

# NORTHERN VIRGINIA STREAM RESTORATION BANK

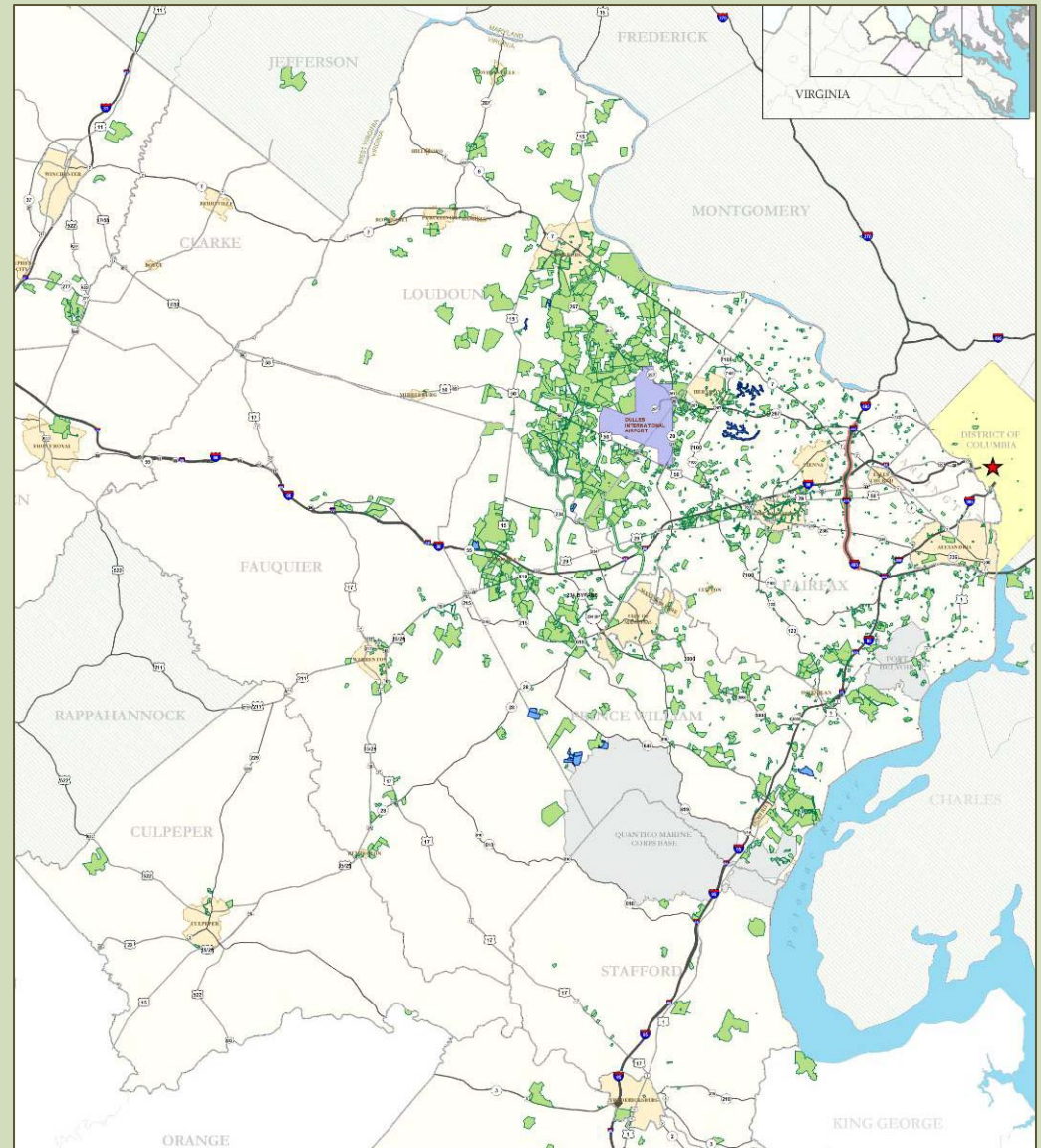
**Presented by Michael S. Rolband**  
**P.E., P.W.S., P.W.D.**

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# WETLAND STUDIES AND SOLUTIONS, INC.

- Natural & Cultural Resource consulting firm to developers & public works
- 100 Staff
  - Archeology, Engineering, Environmental Science, Environmental Technology, GIS, Regulatory, & Surveying



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- Mitigation Banking Experience
  - 17 Banks: 540 Wetland Credits, 93,373 LF of Stream Restoration
- On & Off Projects To Date
  - Streams: 40 Sites / 37,412 LF
  - Wetlands: 80 sites / 289.58 acres

## Mitigation Banking Summary

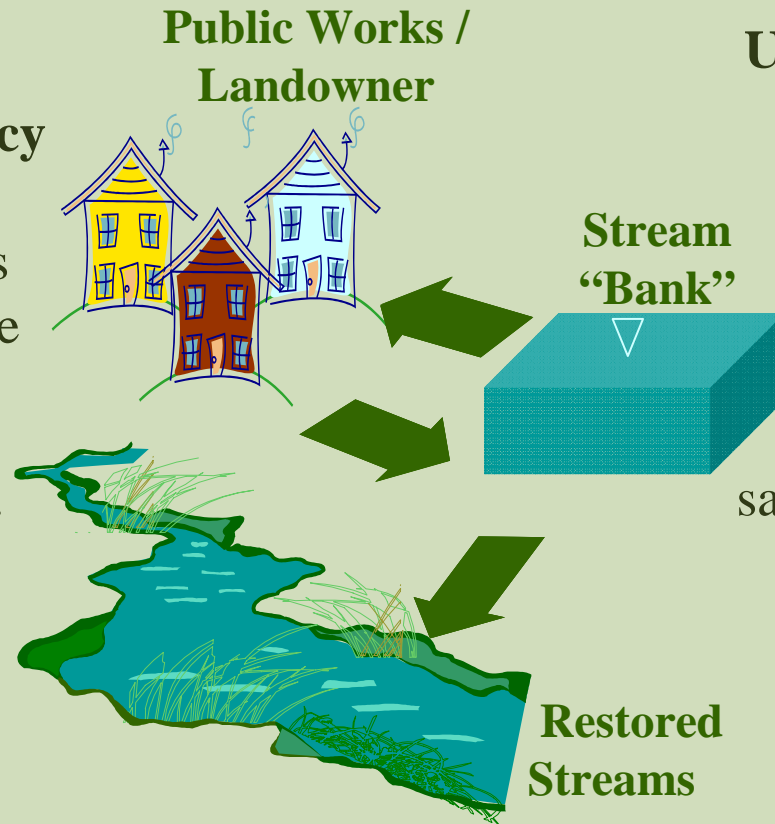
Bank Name*	Year Approved	Wetland Credits	Stream Restoration (LF)
Julie Metz Phase I	1994	19.08	---
Julie Metz Phase II	1996		---
North Fork	1999	80.27	871
Cedar Run Phase 1	1999	15.10	---
Cedar Run Phase 2	1999	23.93	---
Cedar Run Phase 2a	2002	47.58	---
Cedar Run Phase 3	1999	58.94	---
Cedar Run Phase 4	1999	81.62	---
Cedar Run Phase 6	2002	42.47	---
Cedar Run Phase 8	2002	30.35	---
Cedar Run Phase 9	2002	33.58	4,122
Cedar Run Phase 10	2005	41.34	---
Bull Run	2002	28.89	---
Loudoun County Phase 1	2007	10.65	2,092
Loudoun County Phase 2	2007	15.99	1,855
Loudoun County Phase 3	2007	9.96	5,391
NVSRB Phase I	2006	---	79,042
Totals		539.75	93,373
*Cedar Run Phases 5 & 7 determined to be not feasible			



# WHAT IS MITIGATION BANKING ?

## HOW IT WORKS

**A Public Works Agency or private landowner** needs to impact streams on their property. In the past, they would have had to restore streams as compensation, either on- or off-site.



**Under the market-oriented system,** they can go to a “bank” created by a Bank Sponsor who has obtained credit for restoring impaired streams elsewhere in the same portion of the rivershed & physiographic province.

**By purchasing stream credits** from the Bank Sponsor, the mitigation requirements of a permit for stream impacts is satisfied. Stream restorers use this pooled money to create much larger, well-designed, & ecologically valuable conservation projects.



# WHY A STREAM BANK IN RESTON ?

1. Degrading streams are located in preserved corridors (without stormwater management) & mostly controlled by a single entity (Reston Association)

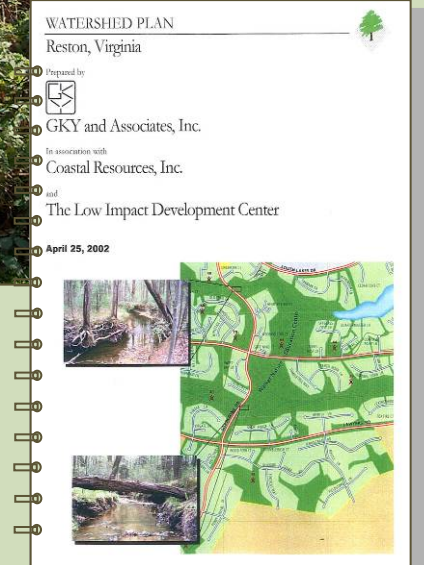
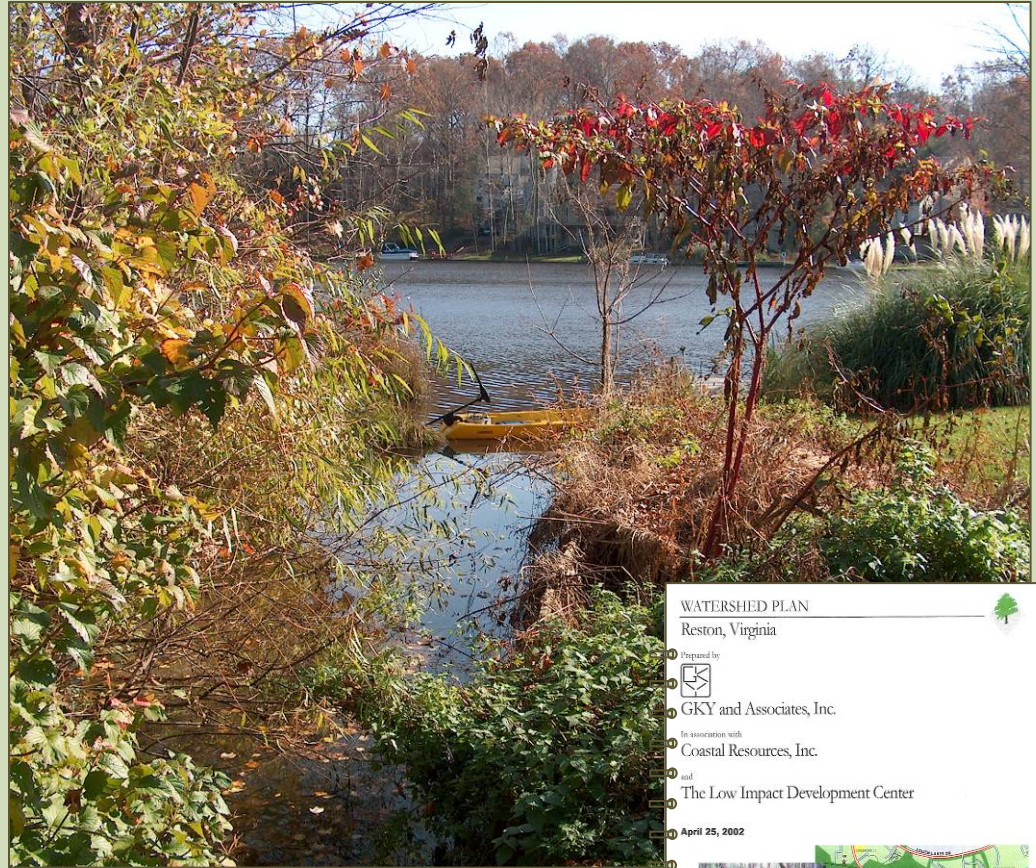


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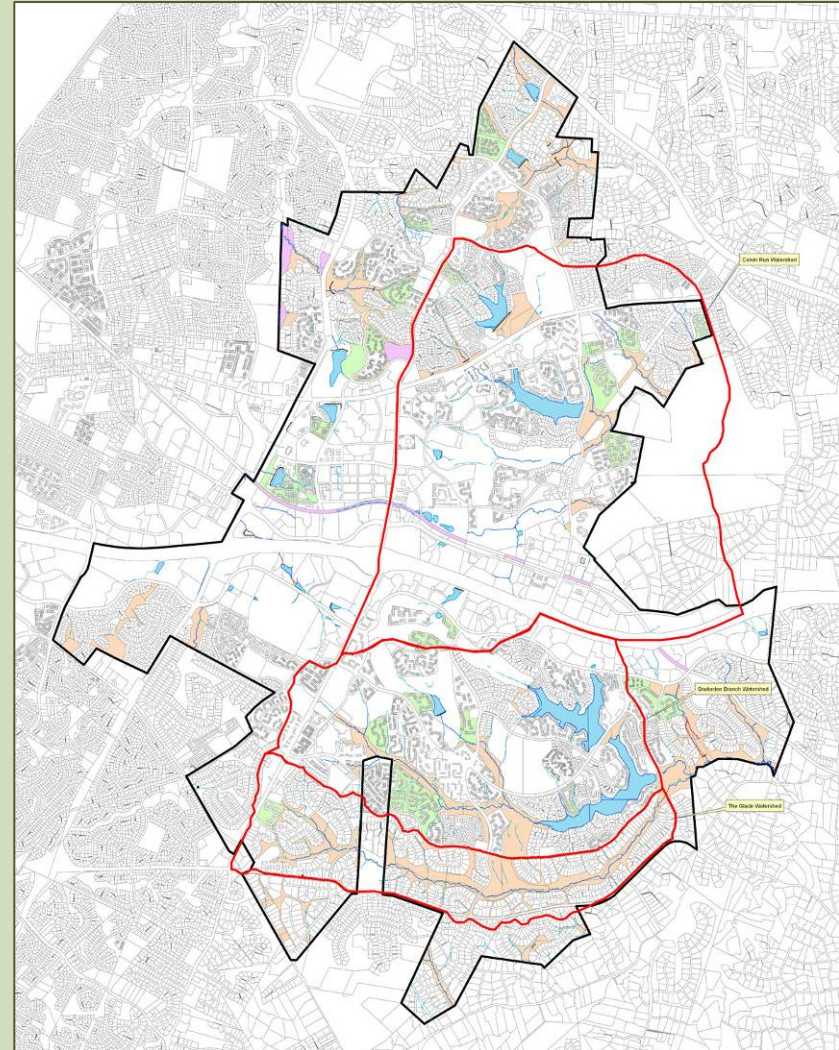
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3. Community of Reston includes entire watersheds



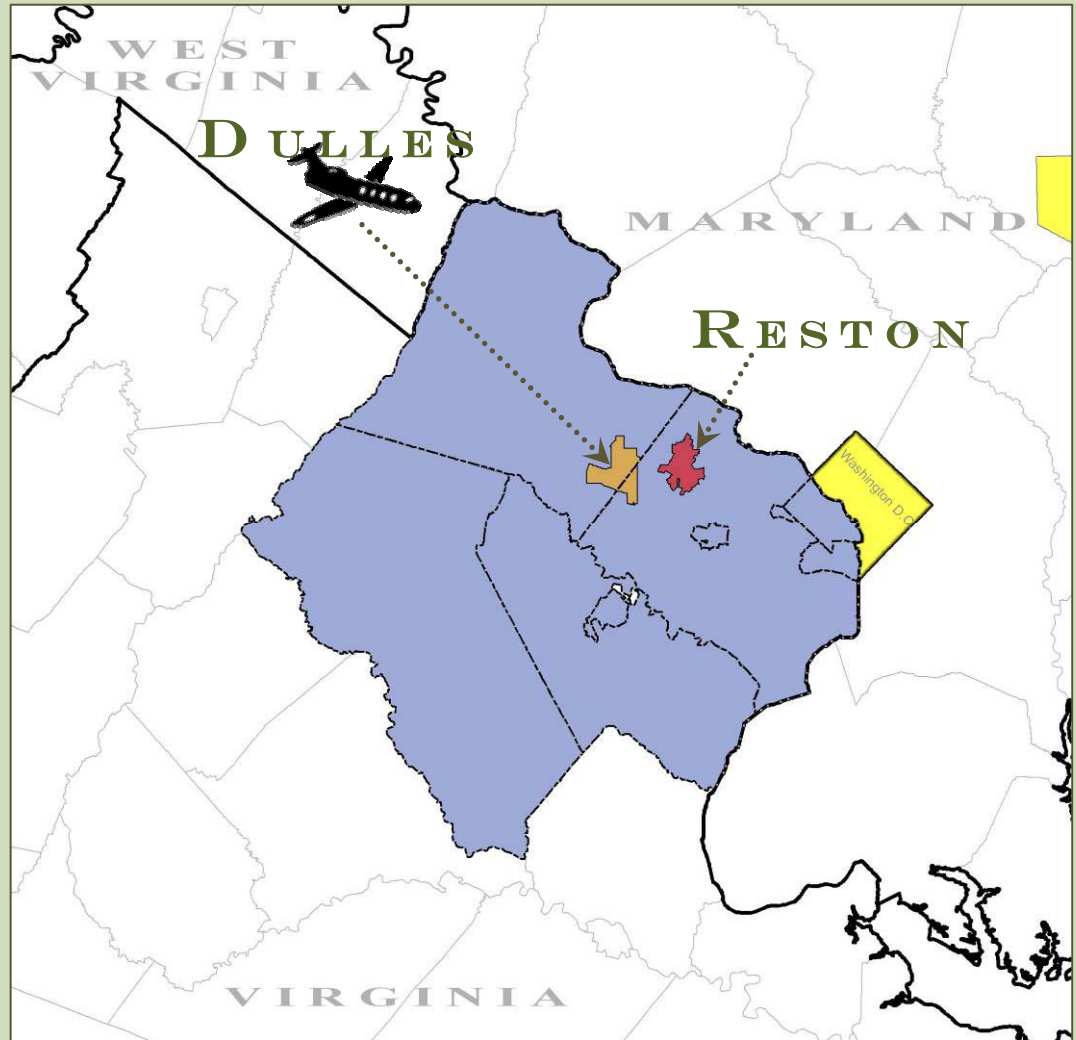
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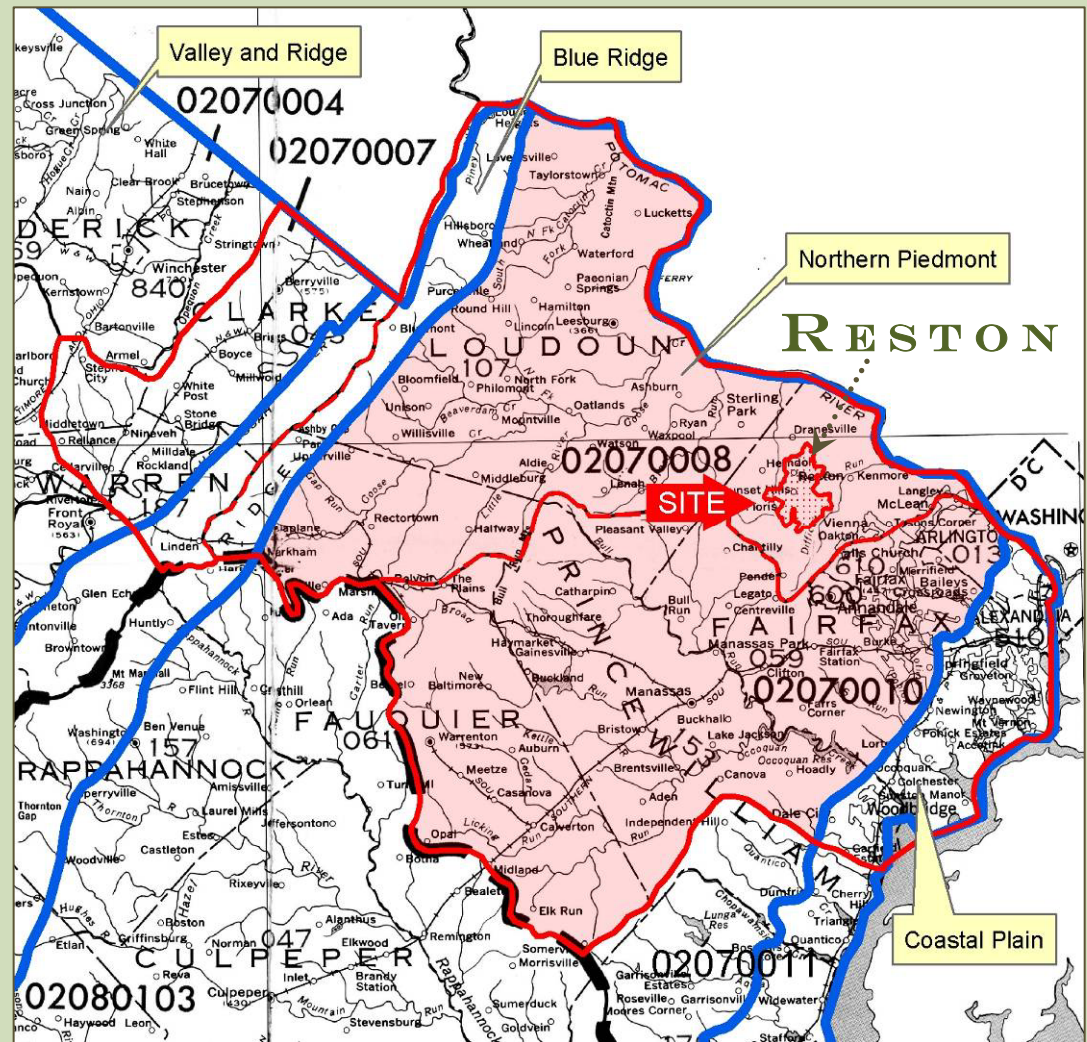


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5. Bank service area is determined by HUC & Physiographic Province



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# THE APPROVAL PROCESS

## March 2002

- Reston Watershed Plan published (*identifies need to improve watershed*)

## Oct 2003

- Letter of Intent signed with Reston
- Mitigation Banking Review Team (MBRT) Meeting requested

## Dec 2003

- MOA signed
- \$250,000 Donation for Reston



## June 2004:

- Public Notice for Prospectus for the Northern Virginia Stream Restoration Bank (NVRSB)

## Oct 2004 – Feb 2006:

- 5 MBI drafts submitted to agencies  
(*DEQ signed drafts 3 & 4, but local COE rep was vetoed*)

## February 2006:

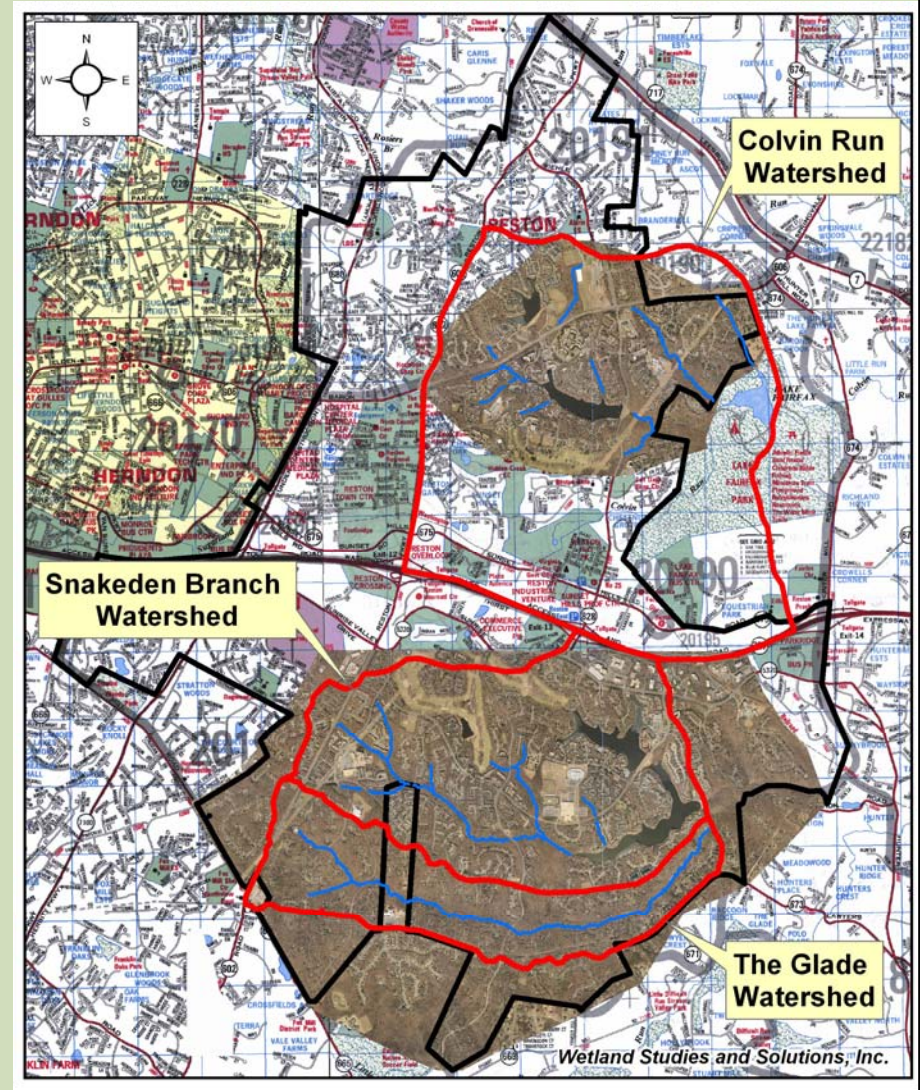
- DEQ & COE sign 5<sup>th</sup> draft! - *Bank limited to Phase I to 14 miles*





# ACCOMPLISHMENTS TO DATE

- Aerial photography and topography for Phase I Watershed (Snakeden, Colvin Run, The Glade)
- Concept Plan approved by COE & DEQ
- Investigated for potential archeological sites
  - 100% Snakeden & Colvin Run
  - The Glade – *scheduled for winter 2006/7*
- Survey located & tagged over 19,000 trees ( $\geq 4''$  dbh) *and more to go!*
- Surveyed channel profile and cross-sections
  - 100% Snakeden
  - 50% Colvin Run (*complete by winter 2006/7*)
  - 10% The Glade (*just starting*)
- Performed wetland delins in Snakeden & Colvin
  - The Glade is scheduled for winter 2006/7
- Installed water level gages to confirm flow rates
  - 5 in Snakeden (*Feb 2005*)
  - 4 in The Glade (*Nov 2006*)
  - 5 in Colvin Run (*Nov 2006*)
  - 1 rain gage (*2 more will be installed soon*)
- Completed hydrologic model of Snakeden
- Design has commenced in Snakeden

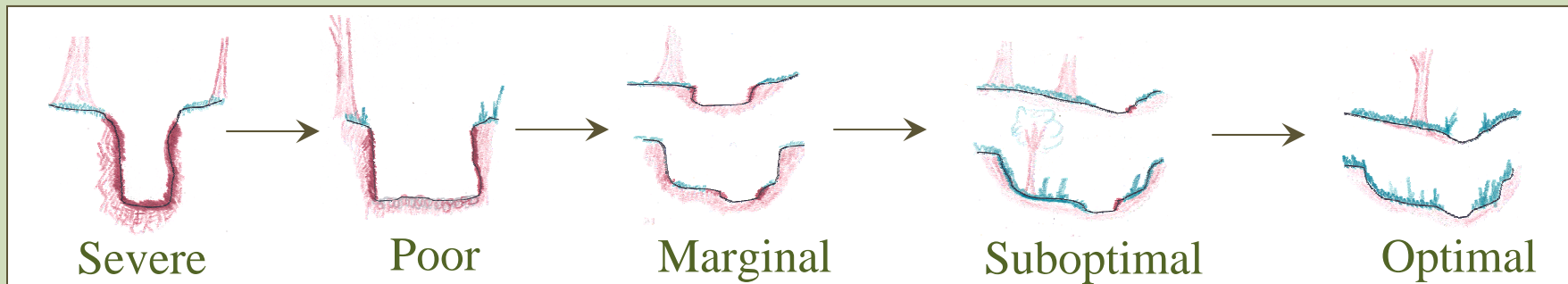




# DESIGN METHODOLOGY FOR URBAN STREAMS

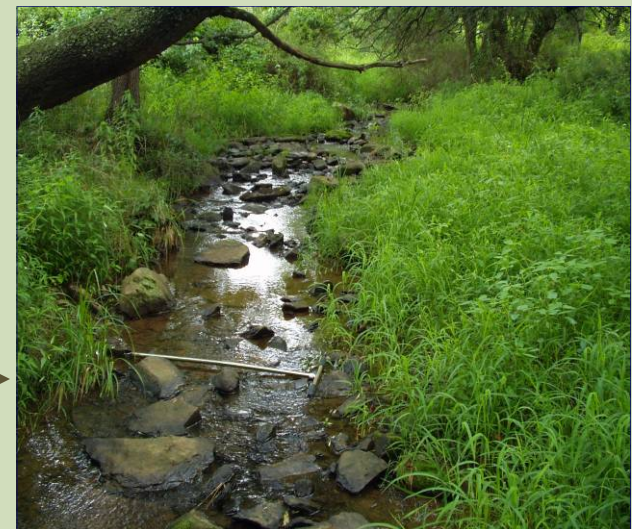
## - NATURAL CHANNEL EVOLUTION -

*Evolutionary process considers the channel's incision, bank stability, & sedimentation load (aggrading or degrading)*



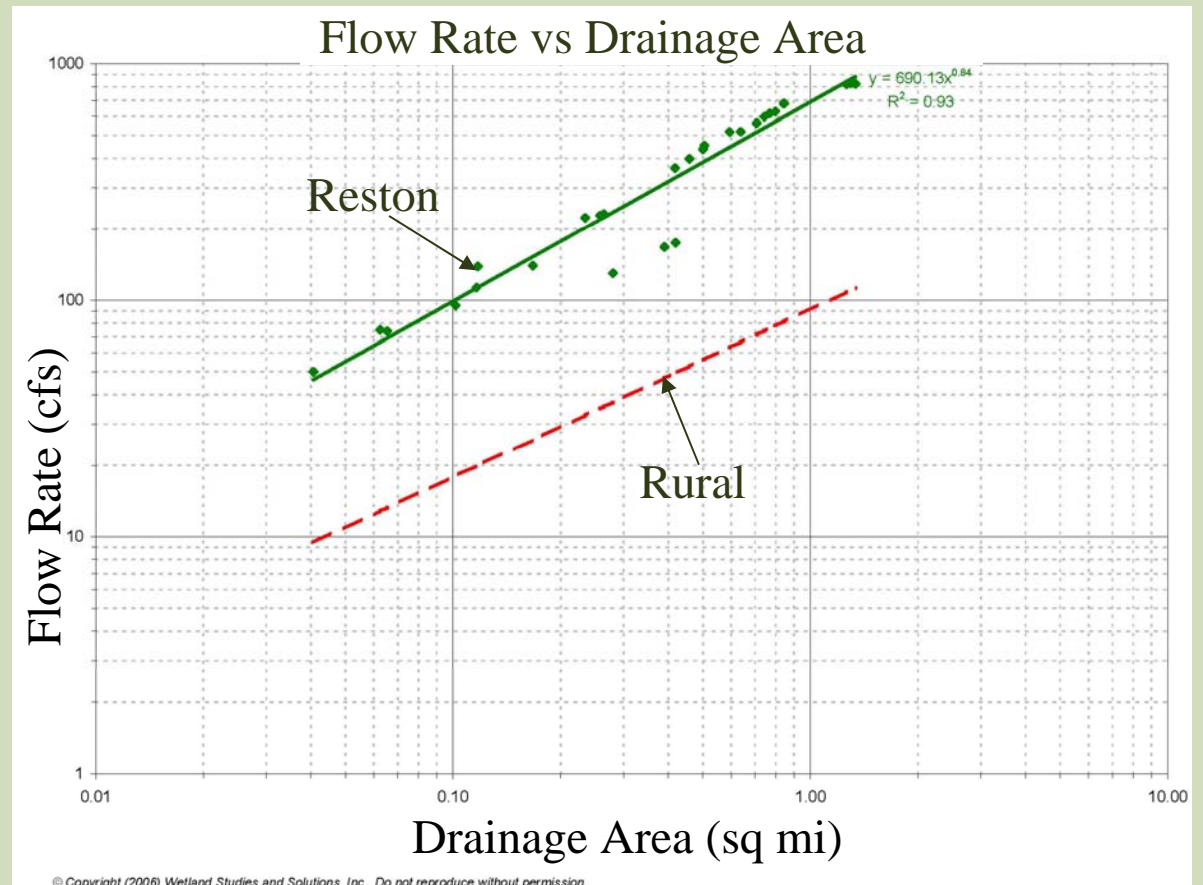
Severe  
Channel Condition

Optimal  
Channel Condition



# DESIGN METHODOLOGY FOR URBAN STREAMS

1. Significantly more flow than rural streams
2. Significantly more “*bankfull*” events than in rural watersheds





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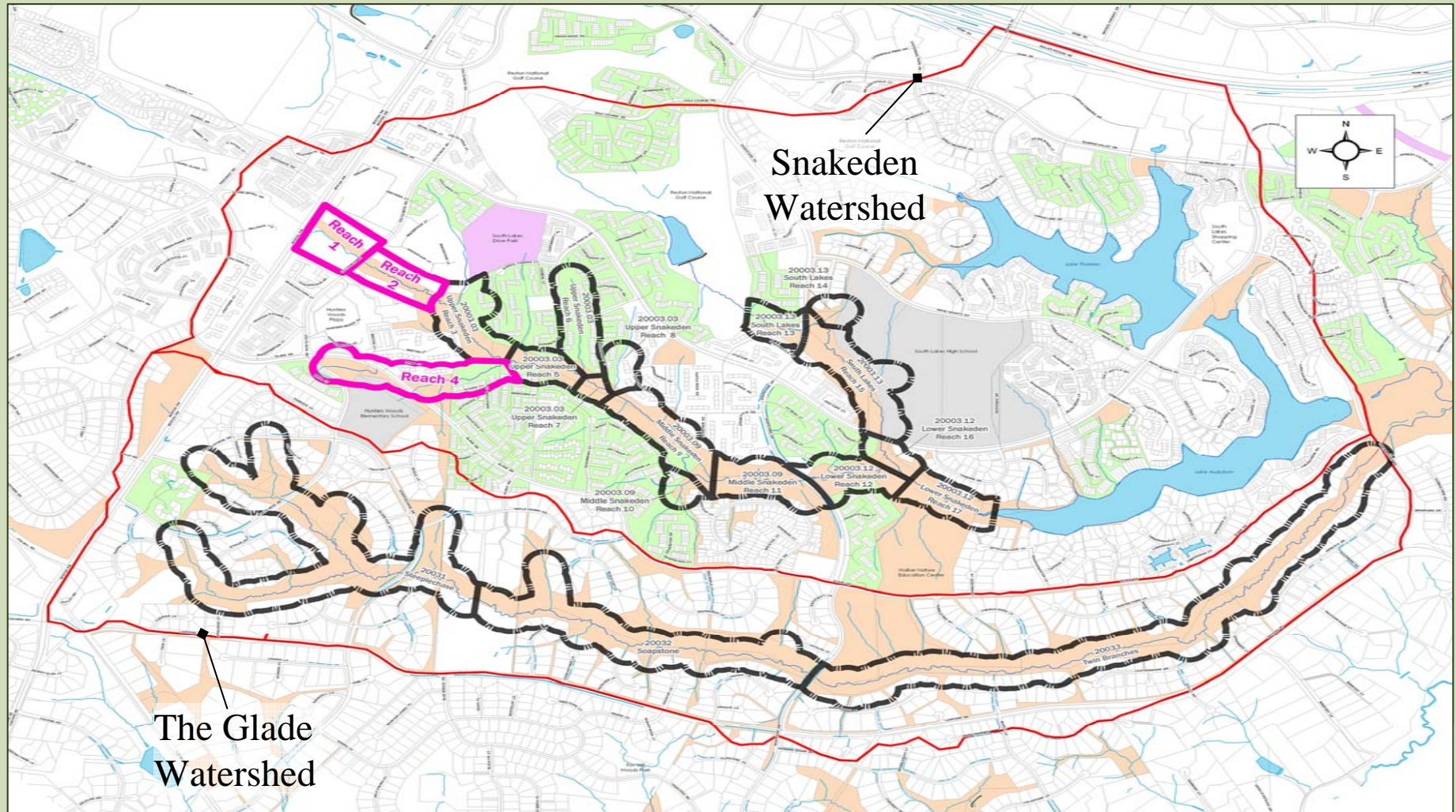
1. Significantly more flow than rural streams
2. Significantly more “*bankfull*” events than in rural watersheds
3. Given site constraints, reinforcement will be necessary
  - Rock structures
  - Reinforced bed
  - Heavy planting densities





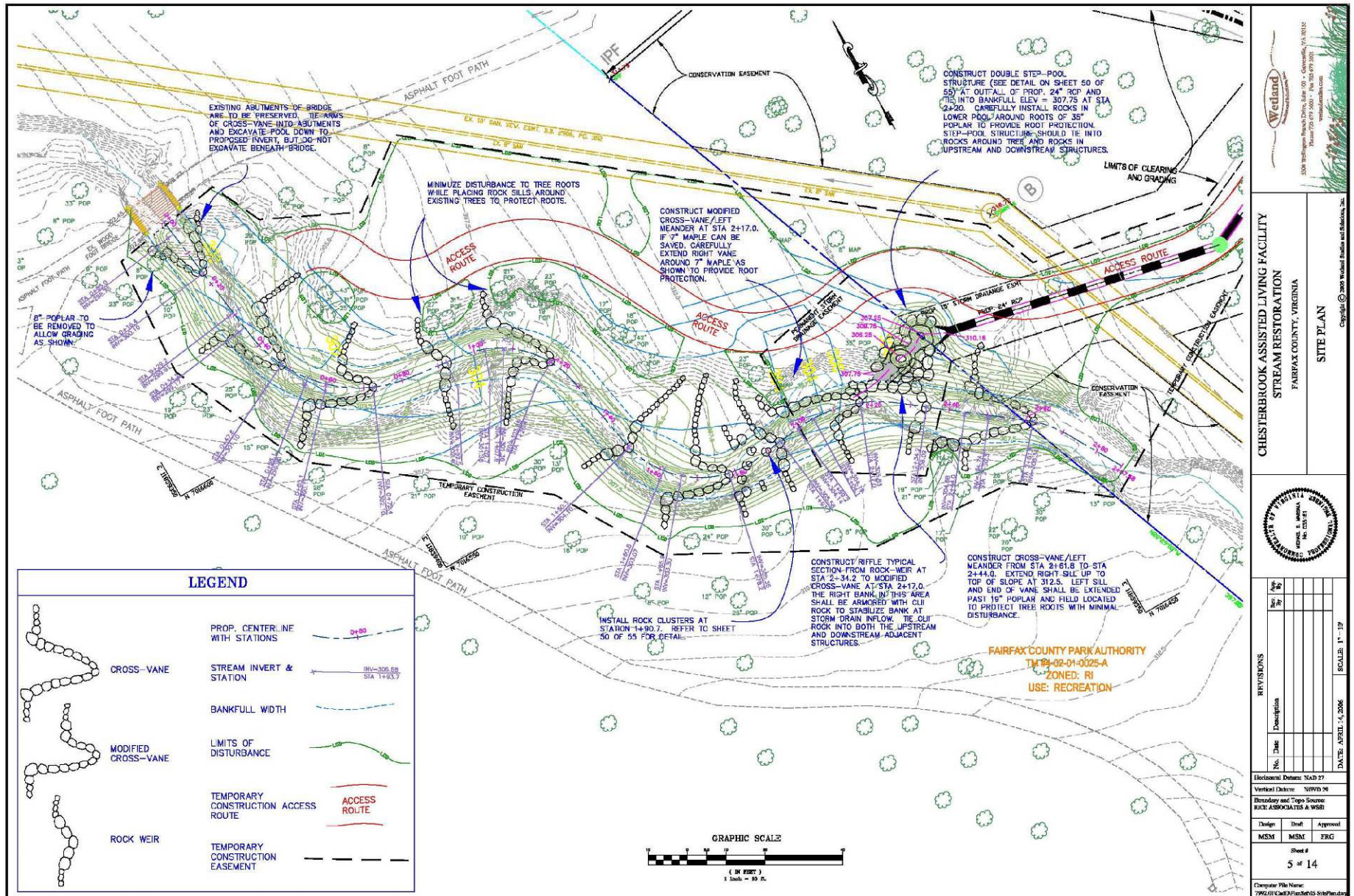
# DESIGN PROCESS

- Watersheds have been divided into manageable design reaches.
- Design & Construction starts in upper reaches & continues in stages downstream.





# DESIGN PLANS





# PROJECT SCHEDULE

- Design underway
- Construction Plan approvals required from
  - Reston DRB
  - COE
  - DEQ
  - Fairfax County
- Construction begins summer/fall 2007
  - Continues sequentially for several years – depending upon market
  - Starting in Upper Snakeden
  - Full-time management by WSSI staff





# EXAMPLE PROJECTS – FAIRFAX COUNTY

## **Pre-Construction Conditions**





# EXAMPLE PROJECTS – FAIRFAX COUNTY

## Construction – September 2006





# EXAMPLE PROJECTS – FAIRFAX COUNTY

## Construction – September 2006





# EXAMPLE PROJECTS – FAIRFAX COUNTY

## Post-Construction



**October 9, 2006**



**November 14, 2006**



# EXAMPLE PROJECTS – FAIRFAX COUNTY

## Re-Vegetation



**Planting.....**



**1-Year Later**



# MONITORING AND MAINTENANCE



## 10-year monitoring program

- Streambed surveys
- Structure surveys
- Vegetation surveys
- Biological Surveys

*Must meet success criteria outlined  
in MBI – or fix!*



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# CONCLUSION

1. Reston Streams are degrading and adversely affecting
  - Water quality
  - Habitat
  - Reston's balance sheet – dredging is expensive!
2. Fully restored streams will provide long-term stability & financial benefits to the community
  - Phase I: \$60 million Restoration
  - \$400,000 to Reston Association
  - \$650,000 to Friends of Reston
3. Construction disturbance will provide long-term, ecological benefits.



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