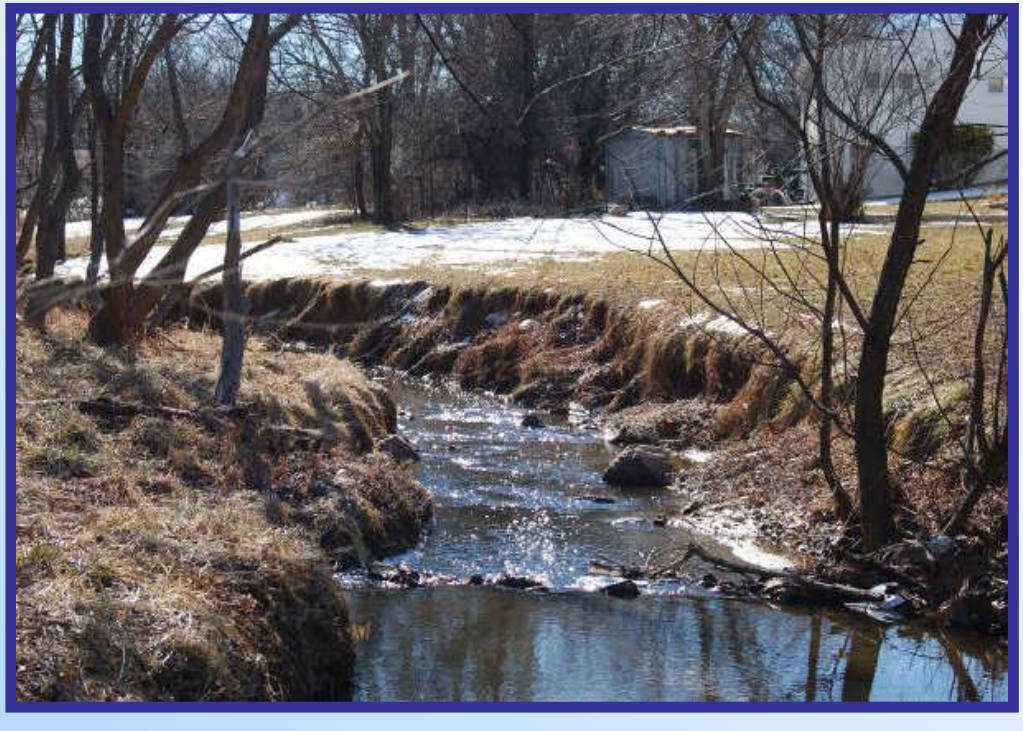
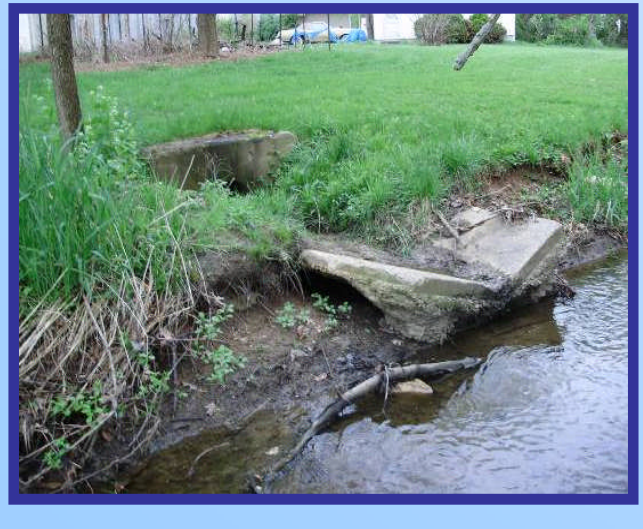
SCOTTS LEVEL BRANCH AT MCDONOGH ROAD WATER QUALITY RETROFIT & STREAM RESTORATION PROJECT





BALTIMORE COUNTY DEPARTMENT OF ENVIRONMENTAL PROTECTION AND SUSTAINABILITY

EA Engineering, Science, & Technology, Inc.

June 26, 2012

Who We Are:

Baltimore County
Department of Environmental Protection & Sustainability (EPS)

- Robert Ryan, Capital Program Manager
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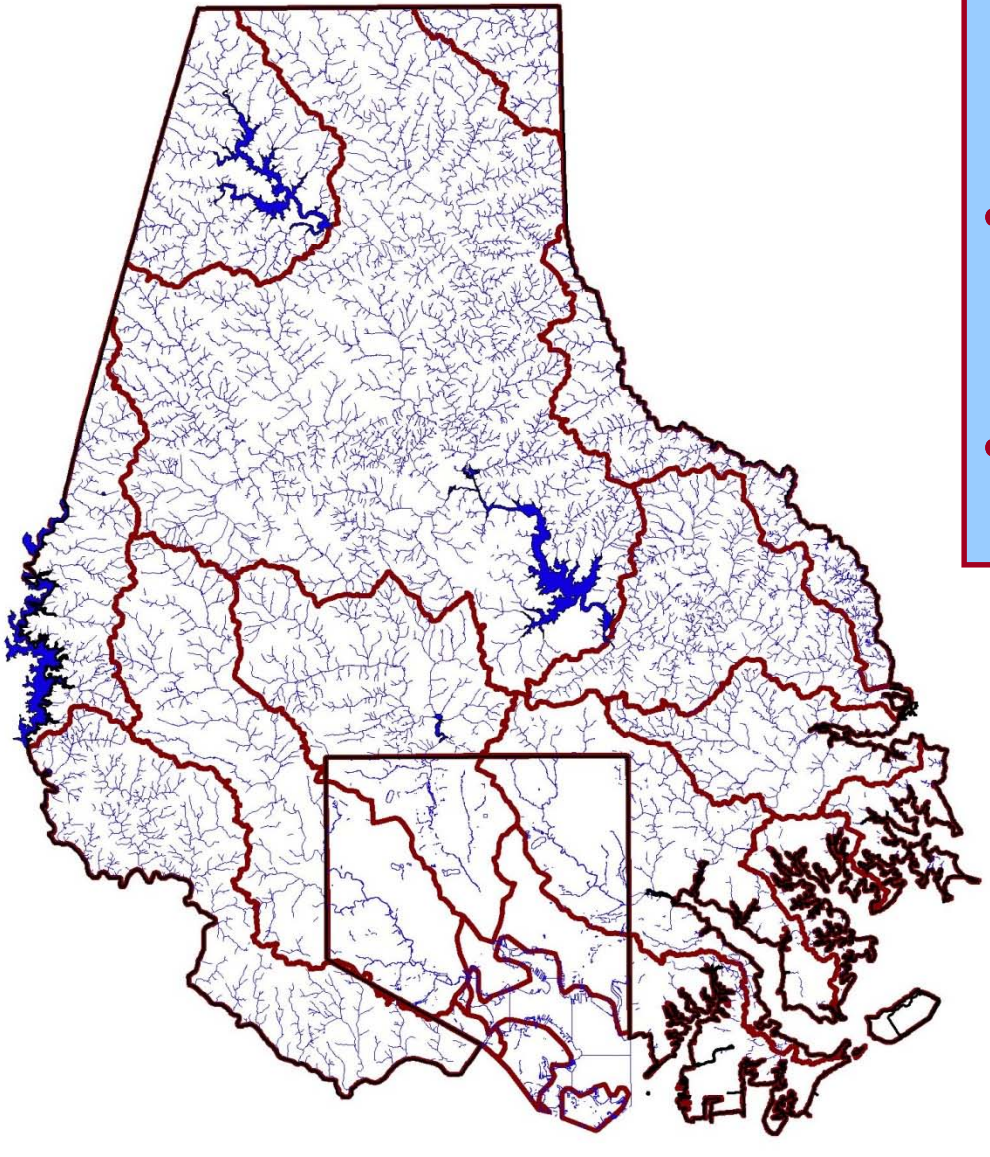
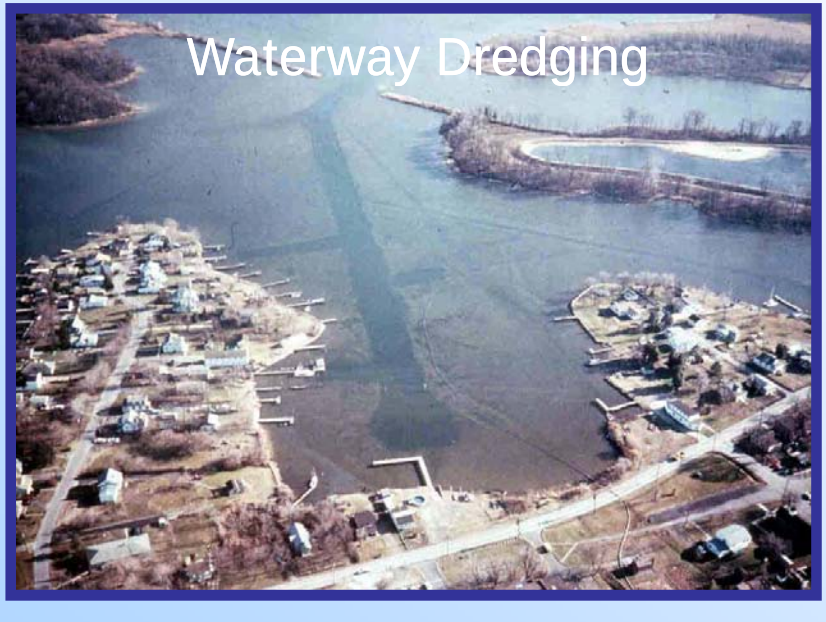
Baltimore County's Watersheds



- 14 major watersheds
- 2,145 miles of streams
- 219 miles of shoreline

EPS - Capital Waterway Improvement Program



Background

Federal and State mandates including the Clean Water Act, NPDES, and the Chesapeake Bay Restoration Program requires local governments to implement water quality improvements

Gwynns Falls Watershed Plan, 2004 – identified water quality improvements within the 11 sub-watersheds throughout the Gwynns Falls

Scotts Level Branch Assessment and Prioritization, 2010 – identified 13 projects for water quality improvement. Scotts Level Branch at McDonogh Road was given high priority and is the first of the 13 projects to be implemented.

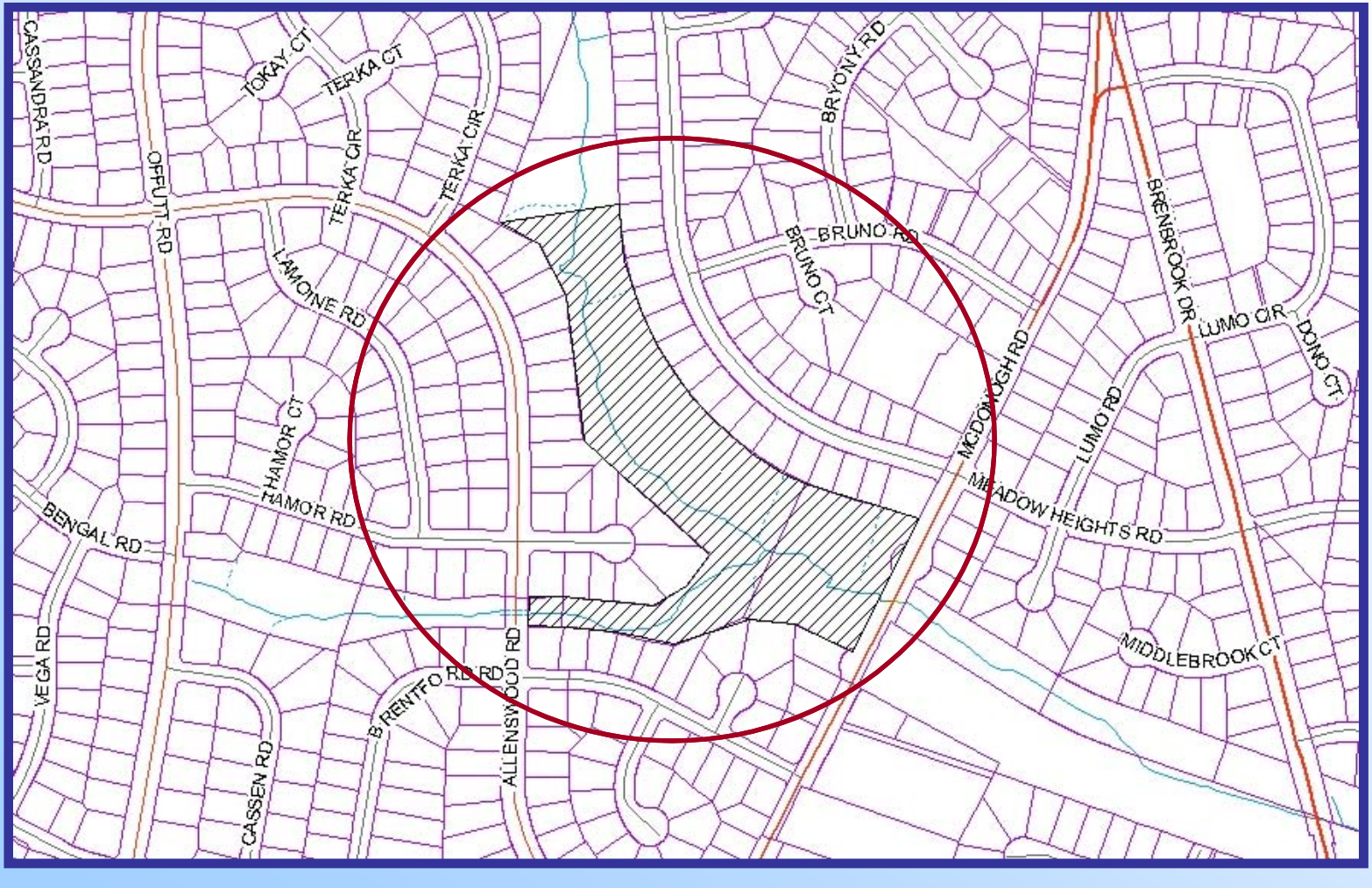
Small Watershed Action Plan (SWAP) getting started this summer is a Partnership with community members to identify and implement community-based projects such as tree plantings, stream clean-ups, and tips for controlling runoff from your property

Project Location

- **Scotts Level Branch is a sub-watershed of the Gwynns Falls, located north of the Liberty Rd corridor in Randallstown.**

Project Site

- **Located west of McDonogh Road on the Baltimore County owned land adjacent to Meadow Heights Rd, Brentford Rd, Brentford Ct, Allenswood Rd, Hamor Ct and Terka Circle.**

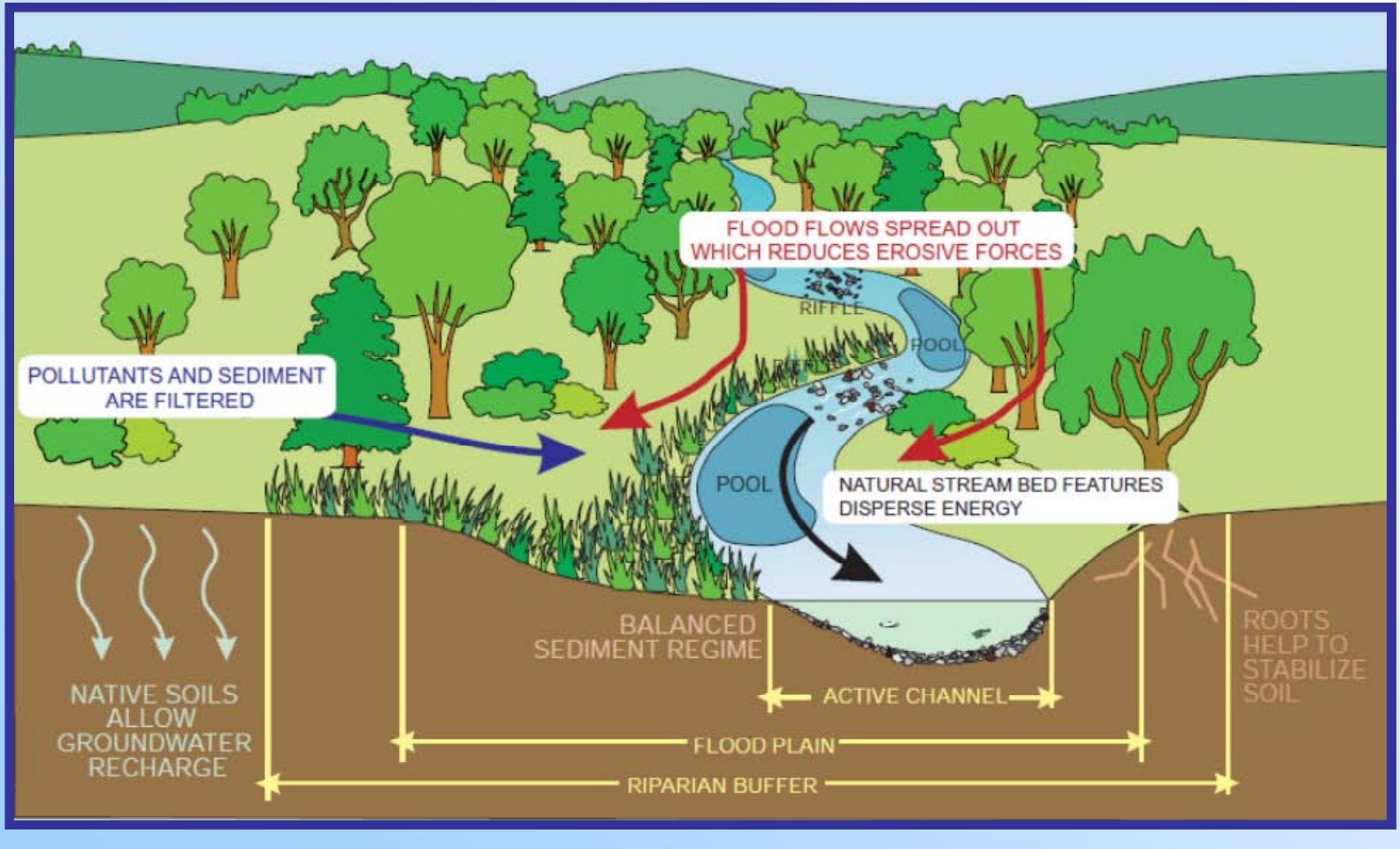


Project Goals

- **Measurable Water Quality Improvement**
  - Reduce stream bank erosion → *decreases the amount of fine sediment entering the Chesapeake Bay*
  - Increase infiltration → *filters pollutants & recharges groundwater*
  - Create/enhance vegetated stream buffer → *absorbs pollutants and helps stabilize stream banks*

Project Goals

- **Floodplain Reconnection**
  - Restore the interactions between the stream and its floodplain
    → *regains hydrologic and ecological function*



Project Goals

- **Wetland Creation and Enhancement**
  - Generate stormwater detention and treatment opportunities

→ *improves water quality and slows discharge into receiving waters*

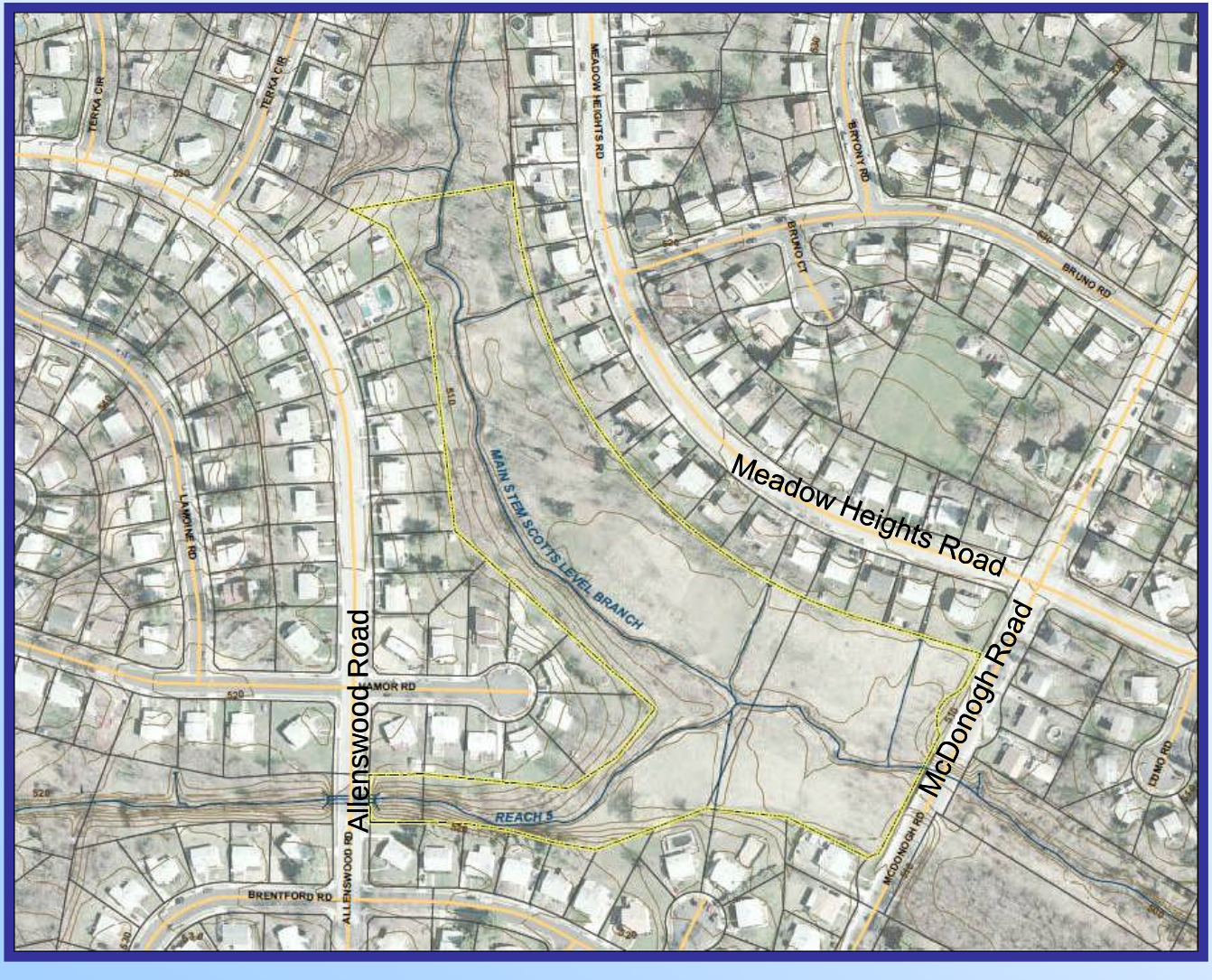
Project Goals

- **Stream Stabilization**
  - Construct a balanced and stable stream channel using grading, stone structures and vegetative techniques → *conveys a range of flows without significant erosion*

Before

After

Project Site Overview



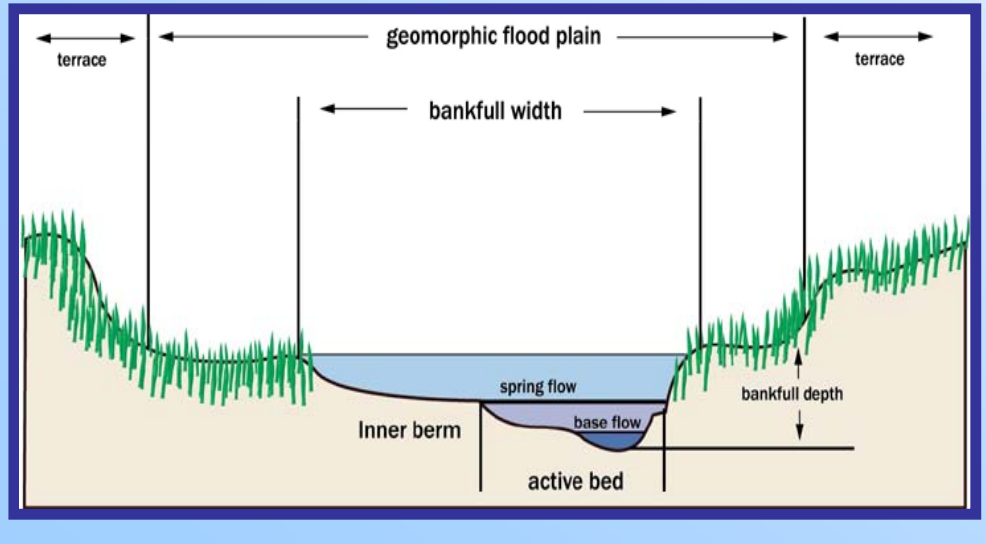
Scotts Level Branch – Mainstem (Upper Reach)

- **Key Problems**
  - Very sharp stream bends
  - Considerable bank erosion occurring
  - Log and debris jams causing channel to collect sediment (or aggrade) and change pattern
  - Erosion is causing exposure of underground communication cables

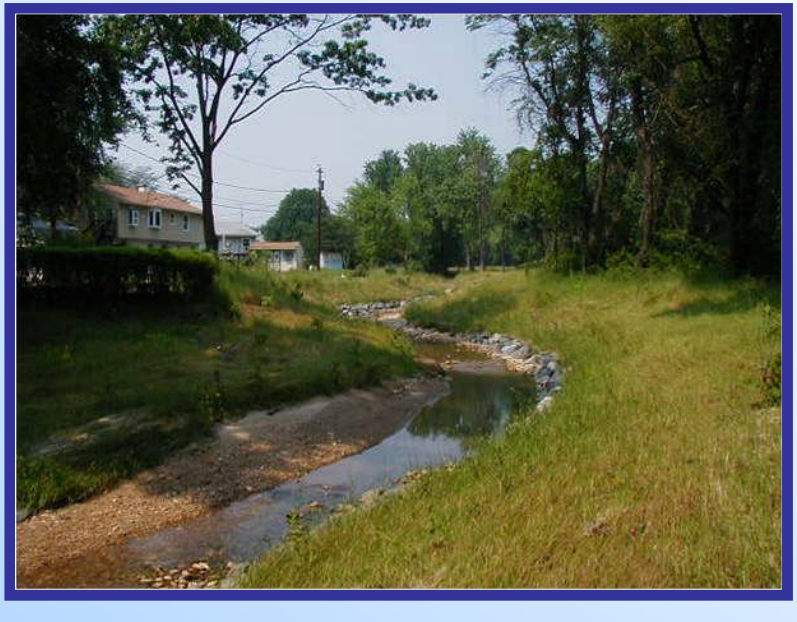
Scotts Level Branch – Mainstem (Upper Reach)

- **Proposed Restoration Techniques**
  - Re-align channel to relieve bank stress and reduce erosion
  - Stable cross-section formation
  - Log & debris jam removal

Stable stream channel cross-section



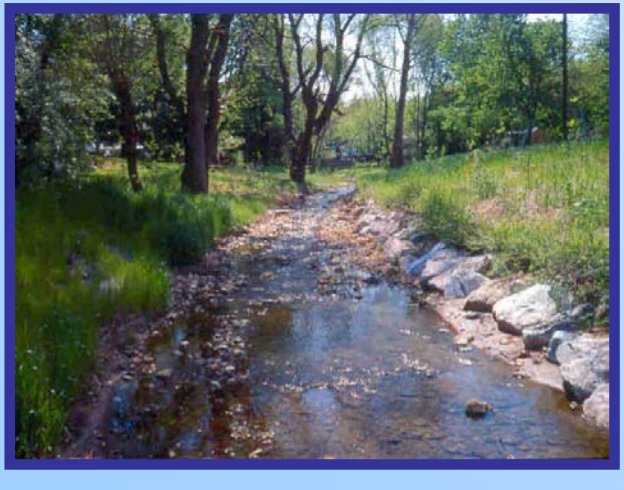
Channel re-alignment and stable cross-section formation



Scotts Level Branch – Mainstem (Upper Reach)

- **Proposed Restoration Techniques (continued)**
  - Stone toe protection at foot of stream banks
  - Minor channel bed re-grading to redistribute gravel bars for riffles
  - Install grade control structures

Stone-toe protection



Rock wall with rock vane to redirect stream flow

Redistribution of gravel bars to create riffles

Scotts Level Branch – Mainstem (Upper Reach)

- **Representative Photo**

Forested Wetlands and Stream Channel

Scotts Level Branch – Mainstem (Confluence)

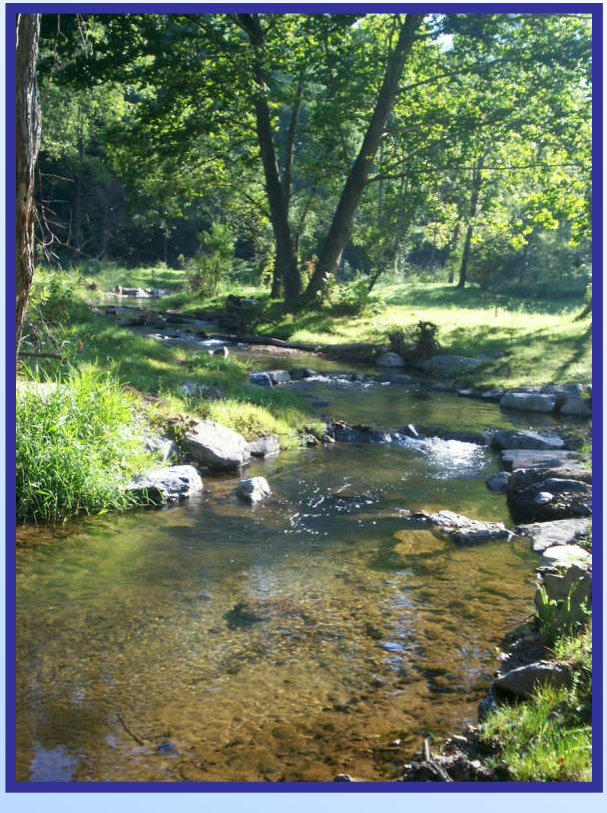
- **Key Problems**
  - High banks and no floodplain access
  - Considerable bank erosion occurring at sharp bends
  - Confluences with stormwater outfalls
  - Log and debris jams

Scotts Level Branch – Mainstem (Confluence)

- **Proposed Restoration Techniques**
  - J-Hook Vanes and/or Cross Vanes to redirect flow
  - Minor floodplain re-grading
  - Log and debris jam removal

Cross-vane structure with floodplain re-grading

J-hook vane structures



Scotts Level Branch – Mainstem (Confluence)

- **Proposed Restoration Techniques (continued)**
  - Create an open water confluence so the channel may self-form and create wetlands naturally
  - Install grade control structures to prevent channel down cutting
  - Grade banks and create floodplain and connected wetlands.

Re-sized stream channel with connected wetlands

Open water confluence with connected wetlands

Scotts Level Branch – Mainstem (Confluence)

- **Representative Photos**

Emergent Wetlands and Sinuous Channel

Scrub Shrub and Forested Wetlands

Scotts Level Branch – Mainstem (Confluence)

- **Representative Photos**

Red-Wing Black Bird Habitat

Blue Flag Iris

Open Water Confluence and Emergent Wetlands

Scotts Level Branch – Mainstem (Lower Reach)

- **Key Problem Areas**
  - Considerable bank erosion occurring before bridge
  - Deep pockets of fine sediment build-up in pools
  - Log and debris jam potential at bridge

Scotts Level Branch – Mainstem (Lower Reach)

- **Proposed Restoration Techniques**
  - Imbricated rock walls along banks & bank re-grading
  - Floodplain and channel bed re-grading
  - Wetland restoration combined with outfall repairs

Rock walls with floodplain and channel re-grading

Log and debris jams removed to improve flow conditions

Rock outfall replacement

Scotts Level Branch – Mainstem (Lower Reach)

- **Representative Photos**

Sycamores and Maples, Riparian Buffer Vegetation

Rock Toe and Imbricated Protection by Bridge

Scotts Level Branch – Reach 5 (Tributary)

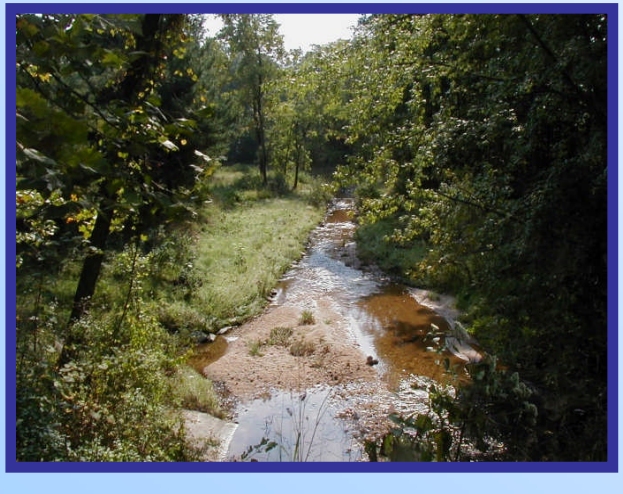
- **Key Problem Areas**
  - Considerable bank erosion occurring, exposing underground communication lines
  - Damaged outfall at Allenswood Road
  - Channel down-cutting occurring
  - Poor fish habitat
  - Difficult construction access
  - Log and debris jams

Scotts Level Branch – Reach 5 (Tributary)

- **Proposed Restoration Techniques**
  - Stone toe protection / rock walls along banks & bank re-grading
  - Minor floodplain and channel bed re-grading
  - Log and debris jam removal
  - Outfall repairs with series of rock step-pools

Rock walls with floodplain and channel re-grading

Log and debris jams removed to improve flow conditions



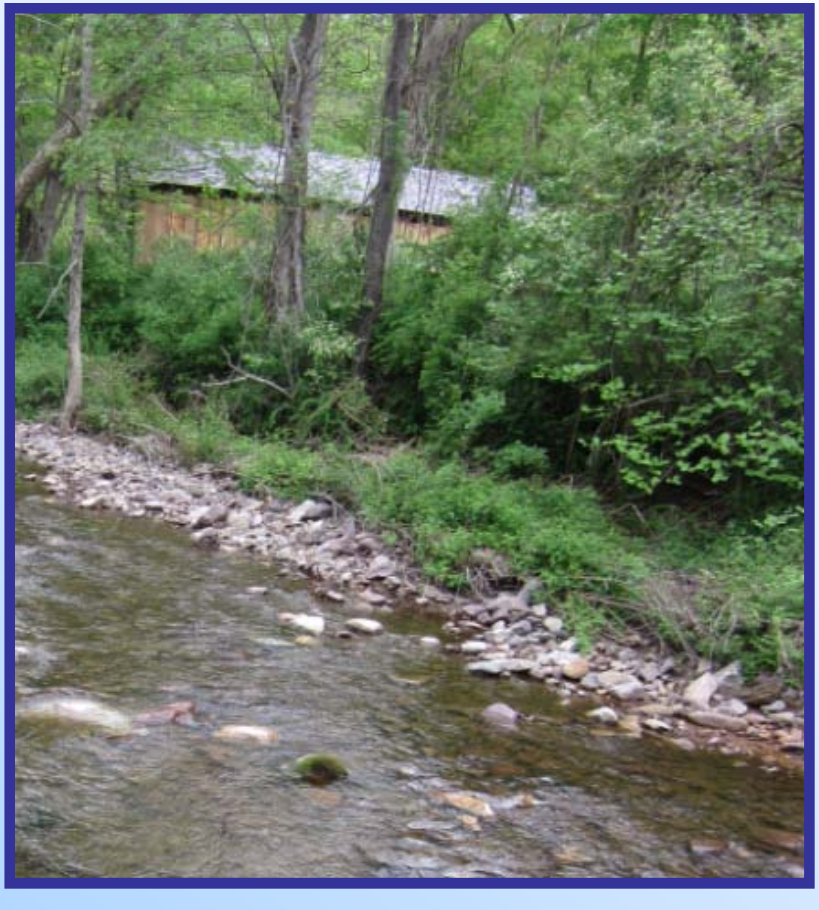
Rock step-pool

Scotts Level Branch – Mainstem (Tributary)

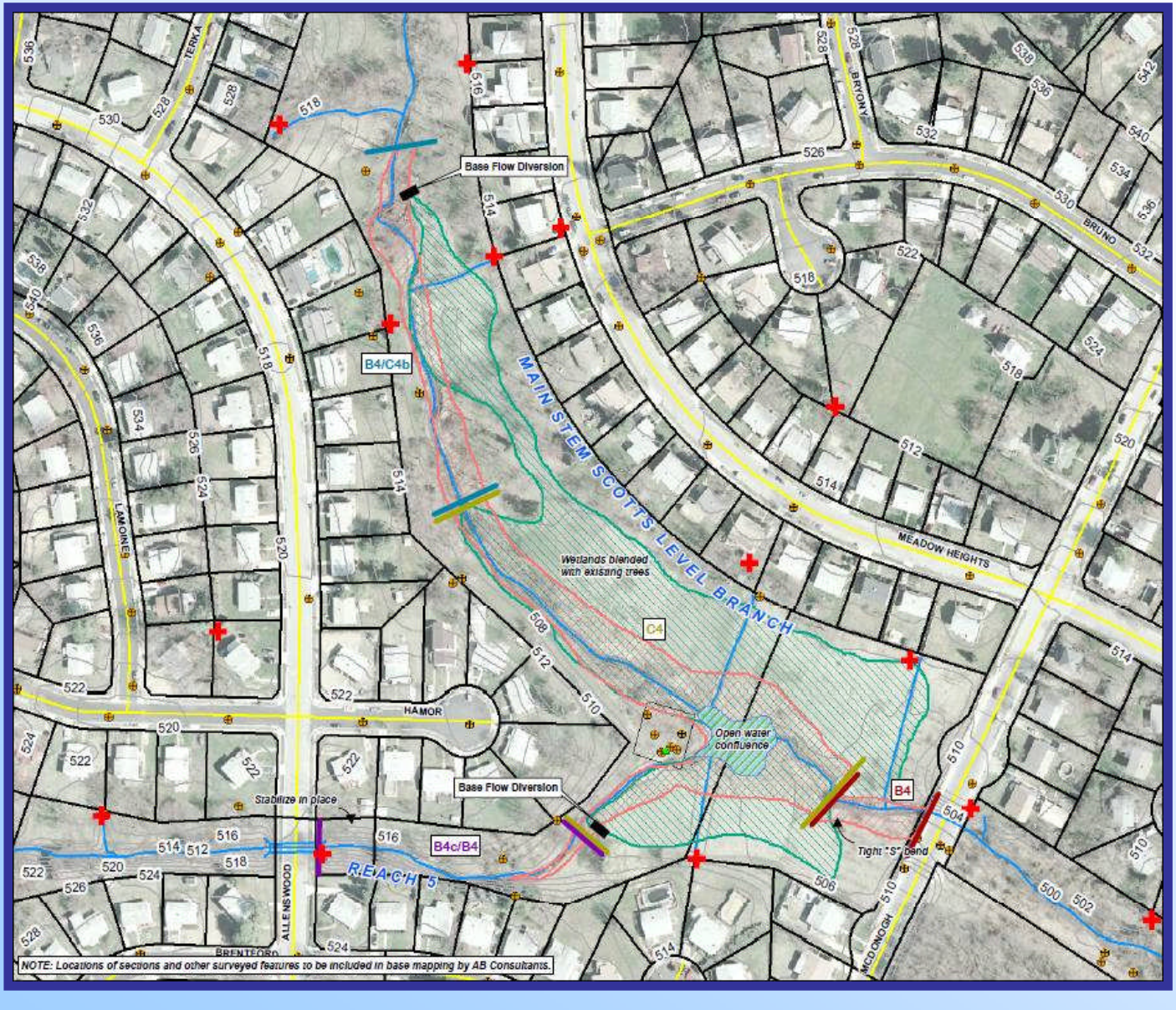
- **Representative Photos**

Cobble and Boulder Cascades and Step Pools

Constructed Riffles and Graded Banks with Vegetation



Conceptual Sketch



Project Schedule

- Project is currently in design, approximately 90% complete

Design Completion	August 2012
Advertise for construction	September 2012
Construction Contract	Oct. – Nov. 2012
Construction Phase	Dec. 2012 – March 2013
Planting	Spring 2013
Monitoring	10 years (2013 – 2023)

Questions?