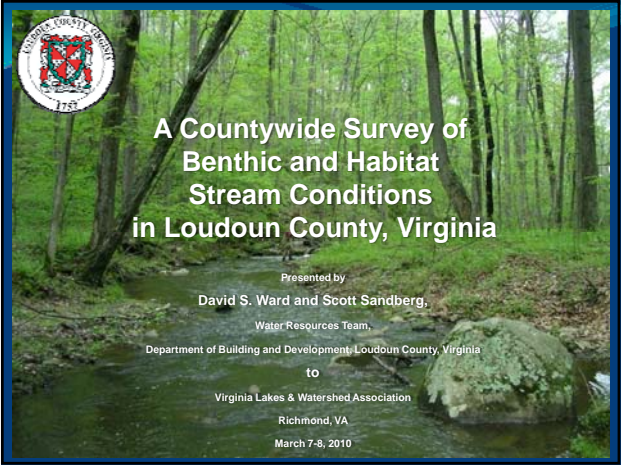



# A Countywide Survey of Benthic and Habitat Stream Conditions in Loudoun County, Virginia

Presented by  
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to  
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Loudoun County  
Stream Assessment

## Overview

- Background of water resources monitoring in Loudoun County
- Comprehensive Stream Assessment
  - Review of Previous Monitoring
  - Strategic Design
  - Benthic and Habitat Assessment
  - Stream Perenniality
- Summary

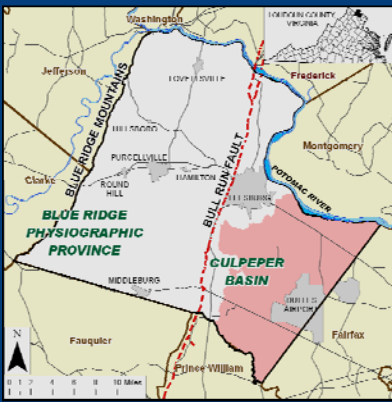





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## Loudoun County

- 520 sq. mi.
- Population ~283,000
- % growth among highest in nation
- 7 incorporated towns and Dulles Airport








Loudoun County  
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## Loudoun County

- "Suburban East"  
"Rural West"
- Surface Water serves ~200,000 (mostly in east)
- Groundwater from ~14,000 wells (mostly in west)

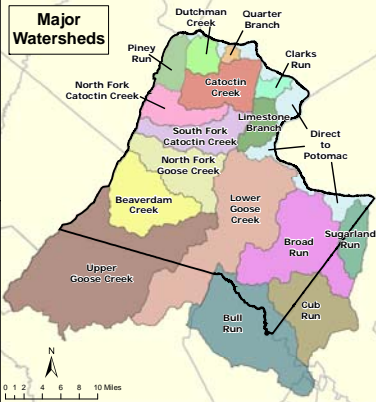





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## Watersheds

- 17 major watersheds
- 1,500+/- miles of perennial streams
- Bull Run and Cub Run drain south to Occoquan, all others drain N/E to Potomac.








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## Watershed Planning History

- 1999 – Recent drought brings attention to groundwater resource and need for monitoring and management
- 2001 – Initiate Water Resources Monitoring Program (WRMP). Supported by EPA grant.
- 2006 – Conduct strategic watershed management planning (SWMS) project. (NFWF and EPA grants.)
- 2007 – Compile/analyze existing data

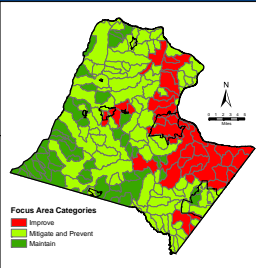





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### Watershed Planning History

- 2007/2008 – Contract with CH2M Hill, Inc. to develop Comprehensive Watershed Management Plan (CWMP). Funded by EPA grant.
- 2008/2009 – Continue working with stakeholders and technical committees to prioritize CWMP report recommendations
- 2009 – Stream assessment








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Stream Assessment

### Purpose of the Loudoun County Stream Assessment

- Assess stream conditions, using **benthic** and **habitat** rapid assessment methods, and
- Develop field-based information on stream **perenniality**, to refine existing information on extent and location of perennial streams.








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Stream Assessment

### Specific Objectives


- Employ a **probability-based** benthic survey to provide an assessment of stream conditions throughout the County's watersheds (at 177 sites),
- Target** additional benthic sampling to provide additional information at sites already established by Virginia Department of Environmental Quality (DEQ, 23 sites),
- Assess stream habitat in conjunction with all benthic sampling (same **200** sites),
- Assess habitat conditions at additional sites to develop a more comprehensive picture of stream conditions throughout the County (**300** sites), and
- Develop field-based information on **stream perenniality** to support further planning/ management needs.




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Stream Assessment

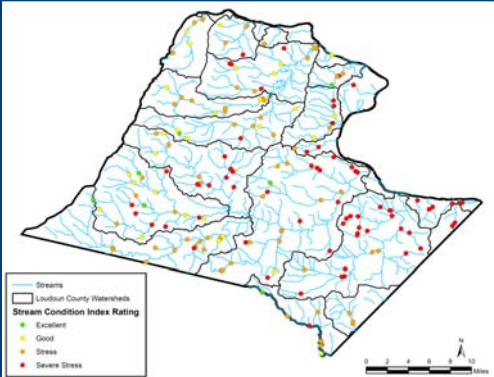
### Ecological Indicators

- Benthic - Virginia Stream Condition Index**
  - Based on EPA RBP
  - Developed and validated for VA
  - Reference based, multimetric indicator – sites are scores by comparison with minimally impaired regional "reference condition"
  - Project Team coordination w/ DEQ
- Habitat assessment (RBP habitat)**
  - Individual parameters (e.g., embeddedness, substrate condition, sediment deposition, bank stability, channel alteration, riparian width) rated on 0-20 scale, contribute to overall score
  - Ratings from Optimal to Poor

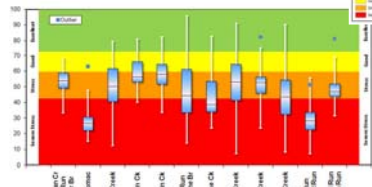






### Probability-based Survey: Benthic Macroinvertebrates (VSCI)



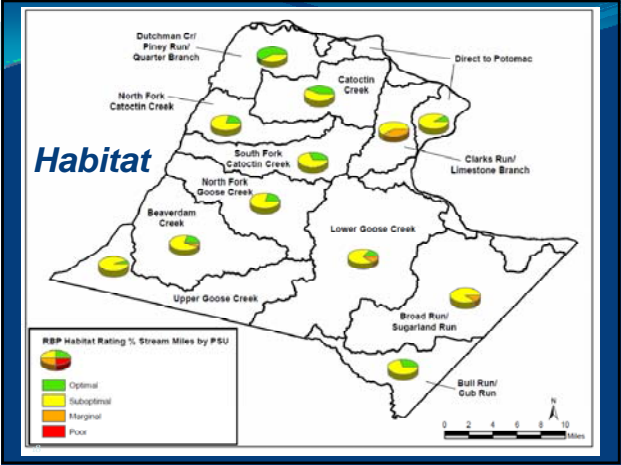
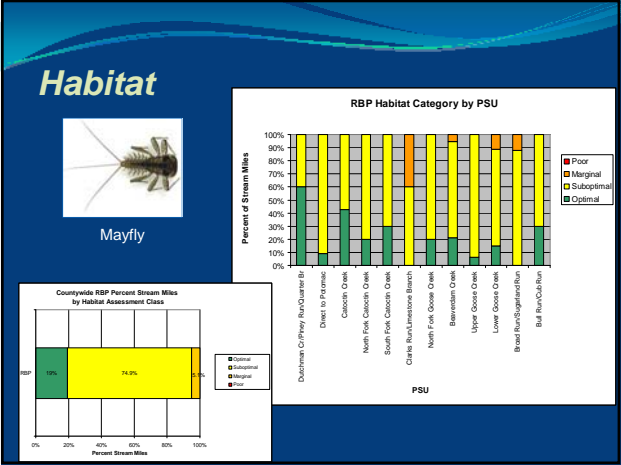
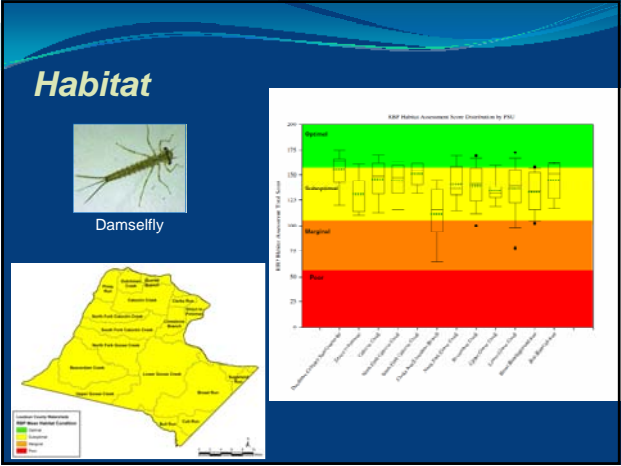
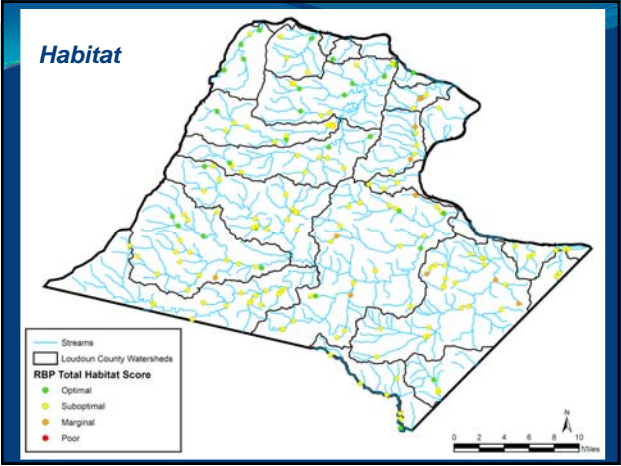
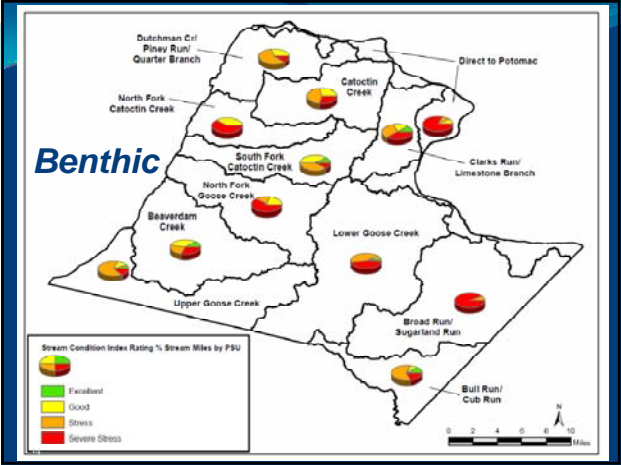
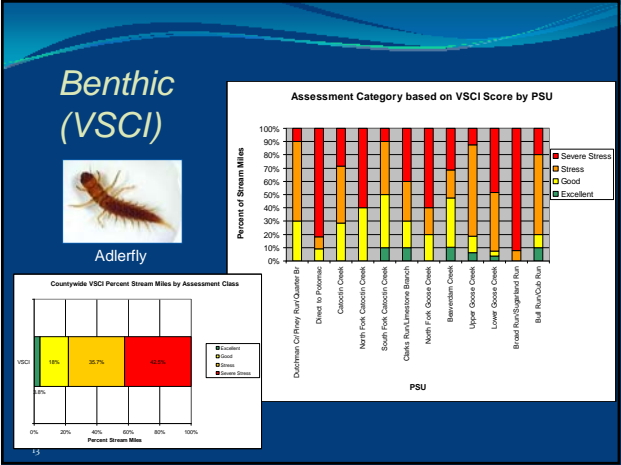
### Benthic (VSCI)



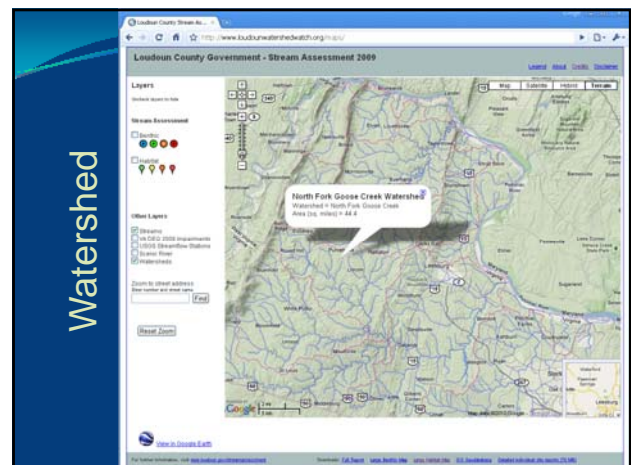
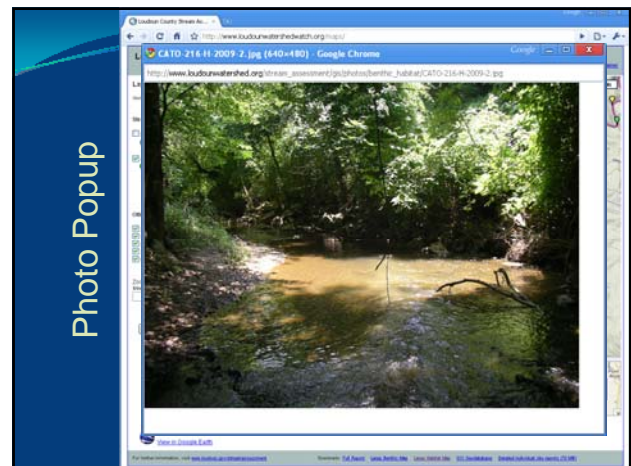
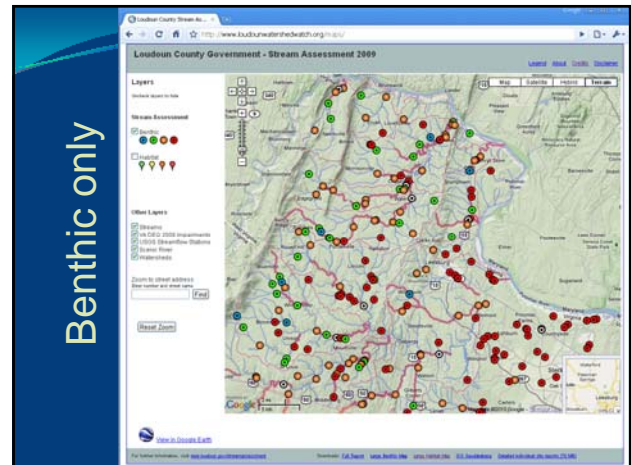


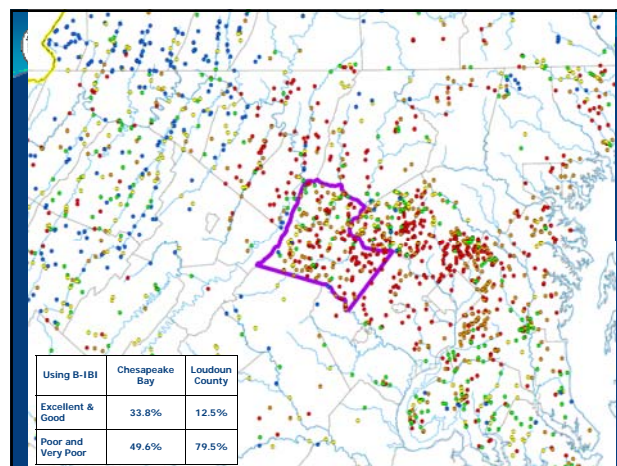
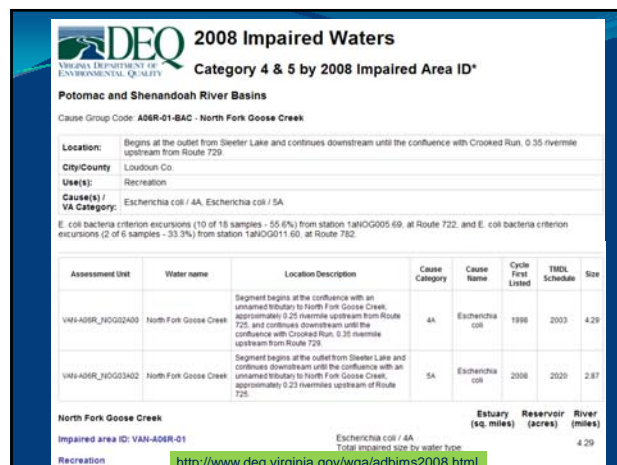


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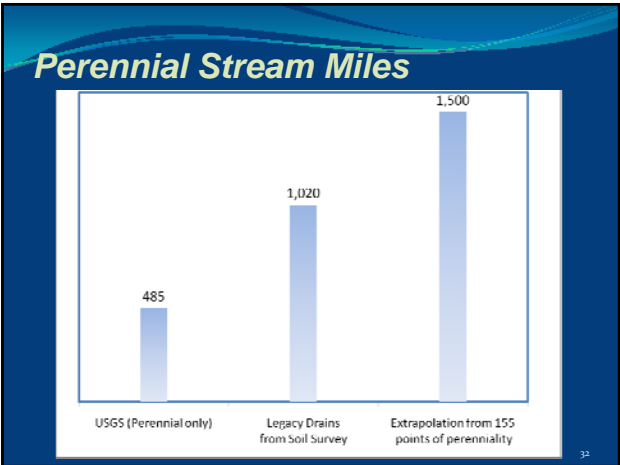
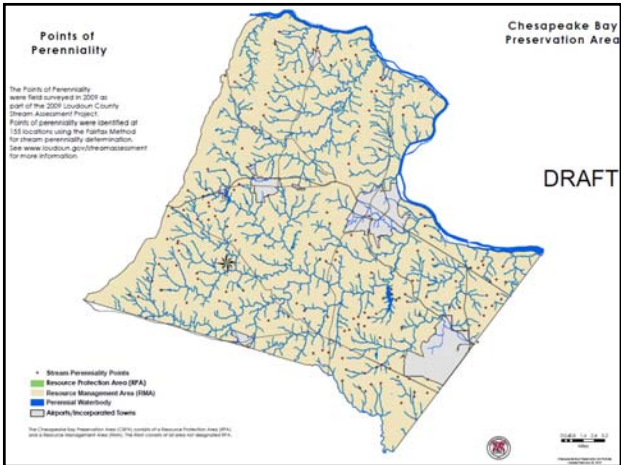












**Loudoun County Stream Assessment**

**Findings**

- Based on a probability-based **benthic** survey at 178 locations more than 78 percent of streams are “stressed” or “severely stressed”.
- The overall **habitat** conditions at 500 locations are generally suboptimal.
- There are approximately 1,500 miles of **perennial** streams, substantially more than USGS or soil surveys indicate.

Stonefly

**Loudoun County Stream Assessment**

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Additional information is available at [www.loudoun.gov/streamassessment](http://www.loudoun.gov/streamassessment)

