categorical exclusions for

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[191] *Id*.

[192] *NAACP v. Med. Ctr., Inc.*, 584 F.2d 619 (3d Cir. 1978).

[193] *Id*.

[194] 40 CFR § 1508.4 (2019).

[195] *Id*.

[196] *Wildlaw v. United States Forest Serv.*, 461 F. Supp. 2d 1221 (U.S. D. M.D. of Ala. N. Div. 2007).

prescribed fire treatment in accordance with the Healthy Forests Initiative, and one exclusion for limited-thinning timber harvest.[197]

The first type of categorical exclusion was for hazardous fuel reductions and the purpose was to reduce the risk and spread of fires.[198] This exclusion would apply to areas of up to 1000 acres.[199] The second categorical exclusion proposed was for "post-fire rehabilitation activities." This exclusion would have allowed the Forest Service to mop up after a wildfire without having to undertake a NEPA analysis.[200] Mop up activities take place after a fire and include suppressing any hotspots that may be reignited, and restoring affected areas to their original or improved conditions.[201] By determining that these activities "do not individually or cumulatively have a significant effect on the human environment and therefore normally do not require further analysis in either an environmental assessment or an environmental impact statement,"[202] the Forest Service categorically excluded them from NEPA documentation, thus reducing their procedural NEPA burdens."[203] The Court of Appeals for the Ninth Circuit held that the agency properly concluded that both of these

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[197] *Id*.

[198] *Id*.

[199] *Id*.

[200] *Id*.

[201] NATIONAL PARK SERVICE AND USDA FOREST SERVICE, *Fire Terminology*, *available at* https://www.fs.fed.us/nwacfire/home/terminology.html

[202] 10 CFR § 1021.102(D) Appendix A.

[203] *Id*.

exceptions were acceptable without an EA or EIS due to the agency's review over 2500 past fuels-reduction and rehabilitation projects and assessed whether those activities had a significant environmental effect satisfied the agency's obligation to determine whether there was substantial impact on the human environment[204]

As a result of the *Wildland* opinion, the court determined the Forest Service could create categorical exclusions for projects that would permit up to 1000 acres of thinning, even though most projects in the review used more mild fuel reduction methods.[205] The creation of these categorical exclusions more easily allows agencies to control fuel in 1000 acre sections.

(c) National Forest Management Act

Congress expanded on the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) and further codified multiple use in Forest Service planning, and passed the National Forest Management Act (NFMA) in 1976.[206] NFMA outlines the process for developing, adopting, and revising land and resource management plans for the National Forest System as required by the RPA.[207] These regulations prescribe how land and resource management planning is to be conducted on National Forest System lands.[208] The resulting plans provide for multiple use and sustained yield of goods and services from the National Forest

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[204] *Id*.

[205] *Id*.

[206] National Forest Management Act, 16 U.S. Code §§ 1600 et. seq.

[207] *Id*. at § 1604.

[208] *Id*.

System in a way that maximizes long term net public benefits in an environmentally sound manner.[209] National Forest Plans must be revised every fifteen years.[210]

Any action a forest manager takes must be consistent with a forest plan.[211] This means in order to treat fuel accumulations in an area, the forest plan must include a fuel management analysis that discusses where and how a prescribed fire will be used.[212] If the proposed fire is allowed under the forest plan, then the agency will have to do a site specific NEPA evaluation in order to conduct the burn.

This means the agency has to ensure consistency of the proposed action with the forest plan. Once the agency has justified its decision, the plan to implement the action must be NEPA compliant, including evaluating all reasonable alternatives to the proposed action. Finally, the agency action must be allowable under that specific forests burn plan.

(d) Endangered Species Act

The Endangered Species Act (ESA) has been described as the most comprehensive legislation for the preservation of endangered species ever enacted by any nation.[213] The goal of the ESA is to conserve endangered and threatened species and the ecosystems upon which they

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[209] *Id*.

[210] *Id*.

[211] *Id*.

[212] *Id*.

[213] *Tennessee Valley Auth. v. Hill*, 437 U.S. 153, 176 (1978).

depend.[214] The United Fish and Wildlife Service (FWS) and the Commerce Department's National Marine Fisheries Service (NMFS) administer the ESA. The FWS has primary responsibility for terrestrial and freshwater organisms, while NMFS is primarily responsible for sea life.[215]

To achieve the goals of the ESA, the Act imposes duties on all federal agencies.[216] Section 7 of the Act requires federal agencies, like the United States Forest Service, to consult with the FWS or the NMFS prior to taking the action on Federal land, to insure its actions will likely not jeopardize the continued existence of any listed species (threatened or endangered) or result in the destruction or adverse modification of its critical habitat.[217] Section 7 consultation requirements place a large burden on forest managers when attempting to conduct a prescribed burn in areas where there are endangered species.[218] If there is a species present in the proposed project area, then the agency must go through a formal consultation with the FWS or NFMS, which includes the issuance of a biological opinion.[219] A biological opinion must assess how the

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[214] Endangered Species Act of 1973, as amended (16 U.S.C. §§ 1531 et. seq.).

[215] U.S. Fish and Wildlife Service/Endangered Species Program, Federal Agencies Programs Official Web page of the U S Fish and Wildlife Service, Available online at https://www.fws.gov/endangered/what-we-do/federal-agency-programs.html.

[216] Endangered Species Act, *supra* note 217.

[217] *Id at* § 1536.

[218] U.S. FISH AND WILDLIFE SERVICE, *S7 Consultation Technical Assistance Official Web page of the U S Fish and Wildlife Service* (2019), *available at* https://www.fws.gov/midwest///endangered/section7/s7process/7a2process.html.

[219] *Id*.

proposed project will affect the species present and issue a finding of no jeopardy, jeopardy with a reasonably prudent alternative, or jeopardy with without a reasonably prudent alternative.[220] Jeopardy is defined as "action reasonably would be expected, directly or indirectly, to reduce the likelihood of either the survival or recovery of a listed species, or to adversely affect designated critical habitat."[221] Based on the result of the biological opinion, the agency can move forward with the action or must adapt the proposed action to an action that will reduce or eliminate the jeopardy to the species.[222]

In *Alliance for the Wild Rockies v. Austin,*[223]the U.S. Federal District Court for Montana addressed Section 7 compliance in relation to a forest prescribed burn plan. In *Alliance*, the Forest Service proposed the Rennic Stark Project which included plans to manage 36,000 acres in the Lolo National Forest.[224] The purpose of the project was to reduce the hazardous fuels and lower the susceptibility of the area to wildfire.[225] Located in the project area were Canada lynx, the North American wolverine, sensitive and old-growth-dependent species (fisher and goshawk), and westslope cutthroat trout.[226] The Alliance for the Wild Rockies brought suit

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[220] *Id*.

[221] *Id*.

[222] *Id*.

[223] *Alliance for the Wild Rockies v. Austin*, 55 F. Supp. 3d 1294 (U.S. D. Mont., 2014).

[224] *Id*.

[225] *Id*.

[226] *Id*.

alleging that the Forest Service failed to conduct adequate Section 7 ESA consultation when creating the Stark Project as required by NFMA.[227] The court found that, the Forest Service had consulted with a wildlife biologist who prepared a biological opinion as required by the ESA, and concluded that there would not be a significant impact with on the Lynx, the Forest Service was not deficient in its consultation process.[228] The importance of *Alliance* is it outlines a practical test for the Forest Service to be ESA compliant. By conducting a consultation with a biologist and following the recommendation, the Forest Service satisfied their obligations under the Section 7 consultation requirement.

(e) State Air Quality Burning Laws

Under the Clean Air Act, the EPA sets National Ambient Air Quality Standards to regulate pollutants considered harmful.[229] Since burns do not involve the NAAQS pollutants, states are allowed to enact their own air quality standards associated with burning.[230] Each state may set their own permitting scheme and the steps to acquire a burn permit in each state is varied.[231] While not specifically aimed at Federal agencies burning on federal lands, these standards can affect a fire manager's decision process in determining whether to burn.[232] Using a

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[227] *Id*.

[228] *Id*.

[229] 40 CFR § 50 (2019).

[230] ENVIRONMENTAL PROTECTION AGENCY, *Interim Air Quality Policy on Wildland and Prescribed Fires* 1, 2, (1998).

[231] *Id*.

[232] *Id*

federal statute to create a standing federal exemption for prescriptive burns will streamline this process for fire managers.

(f) Federal Tort Claims Act

The Federal Torts Claims Act (FTCA) is the act that allows for a private citizen to sue the federal government for damages under a state statute.[233] The FTCA is how a landowner would pursue a claim for damages from an escaped fire against a federal agency. In order to pursue a claim against the Federal Government for damages, an individual must pursue their claim under the Federal Tort Claims Act.[234] The FTCA has a number of requirements for a private individual to bring suit against the Federal Government. [235] These FTCA requires that the United States shall be liable "in the same manner and to the same extent as a private individual under like circumstances;" precludes liability for "prior judgment or for punitive damages."[236] In cases where there was death, the law of where the act occurred will be construed to be fore actual or compensatory damages measured pecuniary injuries to the persons for whose benefit the action was brought. For any claim brought under the FTCA, the United States can assert any defense based upon judicial or legislative immunity that otherwise would have been available to the employee of the United States. If a case meets all of the elements of the FTCA set out above, the

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[233] 28 USCS §§ 2671 et. seq.

[234] *Id*.

[235] *Id*.

[236] *Id.*

claim can still be barred under the discretionary action exception. The discretionary action exception allows for the Government to claim sovereign immunity related to any action that gives the Government discretion in whether to act.[237]

There is a two-step test developed by the courts to determine whether a federal employee was exercising a discretionary function that would invoke sovereign immunity.[238] First, a court will determine whether the conduct involves an element of judgment or choice, which will be the case unless a federal statute, regulation, or policy specifically prescribes a course of action embodying a fixed or readily ascertainable standard.[239] Second, a court will then determine whether this is a judgment or if the choice is grounded in considerations of public policy, because the purpose of the discretionary function exception is intended to prevent judicial second-guessing of legislative and administrative decisions grounded in social, economic, and political policy through the medium of an action in tort.[240] The court held that "when there is established policy whether express or implied, and it allows a government agent to exercise discretion, the agencies' actions are presumed to be grounded in policy when exercising that discretion."[241]

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[237] 28 USCS § 2680.

[238] *State Dep't of Agric. & Consumer Servs. v. United States*, No. 4:09-cv-386/RS-MD, 2010 U.S. Dist. LEXIS 89200 (N.D. Fla. Aug. 30, 2010) citing *Cranford v. United States*, 466 F.3d 955, 958 (11th Cir. 2006) (citing *United States v. Gaubert*, 499 U.S. 315, 322, 111 S. Ct. 1267, 113 L. Ed. 2d 335 (1991)).

[239] *Id*.

[240] *Id*.

[241] *Id*.

When it comes to the federal agency conducting prescriptive fires, there is a disagreement as to whether the discretionary function of the FTCA applies. Several courts have held that prescriptive burning removes the discretionary function.[242] In *Rayonier Inc. v. United States*[243] and on remand *Arnhold v. United States,*[244] the Supreme Court held that Forest Service firefighters may be held liable for negligent firefighting.[245] The court looked to whether a private individual would be held liable for similar conduct under state law.[246] The court found that the firefighters failed to exercise reasonable conduct and could not be granted immunity for their actions.[247] This holding was further applied in *Anderson v. United States,*[248] when the Ninth Circuit held that the United States could be liable under California state law for lighting a prescribed fire to manage chaparral that the Forest Service lost control and that burned part of neighborhood.[249]

In *State Dep't of Agric. & Consumer Servs. v. United States,* in the Northern District Court of Florida, a fire escaped containment and damaged nearby timber that had been leased.[250]

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[242] *Id*.

[243] *Rayonier Inc. v. United States*, 352 U.S. 315, 321 (1957).

[244] *Arnhold v. United States*, 284 F.2d 326, 329-30 (9th Cir. 1960).

[245] *Id*.

[246] *Id*.

[247] *Id*.

[248] *Anderson v. United States*, 55 F.3d 1379 (9th Cir. 1995).

[249] *Id*.

[250] *State Dep't of Agric. & Consumer Servs. v. United States*, *supra* note 238, at 3.

The court found that the United States was not granted sovereign immunity under the discretionary exception of the FTCA because the employee's decision to not create or follow a burn plan was not discretionary.[251] The court held that a prescribed burn plan "must be prepared, meet certain requirements, and be approved prior to prescribing ignition." Approval of the Plan "constitutes firm limits on the prescription to be applied and the objectives to be achieved."

In *Green v. United States*,[252] Ninth Circuit Court of Appeals, Plaintiffs Green et. all, were landowners near a backfire lighted by the United States Forest Service, and challenged that the Forest Service did not provide them with adequate notification that the Forest Service intended to light a backfire.[253] As a result of the Forest Service's failure to notify, when the backfire escaped, the Plaintiffs were unable to escape the fire with their belongings.[254] Plaintiffs claimed this failure to notify was negligent.[255] The court held that this challenge survived the discretionary exception of the FTCA because Plaintiffs did not sue the agency for making the decision to light the fire, rather, they sued that the Forest Service's failure to notify landowners of the backfire was negligent.[256] This is an important distinction because if they had sued the agency for making

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[251] *Id*.

[252] *Green v. United States*, 630 F. 3d 1245 (U.S. 9 Cir., 2011).

[253] *Id.*

[254] *Id*.

[255] *Id*.

[256] *Green v. United States, supra* note 263, at 1252.

the discretionary decision to light the fire they would have been barred under the categorical exclusion and the discretionary exception of the FTCA.[257]

Green is distinguished by the United States District Court for the District of Oregon in *Woodward Stuckart, LLC v. United States.*[258] The Oregon court held that the discretionary function exception only applied when determining whether it was a prescriptive fire to manage fuels or whether it was fire to fight active fires.[259] This ruling sets a precedence that the United States agencies can be liable for negligent implementation of a discretionary action;[260] however, the Green ruling is not recognized in every judicial district. As a result of varying law across the country, it is unclear for forest managers what liability they could face. This uncertainty requires liability for state negligence laws be unified in relation to prescriptive fire to provide certainty and to facilitate easier application of prescriptive fire.

(g) State Liability

Because the FTCA requires that any claim brought by a Plaintiff against the Federal Government must available under state law, and the case law supporting Federal Agency liability under state law for escaped or negligent burning, state laws associated with fire liability and negligence are the standard the agencies will be held to. Upon reviewing nationwide approaches to fire liability, three approaches emerged: strict liability, negligent unless proven otherwise, and

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[257] *Id*.

[258] *Woodward Stuckart, LLC v. United States*, 973 F. Supp. 2d, 1210 (D. Or. 2013).

[259] Elias Kohn, *Wildfire Litigation: Effects on Forest Management and Wildfire Response*, 48 Environmental Law 585, 594 (2019).

[260] *Id* at 597.

traditional negligence. Before diving into state law liability, it is important to define a few legal terms.

1. Legal terms:

The reason these terms are important is they provide the foundation for the legal standards that determine liability. The first term that has an impact on fire management is negligence. Negligence is defined as, "any conduct, except conduct recklessly disregardful of an interest of others, which falls below the standard established by law for the protection of others against unreasonable risk of harm."[261] A more significant type of negligence is gross negligence also known as reckless disregard of safety. Gross negligence is conduct, "in reckless disregard of the safety of another if he intentionally does an act or fails to do an act which it is his duty to the other to do, knowing or having reason to know of facts which would lead a reasonable man to realize that the actor's conduct not only creates an unreasonable risk of bodily harm to the other but also involves a high degree of probability that substantial harm will result to him."[262] Finally, the third type of negligence is contributory negligence. Contributory negligence is, "conduct on the part of the plaintiff which falls below the standard to which he should conform for his own protection and which is a legally contributing cause, co-operating with the negligence of the defendant in bringing about the plaintiff's harm."[263]

In a fire management context, an example of negligence would be lighting a fire without a burn plan or adequate resources to contain it. This is negligent because the agency would be

[261] Restatement of Torts § 282.

[262] Restatement of the Law, Torts § 500.

[263] Restatement of the Law, Torts § 463.

breaching its duty to prevent harm and damage to another. Gross negligence would be lighting a fire knowing there were cabins that were likely occupied within the area planned for burning and not notifying the cabin owners that there was a fire. This is an example of gross negligence because the agency lighting the fire did so without regard for the fact that an injury might occur. Contributory negligence is when a landowner fails to clear ladder fuels from their home, or improperly store flammable or combustible materials and were responsible to a degree for their home being consumed. This is contributory negligence because the homeowner did not take steps to prevent an accident and created a condition that allowed for their home to be consumed.

2. Types of State Negligence Laws that Apply to Fire Management

Liability is controlled by the by the negligence standards listed above. The three types of liability are strict liability, negligent unless proven otherwise and the standard negligent test where the burden of proof on the person bring suit.

i. Strict Liability

Strict liability is the strictest form of the three types of liability a fire manager may face. Strict liability is defined as an activity that is not so unreasonable as to be prohibited altogether, but the activity is sufficiently dangerous or provides unusual risks.[264] Conducting a prescribed burn has been found to be strict liability behavior.[265] In the states that have strict liability, like Connecticut, North Dakota, New Hampshire, and Oklahoma, prescribed burning is considered

[264] Restat. 3d of Torts: Liability for Physical and Emotional Harm, § 20 (3rd 2010).

[265] *Koos v. Roth*, 293 Or. 670, 652 P.2d 1255, 1267 (1982).

by, statute or case law, to be a dangerous activity, but not an illegal one.[266] If a person chooses to manage their property using a prescribed burn, they do so at their own peril. Under a strict liability regime, if the fire were to escape for any reason and cause damages, they would be liable for those damages.[267] In these states, to be found liable it has to be shown that a person set a fire, the fire escaped, and it damage the property of another,[268] because if all three of these elements are shown, then the person is liable even if there was no negligence.[269]

In *Anderson v. United States*, the United States Forest Service lit a controlled burn to deal with chaparral overgrowth.[270] The burn eventually escaped and damaged neighboring property. [271]After an appellate court determined that the Forest Service did not qualify for sovereign immunity, the Forest Service was found labile under a California law that stated that lighting a fire, having it escape and cause damage was enough to impose liability without a showing of negligence. [272]

ii. Negligent unless Proven Otherwise

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[266] Johnathan Yoder, *Effects of Liability Regulation on Prescribed Fire Risk* , THE UNITED STATES, PROCEEDINGS OF THE SECOND INTERNATIONAL SYMPOSIUM ON FIRE ECONOMICS, PLANNING, AND POLICY: A GLOBAL VIEW, 639, 642 (2004).

[267] *Id.*

[268] *Id.*

[269] *Id.*

[270] *Anderson v. United States*, *supra* note 248, at 1380.

[271] *Id.*

[272] *Id.*

The second type of fire liability is negligent unless proven otherwise. There are twenty-two (22) states that have adopted this type of fire liability.[273] Five of the twenty-two states have laws that state that an escaped fire is prima facie evidence of negligence.[274] This means that the burner is presumed to have been negligent simply by lighting the fire. In order to overcome this presumption, the person who started the fire, or defendant, has the burden of proof.[275] The defendant must prove that they exercised due care in creating and implementing their fire plan.[276] If they are unable to do so, then they will be liable for the damages caused by the escaped fire even if the fire escaped due to something outside of their control.[277]

A case that exemplifies the negligent unless proven otherwise approach is *Silver Falls Timber Co. v. Eastern & Western Lumber Co*. decided by the Oregon Supreme Court.[278] In the case, Silver Falls Timber Company conducted timber harvesting operations for two years that lead to a large amount of downed timber.[279] This timber was considered a fire hazard, but Silver Falls did not do anything to address the issue.[280] While continuing operations on a high fire

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[273] Yoder, *supra* note 269, at 641.

[274] *Id*. at 642.

[275] *Id*.

[276] *Id*.

[277] *Id*.

[278] *Silver Falls Timber Co. v. E. & W. Lumber Co*., 149 Or. 126, 40 P.2d 703 (1935).

[279] *Id*.

[280] *Id*.

danger day, Silver Falls machinery ignited the downed timber slash and started a forest fire.[281] Under Section 42-410, Oregon Code 1930, anyone who starts or allows a fire start must make every reasonable effort extinguish it, failure to do so results in liability for the damage.[282] Beginning with the premise that Silver Falls was negligent, the Court reviewed the facts of the case and determined that operating the machinery during a high risk fire day was negligent in itself, and allowing the slash and other material accumulate further exacerbated the danger.[283] As a result, Silver Falls was required to pay the collection of timber owners who lost timber as a result of the fire.[284] While this case is dated, Oregon code has not drastically changed relating to fire on private lands, and this remains a controlling case on the issue.

iii. Negligent

The final type of fire liability present under state law in the United States is a traditional negligence test. This standard is the most forgiving for fire managers and six states currently have this type of standard codified in state law.[285] Under this standard the burden of proof rests with the person claiming the fire manager was negligent, that person must show that the burn plan was insufficient to contain the fire.[286] It is important to note that under this standard, an

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[281] *Id*.

[282] *Id*.

[283] *Id*.

[284] *Id*.

[285] Yoder, *supra* note 269, at 642.

[286] *Id.*

escaped fire is not prima facie evidence of negligence on behalf of the burner.[287] Rather, a fire could have escaped under a perfectly designed burn plan do to an unforeseen event and the fire manager would not be held liable.[288]

This form of fire liability was tested by the Arizona Supreme Court in 1992 when a logging company had a fire start as a result of the weather conditions and their logging operations. In *Lohse v. Faultner*, Southwest Forest Industries received a contract to log in the Kaibab National Forest.[289] Southwest subcontracted some of this logging area to Eddie Faultner.[290] Included in the contract between the Forest Service and Southwest was a duty of fire patrols.[291] Faultner's crew had stopped logging around noon and a high fire danger order was issued by the Forest Service which required shut down for the day.[292] On the day the incident started, Faultner parked his loader fifteen feet from a slash pile and left for the day.[293] Shortly after Faultner left, a fire broke out.[294] Plaintiffs, landowners whose property was damaged by the fire, argued that the location of the loader, and Faultner's failure to conduct a fire patrol on a

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[287] *Id*.

[288] *Id.*

[289] *Lohse v. Faultner*, 176 Ariz. 253, 860 P.2d 1306 (Ct. App. 1992).

[290] *Id*.

[291] *Id*.

[292] *Id*.

[293] *Id*.

[294] *Id*.

high fire danger day, were the negligent actions that caused the fire and the damage to the Plaintiff's property[295] The court found that Plaintiffs did not adequately prove that the location of the loader or failing to conduct a patrol was the cause of the fire or the reason for its spread.[296] As a result, Faultner was not liable for the damages.[297] This type of liability removes the burden from the responsible manager to prove they were not negligent.

Of these three standards, strict liability is the most punitive, negligent unless proven otherwise is the middle ground and the most forgiving for fire managers is not negligent unless proven otherwise. There are also currently sixteen states that do not have some form of fire liability statute codified.[298] In these states, negligence is proven on a case by case basis for fire similar to other negligence cases within each state.

Because states varying in their application of liability law and courts currently disagree on the application of the FTCA, fire managers are uncertain of the applicable law when trying to plan a prescribed burn. This uncertainty and slow implementation of prescriptive burning prevents fire managers from utilizing prescriptive fire efficiently. By failing to implement prescriptive fire, fuel conditions continue to accumulate creating the setting for large wildfire events.

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[295] *Id*.

[296] *Id*.

[297] *Id*.

[298] Yoder, *supra* note 281, at 642.

(h) Public Law 107-203

Another form of federal legislation that has an impact on fire is Public Law 107-203. In 2002, Congress enacted Public Law 107-203[299] following the deaths of four firefighters.[300] Public Law 107-203 allows for an officer or employee of the Forest Service to be subject to criminal charges for decisions they make during a fire.[301] This law creates a chilling effect on firefighters accepting assignments as incident commanders.[302] There have also been instances after deadly fires of firefighters refusing to testify or be interviewed by investigative agencies out of fear of incriminating themselves or their fellow workers.[303]

Public Law 107-203 was reactionary to a tragic event; however, it is ineffective in its implementation. The fear of firefighters that they will incriminate their coworkers prevent investigations into tragic fire to be completed adequately. As a result of Public Law 107-203, managers are concerned they may be held liable for the decision to light the prescribed burn if it were to escape. This leads to use of less effective and sometimes costly methods of fuel reduction, if fuel reductions activities are taken at all.

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[299] 107 P.L. 203, 116 Stat. 744, 2002 Enacted H.R. 3971, 107 Enacted H.R. 3971, 107 P.L. 203, 116 Stat. 744, 2002 Enacted H.R. 3971, 107 Enacted H.R. 3971.

[300] *Id*.

[301] *Id.*

[302] CHARLES H. OLDHAM, *Wildfire Liability and the Federal Government: A Double-Edged Sword.* 48 ARIZ. ST. L.J. 205, 219 (2016).

[303] *Id.*

VI. Creating a New Management Strategy

To address the liability problems associated with the categorical exclusions already codified, FLARE is an attempt to create a strategy and amend the controlling federal acts to allow the Forest Service and other federal agencies to more efficiently implement the recommendations from the Leopold Report, to efficiently use fuel management tools such as prescribed fire, and others, as tools to restore forest ecosystems, and limit the risk of large fire events.

(a) Creating a Policy

The policy below is meant to address the growing number of large-scale fire events, the rising cost of fighting them, necessary changes to combat past policies, and restore the health of forests throughout the Rocky Mountains.

1. Factors to Consider

When creating a policy, it is important to address as many concerns as possible when crafting it. Based on the existing fire liability statutes and the Forest Service approach to managing fires, I have identified a number of concerns that need to be considered when crafting a policy. Those concerns include human safety, ability to contain, human health, the appropriateness for fire application based on the area, animal impacts, risk to property, and flexibility of the statute.

Human safety encompasses a number of concerns. First, the policy must begin the analysis with the safety of humans in the area whether it is a natural, prescribed, or human caused fire. Addressing the safety of residents, visitors and firefighter safety is the top priority. The National Wildland Coordinating Group (NWCG) promulgates a list of rules for firefighter

safety.[304] NWCG produces the 10 Standard Fire Orders which are meant to be the foundational rules for firefighter safety.[305] These rules include being informed of safety zones and their distances, being adequately briefed and importance of monitoring fire conditions.[306] It is important that these standards be review with consistency to ensure that the rules for firefighter safety adapt as new information is issued.

The next issue a policy must address is that ability to contain the fire regardless of the cause. When prescribing a fire or letting it burn, the fire needs to remain in a controlled area in order to reduce liability and the risk to human safety. The policy will need to make sure the fire manager has the structure, flexibility and resources to make real time decisions regarding the risks of escape.

The third element the policy must consider is human health. The fire must be able to burn safely without significant risk of degradation to air quality in a populated area. Impacts of fire and smoke are disproportionately experienced by different members of communities. In areas that closely abut populated cities, wind direction and mixing height will play a significant role in determining the fire strategy. In Missoula last year, smoke from British Columbia's fires

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[304] NATIONAL WILDLAND COORDINATING GROUP, *Six Minutes to Safety*, *available at* https://www.nwcg.gov/committees/6-Minutes-for-safety

[305] NATIONAL WILDLAND COORDINATING GROUP, *10 Standard Fire Orders*, *available at* https://www.nwcg.gov/committee /6mfs/10-standard-fire-orders

[306] *Id*.

degraded the air quality in and around the city.[307] The dangers of high smoke content are disproportionately borne by the young, asthmatic and elderly.[308]

The fourth element that the policy will need to address is the fire adaptions of the region. In areas that have fire adapted plants, like those listed above, then fire may be an appropriate management approach. In areas that are sage brush and sage brush steppe, fire would be a poor management approach due to the environments' inability to recover from fire. Fire application will be dependent on ecological conditions and suitability of fire.

The fifth element the policy would have to address the impact on local wildlife. In areas that there is endangered species or critical habitat, the analysis will have to be different than in areas that do not. In areas with endangered species fire may not be applicable if it would cause further harm to the species. Additionally, there will have to be a method to streamline communication between the Forest Service and the Fish and Wildlife Service so that the two agencies can communicate quickly and effectively. In areas of critical habitat, the Forest Service will have to determine if the habitat will rebound quickly, or if there is suitable habitat nearby that would allow the species to recover.

The sixth element that the policy must address is the risk to property in the area. This is of secondary concern to the health of the landscape; however, in situations where fire is applied or allowed to burn, the new policy will have to address compensation for state or private land that may be damaged. An important consideration in this will be the landowners' potential

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[307] Madeline Broom, *Air Quality Alert Issued for All of Montana Due to Wildfire Smoke*, MISSOULIAN, Aug. 19, 2018.

[308] CENTERS FOR DISEASE CONTROL AND PREVENTION, *Protect Yourself from Wildfire Smoke* (2018) *available at* https://www.cdc.gov/features/wildfires/index.html.

contributory negligence. By offsetting damages based on the landowner's negligence, it will incentivize landowners to maintain their property and build defensible space. If a landowner does not do this, then the agency will not be fully liable for the damages.

The final concern the policy must address is the ability to adapt as time progresses and more is learned about fire applications and forest management through fire. It is rare major policies are passed in the natural resource sphere. As a result, policies are often enacted and then remain law for decades. The policy will need to have the flexibility to adapt as time progresses. Turning from concerns to implementation, the policy will have to be grounded in federal legislation.

VII. Using Federal Legislation to Allocate Liability

FLARE proposes using Federal legislation and the authority of Congress, under the Supremacy, and Property clauses of the Constitution, to allocate liability. The Property and Supremacy Clauses grant Congress the authority to enact rules governing federal lands and the power to pre-empt state law.

(a) Supremacy Clause

Because there are state laws already enacted, any legislation passed would have to preempt any conflicting state law. In order to do this, Congress would evoke what is known as the Supremacy Clause of the United States Constitution. Article VI Paragraph II states that the laws of the United States shall be binding to all States and the "supreme Law of the Land.[309]

[309] U.S. Const. art. IV, Paragraph II.

The important part of this clause is the "shall be the supreme Law of the Land." This gives Congress the power to enact laws that create uniformity amongst the states. In the context of fire, Congress would need to change the liability laws federally and usurp the laws laid out in each state. In order to do so under the Supremacy Clause, Congress would have to justify a national liability law using another power granted to them under the constitution.

(b) Property Clause

The forests and lands owned by the Federal Government are subject to the United States Constitution Article IV, Section 3, known as the Property Clause. Property Clause of the United States Constitution provides the Federal Government with the exclusive power to regulate Federal Property. The Property Clause states that "Congress shall have [p]ower to dispose of and make all needful [r]ules and [r]egulations respecting the [t]erritory or other [p]roperty belonging to the United States."[310]

Congress's power to regulate federal lands was tested in *Kleppe v. New Mexico*.[311] Three years prior to *Kleppe*, in 1971, Congress passed the Wild and Free-Roaming Horses and Burros Act of 1971 (WFRHBA).[312] WFRHBA protected horses and burros from "capture, branding, harassment or death." In 1994, the New Mexico Livestock Board (NMLB) rounded up 19 unbranded and unclaimed burros from federal lands in New Mexico and sold them at a public

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[310] U.S. Const. art. IV, Section 3.

[311] *Kleppe v. New Mexico*, 426 U.S. 529, 96 S. Ct. 2285 (1976).

[312] *Id*.

auction.[313] The Bureau of Land Management (BLM) demanded that the NMLB recover the sold animals and return them to federal lands because the NMLB was in violation of WFRHBA.[314] The NMLB filed suit in the United States District Court for the District of New Mexico seeking declaratory judgment against the Secretary of the BLM that the WFRHBA was unconstitutional.[315] The three-judge District Court granted declaratory judgement in favor of the NMLB.[316] On appeal, the United States Supreme Court unanimously held that "the complete power that congress has over public lands under the property clause in Article IV, 3, cl 2, of the Federal Constitution necessarily includes the power to regulate and protect the wildlife that the WFRHBA was a constitutional exercise of congressional power under the property clause."[317]

VIII. Federal Liability and Fire Recovery Enhancement Act (FLARE)

I am proposing FLARE as a method to restore forests to their natural state pre-suppression. FLARE would further build on the categorical exclusions for prescriptive fire and assign liability to incentivize prescriptive fire in appropriate areas. An ESA consultation would be required when an endangered species is present in the prospective burn area. FLARE should

[313] *Id*.

[314] *Id.*

[315] *Id*.

[316] *Id*.

[317] *Id*.

do this by creating uniform liability for prescribed burning and absolve the federal agencies of any liability associated with negligent burning beyond the assessed property value.

The categorical exclusions for fire in HFI, and FLARE and *Wildlaw* are a start; however, none of these acts or case law address liability. FLARE will codify the NEPA categorical exclusions addressed in *Wildlaw,* located at 68 Fed. Reg. 33,814 (June 5, 2003)(codified at Forest Service Handbook 1909.15, ch. 30, § 31.2 (10)-(11)(2004)), for prescribed fires and for allowing fires to burn. This will prevent any future litigation, which delays the implementation of forest plans, on the grounds NEPA compliance of burn similar to those brought in the *Wildlaw* case.[318]

As addressed above, any policy implemented will have to address a number of concerns from safety to health to the risk of damage to structures. The first element FLARE will address is shifting the nationwide liability standard for federal fire management to a negligent if proven negligent standard. The reason this switch is important is it allows fire managers to have a uniform set of rules that when deciding how to manage a fire. This important because almost all forests have a different liability statute based on what state the forest is located in. Different liability standards create confusion and subject forest managers to a differing duty of care in each state the fire enters. Additionally, I am proposing that FLARE should repeal Public Law 107-203 to shield fire managers from any civil or criminal liability associated with decisions made during a burn. This personal liability clause only applies to decisions that are made in relation to the management of a fire whether from natural or unnatural causes, or prescriptive in nature.

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[318] Kohn, supra note 262, at 606.

Once liability has been allocated FLARE should address the federal constraints that dictate the management of fire. Flare would provide the federal agencies with an outstanding permit to burn on federal lands independent of states' individual requirements. As long as the land met the factors listed in the table then, the agency would be allowed to burn.

In order to facilitate communication between the Forest Service and Fish and Wildlife Service, FLARE would also require the creation of a RISK Management System. A RISK Management system helps agencies work with communities, fire departments, emergency planners to "collectively prepare for and be resilient to wildfires by facilitating effective, efficient, and consistent data information exchange."[319] This system would be required to be created for all federal lands. Risk Management systems build real time mapping and projections for active or planned fires.[320] The Forest Service has begun this process with the Fire Modeling Institute; however, FLARE would make the implementation of the modeling a priority.[321]

To make this easier, FLARE will also have a data access requirement creating uniformity amongst the agencies and allowing the data to upload in real time. Included in this data must be the geophysical data of all federally managed land, any land designated as ESA critical habitat, and the endangered species present in the area. This will allow the fire manager the ability to process the potentially impacted areas by a fire and how much critical habitat may be lost. They can then work with a designated Fish and Wildlife Service biologist to determine in real time whether to let an area burn or suppress.

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[319] Wyoming Wildfire, WYWRAP, https://wywrap.wyo.gov/.

[320] *Id*.

[321] UNITED STATES DEPARTMENT OF AGRICULTURE, *Fire Modeling Institute*, Rocky Mountain Research Station. https://www.fs.fed.us/rmrs/groups/fire-modeling-institute.

FLARE will create a new procedural requirement that will require fire managers to address the following issues, in order of importance:

1. Human Safety	a. Are residents or campers located in the forest in the project burn area? b. Can firefighters safely contain perimeter?
2. Ability to Contain	a. Will laying blacklines contain the fire? b. Are weather conditions conducive to containing the fire?
3. Human Health	a. Can we contain in a way to prevent severe degradation of the air quality? b. What is the mixing height for smoke? c. What direction is the wind blowing? i. Is there a low population density downwind?[322]
4. Fire Adaptation of Plants	a. Is this an area that will rebound from the application of fire?
5. Animals	a. Is there an endangered species present? b. Will the habitat rebound to justify the temporary loss? c. Is there sufficient critical habitat outside of the burn area to support species?
6. Property	a. Is there a way to contain without losing property? b. Is the property properly managed to prevent fire? c. Can firefighters access the property to protect it safely?

To address the concern of private property being damaged, FLARE would establish a sliding scale to payout damages as a result of lost property. These damages would be capped at the appraised value of the property and absolve the service of any additional liability under the FTCA. FLARE will also use a comparative negligence standard, meaning the landowner's negligence will be assessed and their amount of recovery limited by their negligence. Examples of property owner was negligence is failure to maintain upkeep of the property including, but not limited, improperly storing flammable chemicals, failing to mow and/or trim a defensible space around their structure, failure to maintain a road wide enough for fire vehicles, or engines.

[322] An average of one dwelling unit per ten acres shall be used as the definition of areas of low population density.

Finally, FLARE will require the agency to issue an updated list of factors to evaluate the appropriateness for fire and the required measurement in each category.

IX. Conclusion

Congress' passage of the FLAME Act and Forest Service's enactment of the National Cohesive Wildland Fire Management Strategy are steps in the right direction for United States forest fire management policy. FLARE is the next evolution of these policies and built to address the large-scale fire events before they occur. There are other strategies to address climate change and the current drought issues. Until those changes are made, FLARE is designed to allow fire managers to safely and effectively make real time decisions on fires. Until these changes are made, suppression will remain the default policy.

FLARE attempts to address these issues by creating uniformity among state liability standards, facilitating communication and risk analysis between agencies, and provides fire managers with the tools and resources necessary to responsibly manage fire. While FLARE addresses many interest groups concerns, it centralizes the decision making when it comes to forest fire liability. This will face significant pushback from both the states and the property owners in the area. One way to address with would be to have a local representative in discussions with the fire manager when he is making decision on whether to allow a fire to burn or to suppress it. While this may appease local land users, this is not a vital step in FLARE. FLARE's purpose is to provide uniformity for decision makers and reduce the overall cost of forest fire management. The initial support may not be strong but reducing the size and scale of these fires and limiting damage will eventually be supported.

The cycle that created the conditions for massive fires will not reverse itself. The most cost efficient and effective method of fuel management is through prescriptive fire. By enacting

FLARE, federal liability will be standardized, and forest managers will be able to safely and effectively return United States forests their natural state. This will have ecological and societal benefits while reducing the federal funds spent on management.