

# LONG-TERM POST FIRE INTERNSHIP TELLER COUNTY

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## PROJECT INTRODUCTION

In 2002, the Hayman Fire burned 138,114 acres of forested and rural land in northwestern Colorado Springs. This was the largest wildfire in Colorado until 2020 when over 600,000 acres burned across the state.

With climate change and severe drought, wildfires may become more frequent and/or severe. The Hayman Fire demonstrates long-term impacts of wildfire because it is one of the largest high severity fires in Colorado.

Wildfires can alter landscapes for decades, including habitats of a diverse range of wildlife species. Here, birds were observed and quantified to see how species differ within burned landscapes at both high and low severity burn areas. Birds are an indicator species of forest regeneration because of how they use remaining resources for foraging, mating, nesting, and protection.

Studying previous high severity fires can mitigate property, agricultural, and environmental damage as well as save millions of dollars in repair and restoration. It can also help us predict what recent fires, such as the Cameron Peak Fire, may look like in coming decades and how this impacts species diversity.

## INTERNSHIP GOALS

Understand the long-term habitat and forest recovery of the Hayman Fire which enables us to make informed decisions on how to manage current and future fires. Learn research methods and field techniques in selecting and surveying post-fire sites. Receive mentorship from experienced individuals in their areas of expertise to advise in future educational and career decisions.

## HOW DOES THIS APPLY TO YOUR EDUCATION

Direct focus in graduate school and career development.

Involvement with other departments at CSU such as Colorado Forest Restoration Institute (CFRI) and connection with Warner College of Natural Resources.

Practice species identification and research methods on long-term ecological impacts of large, high severity fires.

## WHAT YOU DID

Completed forestry plots in 40 low severity and 30 high severity burn areas:

### Overstory Measurements:

- Canopy cover
- Seed source distance
- Seedling and sapling age
- Trees and snag diameter at breast height
- Stump count

### Bird Counts:

- Identify bird species by observation and call/song
- Estimate distance away from site

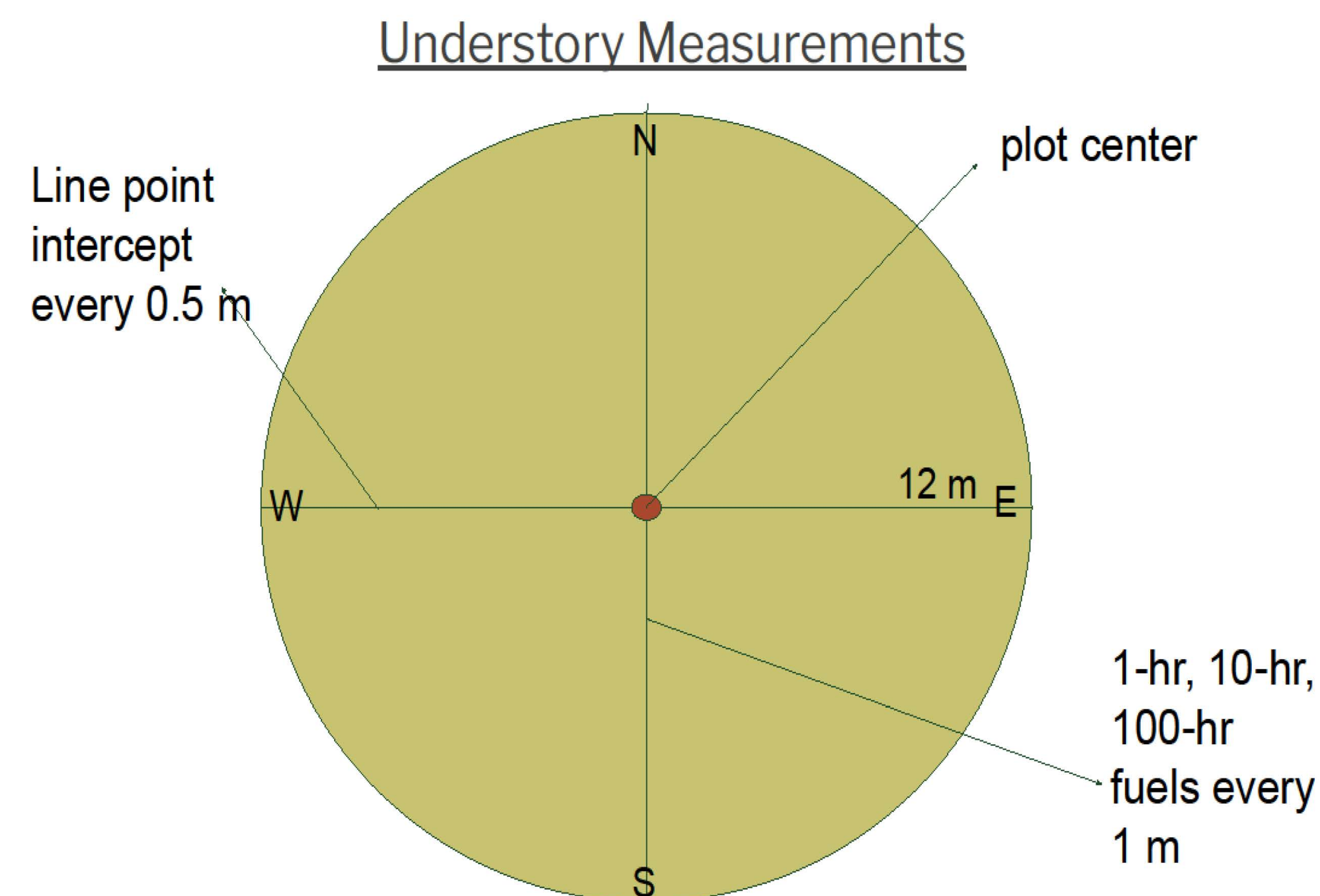


Figure 1.



On the left is a low severity burn area and on the right is a high severity burn area within the Hayman Fire. Severity is defined by tree mortality and loss of biodiversity.

## WHAT YOU LEARNED

Use of forestry measurement tools (clinometer, rangefinder, densitometer).

Factors contributing to low severity versus high severity burn (topography, fuels, moisture).

Calls and songs of approximately 50 different bird species.

Tree and shrub identification of species in montane forests.

Experimental design and methods.

Data entry and data organization skills.

Figure 2



Each bird species requires specific habitat needs for foraging, nesting, and mating. In observing a wildfire decades later, birds serve as indicators of forest regeneration, or as indicators of shifting landscapes. Photos by Jamie Woollet.

## NEXT STEPS

Investigating specific bird species as indicator organisms of forest regeneration and whether patches burned at different severities may have an effect on post-fire species.

Research pyrodiversity; variation in fire characteristics that contribute to plant or animal diversity in relation to fire age, intensity, and elevation.

Impact of climate change of fire intensity and frequency, and whether ecological changes in high severity fires are permanent/irreversible.

Which tree species regenerate after recent fires and how this is affected by elevation and soil composition. Also, how tree planting for conservation efforts in burned areas affects species diversity.