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HB19-1006 Wildfire Mitigation Wildland-urban Interface Areas
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Overview

HB19-1006 will create a state grant program administered by the Colorado Forest Service with the intention of helping fund private forest management projects, thus mitigating the size and impact of wildfires. These projects, not exceeding $200,000 per grant, will focus primarily on wildfire fuel removal in “wildland-urban interfaces” (WUIs) - or areas where human development exists in close proximity to wildfire-prone ecosystems. The bill creates both a grant cash fund and a Forest Service advisory board that reviews and votes on project applications. Applicants must be able to demonstrate matching funds and fit defined logistical characteristics.

The intention of HB19-1006 is justified on the grounds of public economics. This is because it seeks to mitigate the social and environmental costs - called negative externalities - that wildfires impose. These are costs that burden members of society who lack control over others’ private risk taking. Given the absence of defined property rights and responsibilities regarding wildfires, these costs cannot be priced-in by the market alone. In these situations, it is the duty of the government to induce efficiency through taxes or subsidies. As described later, taxes are preferable to subsidies in this case. Therefore, the bill’s methods should be readjusted.

In the following analysis, we first outline both the beneficial and destructive nature of wildfires. Next, we discuss current costs in Colorado. Finally, we critique the methodology of HB19-1006 from the perspective of economic redistribution.

Analysis

Fires produce both positive and negative outcomes. From an ecological perspective, wildfires are both natural and necessary. According to the National Park Service, many plant and animal species in Rocky Mountain National Park benefit from habitual, low-intensity burns ("Fire Ecology"). Fires clear accumulated refuse from the forest floor, reduce competition among remaining vegetation, clear parasitic organisms from burn sites, and reintroduce nutrients into the soil (Baker 2017). Additionally, Collins et. al. (2017) suggest that managed wildfires "increase landscape heterogeneity, and likely [improve] resilience to disturbances, such as fire and drought." Thus, under certain conditions, fires are an integral part of a forest's lifecycle.

It is when wildfire fuel is left unchecked, either through the prohibition of natural burns or negligence of fuel removal, that wildfires become more damaging (Chapin III et. al. 2003). Associated damage accrues costs to both private individuals and society as a whole.

Individuals voluntarily living in WUIs face a number of costs, both pre- and post-disaster. Examples include increased home insurance premiums and reduced coverage (Sell 2018, Quinton 2019), as well as potential reductions in home prices and sales (Donovan et. al. 2007, McCoy and Walsh 2018). These types of costs are private, though, and do not necessitate government involvement. If the financial or emotional risks involved in such living arrangements become too burdensome, then those affected can choose residences elsewhere or provide personal funding for mitigation efforts.

Current literature suggests, though, that wildfires confer costs onto members of the population not voluntarily living in these areas. In other words, these costs burden additional sections of society, thus constituting market inefficiency by means of negative externalities. Here is where government intervention becomes justified.

Summerfelt (2016) suggests that uncontrolled fires put strain on law and safety resources, diminishing the ability to serve other emergency calls. Congested roads also reduce responder effectiveness. Smoke and ash impact the health of both in-state and out-of-state populations, increasing doctor visits and hospital admissions. The demand-side costs of wildfire smoke inhalation are quantified by Richardson et. al. (2013), who find that the individual willingness-to-pay for one less day of adverse symptoms is $87 or $95 in California, depending on the model used.

Financial losses appear primarily in redevelopment costs and economic slowdown. State and federal funding, partially provided by taxpayers, may be made available for redeveloping affected regions. Likewise, this incurs administrative and accounting costs as documentation is settled (Summerfelt 2016). Local economies, including those not directly in WUIs, suffer as residents leave the area, businesses temporarily close, and tourism dwindles ("Fast Facts", Janofsky 2002, Wollan 2013, Almeida et. al. 2017).

Regional economic slowdown may seem like a natural market process, thus precluding government meddling, but here it constitutes a negative externality. This is because livelihoods are damaged by private decision makers in WUIs, who, considering only their own personal costs, do not make the socially optimal decision. Because residents are unable to affect these private decisions directly, the government must implement policy to mitigate these costs on residents' behalf.

Infrastructure, including roads and water systems, is equally affected. The damage to these systems depends on the intensity of the fire, but in certain circumstances they can be completely destroyed (McEvoy 2012). Productivity decreases for everyone if agricultural lands, highways and train rails are made unusable. Additionally, even if these systems are repared, lasting environmental damage may put them at more consistent risk. For example, mountainous regions are more prone to mudslides after a fire destroys vegetation and root systems, instilling future clean-up costs (Acevedo-Cabra et. al. 2014, Sanabria and Valentin 2015).

As in the previous case, infrastructure damage constitutes a negative externality. This is because repair projects spread costs to other, non-WUI parts of the population. Road repairs in Colorado, for example, are funded primarily by the 22-cent-per-gallon state gas tax ("Road Usage Charge"). Water infrastructure is funded through a combination of federal grants, municipal bonds, and private capital, as well as public water rates and surcharges.

In Colorado, the aggregate cost of wildfires is somewhat difficult to ascertain. According to Mackes (2015), the 2002 fire season generated total costs of $436.6 million. The 2010 Fourmile Canyon Fire required $10.2 million in suppression costs and generated $217 million in insured property damage. Another report places firefighting costs for the summer of 2018 at $130 million for 18 separate fires (Brown and Blevins 2018).

Nonetheless, it is questionable whether subsidization of fuel removal projects is the correct route to wildfire efficiency and cost reduction. Conti (2018) suggests that risk perception for individuals living in the El Paso County WUI is the most significant determinant of private wildfire mitigation. Factors such as age, retirement status, political affiliation and duration of residence were not significantly related.

Thus, a subsidy is not guaranteed to increase mitigation efforts. Projects must already be motivated by an individual's assessed level of risk. Additionally, a subsidy redistributes towards those voluntarily living in risk prone areas and away from those with no say in the matter. Reilly (2015) argues that current insurance providers offer an implicit subsidy to residents and developers in WUIs, whose policies do not account for the true risk of wildfires. The optimal correction, he suggests, is a federal National Wildfire Insurance Program that employs a "homeowner mandate", shifting the costs of wildfire management to those who directly benefit from it: residents of the WUI.

The implementation of a tax raises the overall cost of residing in a WUI, transferring some of the unaccounted societal costs to residents voluntarily living in these areas. A penalty for non-compliance to mitigation standards would also provide a sense of risk that may be lacking regarding wildfires. In other words, residents of WUIs may underestimate their wildfire risk, but a more tangible risk of monetary penalty will force more individuals into compliance.

Recommendations

I suggest the General Assembly reassess the subsidies provided in HB19-1006. Rather than appropriating more money for mitigation efforts, the state should obtain revenue from those whose actions contribute to risk. A system of taxation and penalties both confers the costs of wildfires onto WUI residents, rather than subsidizing their inherent risk, and helps correct sub-optimal risk assessment.

Yet, this alone may not be enough to optimally curb the destruction that wildfires bring in the future. There is evidence that prescribed burning, or controlled burning by a fire expert team, helps mitigate the hazard of uncontrolled wildfires (Fernandes and Botelho 2003, Collins et. al. 2017). Thus, if the General Assembly wants to allocate resources for wildfire mitigation, it should do so by funding controlled burns, rather than subsidizing private endeavors.

Additionally, many researchers link the frequency and intensity of wildfires to climate change (Calder et. al. 2015, West et. al. 2016, Sharfstein 2018). While wildfire reduction is a worthy task, the General Assembly should be pursuing legislation that seeks to reduce Colorado's production of greenhouse gasses and other climate change contributors.

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