

# Gulf Branch Stream Resilience Project

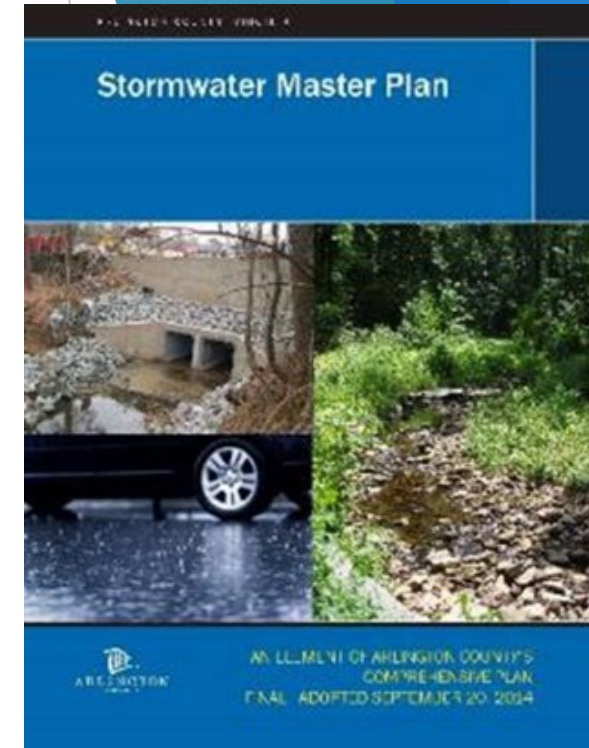
Re-Engagement: June 22, 2022 Community Meeting

# Gulf Branch Stream Resilience Project Goals

What are the goals of the Gulf Branch project?

- ▶ Create a stable stream channel to accommodate storm flows, address active erosion and create overall resiliency to climate change
- ▶ Repair and protect vulnerable exposed infrastructure and prevent sewage releases to the stream and repeat emergency repairs
- ▶ Reduce excess sediment and nutrients being transported downstream to help protect Potomac River and Chesapeake Bay and meet regulatory requirements
- ▶ Enhance habitat and reduce impact to existing high-quality habitat
- ▶ Increase public safety and access to stream for recreational purposes (also supports biophilic goals)

Implement Stormwater Master Plan (2014) Strategy 3: Restore Stream Corridors



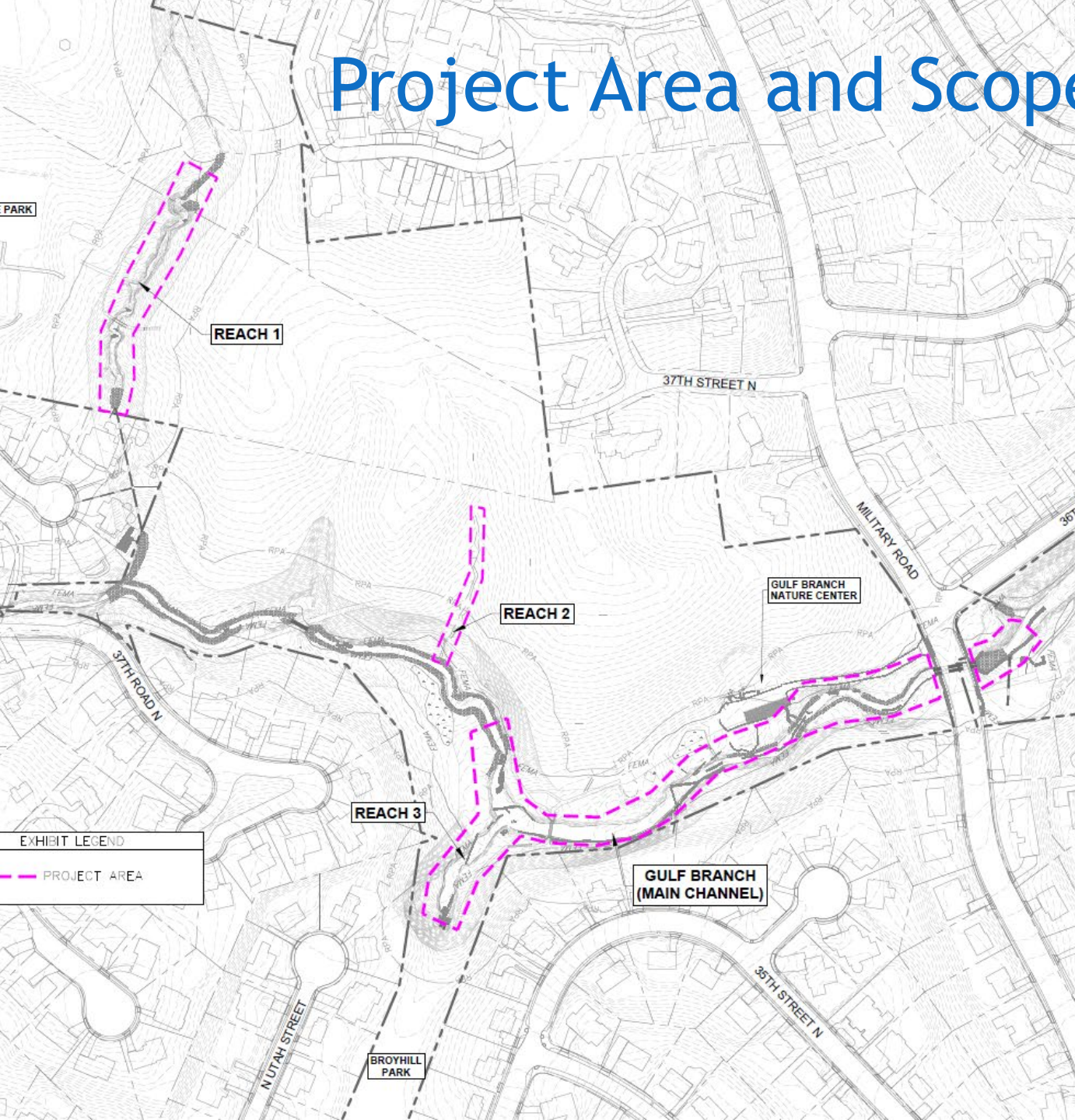
# Process To Date

- ▶ Spring 2019 Advisory Group formed, including representatives from civic associations, key commissions, and local environmental groups (EcoAction Arlington, Arlington Regional Master Naturalists).
  - ▶ Bellevue Forest advisory group position is vacant.
- ▶ Summer 2019 Pre-Design Engagement.
- ▶ Fall 2019 Community Meeting Draft Concept Design.
- ▶ February 2020 Advisory Group Meeting (30% design).
- ▶ March 2020 Community Meeting cancelled.
- ▶ Project put on pause due to budget uncertainty.
- ▶ 2022 Design funding resumed. Comments from internal stakeholders on 30% plans collected.
- ▶ June 2022 Community meeting to gather feedback and input (today).





# Project Area and Scope



- ▶ Scope change to limit stream work to the areas upstream and at Military Road
- ▶ Two reasons for the change: To reduce project impacts and budgetary pressures. Majority of tree removals would have been in areas downstream of Military Road.
- ▶ With no sanitary sewer pipes or other infrastructure downstream of the pump station, the costs of inaction are lower in those stream sections.
- ▶ We can still expect ongoing erosion and tree loss along the banks as the stream continues to widen to accommodate large stormwater flows.
- ▶ The severe outfall erosion will be addressed separately.
- ▶ Green Streets: Currently assessing feasibility for green street bioretention projects to capture stormwater runoff downstream of Military Road.



# Incorporating Feedback

- ▶ *1. What we heard:* Concern about impacts to Broyhill Park and impacts to nature center users.
- ▶ *Response:* Split access (part through Broyhill Park, part through Military) to lessen impacts on each area.
- ▶ *2. What we heard:* Concern about tree loss
- ▶ *Response:* Limit stream work to areas upstream of Military Road, where there would be less tree loss and highest risk of inaction
- ▶ *3. What we heard:* Concerns about sustainability, climate change and volatility
- ▶ *Response:* Prioritize ongoing stability, especially around infrastructure, while acknowledging that streams are dynamic systems. (Stable not static.)
- ▶ *4. What we heard:* Interest in addressing erosion before it becomes severe, with potentially less invasive interventions
- ▶ *Response:* Add more of Reach 2 to scope

# Incorporating Feedback

- ▶ *5. What we heard:* Interest in controlling runoff upslope
- ▶ *Response:* Additional large rain garden (bioretention/green street) projects. Even with these projects, in stream sections outside of the project scope, there will still be stream erosion, bank widening and tree loss.
- ▶ *6. What we heard:* Can smaller equipment be used?
- ▶ *Response:* Contractors use the smallest equipment that can safely transport and lift the material needed to stabilize the stream.
- ▶ *7. What we heard:* Consider additional methods, like using wood.
- ▶ *Response:* We plan to incorporate wood structures in the design.
- ▶ *8. What we heard:* Desire to learn more about the reasoning behind the proposed design and other alternatives that have been or will be considered.
- ▶ *Response:* Will provide more information about the reasoning for preferred options as we move forward with the project.



# Gulf Branch Map with Reach Numbers



1

2

3

Main Stem

Nature Center

Outfall erosion to be addressed separately (Reach 5)

Outfall erosion to be addressed separately (Reach 4)

Green Streets

N RICHMOND ST

N OAKLAND ST

N RANDOLPH ST

37TH ST N

36TH RD N

37TH RD N

38TH ST N

N UPLAND ST

35TH ST N

N QUEBEC ST

MILITARY RD

N PIEDMONT ST

N PEARY ST



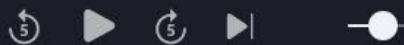
# Gulf Branch Map with Reach Numbers







# Stream Walk Video



00:05.07 / 04:28.19



# Tree Protection Priorities for Streamside Forest Health

- ▶ Potential tree removals will be shown on the following slides. Trees four inches in diameter or larger have been surveyed.
- ▶ Construction access paths will be designed to work around high priority trees based on size, ecological value, and condition
  - ▶ Size / Diameter
  - ▶ Ecological value: Longer-lived, mast-producing climax species (oaks) vs. shorter-lived early successional species (tulip trees, red maples)
  - ▶ Condition assessment and ratings
- ▶ Limit root compaction on access paths with mulch and wood matting; protect tree trunks
- ▶ Native plant rescues to be conducted prior to construction





# Near Term Impact, Long Term Benefit

- ▶ Stable streambanks and floodplain connection will help prevent future erosion and losses.
- ▶ Canopy will close as remaining trees adjust and react to increased sunlight, growing to fill in openings.
- ▶ Robust and diverse replanting plan and invasive control and maintenance.
- ▶ New trees will grow.





# Gulf Branch Map with Reach Numbers



1

2

3

Nature Center

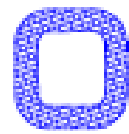
Main Stem

Green Streets

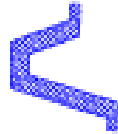


# How to Read the Design Maps

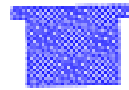
## STONE AND WOOD STRUCTURES



STEP POOL



MODIFIED  
CROSS VANE



ROCK STEP



IN-STREAM  
HABITAT LOG



IN-STREAM ROCK  
SILL/VALLEY WIDE  
GRADE CONTROL



ACCESS PATH



STOCKPILE/  
STAGING AREAS



**CONDITION RATING = 1**  
VERY HIGH QUALITY TREE



**CONDITION RATING = 2**  
GOOD CONDITION TREE  
HEALTHY ROOT/TRUNK SYSTEM



**CONDITION RATING = 3**  
MODERATE CONDITION TREE  
SOME ROOT/TRUNK DAMAGE



**CONDITION RATING = 4**  
POOR CONDITION/DEAD TREE  
HIGH ROOT/TRUNK DAMAGE



ARMORING

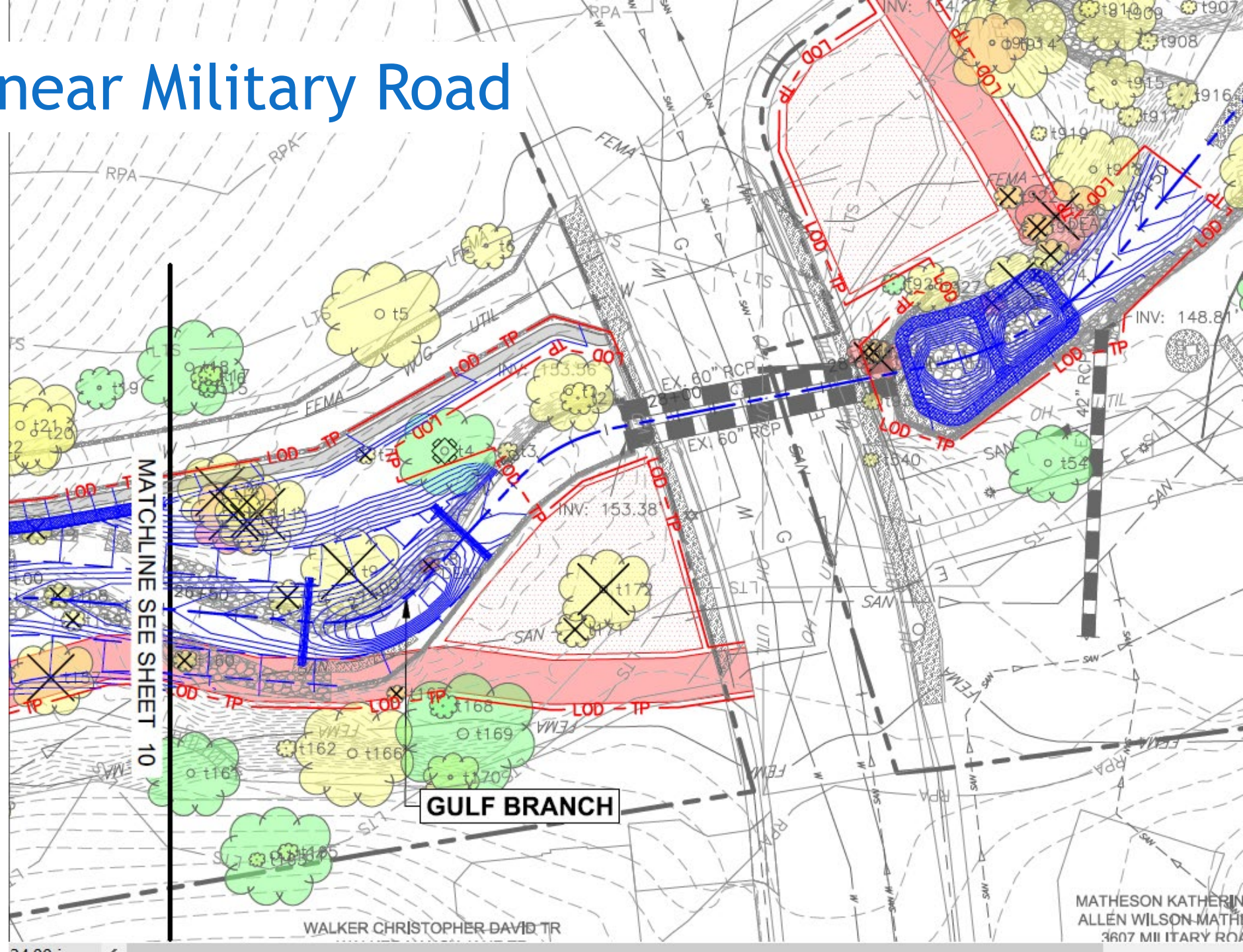


POTENTIAL REMOVAL



# Gulf Branch near Military Road

- ▶ **Problems:** Erosion on banks, floods overtop Military Road, erosion at downstream outfall.
- ▶ **Approach:** Floodplain bench, stone structures and in-stream logs to stabilize stream.
- ▶ Expanding Military Road culvert to address flooding. Plunge pools at outfall downstream of Military Rd.







# Design Visualization vs. Existing Conditions

Just Upstream of Military Road



# Gulf Branch Map with Reach Numbers



1

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3

Nature Center

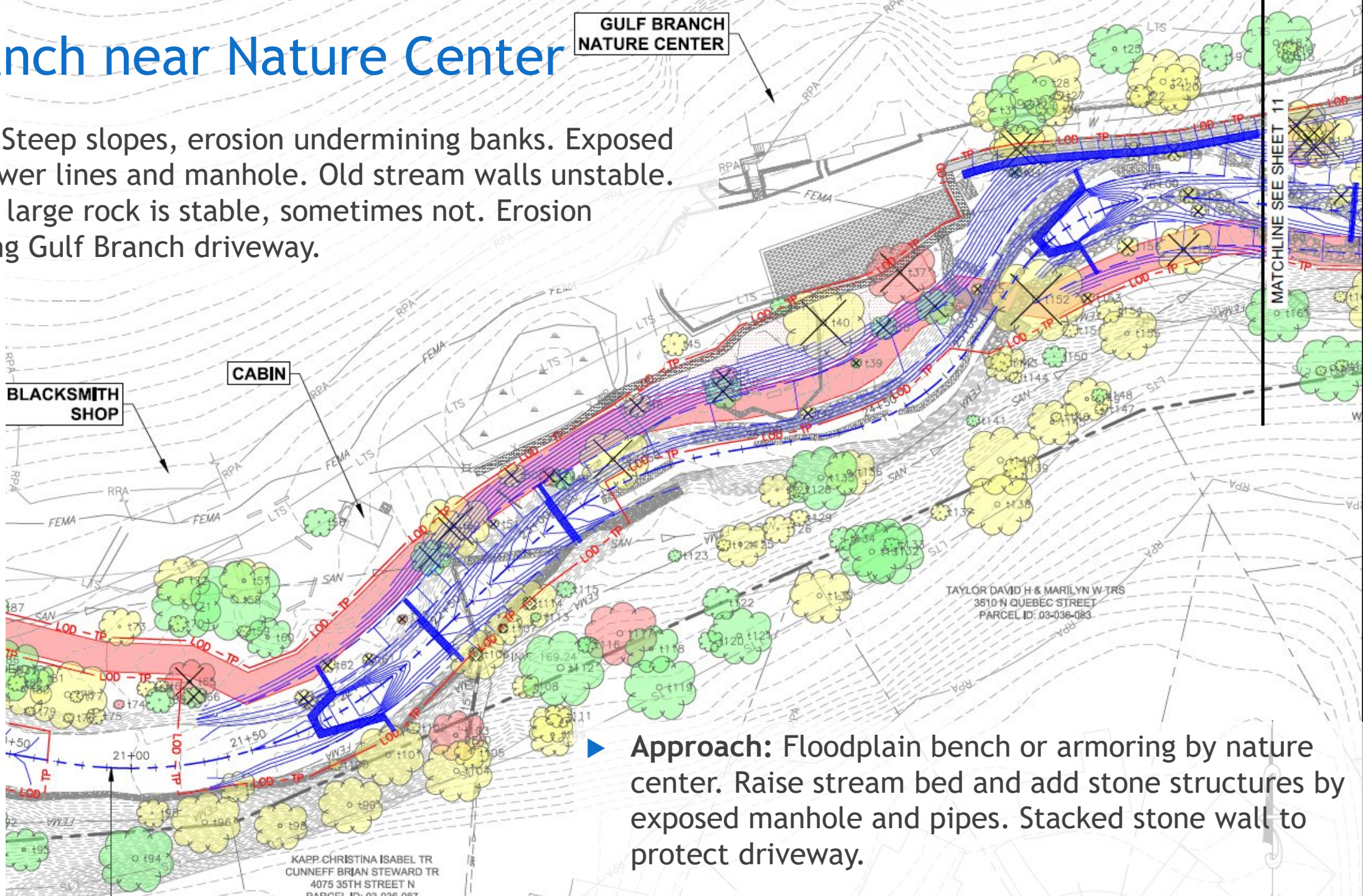
Main Stem

Green Streets



# Gulf Branch near Nature Center

- **Problems:** Steep slopes, erosion undermining banks. Exposed sanitary sewer lines and manhole. Old stream walls unstable. Sometimes large rock is stable, sometimes not. Erosion undermining Gulf Branch driveway.



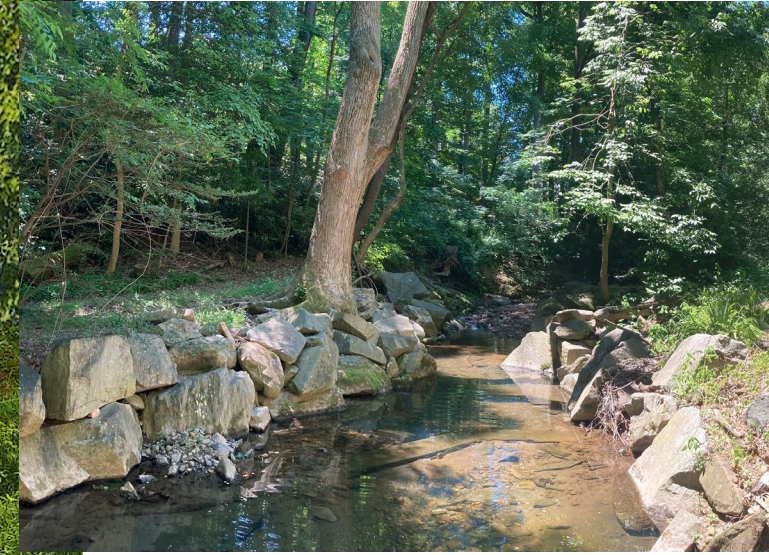
- **Approach:** Floodplain bench or armoring by nature center. Raise stream bed and add stone structures by exposed manhole and pipes. Stacked stone wall to protect driveway.





Raise Stream Bed, Re-Bury Sanitary Sewer Pipes,  
Stabilize Stream Channel





# Gulf Branch Near Nature Center - Floodplain Bench and Stone Structures



# Floodplain Bench Considerations

## Benefits

- ▶ More stable, connected channel
- ▶ Provides relief in storms
- ▶ Gentle slopes allow better access to stream for humans and wildlife

## Drawbacks

- ▶ More tree removal during the project
- ▶ Disturbance to plant communities (plan for plant rescues)

Floodplain bench near nature center would help improve access to the stream for programs.

- ▶ Other options include armoring with stone or leaving as-is, which may lead to more erosion.

## Considerations

- ▶ Even without a floodplain bench, ongoing stream erosion and widening would take down many of the trees and reshape banks (and send sediment downstream)
- ▶ Alternative to floodplain bench: Armoring with heavy rock or let erode
  - ▶ Armoring prevents spot erosion but transfers force downstream. No access benefits.





# Gulf Branch and Reach 3



1

2

3

Nature Center

Main Stem

Green Streets

EDGE RD

N RICHMOND ST

N OAKLAND ST

38TH ST N

N RANDOLPH ST

37TH ST N

36TH RD N

37TH RD N

N PEARY ST

N UPLAND ST

N PIEDMONT ST

35TH ST N

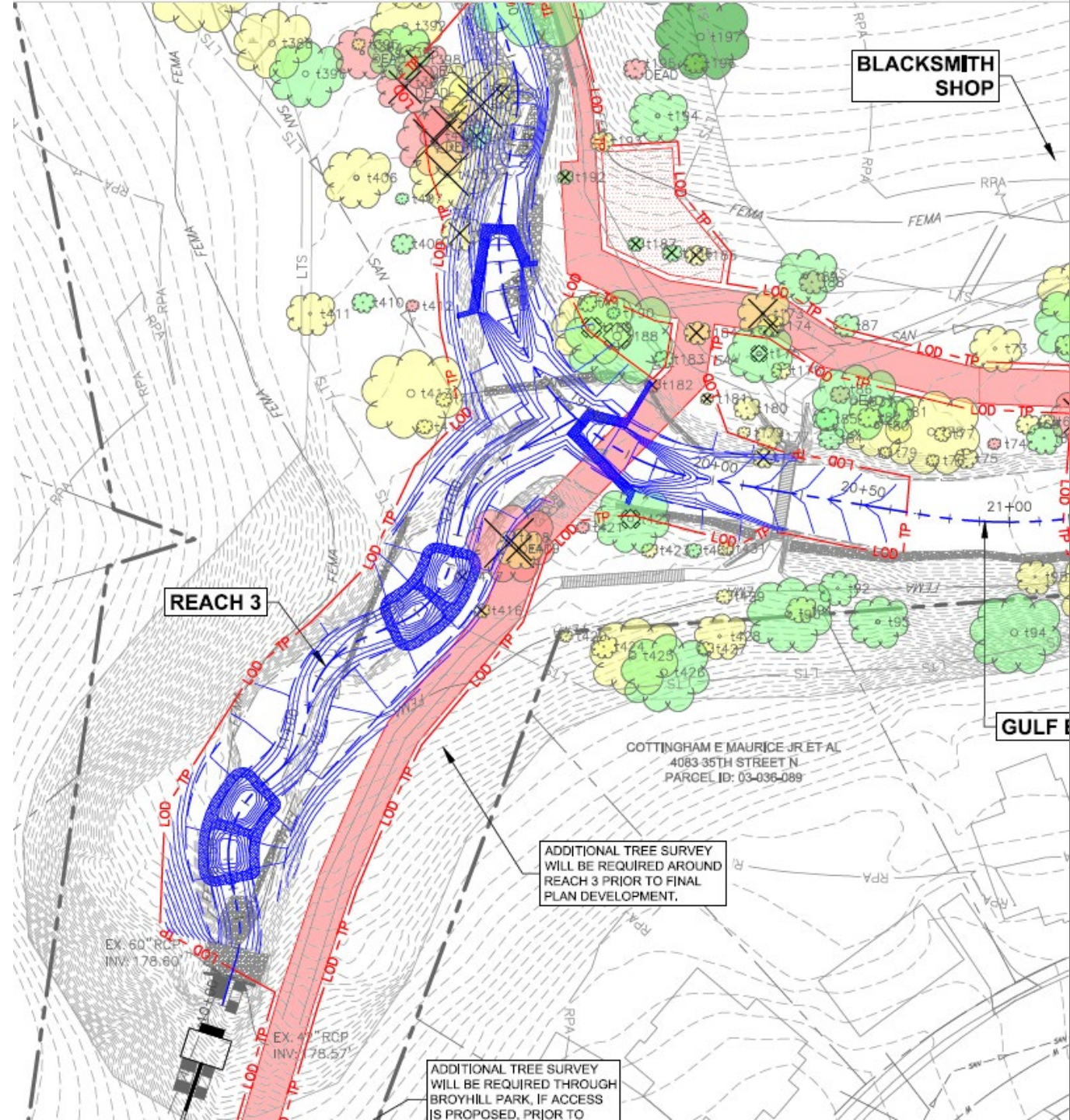
N QUEBEC ST

MILITARY RD



# Gulf Branch and Reach 3

- ▶ Confluence of Gulf Branch with Broyhill Park tributary (Reach 3).
- ▶ **Problems:** Major area of erosion and sanitary sewer lines. Old stream walls have not prevented significant bank erosion. Concrete encasements are only temporary protection for sanitary lines.
- ▶ **Approach:** Re-bury the sanitary sewer lines under the stream bed. Use stone structures to stabilize and prevent future erosion. Work around high-value trees to preserve cover.
- ▶ Also, stabilize slope above the Broyhill Park outfall. Access through Broyhill Park for this section. We will work with the community and construction contractor to try to minimize impacts in the park.





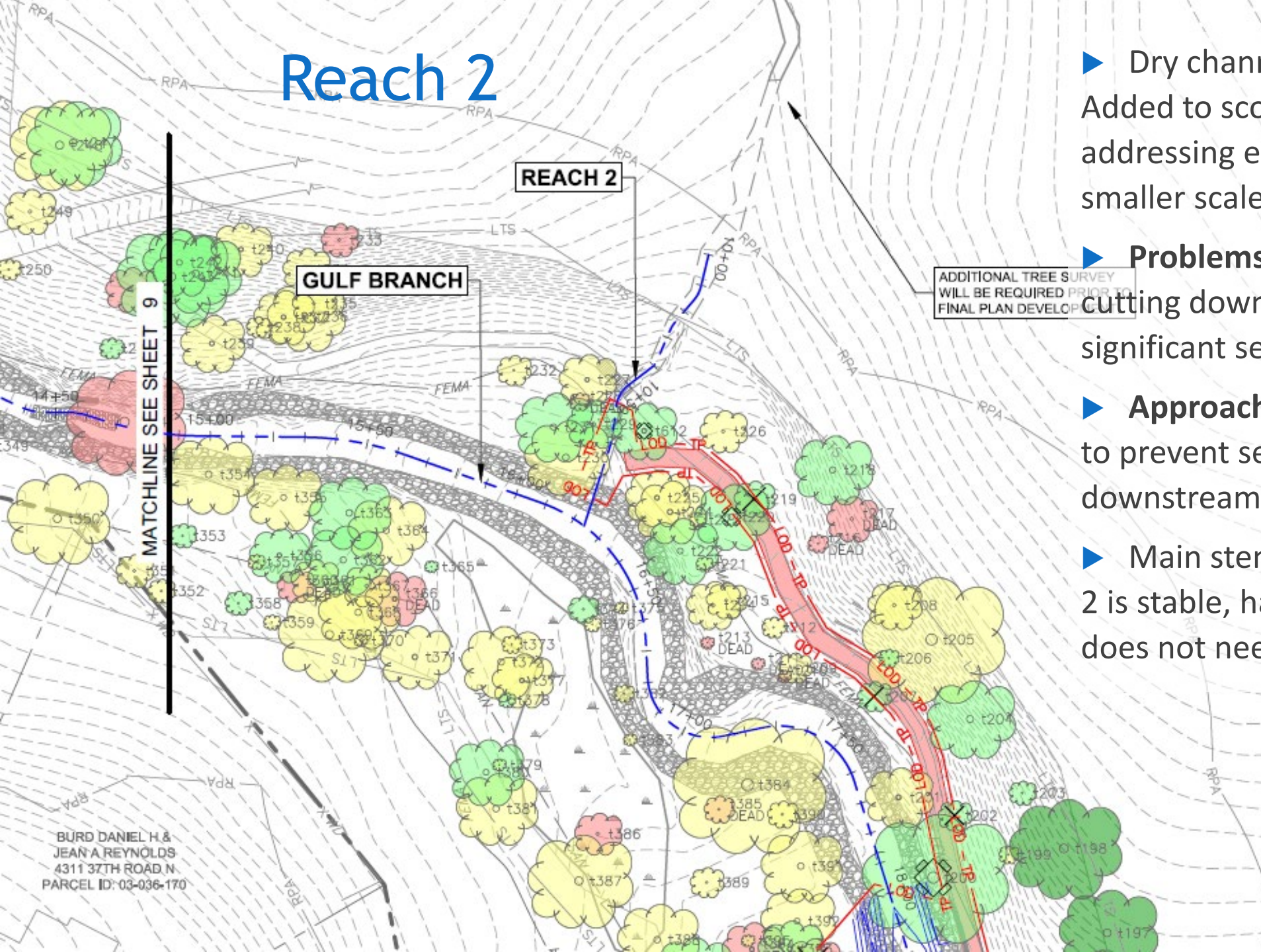
# Reach 3 - Erosion on Slope Above Outfall

- ▶ **Problem:** Excess runoff from Broyhill Park on slope
- ▶ **Approach:** Redirect runoff and stabilize flow path
  - ▶ Also considered additional grate inlet





# Reach 2



► Dry channel through Gulf Branch Park. Added to scope due to feedback about addressing erosion before it worsens and smaller scale stream work.

► **Problems:** Active erosion. Channel cutting down and out. Potential to send significant sediment loads downstream.

► **Approach:** Stabilize with smaller stone to prevent sediment from being carried downstream.

► Main stem of Gulf Branch near Reach 2 is stable, has floodplain access, and does not need stabilizing structures.



# Gulf Branch Map with Reach Numbers



1

2

3

Nature Center

Main Stem

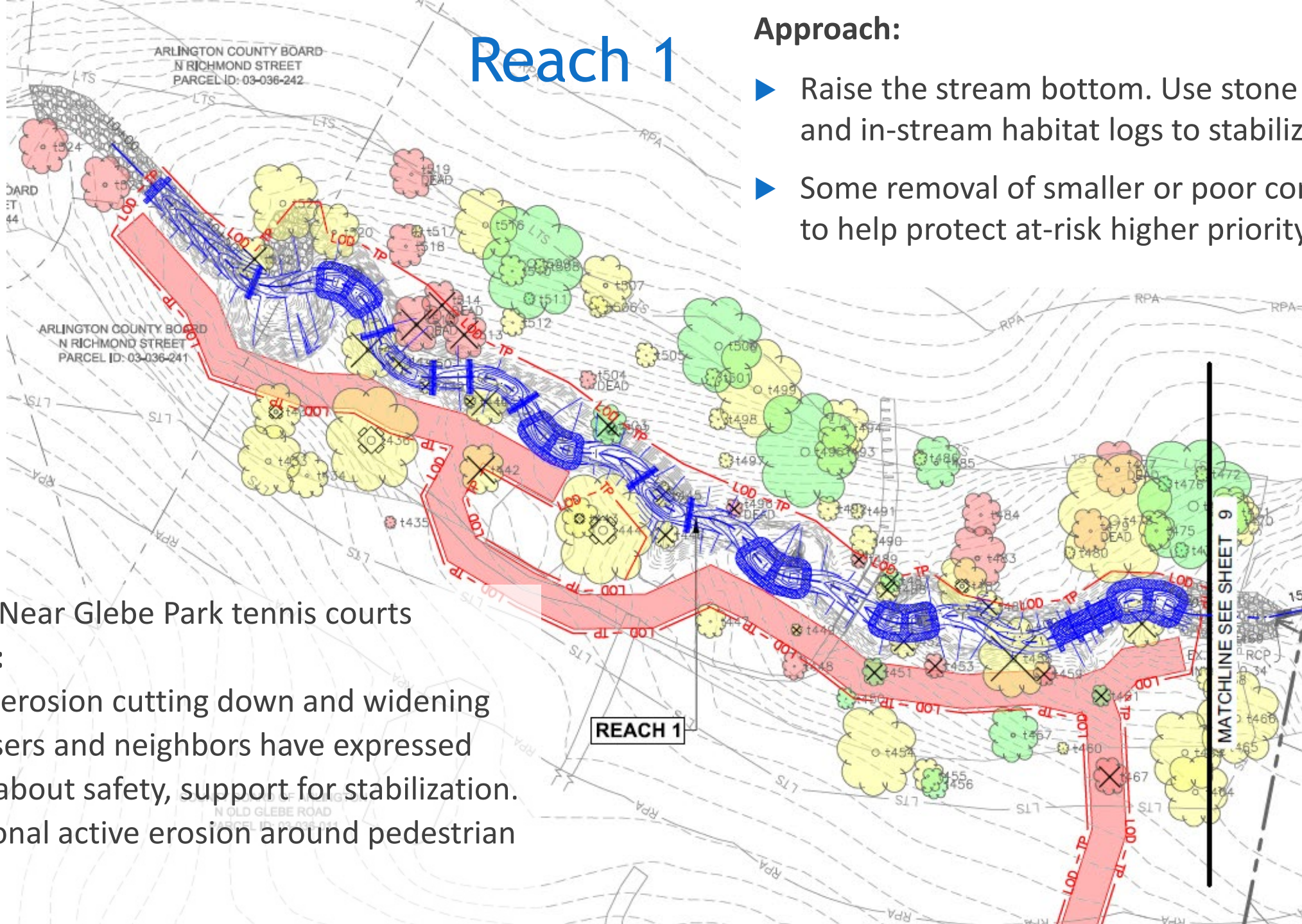
Green Streets



# Reach 1

## Approach:

- ▶ Raise the stream bottom. Use stone structures and in-stream habitat logs to stabilize stream.
- ▶ Some removal of smaller or poor condition trees to help protect at-risk higher priority trees



**Location:** Near Glebe Park tennis courts

## Problems:

- ▶ Active erosion cutting down and widening
- ▶ Trail users and neighbors have expressed concerns about safety, support for stabilization.
- ▶ Additional active erosion around pedestrian bridge



# Looking Forward: Decision Points

- ▶ Floodplain bench vs bank armoring near Nature Center
- ▶ Construction entrances and stockpile areas are not final
- ▶ Habitat assessment and planting plan will be available at a future meeting for feedback
- ▶ Please fill out the online feedback form! <https://bit.ly/Gulf-Branch-2022>
- ▶ Community feedback will be used to help inform decision-making going forward



# Public Process

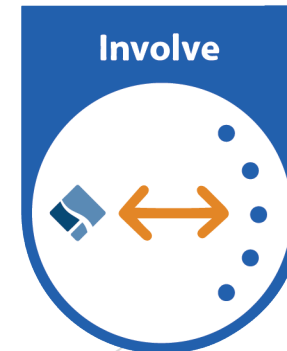
Summer  
2019: Pre-  
Design  
Open  
House

Fall 2019:  
Public  
Meeting  
Draft Concept  
Design

March  
2020-22:  
Project Pause

2022-23:  
Develop draft  
final design,  
seek input,  
permitting,  
procurement

2024-26:  
Construction





# Questions?

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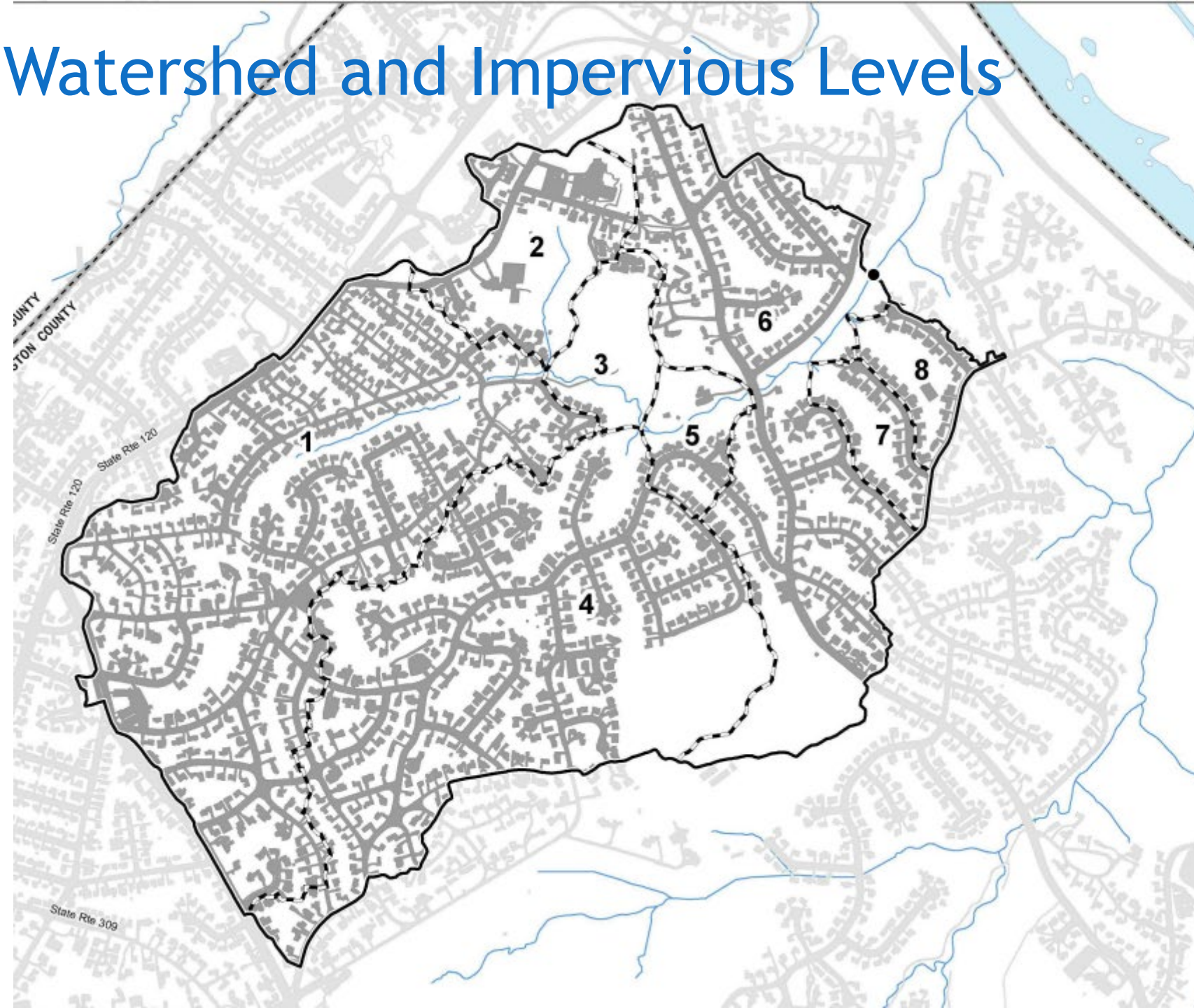
Provide Online Feedback:

[bit.ly/Gulf-Branch-2022](https://bit.ly/Gulf-Branch-2022)

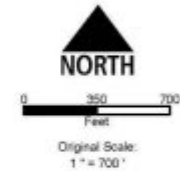




# Watershed and Impervious Levels



Drainage Area and Impervious Surface  
Gulf Branch  
WSSI #28453.01



- Point of Analysis
- ▭ Watershed Boundary
- - - Subshed Boundary
- Impervious Surface

31.7% impervious  
(hard surfaces) overall

Subshed	Impervious Acreage	Subshed Acreage	Percent Impervious
1	57.5	155.5	37%
2	9.0	30.5	30%
3	1.1	15.5	7%
4	43.8	139.7	31%
5	2.8	12.2	23%
6	30.1	102.5	29%
7	3.5	11.0	32%
8	3.7	11.3	33%

151.5 impervious acres  
478.2 total acres

\*Impervious Surface Data Source: Arlington County Digital Data  
Additional impervious surfaces digitized manually using Spring 2017  
natural color imagery from Virginia Base Mapping Program (VBMP).