

Perceptions of Post-Wildfire Landscape Change and Recovery

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Introduction

The general public tends to have basic understandings, or mental models, of complex ecological processes like wildfire, which often creates challenges for land managers, community leaders, and emergency personnel when communicating about wildfire risks and mitigating negative impacts (Lazo et al., 1999; Zaksek & Arvai, 2004). Exploring people's mental models about wildfire impacts, helps researchers, land managers, and community leaders identify important biophysical and social characteristics that influence people's responses to wildfires.

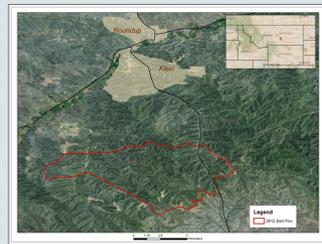
While studies have shown that people often support post-fire management decisions such as salvage logging, reseeding, and erosion control to mitigate further impacts and promote forest regeneration (Hamin & Ryan, 2008; Olsen & Shindler, 2010), there is a gap in understanding how people perceive landscape change and recovery over time after wildfires and how these perceptions influence attitudes towards management.

Our research addresses this gap by describing people's perceptions of landscape recovery following a significant wildfire, the 2012 Dahl fire near Roundup, MT. It provides insights into how people experience wildfire, and serves as a base for longer-term research that integrates social and biophysical sciences to understanding wildfire impacts over time.



Dahl Fire Facts

- Lightning ignited
- Burned from 6/26/2012 to early July, 2012
- 22,045 acres burned, mostly on private land
- Destroyed 73 homes and 150 outbuildings
- Most prominent vegetation was ponderosa pine and conifer forest, as well as mixed grass prairie



Map of the 2012 Dahl Fire

Methods

Data Collection

We conducted semi-structured interviews in the summer of 2013 with approximately 50 residents, land managers, emergency personnel, and other stakeholders. While interviews covered several topics, this poster focuses on responses to questions regarding perceptions of short- and long-term landscape recovery after the fire.

Examples of initial questions about recovery:

- "What does it mean for this landscape to recover?"
- "What does a recovered landscape look like?"
- "How long will that take?"



Data Analysis

- The interviews were digitally recorded and transcribed verbatim
- We summarized the interviews and identified main themes related to perceptions of landscape recovery



Interview Insights

Perceptions of landscape recovery after the Dahl Fire revolved around several themes:

Aesthetic Impacts

- The majority of interviewees discussed the negative impact of the fire on the appearance of the landscape, especially considering many of them lived there because they enjoyed the landscape. However, some commented on the positive impacts of the fire on the landscape.

"It looks like a bomb hit...it's just black ground with black trees and nothing there." (fire chief)

"We bought this place because it had trees, it shielded us from everybody else and now it is not there any more." (resident)



"My scenery is ugly, it looks like Mars." (resident)

"Some people may not be sorry to see the trees gone because it opens up land for grazing livestock and wildlife." (resident)

Temporal and Spatial Aspects of Recovery

- Most people spoke about landscape recovery in generational or long-term perspectives, often noting that the severe fire conditions will affect how the landscape recovers, especially in terms of vegetation types and distribution

"It'll take a hundred years to bring those trees back. When you only get 12 inches of rain, they don't grow very well." (resident)



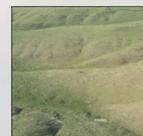
"...the timber is burned, it's gone... it burned so hot that even the grass is not coming back in some places. It's just black." (resident)

"First of all, there's places that are sterilized. Nothing grows there for a year or two. Next is weeds. Eventually, you've got good grass coming back." (resident and emergency official)

References to Past Fires in the Area

- People who remember past wildfires in the area tended to refer to areas previously burned when discussing landscape recovery from the Dahl fire:

"You can see the Hawk Creek Fire, there's still no trees." (emergency official)



"It's going to take a while. You can see the remains from the '84 Hawk Creek fire. There's no trees and there's dead fall everywhere." (fire official)

"If you look at where the Majerus Fire was, it's pretty much a moonscape." (NGO manager)



Landscape Effects from Erosion

- The Dahl fire led to severe erosion in many places, which has changed how the landscape looks and functions for many residents:



"We had severe rains here about one to two weeks ago. Some of the roads looked like rivers. There is nothing to hold any of the water back." (resident)



Attitudes Towards Management

- The need for active management was often supported as a way of encouraging landscape recovery and preventing erosion:



"Pine trees grow really slow, and it all has to be cleared, which helps them regrow." (resident)

"It will need to be seeded and replanted." (resident)

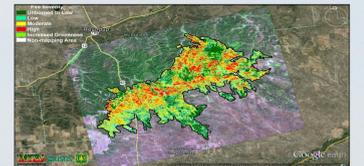
Discussion and Future Work

Our interviews revealed that many people who experienced the Dahl fire are well aware of and emotionally affected by the physical changes in the landscape. Their mental models of the fire behavior, management actions, and climate conditions affect their perceptions of landscape recovery, which are often informed by past experiences with wildfires.

It is still unclear how long after the fire people are impacted by the changed landscape and which biophysical characteristics most influence perceptions of a 'recovered' landscape. E.g., does it matter if the same vegetation returns or is any type of live vegetation better than seeing 'black sticks' and at what temporal and spatial scales?

To gain a better sense of how perceptions of recovery develop and change over time, we are extending this research in two ways:

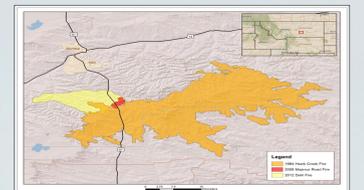
- 1) Use remotely sensed Landsat images and ground-truthing to better understand the biophysical impacts and changes to the landscape



Burn severity map (MTBS) for the 1984 Hawk Creek Fire

- Other studies illustrate how integrating these methods with social science provide a more complete perspective on changing landscapes (e.g., Dennis et al., 2005; Jiang, 2003)

- 2) Conduct follow-up interviews to gain more insights about perceptions of wildfire as an ecological process and landscape recovery for the prominent fire events near Roundup, MT.



Map of the 1984 Hawk Creek Fire, 2006 Majerus Road Fire, and the 2012 Dahl Fire

- Mental model extraction techniques can help reveal how perceptions of landscape recovery form through experiencing fires and landscape change over time (Jones et al., 2011)

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