



# Restoration of the Hayman Burn Area

An analysis of the integration of  
social and ecological values in a  
post-fire restoration case study.

Andrea Hassler  
M.A., Applied Geography  
University of Colorado Colorado Springs  
Rocky Mountain Field Institute

# Research Questions

(1) What social and ecological values have informed restoration in this place?



(2) How do these values integrate as restoration geography, creating a socio-ecological place?

(3) How can this knowledge inform decision making at fire-prone wildland-urban interfaces?

# Restoration Geography

- **Traditional: “The process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed”** (S&P)
- **Social values define degradation and reference conditions** (Urbanska et al. 1997, Lackey 2001, Wohl 2005, Edwards 1997, Hobbs 2004)
- **Restoration Geography: “socio-ecological” places** (Havrick and Doyle 2009, Smith 2012)
- **GIS and remote sensing as a tool**



# Wildfires, Society and Restoration

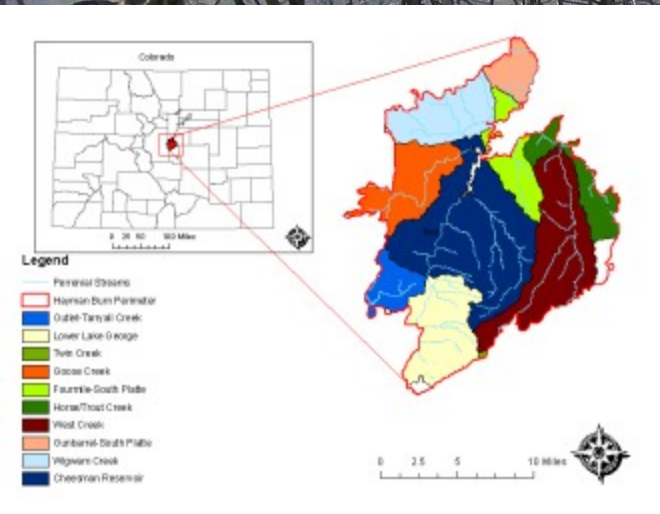


- History of fire suppression
- Post-fire Hydrology
- Wildland-urban interface

Photo courtesy of Bob Jarret, USGS

# Study Area

- Hayman Wildfire
- Pike National Forest & private Land
- Major Reservoirs
- Kaufman et al., 2004
- Post-fire Restoration
- NFF Treasured Landscapes
- Watershed approach
- Trail Creek Project



# Methodology

## ■ Data

- 1. Qualitative: Interviews, Observations

- 2. Quantitative: Satellite Imagery, GIS

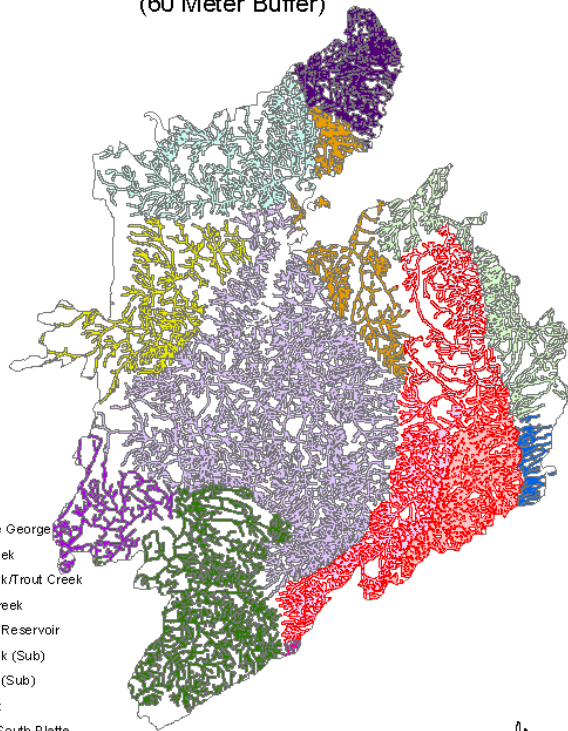
## ■ Integration

- Role of social and ecological values in determining site and treatment selection



# Quantitative Analysis

Hayman Burn Area Stream Corridors by Watershed  
(60 Meter Buffer)

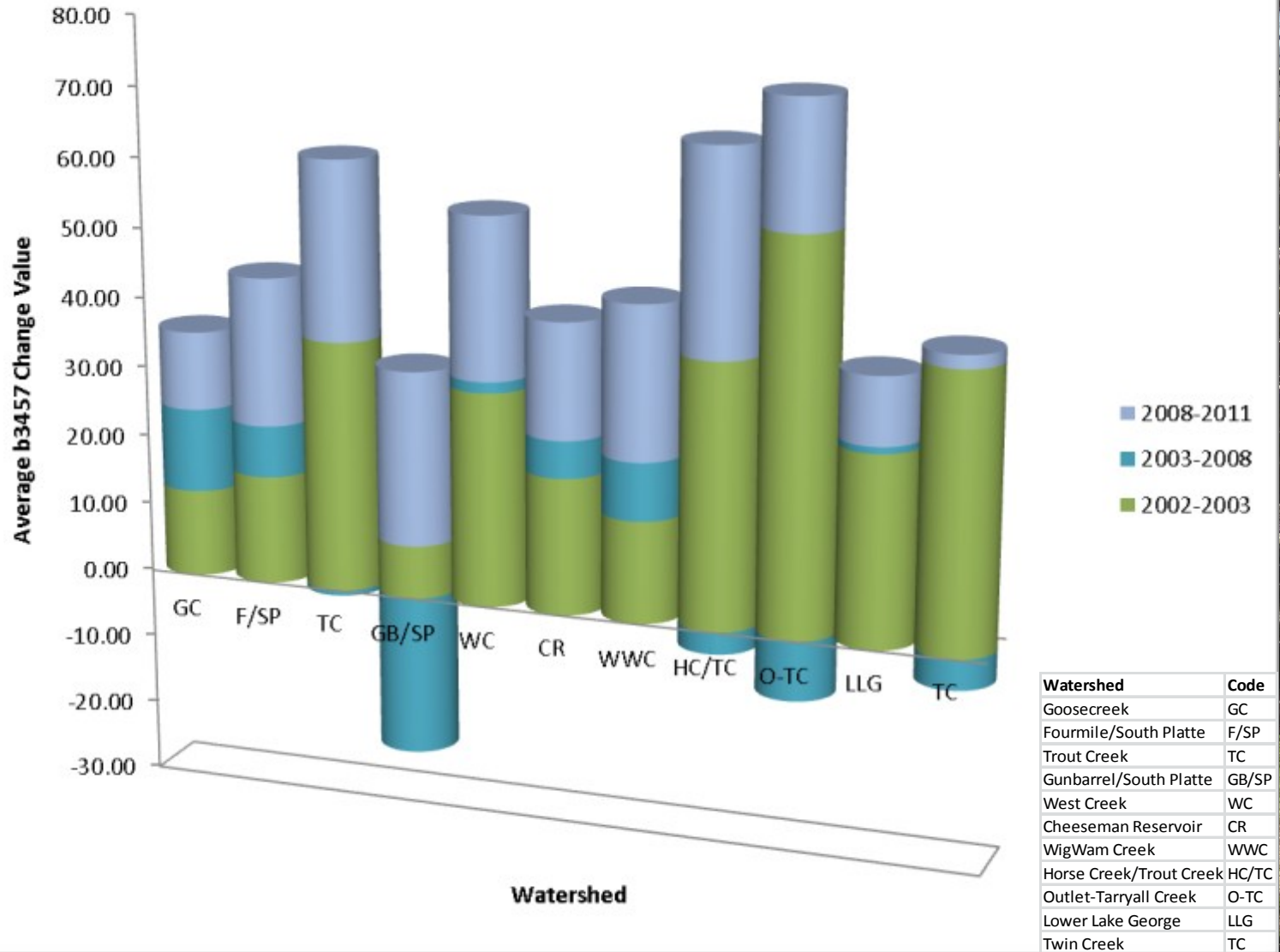


- Remote Sensing
  - Measures for vegetation and bare soil
  - Change Detections for 1, 3, 6 and 10 years
- GIS
  - 60 meter stream buffer
  - Extracted values by watershed
- Statistics
  - ANOVA comparison of burned watersheds

# Results – Remote Sensing\*

\*b3457 = measure for riparian vegetation reflectance values

## b3457 Change Values by Watershed









October 2011



2012/05/15



August 2012

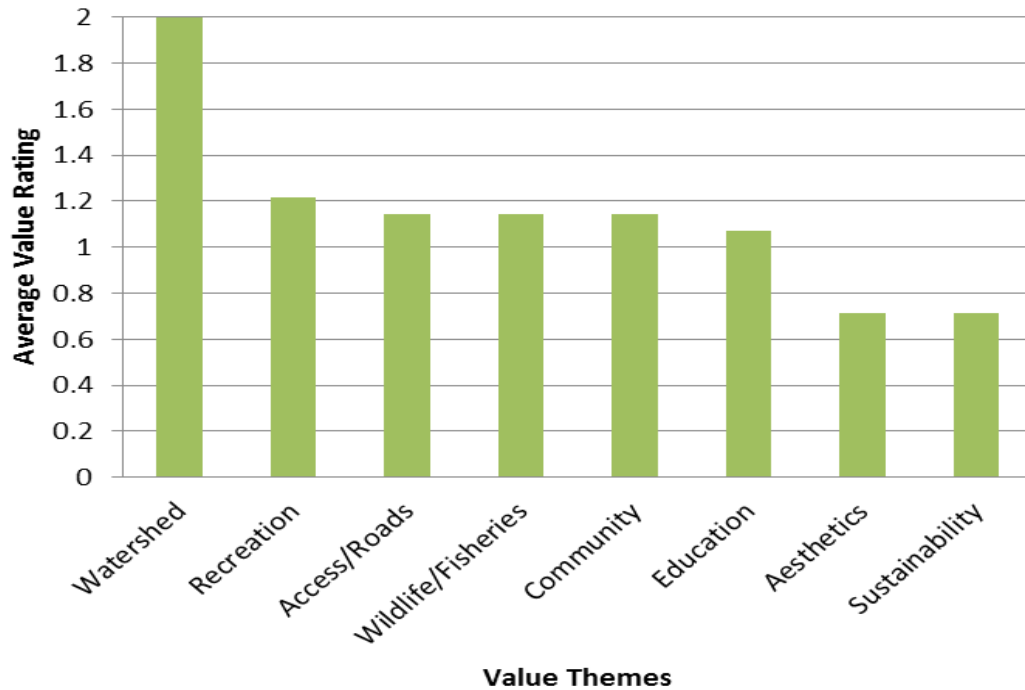


2013/09/19

September 2013

# Results – Interviews

## Identified Values by Average Rating



### Value Themes

- Motivators
- Results/Impacts

### Rating Method

- 2 = discussed at length or highlighted specifically
- 1 = briefly discussed or mentioned
- 0 = not discussed



2013/09/19

Money was allocated to communities that were immediately impacted by fires, such as those in California. However, the Hayman fire presented a case where large metropolitan areas that were miles away were directly impacted because of water resources within the burned area.

“...the hill slopes have recovered quite a bit... but due to evapotranspiration we still see a lot more water entering into channels and ephemeral drainages...”



# Watershed and Water Resources



Rivers are self-formed and self-maintained, and our goal is to understand what constitutes a stable form within a stable watershed.



## Access/Recreation



most roads in Colorado are built on a  
slope rather in drainages because it's the easiest  
place now we're thinking about, **no, maybe  
that's not the best place to put it**

## Access/Recreation

In Trail Creek, we understand there is a lot of use and people out there, so we left parking areas open for people to come in with trailers.

Someone flagged us down [in Trail Creek] and said, "I'd like to let you know we've been impacted here all weekend. [there have been] **so many more people in here now since you've done this work**, enjoying this area - tons of campers, and ATVers, they're using the repaved roads (we put in), using the new trails. **It's working. It's all about planning and trying to find that balance.**"



# Aesthetics

"Then you talk to some people, and the most important for you could be aesthetics. You may want to look at a hillside with green grass again. People will ask, 'When is it going to look like it did?'"



# Aesthetics

"Is it aesthetically pleasing? We don't. I don't want to see impact of humanity on these natural systems. [so] there is an engineering perspective but half of restoration projects, it's a farmas. We're painting a picture we feel to be what folks want..."



# Education

“A lot of people don’t understand the connection they have to it—[they] turn on the shower and water comes out.”



...highlight the value not just of Hayman but of National Forests for water supplies for urban areas. A lot of people don’t understand the importance of forests for contributing to water quality and quantity.”

# Sustainability

“The environmental...we are finding is that is now moving up the list. As the demographics change and as our society changes it's now time to be doing right by being sustainable in every sense...On the other side, sustainability is the number one driver for our employees.”



# Sustainability/Resiliency

“We want trails and rivers and forest to sustain themselves without an outlay of too much human intervention... [creating a] dynamic built environment that can withstand the natural world.”



# Analysis

- Shift from traditional definition of restoration
  - Social considerations guide selection of sites and treatments
- Restoration treatments create a socioecological landscape which accommodates for multiple values
  - This benefits society and assists in the recovery of preexisting ecological form and function
- Natural restoration as an alternative to hard engineering results in added value to places





# Demonstration of holistic watershed approach



- Support from local and regional community because of values
- Incorporating social values strengthens human-nature relationships and understanding
- Partnerships communicate socio-ecological concepts



# Potential Contradictions—Questions of Authenticity



- Channel stability versus post-fire geomorphic change
- Historic forest structure
- Tree plantings versus “Forest Restoration”

## Conclusion

- **Research and action has furthered our understanding of the relationships amongst fire, forests, watersheds and society.**
- **Incorporating social values in restoration serves to promote ecological values and create places that balance culture and nature**
- **Post-fire restoration can aid in building resilient ecosystems, however further management practices are needed.**





**Thank you!**

