

The Mountain Pine Beetle Outbreak in Colorado: Community Perceptions

Grand County Community Forum
Grand County Wildfire Council
October 17th, 2019

Research Team

- ▶ **Hua (James) Qin**, Principal Investigator, University of Missouri
- ▶ **Hannah Brenkert-Smith**, Co-Principal Investigator, University of Colorado Boulder
- ▶ **Jamie Vickery**, Postdoctoral Researcher, University of Colorado Boulder
- ▶ **Elizabeth Prentice**, Doctoral Candidate, University of Missouri
- ▶ **Christine Sanders**, Doctoral Student, Graduate Research Assistant, University of Missouri



Purpose of this Work

- ▶ Long-term research on risk perception is largely lacking
 - Longitudinal understandings of insect-related risk perceptions poorly understood
- ▶ Need for more research into human dimensions of insect outbreaks
- ▶ Natural resource-dependent communities and environmental change

Study Background

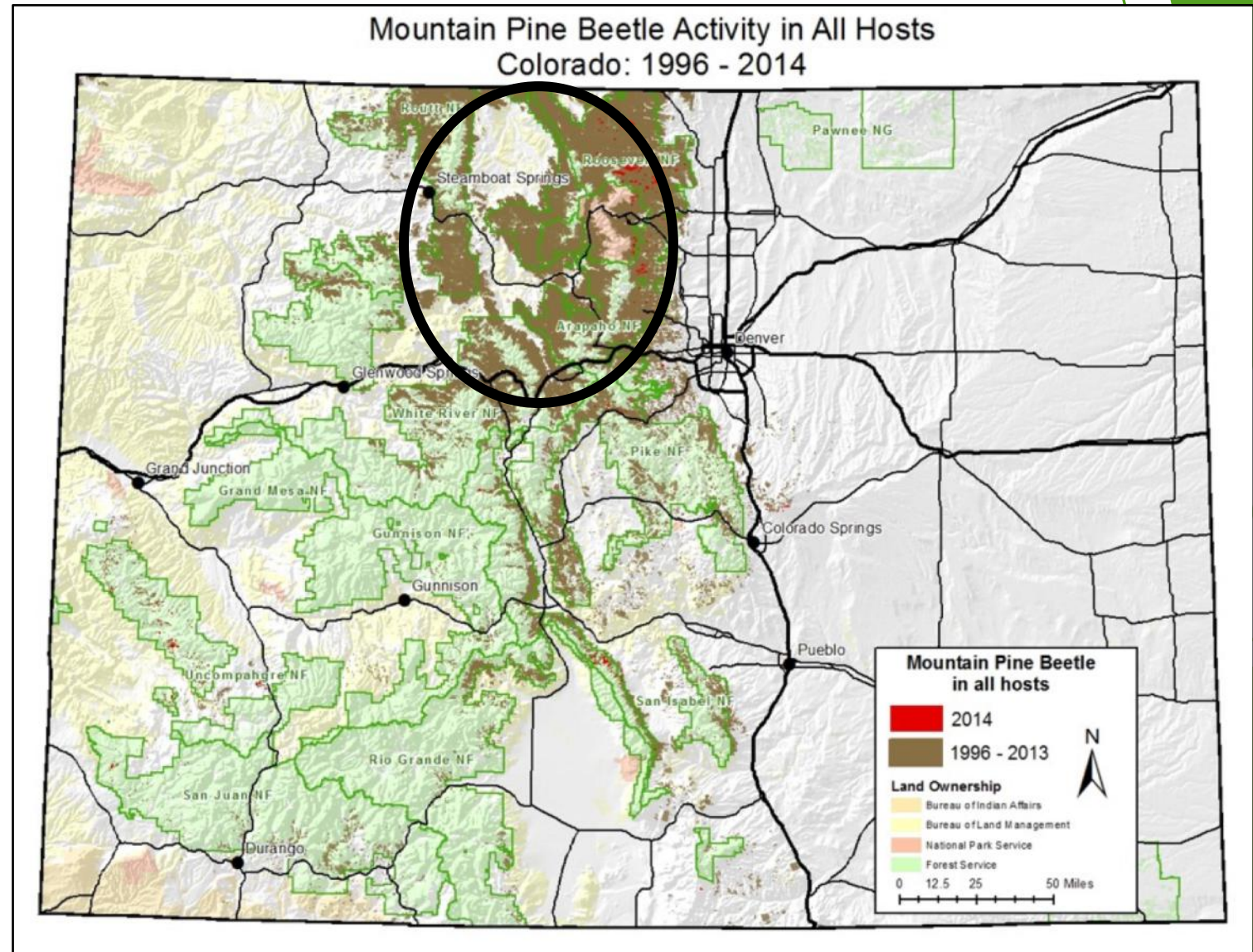
- ▶ Mountain pine beetles (MPB), or *Dendroctonus ponderosae*, are native to Colorado, but a number of factors allowed the species to flourish, including:
 - ▶ warmer winters and
 - ▶ dense, single species forests
- ▶ The MPB outbreak has affected 3.4 million acres in Colorado since 1996
- ▶ Since 2011, rates of infestation have decreased substantially

Research Objectives

1. Explore the dynamic relationship between risk perception and action in response to the MPB outbreak
2. Better comprehend how individuals and communities respond to changing understandings of the risks they face
3. Understand change over time as it relates to their experiences with hazards, perceptions of the risks they face, and what people are/n't doing in response to the beetle outbreak
4. Assess if there are key factors that influence how residents and local leaders understand changing forest conditions

Study Area

- ▶ Breckenridge
- ▶ Dillon
- ▶ Frisco
- ▶ Granby
- ▶ Kremmling
- ▶ Silverthorne
- ▶ Steamboat Springs
- ▶ Vail
- ▶ Walden



U.S. Forest Service Aerial Detection Survey

Methods

54 key informant interviews with city/county officials, forest managers, fire fighters, members of local groups/organizations, and residents

1,130 mail surveys (~32% response rate)

Media analysis of five local and regional newspapers between 2006-present pertaining to MPB

Secondary socioeconomic and biophysical data analysis

Town/Community	Percentage of Total Respondents (N=1,130)
Breckenridge	11% (n=124)
Dillon	10% (n=111)
Frisco	9.5% (n=107)
Granby	11% (n=129)
Kremmling	11% (n=128)
Silverthorne	16% (n=177)
Steamboat Springs	12% (n=133)
Vail	7.5% (n=86)
Walden	12% (n=135)

Town/Community	Number of Interviews (N=54)
Breckenridge	4
Dillon	1
Frisco	3
Granby	2
Kremmling	2
Silverthorne	2
Steamboat Springs	4
Vail	7
Walden	6
Eagle County*	3
Grand County*	6
Routt County*	6
Summit County*	4
Other*	4



Overview of Findings

- ▶ Concerns associated with MPB outbreak
- ▶ Risk perception over time
- ▶ Perceived impacts of MPB outbreak
- ▶ Perceptions of forest management

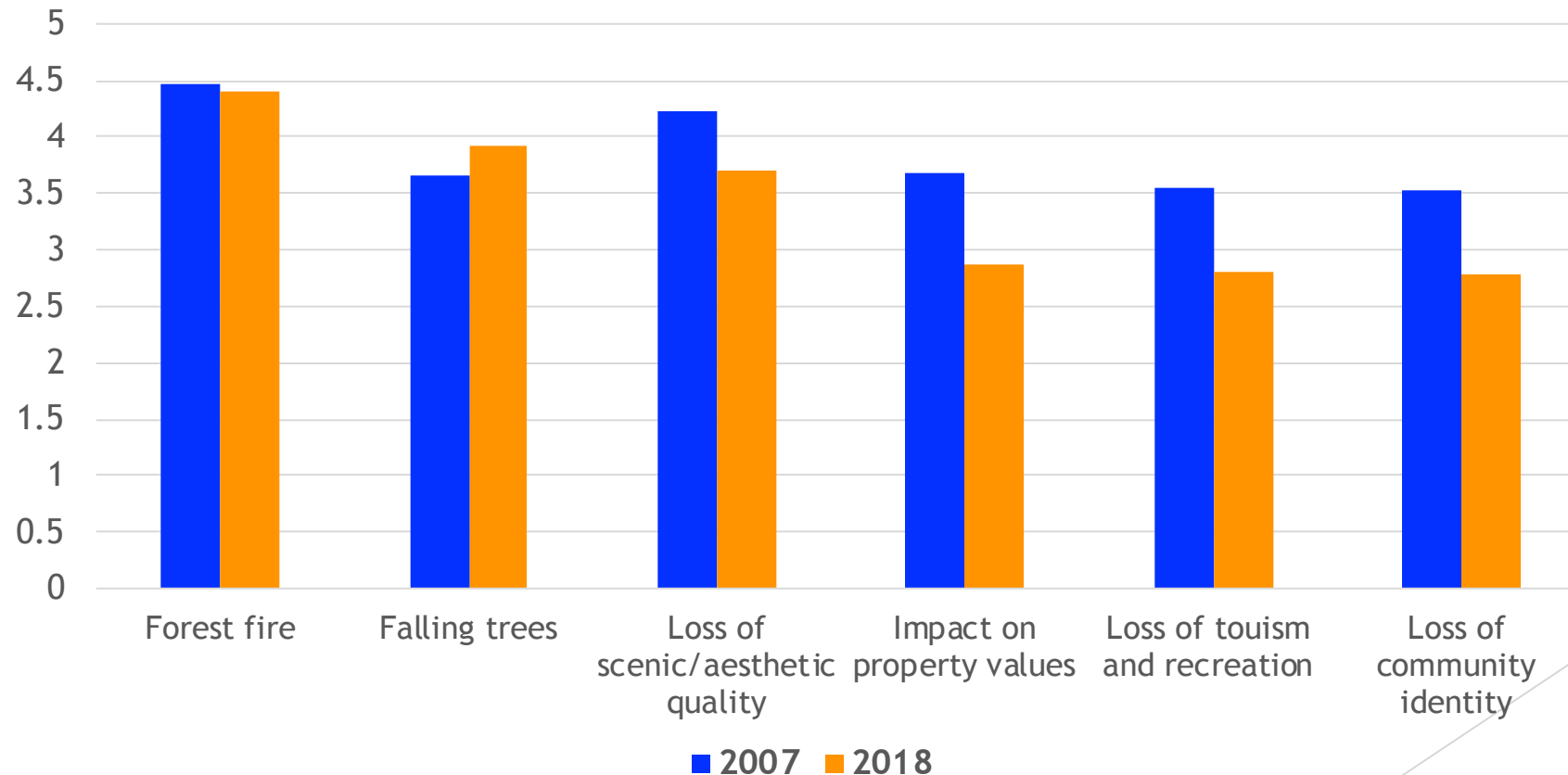


Findings: Forest Risk Concerns

- ▶ **Forest fire**
- ▶ **Falling trees**
- ▶ **Loss of scenic/aesthetic quality**
- ▶ Invasive plant species
- ▶ Decline in wildlife habitat
- ▶ Increased erosion
- ▶ Loss of forests as an economic resource
- ▶ **Impact on property values**
- ▶ **Loss of tourism and recreation**
- ▶ **Loss of community identity**
- ▶ Impact on livestock grazing

Findings: Forest Risk Concerns

How concerned are you about each of the following forest risks for your community as a result of the beetle outbreak and changes in forest health?



1 = Not concerned
5 = Extremely concerned

Findings: Risk Perception Over Time

- ▶ Perceptions of risk have changed with the pine beetle cycle
- ▶ Heightened wildfire risk perception when trees were red
- ▶ Shared sense that levels of concern and public interest decreased as trees turned gray

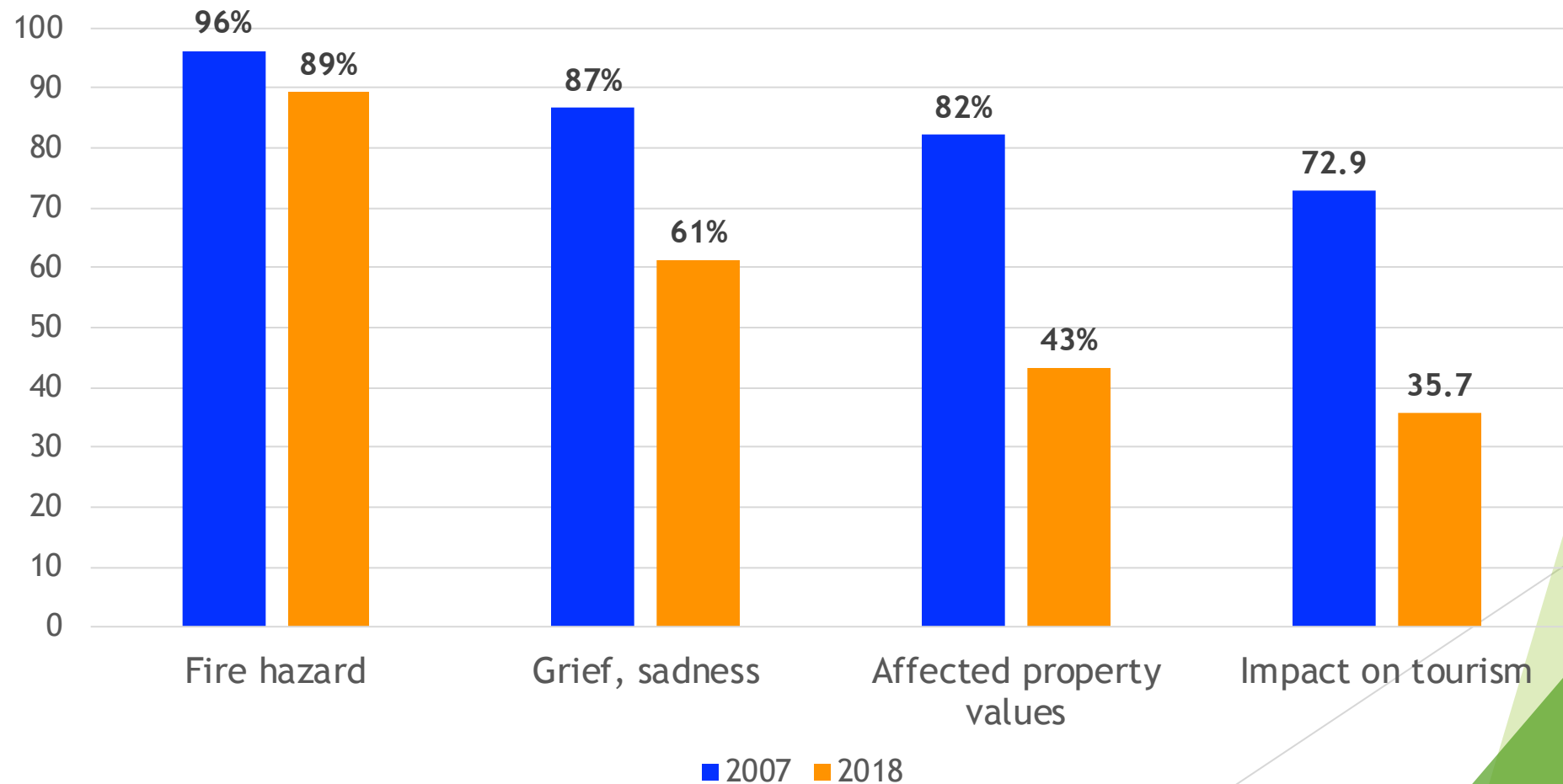


Findings: Perceived Impacts

- ▶ Creation of jobs and economic opportunity
- ▶ Logging and land clearing
- ▶ Expanded timber industry
- ▶ Loss of privacy
- ▶ Emergent view on property with loss of trees
- ▶ **Affected property values**
- ▶ **Fire hazard**
- ▶ Soil erosion and runoff
- ▶ Falling trees
- ▶ Visual/aesthetic loss
- ▶ **Impact on tourism**
- ▶ Tree cleaning cost
- ▶ Increased ecological awareness
- ▶ Trails and forests accessibility
- ▶ Availability of firewood
- ▶ Wildlife habitat
- ▶ Conflict over land use or management
- ▶ Emotions such as worry, fear, or anxiety
- ▶ **Emotions such as grief or sadness**

Findings: Impacts from MPB Activity

Perceived Impacts from MPB Outbreak (% Yes)

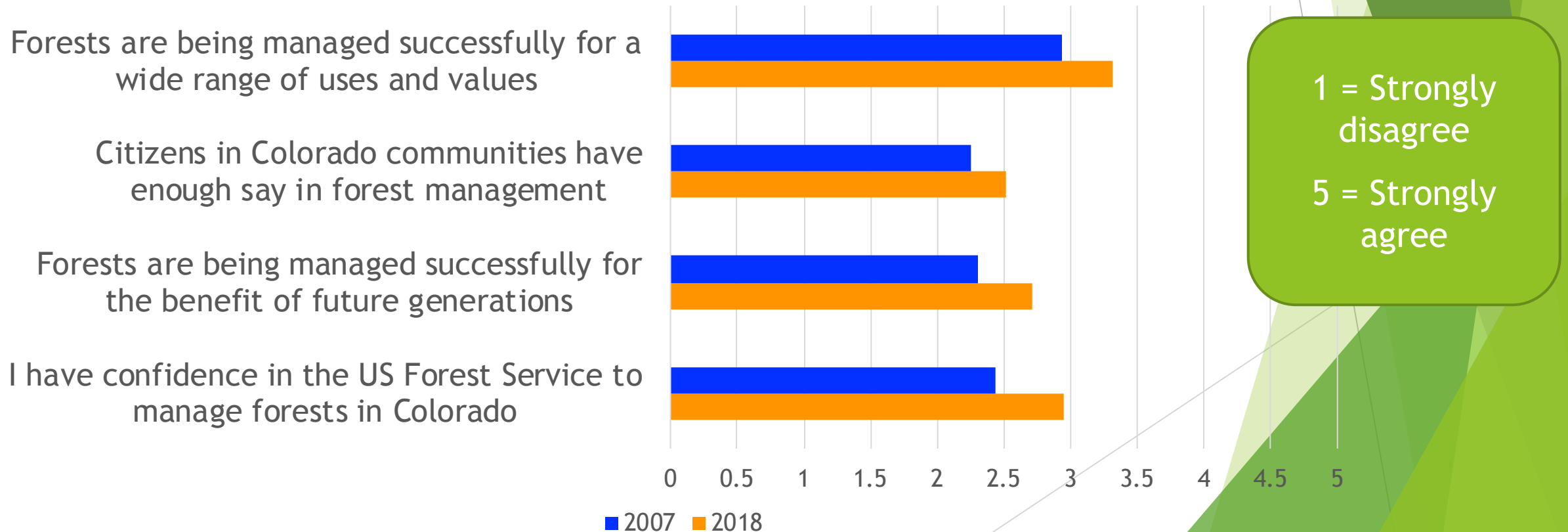


Findings: Perceptions of Forest Management

- ▶ Survey findings about management perceptions
- ▶ Convergence in acceptance and/or support of proactive forest management
- ▶ Importance of community context in understanding forest management relationships
- ▶ Acknowledgement of management constraints

Findings: Perceptions of Forest Management

Please indicate your agreement or disagreement with the following statements about forest management in and around your community.



Findings: Social License for Forest Management

- ▶ Calls for mitigation since outbreak
 - ▶ Increased following major fires
- ▶ Decrease in social barriers for management
 - ▶ Although community concerns exist
 - ▶ Visual aspects/aesthetics



Findings: Community Context Matters

- ▶ Relationship between residents, industry, and forest managers
 - ▶ Perceptions of industry and land managers
 - ▶ Historical acceptance of/opposition to management and industry
 - ▶ Perceptions of residents' voices being valued and included in management decisions

Findings: Management Constraints

- ▶ General acknowledgement of USFS constraints in managing forests
 - ▶ Resource constraints
 - ▶ Bureaucratic hurdles
 - ▶ Balancing concerns within and among communities
 - ▶ Educating and re-educating



Summary of Key Findings

- ▶ Perceptions of socioeconomic risks, such as impacts on tourism and property values, have generally declined while some environmental risk perceptions (e.g., forest fire and falling trees) have remained the same or increased since the last study
- ▶ Qualitative data point to a convergence in acceptance and/or support of proactive forest management
- ▶ Findings indicate the significance of community context in informing people's experiences of environmental change and risk perceptions

Acknowledgements

- ▶ This research is funded by the National Science Foundation (Award ID: 1733990).
- ▶ The research team would like to acknowledge the support of their respective institutions, University of Missouri-Columbia and University of Colorado Boulder Institute of Behavioral Science.
- ▶ Courtney Flint, Ph.D. (Utah State University) led the original 2006-2007 study and provides support for the current project.
- ▶ Forest Health Task Force, High Country Forest Collaborative, and the Northwestern Council of Colorado Governments
- ▶ Dr. Daniel Williams at the Rocky Mountain Research Station of the U.S. Forest Service
- ▶ Community members and stakeholders

Thank you!

- ▶ Jamie Vickery, Ph.D. (Jamie.Vickery@Colorado.edu)
- ▶ Hannah Brenkert-Smith, Ph.D. (HannahB@Colorado.edu)
- ▶ Hua (James) Qin, Ph.D. (QinH@Missouri.edu)

