




**Bolling Branch Stream Restoration Project**

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March 12, 2009


### Project Site Near Delaplane, Virginia



- Includes Bolling Branch near its confluence with Goose Creek
- Located on the site of the Flint Hill Farm (Chattins Run Farm)
- Bolling Branch flows
  - from Little Cobbler Mountain
  - through the Asheville Historical District
  - through the John Marshall home site at "Oak Hill"
  - Through George Washington's "Tract at Chattin's Run" (Flint Hill Farm)
  - into Goose Creek

### Project Scope

- Stream Restoration
  - Over one mile of Bolling Branch
  - Almost 2,300 feet of several unnamed tributaries
- Wetlands & Open Water
  - 5.2 acres created
  - 1.2 acres enhanced
- Riparian Buffer
  - 33 acres of native plantings
  - 14,500 plants (not including live stakes)
- Will replace triple culvert with free-span bridge




### Important Partnerships



- Full-service environmental consulting and engineering firm
  - Contact: Travis Crayosky
  - www.wegnet.com
- Global environmental organization
  - Administers Virginia Aquatic Resources Trust Fund
  - Contact: Karen Johnson
  - www.nature.org
- Environmental construction company
  - Contact: Rick Scaffidi
  - www.eqri.com

### Why the Goose Creek Watershed?




**Paradigm Shift**

**“Conservation Easements should be viewed as the starting point, not the end result, for conservation efforts in the Goose Creek Watershed”**

- Prevalence of Conservation Easements
- Conservation Easements effectively constrain impervious surface
- Constraints on impervious surface make the Goose Creek Watershed an ideal location for stream restoration

### Project Timeline

2006		2007		2008		2009	
June - December	Property Acquired	January - December	Discussions with TNC	January - August	Assessment and Design	January	Construction Begins
September	Feasibility Study Completed	July	Project Approval by USACE	December	Permits in Hand	April	Monitoring Begins
November	Funding Sources Evaluated	December	Conservation Easement Recorded				



### Feasibility Study Findings

<u>Evaluation</u>	<u>Results</u>	<u>Reference</u>
• Rapid Bioassessment	Marginal – Suboptimal	Optimal
• Macroinvertebrate Analysis		
– Diversity Index	0.67 – 0.85	0.85
– Pollution Tolerance		
• Total Sample	Good – Excellent	Excellent
• Insects Only	Good – Excellent	Excellent
– Percent EPT	13.2% – 74.4%	87.5%
• Water Quality Analysis		
– Dissolved Oxygen	Achieve Standards	Achieve Standards
– Fecal Coliform	Exceed Standards	NA
– Total Nitrogen	Exceed Standards	NA
– Total Phosphorus	Exceed Standards	NA

### Anticipated Environmental Benefits

- Improved in-stream aquatic habitat
- Reduced sediment (1,000 tons annually)
- Increased Dissolved Oxygen
- Cooler water temperatures (with buffer growth)
- Lower nitrogen and phosphorus (with buffer growth)

### Improved In-Stream Aquatic Habitat



### Reduced Sediment



Old Channel



New Channel