

Spectrum of River Restoration in Left Hand Watershed

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River Program Manager



the
**Watershed
Center**

The Watershed Center

We protect and restore watersheds for people and the environment using a collaborative, science-based approach.



Mines

Floods

Fire

Resilience



Our Watersheds

Boulder County's watersheds provide multiple benefits.



Clean Water



Local Food



Recreation

What's the problem?

Natural disasters and human land use threaten our quality of life.



Mines



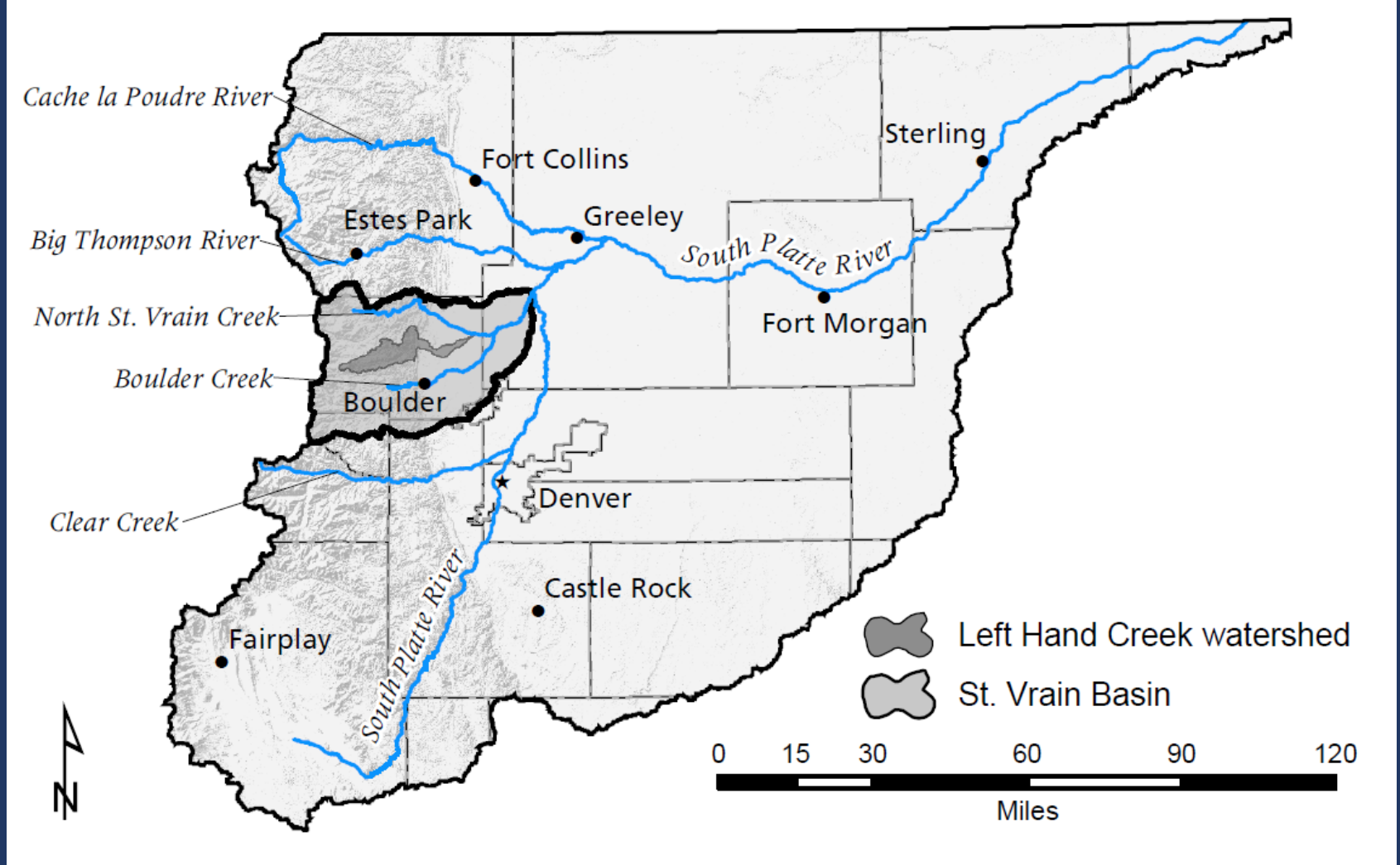
Floods



Fire

River Restoration in Left Hand Watershed

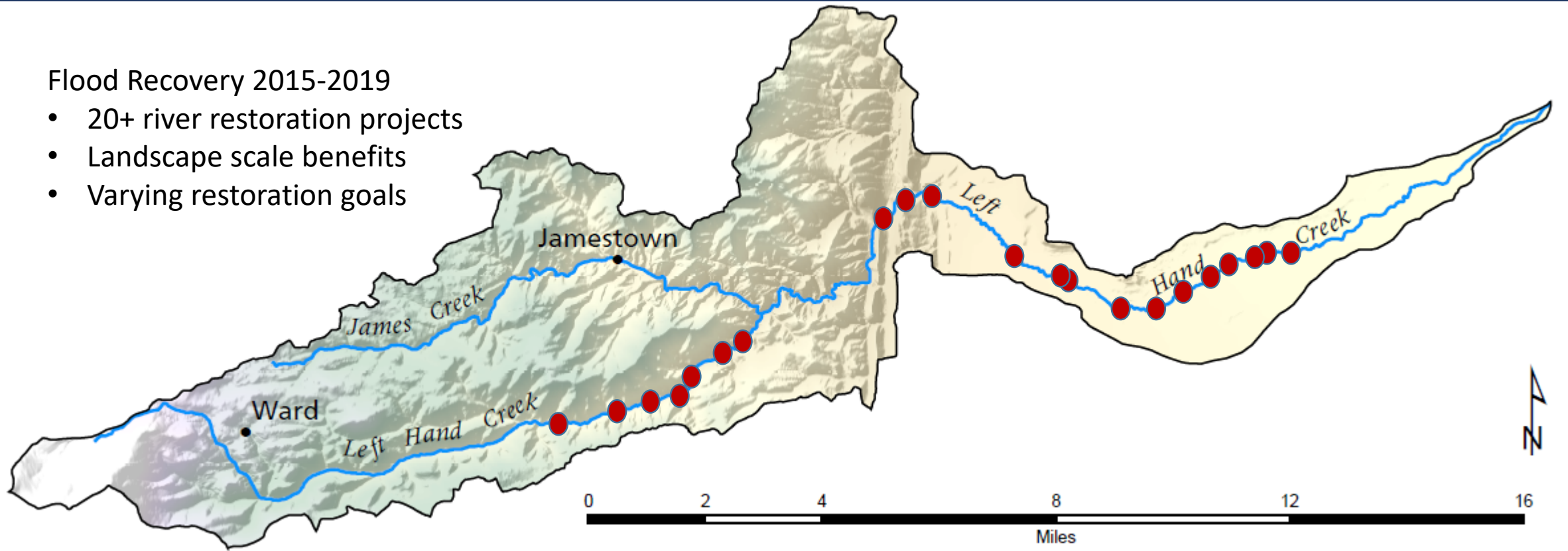
Addressing flood recovery and future climate resilience



Flood Recovery Work

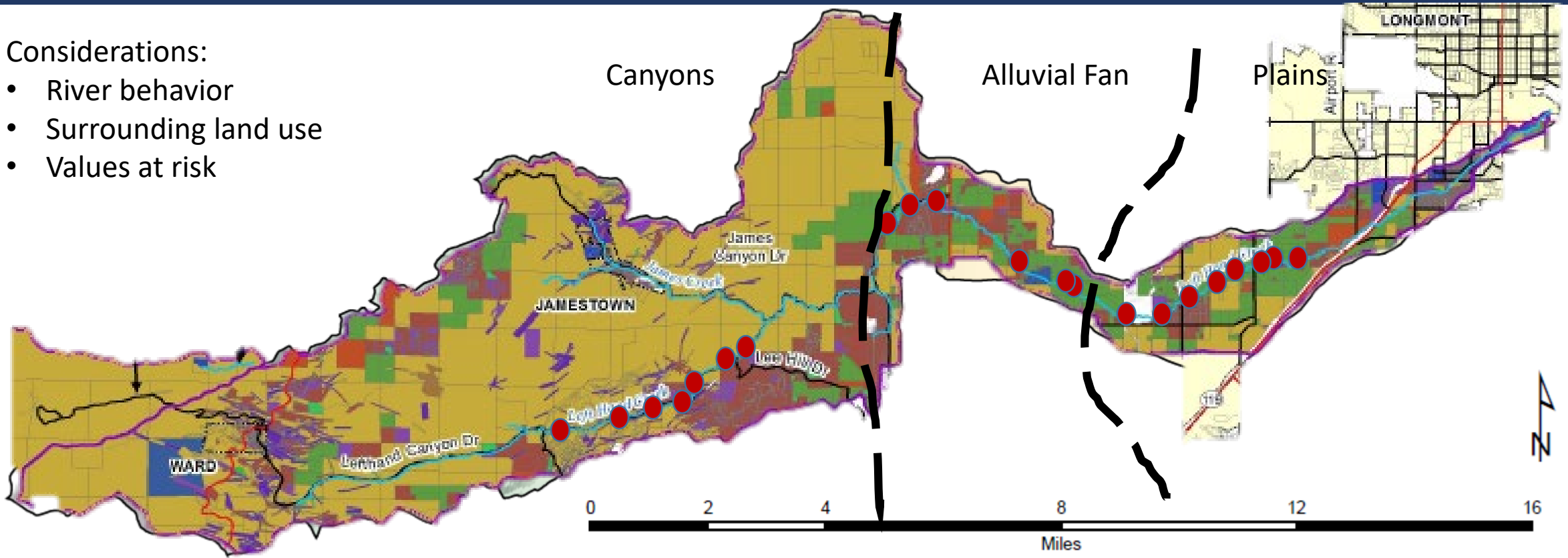
Flood Recovery 2015-2019

- 20+ river restoration projects
- Landscape scale benefits
- Varying restoration goals



Considerations for Project Goals

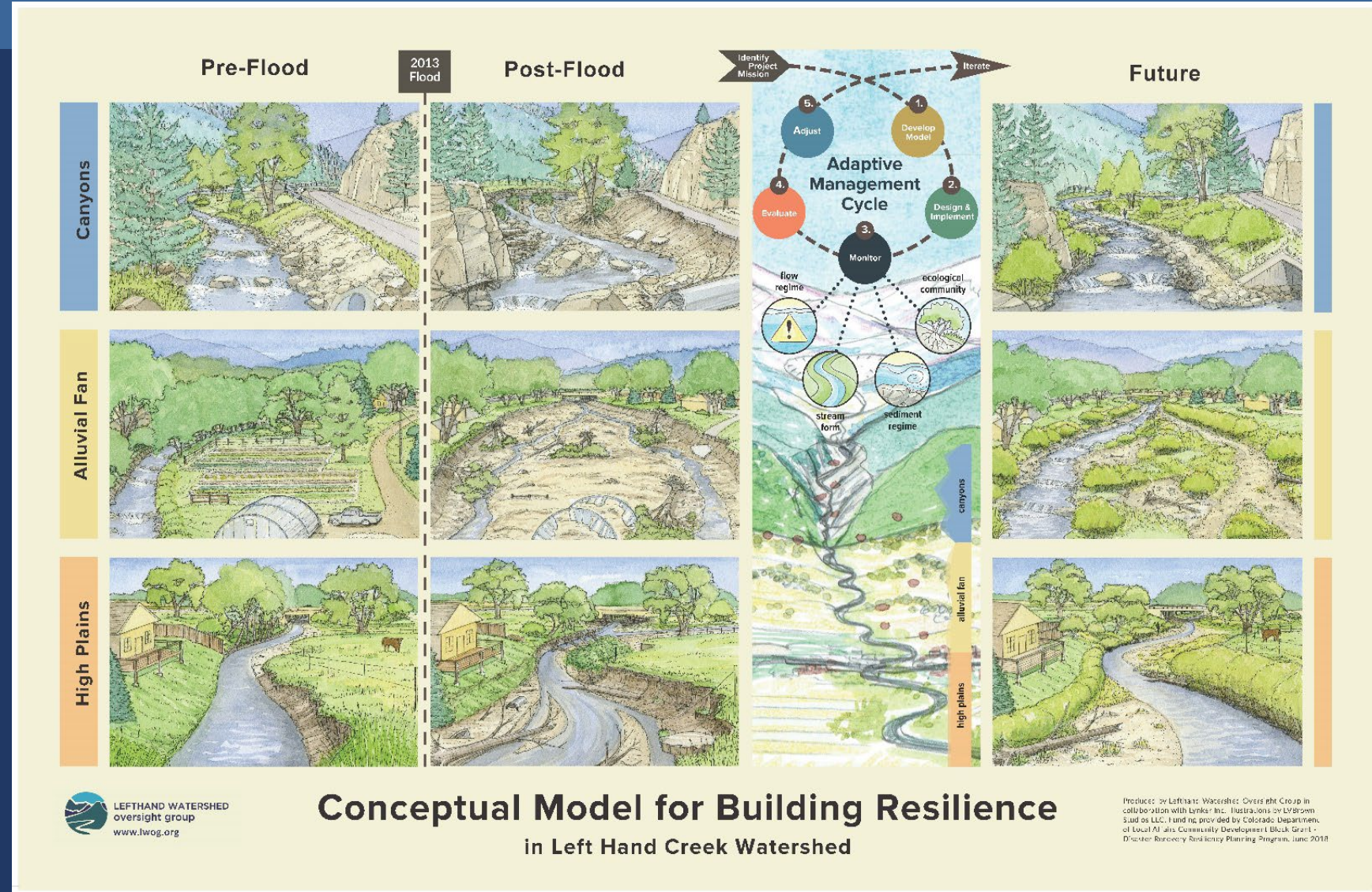
- Considerations:
- River behavior
 - Surrounding land use
 - Values at risk



Legend				
Property Type				
■ AFFORDABLE RESIDENTIAL	■ APARTMENT	■ INDUSTRIAL	■ PART EXEMPT	■ STATE ASSESSED
■ AGRICULTURAL	■ COMMERCIAL	■ MINOR STRUCT/VL	■ POSS INTEREST	■ VACANT LAND
■ AG_MIXED	■ EXEMPT	■ MIXED USE	■ RESIDENT LAND	
	■ IMP ONLY	■ NATURAL RESRC	■ RESIDENTIAL	

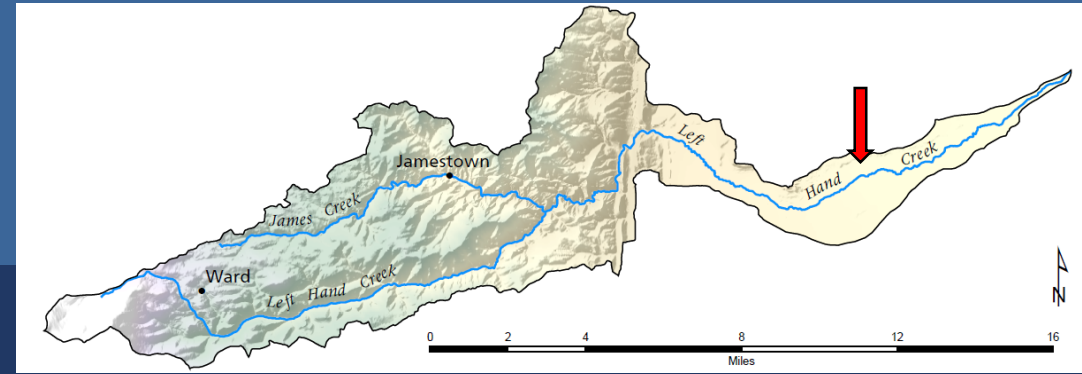
Spectrum of Restoration Goals

- Reducing hazards and increasing flood safety
- Stabilizing banks and reducing active erosion
- Improving ecological conditions and climate resilience
- Improving homeowner access to the creek
- Maintaining or improving water quality



Protecting Infrastructure

Promoting river transport

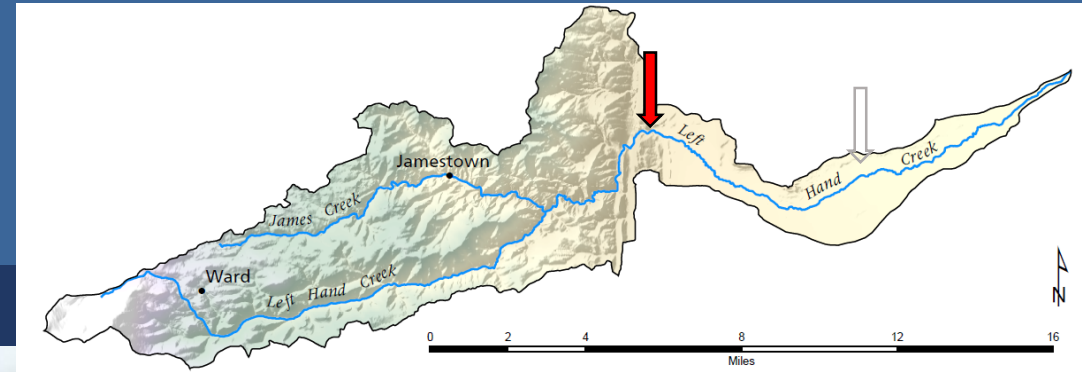


Post-Flood Conditions,
11-28-16



Post-Restoration Conditions,
8-11-17

Protecting Neighborhood and Improving Habitat



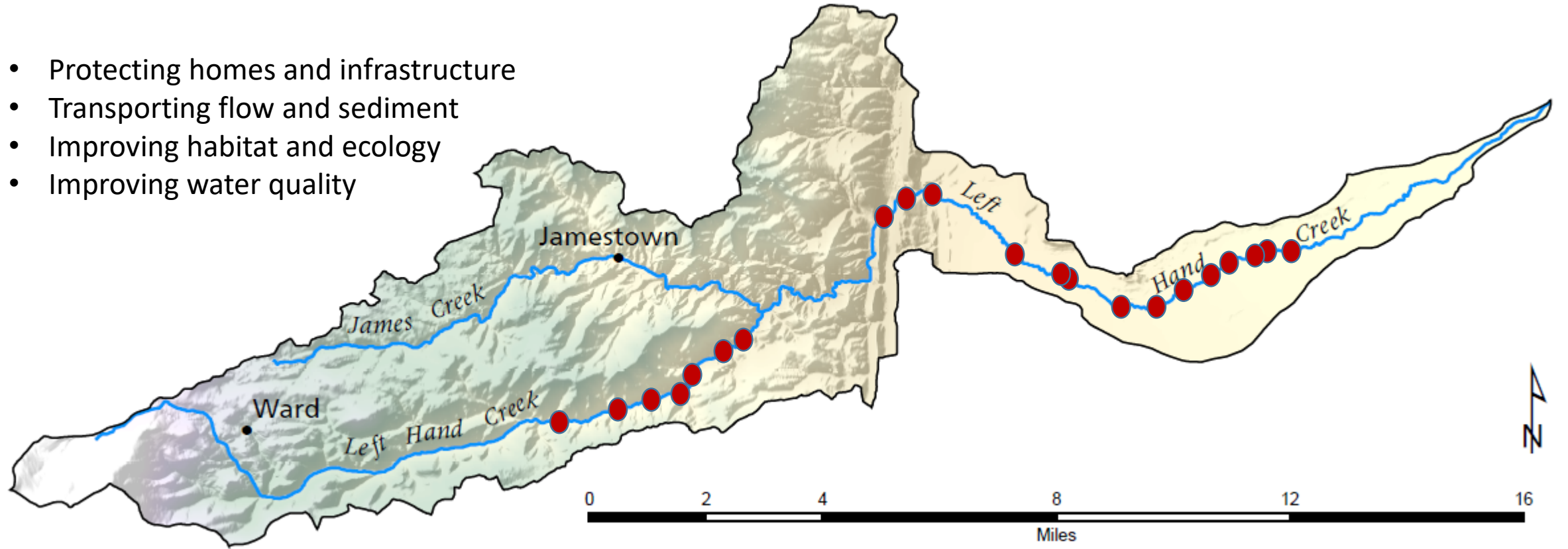
Wood Revetment During Construction,
Fall 2016



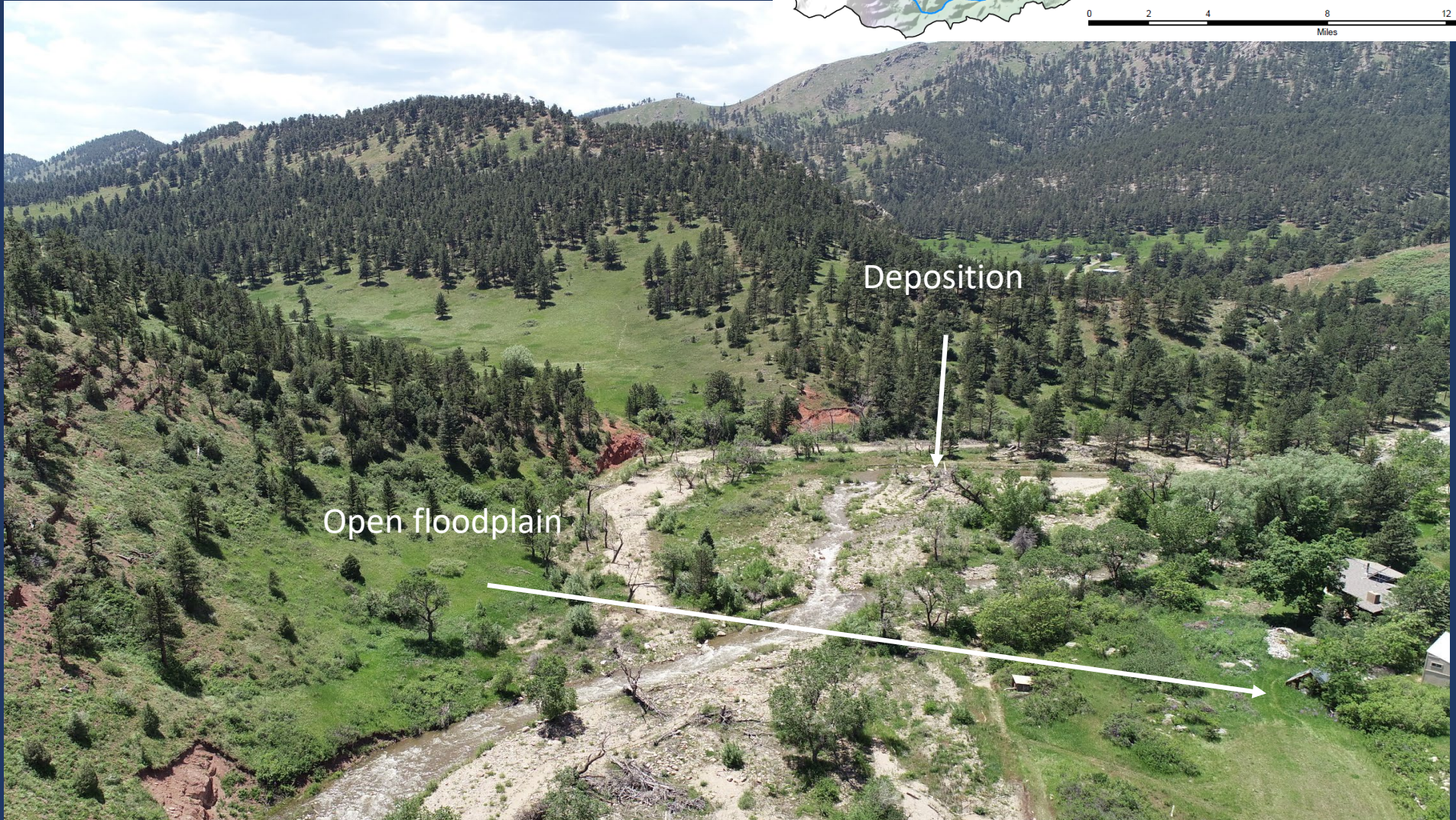
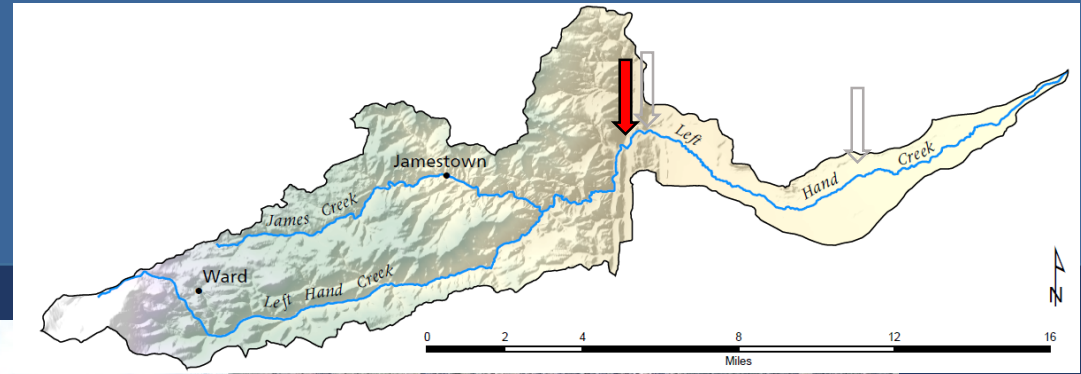
Post-Restoration Wood Revetment,
Summer 2017

Flood Recovery Work: Cumulative Benefits Throughout the Watershed

- Protecting homes and infrastructure
- Transporting flow and sediment
- Improving habitat and ecology
- Improving water quality



Climate Resiliency Projects



Climate Resilience Restoration

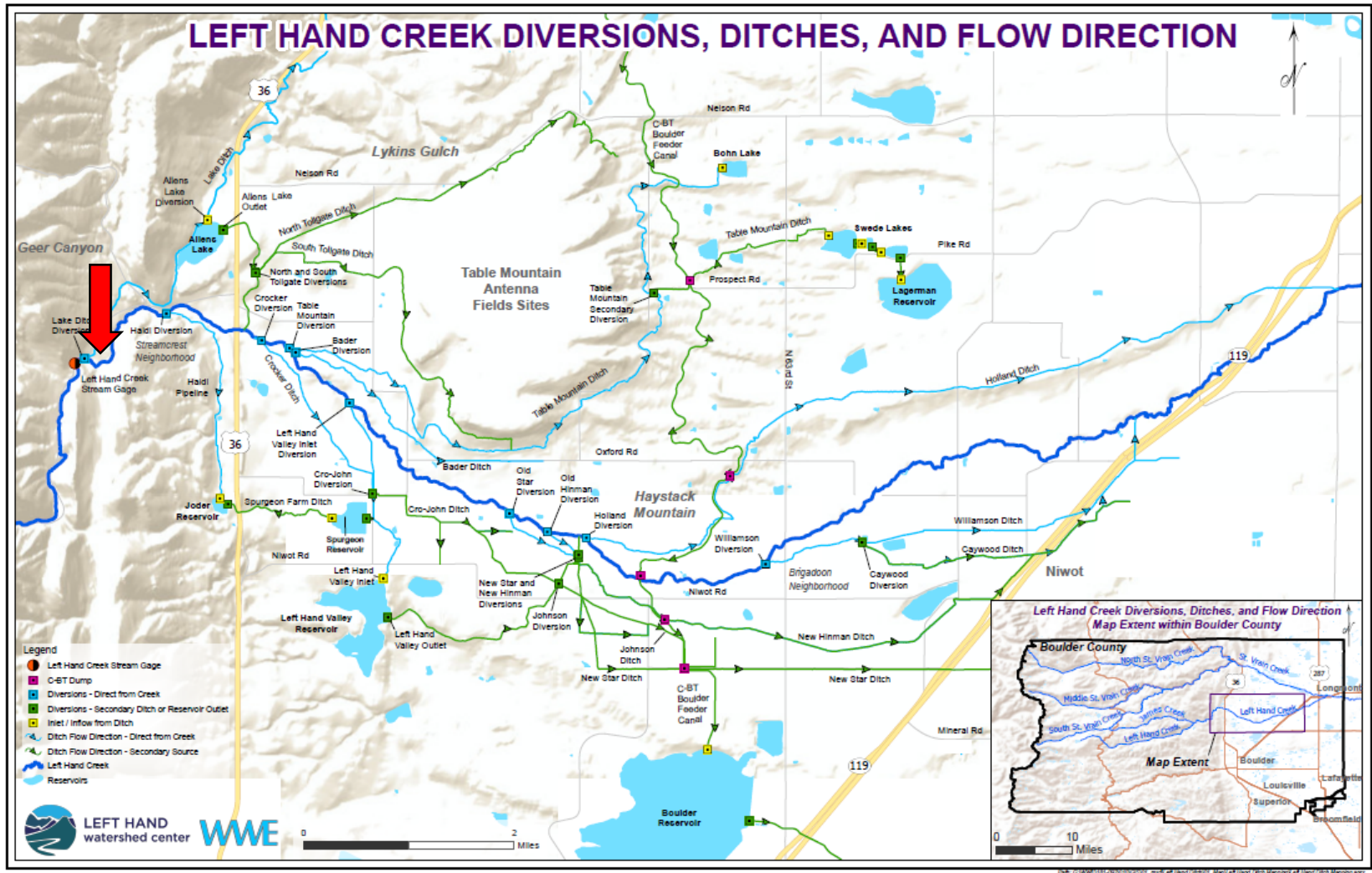


Starts with Collaboration

- Water Managers
- Biologists
- Land Managers
- Design + Build Team
- Landowners



Shared Goals



- Improved ditch maintenance
- Promoting sediment deposition during high flows



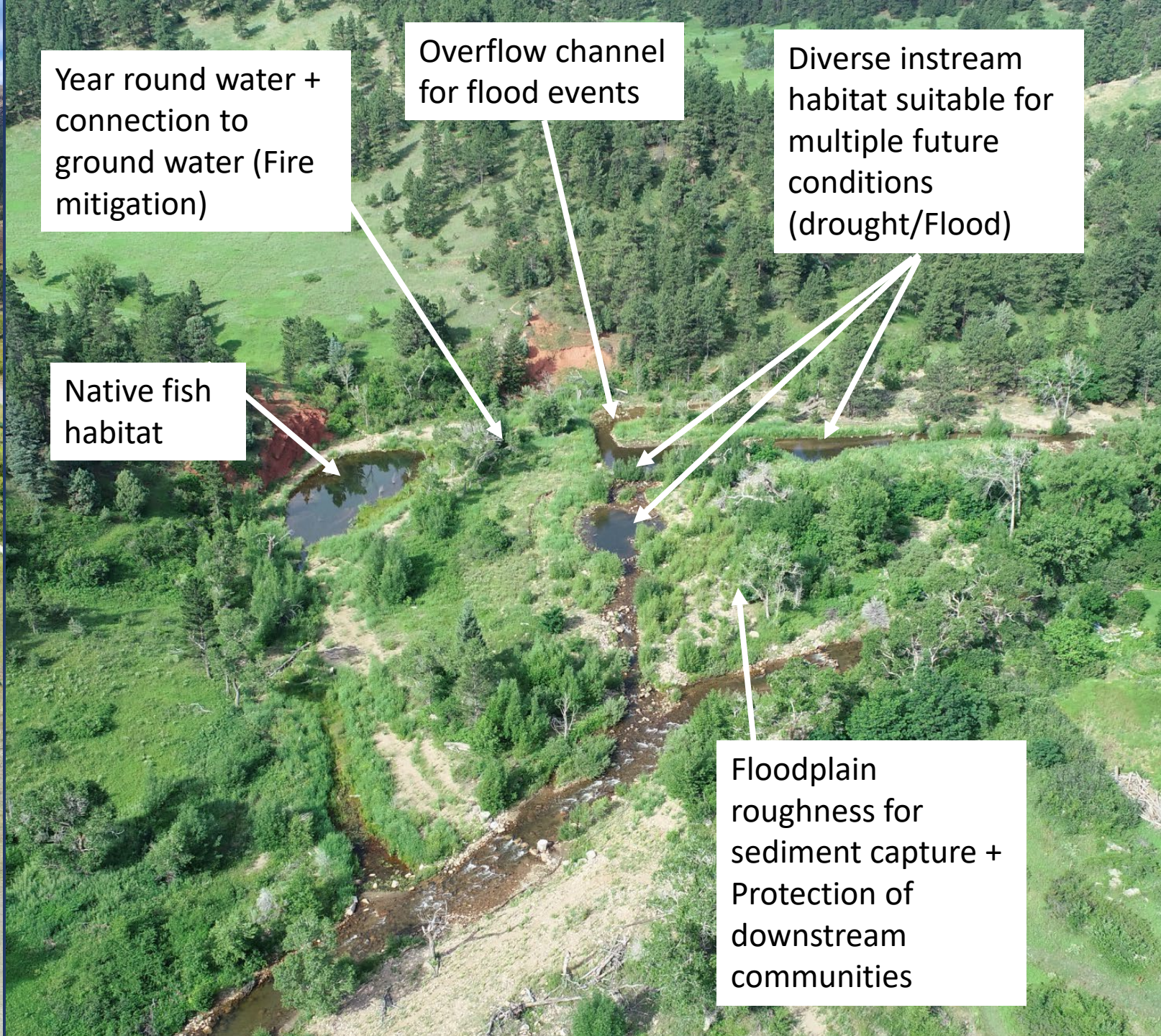
Expectations



1-year



5-years



Year round water + connection to ground water (Fire mitigation)

Overflow channel for flood events

Diverse instream habitat suitable for multiple future conditions (drought/Flood)

Native fish habitat

Floodplain roughness for sediment capture + Protection of downstream communities

Beaver Dam Analog Techniques



Multiple Benefits



Sediment capture and reduced ditch maintenance



Seasonal high flow attenuation & groundwater recharge

Biodiversity and sustained native fish populations



Restoration Ideas on the Road!



Thank you!

Questions?

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