ASSESSING THE PREVALENCE OF PRESCRIBED FIRE IN PACIFIC NORTHWEST WILDFIRE MEDIA COVERAGE

A SOJC Honors Thesis

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Abstract:

As climate change alters landscapes and exacerbates natural hazards like wildfires, people increasingly experience anxiety, dread, and loss, all of which negatively impact mental health. When the print media reports on wildfire events, previous research has shown that newspapers primarily focus on immediate developments, such as acres burned and containment efforts, rather than offering comprehensive discussion of wildfire, including strategies to mitigate future wildfire risk. Prescribed fire is one strategy to do so, and many ecosystems across the Pacific Northwest would readily benefit from more frequent, low-severity fire. This study seeks to determine whether print media in the Pacific Northwest follows a solutions journalism framework in their wildfire coverage, which, by highlighting solutions to prevalent problems, can provide readers with a greater sense of optimism and self-efficacy. Through content analysis, this study examines how often the *Post Register*, *Idaho Spokesman*, *The Oregonian*, *The Register-Guard*, *The Seattle Times*, and *The Spokesman-Review* mentioned prescribed fire in their coverage both during and outside of wildfire events, and the tone of that coverage, from 2010 to 2023. It found that major Pacific Northwest newspapers rarely mentioned prescribed fire when reporting on wildfires, but provided more coverage and more positive coverage of prescribed fire disconnected from specific wildfire events during the study period. These results show that large circulation print media outlets in the Pacific Northwest had positive coverage of prescribed fire overall, but relatively narrow coverage of wildfire events from a solutions journalism perspective.

Introduction:

Wildfire is a progressively important topic for individuals, communities, and governments across the globe. Wildfires can represent a substantial risk to societal systems in many ways: causing economic and environmental damage (Artes et al., 2019); creating significant risk to public health, both physical and psychological, during and after a fire event (World Health Organization, 2022; To et al., 2021); and sparking local conflict that undermines community resilience (Paveglio et al., 2015). As in many other places, the extent and severity of wildfires in the United States are increasing (Environmental Protection Agency, 2021), but Americans are moving into areas of greater wildfire risk (Radeloff et al., 2018). Exacerbated by anthropogenic climate change and largely caused by a decades-long paradigm of fire suppression (Wuerthner, 2006), what can we, as a society, do to reduce the environmental damage and human toll of today's catastrophic wildfires?

Indigenous peoples in the Pacific Northwest, like many other tribes native to North America, have put fire onto the landscape since time immemorial to engage in environmental stewardship and support their lifestyles (Boyd, 2021; Long et al., 2021). Western science now acknowledges the critical role of fire in improving forest resilience and maintaining ecosystem functioning (Prichard et al., 2017; Kalies & Yocom Kent, 2016), as well as the role of prescribed fire in lessening the severity of future wildfires (Prichard et al., 2021; Government Accountability Office, 2019). Prescribed fire is one solution to mitigate wildfire risk, and this study, through content analysis, explores whether print media in the Pacific Northwest frames prescribed fire as such in its coverage of wildfire, and how it discusses prescribed fire disconnected from specific wildfire events. Previous studies have already established that

wildfire media coverage emphasizes short-term impacts (Nillson & Enander, 2020; Paveglio et al. 2011; Mercer & Prisbrey, 2004) and oftentimes fails to provide a holistic explanation of wildfire, including the relationship between wildfires and climate change (Gutsche Jr. & Pinto, 2022; Cordner & Schwartz, 2019; Morehouse & Sonnet, 2010). Less explored, however, is the prevalence of solutions-oriented journalism in wildfire media coverage.

A Brief Overview of U.S. Wildfire Policy

While wildfire is a global phenomenon, this study focuses on the context of the U.S. and, therefore, must begin by acknowledging our historically fraught relationship with fire. Given that humans are uniquely fire creatures, we have an inherent responsibility to manage fire; however, throughout the nineteenth and twentieth centuries, colonizers in the American West intentionally disrupted Indigenous fire regimes that many landscapes depended on (Jensen & McPherson, 2008; Pyne, 1997). This pyrophobia became institutionalized with the establishment of the United States Forest Service (USFS) in 1905, which pushed for a vision of forest conservation that revolved around fire suppression and actively discredited, downplayed, and erased Indigenous knowing (Vinyeta, 2021). Motivated by figures like Theodore Roosevelt and Gifford Pinchot, William James' 1910 essay "The Moral Equivalent of War," and a backward notion of wilderness, the USFS officially condemned prescribed burning in 1923 and soon afterward adopted the infamous 10 A.M. policy — effectively beginning a century of forest management aimed at suppression (Wuerthner, 2006). Many of these ideas were rooted in European policy, where the science of forestry originated and where there is no equivalent ecological basis for fire as there is in the U.S. (Nijuis, 2015).

Due to a surplus of manpower stemming from Depression-era emergency conservation programs, the mechanization of firefighting that occurred after World War II, and a period of favorable climatic conditions that spanned the mid-twentieth century, the 10 A.M. policy was initially successful and America was winning the war on wildfire (Pyne, 1997). Amidst this success, the USFS began to pursue partial fire suppression and warmed up to prescribed fire as America's cultural and ecological landscape changed with the Civil Rights Movement, the American Indian Movement, and the Leopold Report of 1963 (Vinyeta, 2021). In the 1980s, however, the Western United States experienced a prolonged drought and its forests were inundated with extremely dry fuel due to continuing fire suppression efforts by the USFS. Such circumstances set the stage for the 1988 Yellowstone Fires, a culturally symbolic precursor of the decades of wildfire-filled summers to come (Pyne, 1997).

The Effects of More Frequent, More Severe Wildfire

As a result of the legacy of fire suppression and worsening anthropogenic climate change, the amount of acreage burned, the length of the fire season, and the severity of wildfires have all increased (Environmental Protection Agency, 2021). Over the past four decades, the area burned by wildfire in the U.S. has roughly quadrupled, with the largest loss of forest occurring in 2015 when 10.13 million acres burned (Congressional Research Service, 2022; Burke et al., 2021). While fire is typically a regenerative force essential to fire-adapted ecosystems, their effects on ecosystem health are becoming more dire as fire severity worsens, particularly in the Southwest. Most notably, high-severity wildfires can bake soil, effectively sterilizing it of critical nutrients and microorganisms while also exacerbating soil erosion and negatively impacting water quality, all of which hinder ecosystem recovery (California

Department of Fish and Wildlife, 2022; Agbeshie et al., 2022; Murphy et al., 2018; Government of New South Wales, 2016). Such effects can be exacerbated when they occur in tandem with post-fire salvage logging, a practice oftentimes done by the USFS to recover a forest's economic value following a disturbance. While the effects of salvage logging are temporally and site-specific, the practice can particularly harm cavity-nesting birds, can increase soil disturbance and compaction, and can reduce the amount of organic carbon in soils; notably, there is not consensus on how salvage logging affects the likelihood of future wildfires in already-burned areas. (United States Forest Service, 2019b).

That being said, wildfire is not just an isolated environmental or ecological issue, it is inherently social — inextricably intertwined with human life and societal functioning. Due to the expansion of the Wildland Urban Interface (WUI), or the transitional zone between unoccupied land and human development, wildfire danger to lives and property is increasing (USDA, 2020). From 1990 to 2010, there was a 41% increase in the number of houses in WUI areas and a 33% increase in WUI land area in the United States, making it the fastest-growing land-use type in the nation and one that is accompanied by considerable risk (Radeloff et al., 2018). According to the First Street Foundation Wildfire Model, in the U.S., there are 49.4 million properties with minor wildfire risk (with a cumulative burn probability below 1%); 20.2 million properties with moderate risk (6% maximum cumulative burn probability); 6.0 million with major risk (14% maximum burn probability); 2.7 million with severe risk (26% maximum cumulative burn probability); and 1.5 million properties with extreme risk (with cumulative burn probabilities of 26% and up). Such risk is most concentrated in the West and South, specifically in California, Texas, Florida, Arizona, and Oklahoma, which have the largest number of properties with at

least 0.03% burn probability in 2022 (First Street Foundation, 2022). Considering nearly 80 million American properties are threatened by wildfires this year, a significant amount of resources must be diverted to support wildfire prevention and protection efforts. On average, the federal government spends $2 billion annually on local, state, and national wildfire suppression initiatives, costs which could potentially rise to $0.83 billion annually under conservative climate change scenarios by 2050 and perhaps to as much as $2.32 billion annually under higher emissions scenarios (Office of Management and Budget, 2022). Apart from suppression expenditures, Crowley et al. (2023) estimate that the annual economic and ecological cost of wildfire is "on the order of tens to hundreds of billion dollars per year" (p. 8).

Mitigating Wildfire Risk

Today's fire management problems exist because fire regimes — the general pattern of wildfire in a particular ecosystem over an extended period — have been altered since colonization, in large part due to the removal of Indigenous people and repression of cultural burning, fire suppression, the logging of fire-resistant trees, and climate change (Jane Davis et al., 2023). Indigenous communities, specifically those in the Pacific Northwest, have long depended on fire to pursue environmental stewardship and create varied landscapes, from open oak savannas to fertile meadows (Boyd, 2021; USDA Natural Resources Conversation Service, 2009). Cultural burning is used to fulfill several socio-ecological objectives, including, but not limited to: enhancing ecosystem health and biodiversity; cultivating tribally important food, medicine, and weaving resources; managing wildlife; fostering spiritual connectivity through ceremonies; and facilitating the intergenerational transfer of knowledge (Long et al., 2021). Haugo et al. (2019) estimate that, from 1984 to 2015, approximately 13.3-18.9 million

more hectares of Pacific Northwest forest would have burned if historic fire regimes were restored, illustrating that ecosystems in the Pacific Northwest are in dire need of more healthy fire.

Initially denounced as an effective management tool, Western institutions are beginning to embrace prescribed fire, intentional fire put onto landscapes to counteract unnaturally high surface fuel loads, improve forest resilience, and better overall ecosystem functioning (Prichard et al., 2017; Kalies & Yocom Kent, 2016). A recent report by the Wildland Fire Mitigation and Management Commission (2023) readily emphasized the ecological role of fire and its centrality in wildfire mitigation efforts:

> "While fire is central to this crisis, it is also a critical part of the solution. Beneficial fire — including prescribed burning, cultural burning, and wildfire managed for resource objectives — is necessary to restore fire-adapted ecosystems and reduce the risk of high-severity wildfires that pose a significant threat to communities. Policy change is needed to enable a new relationship with fire, one in which fire is no longer an existential risk to communities and landscapes, but instead an integral and beneficial component of our human and natural systems" (p. 3).

Under appropriate weather and safety conditions, there is broad scientific consensus that spatially strategic prescribed fire is a useful and cost-effective tool for reintroducing wildfire into fire-excluded forests and lessening the severity of future wildfires (Prichard et al., 2021; Government Accountability Office, 2019). However, prescribed fire is most successful when

applied in conjunction with mechanical thinning and should only be used in specific types of forests that generally have a high-frequency, low-severity fire regime, which the Pacific Northwest has in abundance (Prichard et al., 2021; Kalies & Yocom Kent, 2016). For instance, the drought-prone forests east of the Cascades and extending into Idaho, such as ponderosa pine and dry mixed-conifer forests, readily benefit from prescribed fire (Haflovsky et al., 2020), and there is growing evidence that fire occurred more frequently than previously thought in the wetter, high-elevation forests west of the Cascades (Johnston et al., 2023; United States Forest Service, 2022a ; Bakker et al., 2019). To implement prescribed burning on a regional or national scale, though, requires both collaborative, equal partnerships that meld traditional fire knowledge with Western fire knowledge and mass mobilization on all levels, including tribal governments, residents, private industry, the research community, and the federal government (Wildland Fire Mitigation and Management Commission, 2023; Lake et al., 2017).

Ultimately, wildfires are an ecological, political, and social phenomenon that directly influences land use, poses potentially significant risks to public and private property, and demands mass mobilization of resources.. Whether it be through spirituality, tax dollars, or proximity to burnable areas, we are all connected to wildfire in one way or another; thus, given its prevalence, we must develop an understanding of how and why we, as a society, perceive wildfire in the manner that we do. Accordingly, this endeavor must begin with a critical examination of wildfire coverage in the media, and — particularly as climate change worsens — what solutions the media proposes to address increasing wildfire risk.

Literature Review:

Media Framing and Wildfire Coverage

Known as the fourth estate and serving as gatekeepers of information, the media plays a pivotal role in cultivating an informed citizenry and influencing public opinion regarding important debates, issues, and events (Allan, 2022). One primary way the media influences public opinion is through framing. Entman (2007) defines framing as "the process of culling a few elements of perceived reality and assembling a narrative that highlights connections among them to promote a particular interpretation" (p. 164). Framing, along with which issues the media chooses to cover, can determine the salience of topics on the public agenda, otherwise known as the agenda-setting role of the media. According to Walter Lippman, the intellectual father of agenda-setting, the media is fundamental in determining our mental maps of the world and argued that public opinion responds "not to the environment, but to pseudo-environment constructed by the news media" (McCombs, 2014, p. 3).

Despite journalism's commitment to objectivity, a number of factors influence the production of news, from who journalists are to the publications they work for. Generally, newsrooms are not diverse spaces as 77% of U.S. journalists are white and 61% identify as male, according to a survey by the Pew Research Center (Greico, 2018). Like all people, journalists also hold values, attitudes, and beliefs that affect their production of content, such as personal ideology, religious orientation, level of education, and perceptions about what journalists should epitomize (Shoemaker & Reese, 2013). Perhaps an even stronger influence is that journalists follow specific media routines, abide by professional roles and ethics, work within a power-laden organizational structure, and are embedded in the social context of news

organizations (Shoemaker & Reese, 2013; Singer et al., 2004). This socialization produces organizational standards that are inferred from a newsroom's policy, which commonly delineates ideological orientation and class considerations, and may override personal beliefs (Breed, 1955). Relatedly, elitist voices representing powerful or authoritative institutions tend to be featured in journalism (Cox et al., 2008; Carson, 2009), while marginalized voices are often neglected (Nelson et al. 2014), effectively reinforcing the status quo.

When it comes to natural hazard coverage, such as wildfires, the public relies on the media as one channel to stay informed and understand potential risks (Houston et al., 2012). The media weaves together scientific understanding, disaster response coordination, and public understanding (Paveglio et al., 2011), which may influence the public policy response in the aftermath of a fire, such as increasing wildfire suppression expenditures (Donovan et al, 2011). Wildfire coverage that centers solely on disaster response sometimes results in a cycle of blame between authorities and the public (Nillson & Enander, 2020). Generally, natural hazard coverage is not sustained for long (Houston et al., 2012), and wildfire coverage in particular tends to focus on immediate risk rather than a systemic explanation of the wildfire (Nillson & Enander, 2020; Paveglio et al. 2011; Mercer & Prisbrey, 2004). Wildfire coverage is episodic because wildfires themselves are focusing events, dramatic or harmful events that highlight the potential for greater future harm (Birkland, 1998). Accordingly, wildfire coverage on the anniversary of fires is more comprehensive than episodic coverage as the former is more likely to raise wildfire-related policy problems and discuss what caused the wildfire (Kroepsch et al., 2018).

The most frequently deployed frames in wildfire coverage are those related to immediate wildfire risk. In their survey of wildfire coverage in the *Albuquerque Journal*, *Arizona Republic*, *Los Angeles Times*, and *New York Times* from 1999 to 2003, Morehouse and Sonnet (2010) found that the most common frames were changes in weather, fire suppression efforts, and impacts on humans and property, with an emphasis on fuels management and policy rather than climate or science. When Terracina-Hartman (2020) examined how U.S. state and regional newspapers covered the 10 most historically significant U.S. wildfires from 2003 to 2013, the dominant frames were threats to land or structures (65%), management resources (18%), conflict (8%), and ecosystem losses (7%) while the most used sources included firefighters and law enforcement, followed by citizens, government officials, industry personnel, and scientists. Through large-scale content analysis, Sachdeva and McCaffery (2022) assessed newspaper coverage of wildfires in the U.S., Canada, and Australia from 1986 to 2016 in which the most prevalent U.S. frames included firefighting (7%) and local fire response (5%), followed by the fire season (4.1%), fire survival stories (3.2%), and drought (2.7%).

Among more localized studies, the framing pattern remains the same. Paveglio et al. (2011) analyzed newspaper coverage of the Columbia Complex Fire in Washington and the Day Fire in southern California in 2006, finding that private property destruction was a broadly used frame that served to reinforce the fire suppression paradigm. In another study on the 2014 Carlton Complex and the 2015 Okanogan Complex in Washington, Cordner and Schwartz (2019) established that subsequent newspaper coverage was framed according to property damage like burned structures (55% of Carlton articles and 37% of Okanogan articles), smoke impacts (14% and 23%, respectively), and evacuations (20% and 44%, respectively). Evidently, wildfire

coverage in U.S. print media is framed according to short-term — albeit necessary — developments such as acres burned, property destruction, firefighting efforts, and evacuation updates, and rarely includes a more holistic conversation about the ecological role of wildfire and the factors that exacerbate wildfire.

The Climate Link

Research on wildfire media coverage has largely been conducted through broad framing or thematic analysis, but several studies have focused on a more specific issue: whether the media discusses climate change in the context of wildfires. Given the agenda-setting role of the media, increased coverage of climate change has been proven to both heighten public concern (Sampei & Aoyagi-Usiu, 2009) and issue salience (Brulle et al., 2012; Andrews & Caren, 2010; Gamson & Wolfsfield, 1993). However, since climate change influences wildfires indirectly via rising temperatures and changing precipitation patterns, journalists struggle to link climate change with wildfires because it's complex (Gutsche Jr. & Pinto, 2022; Berglex & Lidskog, 2019). The role of political elites is also pronounced in climate change coverage. Through corporate ownership and control of media companies, elites embed their ideology into such companies and have a disproportionate amount of power in the selection of scientific news, which shapes the coverage of highly politicized issues like climate change (Carvalho, 2007). Journalists subsequently follow elite cues in their selection and representation of content (Carmichael & Brulee 2016; Yin, 1999), but have moved beyond the norm for balanced reporting when it comes to climate change (Brüggemann & Engesser, 2017; Boykoff, 2007).

Research has shown that print media, regardless of national context, oftentimes fails to identify climate change as a driving factor of increasing wildfire extent and severity. In their analysis of how Swedish newspapers covered wildfires in Australia, the Mediterranean region, and the U.S. from 2013 to 2016, Berglez and Lidskog (2019) found that only 37 of the 330 articles studied (11%) mentioned climate change, with only 9 of the 228 articles (4%) focused on U.S. wildfires drawing the connection. Similarly, when Davidson et al. (2019) surveyed wildfire coverage in the *Edmonton Journal* and the *Calgary Herald* from 2000 to 2017, just 2% of those articles referenced climate change. In a more comprehensive assessment, Hopke (2020) examined how 35 news outlets in 5 countries (Canada, China, India, the U.S., and the United Kingdom) covered extreme heat events from 2013 to 2018. Hopke established that articles about wildfires most frequently linked to climate change in India (16.67%), followed by the United Kingdom (16.64%), Canada (8.28%), the U.S. (4.71%), and China (2.95%). Of those wildfire-related articles that mentioned climate change, they tended to be well-resourced news outlets that had a dedicated staff working the climate beat, such as the *New York Times*, *Washington Post*, *Guardian*, *BBC*, *NPR*, and *Climatewire* (Hopke, 2020).

In research specific to the U.S., the trend continues. Referencing Morehouse and Sonnet (2010) again, they found that 97% of U.S. newspaper articles about wildfires between 1999 and 2003 did not address larger issues of climate change, fuel management, policy, or science. Likewise, in their analysis of how print media covered the 2014 Carlton Complex and the 2015 Okanogan Complex in Washington State, Cordner and Schwartz (2019) learned that 15% of articles about the Carlton Complex mentioned climate change, compared to just 9% of articles about the Okanogan Complex that made the same connection.

The Role of Solutions

Less explored in research related to wildfire media coverage is how the media contextualizes and discusses solutions to more extensive and more severe wildfires, specifically the efficacy of prescribed burning. Sometimes called constructive or problem-solving journalism, solutions journalism is an evidence-based reporting approach that holistically covers credible responses to social problems, according to the Solutions Journalism Network (2023). Popularized in the early 2010s, solutions journalism is an extension of the 1960s peace journalism movement, which questioned conflict and negativity as a news value, and the civic or public journalism movement in the 1990s, which took a bottom-up approach to news where citizens set the media's agenda (Wenzel et al., 2016). In their book, *The Elements of Journalism*, Kovach and Rosenstiel (2007) delineate the void that solutions journalism sought to fill:

> "The press should recognize where powerful institutions are working effectively as well as where they are not. How can the press purport to monitor the powerful if it does not illustrate successes as well as failures? Endless criticisms lose meaning, and the public has no basis for judging good from bad" (p. 174).

Solutions journalism is not advocacy; rather, it is an objective reporting method by which journalists uplift stories that showcase growth or progress and question sources about potential solutions (McIntyre, 2019). Solutions journalism is achieved through problem-solution framing and is indicative of an active journalist. Whereas a passive journalist is simply concerned with disseminating news stories regardless of their effect, an active journalist is a more embodied

participant in the story and considers the effect of the story itself (Bro, 2007). According to Thier (2016), solutions journalism stories have four main attributes: a response to a well-established social problem, evidence of results, insights about why solutions work, and limitations of the response.

Solutions journalism attempts to cultivate a more engaged, less apathetic audience that is motivated to take action, but evidence on whether solutions journalism fully achieves this purpose is mixed. In a series of six focus groups centered in a southern Los Angeles neighborhood, which had been historically stigmatized and negatively portrayed by the media, participants were more inspired to remediate vacant local lots after reading solutions-oriented stories as opposed to non-solutions stories (Wenzel et al., 2016). These results also suggested that solutions journalism offers a pathway to rebuild trust with underserved communities. In a survey of 755 U.S. adults, the Solutions Journalism Network and the Engaging News Project established that solutions-based journalism holds promise in at least three areas: “heightening audiences’ perceived knowledge and sense of efficacy, strengthening the connection between audiences and news organizations, and catalyzing potential engagement on an issue” (Curry & Hammonds, 2014). When evaluated in an experimental setting, however, McIntyre (2019) found that while solution information did make readers feel less negative about the problem and more favorable to the solutions presented, it didn't impact their behavior or intention to act. Walth et al. (2019) suggested marrying solutions journalism with investigative journalism to create stories with a more powerful impact. This reporting paradigm could illuminate the causes and responses to problems in a manner that holds authority figures accountable, which might be more meaningful for readers and the community at hand. Although more research is necessary

on the relationship between solutions journalism and civic action, solutions journalism certainly has a role to play in maintaining a functioning democracy and improving the perception of the news media amidst an increasingly cynical public (Powers & Curry, 2019; Walth et al., 2019).

Climate change is one area where solutions journalism is actively employed. Since climate change is an inherently fatalistic issue with global implications, climate change reporting must toe a very fine line between constructive hope and constructive doubt — it must not portray climate change as insurmountable while also evoking just enough concern to motivate action (Marlon et al., 2019). One way to build constructive hope is by discussing climate solutions, which there is a clear appetite for. In a survey of 505 members of the *Society of Environmental Journalists*, Borth et al. (2021) found that journalists included adaptation and resilience stories (80%), adequate policy responses (78.8%), and considered renewable energy (67.2%) in their reporting on climate change. The American public also has a broad interest in consuming news stories about actions taken by their local community (76%) and how the U.S. government responds (79%) to global warming (Maiback et al., 2020). Discussing solutions in climate change reporting increases readers' perceived behavioral control, a proxy for support for collective climate change adaptation — suggesting that solutions journalism enables reporters to communicate the danger of climate change without depressing support for mitigation efforts (Thier & Lin, 2022). This affirms an analysis of climate futures in four magazines across India, Germany, the United Kingdom, and the U.S. completed by Guenther et al. (2020), which illustrated a shift from apocalyptic framing in climate change stories, like global doom and local tragedies, to more sustainable future visions with empowering solutions beginning in the early 2000s.

Unfortunately, research on solutions journalism as it relates to wildfire coverage is scant, especially in the Pacific Northwest. In the aftermath of Colorado's two most catastrophic wildfires in 2012, Crow et al. (2017) performed a narrative analysis of 876 local newspaper articles on the wildfires, finding the majority of articles (66%) did not define a policy problem and did not consistently indicate that risk can be mitigated through policy or other human actions. In another Colorado-specific study, this time on wildfire coverage in Larimer County from 2008 to 2018, Jacobsen et al. (2022) established that the media fixated on immediate, short-term solutions — primarily increasing fire suppression capacity — while only two articles described more comprehensive fuels management, such as prescribed fire and thinning, which were published months after the wildfires began.

Given the potential of solutions journalism to, at minimum, make readers feel more optimistic about a problem, and, at maximum, motivate collective action; the lack of research on solutions journalism within wildfire media coverage; and the beneficial role of prescribed fire on certain ecosystems in the Pacific Northwest, this study addresses the following research questions:

RQ1: To what extent does print media in the Pacific Northwest discuss prescribed fire in the context of wildfire events?

RQ2: When mentioned in any context, is prescribed fire discussed with a positive or negative valence?

RQ3: Has the frequency or valence of prescribed fire coverage in the Pacific Northwest changed over time?

Methods:

Data Sources and Period of Study

The primary data sources for this study were daily newspapers in the Pacific Northwest with the largest circulation, two from each state, to ensure a broad sample. In Idaho, these newspapers include the *Idaho Statesman*, which is based in Boise and has a weekly circulation of 48,000, and the *Post Register*, eastern Idaho's main news outlet that distributes 24,000 newspapers weekly. As for Oregon, *The Oregonian* has the largest weekly circulation of about 394,000, and chiefly serves Portland, while *The Register-Guard* has the second largest weekly circulation at about 30,000 and primarily covers the Eugene-Springfield area. In Washington, *The Seattle Times* is the largest news outlet in the state circulating over 1.44 million newspapers weekly, and, to the east of the Cascades, *The Spokesman-Review* disseminates 66,000 newspapers daily throughout Spokane and outlying areas (Official USA, 2024; Standard Rate and Data Service, 2024). The newspaper articles were sourced from Newsbank.com since the database provides wider access to regional and local outlets than other platforms (Buntain et al., 2023).

Although this study solely focused on print media, it acknowledges the importance of social and digital media platforms as news sources and their increasing relevance for wildfire communications (Brengarth & Mujkic, 2016). However, for a study such as this which seeks to characterize the regional character of wildfire coverage, print media may be more appropriate given the non-regional character of most broadcast and online media (Davidson et al., 2019). Furthermore, newspaper articles can provide comprehensive coverage of disaster-related topics

(Quarantelli, 2002), offer more in-depth coverage than broadcast media (Dreidger, 2007) and remain a readily used source for information about wildfires (Steelman et al., 2015).

Only articles published from January 1, 2010, to December 31, 2023, were considered for analysis. Recency and length were critical factors: This study was interested in how print media in the Pacific Northwest *currently* reports on prescribed fire and, in order to adequately assess change in frequency and valence over time, an extensive period of study was necessary. Moreover, out of the five wildfire seasons with the most acres burned in the U.S. since 1996, four of those seasons occurred within this span, averaging 6.85 million acres burned annually (National Interagency Coordination Center, 2023; National Interagency Coordination Center, 2013). Considering there were several record-breaking seasons during this period, in theory, reporters had ample opportunities and motivation to convey strategies that would mitigate wildfire risk, intensity, and severity.

Data Analysis

This study engaged in content analysis, or the systemic analysis of "recorded human communication," which is an ideal method for analyzing print media (Babie, 2016, p. 324). Content analysis is readily used in similar studies on framing and wildfire media coverage (Sachdeva & McCaffery, 2022; Terracina-Hartman, 2020; Cordner & Schwartz, 2019; Crow et al., 2017; Morehouse & Sonnet, 2010; Paveglio et al., 2011), and this study built off those already-established methods. My coding structure was both descriptive, for quantitative coding of the frequency at which print media in the Pacific Northwest discusses prescribed fire, and thematic, for qualitative coding of the valence, tone, and language of those discussions. I developed codes both deductively, based on pre-identified themes and topics related to the

research questions and review of the existing literature, and inductively, with additional codes identified after reading and coding a sample of articles. Deductive content analysis is used when previous knowledge can drive the structure of analysis and the purpose of the study is theory testing, whereas inductive content analysis is preferred when former knowledge is either meager or fragmented (Elo & Kyngäs, 2008). Generally, inductive content analysis involves creating a list of all possible categories in a dataset, then collapsing those that are similar or dissimilar into broader higher-order categories, which help to describe a phenomenon (Dey, 1993). Since there is large amount of literature on framing and wildfire media coverage overall, but much less research on prescribed fire specifically in the Pacific Northwest, I developed most of my subcodes inductively.

To answer RQ1, I searched for English-language articles with headlines that contained the boolean string “wildfire” OR “forest fire” OR “brush fire” OR “wildland fire” in Newsbank, generating 981 results. Terracina-Hartman (2020) used the same combination of search terms, and although “brush fire” and “wildland fire” are rarely used by reporters (Morehouse & Sonnet, 2010), I included them to capture the greatest range of wildfire events. I only searched for those terms in headlines to ensure relevance. Then, I excluded articles from my sample based on several criteria: if the article was a duplicate, was too short (less than 200 words), was a letter to the editor, didn’t have a byline, or metaphorically used any of the above search terms. Since the efficacy of prescribed fire is ecosystem-dependent, I also excluded articles that were originally published outside of the study area or written about a wildfire event outside of the study area. After filtering out articles that met any of my exclusion criteria, I was left with a sample of 607 articles. Once downloaded and transferred to NVivo 14, I used to the text search

function to identify articles that contained the boolean string “prescribed fire” OR “prescribed burn” OR “prescribed burning” OR “controlled fire” OR “controlled burn” OR “controlled burning” OR “broadcast burn” OR “broadcast burning” OR “cultural fire” OR “cultural burn” OR “cultural burning” OR “ecological fire” OR “ecological burn” OR “ecological burning” OR “Native burn” OR “Native burning” OR “Indigenous fire management” OR “Indigenous fire stewardship” anywhere in its text. A total of 64 articles mentioned any of the above search terms, and of those articles, only 20 mentioned the search terms more than once.

To answer RQ2 and RQ3, I required a sample larger than 20 articles, so I conducted a second search. Since print media in the Pacific Northwest seldom provides an in-depth discussion of prescribed fire in its coverage of wildfire events, I broadened my search to include articles that mentioned prescribed fire anywhere in its text — regardless of whether the article focused on a wildfire event. Newsbank limits searches to nine fields, so I first excluded “broadcast burn” and “broadcast burning” because they are a technical, specific type of controlled burn along with “Indigenous fire management” and “Indigenous fire stewardship” since they were only recently formalized (Coughlan et al., 2023). I then repeatedly substituted my remaining terms in Newsbank until I determined the following boolean string which generated the most results: “prescribed fire” OR “prescribed burn” OR “prescribed burning” OR “controlled fire” OR “controlled burn” OR “controlled burning” OR “cultural burn” OR “ecological fire” OR “ecological burn.” This search returned 406 articles. After filtering these articles according to the same exclusion criteria, except for the geographic limitations, I had a sample of 234 articles. Since this study is interested in measuring detailed stories, it was necessary to eliminate articles that only mentioned the search terms once as both a proxy for depth of

coverage and to ensure an accurate valence assessment (Pew Research Center, 2024). Accordingly, I did the same text search in NVivo14 that I used for my original sample to identify articles that mentioned prescribed fire and all its iterations more than once, leaving me with a second sample of 101 articles.

When assessing valence, I sought to determine whether articles gave more weight to the benefits and advantages of prescribed fire, or to the risks and challenges. Based on my understanding of the literature, I expected the ecological value of prescribed fire to be among the prominent benefits and smoke impacts to be the main risk discussed. Following an inductive coding process, I first read through 20 articles at random to identify key themes related to the valence of prescribed fire mentions. I then developed three categories for the benefits and

Table 1: Codebook

Benefits and Advantages

Ecological Improvement	Community Protection	Cultural Heritage	Reducing the Financial Cost of Wildfires	Firefighter Training Opportunities
• Removing dead, dry fuel • Promoting new growth of native plants, trees, and fungi • Minimizing the spread of invasive species, insects, and diseases • Decreasing soil erosion and recycling soil nutrients • Providing forage for wildlife • Improving habitat for native wildlife • Reducing carbon emissions from wildfires • Increasing the ecological diversity and resilience of forests • Restoring historic fire regimes and patterns	• Decreasing wildfire intensity and severity • Containing already burning wildfires • Creating a buffer area around communities • Establishing a refuge for firefighters • Reducing long-term smoke impacts	• Indigenous peoples used prescribed fire to clear hunting paths, increase foraging abundance, improve community safety, and other purposes	• Can decrease the amount of money spent on wildfire suppression and firefighting	• Allows firefighters to train for wildfires and gain hands-on experience

Risks and Challenges

Temporally, Spatially, and Resource-Limited	Smoke Impacts on Nearby Communities	Transitioning to Wildfire	Loss of Aesthetic Value
• Dependent on both weather conditions and seasonality • Lack of funding and labor intensive • Ineffective if implemented in remote forests, rather than around communities • Difficult to implement in dense, climate-affected forests • Small likelihood of wildfires encountering treated forests	• Produces smoke that worsens air quality in adjacent communities • Must contend with strict air quality regulations	• Can become out-of- control depending on weather conditions and planning	• Lessens the natural beauty of a landscape

Table 2: Overall Valence Score

Positive Valence	Negative Valence	Mixed Valence	No Valence
The majority of paragraphs about prescribed fire discuss the benefits and advantages of prescribed fire	The majority of paragraphs about prescribed fire discuss the risks and challenges of prescribed fire	There are an equal number, or relatively equal number of paragraphs that discuss the positives and negatives of prescribed fire	Of the paragraphs that discuss prescribed fire, none discuss the positives or negatives of prescribed fire

advantages of prescribed fire and three categories for the risks and disadvantages of prescribed fire, incorporating additional categories and subcategories as I coded my sample (see Table 1 above). Next, I proceeded to code my sample at the paragraph level, examining whether each paragraph was thematically about the benefits and advantages or risks and challenges of prescribed fire. After coding each article, which I did three separate times to ensure all codes and subcodes were accurately accounted for, I assigned it an overall valence score based on the criteria outlined above in Table 2.

Findings:

RQ1 questions the extent to which print media in the Pacific Northwest discusses prescribed fire in their coverage of wildfire events, and, in short, those discussions are limited. Out of 607 articles published between 2010 and 2023, the practice of prescribed fire is mentioned in 64 articles (10.5%) about wildfire events and referenced more than once in just 20 articles (3.3%). This supports the findings of several other studies that established wildfire coverage typically revolves around immediate risk and short-term developments, like property destruction or evacuation routes, and seldom includes a broader discussion of wildfire, like its relationship to climate change or the ecological role of fire (Gutsche Jr. & Pinto, 2022; Nillson & Enander, 2020; Terracina-Hartman, 2020; Cordoner & Schwartz, 2019; Paveglio et al. 2011;

Morehouse & Sonnet, 2010; Mercer & Prisbrey, 2004). Of those articles, 18 were published during the fire season, which spans from May through October and is when practitioners generally avoid prescribed fire. Both *The Seattle Times* and *Post Register* published five articles that mentioned prescribed fire more than once, followed by *The Oregonian* (4), the *Idaho Statesman* (3), *The Spokesman-Review* (2), and *The Register-Guard* (1).

RQ2 looks more broadly at all coverage of prescribed fire and seeks to determine whether that coverage is positive or negative in valence. Of the 101 applicable articles, 61 devoted more space to discussing the benefits and advantages of prescribed fire rather than the risks and challenges, whereas 22 articles had a negative valence, 17 had a mixed valence, and just one article had no valence (see Figure 1). Of the six newspapers studied, *The Register-Guard* published the most articles with a positive valence (17), followed by the *Idaho Statesman* (11) along with *The Spokesman-Review* (10) and *Post Register* (10). Both the *Idaho Statesman* and

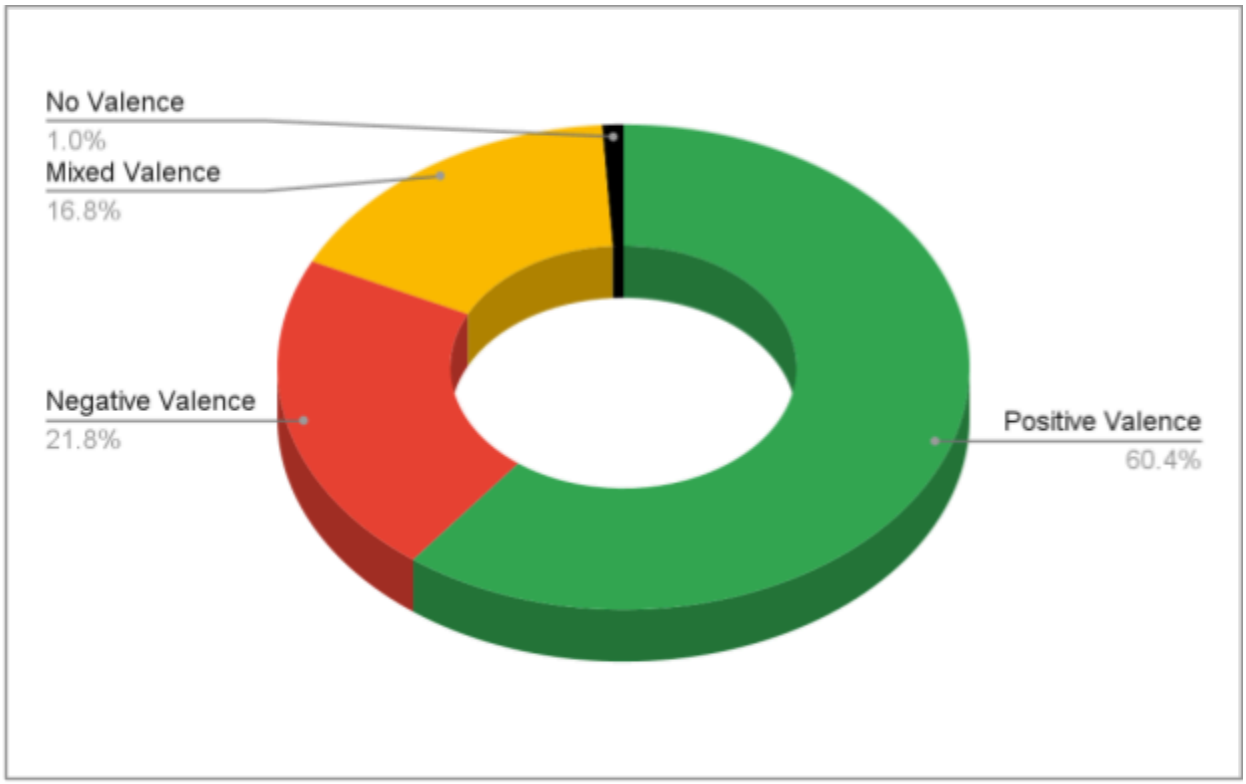

Figure 1: Overall valence of prescribed fire coverage in the Pacific Northwest

Post Register published six articles with a negative valence, which was more than the four other newspapers. *The Seattle Times* produced the fewest number of articles with a positive valence (5), the most articles with a mixed valence (5), and the least total articles (11) (see Figure 2). *The Seattle Times* serves the largest metropolitan area out of all six newspapers, and since prescribed fire is generally more routine in and around smaller cities, this factors into their comparative lack of coverage. Furthermore, *The Register-Guard* is based in Eugene, the traditional homeland of the Kalapuya people who actively put fire onto the Willamette Valley for thousands of years (Boyd, 2021). Eugene's city government also coordinates a relatively robust prescribed fire program with various local park and conservation agencies, both of which may explain *The Register-Guard's* outsized positive coverage (City of Eugene, n.d.).

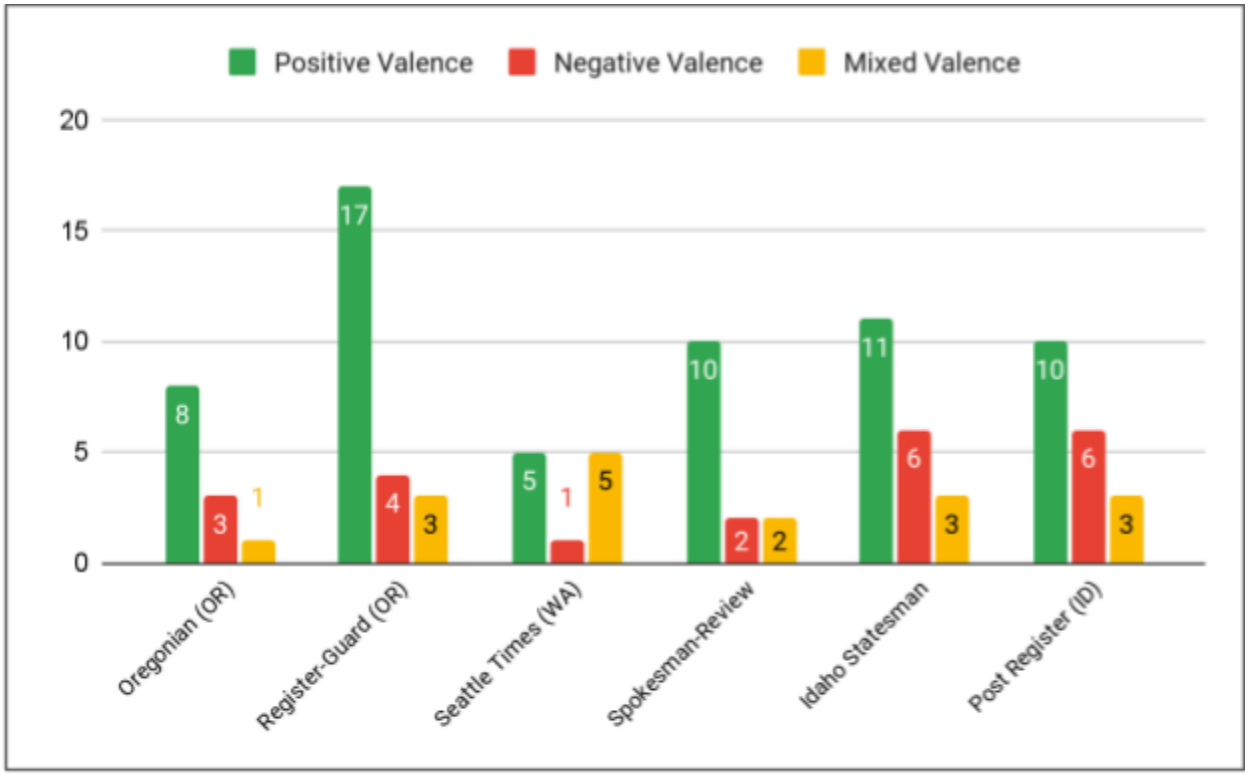

Figure 2: Valence by individual newspaper

Moving from overall valence to specific subject codes, newspapers talked about ecological improvement most frequently, which appeared in 75 articles. It also had the greatest number of subcodes. As for the other benefits and advantages, 45 articles referenced how prescribed fire can help protect communities, 16 mentioned that prescribed fire is an expression of Indigenous cultural heritage and stewardship, four articles discussed how the practice can reduce the financial cost of wildfires, and three articles connected prescribed fire with increased firefighter training opportunities (see Figure 3). Being the largest category, newspapers provided an array of reasons as to how prescribed fire can enhance the quality of and life on natural landscapes, including removing excess dead fuel, improving native habitat, recycling soil nutrients, fostering ecological resilience, and several others (see Appendix A for examples of all codes and subcodes). For example:

> “The first step of the National Cohesive Wildland Fire Management Strategy calls for creating a wildfire-resistant landscape. One way to do that is to use prescribed burning to burn debris on the forest floor to reduce the fuel load” (Culver, 2018).

> “Prescribed burns reduce fire danger, but the main objective of Tuesday's effort was to rid the area of blackberry bushes and dead vegetation, in order to open up the soil for germination and enhance the habitat for native plants and insects, including Fender's blue butterfly — an endangered species — and Kincaid's lupine, which is a federally listed threatened species” (Moran, 2011).

" ‘It's really taking material that's not very useful, because it's dead, and it's accumulating, and it turns it into something useful, (like) meaningful nutrients for the soil,’ Rau said” (Cyr, 2023).

“We found that tree mortality was high in untreated or recently thinned forests, but lower in forests that had been recently thinned and prescribed burned. Our results, along with other studies in the western United States, provide compelling evidence that thinning, in combination with prescribed burning, can make forests more resilient” (Prichard, 2017).

When it came to community protection, newspapers noted that prescribed fire can not only contain already burning wildfires and establish a buffer around communities, but also reduce the long-term amount of smoke generated by wildfires:

“Crews dig ‘hand lines,’ removing vegetation in a long line through the forest about 3 feet wide. Bulldozers cut much larger lines, about 8 to 10 feet across. Air tankers drop retardant, creating lines where flames won't pass through slurry-coated woods. And firefighters light controlled burns. All the efforts have the same goal. ‘They are removing the fuel from the fire's path,’ Kauffman said. Fuel is anything that can burn” (Darling, 2017).

“The Millie Fire, which burned nearly 25,000 acres in the Three Sisters Wilderness in

> 2017, could have been much worse had the area near the town of Sisters not been treated with controlled burns before the wildfire" (Williams, 2018).

> "Conducting controlled burns under good weather conditions generates far less pollution than massive smoke plumes from the huge wildfires that broke out amid last summer's heat. At their peak, the Okanogan fires in August, for example, generated air pollution 20 times worse over a 24-hour period than the 2009 controlled burn that caused the fuss in Yakima, state air-quality data show" (Brunner & Bernton, 2015).

Newspapers also described several reasons that Indigenous peoples in the region have used and depended on prescribed fire to sustain their lifestyles since time immemorial:

> "Tribes in the Pacific Northwest have used fire as a tool to shape the landscape for thousands of years. The touch of flame kept huckleberry and camas fields abundant. In areas where tribes hunted deer and elk, fire created a mat of forage plants on the forest floor, a favorite food for the ungulates. Burned areas recycle nutrients more efficiently and help to control the spread of invasive species" (Williams, 2018).

> "Native peoples, less than 150 years ago, proactively burned the landscapes we currently inhabit – for personal safety, food production and enhanced forage for deer and elk. In some places, people still maintain and use traditional fire knowledge. As we

too learn to be more fire-adapted, we need to embrace fire not only as an ongoing problem but an essential part of the solution" (Prichard, 2017).

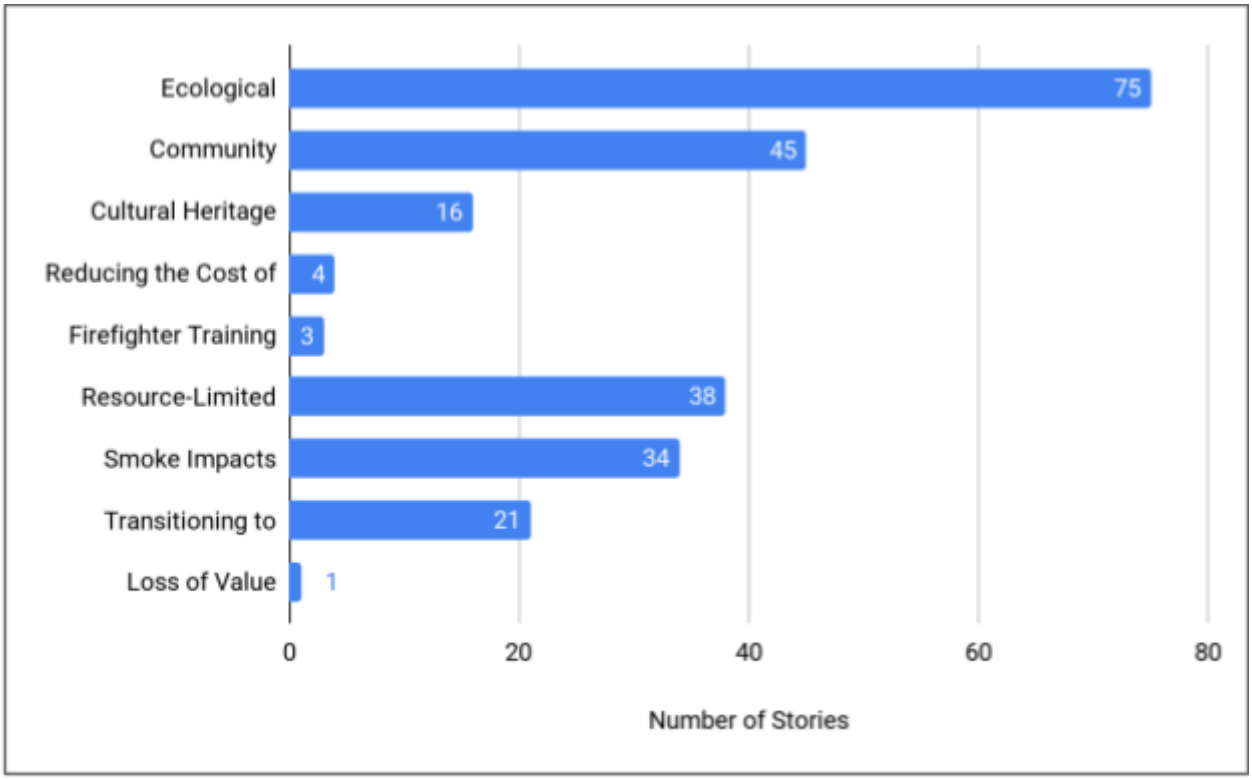

Figure 3: Overview of code prevalence

As for the risks and challenges, 38 articles highlighted how setting prescribed fires involves several temporal, spatial, and resource-related limitations; 34 articles mentioned that the practice exposes nearby communities to harmful smoke; 21 articles discussed the risk of prescribed fires transitioning to wildfires; and just one article noted they jeopardize the aesthetic value of landscapes. Of the factors that make prescribed fires difficult to implement and ineffective, newspapers stressed they are dependent on both weather conditions and seasonality, have very little funding available, and that wildfires rarely encounter areas treated with prescribed fire:

> “Even if plenty of dollars are available, pulling off large-scale burns is no sure thing. Prescribed fires have relatively narrow weather windows in the spring and fall when they can be carried out…When it is too moist, the fires don’t generate enough heat to get the job done. So even if a crew is ready to go, the burn may have to be called off” (Bernton, 2018).

> “Thinning and prescribed burning have increased steadily in Idaho since 2001, but have been hindered nationwide by federal policies that require agencies to take money from other programs when the federal firefighting money is exhausted. The Forest Service shifted $250 million from other accounts…including money from hazardous fuel treatments…to pay for firefighting this year. Firefighting costs are $700 million over the appropriation” (Barker, 2015).

> “Various studies have also shown that the probability that a wildfire will encounter a ‘fuel reduction’ site is extremely small — typically less than 1%” (Wuerthner, 2023).

One of the main challenges of conducting prescribed fires is managing smoke, which newspapers emphasized can lessen the quality of life in nearby communities and involves navigating strict air quality regulations:

> “A big concern is air pollution. Luke Montrose, a Boise State University environmental

> toxicology professor, said he worries about deliberately introducing smoke into communities that have already had wildfires in summer. 'The exposure becomes chronic then, because it's year-round,' Montrose said" (Kasler & Blanchard, 2021).

> "Agencies with more resources battled strict smoke management regulations, which prevented Wildlife Department prescribed fire manager Matt Eberlein from burning more than 7 or 8 acres of what was scheduled to be a much larger burn at Oak Creek, 14 miles west of Naches, this fall. He said the department aims for 2,000-3,000 acres annually, but they fell far short of that mark this year in part due to the state's air quality regulations and smoke restrictions" (Thompson, 2018).

> "Frustrating matters, the Environmental Protection Agency proposed a rule this spring for the Clean Air Act that would further regulate smoke particles. The rule could add additional complications to the use of prescribed burning throughout the country" (Clark, 2023).

Related to temporal and resource limitations, prescribed fires also pose the risk of transitioning into wildfire in dry, windy conditions and/or as a result of poor planning. Newspapers frequently highlighted previous prescribed burns that escaped control:

> "In California in 1999, a fire set by the U.S. Bureau of Land Management to eradicate

> noxious weeds near Redding got loose and burned 2,000 acres. Investigators blamed the Lowden Ranch Fire on a supervisor who ignored hazardous conditions. A 2012 fire gone wrong in Colorado killed three people. A 2000 fire in New Mexico burned 200 homes and 45,000 acres, and even threatened the Los Alamos National Laboratory" (Kasler & Blanchard, 2021).

> "In New Mexico last year, a controlled burn sparked that state's largest wildfire, leading to a pause on prescribed burning. Also last year, a 'burn boss' leading a prescribed burn was arrested in Oregon after the intentionally set fire jumped the containment line and burned 20 acres of a private ranch" (Wozniacka, 2023).

Several thematic differences emerge when examining differences in code prevalence across individual newspapers, primarily between those to the west of the Cascades (*The Oregonian*, *The Register-Guard*, and *The Seattle Times*) and those to the east (*The Spokesman-Review*, *Idaho Statesman*, and *Post Register*) (see Figures 4 and 5). Western, more urban newspapers like *The Register-Guard* and *The Seattle Times* mentioned how prescribed fire can protect communities in a greater percentage of their articles (58.3% and 72.7%, respectively) than Eastern, more rural newspapers like *The Spokesman-Review* and the *Post Register* (35.7% and 15.8%, respectively). When discussing risks and challenges, all newspapers west of the Cascades devoted a nearly equal proportion of their coverage to the resource limitations and smoke impacts associated with prescribed fire. *The Spokesman-Review*, however, discussed the smoke impacts of prescribed fire in 57.1% of their articles (just 14.2% mentioned resource limitations) while the *Idaho Statesman* and *Post Register* did so in only 20%

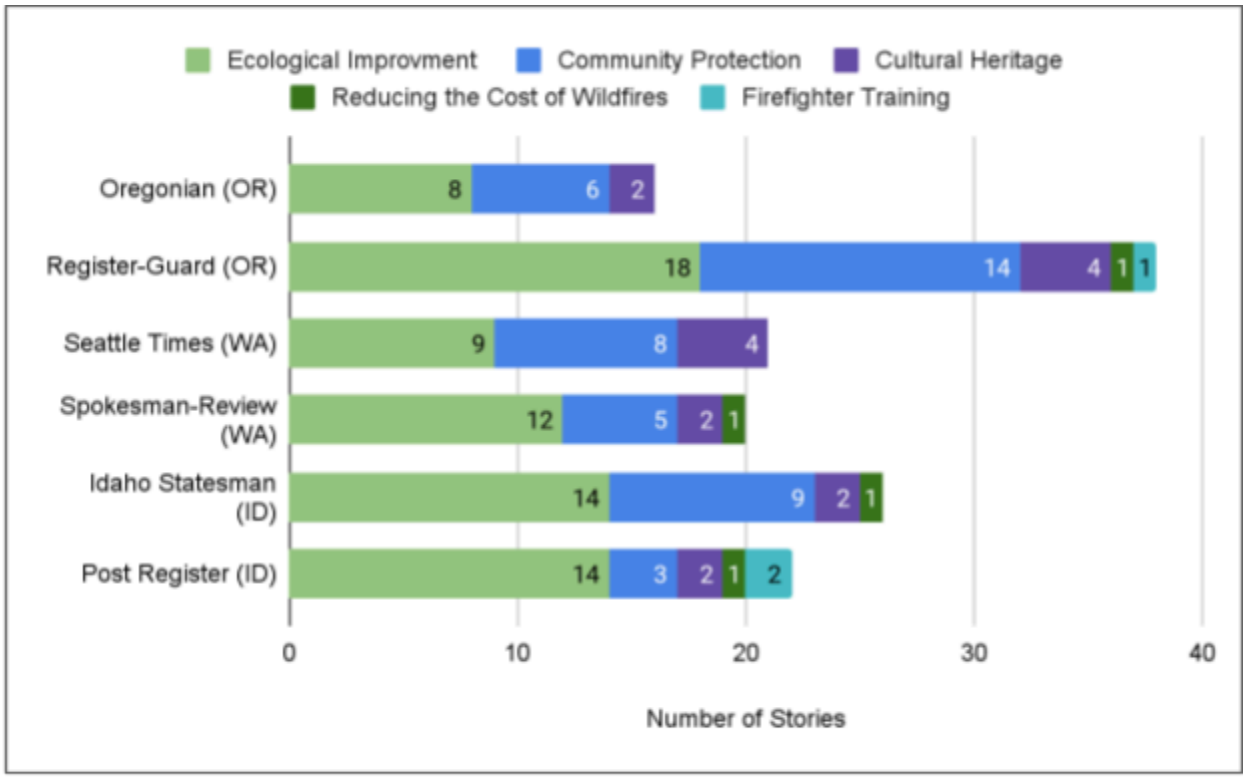

Figure 4: Benefits and advantages by individual newspaper

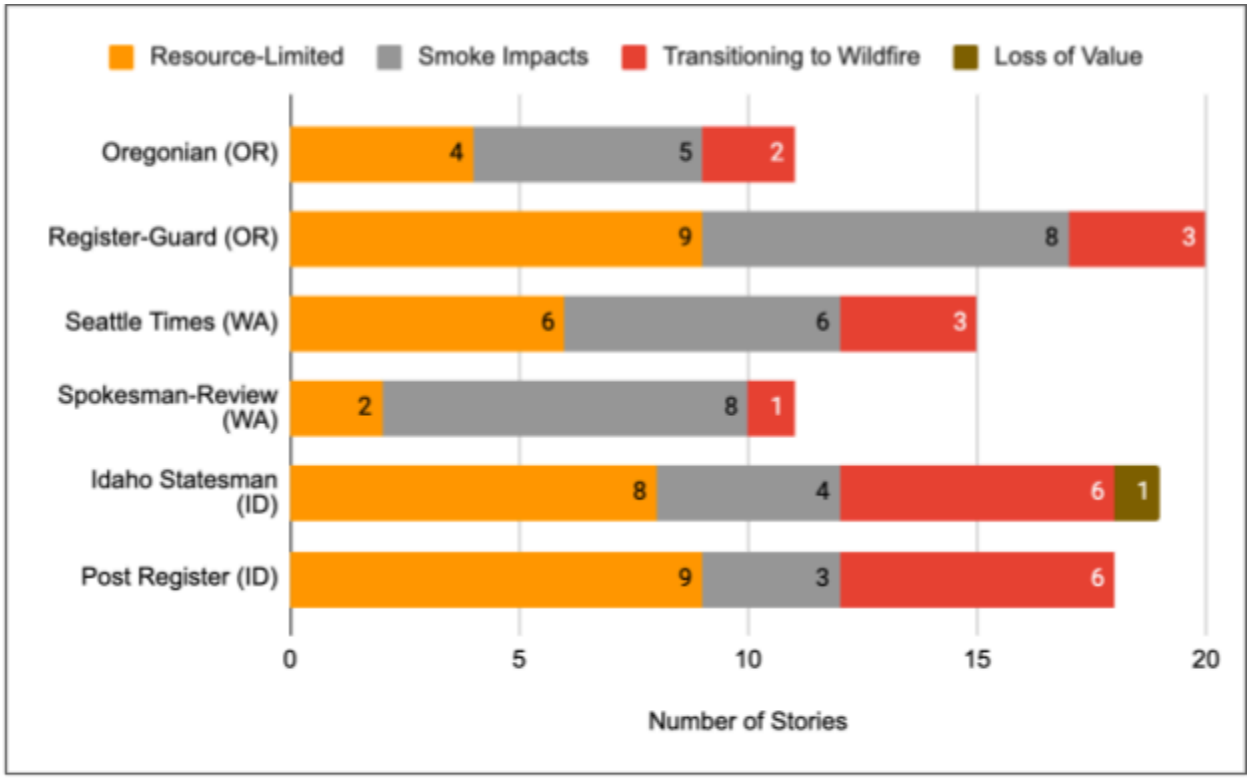

Figure 5: Risks and challenges by individual newspaper

and 15.7%, respectively, of their articles. Out of all newspapers, the *Idaho Statesman* and *Post Register* also noted how prescribed fires can grow into wildfire the most (in 30% and 31.5% of their articles, respectively).

Considering RQ3, both the frequency and amount of positive prescribed fire coverage in the Pacific Northwest increased during the study period (see Figures 6 and 7). Prescribed fire coverage peaked in 2021, which saw 15 articles published, and positive prescribed fire coverage peaked in 2019, which saw nine articles published. Multiple environmental, political, and social factors underlie these trends. For one, the number of wildfire-related newspaper articles has steadily increased over time, with significantly more articles being published in the U.S., Australia, and Canada from 2005-2015 than in the prior two decades (Sachdeva & McCaffery, 2022). Likely driven by the relationship between climate change and heightened wildfire extent and severity, more media attention on wildfire, theoretically, prompts more deliberation about the efficacy of prescribed fire. Accordingly, it's no surprise that prescribed fire coverage peaked following 2020, the second-worst fire season in terms of acres burned over the last half-century (National Interagency Coordination Center, 2023). Around 2.5 million fewer acres burned in the 2022 wildfire season compared to 2020, but the USFS announced a 90-day moratorium on prescribed fire after two escaped burns caused the Hermits Peak and Calf Canyon Fires in New Mexico, the largest in state history (United States Forest Service, 2022b). This may explain why both the frequency and amount of positive prescribed fire coverage fell significantly in 2022.

As for wildfire policy, Congress passed The Federal Land Assistance, Management, and Enhancement (FLAME) Act in 2009, creating additional avenues for firefighting funding and

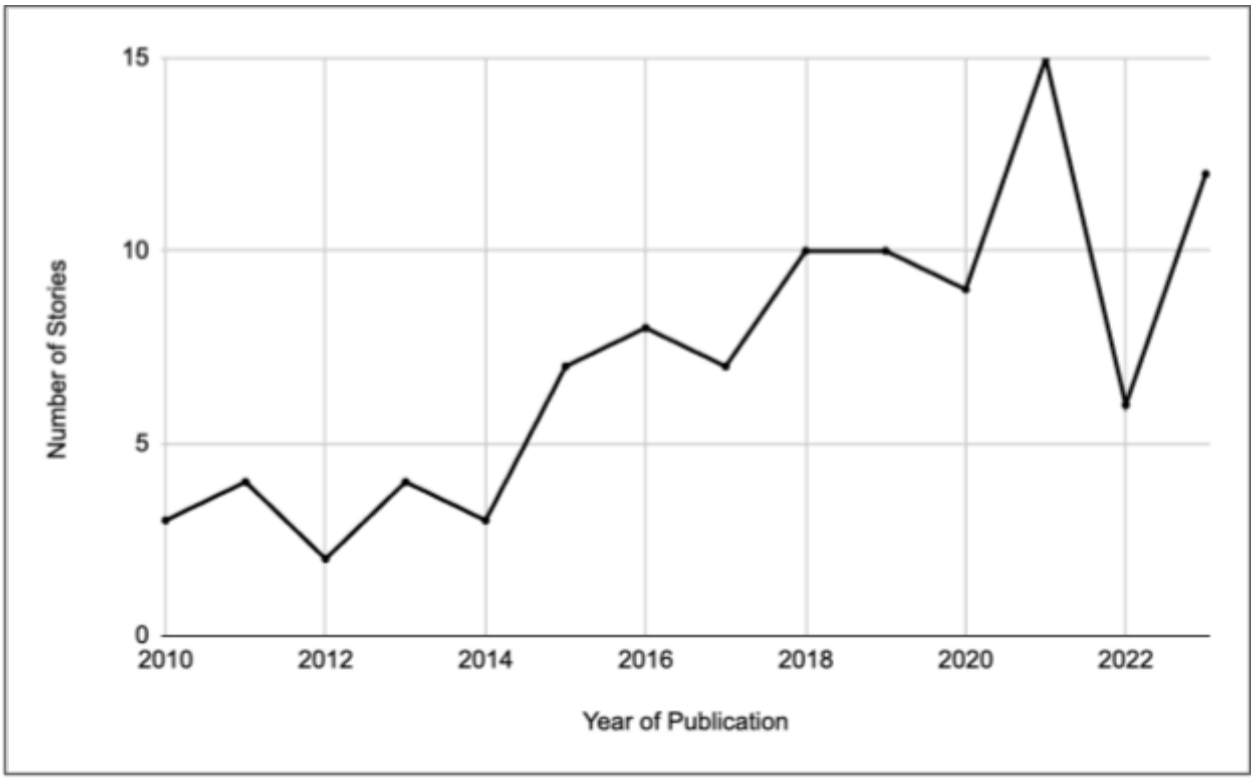

Figure 6: Frequency of Pacific Northwest prescribed fire coverage over study period

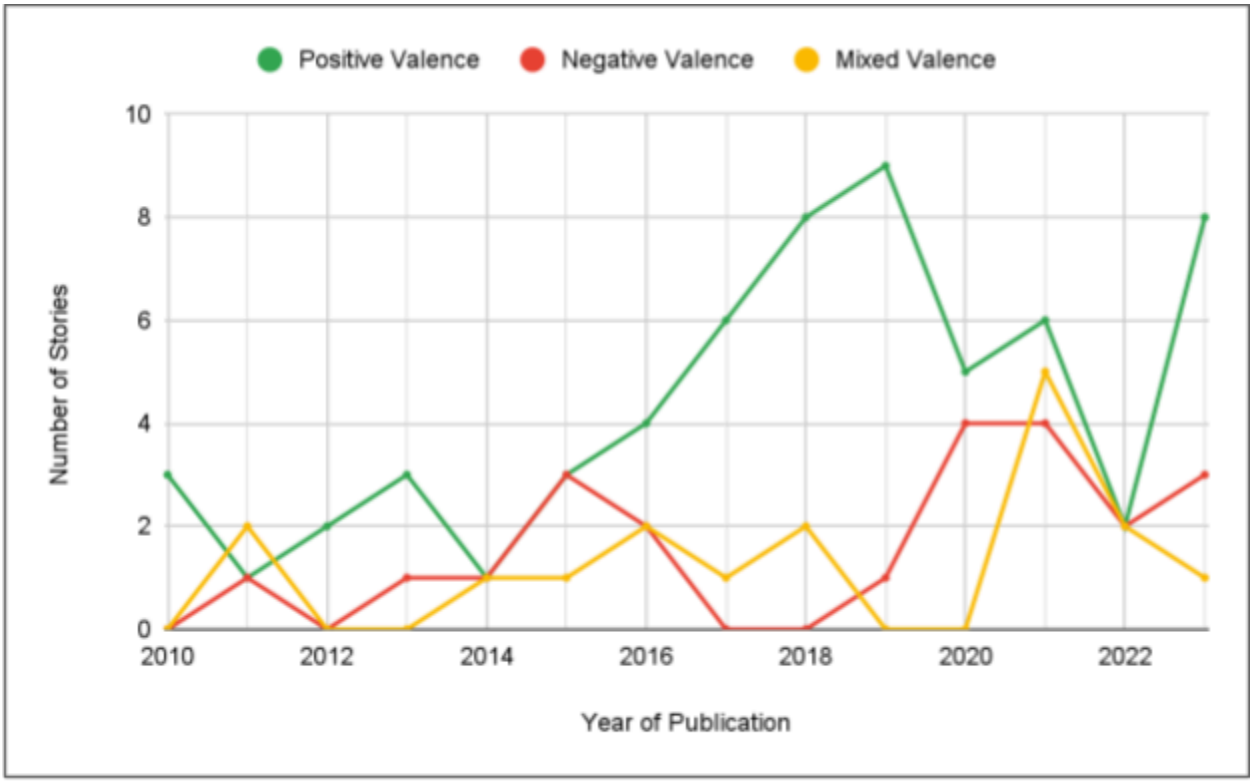

Figure 7: Valence of Pacific Northwest prescribed fire coverage over study period

mandating the development of a National Cohesive Wildland Fire Management Strategy, which came to fruition in 2014 (United States Forest Service, 2009). Under the motto “all hands, all lands,” it established a streamlined, localized decision system and risk framework for wildfire management, and prioritized prescribed fire as a means for mitigating wildfire risk (Forests and Rangelands, 2014). Congress also initiated the Collaborative Forest Restoration Program (CFLRP) in 2009, which took a community-centric approach to landscape rehabilitation and similarly situated prescribed fire as a key fuel reduction strategy (United States Forest Service, 2019a). According to the National Interagency Coordination Center, the annual number of prescribed fire projects conducted by all federal agencies jumped from 16,882 in 2010 to 202,434 in 2017, which is when the center stopped collecting prescribed fire data (2017).

During the study period, Indigenous rights and knowledge became more prominent as well, among both the public and academia. The Dakota Access Pipeline controversy of 2016 and 2017 brought questions over tribal sovereignty and treaty rights to the national stage, and the NDN Collective, an Indigenous-led activist and advocacy organization, formally launched its LANDBACK campaign in 2020 (Herscher, 2017; Manning, 2020). Furthermore, a systematic review of scientific literature published in the Pacific Northwest by Coughlan et al. (2023) found the number of articles that mentioned Indigenous burning practices steadily increased from 1971-2022. Altogether, a combination of especially severe wildfire seasons, federal policies that put more prescribed fire onto the landscape, and growing recognition of Indigenous rights and fire stewardship likely caused an increase in Pacific Northwest prescribed fire coverage and explains why that coverage was heavily positive.

Discussion:

This study established that print media in the Pacific Northwest rarely discusses the efficacy of prescribed fire in their coverage of wildfire events, but, in recent years, has increasingly provided positive coverage of prescribed fire disconnected from specific wildfire events. Again, this is consistent with previous research that found wildfire coverage generally focuses on the immediate and short-term, rather than providing a systemic explanation of wildfire, its connection to climate change, and how we can mitigate future risk (Gutsche Jr. & Pinto, 2022; Nillson & Enander, 2020; Terracina-Hartman, 2020; Cordoner & Schwartz, 2019; Paveglio et al. 2011; Morehouse & Sonnet, 2010; Mercer & Prisbrey, 2004). Considering that the media's primary responsibility when covering natural hazards is to help the public understand potential dangers (Houston et al., 2012), expecting reporters to talk about prescribed fire when a wildfire is actively burning homes and taking lives may be unreasonable. This begs the question: What responsibility, if any, does print media in the Pacific Northwest have to include and frame prescribed fire as one part of the solution to more severe wildfires in its coverage of wildfire events?

As climate change becomes more extreme, parts of the American public are understandably concerned. According to a survey conducted by the Pew Research Center, 73% of adults who identified as Democrats said that climate change news makes them anxious for the future, and 63% of U.S. adults, regardless of political affiliation, worried that the harm caused by climate change will get a lot or a little worse during their lifetime (Kennedy & Tyson, 2023). Likewise, Google searches for "climate anxiety" soared 565% nationally between 2020 and 2021 (Yoder, 2021). A scoping review that examined 63 studies on the relationship between

wildfires and mental health found that rates of PTSD, depression, and generalized anxiety all increased immediately following wildfires to years after (To et al., 2021). Another study by Zhu et al. (2024) analyzed nearly 1.9 million emergency department visits across five western states (California, Arizona, Nevada, Oregon, and Utah) from 2007 to 2018, and found that wildfire smoke events led to a 6.3% rise in mental health-related visits.

While the news media is not responsible for the psychological well-being of American citizens, it is responsible for reporting on issues of public concern (Allan, 2022). With the relationship between wildfires and negative mental health outcomes, along with eroding community resilience more broadly, some Americans are personally impacted (Paveglio et al., 2015). Fundamentally, journalism exists to serve the public: But when it comes to wildfire coverage, is simply informing the public about the number of acres burned, containment efforts, evacuation routes, and otherwise enough? I contend that journalism can be better — that the news media should do more, especially in the Pacific Northwest where many ecosystems would readily benefit from prescribed fire (Johnston et al., 2023; Haflovsky et al., 2020; Kalies & Yocom Kent, 2016). Though it may not be appropriate to highlight the efficacy of prescribed fire during wildfires, there are opportunities for solutions-oriented coverage outside of the fire season or on the anniversary of wildfires. Complex, time-intensive stories are difficult to pursue due, however, especially since national newsroom employment has declined by 26% since 2008 (Walker, 2021). While an important constraint, public faith in journalism is also declining: Only 32% of Americans said they trust the news media “a great deal” or “a fair amount” in 2023, the lowest historical reading apart from 2016 (Brenan, 2023). Solutions journalism can not only improve public trust, but make seemingly intractable problems, like

increasing wildfire severity, tractable and help the public feel more optimistic about managing those problems (Curry & Hammonds, 2014; Wenzel et al., 2016). When appropriate and possible, solutions journalism can benefit readers and the industry.

For instance, when survey participants read solutions stories as opposed to problem stories, they reported significantly greater confidence in the fairness and truthfulness of solutions stories (Thier et al., 2021). Furthermore, discussing solutions in climate change reporting has been shown to increase readers' perceived behavioral control, a proxy for support for collective climate change adaptation (Thier & Lin, 2022). In order to be effective, though, solutions journalism stories must identify a response to a well-established social problem, evidence of results, insights about why solutions work, and limitations of the response (Thier, 2016). While some articles that mentioned prescribed fire outside of a specific wildfire event had these elements present, not all did. For example, several articles simply covered a local prescribed fires and discussed the benefits and/or risks, but did not explain how prescribed fire fits into the larger picture of forest management, climate change, and wildfire risk (Phillips, 2011; Glazar, 2014; Darling, 2019; Kauffman, 2020). By definition, these stories are not solution journalism stories.

However, it is notable that the majority of articles that mentioned prescribed fire disconnected from a wildfire event were positive and that the frequency of those articles, regardless of valence, increased from 2010 to 2023. The paradigm of fire exclusion originated in public discourse during the early 20th century, and the news media has perpetuated that narrative since (Pyne, 1997). Reflecting early management practices by the USFS, the news media tainted wildfire as the "enemy" of human settlement and the environment (Paveglio et

al., 2011). My results indicate that, at least in the Pacific Northwest, this is no longer the case for the papers included in this study. All six regional newspapers published more articles about the benefits and advantages of prescribed fire than the risks and challenges, reflecting what Indigenous peoples have known since time immemorial (Boyd, 2021), what Western science has only recently acknowledged (Wildland Fire Mitigation and Management Commission, 2023; Government Accountability Office, 2019), and what management agencies like the USFS have decided to implement (National Interagency Coordination Center, 2017) — that prescribed fire improves ecological sanctity and reduces wildfire risk in appropriate areas. Ultimately, print media in the Pacific Northwest is providing more nuanced, accurate coverage of prescribed fire generally, but fails to do so in their wildfire-specific coverage.

Study Limitations:

This study has several limitations worth acknowledging, most notably being the type and character of media analyzed. While print media is a critical facet of wildfire communication, it's by no means the only medium or forum where that information propagates, from broadcast, to social media, to newer apps like Watch Duty. In order to truly characterize how the news media frames prescribed fire, it's necessary to conduct a more extensive analysis that incorporates more than one type of media. By focusing on a specific geographic area, the results of this study also are not generalizable. Likewise, by targeting six regional newspapers with the widest circulation, this study overlooks smaller, more rural newspapers that cover areas where prescribed fire is more common, which may invite more frequent and nuanced discussions. Furthermore, this study did not capture all articles that mentioned prescribed fire. As noted in

the methodology section, prescribed fire has a number of synonyms, but Newsbank only allows for nine search terms and does not have a function to amalgamate searches without article overlap. I used the combination of search terms that generated the most results, but I certainly excluded some applicable articles from my second sample and did not search any other databases apart from Newsbank. Lastly, I was the only person coding the data and did not code for the frequency at which different subcodes appeared in the sampled articles, which would have invited more in-depth analysis than simply looking at the larger parent codes.

Conclusion:

The news media, and particularly print media, helps the public understand several aspects of wildfire: its causes, containment efforts, the extent of damage, evacuation orders, and so on. As established through a range of studies, however, this coverage is seldom comprehensive, oftentimes neglecting climate science and the ecological role of fire, but there is very little literature that addresses solutions in the context of wildfire coverage. This study fills part of that gap. Through analyzing content from the six largest circulating newspapers in Idaho, Oregon, and Washington, this study established that Pacific Northwest print media rarely discusses prescribed fire in their coverage of wildfire events. By placing more emphasis on the benefits and advantages of prescribed fire, however, regional print media has increasingly moved away from narratives rooted in fire suppression and has acknowledged the role of healthy fire, but separate from wildfires themselves. Additional research is necessary to determine why this separation between wildfires and prescribed fire — between problem and

solutions — occurs, and how the production of full-fledged, solutions-oriented wildfire coverage may impact readers in the Pacific Northwest both psychologically and behaviorally.

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Appendix A:

Benefits and Advantages

Ecological Improvement:

- Removing dead, dry fuel

    - “The first step of the National Cohesive Wildland Fire Management Strategy calls for creating a wildfire-resistant landscape. One way to do that is to use prescribed burning to burn debris on the forest floor to reduce the fuel load” (Culver, 2018).

- Promoting new growth of native plants, trees, and fungi
    - “ ‘The preserve is a pretty remarkable success story in restoration — being transformed from a Scotch broom field to a largely native camas prairie,’ said Sanders Freed, restoration manager for the Bureau of Land Management. ‘That work has taken decades utilizing all tools in the restoration toolbox — including prescribed fire’ ” (Grivas, 2023).
- Minimizing the spread of invasive species, insects, and diseases
    - “Fire can enhance the germination of many native plants and give them an edge against invasive plants. ‘Charcoal reduces the effect of a chemical (that) diffuse knapweed or Barnaby's thistle produce to enhance their ability to out-compete native plants,’ he said. Ash is a fertilizer for the new growth, he added” (Landers, 2015).
- Decreasing soil erosion and recycling soil nutrients
    - " ‘It's really taking material that's not very useful, because it's dead, and it's accumulating, and it turns it into something useful, (like) meaningful nutrients for the soil,’ Rau said” (Cyr, 2023).
- Providing forage for wildlife
    - “ ‘Heat is required to stimulate germination of some native plants like evergreen

ceanothus,’ he said. ‘That translates into stimulating regrowth of forage for deer." One study found that ceanothus is a top 50 percent winter forage for deer, he said’ ” (Landers, 2015).

- Improving habitat for native wildlife
    - “Prescribed burns reduce fire danger, but the main objective of Tuesday's effort was to rid the area of blackberry bushes and dead vegetation, in order to open up the soil for germination and enhance the habitat for native plants and insects, including Fender's blue butterfly — an endangered species — and Kincaid's lupine, which is a federally listed threatened species” (Moran, 2011).
- Reducing carbon emissions from wildfires
    - “The study is the first landscape-scale look at how prescribed burns affect carbon emissions. Widespread prescribed burning could reduce carbon output from forest fires by an average 18 percent to 25 percent, the researchers found. In some forest types, the carbon reductions were as high as 60 percent” (Kramer, 2010).
- Increasing the ecological diversity and resilience of forests
    - “We found that tree mortality was high in untreated or recently thinned forests, but lower in forests that had been recently thinned and prescribed burned. Our results, along with other studies in the western United States, provide compelling evidence that thinning, in combination with prescribed burning, can make forests more resilient” (Prichard, 2017).
- Restoring historic fire regimes and patterns

- “However, the imprints of recent fires are large, and it will take many small to medium wildfires to restore the diverse mosaic these landscapes need and once supported. Managing naturally ignited wildfires that burn in the late season or under favorable weather conditions, in combination with prescribed burning, will be essential to restore self-regulating landscapes” (Prichard, 2017).

Community Protection:

- Decreasing wildfire intensity and severity
  - “Meanwhile, the value of a forest that's been thinned, logged or cleared by prescribed burn that brings a raging crown fire to the ground where firefighters can control it has been proved repeatedly over the past 20 years. A prescribed fire in the Tiger Creek area on the Boise National Forest brought the 1992 Foothills Fire ... near this year's Elk and Pony complex fires ... to the ground in an incident that was cited as an example for years afterward. A similar prescribed burn on the Salmon National Forest dropped the Clear Creek fire west of Salmon from its run through Douglas firs in 2000” (Barker, 2013b).
- Containing already burning wildfires
  - “Crews dig ‘hand lines,’ removing vegetation in a long line through the forest about 3 feet wide. Bulldozers cut much larger lines, about 8 to 10 feet across. Air tankers drop retardant, creating lines where flames won't pass through slurry-coated woods. And firefighters light controlled burns. All the efforts have the same goal. ‘They are removing the fuel from the fire's path,’ Kauffman said. Fuel is anything that can burn” (Darling, 2017).

- Creating a buffer area around communities
    - “The Millie Fire, which burned nearly 25,000 acres in the Three Sisters Wilderness in 2017, could have been much worse had the area near the town of Sisters not been treated with controlled burns before the wildfire” (Williams, 2018).
- Establishing a refuge for firefighters
    - “In this thinned-out forest, they helped halt the northern advance of the North Star wildfire, one of the largest of summer blazes that consumed hundreds of square miles across the state. ‘This definitely gave us the upper hand to hold the fire where we wanted,’ said Matt Marsh, a Forest Service task-force leader who directed the effort. A case in point is the 850-acre tract that was used by the Forest Service crew in its successful stand to defend the Aeneas Valley in Okanogan County, this summer” (Brunner & Bernton, 2015)
- Reducing long-term smoke impacts
    - “Nearby communities need to learn to live with some smoke from controlled burns, but it's a trade-off for reducing the risk of deadly, fast-moving blazes in the summer, he said. ‘How do you like your smoke? Do you like it as these big wildfire massive events that trap you in your house a week at a time or some prescribed burning smoke in the spring and the fall when weather conditions aren't too bad,’ he said” (Urness & Arthur, 2021)

Cultural Heritage:

- Indigenous peoples used prescribed fire to clear hunting paths, increase foraging

abundance, improve community safety, and other purposes

- "Tribes in the Pacific Northwest have used fire as a tool to shape the landscape for thousands of years. The touch of flame kept huckleberry and camas fields abundant. In areas where tribes hunted deer and elk, fire created a mat of forage plants on the forest floor, a favorite food for the ungulates. Burned areas recycle nutrients more efficiently and help to control the spread of invasive species" (Williams, 2018).
- "Native peoples, less than 150 years ago, proactively burned the landscapes we currently inhabit – for personal safety, food production and enhanced forage for deer and elk. In some places, people still maintain and use traditional fire knowledge. As we too learn to be more fire-adapted, we need to embrace fire not only as an ongoing problem but an essential part of the solution" (Prichard, 2017).

Reducing the Financial Cost of Wildfires:

- Can decrease the amount of money spent on wildfire suppression and firefighting
  - "But the 2 percent that escape containment are increasingly likely to burn under extreme conditions on lands that are thick with fuel , accounting for 97 percent of the wildfire suppression costs and area burned. Since the early 1990s, foresters have argued that we could reduce these costs and the areas burned if we could implement a combination of mechanical thinning — logging — and prescribed burning" (Barker, 2015).
  - "In fact, Oregon prepared a cost benefit analysis in 2012 and found that for every

> $1 million spent on forest restoration, there is $5.7 million generated in economic returns, and that for every $1 invested in restoration, the state saves $1.45 in suppression" (Astor, 2021a).

Firefighter Training Opportunities:

- Allows firefighters to train for wildfires and gain hands-on experience
    - " 'It's also an opportunity to get our personnel practice for a real wildfire event,' said Capt. Sean Allen of the Idaho Falls Fire Department. Henry's Creek volunteers rely on controlled burns and training events held by the BLM to prepare farmers and ranchers on how to combat fires. Association Chairman David Rafferty said the group had not had a full meeting with all of its volunteers in several months because of the coronavirus and had fallen slightly behind on new member training before last week's controlled burn" (Kauffman, 2020).

Risks and Challenges

Temporally, Spatially, and Resource-Limited:

- Dependent on both weather conditions and seasonality
    - "Even if plenty of dollars are available, pulling off large-scale burns is no sure thing. Prescribed fires have relatively narrow weather windows in the spring and fall when they can be carried out…When it is too moist, the fires don't generate enough heat to get the job done. So even if a crew is ready to go, the burn may have to be called off" (Bernton, 2018).
- Lack of funding and labor intensive

    - “Thinning and prescribed burning have increased steadily in Idaho since 2001, but have been hindered nationwide by federal policies that require agencies to take money from other programs when the federal firefighting money is exhausted. The Forest Service shifted $250 million from other accounts…including money from hazardous fuel treatments…to pay for firefighting this year. Firefighting costs are $700 million over the appropriation” (Barker, 2015).

- Ineffective if implemented in remote forests, rather than around communities
    - “Fuel treatments should be strategic and focused primarily near communities and homes. Typically, fuel reductions more than 100 feet from a structure provide no additional protection” (Wuerthner, 2021).
- Difficult to implement in dense, climate-affected forests
    - “First, we must recognize that Oregon cannot burn our way out of the problem, and stating climate change as the sole reason for our wildfires is unhelpful because our forests are too dense in many places to safely apply prescribed fire. If climate change is the problem, then it seems like addressing climate change is the only solution. This rhetoric is not helpful or accurate” (Astor, 2021b).
- Small likelihood of wildfires encountering treated forests
    - “Various studies have also shown that the probability that a wildfire will encounter a ‘fuel reduction’ site is extremely small — typically less than 1%” (Wuerthner, 2023).

Smoke Impacts on Nearby Communities:

- Produces smoke that worsens air quality in adjacent communities
    - “A big concern is air pollution. Luke Montrose, a Boise State University environmental toxicology professor, said he worries about deliberately introducing smoke into communities that have already had wildfires in summer. ‘The exposure becomes chronic then, because it's year-round,’ Montrose said” (Kasler & Blanchard, 2021).
- Must contend with strict air quality regulations
    - “Frustrating matters, the Environmental Protection Agency proposed a rule this spring for the Clean Air Act that would further regulate smoke particles. The rule could add additional complications to the use of prescribed burning throughout the country” (Clark, 2023).

Transitioning to Wildfire:

- Can become out-of-control depending on weather conditions and planning
    - “Forest Service officials Greg Burch and Arik Jorgensen waited from a trail within the East Mink Creek Nordic Center last month, listening to the workers report their positions and observations about the wind's behavior on handheld radios. Two water engines were parked in the vicinity in case the controlled burn were to grow too large” (O’Connell, 2010).
    - “In New Mexico last year, a controlled burn sparked that state’s largest wildfire, leading to a pause on prescribed burning. Also last year, a ‘burn boss’ leading a prescribed burn was arrested in Oregon after the intentionally set fire jumped the containment line and burned 20 acres of a private ranch” (Wozniacka, 2023).

Loss of Aesthetic and Recreational Value:

- Lessens the natural beauty of a landscape
    - “He and the Forest Service's local fire managers support what the Canadians have done, but Timm is skeptical that large Canada-style winter burns, along with the necessary logging, could get the support needed from Idahoans who want their scenic views unchanged” (Barker, 2013a).