

# CAMERON PEAK POST-FIRE PLANT RECOVERY LARIMER COUNTY

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## INTRODUCTION

2020 was the year of some of the most devastating wildfires around the globe. As most Coloradoans experienced last summer, the Cameron Peak Fire burned almost 209,000 acres in Larimer County, making it the largest wildfire in Colorado's recorded history. Burning for 112 days straight, this high-intensity fire posed the question of how the landscape will recover naturally over time and when human assistance is needed for natural recovery. The 2020 fire season was an extreme one here in Colorado burning over 600,000 acres. With such large-scale disturbances in mind, many public land managers and private landowners worry about the increased presence of non-native and noxious weeds following fires of this size. Additionally, the soil's health is also of importance as when a fire of this intensity occurs, the soil's chemistry and composition change due to the intense heat, making it difficult for plant recovery.



## INTERNSHIP GOALS & OBJECTIVES

- Understanding early post-fire recovery of the Cameron Peak Fire.
- Quantify the plant communities one year post-fire in different forest types.
- Understand the differences in native and non-native species abundances across a gradient of elevation and previous human impacts.

## EDUCATIONAL APPLICATION

From this experience, the skills that I learned and further developed through this internship, directly apply to my professional development and future career in natural resources. For example, some of these skills include:

- Plant ID and botany field techniques
- Forest structure measurements
- A deeper understanding of fire ecology
- CSU Colorado Forest Restoration Institute training and protocols
- Soil science methods and collection techniques
- Implementation of mapping tools such as Avenza Maps

In addition, the experiences I have gained through this internship have provided valuable insight into what some professions look like in practice, and the different career paths I could possibly take in the future.

## WHAT YOU DID

During this internship, I worked alongside CSU's Colorado Forest Restoration Institute doing research on how forests are recovering immediately after fire. Throughout my time with CFRI, we mainly focused on understory and overstory measurements. Additionally, we looked at groundcover estimates, plant and tree identification, and seedling regeneration in each plot.

Halfway through the internship, I worked with Michael McNorvell, a CSU grad student, completing a research project on soil health and fungal communities in the 2020 wildfires.



Data collection consisted of:

- Classifying soil burn severity
- Measuring soil hydrophobicity
- Collected soil cores to look at bulk density and composition
- Measured water infiltration rates
- Soil microbe composition
- Fungal communities
- How deep the soil was burned
- Soil structure changes
- Percent ground vegetation

Figure 1. ArcGIS Map of Site Locations

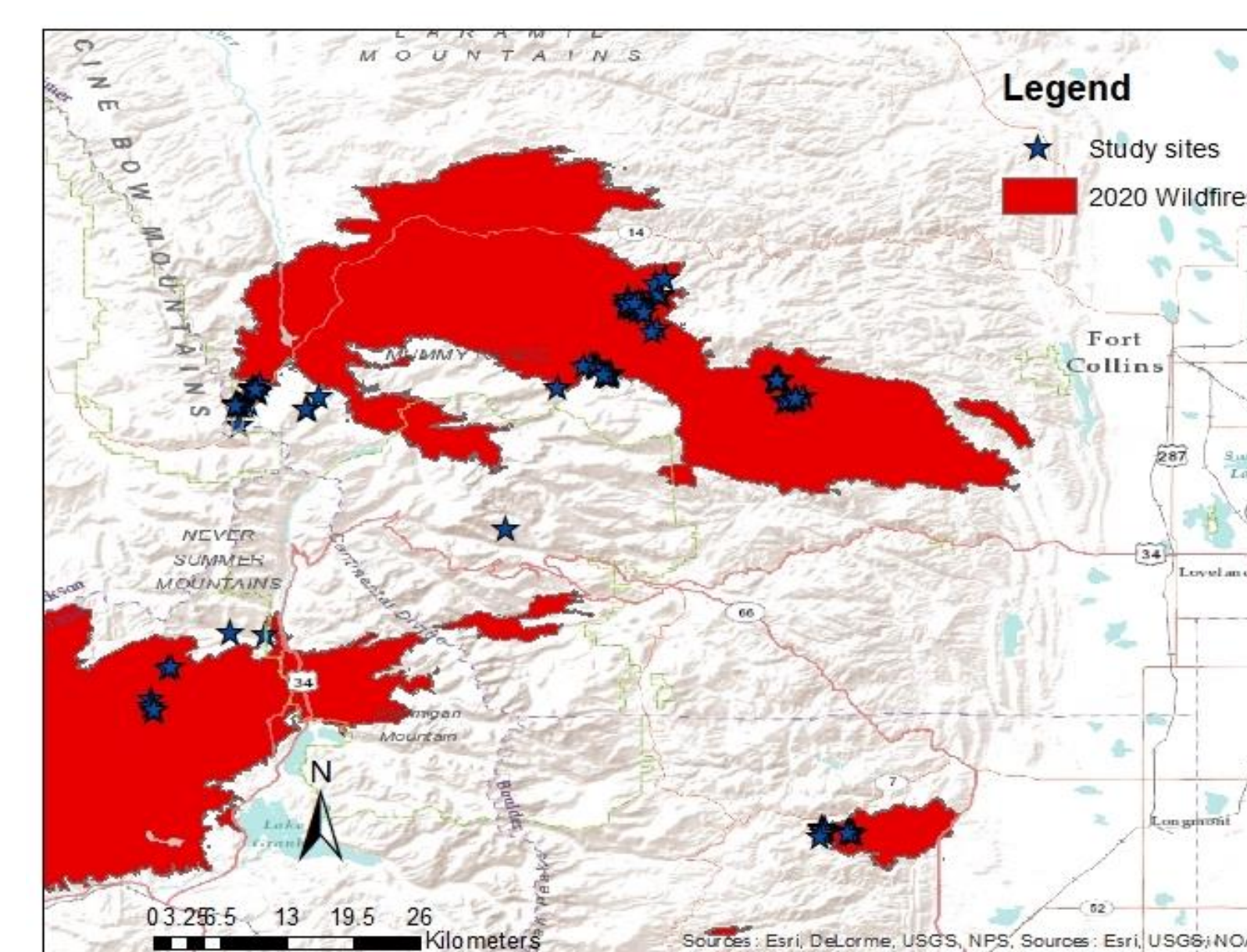
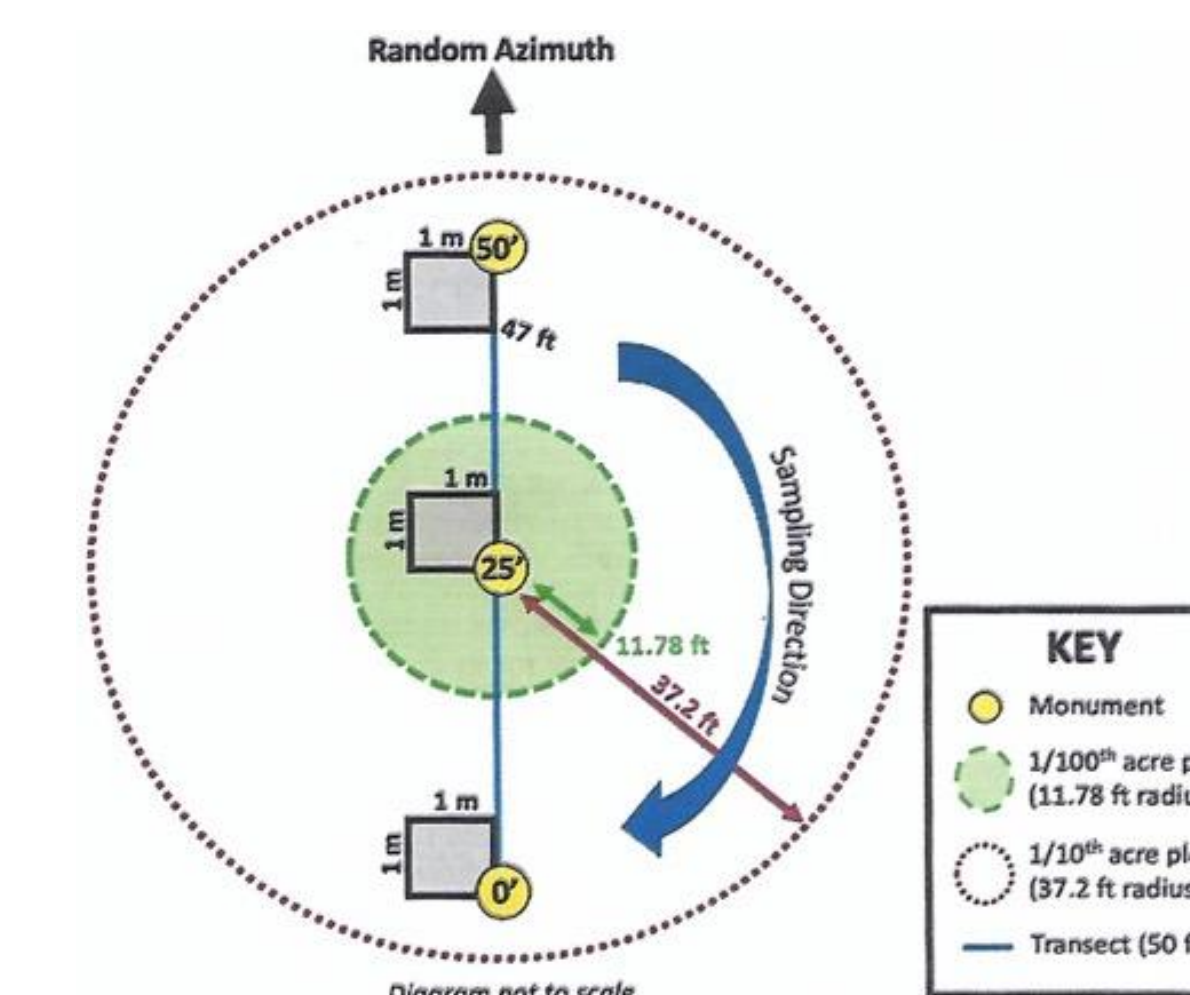


Figure 1. An ArcGIS map showing the size and location of the many 2020 wildfires, such as the Cameron Peak Fire, Calwood Fire, and East Troublesome Fire. In addition, the study sites visited throughout the project are shown.

## WHAT YOU LEARNED

Throughout this internship I had the opportunity to learn:

- Plant & tree ID methods
- Non-native and noxious weed ID
- Groundcover estimates
- Overstory measurements
- Calculating fuel loading on the forest floor
- A deeper understanding of soil science
- Working in a lab setting
- How a research project is performed
- Using scientific instruments



## High vs. Low Severity

Many of the study sites I visited throughout this internship burned at high-severity, leaving behind nothing but ash and charred trees. When soils are burned at high-severity, the chemical composition changes and alters the landscape. This transforms the flow of water and nutrients not only above ground, but below as well. With this in mind, invasive plants and noxious weeds establish more rapidly and can quickly overtake the ecosystem. Plant cover was significantly lower on high severity burned sites, often as low as <5% cover. Some conifer tree seedlings were observed, but primarily only lodgepole pine. Many of the observed plant communities in burned area were dominated by resprouting plants such as aspen, kinikini, and bunch grasses.



## NEXT STEPS

Next summer, I will further my knowledge and understanding of fire ecology and botany by working with CFRI. By continuing to work in these burned areas, I aspire to learn as much as I can about fire mechanics and how fire affects not only the landscape, but the entire ecosystem as well. As these high-intensity fires burned so much land, there is much work and research to be done in the decades to come. I strive to stay near Fort Collins, and one day either work in research or active restoration on these burn scars.



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