

California Wildfires, Land Erosion, and the Effects on Ranchers and Farmers

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Introduction

This project is about assessing the land erosion caused by California wildfires and how that erosion continues to affect farmers and ranchers across the state. Existing erosion assessments for northern California wildfires, through Geo-Engineering Solutions, will provide some supplemental data that can be used for the project. Watershed and erosion reports from the US Geological Survey will also be used. The Adam's Canyon ranch in Santa Paula, California, will be used as an example since the Thomas Fire consumed the majority of the ranch and it was imperative the resulting erosion damage had to be attended to over the last couple of years.

Success would entail finding out how extensive the erosion damage within California is, and concurrently, what will have to be done to prepare for future because the fires, which are predicted to become increasingly more intense. This puts ranchers and farmers at further risk than just fire damage.

Background

The UC Cooperative Extension provides an introduction to the effects of erosion from wildfires. In addition, the website also provides information on the various types of erosion and how they can be mitigated prior to new wildfires (UC Cooperative Extension, 2017).

Furthermore, the US Geological Survey discusses how erosion from all the recent CA wildfires will lead to increased sediment and debris in rivers and watersheds. This increased amount of contamination is a major issue for ranchers and farmers across the state and must be understood in order to find a solution (USGS, 2017). Cal Fire has a data base that contains all the details of every California wildfire (acreage, containment, dates, casualties, cause, etc.) which is key in assessing how many ranches and farms have been impacted by the fires.

The Thomas Fire consumed a major portion of the Adam's Canyon ranch in Santa Paula, California, which is one of the ranches that will be evaluated in this project (Cal Fire, 2020). The Modesto Bee adds another local/personal level to this project by discussing the pros and cons of wildfires for ranchers and farmers in the central valley. The article mentions the extent of land and money that the Butte Fire cost locals; the Butte Fire will be another focus in this project. (Modesto Bee, 2016). The UC Agriculture and Natural Resources Department discusses a program that was put into effect after the Thomas and Camp Fires in order to help ranchers feed their herds while they figured out what to do with their livestock and land. Livestock was not able to remain on the burnt land due to lack of feed, water, and potential erosion risks on the mountainsides (UC Ag and Natural Resources, 2019).

The American Geophysical Union predicts the amount of land that will be burnt in California wildfires will continue to increase due to climate change. Due to this enlarged amount of burnt land, sediment levels in watersheds will increase by over 100% due to erosion. Increased sediment in watersheds will severely affect ranchers and farmers in a negative fashion. (American Geophysical Union, 2017).

Methods

Research about the history of California wildfires and the magnitude of their consumption was

conducted in order to assess approximately how much land is affected every year. From there information about how these California wildfires can change a landscape through plant depletion, land erosion, and the destruction of man-made structures was gathered from the California Department of Forestry.

How these changes can be a detriment to farmers and ranchers in California was investigated and evaluated in order to determine the potential short- and long-term ramifications of working in a state with frequent wildfires. Interviews with cattle ranchers and expert witnesses for erosion damage from wildfires were conducted in order to get a closer perspective to the effects of California wildfires. Research on potential solutions to manage the erosion damage caused by these wildfires and how these solutions could be implemented was analyzed. All the aforementioned data was then compiled together so that an accurate representation of the damage caused by California wildfires, how it can affect farmers and ranchers, and how this damage can be mitigated could be assembled for use across the state.

Results

This study was set up in order to assess the effects of wildfires on ranchers and farmers in California. The two main fires that were researched were the Thomas Fire of 2018 and the Camp Fire of 2018. The former burned over 280,000 acres, making it the largest fire in modern times and the latter burned over 150,000 acres. The Thomas Fire caused over \$170 million dollars in damage to farms as well as thousands of acres of grazing land lost. Many of the farmers in Ventura County are not large, commercial operations so the damage that occurred hit the community extremely hard.

The Camp Fire caused similar damage with an approximate 30,000-40,000 acres of grazing land being consumed by the fire. All of this burning acreage left the ground free of brush, trees, and their roots. This resulted in loose soil which lead to large amounts of soil erosion when the rains came after the fires were contained. This erosion after the fact caused large amounts of additional damage to farms and ranches alike. Steps are being taken now in order to prevent further fires. One of the most immediate ones being power shutoffs from PG&E. Normally thought of as destructive and not essential, active forest thinning has begun to take place as well.

Conclusions

The future of California depends on more studies and research done on natural disasters. Whether it is for the protection of suburbs and major cities or if it is for the protection of California's agricultural and wildlands, understanding how wildfires affect ranchers, farmers, and the land on which they operate is essential to the state's safety. Wildfires are a lot more than just burning plants, they will destroy the soil in which these plants grow and can cause major unnecessary erosion events. By becoming aware of these issues, the people of California can better understand and support wildfire preventative measures such as power shutoffs, forest thinning, and erosion prevention projects.

References

Armstrong, M., & Richter, F. (2019, October 29). Infographic: The Spiraling Cost of California's Wildfires. Retrieved June 02, 2020, from <https://www.statista.com/chart/19807/california-wildfire-emergency-fund-expenditure/>

California Department of Forestry. (n.d.). Thomas Fire. Retrieved from <https://www.fire.ca.gov/incidents/2017/12/4/thomas-fire/>

Feldman, S., & Richter, F. (2018, November 13). Infographic: Wildfires Continue to Be More Devastating in 2018. Retrieved June 02, 2020, from <https://www.statista.com/chart/14462/california-wildfire-deadly/>

Holland, J. (2016, January 23). California ranchers see wildfire as foe and friend. Retrieved from <https://www.modbee.com/news/business/agriculture/article56306800.html>

Increases in Wildfire-Caused Erosion Could Impact Water In the West. (2017, September 7). Retrieved from <https://www.usgs.gov/news/increases-wildfire-caused-erosion-could-impact-water-supply-and-quality-west-2>

Sankey, J. B., Kreitler, J., Hawbaker, T. J., McVay, J. L., Miller, M. E., Mueller, E. R., ... Sankey, T. T. (2017, September 7). Climate, wildfire, and erosion ensemble foretells more sediment in western USA watersheds. Retrieved from <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2017GL073979>

University of California. (n.d.). Erosion Control. Retrieved from <https://ucanr.edu/sites/fire/PrePost/Recovery/Revegetation/Erosion/>

White, H. (2019, May 31). UC ANR advisors support cattle ranchers after wildfires. Retrieved from <http://calag.ucanr.edu/Archive/?article=ca.2019a0004>