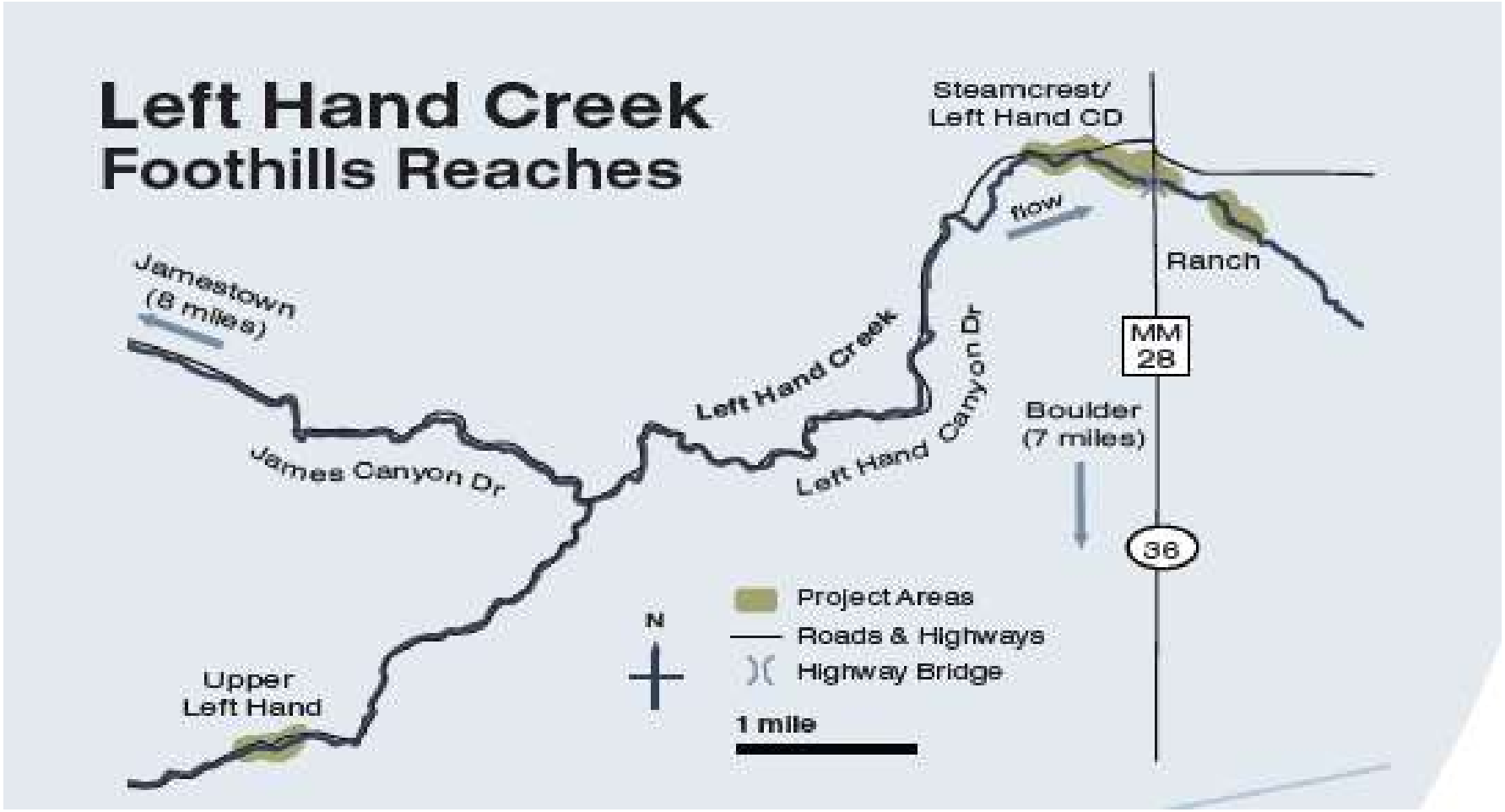
Communicating fluvial geomorphic process and risk to homeowners

Colorado EWP Phase II

2015-2017

Left Hand Creek Foothills Project

Kevin Pilgrim



Screenshot from Colorado EWP Success stories online at https://coloradoewp.com/success-stories-now-available

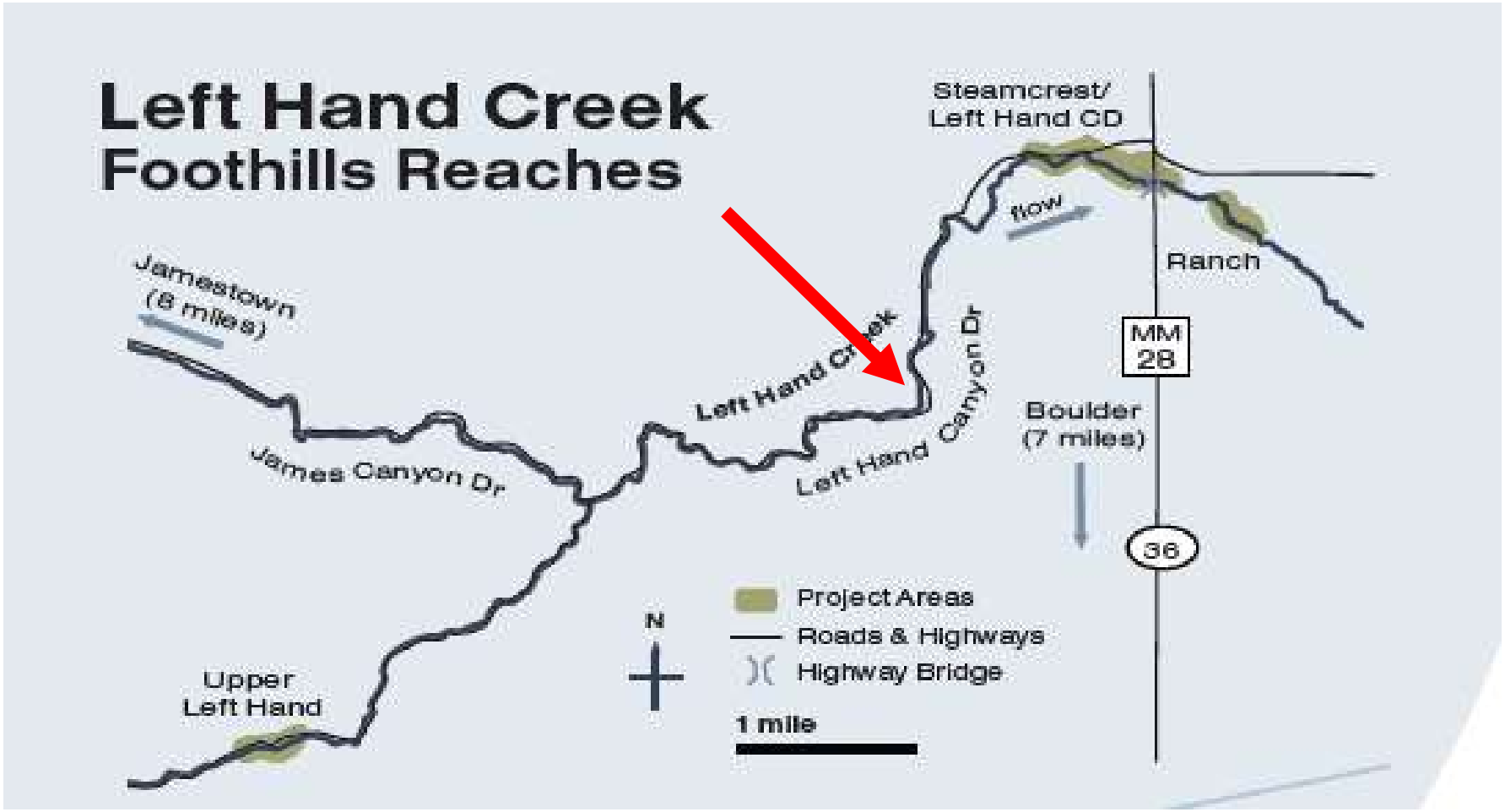
Hydrologic Evaluation of Left Hand Creek Watershed for CDOT (Jacobs, 2014)

- Rainfall data used Storm Precipitation Analysis System (SPAS)
  - Nexrad radar and climatological base maps and calibrated based on rain gages
- Rainfall totals ranged from 5 to 1000 year precipitation event depending on the time
- Built a rainfall – runoff model with HEC-HMS
- Peak flow estimates were based on
  - post flood high water marks
  - Gage analysis

Hydrologic Evaluation of Left Hand Creek Watershed for CDOT (Jacobs, 2014)

Table ES-2. Estimate of September 2013 Peak Discharge Recurrence Interval

Location	Estimated Discharge	Annual Chance Peak Discharge (cfs) Estimated					Estimated Recurrence Interval
	(cfs)	10%	4%	2%	1%	0.20%	(yr)
Upper Little James Creek	1,050	187	316	442	587	1,010	~ 500
Lower Little James Creek	1,800	423	730	1,036	1,386	2,425	100-500
James creek above Little James Creek	2,900	776	1,278	1,772	2,339	4,003	100 to 500
James Creek in Jamestown	4,800	912	1,502	2,095	2,777	4,834	~ 500
James Creek below Jamestown	3,300	954	1,647	2,395	3,304	6,195	~ 100
Left Hand Creek at Lickskillet Gulch	1,300	364	667	988	1,371	2,581	~ 100
Left Hand Creek below Old Stage Road	**3,520**	1,260	2,336	3,438	4,804	9,220	**50-100**

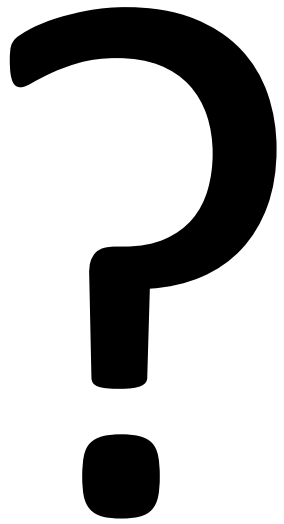


Screenshot from Colorado EWP Success stories online at https://coloradoewp.com/success-stories-now-available

Hydrologic Evaluation of Left Hand Creek Watershed for CDOT (Jacobs, 2014)

- Sources of uncertainty for the rainfall totals and peak flow estimates
- “NEXRAD can be highly questionable in the Colorado Front Range foothills”
- Spatial variability of the rainfall
- Flow estimates based on high flow marks affected by debris flow
- Gage analysis - Length of record for gages – 17 years
- Model error – simplicity of a 1 D clear water runoff model
- Roughness estimates

What does this mean?
When will the next large event happen again?



Money for restoration!!!!!!

- Project cost total was $5,061,385
  - ~$400,000 for design that needs to be done by August (starting in June)
  - Submit 30% design plans to Boulder County
  - Just kidding get it done by October for a community meeting

- Constraints
  - 99% of the land is private property
  - The river has to be in the same original channel per landowners

EWP Goals

1) Reduce hazards and protect life, safety and property.

2) Use federal and state funding effectively.

3) Enhance the health and resilience of stream corridors and their broader watersheds.

4) Build the capacity of watershed coalitions.

5) Advance a watershed-based approach to flood recovery hazard, **hazard identification**, and **risk communication**.

EWP Financial Constraints Funds MAY NOT

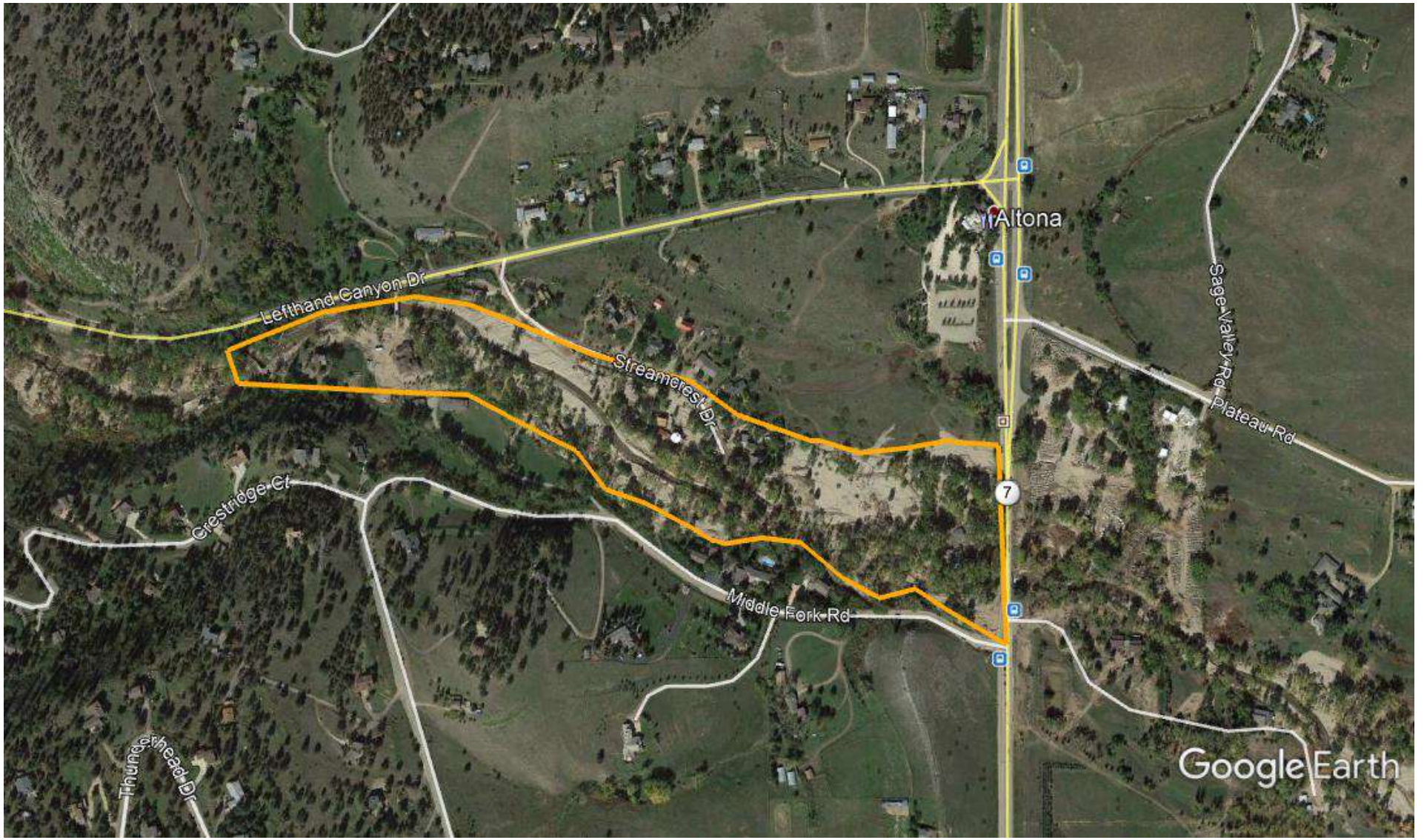
- Perform O&M, such as the periodic or routine work necessary to maintain the efficiency and effectiveness of a measure to perform as originally intended (e.g., removing sediment or debris from reservoirs or debris basins)
- Repair, rebuild, or maintain public or private transportation facilities (e.g., roads, ***bridges, culverts**) or correct damage to transportation facilities administered by Federal Highway Administration, Department of Transportation.

EWP Financial Constraints Funds MAY NOT

- Landscaping practices exclusively for aesthetic purposes

Homeowners Want

- Landscaping practices exclusively for aesthetic purposes


Altona
Lefthand Canyon Dr
Streamcrest Dr
Sage Valley Rd
Plateau Rd
Crestridge Ct
Middle Fork Rd
Thrungshead Dr
7
Google Earth

Erosive reaches- New channel

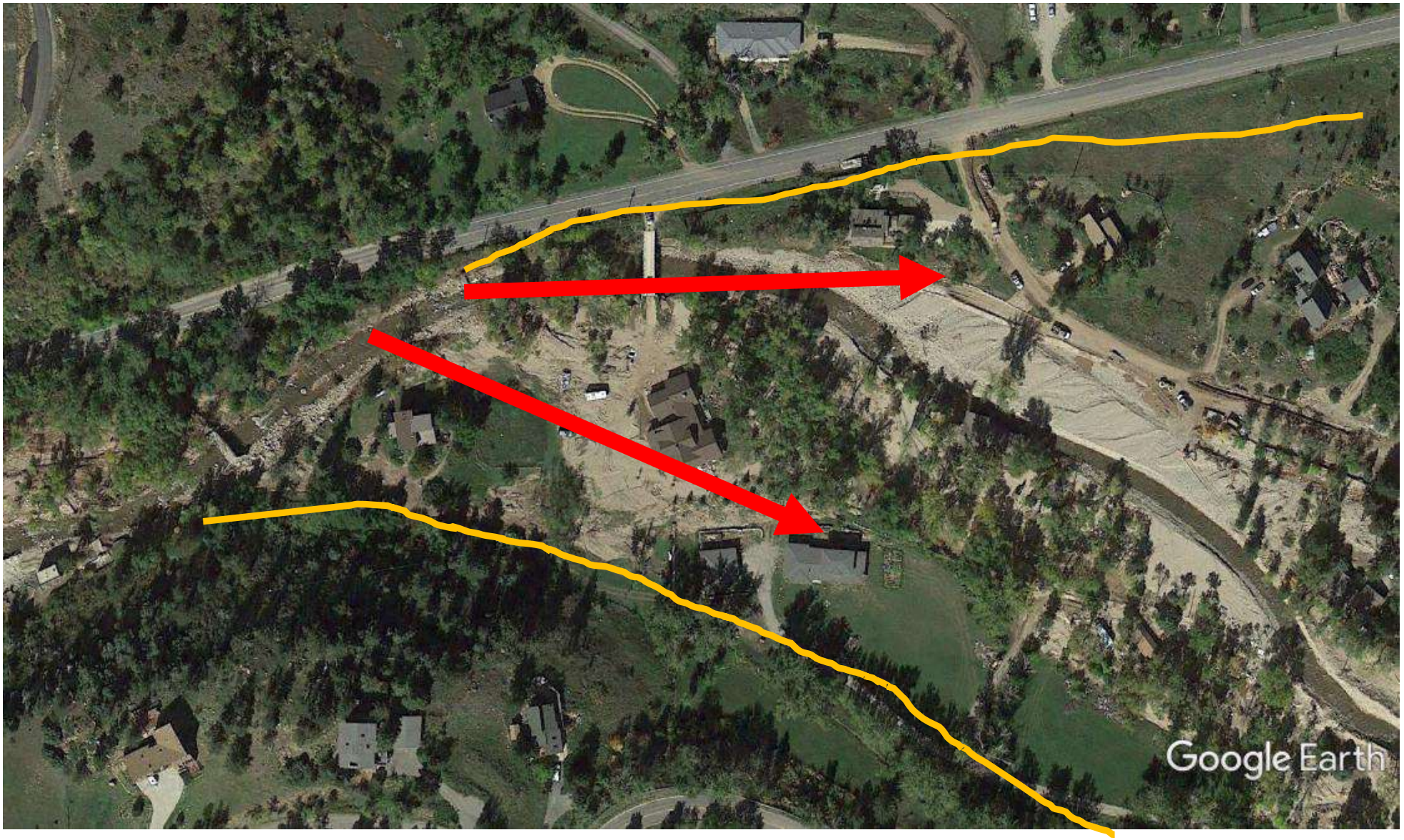


Banks eroded around bridges.



Depositional Zone Buried cars…..

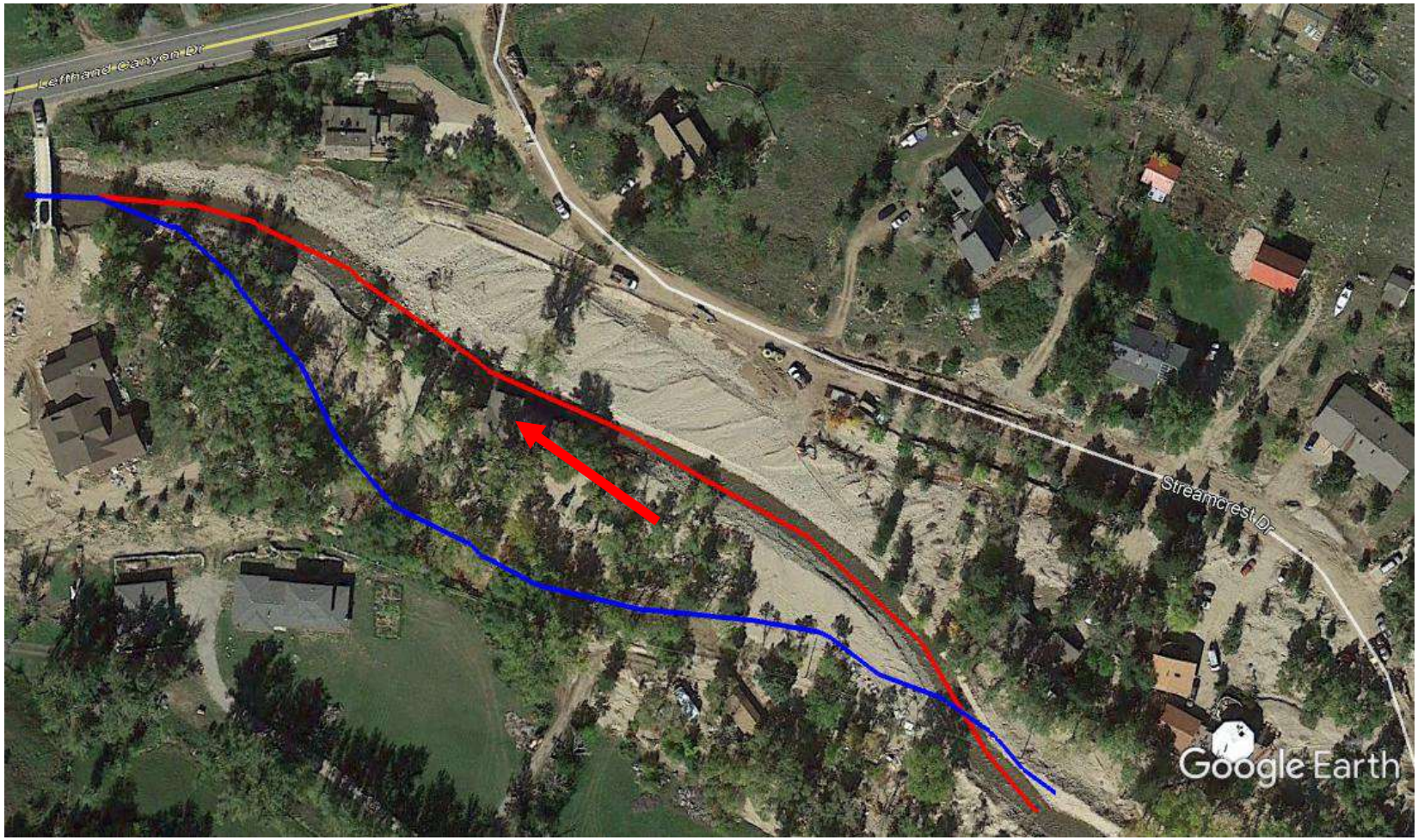



Google Earth

2012 Low Flow Channel

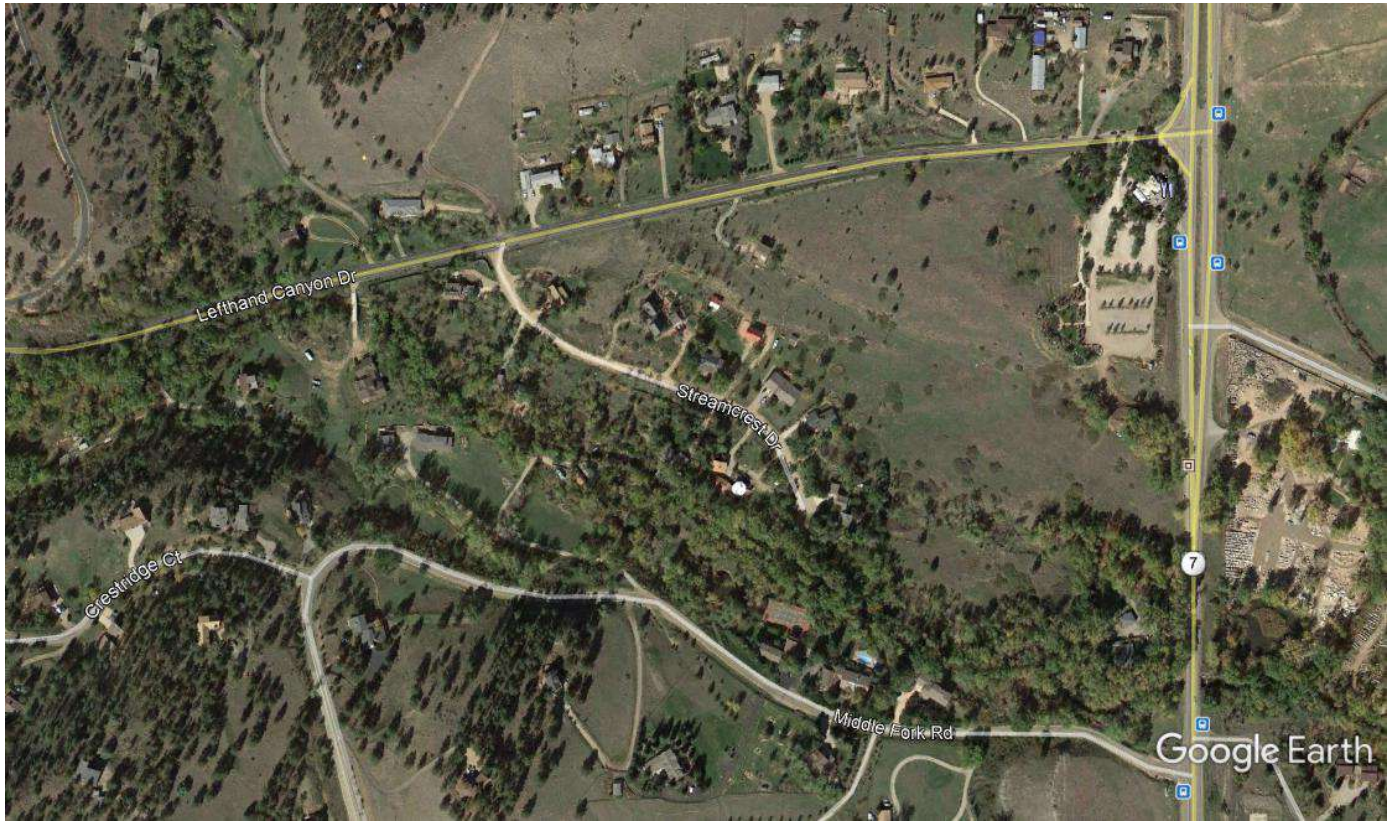


Post 2013 Flood Channel



Homeowner Goals

Put it back the way it was!



My Response

- I can't…..
- It's not safe
- Its not geomorphically appropriate
- You live on an alluvial fan
- Statistics! Probability! Blah…….

Homeowner Response

- Fear response – memories of the event would come back to them
- People facing fear don't hear very well
- "It won't happen again!"
- "Not in my lifetime"

My Response

- It happened before, it could happen again let's plan for it
- I cannot eliminate the flood risk, I can reduce the flood risk
- I can reduce the flood risk
- I can reduce the flood risk

(repeated for effect)

Homeowner Response

- "It won't happen again!"
- "Not in my lifetime"
- "Why do I have to give away my yard?"

- "I want my yard back!"

Lessons Learned

- Hold multiple community meetings
- Try to illustrate the designs instead of using design plans to communicate what things look like
- Be firm and fair with the limitations
- Consider hiring a mediator/communicator
- Stats don’t help
- Constant communication is required!
- Listen to people and try to hear them – Seek first to understand and then be understood (Franklin Covey)

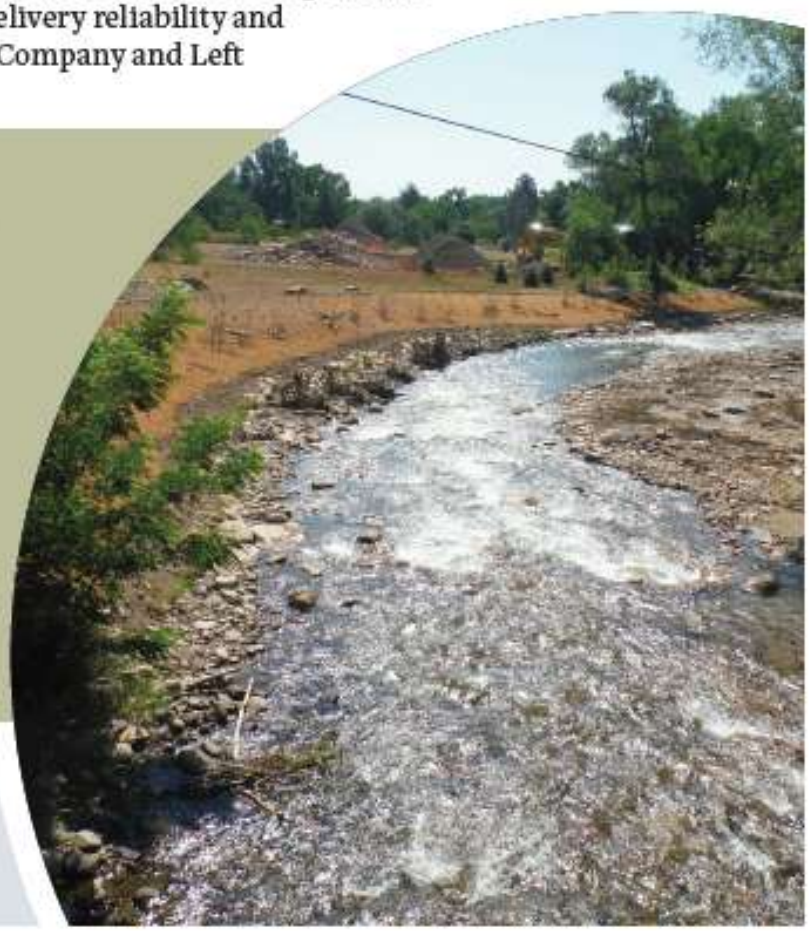
After

The completed project directly improves the ecology, safety, and quality of life for private landowners within the project areas, including improved home protection, landowner access, reduction of hazards, and enhanced riparian and aquatic habitat.

The rehabilitation of this reach benefits many residents and recent restoration projects downstream by reducing the risk of unstable sediments migrating downstream and causing further problems. In addition, this project improves water delivery reliability and reduces maintenance needs for the Left Hand Ditch Company and Left Hand Water District.

BY THE NUMBERS

- project length: 4,702 linear feet
- 30 participating landowners
- 37 in-stream structures
- 5,034 linear feet of bioengineered streambanks
- 7,963 willow & cottonwood live stakes
- 12 acres seeded



Post-construction channel with pool-riffle sequences, large wood structures to stabilize banks and increase roughness, a graded point bar on the inside of the meander bend, and planted native riparian vegetation.

Acknowledgements

- Lefthand Watershed Oversight Group (LWOG)
- Otak design lead
  - Julie Ash Engineer of Record
- Great Ecology
- Construction Team
  - FlyWater
  - Iron Woman
  - Wildlands Restoration Volunteers (WRV)


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