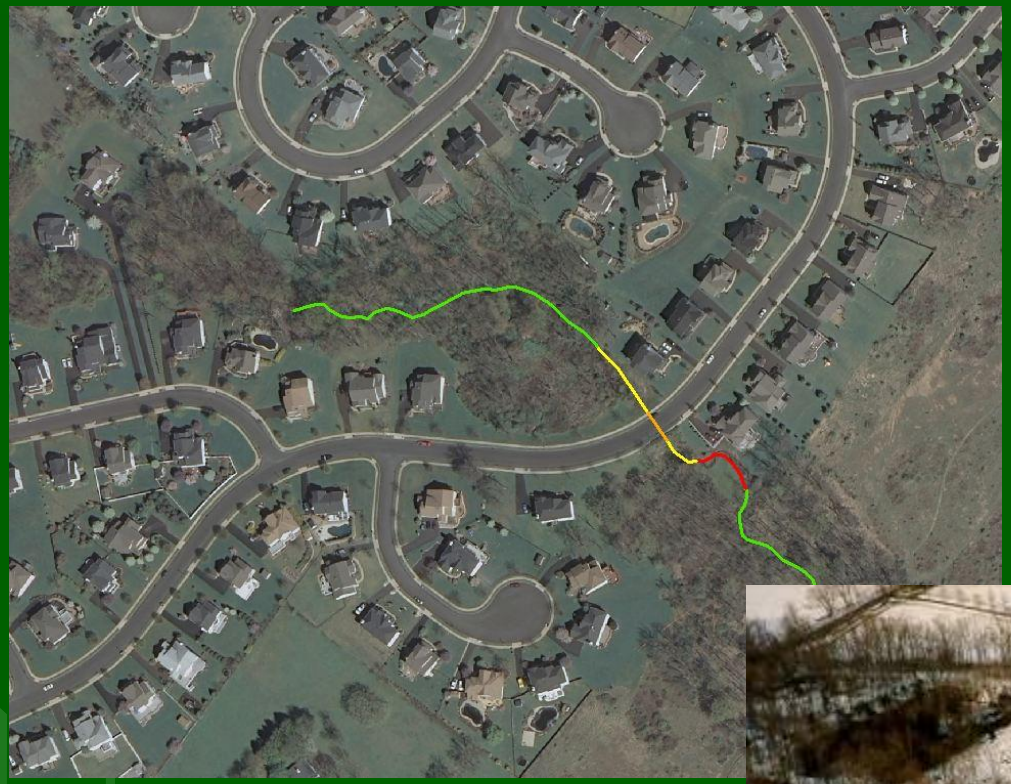
Riparian Buffer Assessment Update for Southeastern PA



Delaware Estuary Science & Environmental Summit

January 29, 2013

Thank You to Our Funders:

This project was funded through a Federal Coastal Zone Management Grant, administered by the Pennsylvania Department of Environmental Protection (DEP).

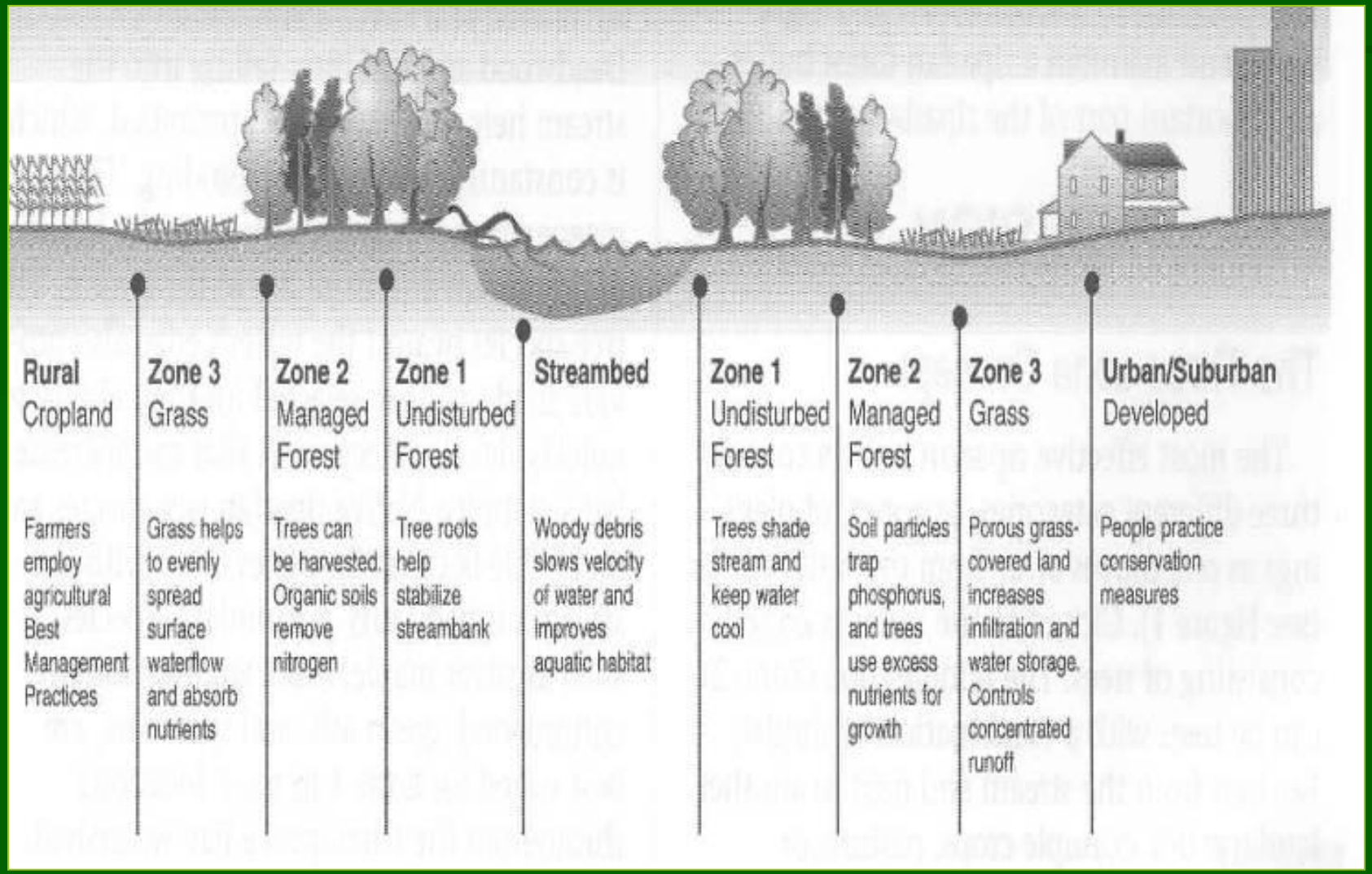
Matching funds were provided in part by a Keystone Recreation, Park and Conservation Fund Program Grant from the PA DCNR, Bureau of Recreation and Conservation.

In-kind support provided by the Montgomery County Planning Commission

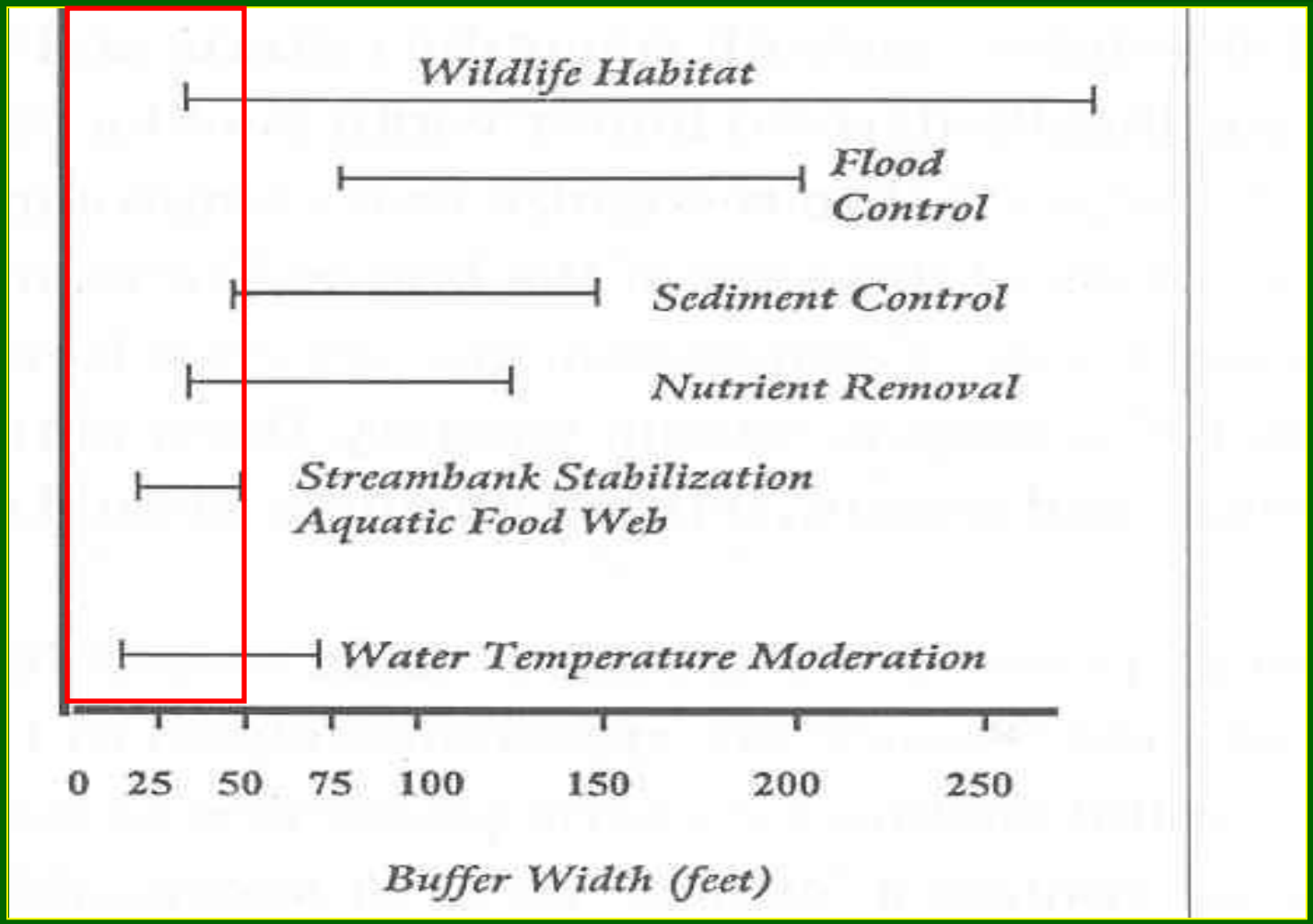
What is a Riparian Forest Buffer?

A riparian buffer is a zone of trees & other native vegetation adjacent to a watercourse or body of water.

Multi-Zoned Buffer



Zone Width Varies with Goals



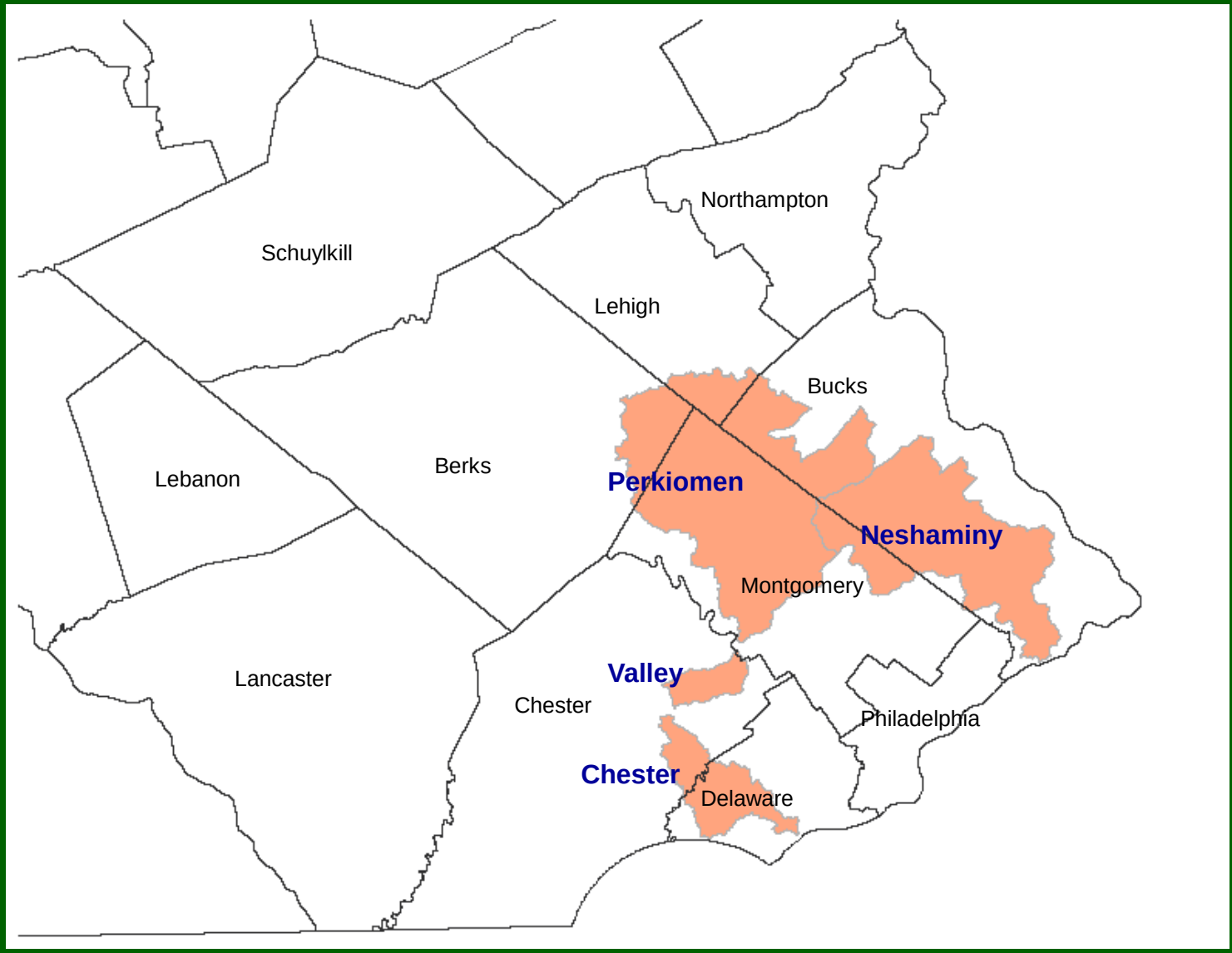
Buffer Benefits

- Buffer against pollution impacts
- Maintain biodiversity
- Help reduce flooding by slowing runoff to streams
- Wildlife corridor and habitat
- Can provide seasonal blooms and autumn color

Project Definition of Riparian Forest Buffer:

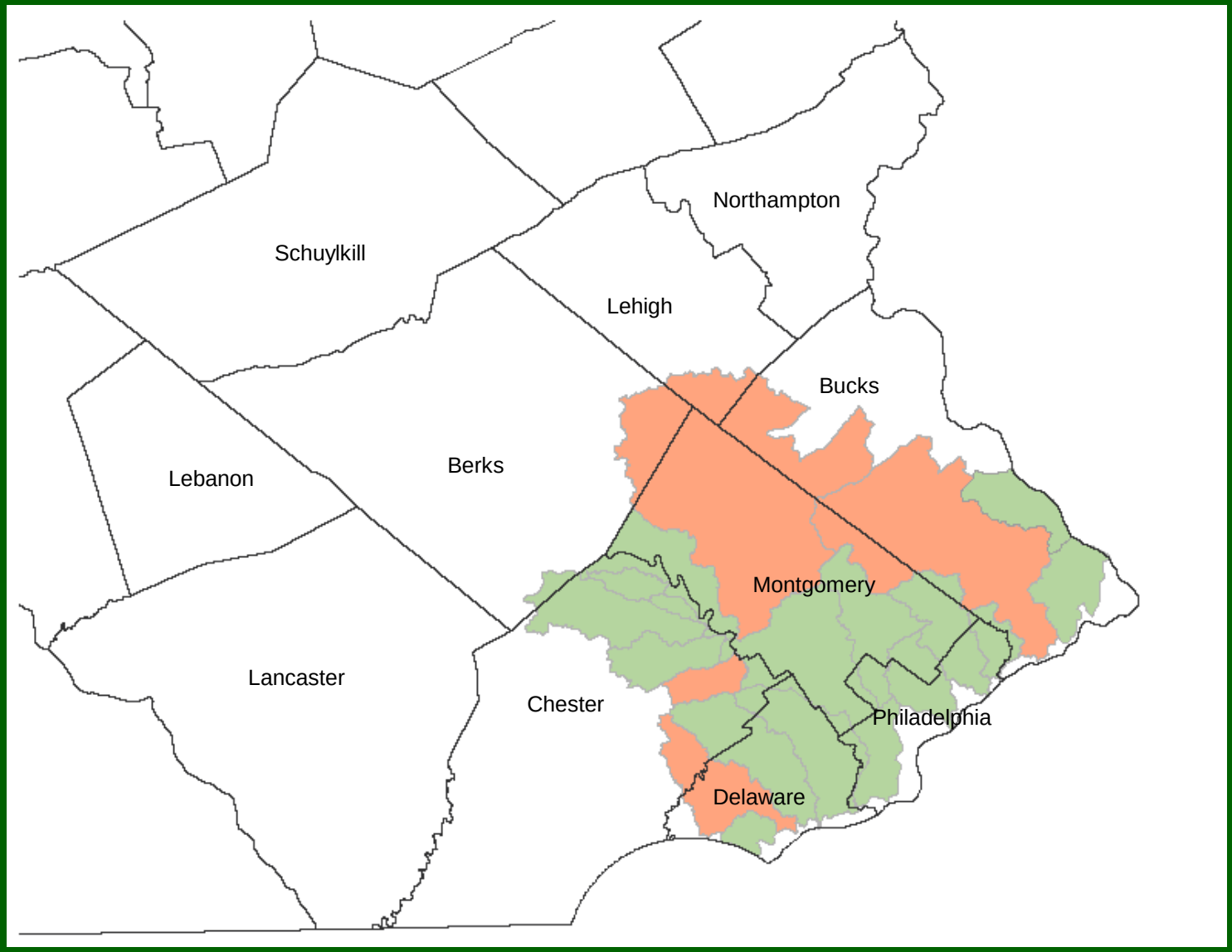
History of Efforts

Pilot Watersheds studied in 2000



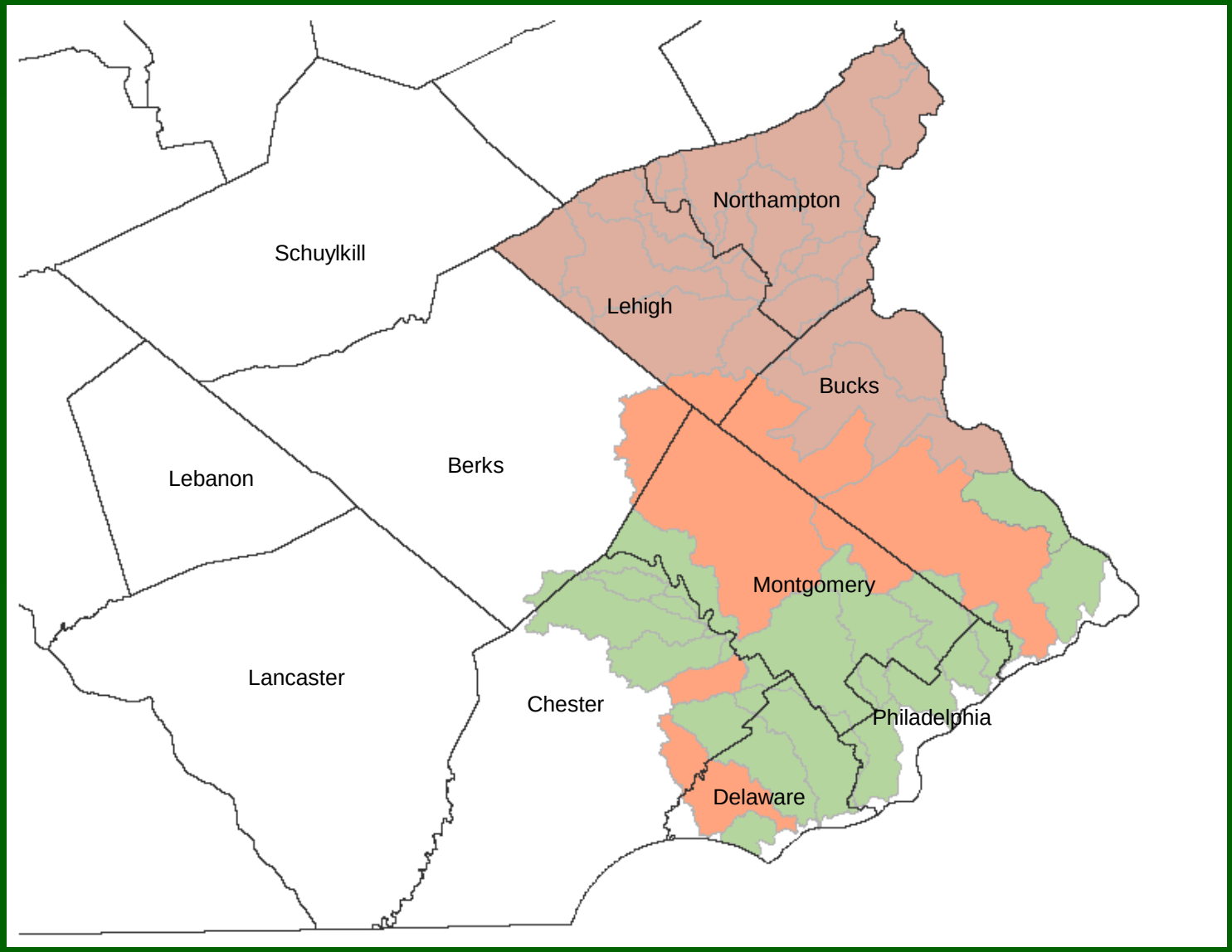
History of Efforts

Watersheds studied in 2001-2002



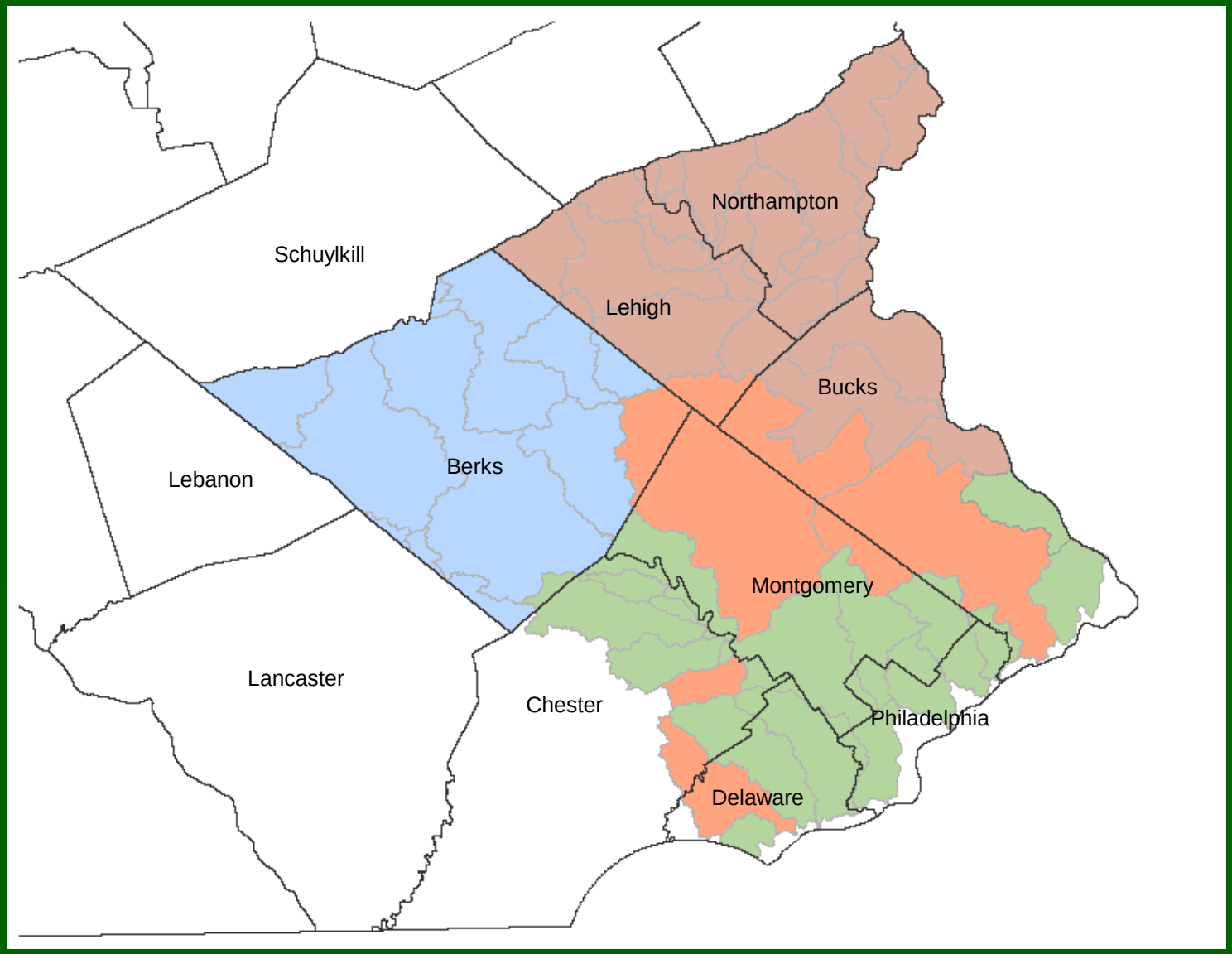
History of Efforts

Watersheds studied in 2003

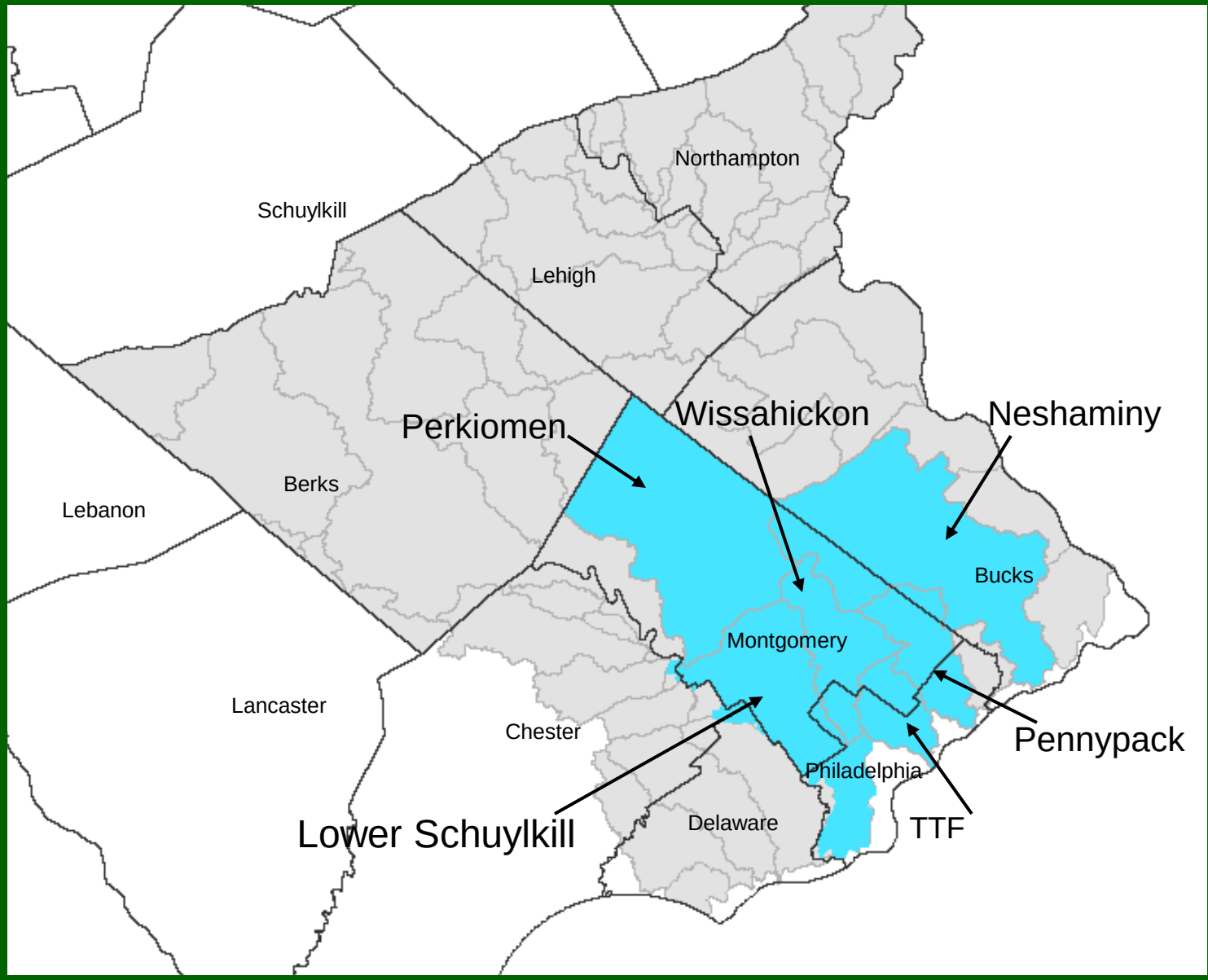


History of Efforts

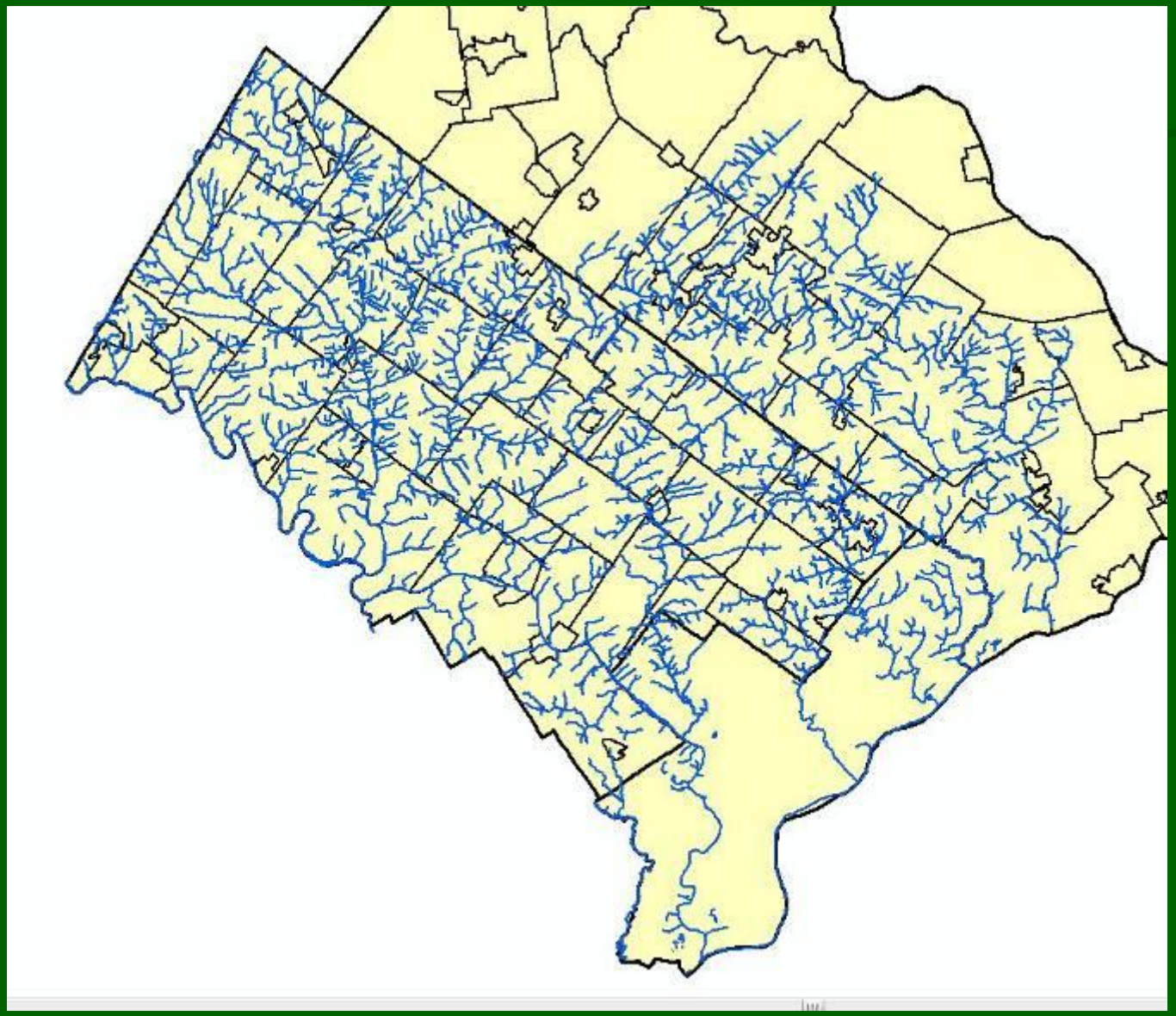
Watersheds studied in 2006-2007



Watersheds being Re-evaluated



Streams in the Project



Riparian Buffer Assessment - Update

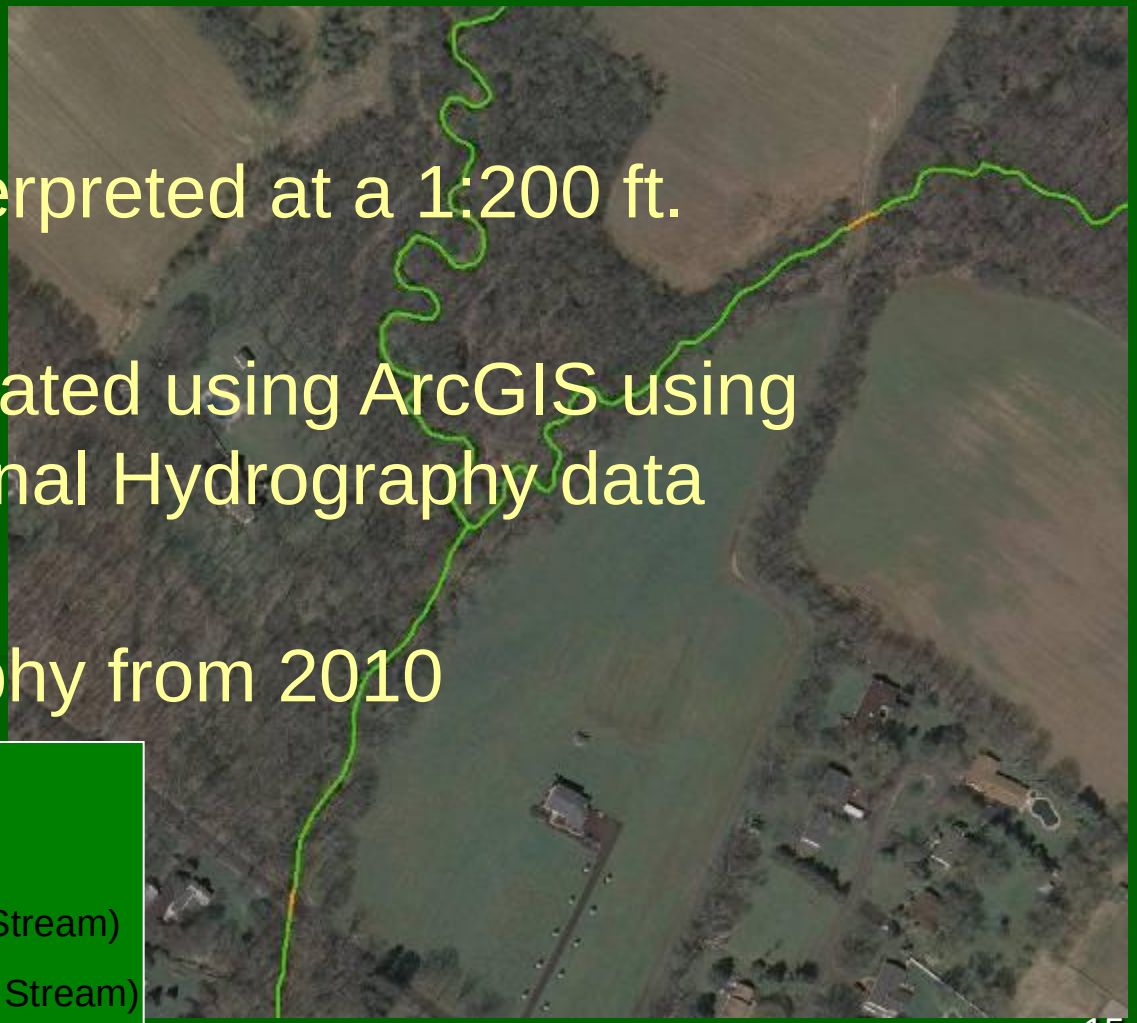
Buffer status threshold set at 50% or greater canopy coverage from the water's edge to 50 ft. from water

Four Buffer Status Categories:

- ***Full Buffer*** – Both banks have 50% or greater canopy coverage for 50 feet from the water's edge
- ***Half Buffer*** – Only one bank has 50% or greater canopy coverage
- ***None*** – Neither bank has 50% or greater canopy coverage
- ***Culvert*** – Area where stream is not visible

Assessment Methodology

- Orthophotos interpreted at a 1:200 ft. scale
- 50 ft. buffers created using ArcGIS using the USGS National Hydrography data set.
- Aerial photography from 2010



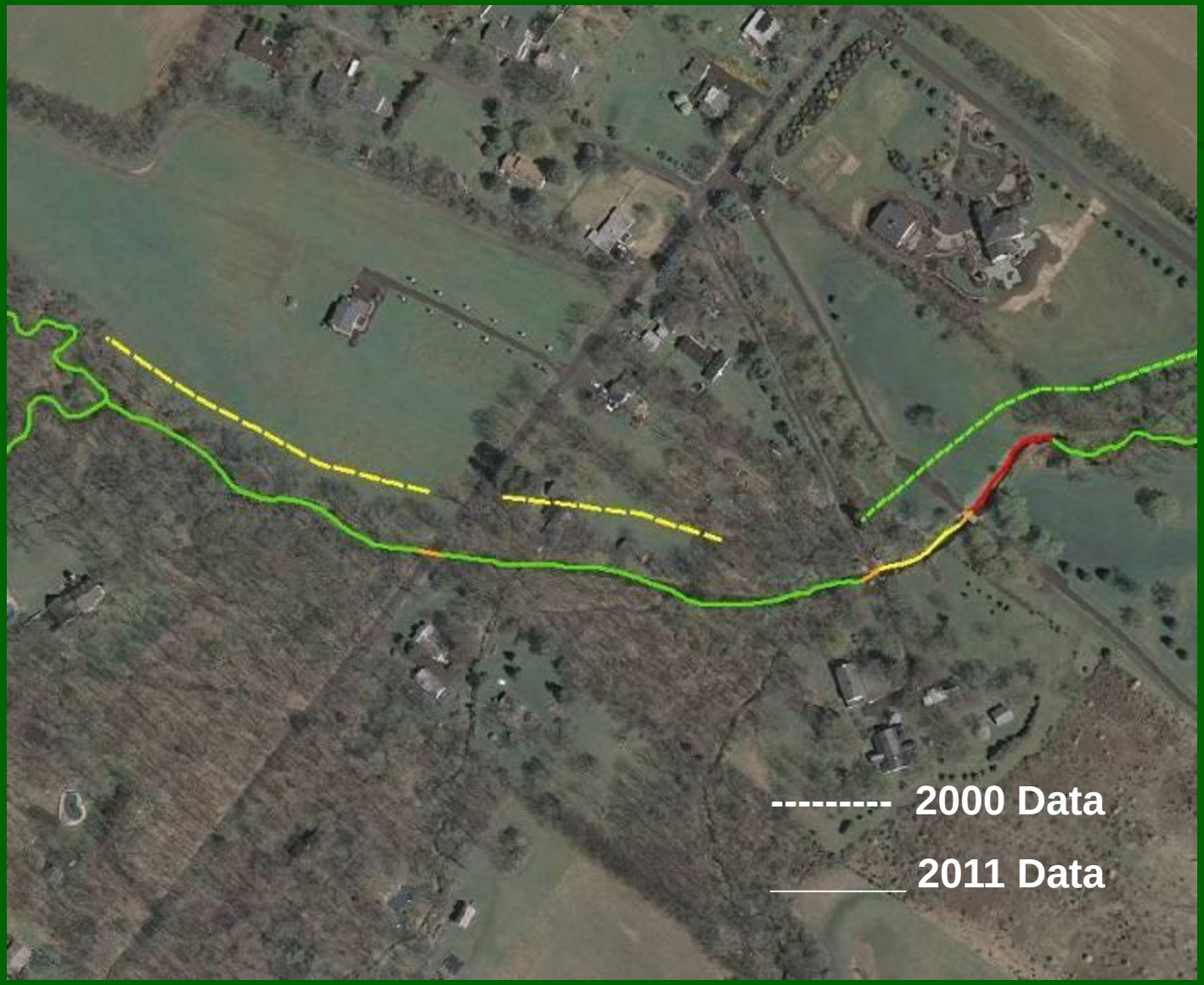
Forest Buffers

- No Buffer
- Half Buffer (One Side of Stream)
- Full Buffer (Both Sides of Stream)
- Culvert

Project Objectives

- Produce updated annotated aerial photos and topographic maps for the six watersheds/1,400 stream miles.
- Compare new assessment data with original
- Evaluate correlations between land use and buffer status
- Generate statistics table for each watershed
- Present 3 workshops

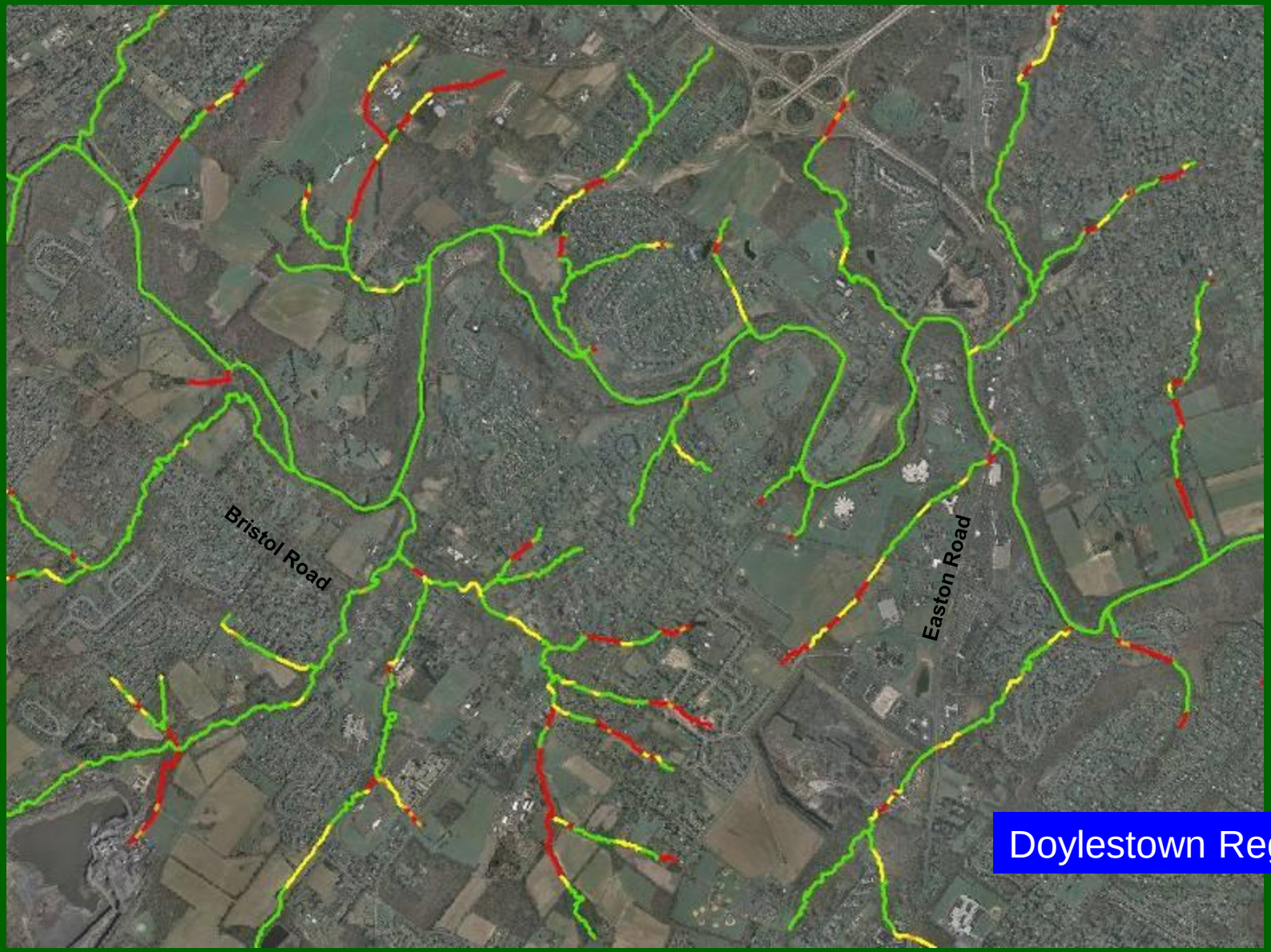
Comparison



Summary - GIS Based Statistics

Buffer Status	*Miles*	*Percentage*
None	279	19%
Half	331	22%
Both	837	56%
Culvert Areas	46	3%
Total Stream Miles	1,493	100%

Area Level



Neighborhood Level

Neighborhood Level

Preserved Buffers Protect

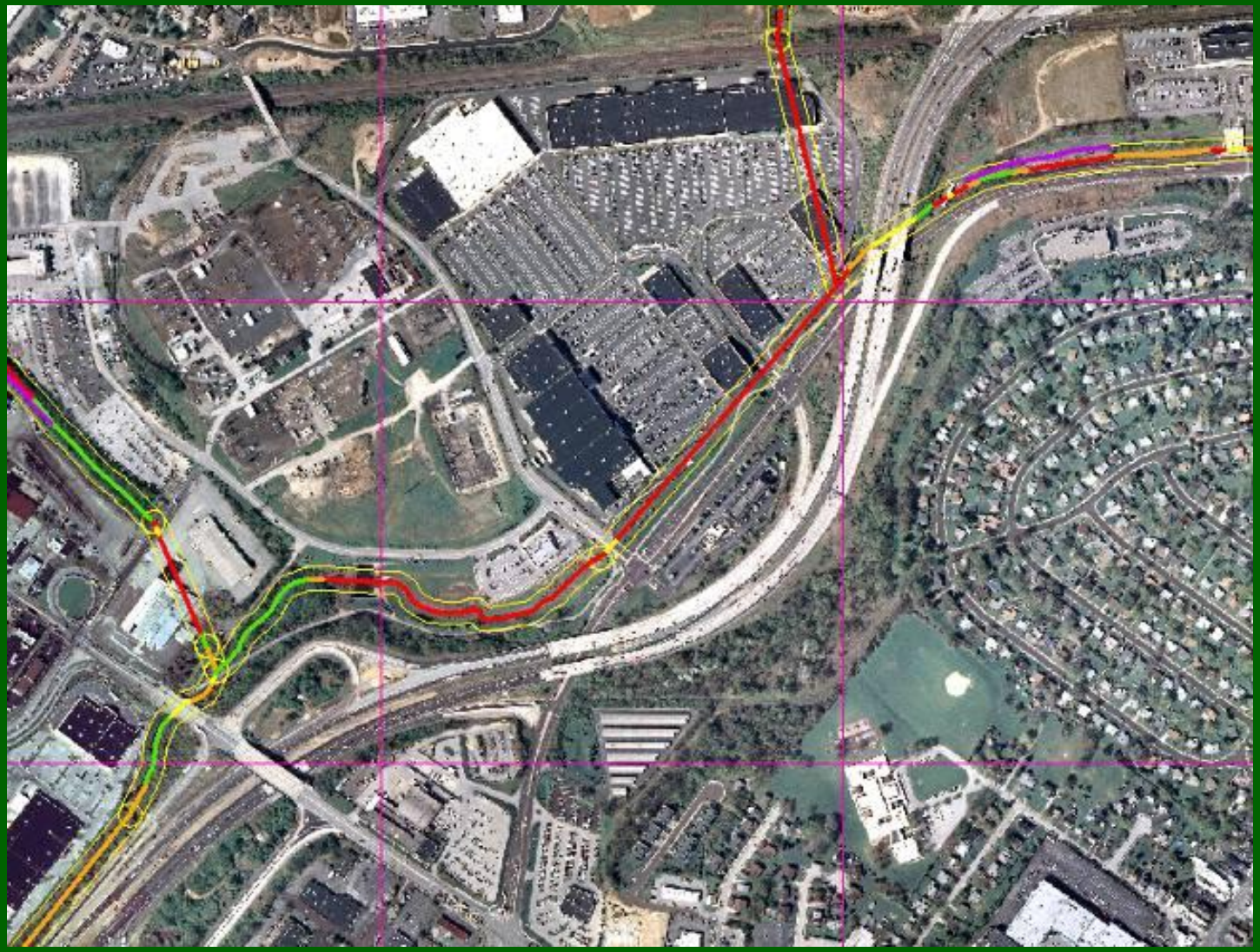
Natural Change

2000 - 2011 - Succession

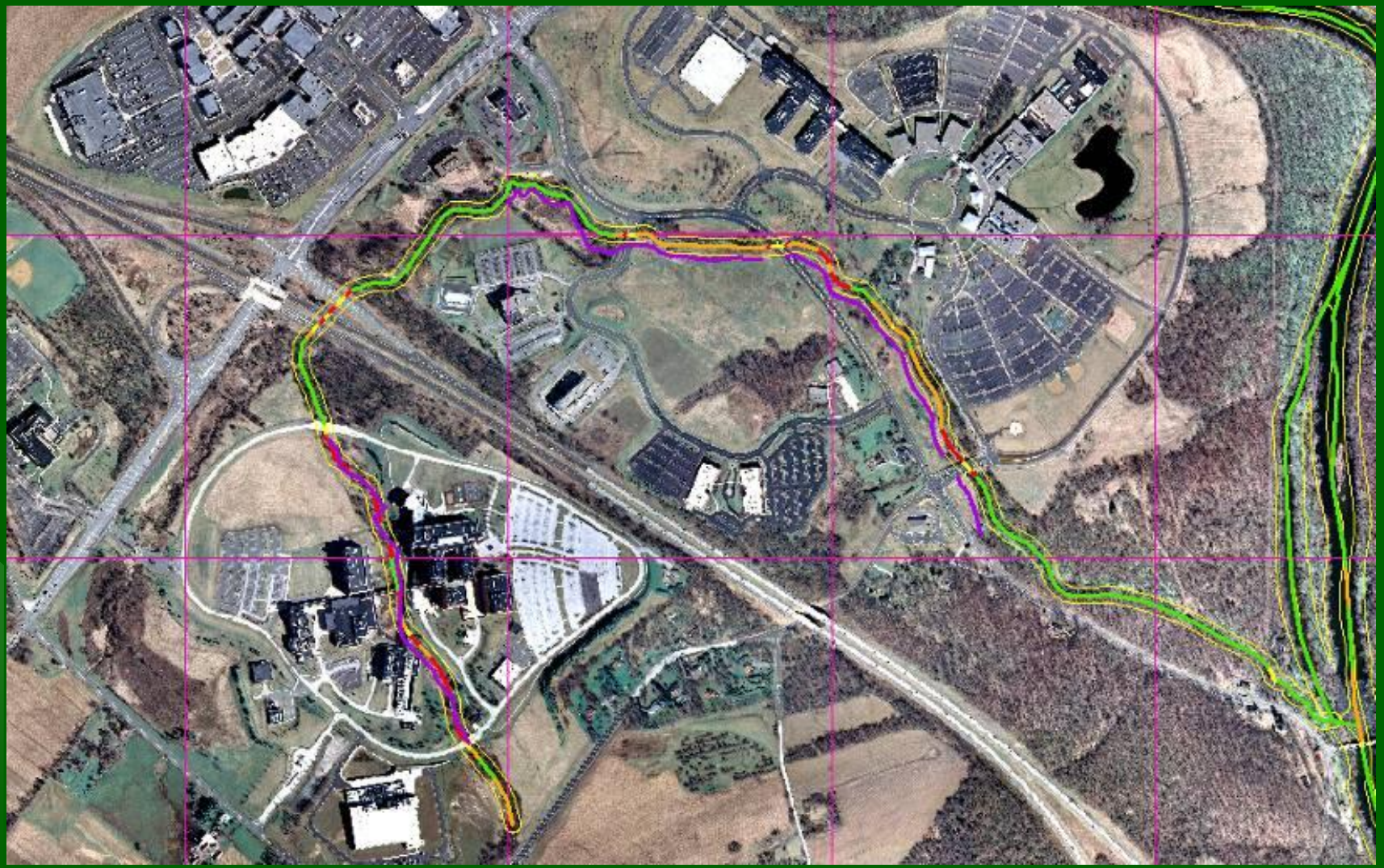
Change On Purpose

Missed Opportunity

Projects vs. Preservation



Education and Promotion

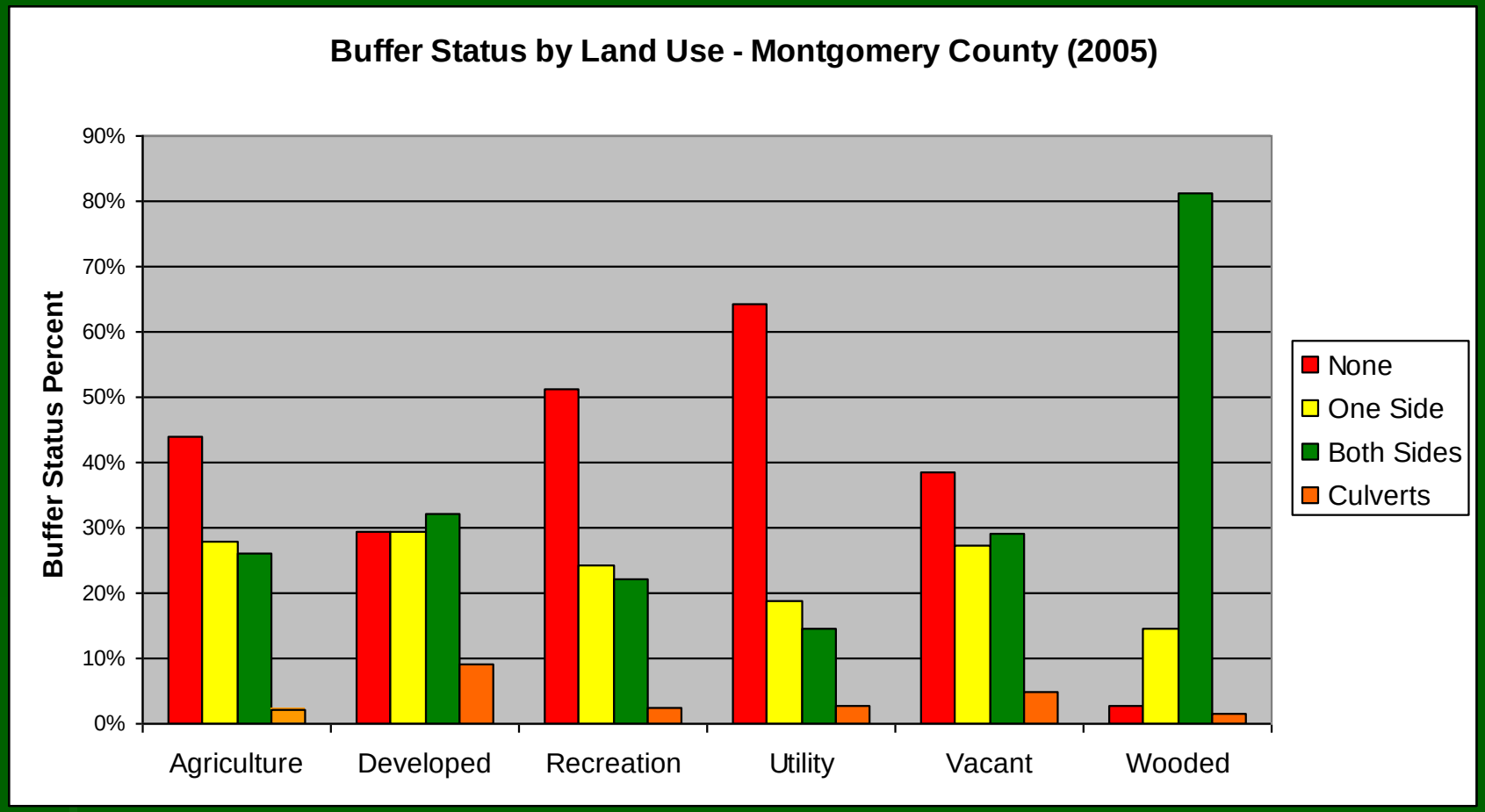


Land Use Comparison

Buffer Status by Land Use* – Montgomery County				
	None	One side	Both Sides	Culverts
Agriculture	44.1%	27.9%	25.9%	2.1%
Developed	29.3%	29.4%	32.3%	9.0%
Recreation	51.1%	24.3%	22.2%	2.4%
Utility	64.3%	18.7%	14.4%	2.6%
Vacant	38.5%	27.4%	29.1%	5.0%
Wooded	2.7%	14.6%	81.2%	1.4%

*Based on 2005 DVRPC Land Cover

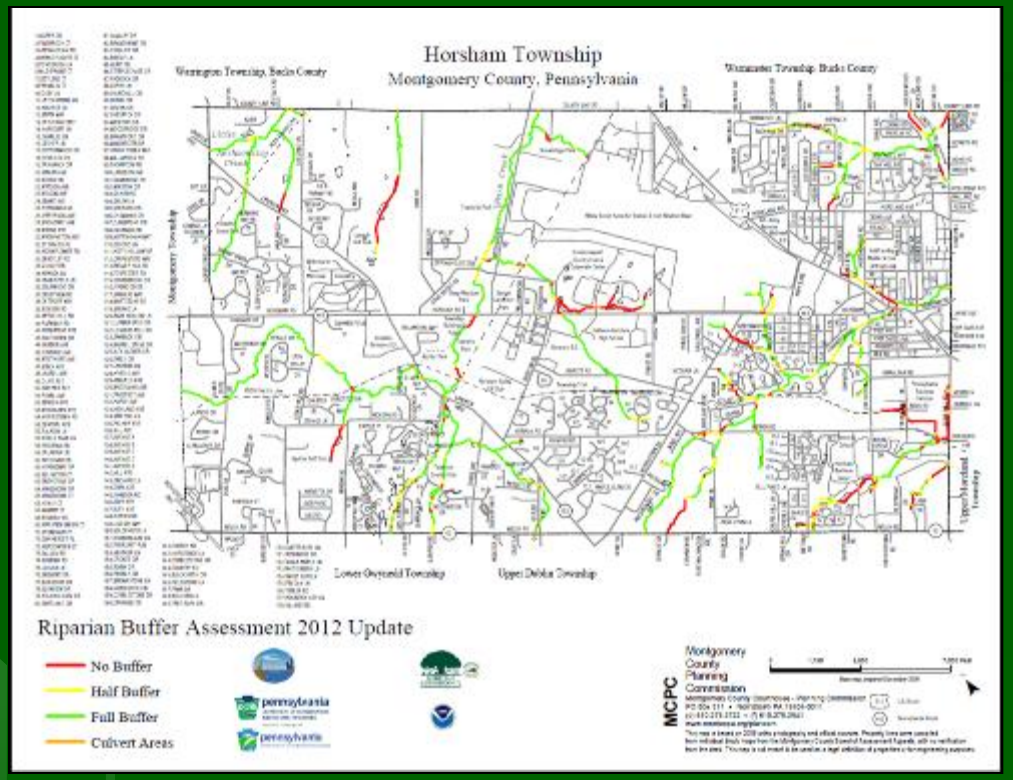
Land Use Comparison

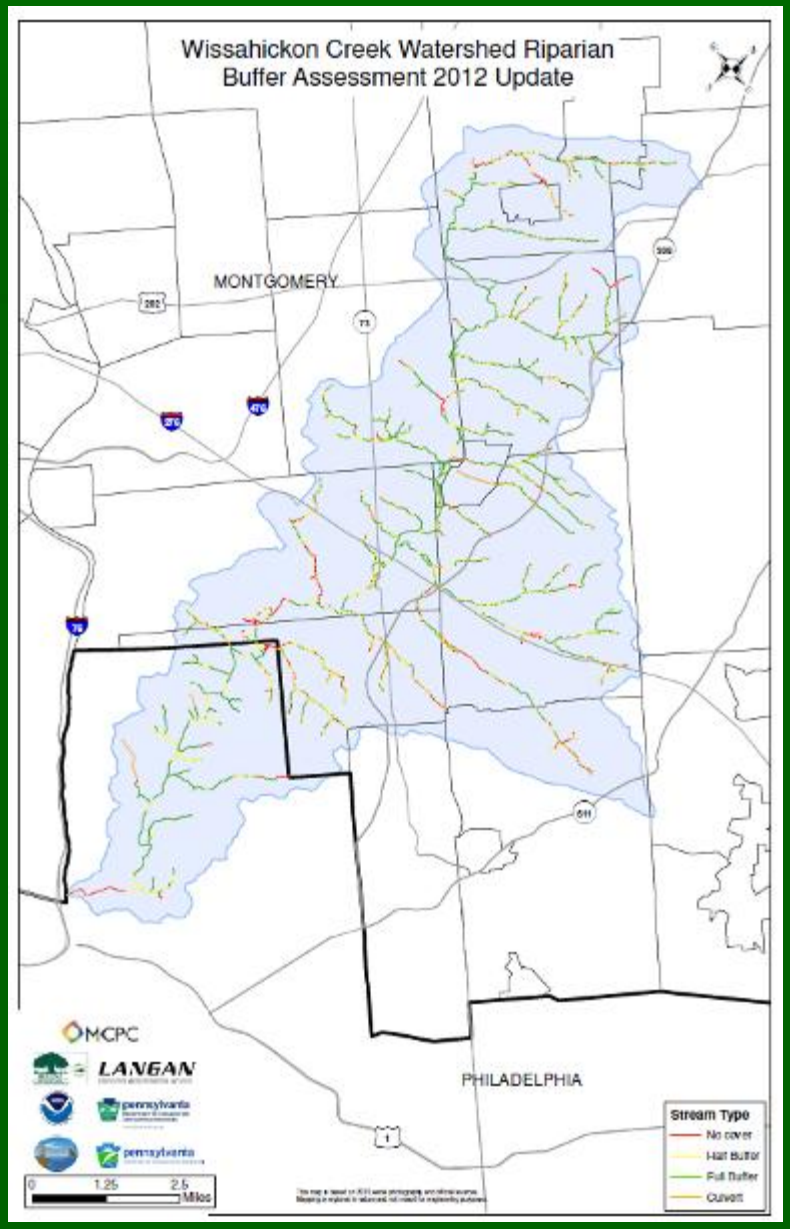


Deliverables

- Edited and attributed stream shape file for project watersheds
- Statistics table for each municipality
- Statistics table for each sub-watershed
- PDF image maps of streams clipped to municipalities and to sub-watersheds
- KML Files for desktop analysis

Sharing Results

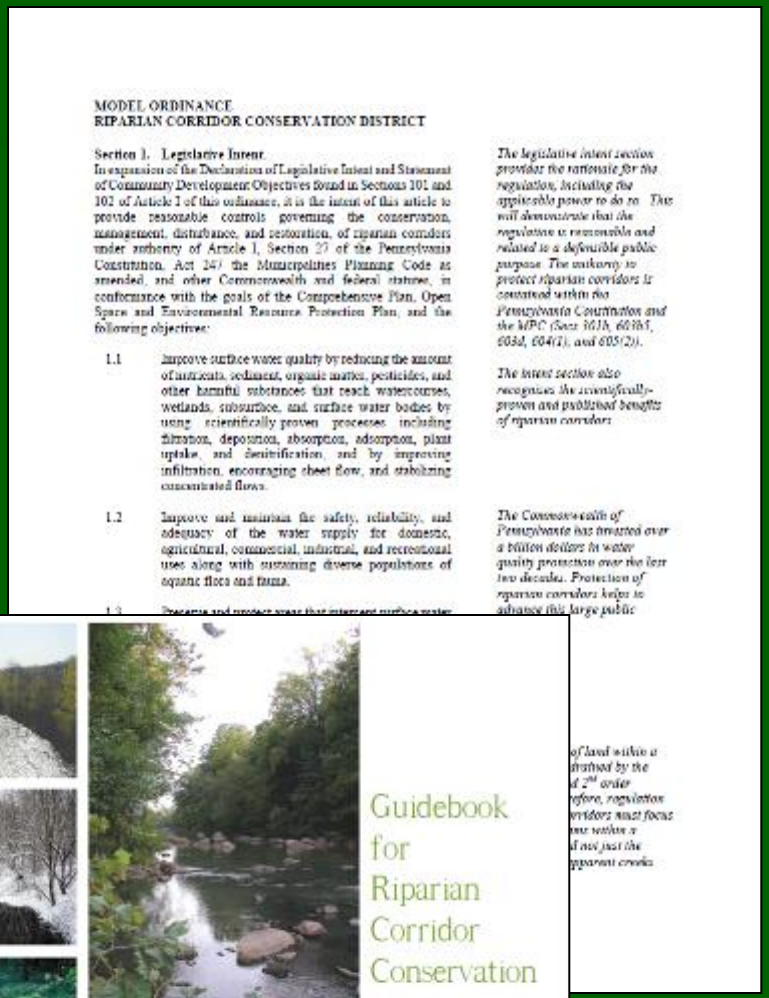




All generated data is publically available through PASDA: www.pasda.psu.edu

Opportunities for Further Analysis

- Evaluate effectiveness of ordinances
- Prioritize actions and projects
- Compare to other stream indicators
- Identify local hot spots
- Support further research



MODEL ORDINANCE
RIPARIAN CORRIDOR CONSERVATION DISTRICT

Section 1. Legislative Intent.
In expansion of the Declaration of Legislative Intent and Statement of Community Development Objectives found in Sections 101 and 102 of Article I of this ordinance, it is the intent of this article to provide reasonable controls governing the conservation, management, disturbance, and restoration, of riparian corridors under authority of Article I, Section 27 of the Pennsylvania Constitution, Act 247 the Municipalities Planning Code as amended, and other Commonwealth and federal statutes, in conformance with the goals of the Comprehensive Plan, Open Space and Environmental Resource Protection Plan, and the following objectives:

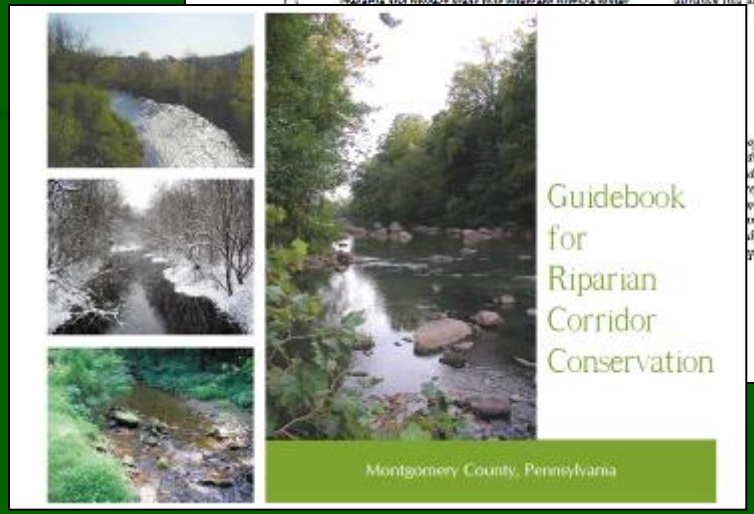
1.1 Improve surface water quality by reducing the amount of nutrients, sediment, organic matter, pesticides, and other harmful substances that reach watercourses, wetlands, subsurface, and surface water bodies by using scientifically proven processes including filtration, deposition, absorption, adsorption, plant uptake, and denitrification, and by improving infiltration, encouraging sheet flow, and stabilizing concentrated flows.

1.2 Improve and maintain the safety, reliability, and adequacy of the water supply for domestic, agricultural, commercial, industrial, and recreational uses along with sustaining diverse populations of aquatic flora and fauna.

The legislative intent section provides the rationale for the regulation, including the applicable power to do so. This will demonstrate that the regulation is reasonable and related to a defensible public purpose. The authority to protect riparian corridors is construed within the Pennsylvania Constitution and the MPC (Sect. 603, 604(1), 605(2), 605(2)).

The intent section also recognizes the scientifically-proven and published benefits of riparian corridors.

The Commonwealth of Pennsylvania has invested over a billion dollars in water quality protection over the last two decades. Protection of riparian corridors helps to advance this large public



Prioritize Actions

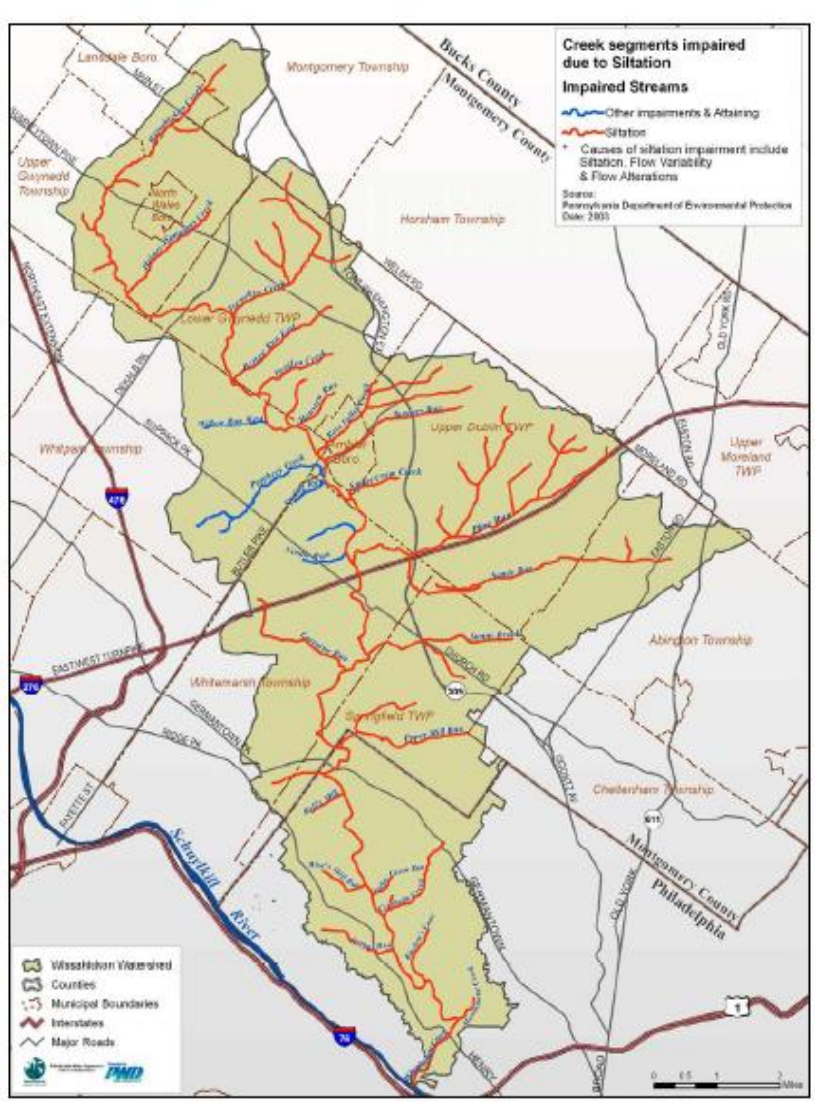


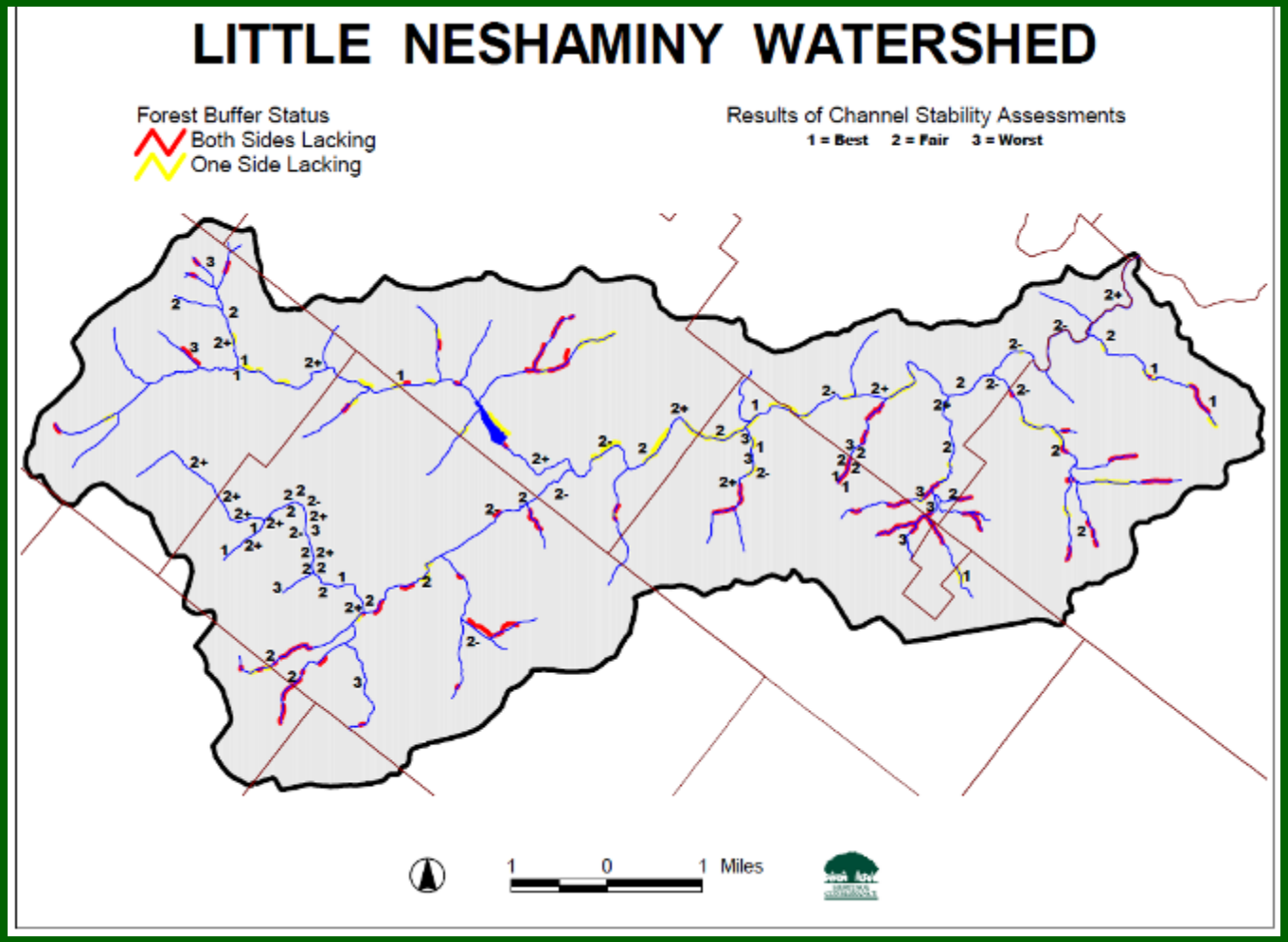
Figure 2: 303d listed streams impaired due to Siltation in the Wissahickon Creek Watershed

Identifying priority areas for restoration – TMDL or MS4 requirements

Wissahickon Creek Watershed – Impaired Waters – PA DEP 303d report (2003) – Updated 3/10/08

Source: PWD, Inventory of Existing Stormwater Management Facilities with Retrofit Potential within the Wissahickon Creek Watershed - 2007

Compare to Other Stream Indicators



Target Restoration Areas

- Good education opportunity
- Public access
- Benefits greater community
- Encourages volunteer participation

Public Lands Overlay

Questions ?

Project Team

Drew Shaw, Jon Lesher - Montgomery County Planning Commission

Susan Myerov, Heritage Conservancy

Tony Yates, Dennis Quinlan – Langan Engineering & Environmental Services