# Understanding the human dimensions of river restoration: Evidence from the Clark Fork River, MT

## Elizabeth Covelli Metcalf

Associate Professor, W.A. Franke College of Forestry and Conservation

Elizabeth.Metcalf@umotana.edu

UNIVERSITY OF
**MONTANA**

MONTANA NSF
EPSCOR

MONTANA INSTITUTE
ON
ECOSYSTEMS

Core project team:
Cara Nelson, FCFC
Ray Callaway, OBE
Theresa Floyd, SOBA
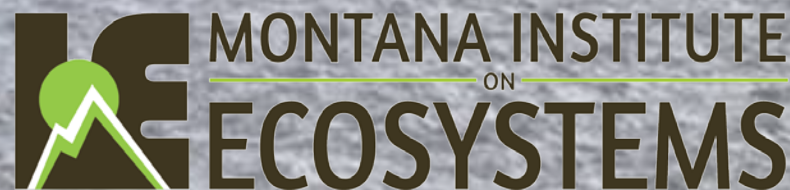Jakki Mohr, SOBA
Marc Peipoch, DBS

Annex project team:
Maury Valett
Alex Metcalf
Fred Lauer
Megan Keville
Peter Metcalf

# Social-ecological systems

- Global change shaping ecosystem dynamics from local to global systems
  - Damage and loss of natural resources (fisheries, lakes, forests, biodiversity)

- Human communities rely on these ecosystem services

- Multiple sub systems
  - Resource systems, governance systems, resource units, users

- "Scientific knowledge is needed to enhance efforts to sustain SES's, but the ecological and social sciences have developed independently and do not combine easily" (Ostrom 2009)

# Restoration Literature

- River restoration important for ecological factors and social factors (Bernhardt et al., 2005)

- Call for social and economic research (Hobbs, 2007)

- Documented that 'successful' river restoration efforts all had citizen involvement (Palmer et al., 2007)

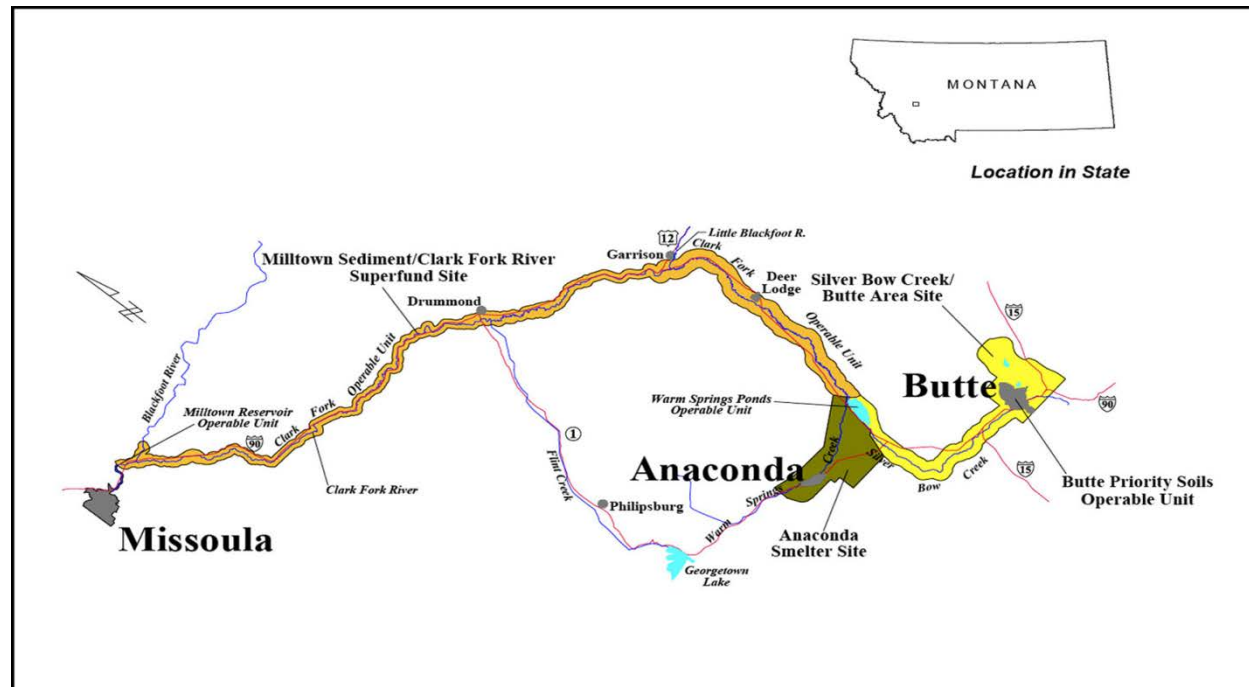- Public attitudes and public engagement (Tunstall et al., 2000; Petts, 2007)

# Clark Fork River Clean-up

- Superfund complex comprised of four operable units
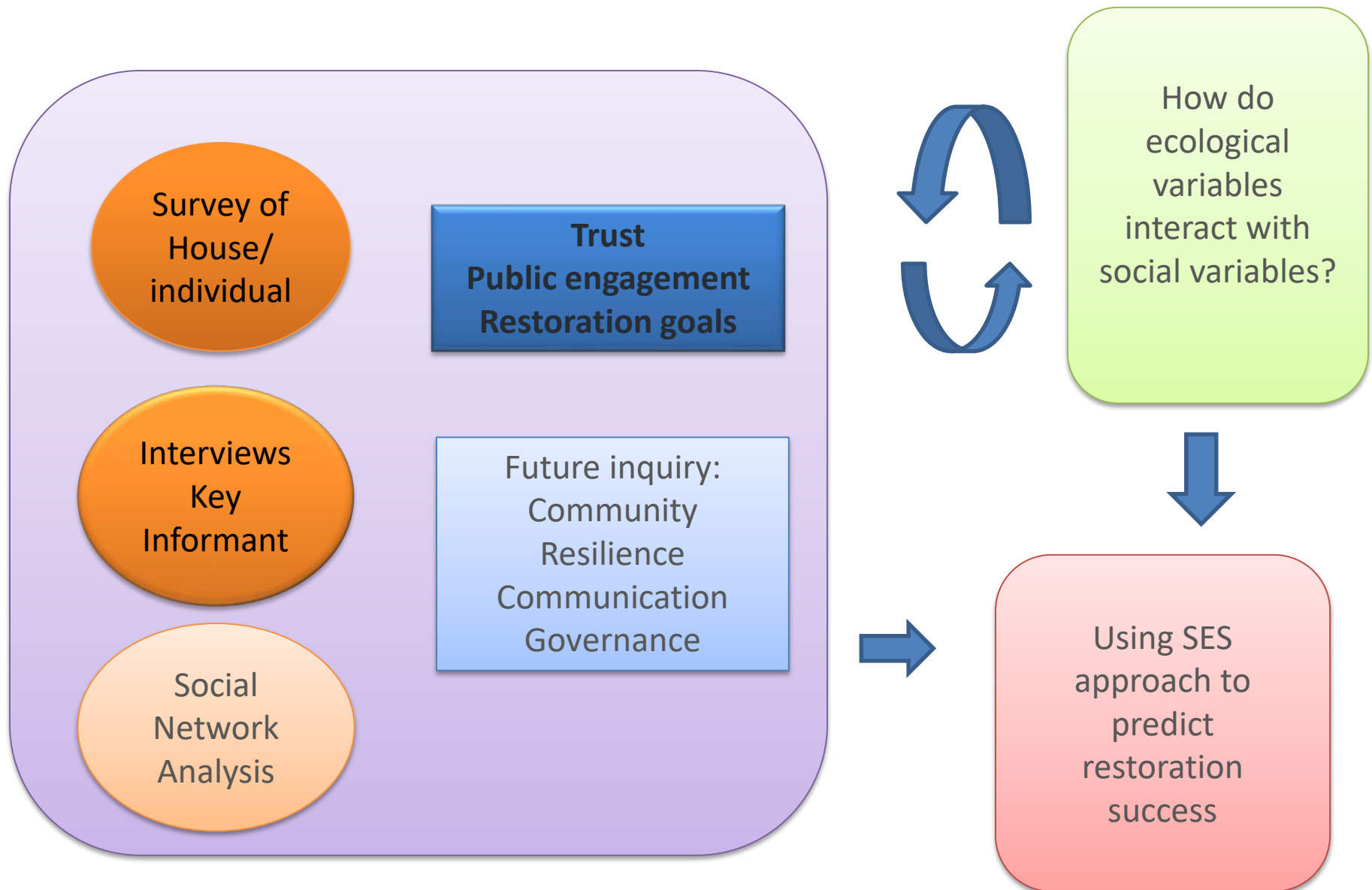- Ecosystem restoration is a key aspect of this Superfund plan

1981: Arsenic found in the drinking water

1983: State of Montana files lawsuit against ARCO

1999-2009: Three settlements totaling over $400 million

# Clark Fork SES approach

# Mixed method design

- Qualitative: semi-structured interviews (summer 2013)

- Measures: Success, constraints, relationships, information, restoration goals

- Purposive, chain referral sampling

- 40 interviews conducted in total

- Quantitative: Survey of residents in Milltown/Bonner area (winter 2016)

- Measures: Success, restoration goals, public engagement, trust

- Intercept method (e.g knock on doors)

- Initial sample consisted of 894 addresses (response rate 29%)

# In-depth interviews

# Survey

**Outfitter & Guides**
n=1

**Agencies:**
State , Federal, Tribal
n=13

**Restoration Businesses**
n=7

**NGO's**
n=8

**Citizens**
n=123

**Landowners along Clark Fork**
n=10

**Citizen groups**
n=2

Key findings

# Restoration goals

- CERCLA law: protect human health and environment

- Goals varied by stakeholder group
  - "Healthy" fish populations
  - Clean water
  - Opportunities for recreation
  - Bank stabilization

# Restoration goals

| Item | M | SD |
|---|---|---|
| Quality wildlife habitat | 4.7 | 0.7 |
| Human health | 4.7 | 0.6 |
| Quality of fish/aquatic habitat | 4.6 | 0.7 |
| Economic health of communities | 4.4 | 0.7 |
| Access to quality recreation experiences | 4.3 | 0.9 |
| Increased tourism in local communities | 3.5 | 1.2 |
| Aesthetic quality of the landscape | 4.3 | 0.9 |
| Clean water | 4.9 | 0.5 |
| Controlling invasive species | 4.5 | 0.7 |
| Healthy river vegetation | 4.6 | 0.7 |

Likert Scale 1 "strongly disagree" to 5 "strongly agree"

# Trust building

- Critical in natural resource decision making

- Focus on trust in agency
  - Domains for trust: procedural, affinitive, dispositional

*"You have to build trust one person at a time…you have to be patient. And you have to be careful that you don't make any blunders along the way, because there's people looking for you to reveal your hand that you really don't give a damn about agriculture and that all you want is to preserve fish"* (NGO personnel)

# Trust across stakeholders

- Time delays in the settlement and actual progress on the ground

- Government mistrust (western mentality)

- How public is engaged in the process

- Good communication, building relationships, and appropriate public engagement builds trust

# Trust measures

| Item | M | SD |
|------|---|-----|
| People are generally interested in their own welfare | 4.1 | .8 |
| The MT DEQ thinks like me | 2.4 | 1.1 |
| DEQ personnel really care what happens to me | 2.6 | 1.1 |
| DEQ personnel did a good job of communicating with the public | 2.7 | 1.2 |
| I could relate to DEQ personnel | 2.7 | 1.1 |
| DEQ personnel were easy to get along with | 3.3 | 1.0 |
| DEQ personnel were outsiders | 3.5 | 1.1 |

Likert Scale 1 "strongly disagree" to 5 "strongly agree"

# Public engagement (+)

*"public engagement and interest and maybe the (NGO) deserves a lot of that credit, because they've been in it for the long haul and have done a lot to make sure the public voice was heard and to get the public involved. I think it's been one of the more outstanding processes I've ever been involved in"* (Tribal entity)

- Depends on location
- Public comment
- Citizen groups
- Site tours
- Newsletters
- Public meetings

# Public engagement (-)

- Landowners not engaged
- Process was determined before public input
- 'Closed door' negotiations
- Relates to mistrust

*"One group too late to the party was the rancher's group. I think that active engagement from ranchers, from the beginning, other than frightened pushback, would have been incredibly helpful, 'cause they know that land better than anybody at the moment...I think we're gonna pay that price as the cleanup goes along"*
*(State agency)*

# Public engagement measures

| Item | M | SD | α |
|---|---|---|---|
| Process control | 3.1 | 1.1 | .87 |
| I had sufficient opportunity to comment on the river restoration process | 3.2 | 1.3 | |
| There were ample opportunities for public input | 3.4 | 1.2 | |
| The local community was involved in the decisions making process | 3.0 | 1.2 | |
| I was able to participate in decisions about the river restoration | 2.7 | 1.2 | |
| Decision control | 2.7 | 1.1 | .89 |
| Public comment were seriously considered | 2.9 | 1.2 | |
| Minds were made up before the public had a chance to comment | 2.4 | 1.2 | |
| Public comment felt meaningless | 2.8 | 1.2 | |
| Final decisions balanced the concerns for all people | 2.9 | 1.2 | |

Likert Scale 1 "strongly disagree" to 5 "strongly agree"

# Discussion: Building Trust

- Buy-in: getting the right people involved
  - General public
  - Landowners

- Landowner engagement
  - Get foot in door
  - Use existing relationships

- Early and often
  - Engage people at the onset
  - Stay connected over time
  - Move beyond public comment

RESEARCH ARTICLE

# The role of trust in restoration success: public engagement and temporal and spatial scale in a complex social-ecological system

Elizabeth Covelli Metcalf[1,2], Jakki J. Mohr[3], Laurie Yung[1], Peter Metcalf[1], David Craig[1]

RESEARCH ARTICLE

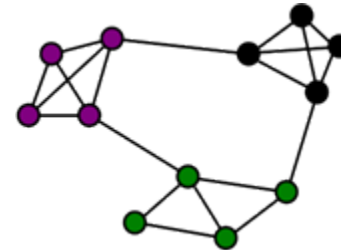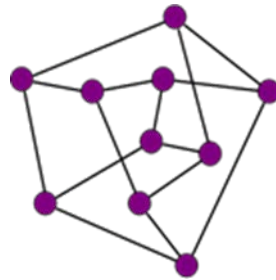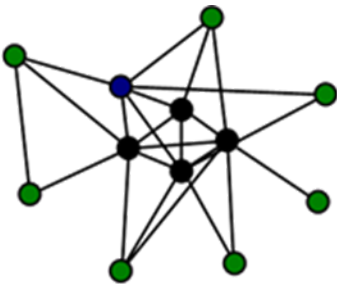# The business perspective in ecological restoration: issues and challenges

Jakki J. Mohr[1,2], Elizabeth Covelli Metcalf[3]

Lauer, F.I., A.L. Metcalf, E.C. Metcalf, J.J. Mohr. (In Press). Public engagement in social-ecological systems management: An application of social justice theory. Manuscript forthcoming at Society and Natural Resources.

# Social network theory
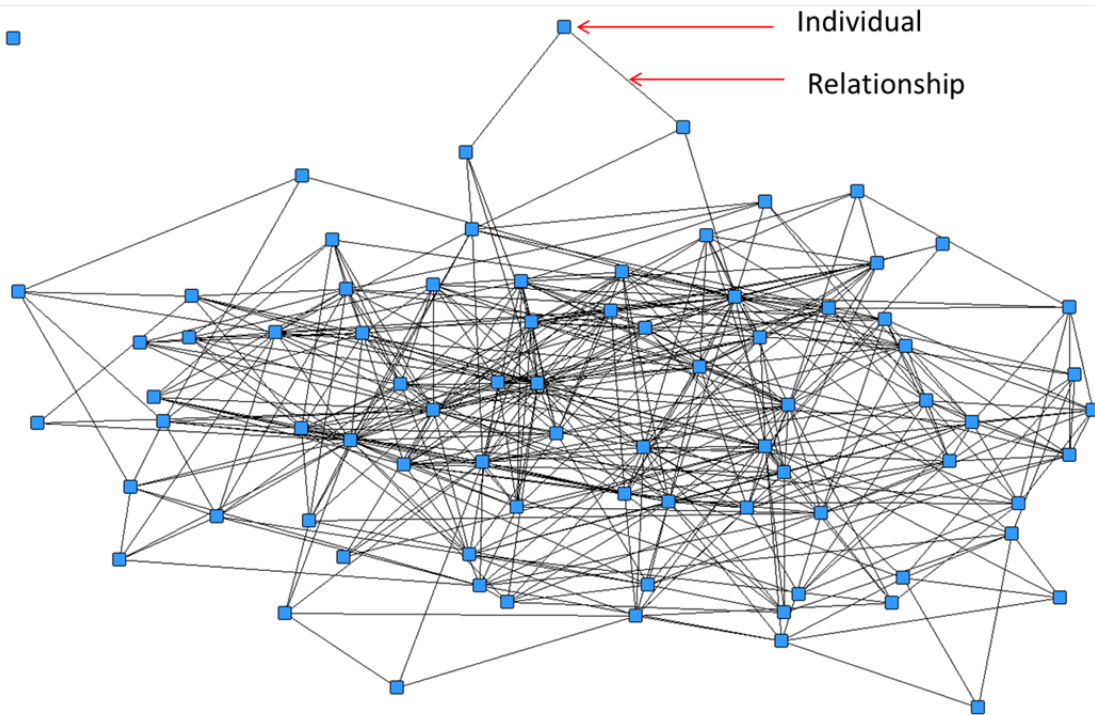


- Individuals are embedded within networks of interconnected social relationships

- These networks act as a kind of "informal" structure

- Network properties provide opportunities and constraints...
  - and thus affect individual and group outcomes

Thank you

Questions?