

Upper Fourmile Creek Stream Restoration

**Public Meeting
March 15th, 2016**

Meeting Format:

- **Welcome & Introductions**
- **Presentation**
- **Group forum Q&A session**
- **Open House**



Introduction – Purpose

Why are we here today?

➔ *Share the Current Stream Design Progress*

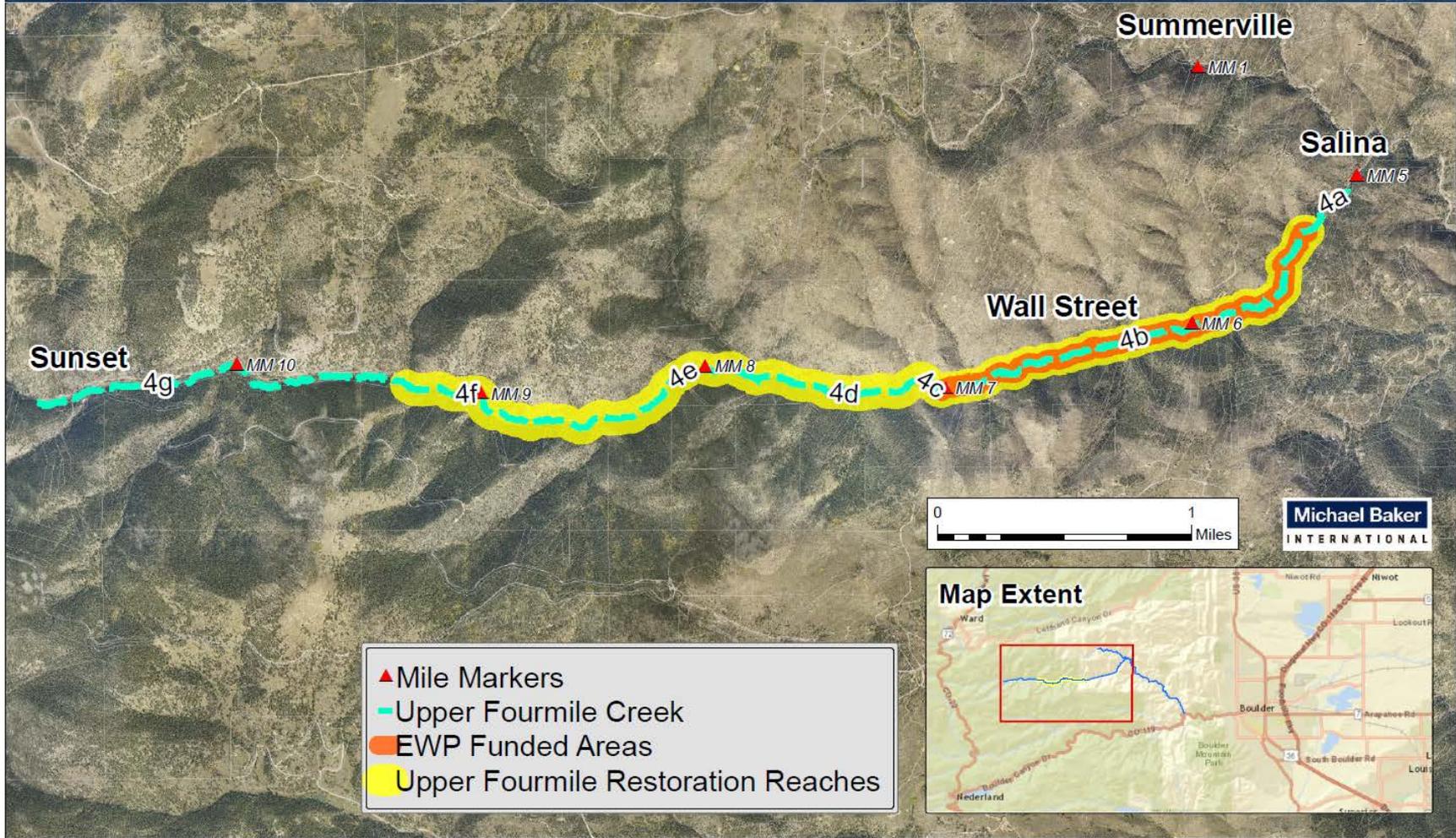
➔ *Obtain community feedback*

Introduction – Funding Update

- **Funding**
 - **Design**
 - **CDBG-DR Planning funds**
 - **Construction**
 - **Emergency Watershed Protection (EWP) funds**
 - **Additional funds could be provided by**
 - **CDBG-DR**
 - **Boulder County**

Background – Project Limits

Upper Fourmile Creek - Stream Restoration Work



Background – Summary of Impacts

- Total project length = 4.2 miles
- Impacts of 2013 Flood
 - Substantially altered creek geometry
 - Severely impacted/destroyed aquatic habitat
 - Stripped wetland and riparian vegetation
 - Damaged/destroyed roadway infrastructure and private bridges
 - Damaged/destroyed homes
- Many sub-reaches currently in a state of instability
- Master Plan completed in 2014



Background – Instabilities

Channel bank erosion



Channel incision



Background – Instabilities

Channel widening



Channel deposition



Background – Project Purpose

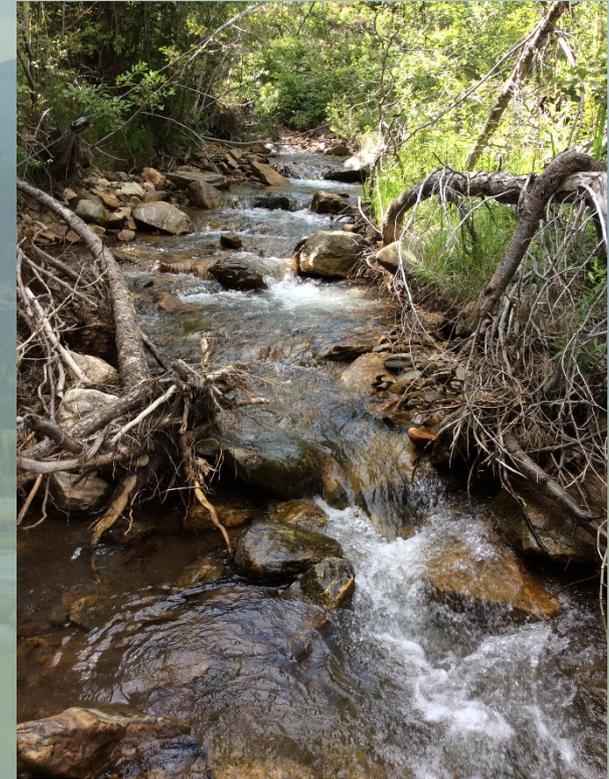
- 1. Limit Damage to Private Residences**
- 2. Improve Road/Creek Interaction**
- 3. Expedite Recovery**
- 4. Address Additional Damage Since the Flood**

Background – Project Goals

- ✓ **Restore the natural channel**
- ✓ **Design features in context with current watershed setting**
- ✓ **Restore aquatic and terrestrial habitat**
- ✓ **Restore ecological connectivity**
- ✓ **Reduce flood risk**
- ✓ **Integrate the restoration strategies with the adjacent
Fourmile Canyon Drive project**

Background – End Result

.....to make it look like nothing was done



Background – Design Team

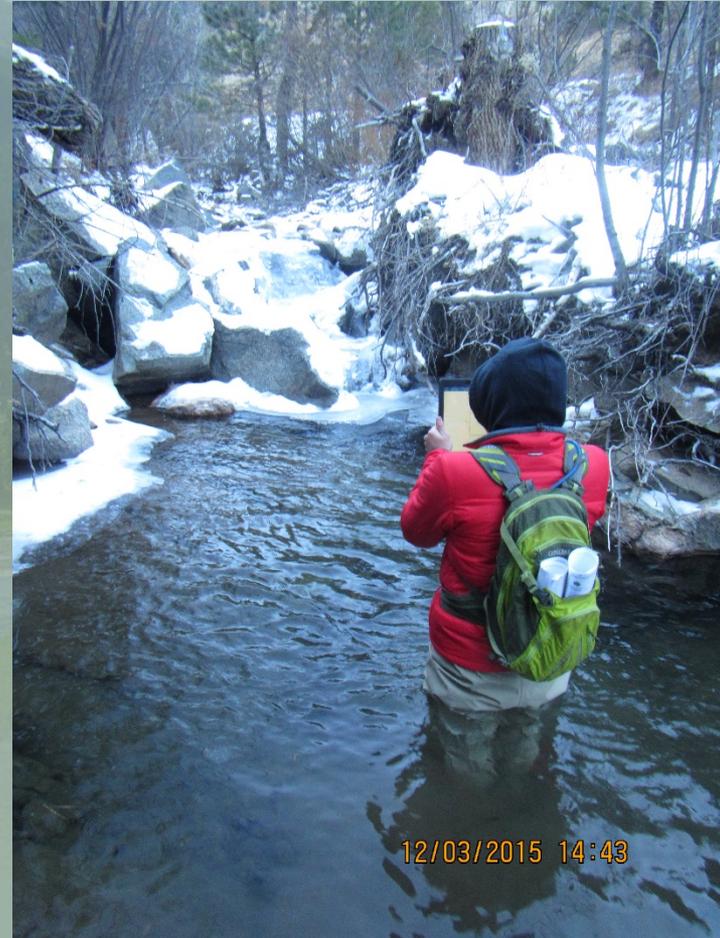
- **Michael Baker International**
 - **Watershed & geomorphic assessments**
 - **Natural channel design**
- **AlpineEco (Andy Herb)**
 - **Ecologic assessment**
 - **Revegetation plan**
- **GEI (Ashley Fickey)**
 - **Aquatic habitat assessment**
 - **Aquatic habitat design**

Anticipated Project Schedule

- **Final Design Completed – Spring 2016**
- **Permitting – Spring 2016**
- **Begin Construction – Fall 2016**

Design Process

1. Assessment
2. Design
3. Constructability review



Stream Assessments

- **Assessments are the foundation for design**
 - Pre-flood
 - Project reach (post-flood)
 - Reference reaches
- **Quantify the degree of impairment**
 - Biology
 - Ecology
 - Geomorphology
 - Hydrology
- **Formulate a basis of design based on scientific methods**



Stream Assessments

- **Opportunities**
 - Areas to preserve (i.e. stable reaches)
 - Floodplain storage (flood & sediment)
 - Functioning habitat features
 - Additional aquatic and terrestrial habitat
 - Unique watershed features
 - Vegetation
- **Constraints**
 - Homes
 - Culvert/bridge crossings
 - Roads
 - Utilities, wells, septic systems
 - Ponds



Design Philosophy

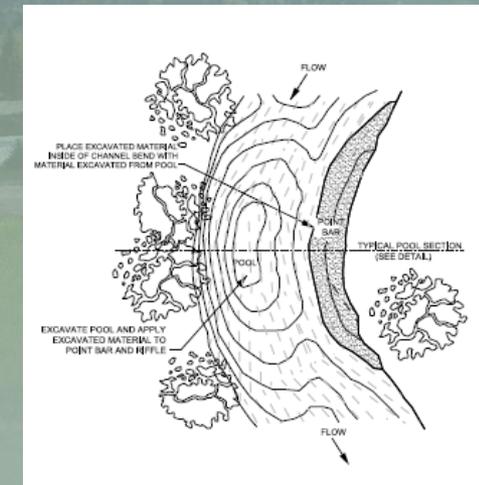
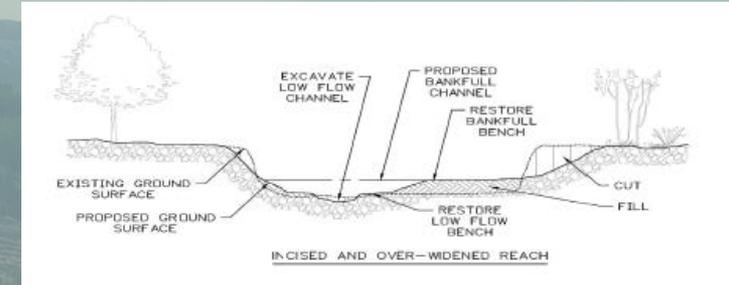
To establish physical, chemical, and biological functions of the river system that are **self-regulating and emulate the natural stable form within the constraints imposed by the larger landscape conditions**. It is important to restore all components of a stream system that are required to make it sustainable, rather than just focusing on what is visible. – Natural Channel Design Definition (Wildland Hydrology)

Design Approach

- Restore Upper Fourmile Creek in the pre -or post-flood channel corridor
- Restore the natural channel geometry
- Reconnect the channel to the adjacent floodplain where possible
- Revegetate the wetland, riparian, and upland zones with ecotypic (native) plant species
- Implement structure only where necessary

Design Steps

1. Identification of areas to preserve (i.e. minimal work)
2. Classify reach type and design approach
3. Apply reference reach survey information
4. Verify with hydraulic and sediment transport modeling
5. Design other elements



Private Culvert/Bridge Crossings

- Some have been replaced
- Inappropriately designed crossings
 - At risk for washing out
 - May cause unanticipated flooding
 - Post significant stability risk to the creek
 - Are a barrier to fish passage
- Working with Boulder County and Fourmile Coalition to provide design guidance for future replacements



Constructability Review

- 30% design, preliminary design, 65%, etc.
- “Design-Build Ready” plans
- **Constructability Review**
 - Performed by an independent Construction Manager
 - Ensures adequate level of detail provided to begin construction
 - Ensures design is constructible
 - Have engaged local contractors on other projects
- Post-design field walk

Next Steps

- **Final 30% Design**
 - **Additional design elements**
 - **Additional detail**
 - **Visually intuitive to contractor**
- **Obtain Participant Agreement**
- **Obtain permits**
- **Contractor selection**
- **Implementation!**
 - **Likely through design-build**

Participant Agreement Forms

- **Forms**
 - **Required for construction**
 - **Required to obtain funding from Emergency Watershed Protection (EWP) program**
- **Overview & Intent**
 - **For stream restoration work only**
 - **Wont change anything on private property without permission**
 - **Will provide 24-hour notice (minimum) before entering property**
 - **Operations & Maintenance access for up to 3 years required by EWP**

Participant Agreement Forms

- **Sign forms by April 15th (ideally)**
- **Options**
 - **Sign tonight**
 - **Send to Boulder County via**
 - **E-mail**
 - **Mail**
 - **Setup individual meeting to discuss**

Community Discussion

Questions?

Community Discussion

Open House

Opportunity to ask questions and provide input on designs, such as:

- Are you **comfortable with the proposed improvements** on your property (e.g., where the creek will be located and how it flows/ meanders, in-stream features, bank stabilization, and revegetation)? If not, why? Do you have any **stream restoration customization requests**?
- Do you have a **well or septic system** that is on the creek side of your property? Is it within 50 feet of the current creek alignment? If so, can you send us a photo by March 21, 2016?

Community Discussion

Questions & Feedback

Fourmile Creek Recovery and Restoration

<http://www.bouldercounty.org/flood/creekrestoration/pages/fourmilecreek.aspx>

Contact Boulder County with feedback or questions, to submit a form or to be added to the community list serve:

- Stream Contact: Clarissa Hageman: 303-441-1610, chageman@bouldercounty.org
- Road Contact: Andrew Barth: 303-441-1032 - abarth@bouldercounty.org
- Boulder County Transportation Department, PO Box 471, Boulder, CO 80306, Boulder, CO 80203

Contact Fourmile Creek Watershed Coalition: Maya MacHamer, 303-449-3333, fourmilewatershed@gmail.com

We appreciate feedback by March 18th, 2016
Submit Participant Agreement Forms By April 15th, 2016