

Town of Jamestown Stream Corridor Master Plan Community Meeting #4

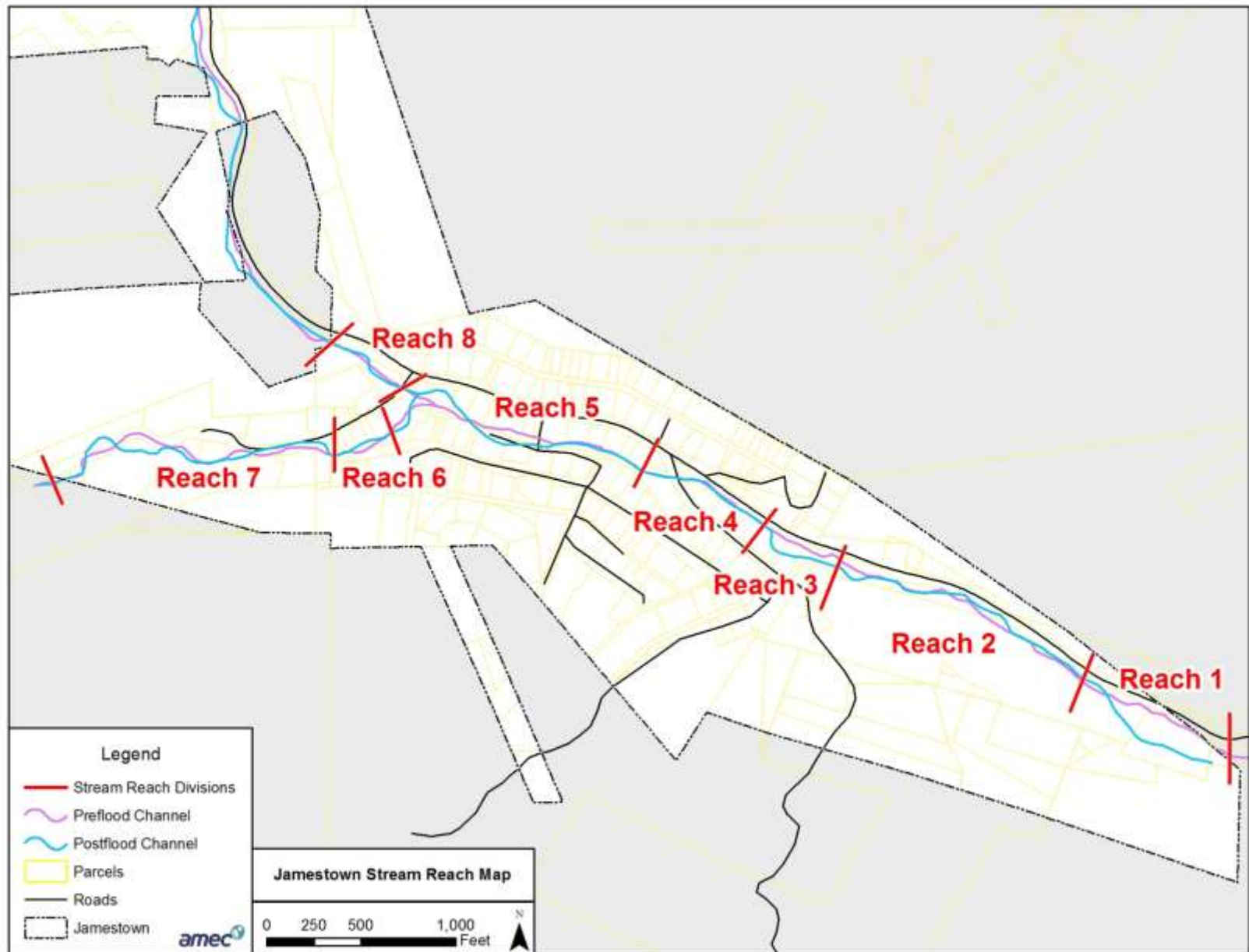
January 7, 2014



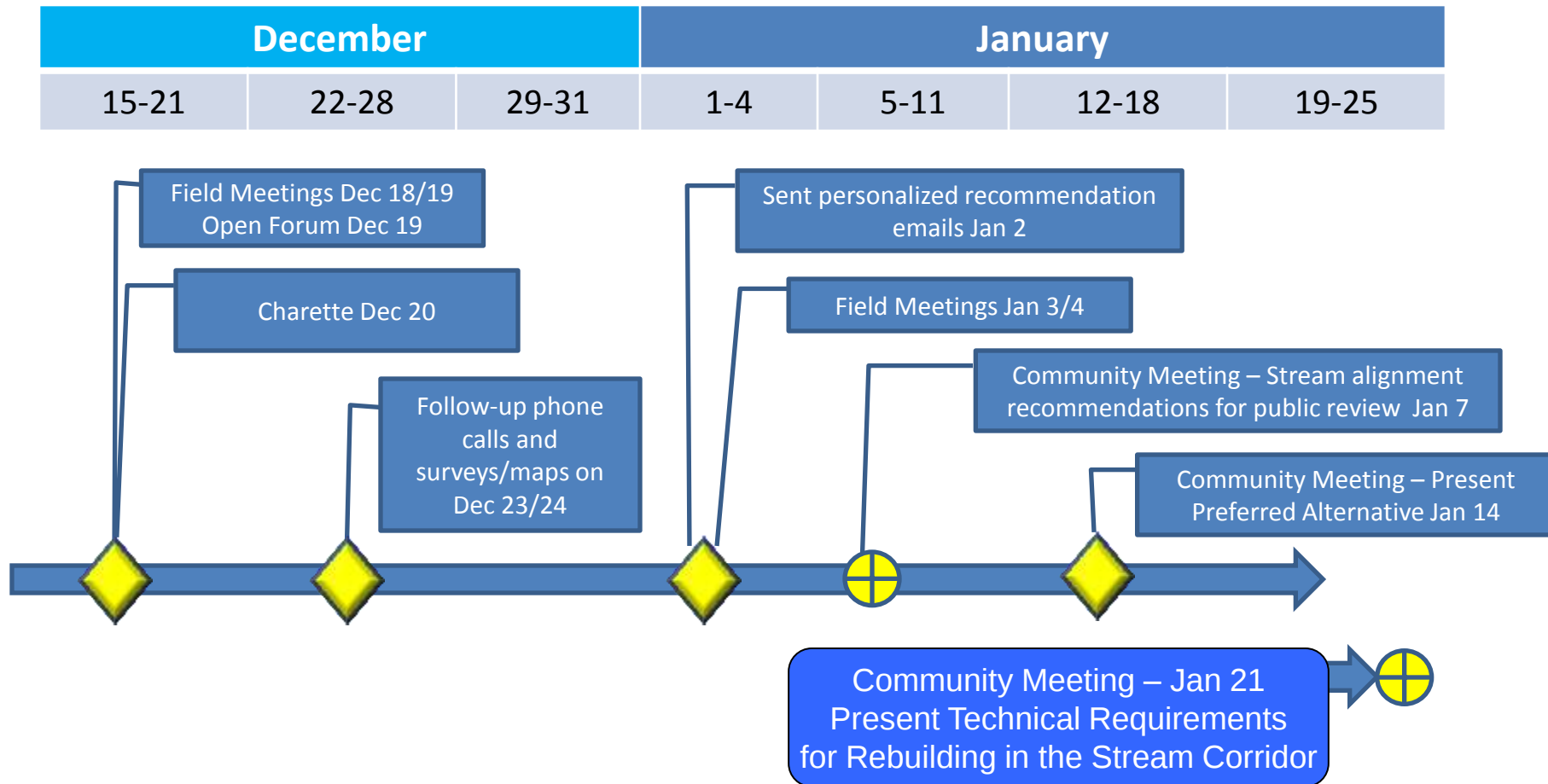
Here is the outline for tonight's presentation

- Organization of study area into reaches
- Report on interaction with private property owners in the stream corridor
- Stream alignment recommendations

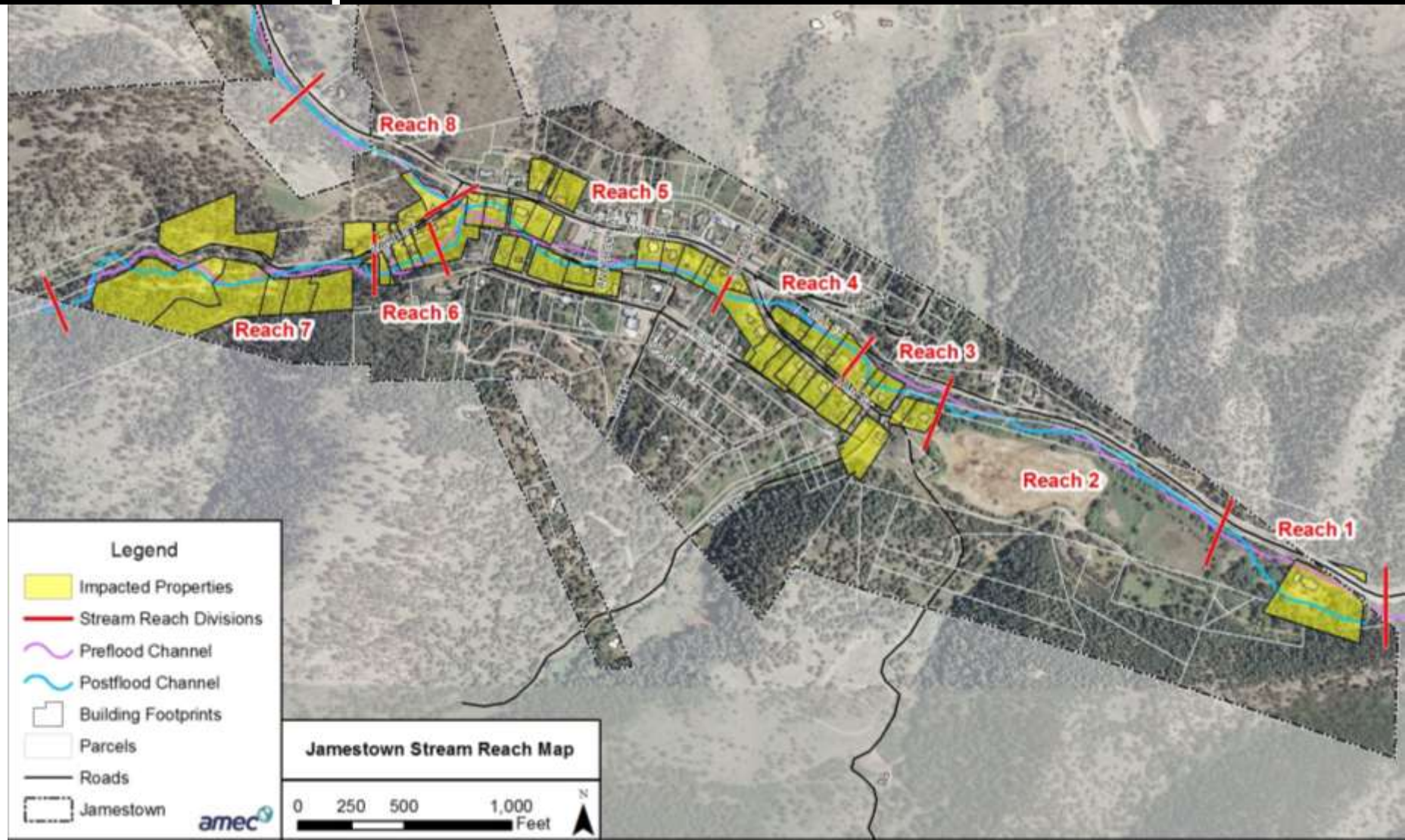
We divided the stream into 8 reaches



The last 3 weeks have included contact with private property owners impacted by water or debris



Out of the 49 private property owners contacted, we received response from 94%



Reach 1 residents like the current stream alignment



Desires/Concerns

- Keep current stream alignment
- Stabilize banks, especially at stream bend west of 2199 James Canyon
- Install drainage for highway culvert

Differing desires for stream alignment in Reach 3; Drainage for Gillespie Gulch is a major concern

Desires/Concerns

- Need drainage for Gillespie Gulch
- Differing desires for stream alignment
- Deepen channel and stabilize banks



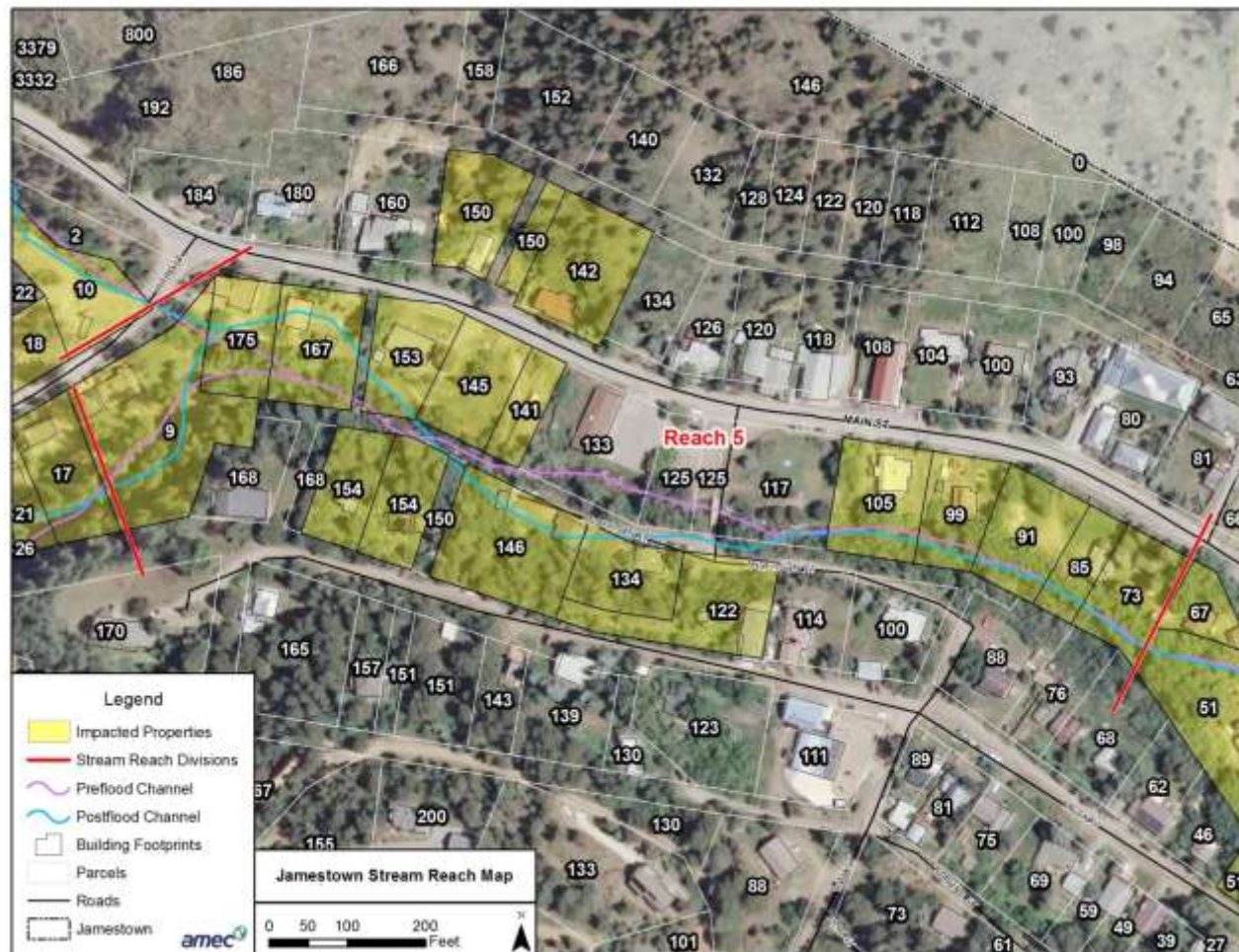
Main St. bridge is pivotal for Reach 4



Desires/Concerns

- Generally okay with current stream alignment
- Need to increase capacity of Main St. bridge
- Need to address issues regarding high water table/natural springs
- Stream channel needs to be deepened

Reach 5 faces several complicated issues



Desires/Concerns

- Debris flow from Howlett's Gulch
- Anderson Hill needs to be stabilized/access restored
- Deepen channel and stabilize banks
- Desire to return confluence to pre-flood alignment

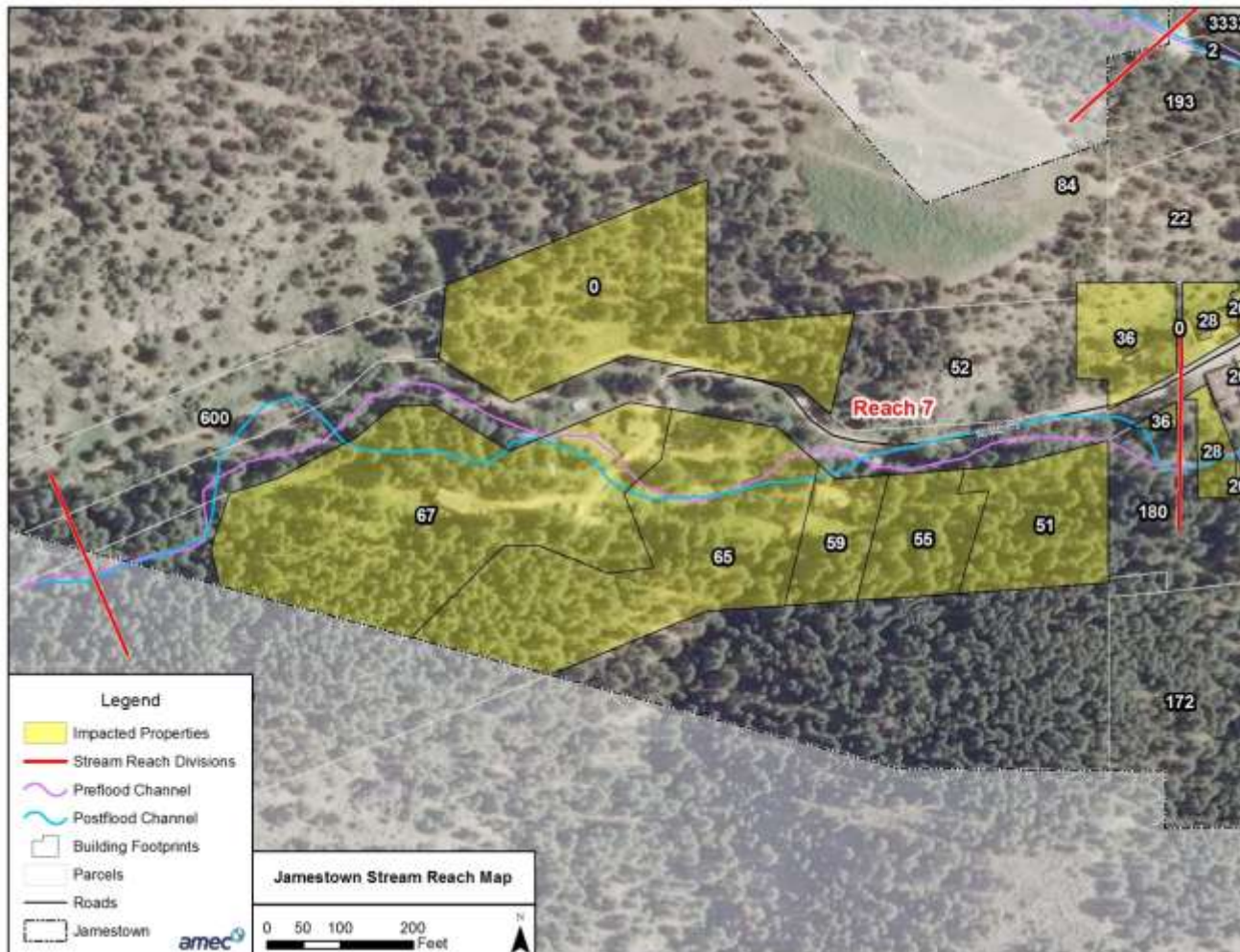
Most of Reach 6 residents prefer the pre-flood stream and road alignment



Desires/Concerns

- Most want to return James Creek and road to pre-flood locations
- Deepen channel and stabilize banks
- Culvert upstream is already clogging with ice

Major concerns in Reach 7 include culverts and access



Desires/Concerns

- Differing desires on stream alignment
- Culvert near 36 Ward must be removed – already clogging with ice
- Deepen channel and stabilize banks

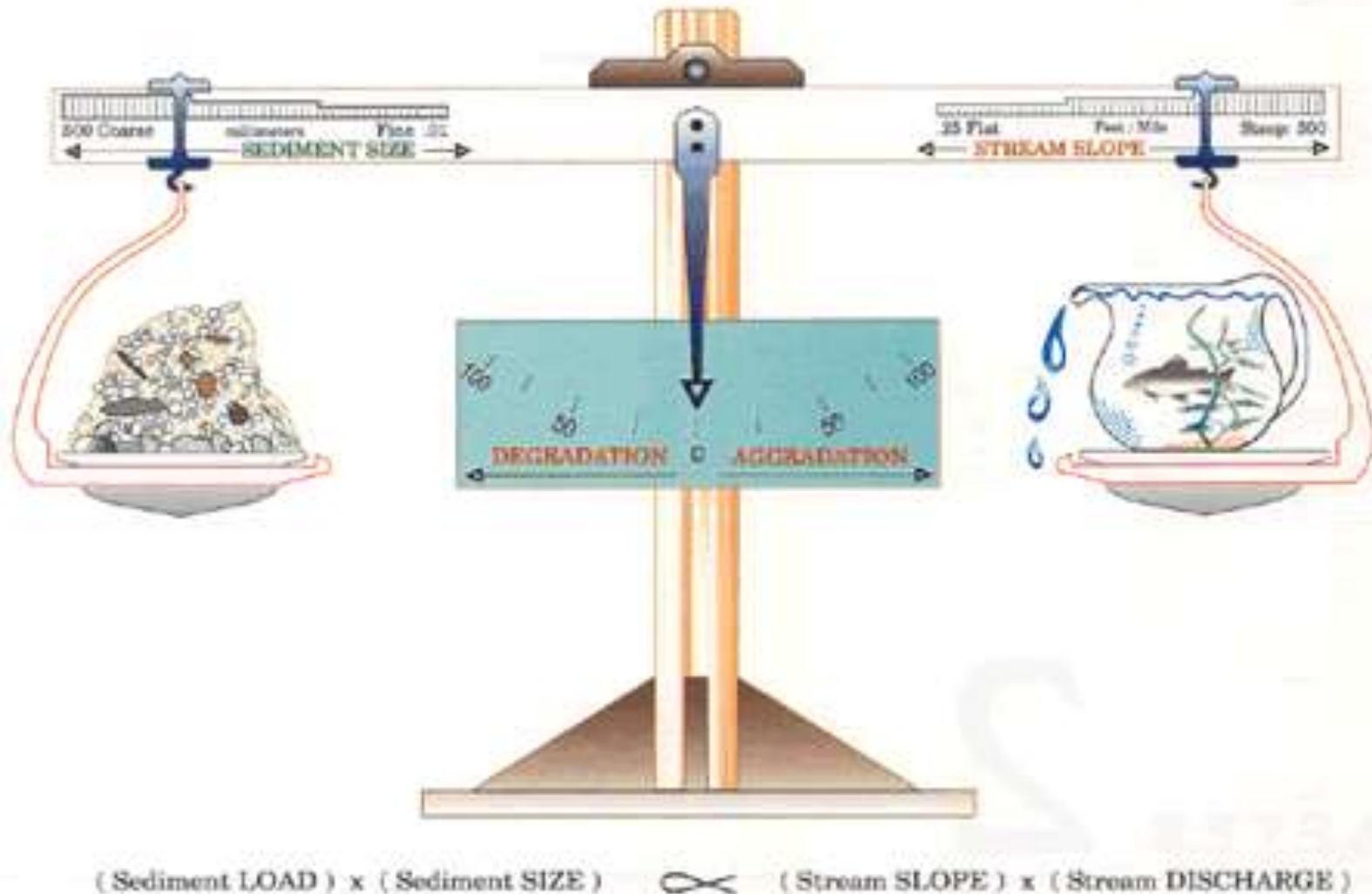
We will present the challenges and recommendations for each Reach

- Review of how fundamental concepts guide solutions
- Discussion of the challenges present in each reach
- Recommended solutions

In designing solutions, it is important to keep in mind the fundamentals:

- Stream channel characteristics are a result of:
 - Streamflow (from precipitation)
 - Sediment supply (watershed slopes, debris flow, channel migration)
 - Morphologic controls (e.g., valley pinches, roads, bridges)
- Any particular channel is an expression of the relationship of these processes
- Solutions (e.g. bank stabilization, grade control, etc..) need to respect an individual system's processes

Stream equilibrium requires readjustment



There are 3 main goals driving the recommendations

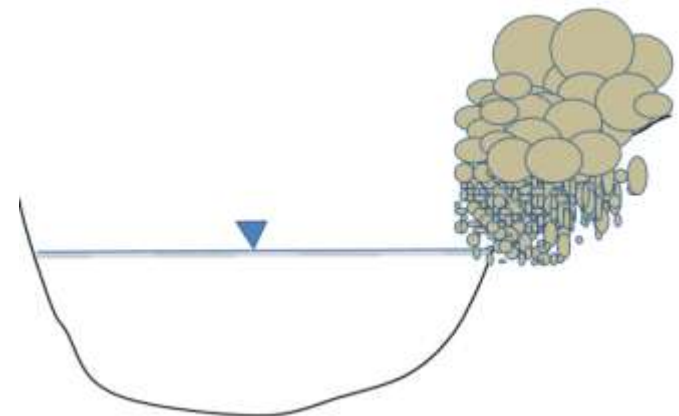
- 1. Create a channel that has the ability to transport increased flows and sediment supply without major adjustments**
 - Increase channel capacity to handle flood flows**
 - Engineered structures, bank stabilization measures, and channel re-alignments need to maintain sediment transport**

There are 3 main goals driving the recommendations

- 2. Create the ability to capture debris and sediments in controlled or defined locations**
 - Prevent material from plugging at random locations and influencing vertical and lateral adjustments**

Debris flows behave differently

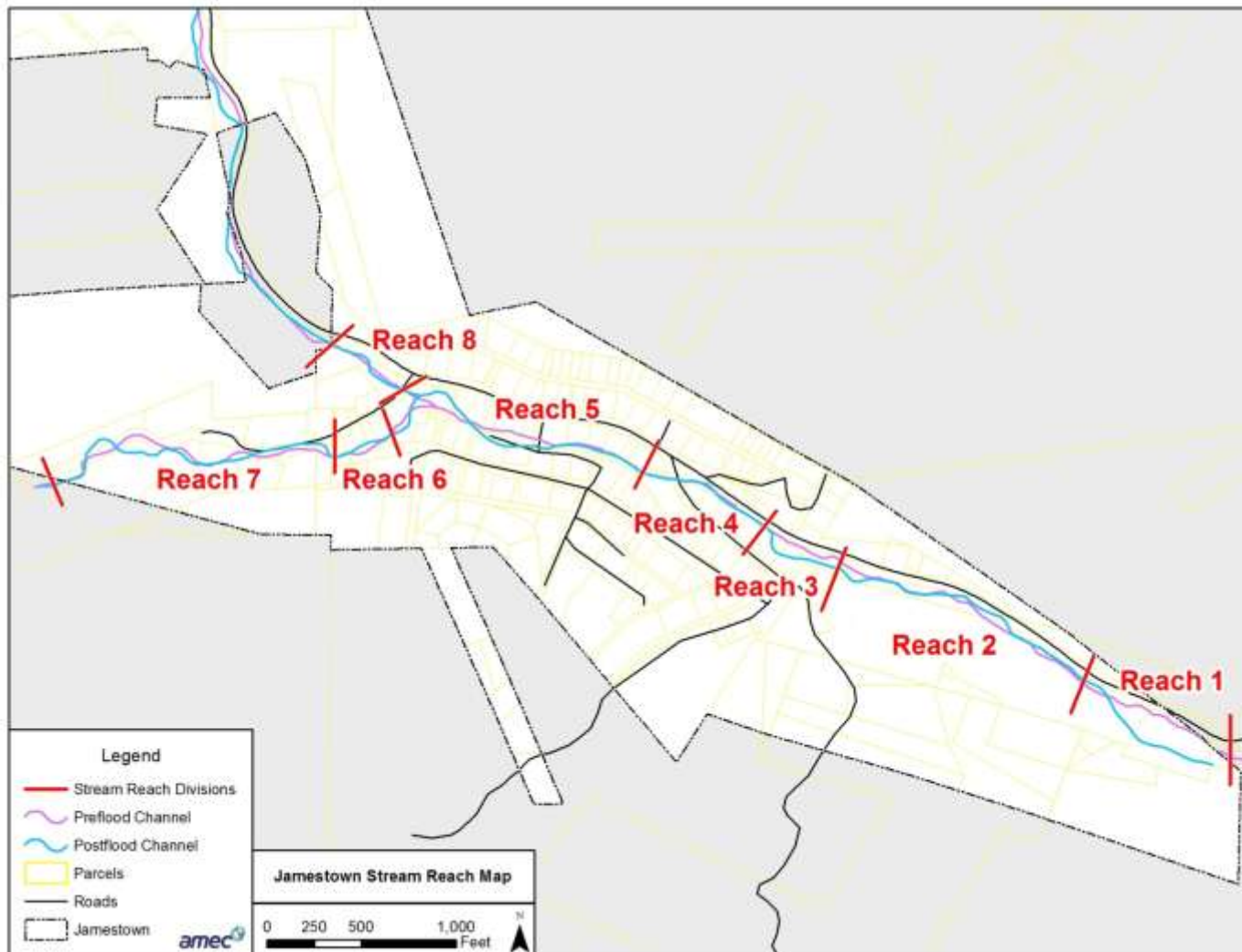
- Relatively few direct observations
- 0.5-20 m/sec
- Non-newtonian flow: high viscosity
- capacity to carry large boulders long distance
- High erosive capacity on channel sides
- up to 6 times the shear stress on channel beds compared to flood flow
- bedrock scour observed: 4 m in less than 24 hours
- Surges: Temporary damming and breaching of channels by debris, and channel avulsions



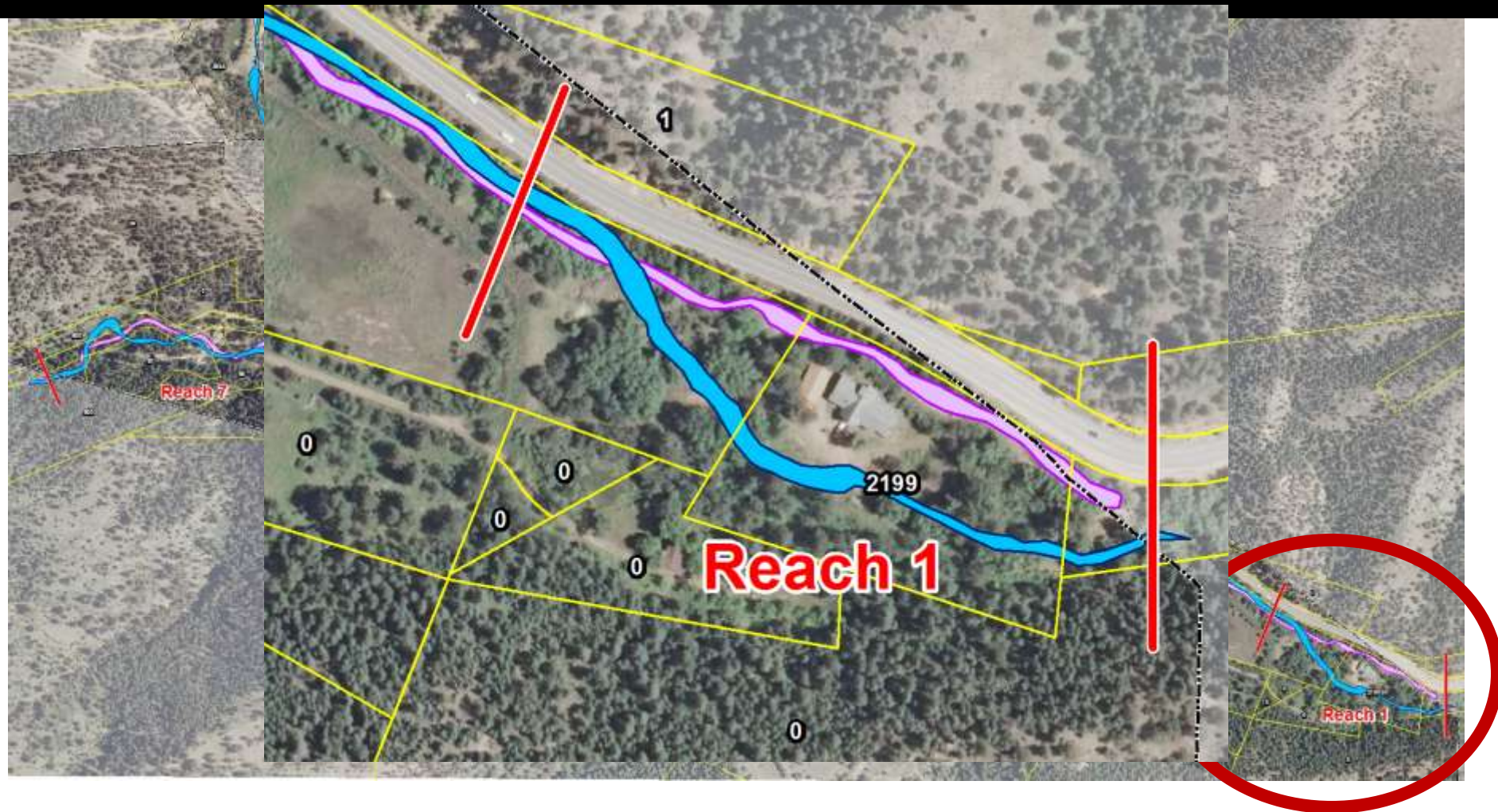
There are 3 main goals driving the recommendations

- 3. Create space for channel to flood and migrate where possible**
 - Channel needs space to adjust to expected increases in discharge and sediment load**

We divided the stream into 8 reaches



Reach 1 includes dynamic avulsion



The stream channel in Reach 1 moved considerably

- Major channel avulsion to current location



Current Channel

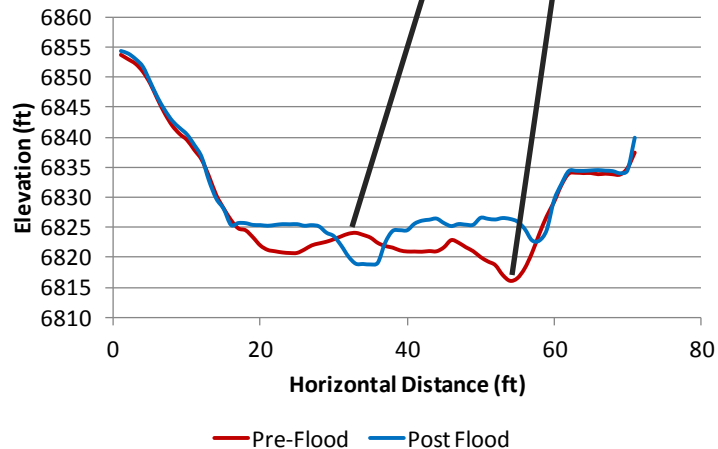


Approximate pre-flood channel

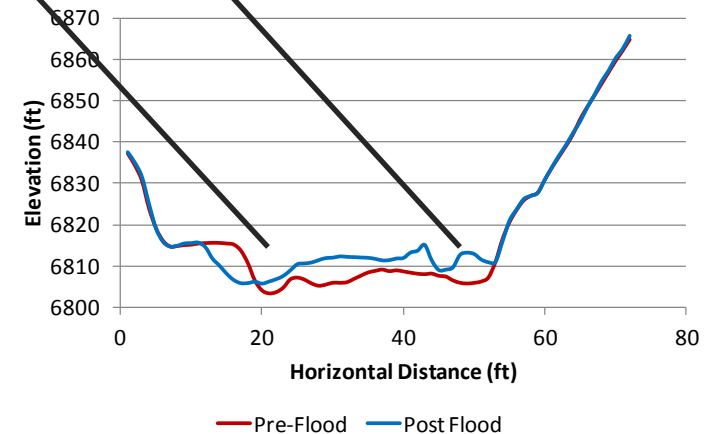
Here are the Reach 1 cross-sections with corresponding channels



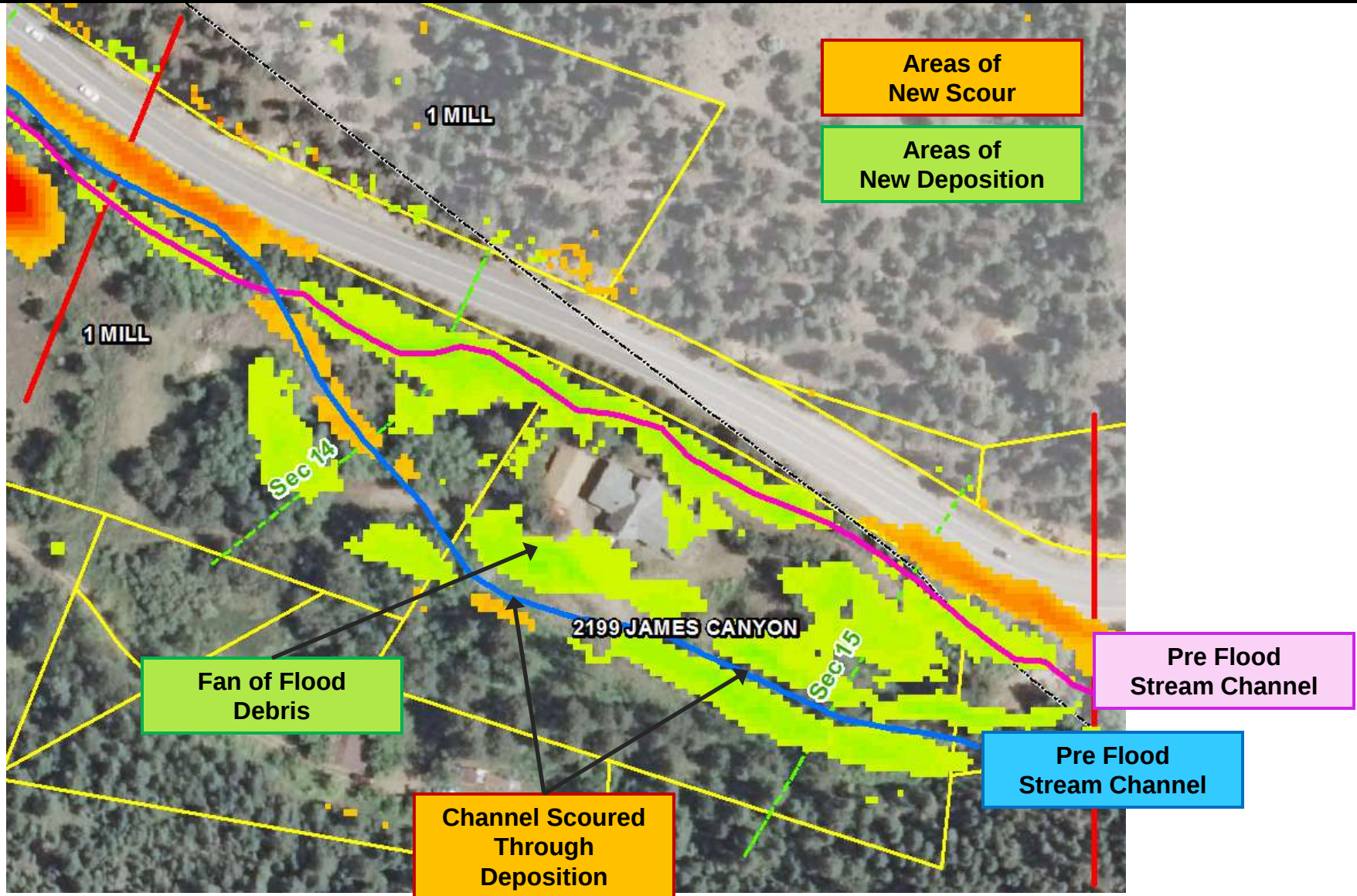
Looking Upstream: Sec 14 - 2199 James



Looking Upstream: Sec 15 - DS Town

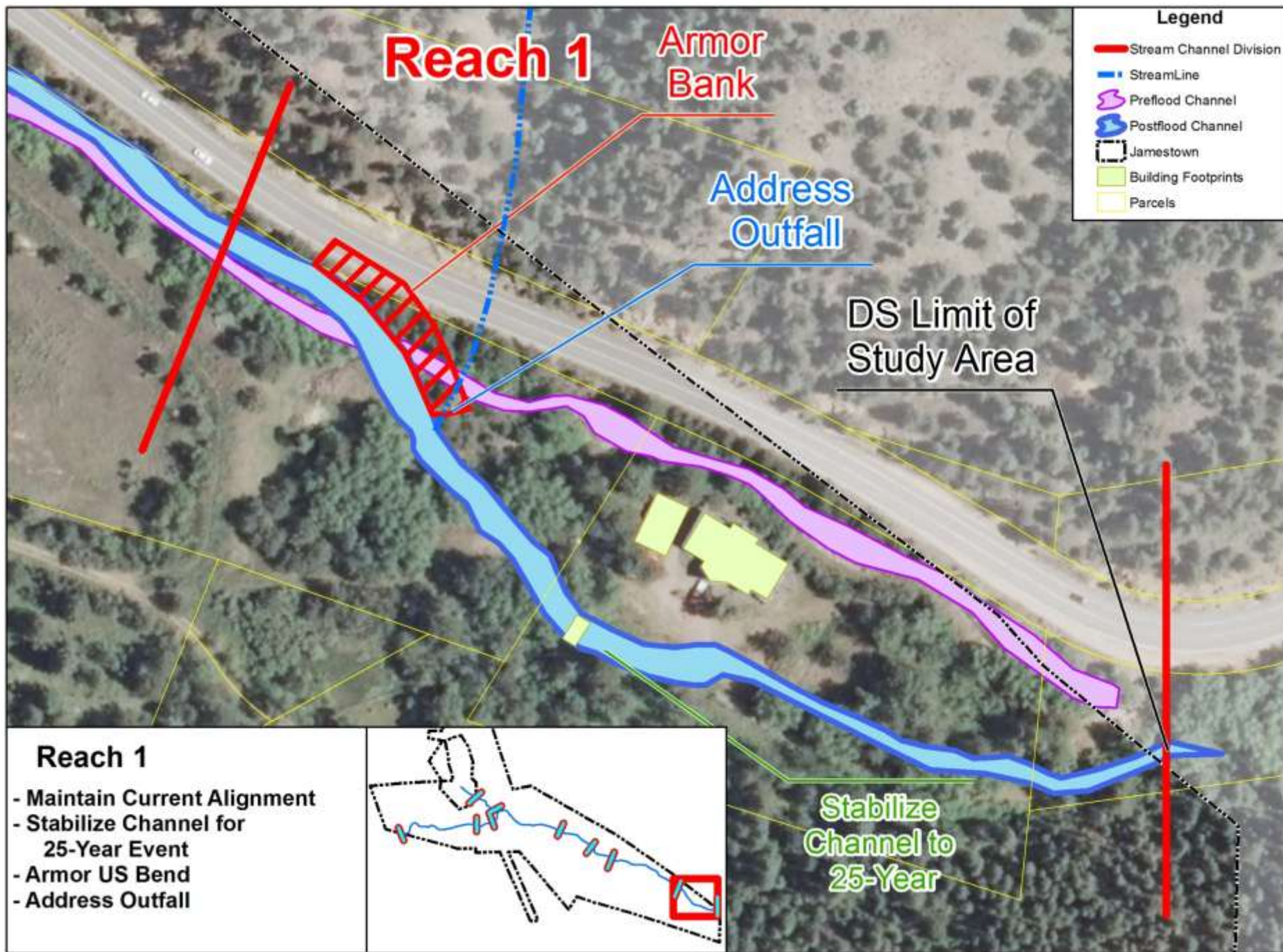


Reach 1 experienced significant deposition



We recommend keeping the current stream alignment in Reach 1

- Keep stream where it currently is
- Stabilize stream bank west of Loving property to maintain current stream alignment
- Stabilize stream banks and deepen channel to allow for 10-year capacity
- Depositional area – increase channel gradient to promote sediment transport?
- **Key property issues**
 - Create a drainage in the pre-flood location of the stream to manage drainage from the culvert west of the house





Here are examples of bank stabilization

Hard measures requiring concrete and rip rap



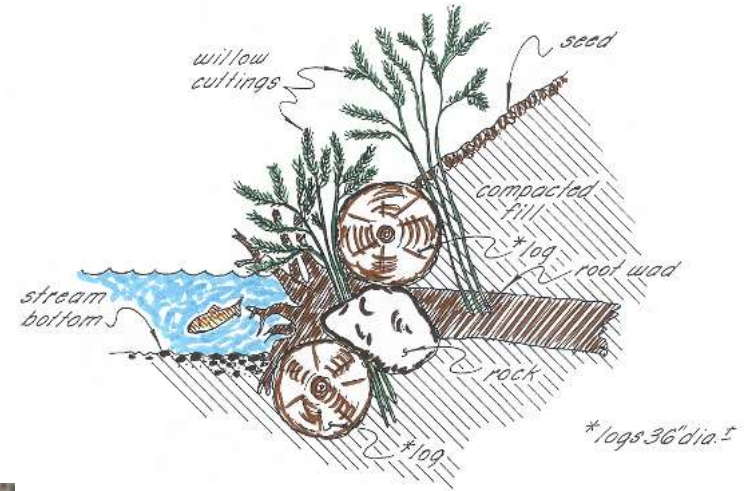
Here are examples of bank stabilization

Rip rap applied with some sensitivity to restoring a natural channel



Here are examples of bank stabilization

Engineered woody debris protects the banks and builds biogeomorphic diversity



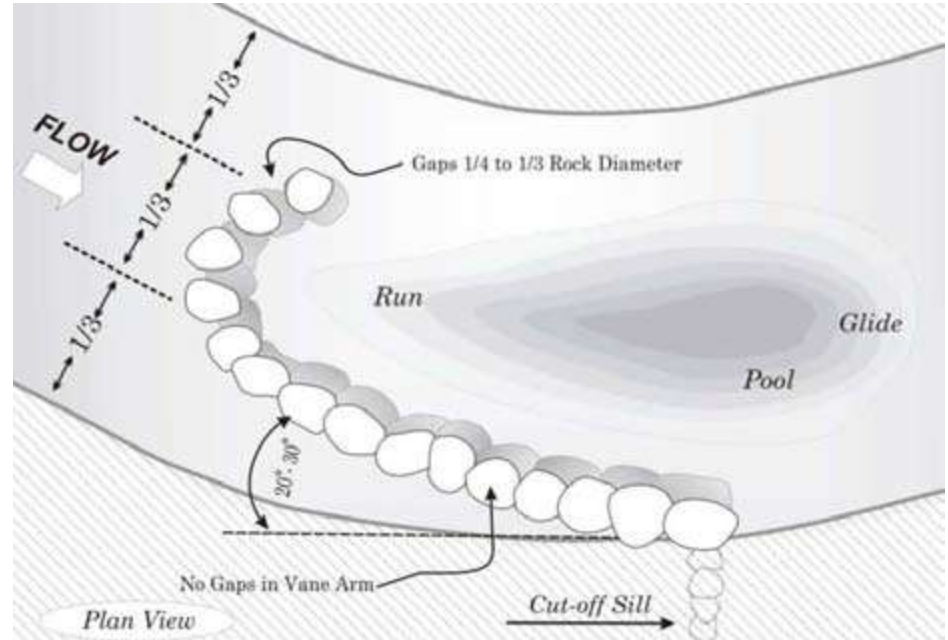
Here are examples of bank stabilization

Revegetation of the banks



Note the willow cuts

Grade control measures may look like this



Reach 2 had significant bank failures



Key challenges in Reach 2 include topography, vegetation and bank stability

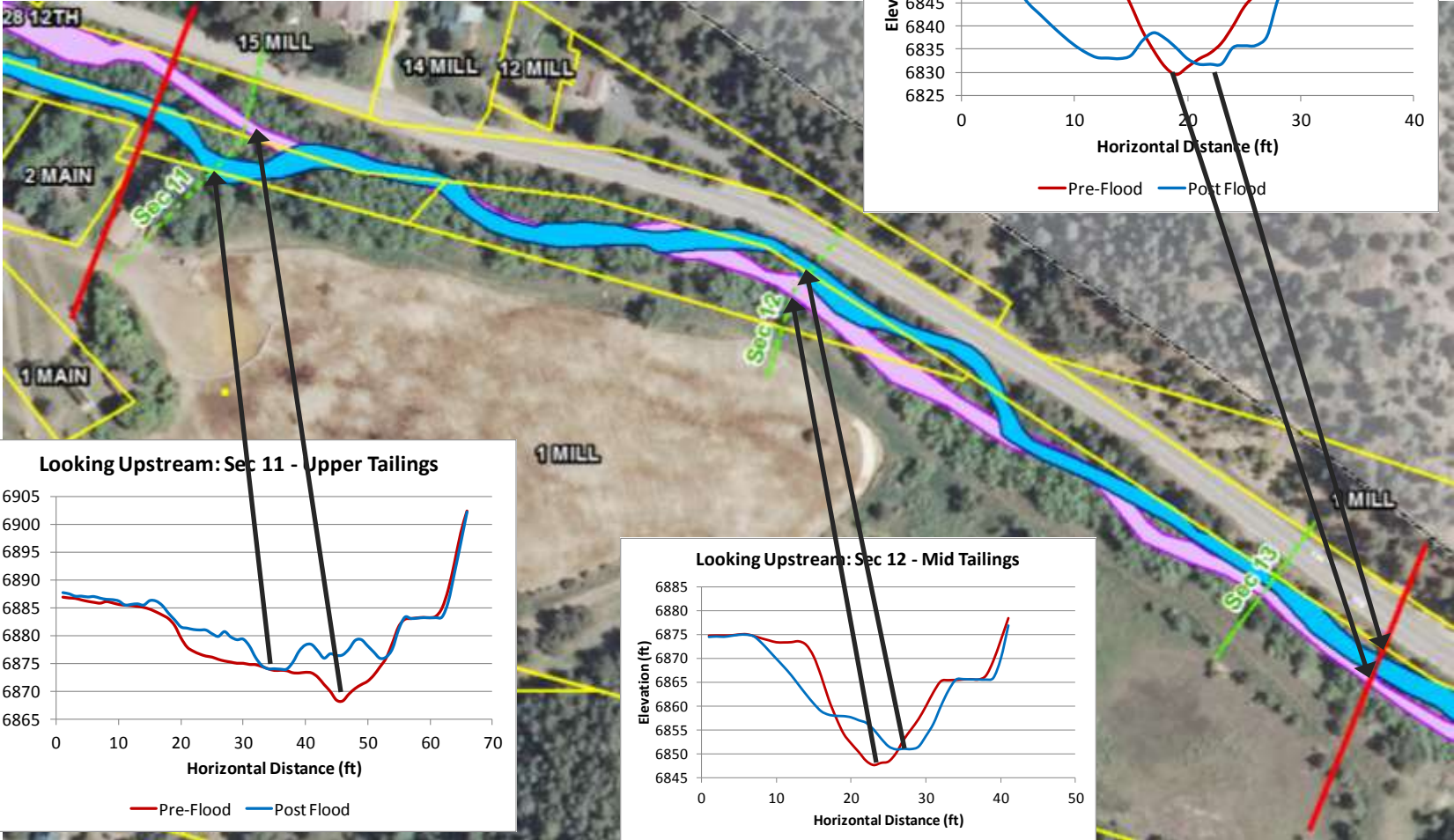
- Relatively straight, steep, confined reach
- Heavily wooded – floodplain roughness
- Significant bank failures



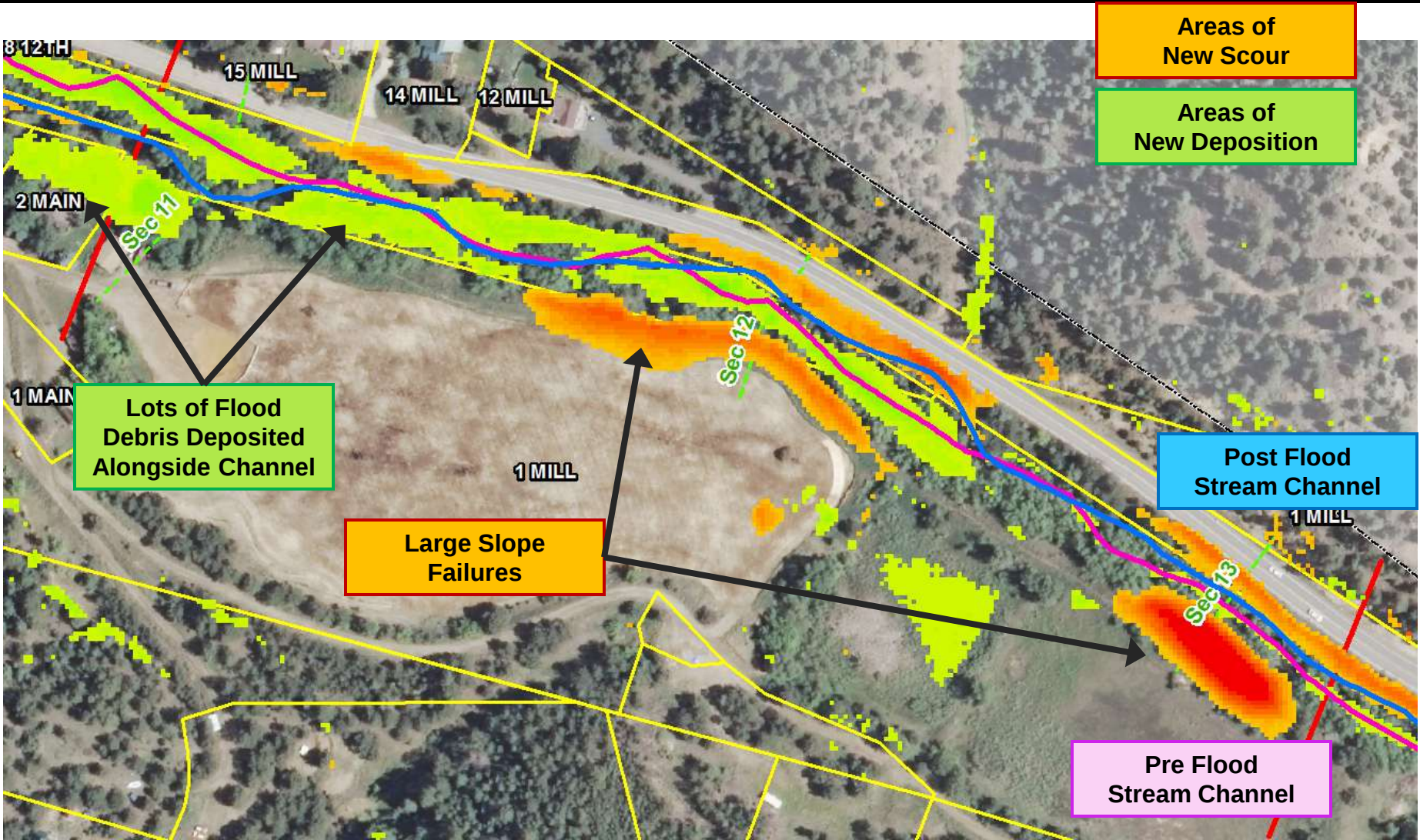
Here are the Reach 2 cross sections with corresponding channels

Pre Flood
Stream Channel

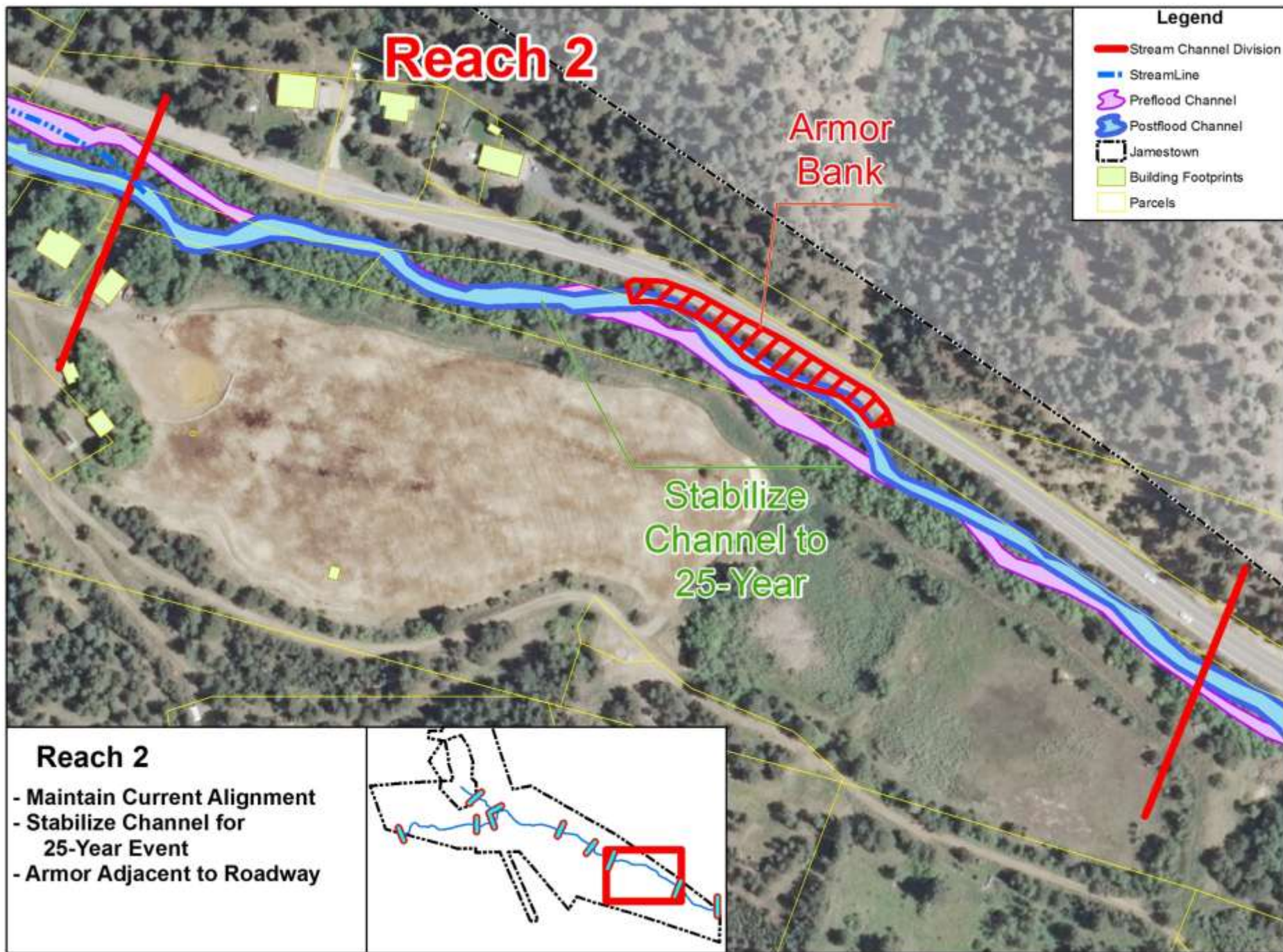
Post Flood
Stream Channel



Reach 2 experienced both scour and deposition



Reach 2 recommendations focus on stabilization measures



Reach 3 experienced major stream avulsions



Key challenges in Reach 3 include drainage problems and debris flows

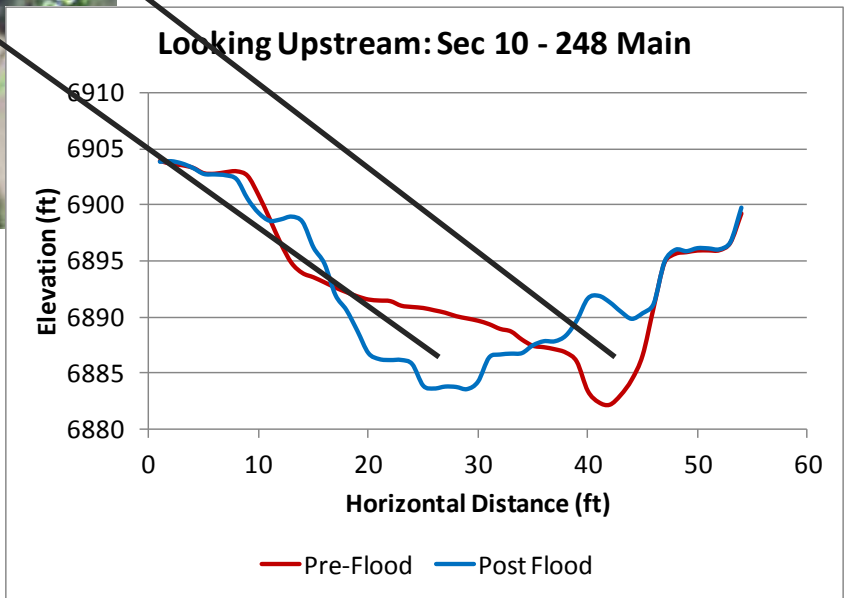
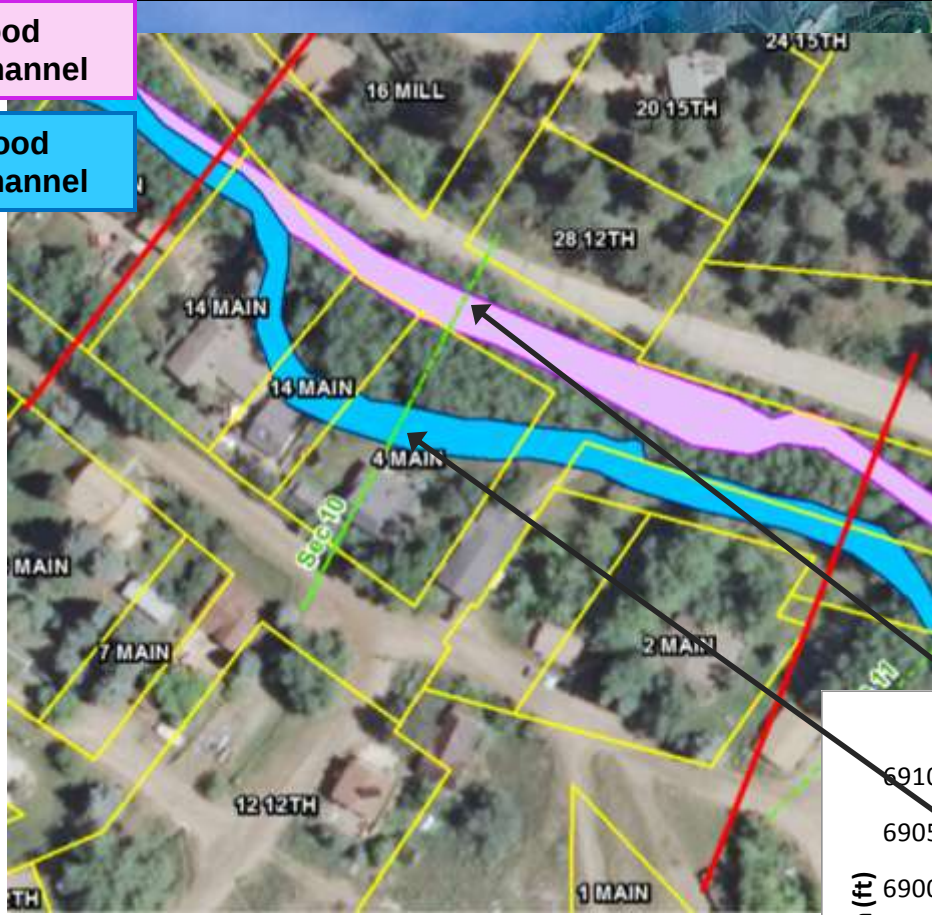
- Major channel avulsion caused by debris jam
- Degradation from Gillespie Gulch discharge
- Plugged Lower Main Street bridge causing Main Street to capture flows



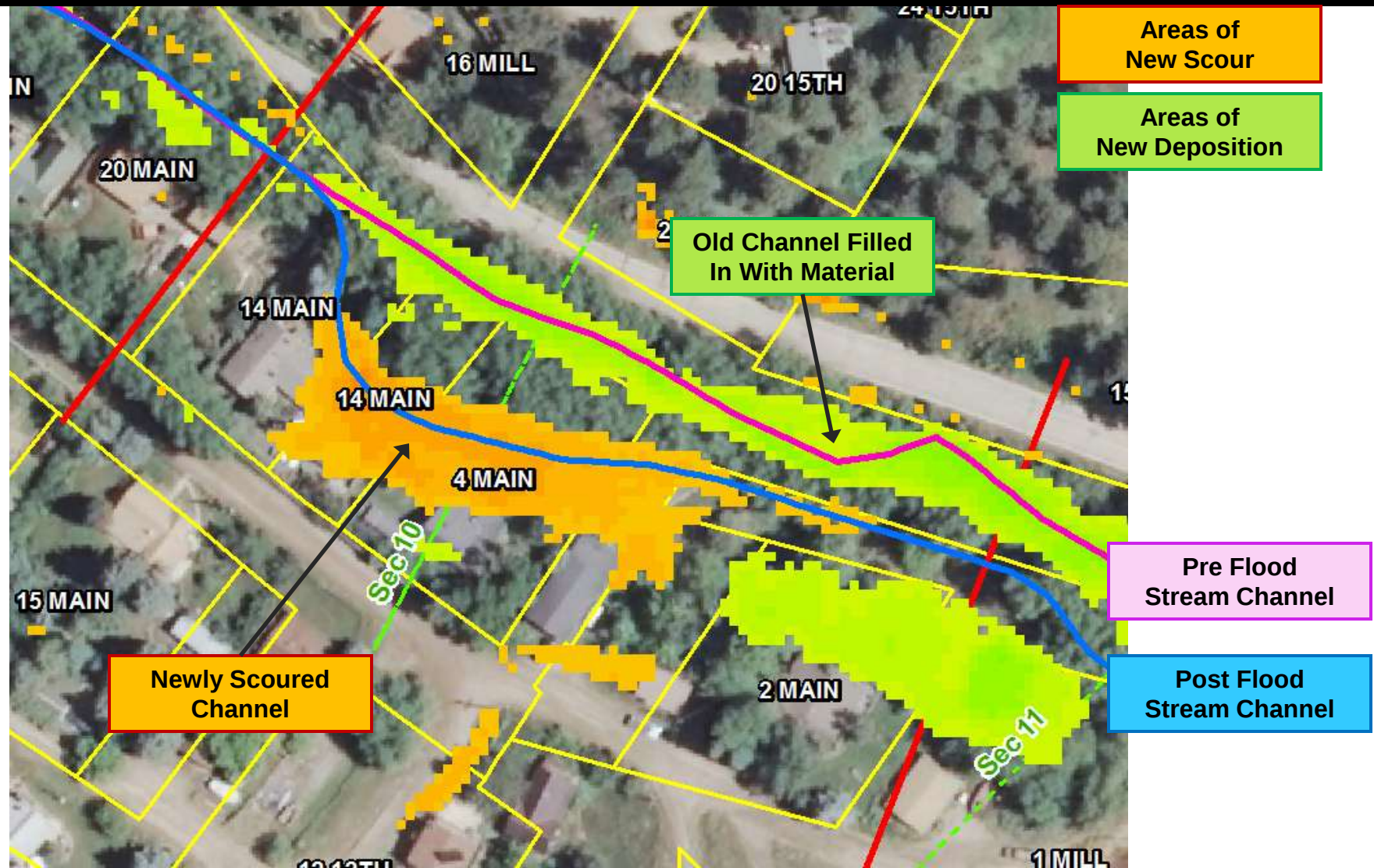
Here the Reach 3 cross sections

Pre Flood
Stream Channel

Post Flood
Stream Channel

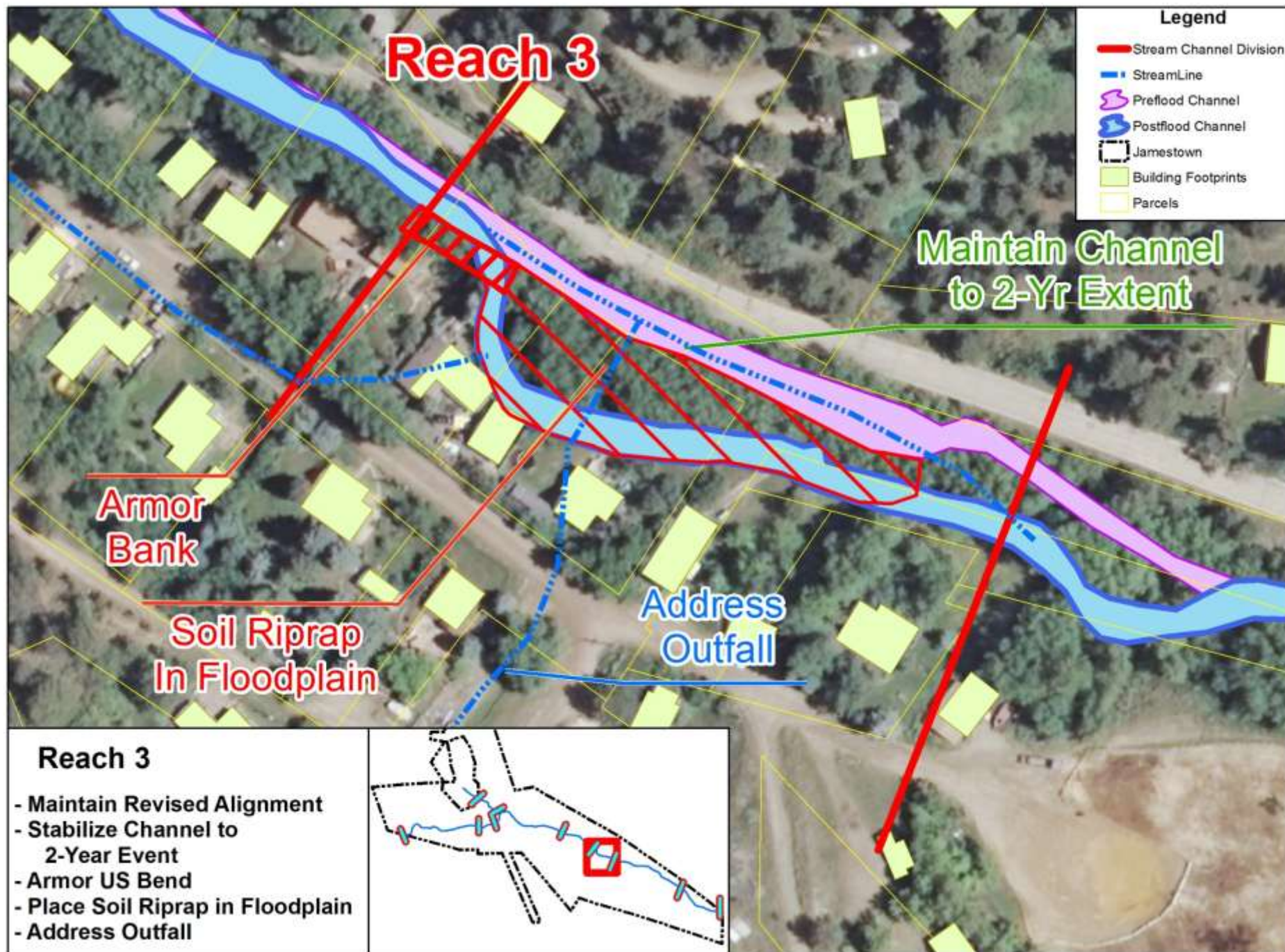


Reach 3 had scour along Main St and deposition along the stream channel



Reach 3 recommendations address drainage problems, debris issues and stream channel stability

- Maintain current stream alignment
- Create high-water overflow channel in pre-flood stream bed
- Stabilize stream banks, deepen channel, and implement energy dissipation strategies
- Create drainage for Gillespie Gulch on the town's right-of-way between Kohlhaas garage and town pump house
- Increase capacity of lower Main St. bridge
- Address drainage issues for natural springs along lower Main St. in conjunction with permanent road repairs
- Suggested possibility of moving lower Main St bridge to Reach 2
- **Key property issues**
 - Potentially shift 8 Main St (Matt and Julie Kohlhaas) property line to the west to allow for a direct drainageway from Gillespie Gulch to the creek
 - Potential buyout for 14 Main St (Tim and Wendy Stokes)





UTC 2013:10:09 20:41:04
 58° ENE 1ru
 W:105° 23' 01.512"
 N:040° 06' 49.374"





UTC 2013:10:09 20:36:42
26° NNE tru
W:105° 23' 02.334"
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Reach 4 had scour and deposition, and issues from Main St. bridge and a high water table



Reach 4 faces debris flow issues at the bridge and high water table complications

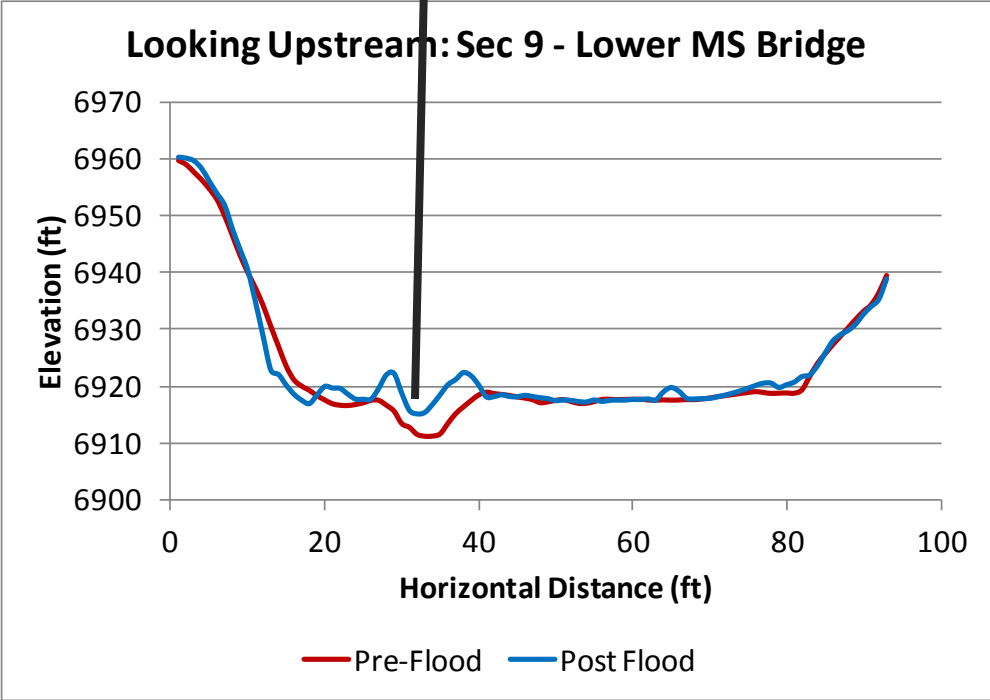
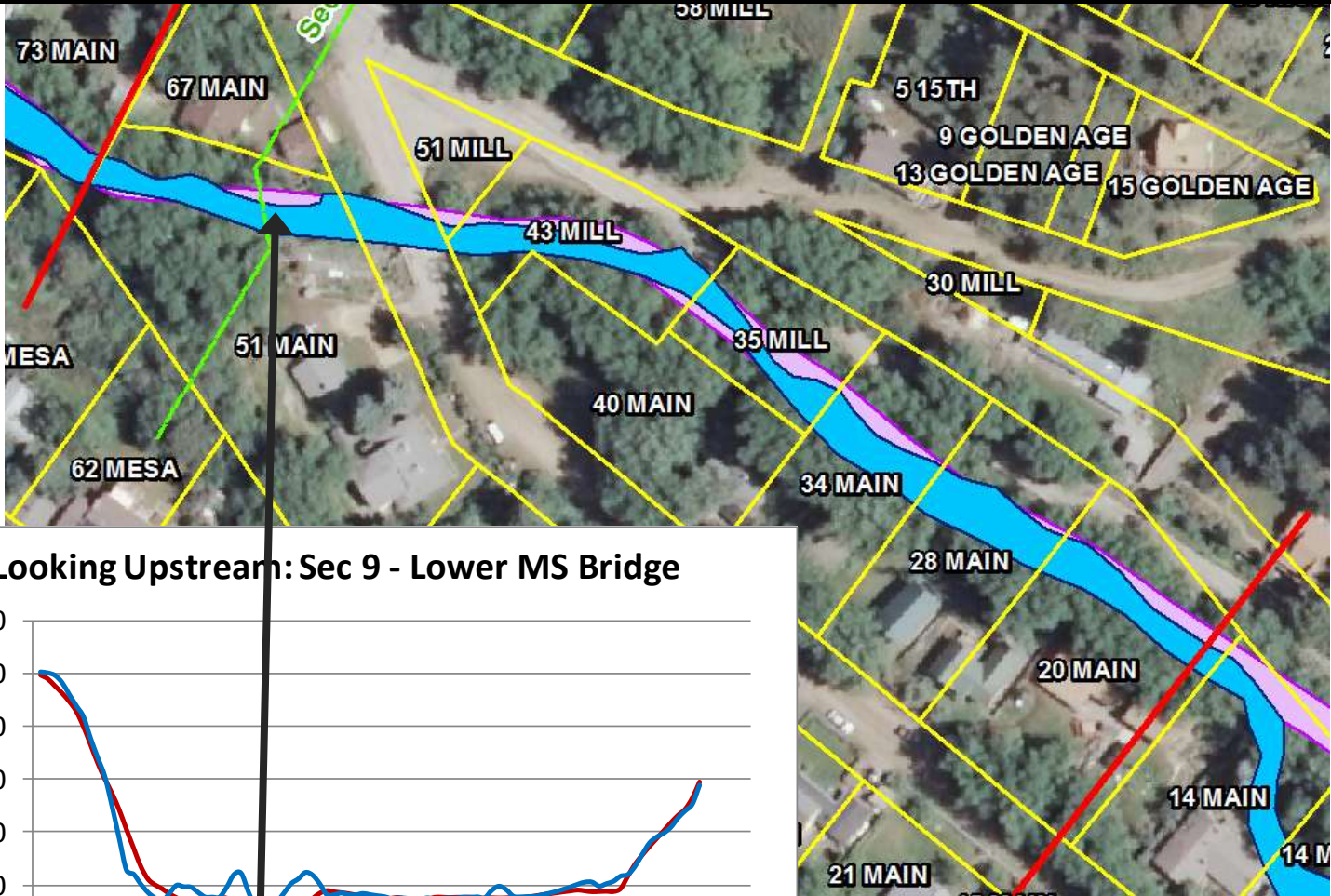
- The lower Main Street bridge was completely plugged – likely due to size and orientation
- Stream is confined between road and houses



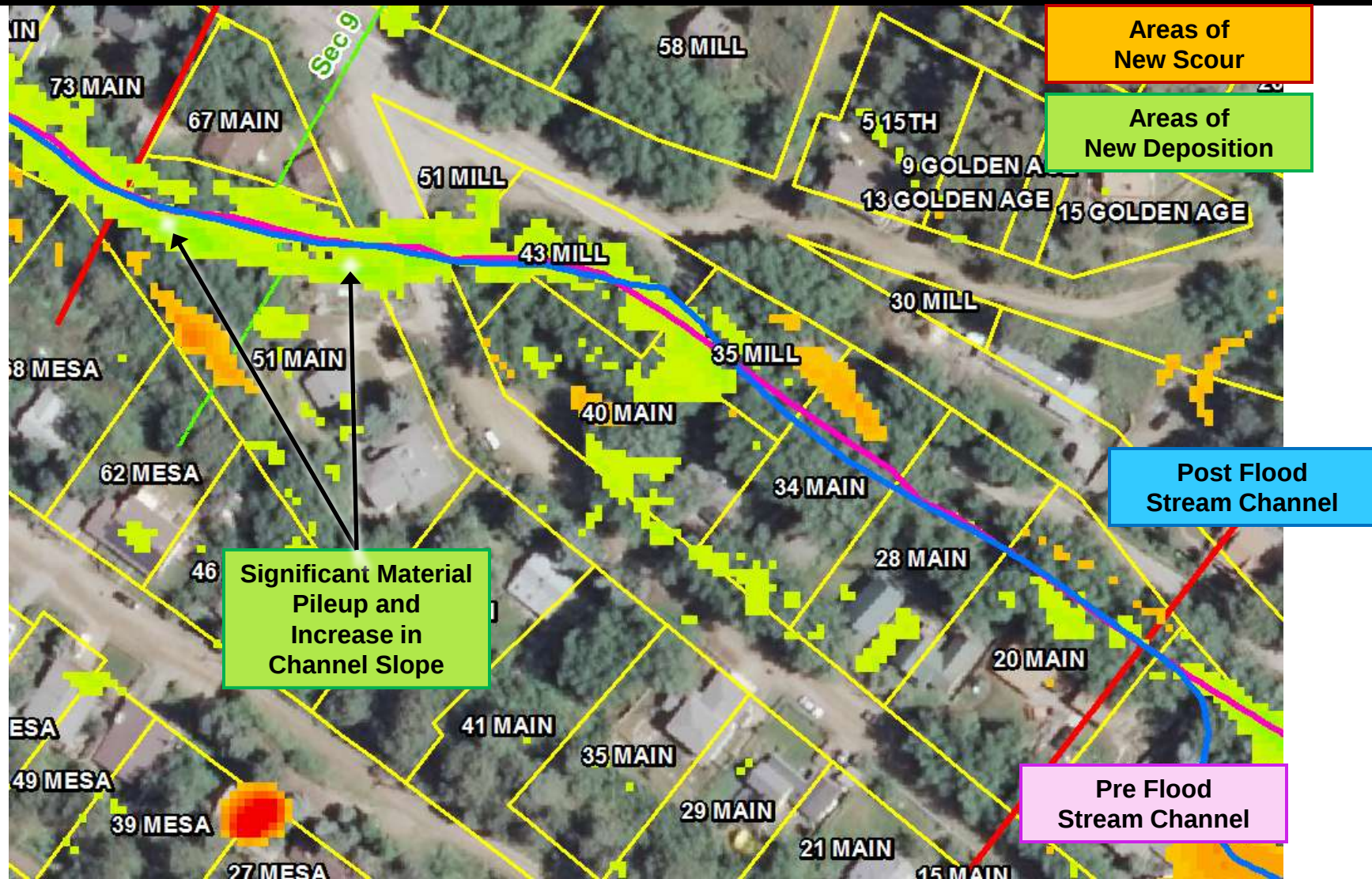
Here are the Reach 4 cross sections

Pre Flood
Stream Channel

Post Flood
Stream Channel



Reach 4 had significant deposition



Reach 4 recommendations focus on drainage, debris issues, and protecting the current stream channel

- Maintain current stream alignment
- Stabilize stream banks, deepen channel, and implement energy dissipation strategies
- Increase capacity of lower Main St. bridge
- Address drainage issues for natural springs along lower Main St. in conjunction with permanent road repairs
- Suggested possibility of moving lower Main St bridge to Reach 2
- **Key property issues**
 - Potential buyout for 34 Main St (Ron Losasso)
 - Restore vegetation for stream bank stabilization at 40 Main St (Paul Midkiff), 51 Main St (Deborah Haynes and David Thorndike) and 67 Main St (Burt Loupee)
 - Use location of garage on 67 Main St (Burt Loupee) as an overflow area or to enlarge the capacity of the lower Main St bridge





001 10-1-2018 20:27:03
108 EST 1.00
E-1106 73.89 737
N-0000 00 55.000



07E 2017-10-09 20:05:18
100 84W tru
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5:040 06' 53.748"

Reach 5 had major avulsion, and scour and deposition



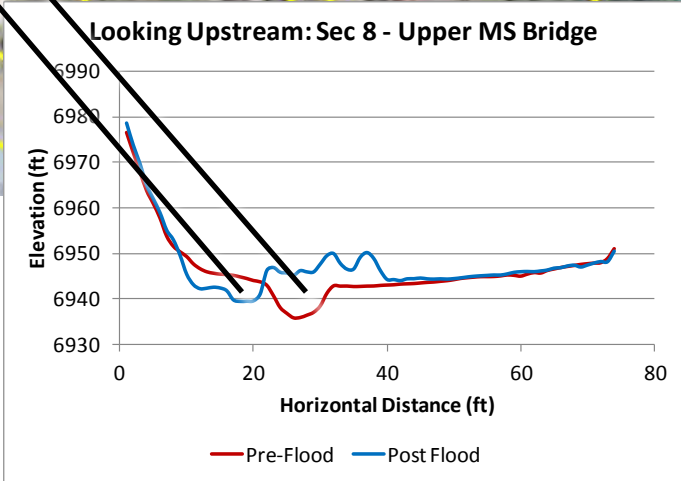
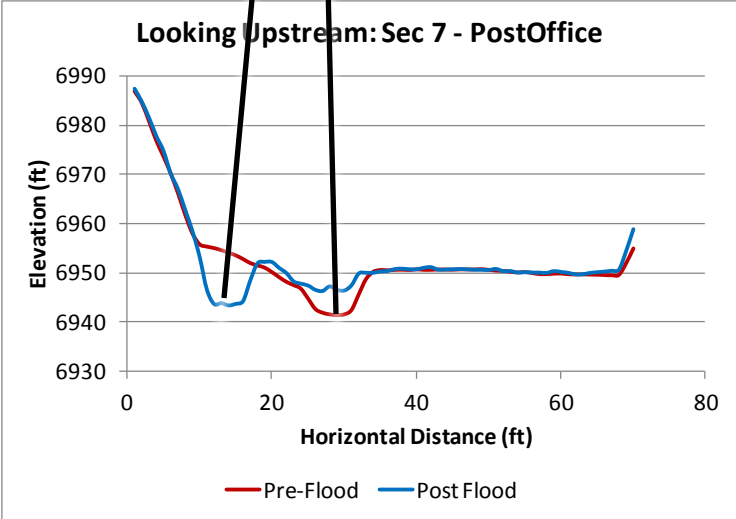
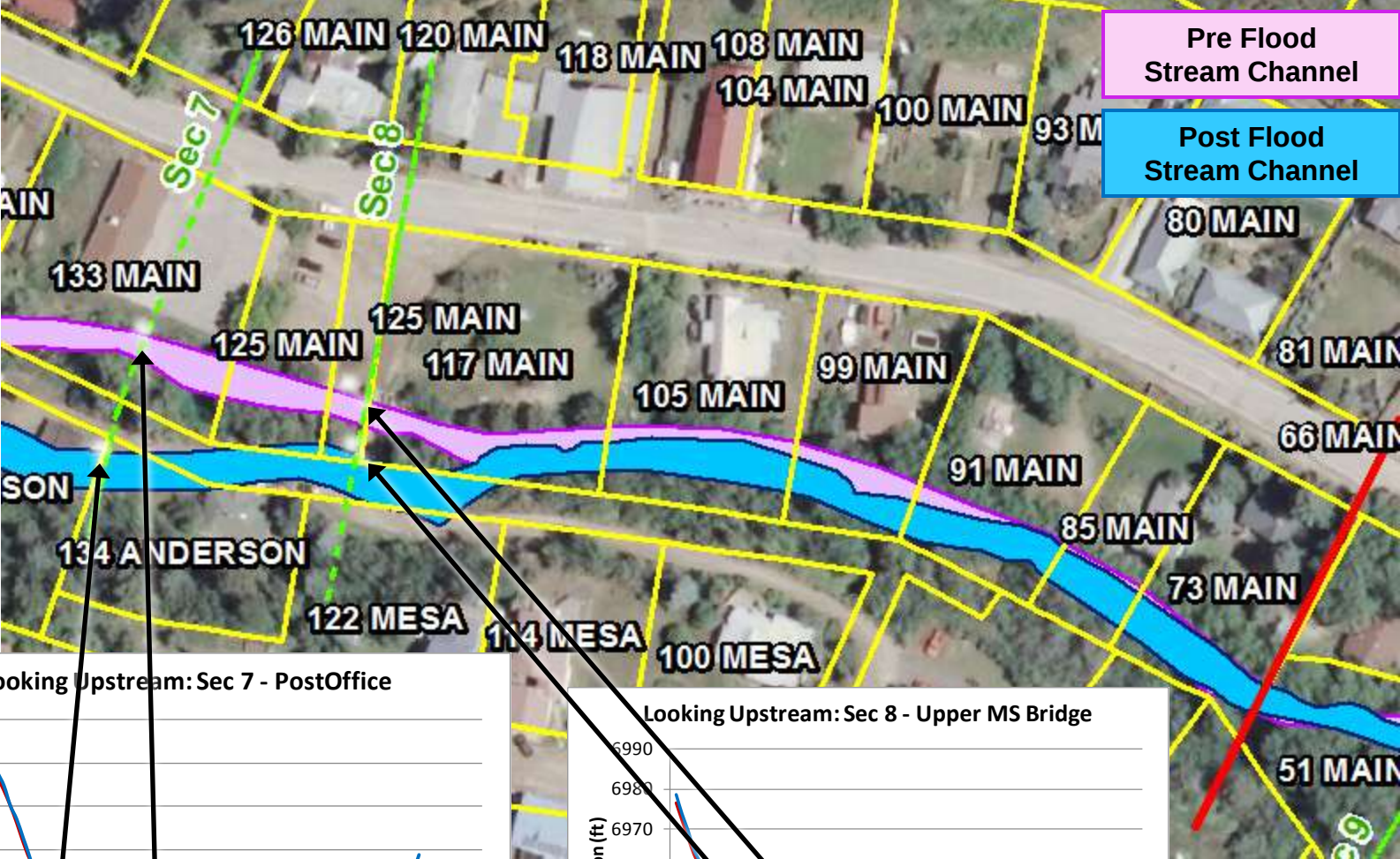
Reach 5 faces several key challenges

- Channel base level drop at confluence caused by plugged culvert
- Plugged Anderson Hill Bridge
- Lateral migration as channel tried to expend energy and navigate around the bridge
 - Toward Main St
 - Into Anderson Hill
- Debris flow channel at Howlett's Gulch

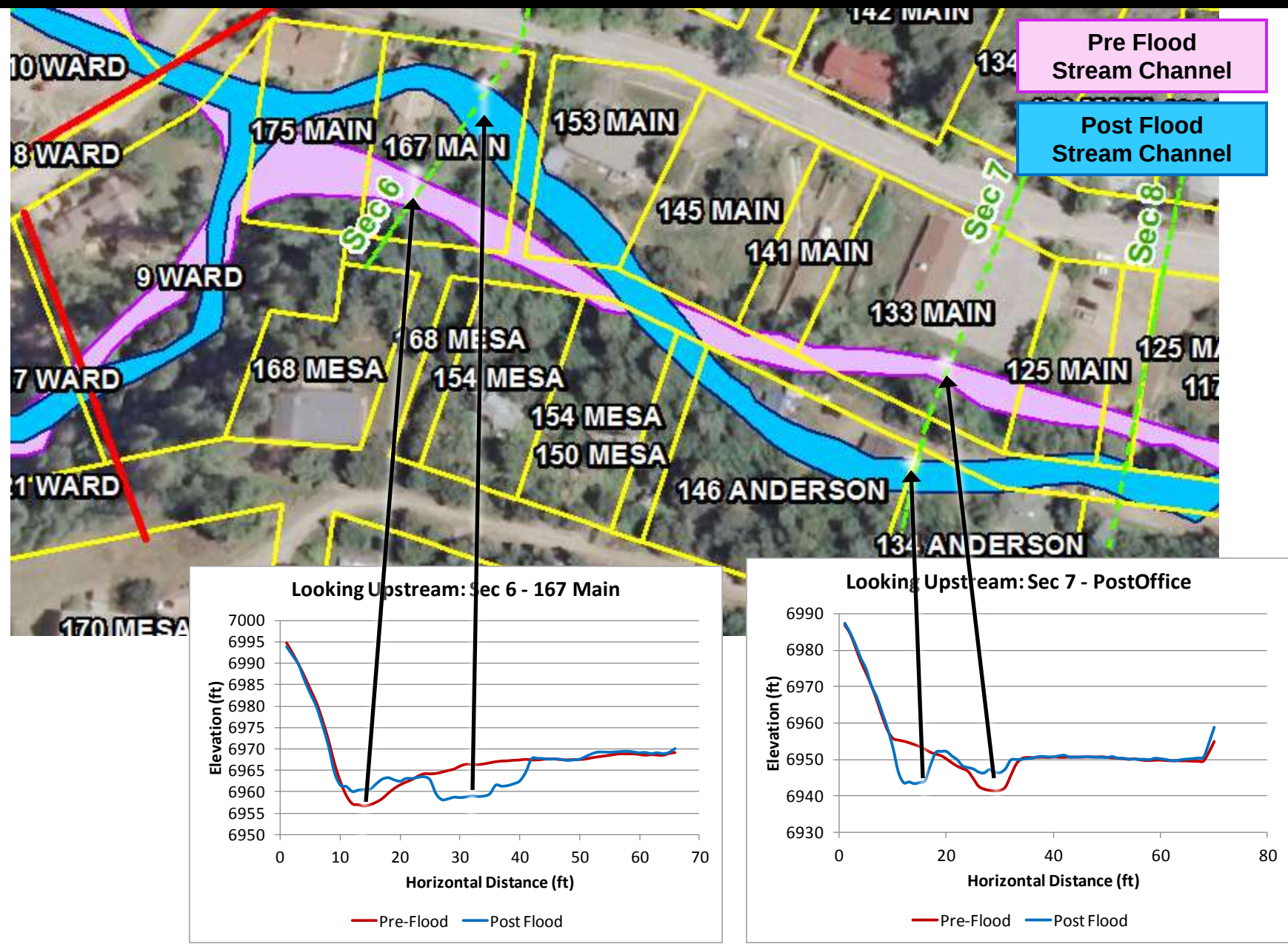
Reach 5 faces several key challenges



Here are the Reach 5 cross sections



Here are the Reach 5 cross sections



Areas of New Scour

New Deposition Filled In Old Channel

Areas of New Deposition

Post Flood Stream Channel

Pre Flood Stream Channel

Massive Scouring and Change in Channel Sinuosity

Areas of New Deposition

New Deposition Filled In Old Channel

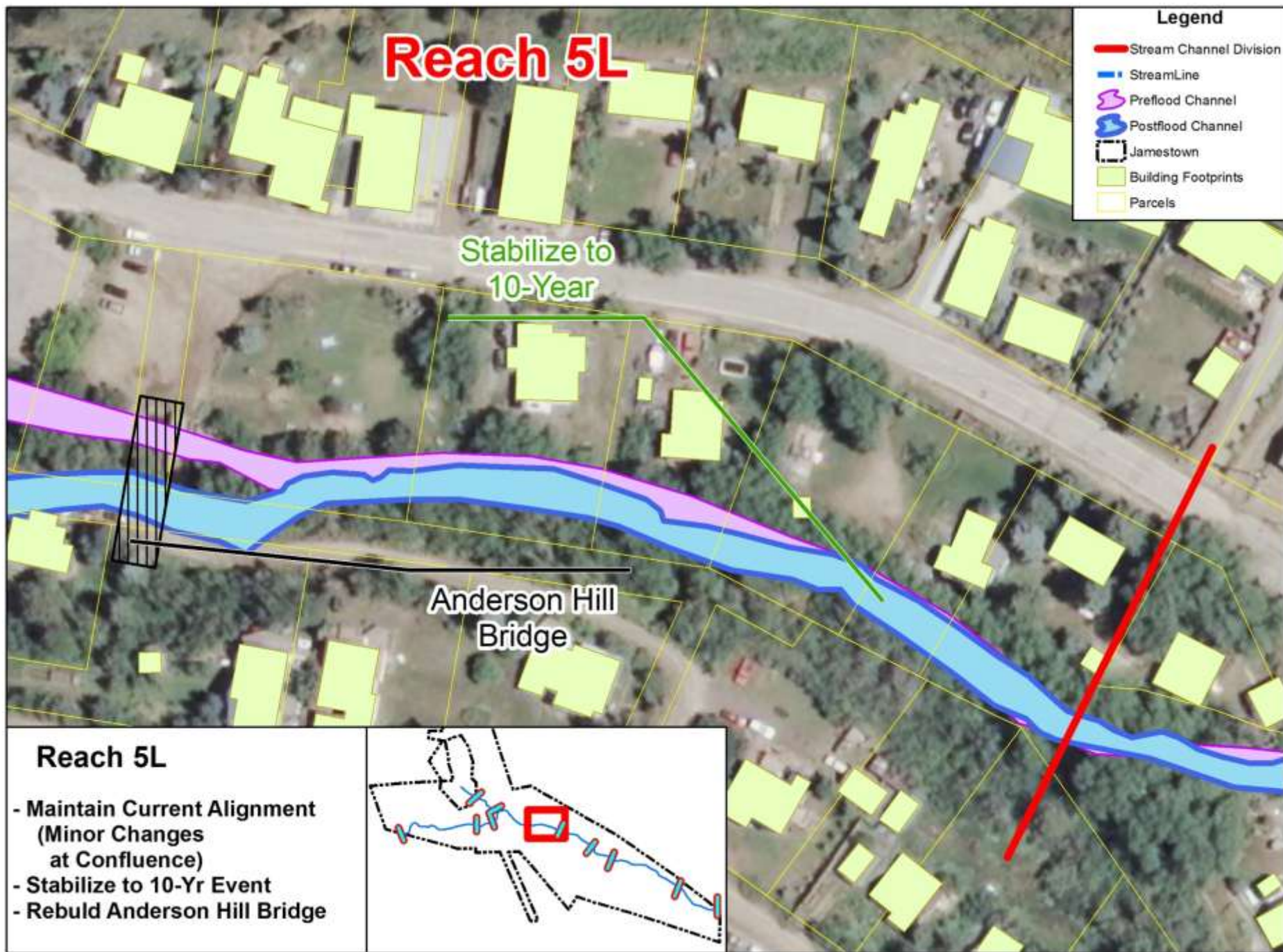
Massive Scouring and Change in Channel Sinuosity

Post Flood Stream Channel

Pre Flood Stream Channel

Reach 5 recommendations focus on debris flows, Anderson Hill stability, and stabilizing the current stream

- Maintain current stream alignment
- Stabilize stream banks, deepen channel, and implement energy dissipation strategies
- Restore vegetation for stream bank stabilization
- Address the drainage issue from the Anderson Hill culvert with the permanent road repairs
- Address Anderson hillside stability in conjunction with permanent road repairs (separate geotechnical engineer consultation)
- Address debris flow issues from Howlett's Gulch (primarily impacts the road, 141/142 Main St (Jonathan Bartsch), and 153/145 Main St (Nancy Farmer))
- **Key property issues**
 - Potential buyout for 167 Main St (Dave Rosenberg), 146 Anderson (David and Emma Mans-Hardy), and 134 Anderson (Dan and Kelly Kennelly)
 - 153/145 Main (Nancy Farmer), 175 Main (Jyoti Sharp), and 10 Ward St (Jon Ashton) need further analysis to determine feasibility of restoring the properties
 - May realign stream/restore fill for 175 Main (Jyoti Sharp) and 153/145 Main (Nancy Farmer) to help rebuild their properties





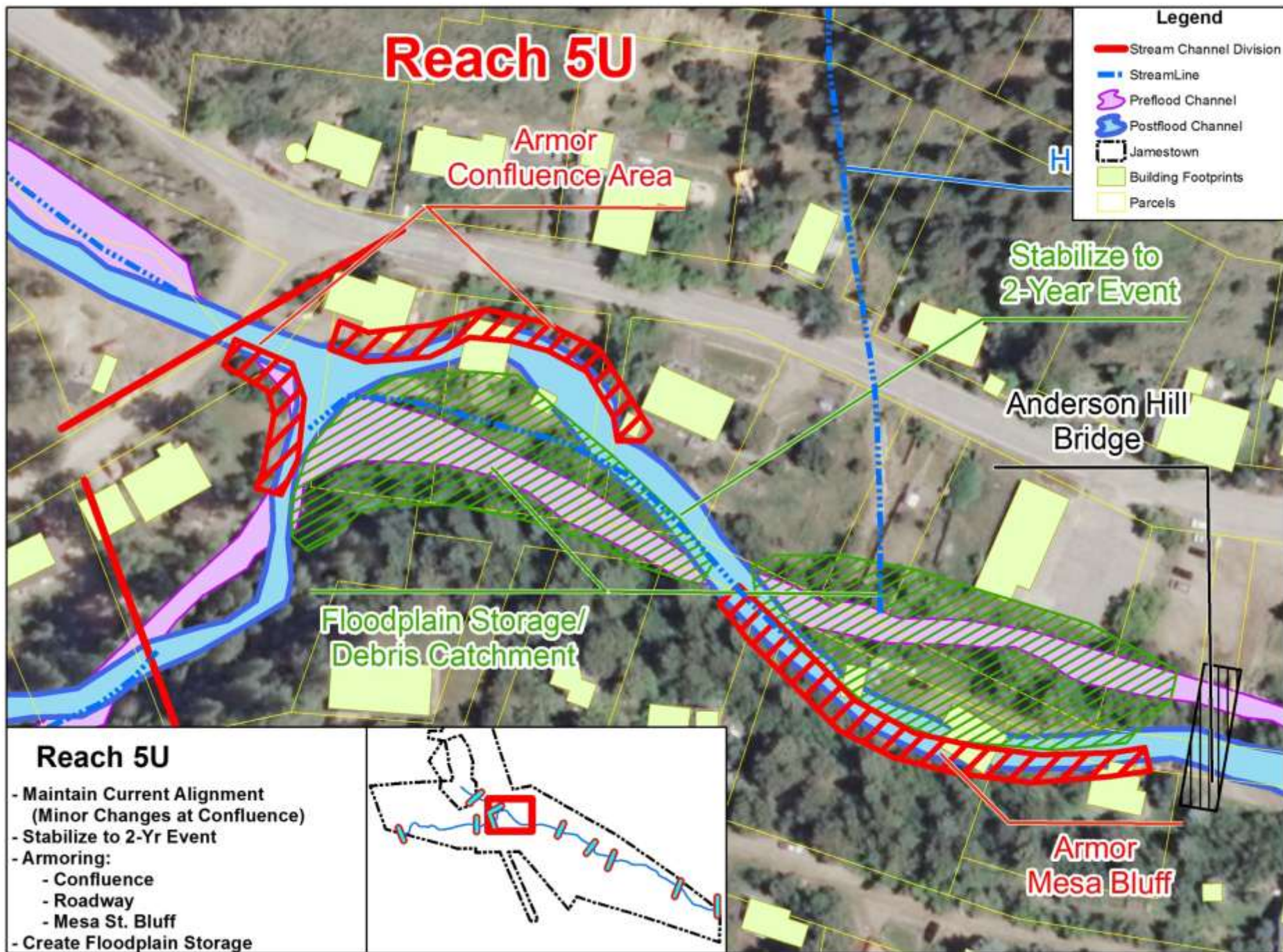
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N:040° 06' 54.792"



UTC 2014:01:03 18:03:25
278° W tru
W:105° 23' 17.73"
N:040° 06' 54.954"



UTC 2013:10:09 19:40:13
74° ENE tto
W:105° 23' 26.97"
N:040° 04' 57.816"





UTC 2013:10:09 19:47:44
122° 55E 100
43185 21° 23.918"
0:040 00' 10.056"



The road and stream switched places in Reach 6

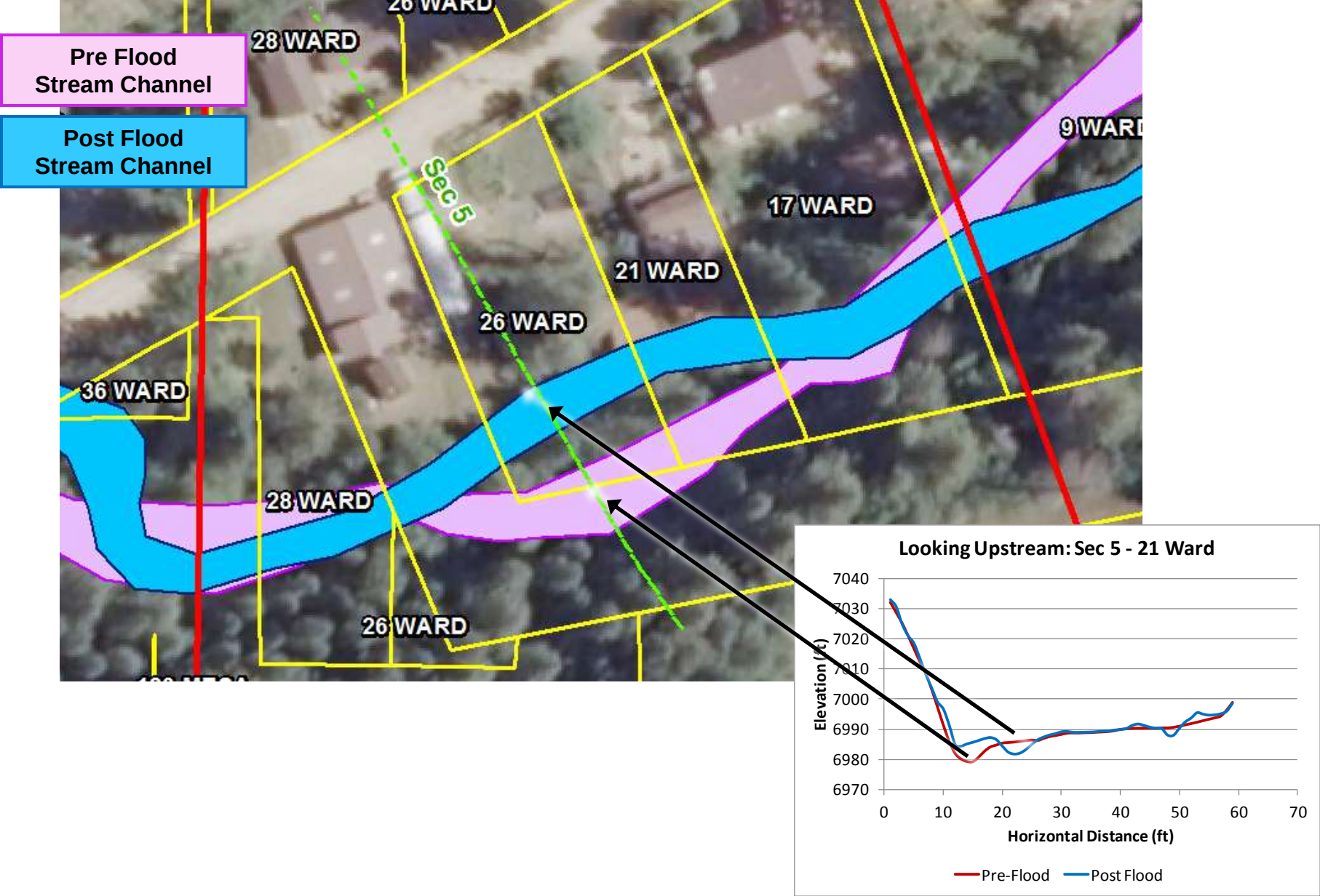


Key challenges Reach 6 include deposition and topography

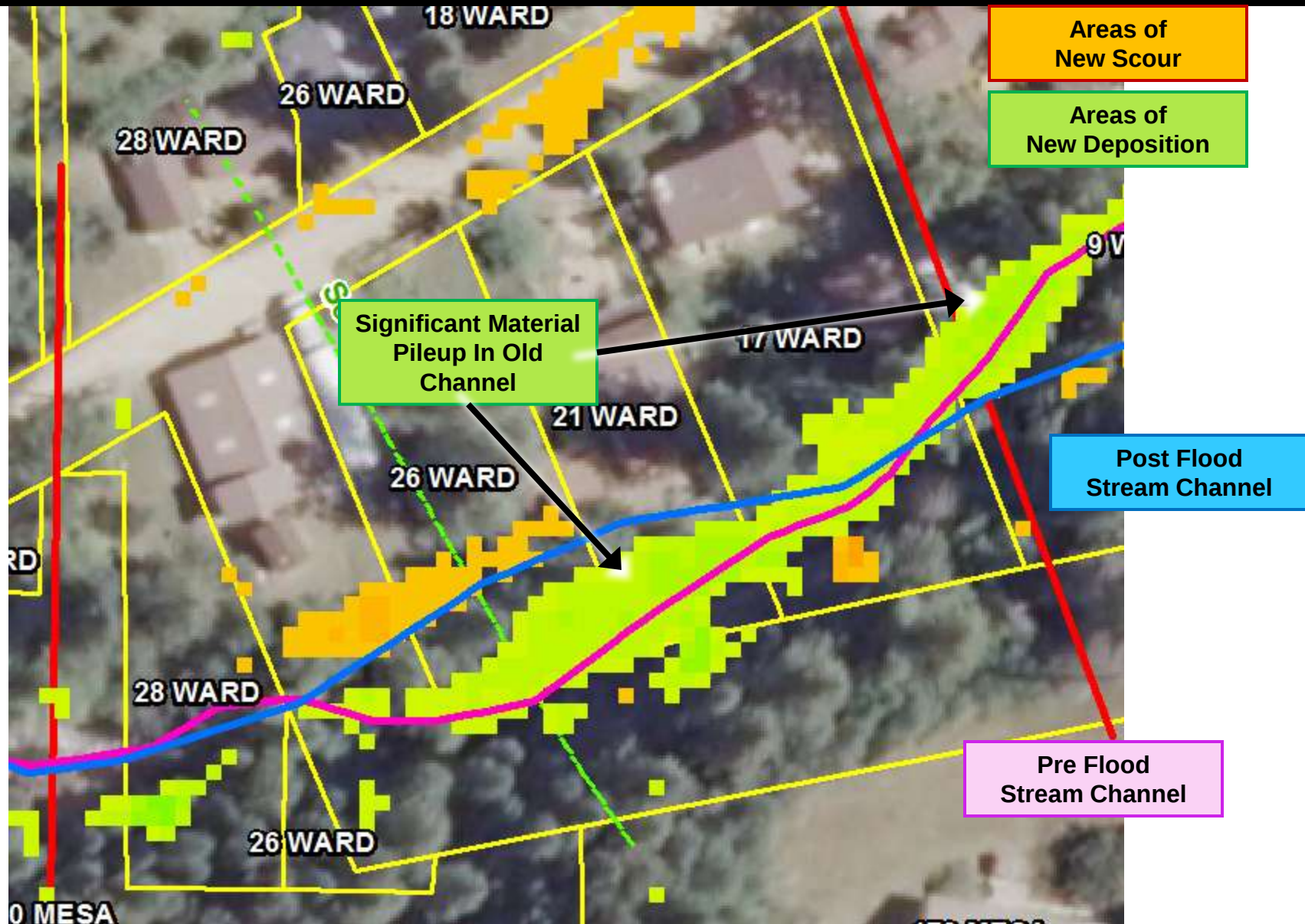
- Lateral migration caused by large depositional area along cliff
- Steep channel gradient above confluence



Here are the Reach 6 cross sections

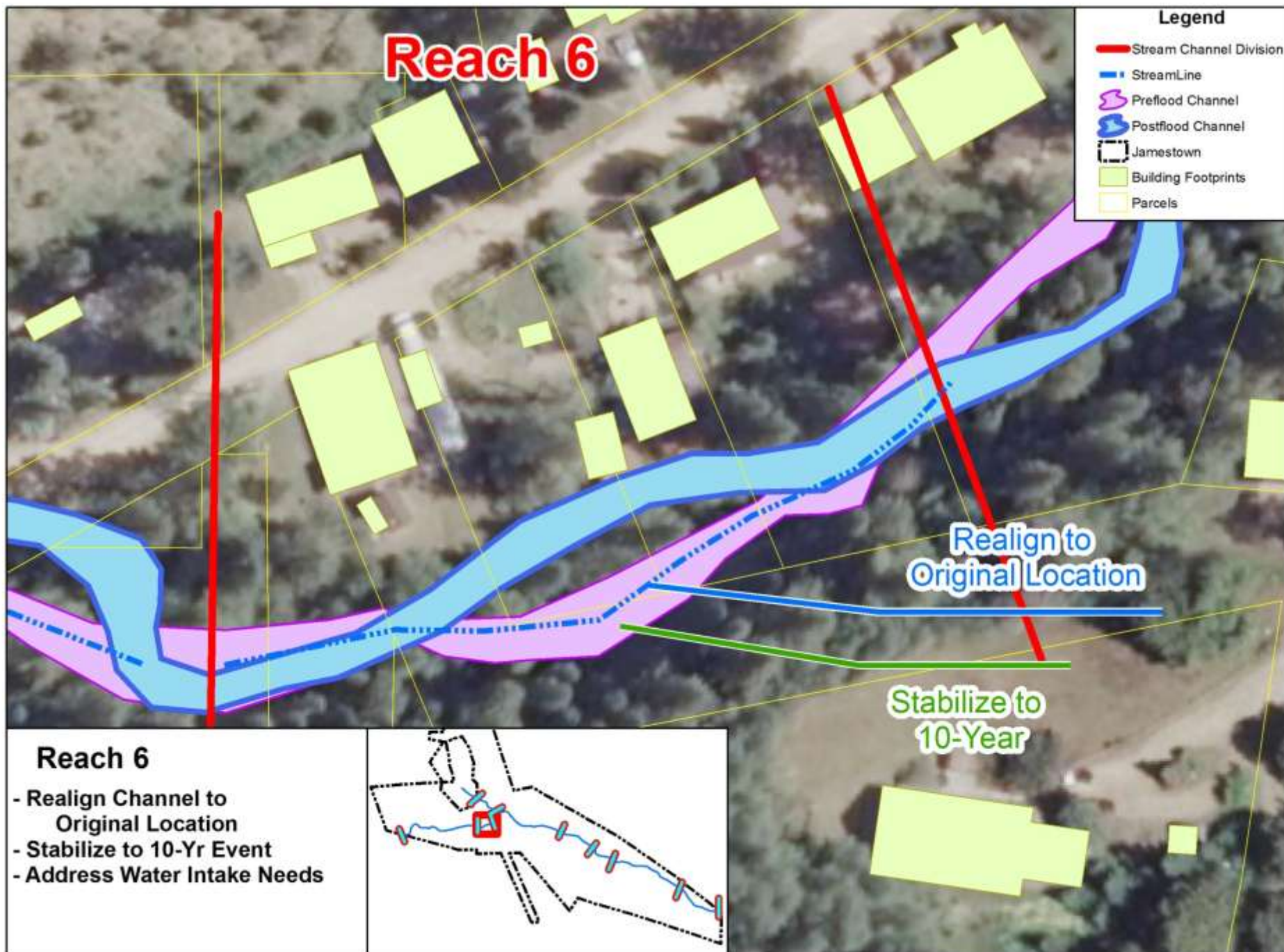


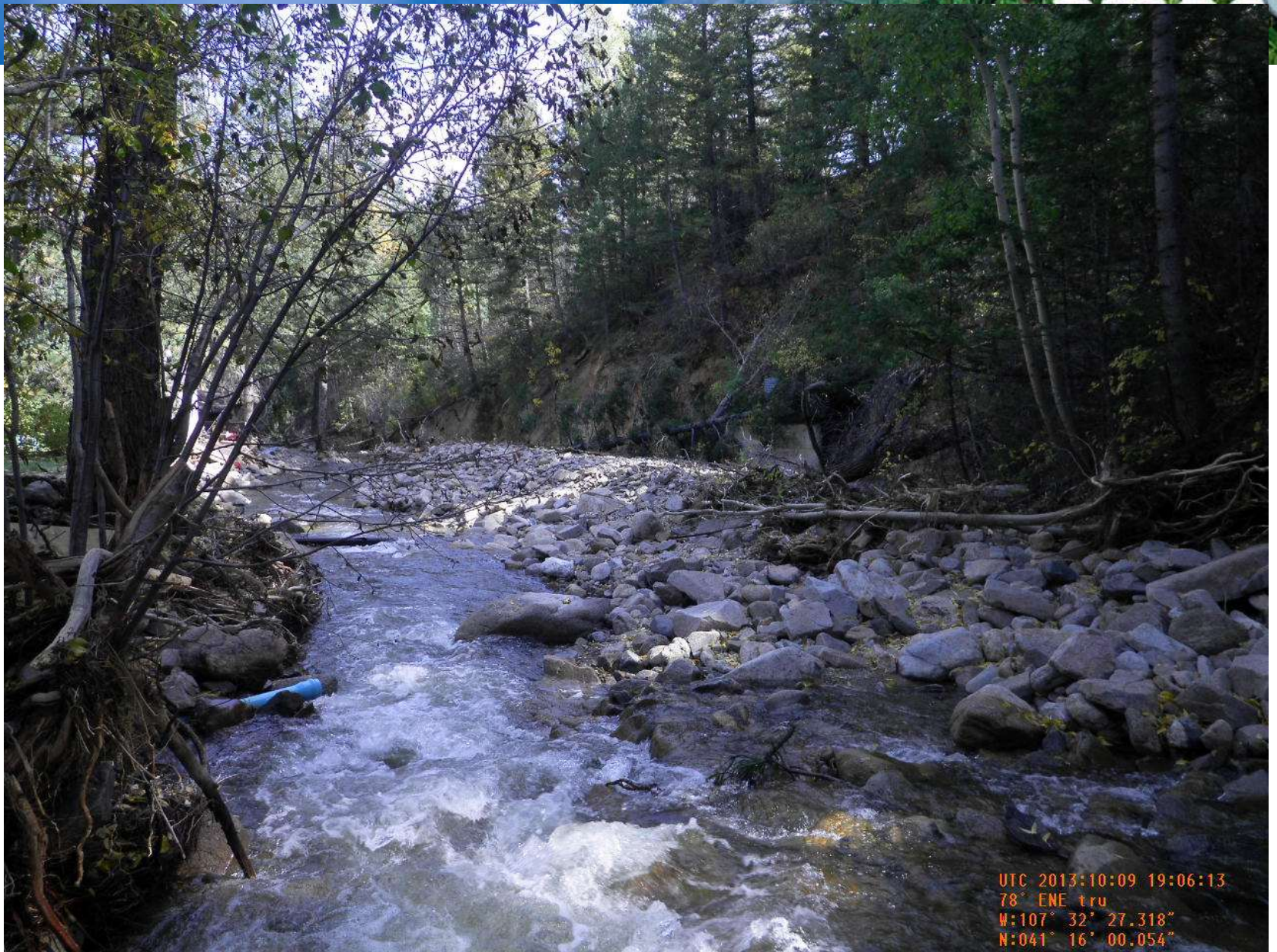
Scour occurred along Ward St, with deposition and scour along the stream channel



For Reach 6 we recommend returning James Creek and Ward St. to their pre-flood alignments

- Return James Creek and Ward St to their pre-flood locations
- Stabilize stream bank, increase channel capacity, and implement energy dissipation strategies
- Restore vegetation for stream bank stabilization
- Address road elevation and property access in conjunction with the permanent road repairs





UTC 2013:10:09 19:06:13
78° ENE tru
W:107° 32' 27.318"
N:041° 16' 00.054"

The road and stream switched alignment in Reach 7



Key challenges in Reach 7 include the stream avulsion and difficult options for stream alignment

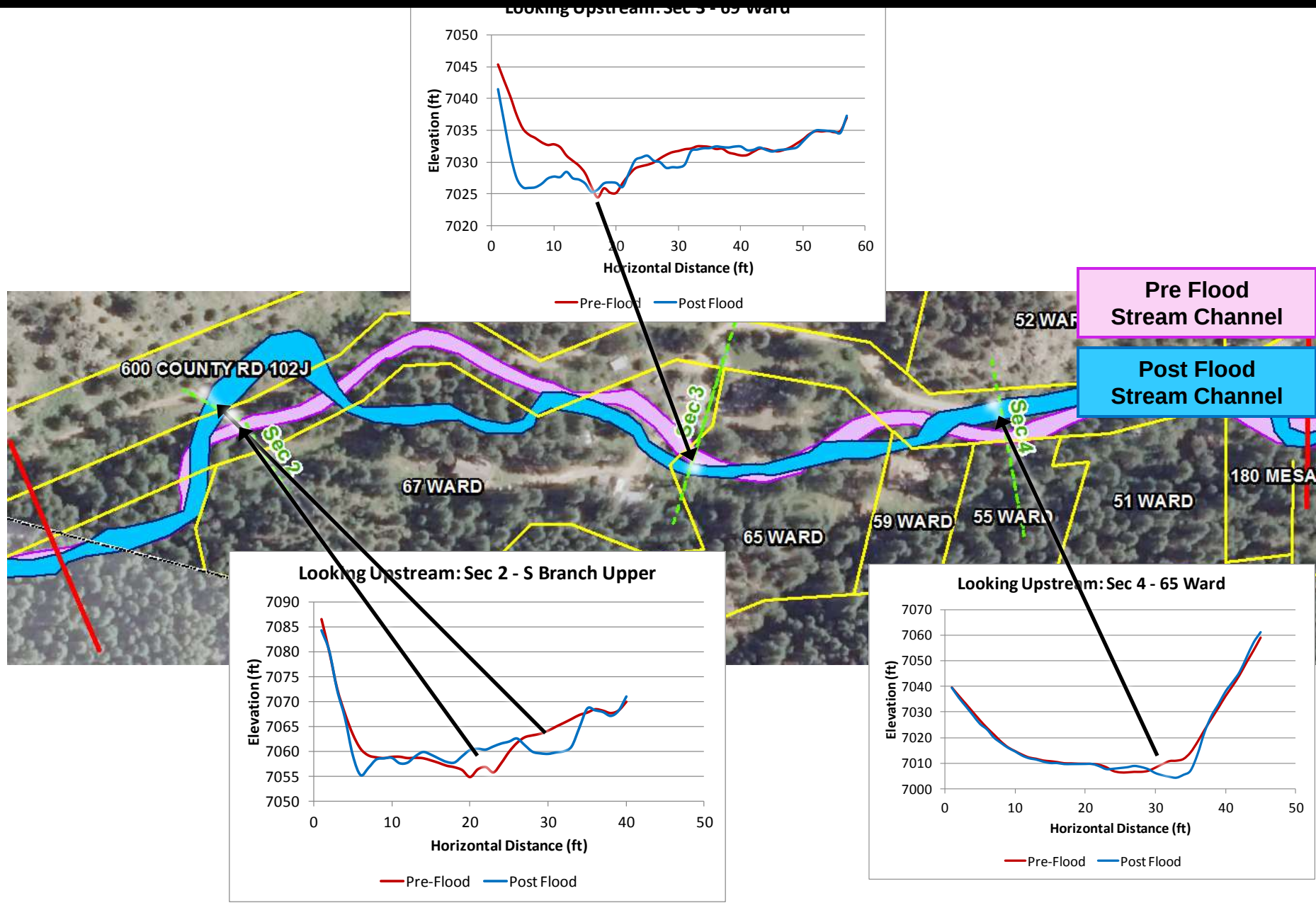
- Lateral migration in wider, upper portion of reach
- Bedrock pinch concentrates energy near location of bridge making road and channel alignment difficult



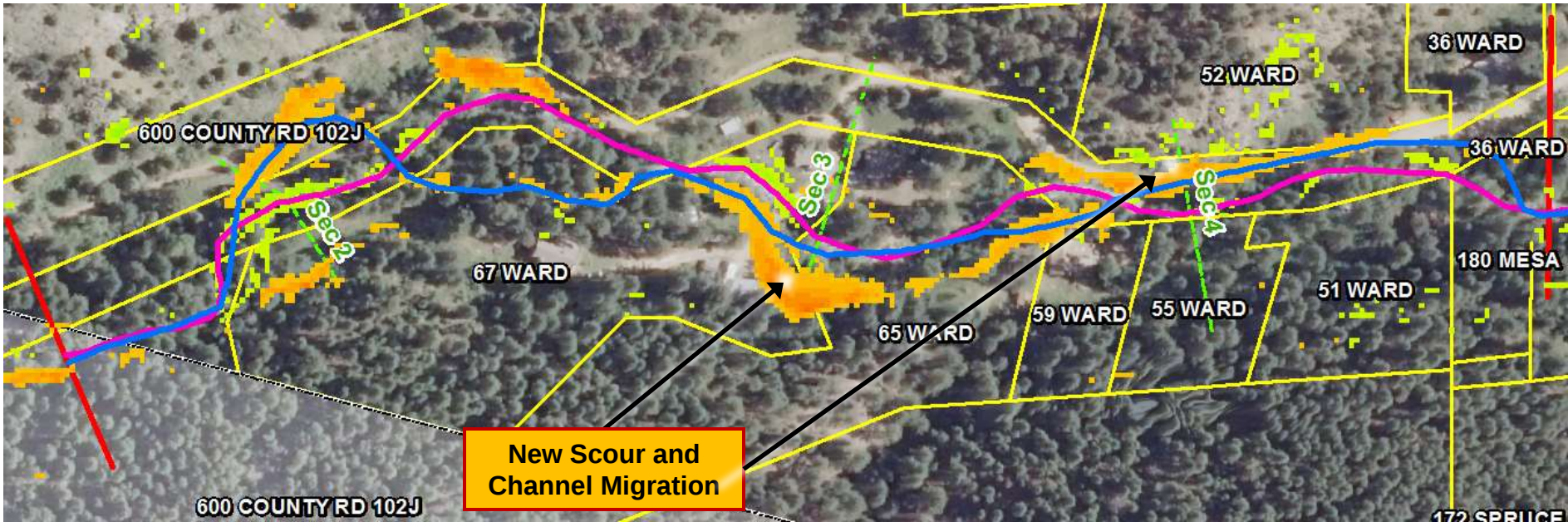
Pinch

Lateral migration,
deposition

Here are the Reach 7 cross sections



Significant scour and deposition occurred in Reach 7



Areas of
New Scour

Areas of
New Deposition

Post Flood
Stream Channel

Pre Flood
Stream Channel

Reach 7 recommendations include stream stabilization, property access, and restoring pre-flood alignment

- Return James Creek and Ward St to their pre-flood locations
- Stabilize stream bank, increase channel capacity, and implement energy dissipation strategies
- Restore vegetation for stream bank stabilization
- Address road elevation and property access in conjunction with the permanent road repairs
- **Key property issues**
 - 59 Ward St (Karen Zupko) needs further analysis to determine feasibility of restoring the property
 - Culvert near 36 Ward St (Mike and Rhonda Taillon) must be moved – already clogging with ice and debris

Reach 7

Legend

- Stream Channel Division
- StreamLine
- Preflood Channel
- Postflood Channel
- Jamestown
- Building Footprints
- Parcels

US Limit
Study Area

Pedestrian Bridges

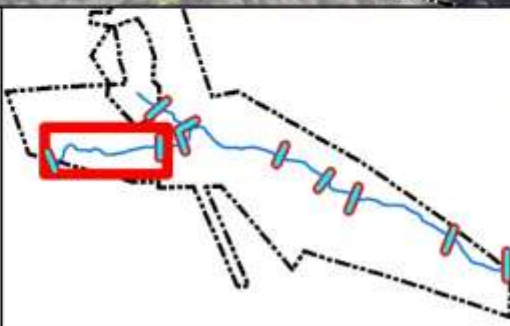
Armor Bend
At Roadway

Floodplain Storage/
Debris Catchment

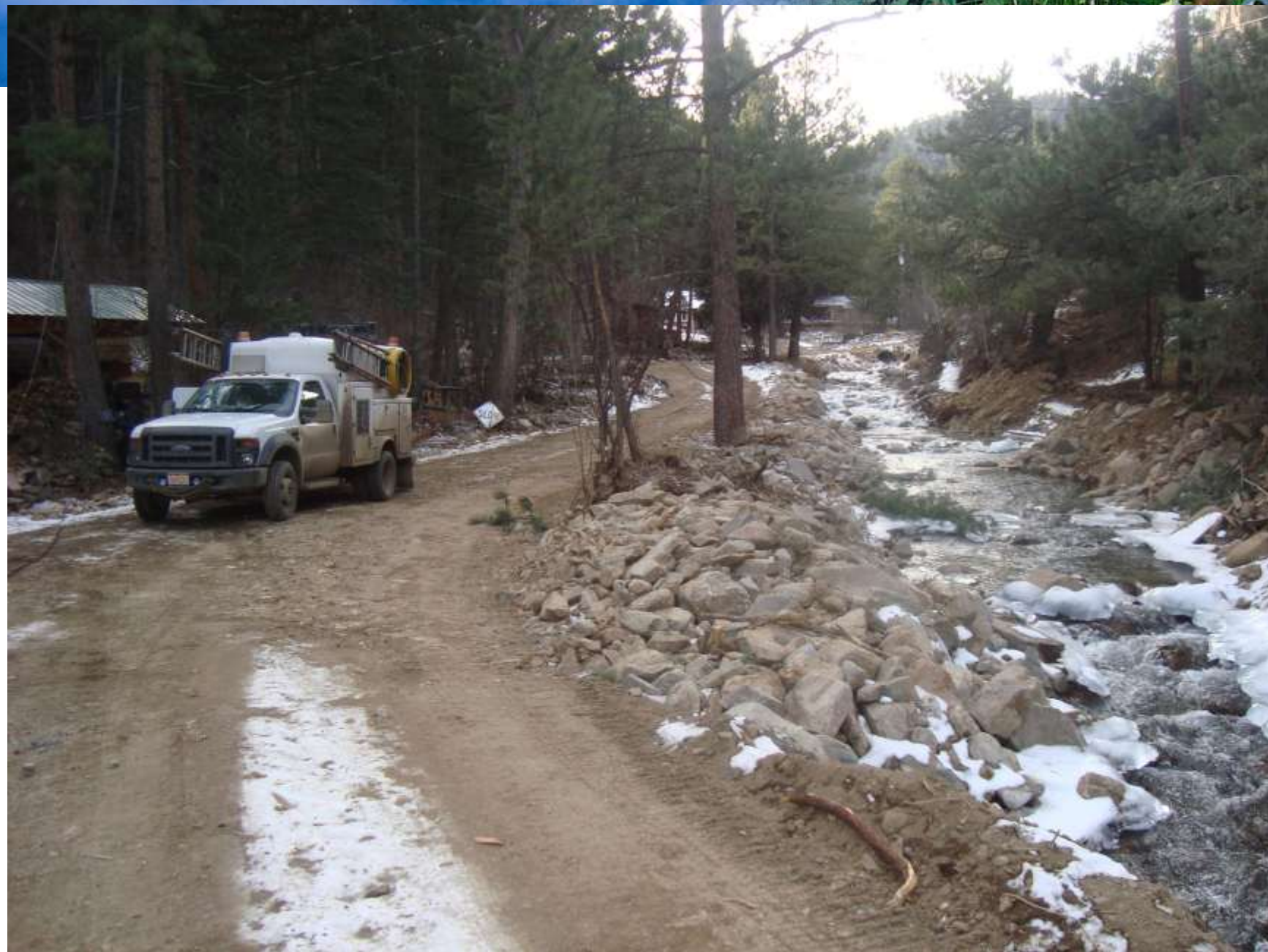
Align to
Original Location

Reach 7

- Realign lower channel to orig. location
- Realign Ward St. to orig. location
- Armor Bend at 36 Ward st.
- Pedestrian Bridges on Ward St.
(#'s 51, 55, 59, 65, 67)
- Create Floodplain Storage/
Debris Catchment Areas







Reach 8 includes the northwest area of town

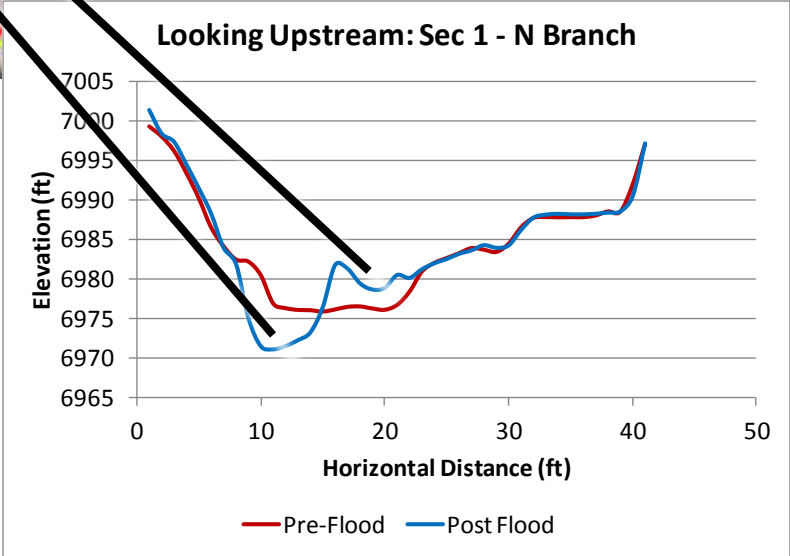
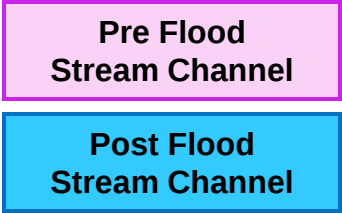


Key challenges in Reach 8 include scouring and topography

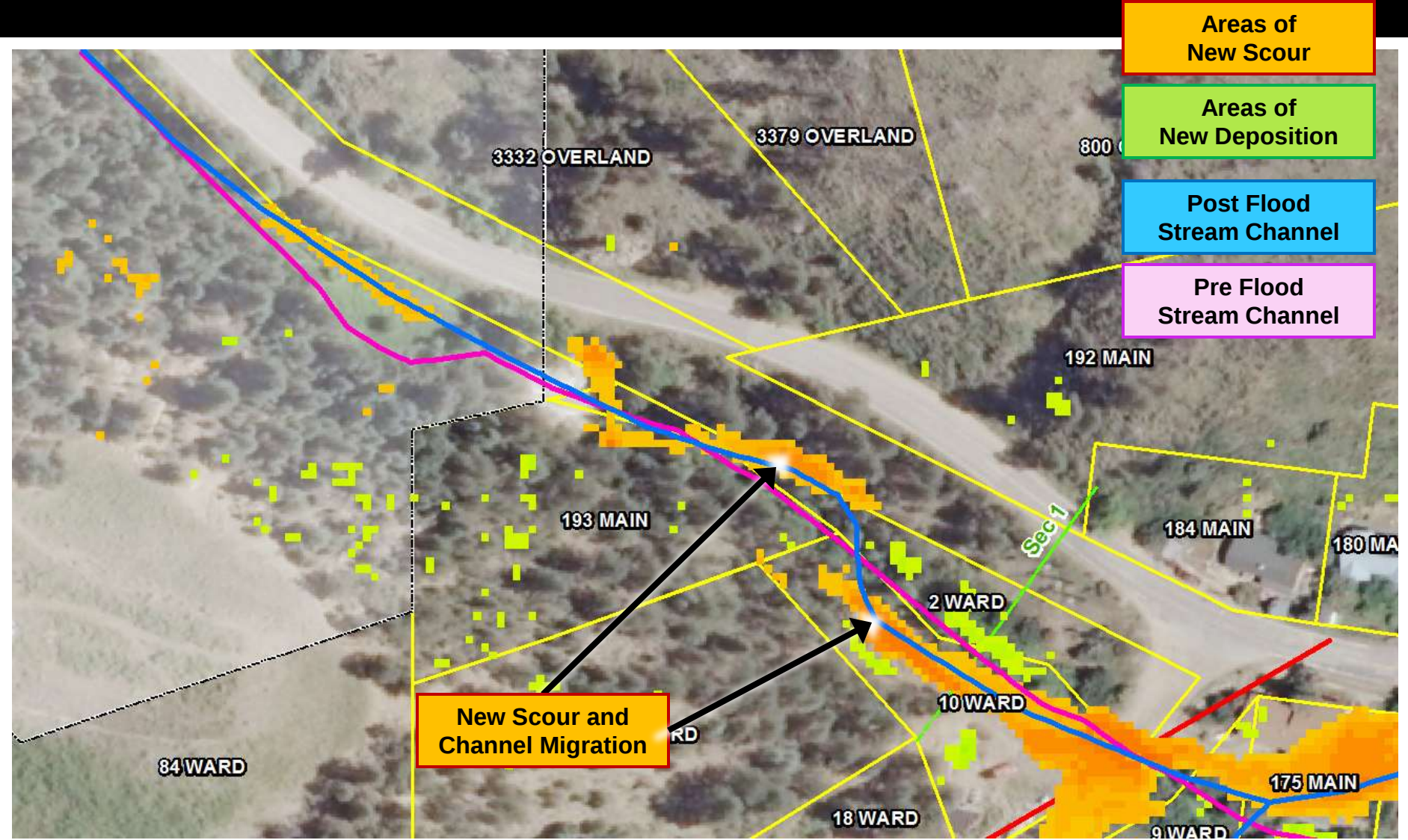
- Steep, confined reach
- Scoured to bedrock in many locations



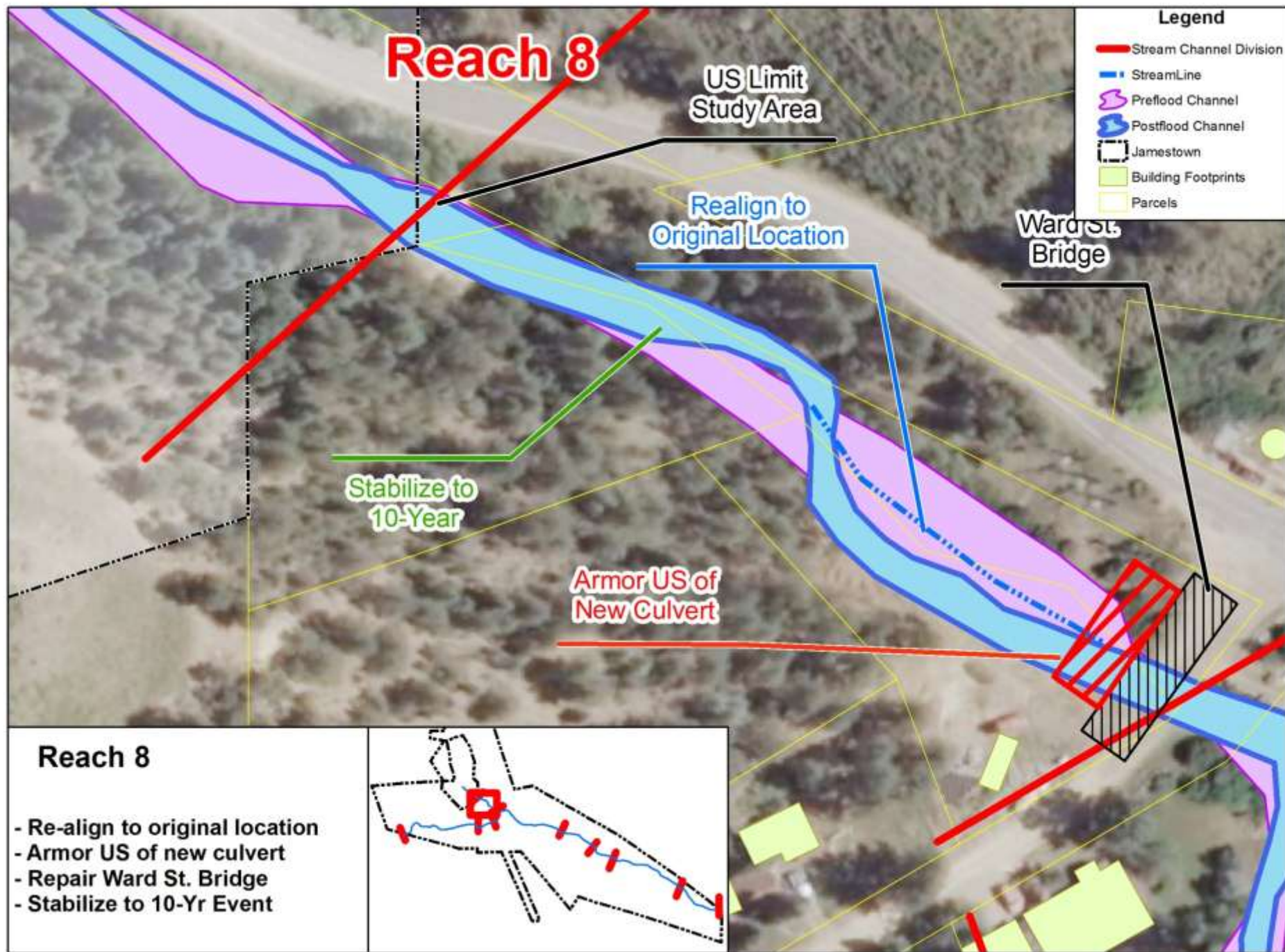
Here are the Reach 8 cross sections



Here is the Reach 8 DEM difference



Reach 8 recommendations include stabilization and realignment



Questions?