

Precision Conservation in the Susquehanna River Watershed

*Carly Dean,
Project Manager*

Thursday, September 7, 2017

*Chesapeake Bay Program Citizens Advisory Council Meeting
Blue Spruce Room, Lake Raystown Resort Conference Center*

Background on Chesapeake Conservancy

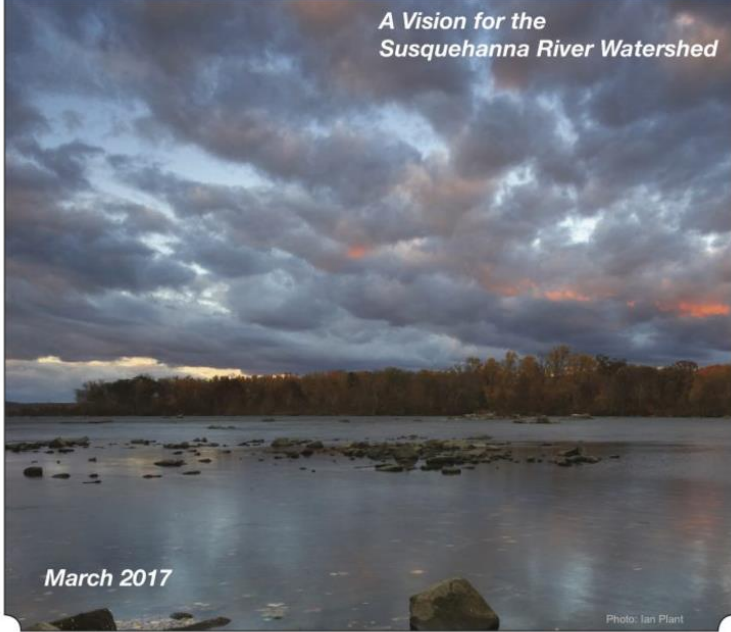
The Chesapeake Conservancy works to achieve a healthier Chesapeake Bay watershed by **connecting** people with its wildlife and history; **conserving** landscapes and rivers; and **restoring** its natural resources.

From our founding, we have embraced the **National Park Service's Captain John Smith Chesapeake National Historic Trail** as an inspiration and framework.



envision the susquehanna

A Vision for the
Susquehanna River Watershed



March 2017

Photo: Ian Plant



SRHCES

ETS Partners



Susquehanna



SRHCES



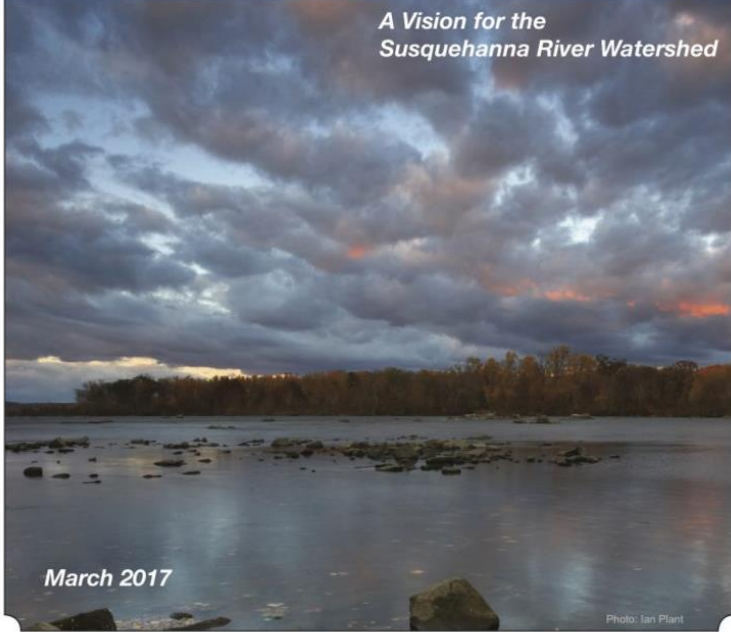
EXPLORE. CONSERVE. INNOVATE.

ETS Themes

- Recreation and Public Access
- American Indian Heritage and History
- Working Lands
- Stormwater and Flooding
- Wildlife Habitat

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March 2017

Photo: Ian Plant



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Chesapeake
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Background: Conservation Goals

Bay Agreement: Restore and Conserve Riparian Forested Buffers until 70% buffer coverage is achieved (**Lead GIT:** Water Quality-GIT3; **Workgroup:** Forestry; **Partner GITs:** Habitat GIT2; Healthy Watersheds GIT4)

PA Buffer Initiative: Plant an additional 95,000 acres of buffers by 2025

PA Phase III WIP: load reductions by 2025
Nitrogen: 27 M lbs, 74% from agriculture
Phosphorus: 0.7 M lbs, ~75% from agriculture
Sediment: 246 M lbs, ~70% from agriculture

Forest buffers on farmland provide cost effective water quality benefits

Year	Acres of Buffer Planted in PA
2010	1,129
2011	2,848
2012	948
2013	6,822
2014	3,616
2015	77

Community-identified challenges:

- Setting goals and tracking progress
- Engaging new landowners in conservation
- Site-level, evidence-based prioritization
- Leveraging strengths of partners through collaboration

Precision Conservation

Utilizing **GIS** to implement the **right practices**, in the **right place**, at the **right scale**.



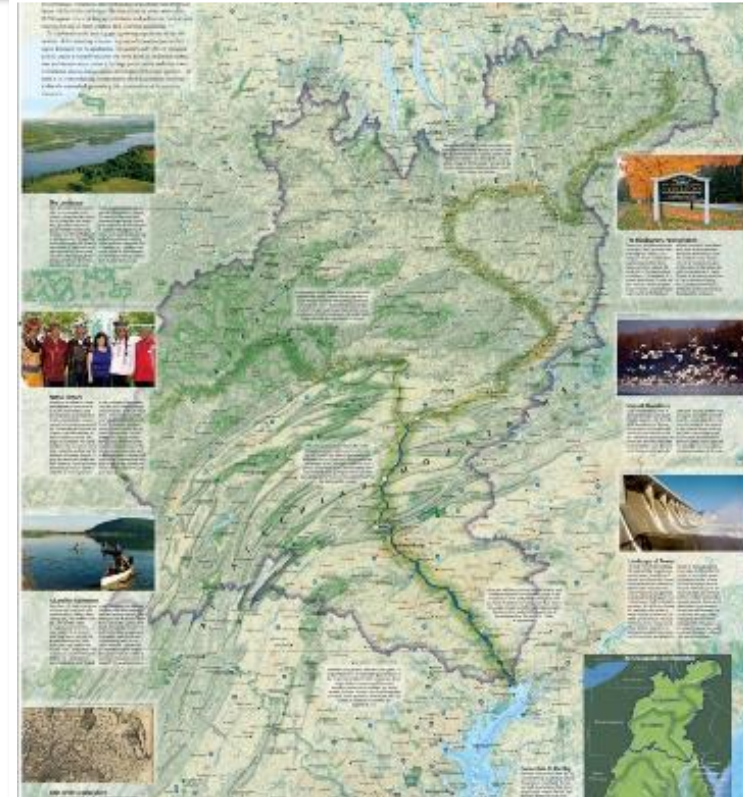
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Chesapeake Bay Program
Science. Restoration. Partnership.

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Saving the Chesapeake's Great Rivers and Special Places

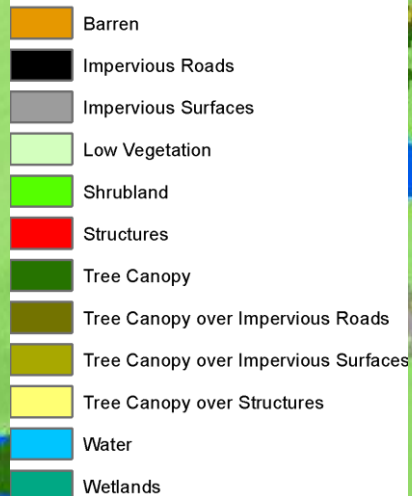


Goal: Identify and quantify restorable riparian areas



1. Map Enhanced Flow Paths

CBP Land Cover Classification

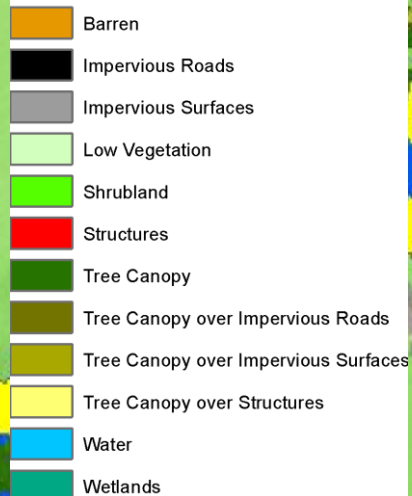


Pixel size: 1 meter by 1 meter

2. Add High Resolution Land Cover Dataset

200m

CBP Land Cover Classification



Pixel size: 1 meter by 1 meter

3. Clip Land Cover to a 35-foot buffer around Enhanced Flow Paths



4. If Land Cover = Low Veg. or Barren, then ID'd as Flow Path Restoration Areas

Summary

Achievements	Recommendations
<ul style="list-style-type: none">Identified over 150,000 acres of flow path restoration areas in the Susquehanna River Watershed	<ul style="list-style-type: none">Develop a verifiable baseline from which to set goals and track progressEngage the implementation community early



1.18 acres

1.16 acres

Beech Creek

Clinton Centre

0 300 600

Application: Precision Conservation



Community workshops:
What does it mean to get the biggest bang for the buck?



1.18 acres

1.16 acres

Beech Creek

Clinton Centre

0 300 600



1.18 acres

1.16 acres

Beech Creek

Clinton
Centre

0 300 600



59.7 acres

[] [X]	
Gap Area	1.16
Drainage Area	59.70
Acres Agriculture	53.62
Acres Turf	5
Acres Impervious	0
Drainage Area to Gap Size	50.88
Channel Meander	0.68
Trout Water	0
Impaired	0
Exceptional Value or High Quality Stream	0
Habitat Connectivity	5
Brook Trout	0
American Woodcock	1
Cerulean Warbler	1
Louisiana Waterthrush	1
Black-throated Blue Warbler	1
Hellbender	1
Golden-winged Warbler	1
Total Species of Interest	6
Soil Erodibility Factor	0.69
No Karst	1
Area Low Gap Slope	1.16
Area Medium Gap Slope	0.00
Area High Gap Slope	0.00
Final Rank	16,114

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<ul style="list-style-type: none">Prioritized over 43,000 restoration areas in the two-county pilot region	<ul style="list-style-type: none">Integrate flow path analysis into nutrient and sediment load reduction modelsDeliver data in a way that's useful to partners

Field monitoring

- Validating the prioritization on 6 restoration areas
- Projects will be implemented in 2017-2018
- Restoration areas rank from #36,631 - #1



United States Department of Agriculture
Natural Resources Conservation Service



Susquehanna UNIVERSITY

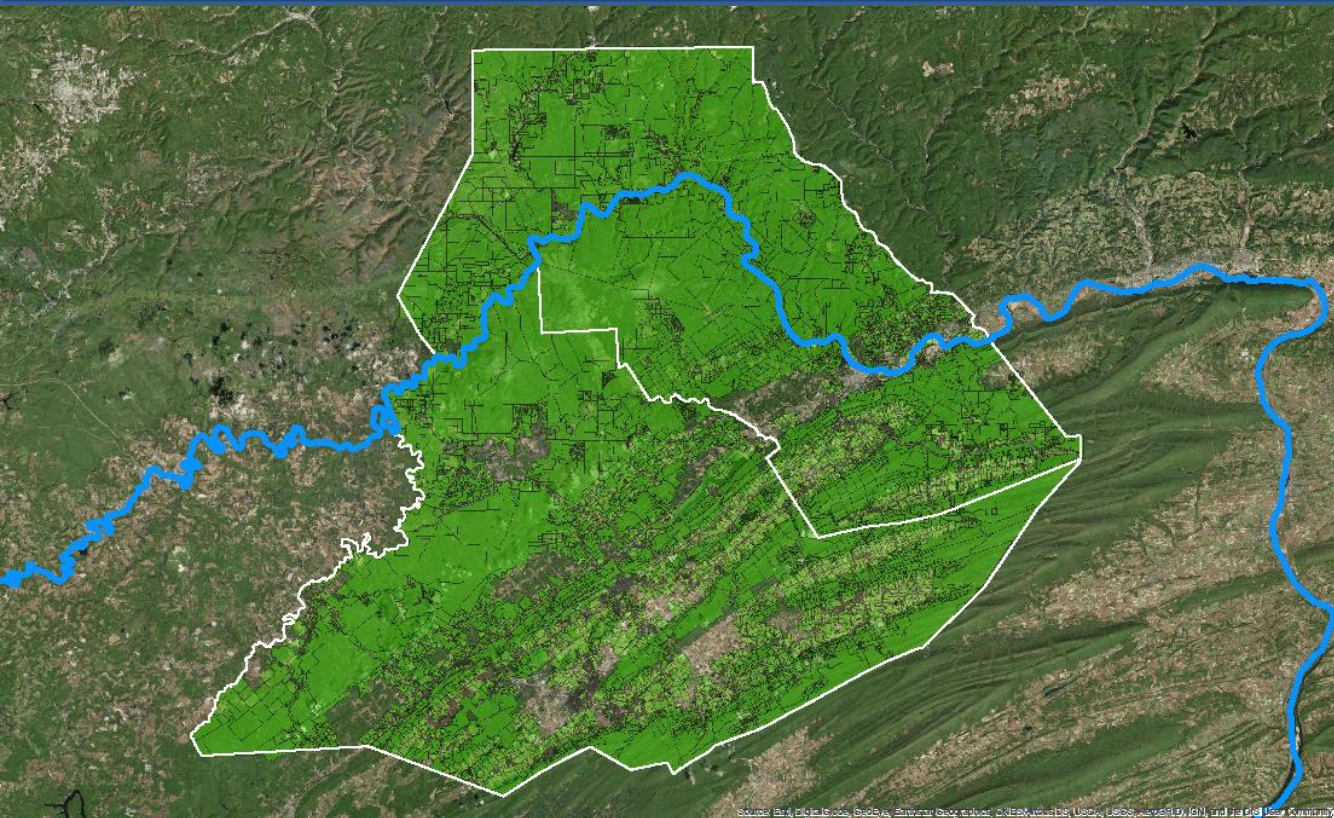


Achievements

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Partner priorities



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, AeroGRID, IGN, and the GIS User Community



Lyle Sherwin, USFWS

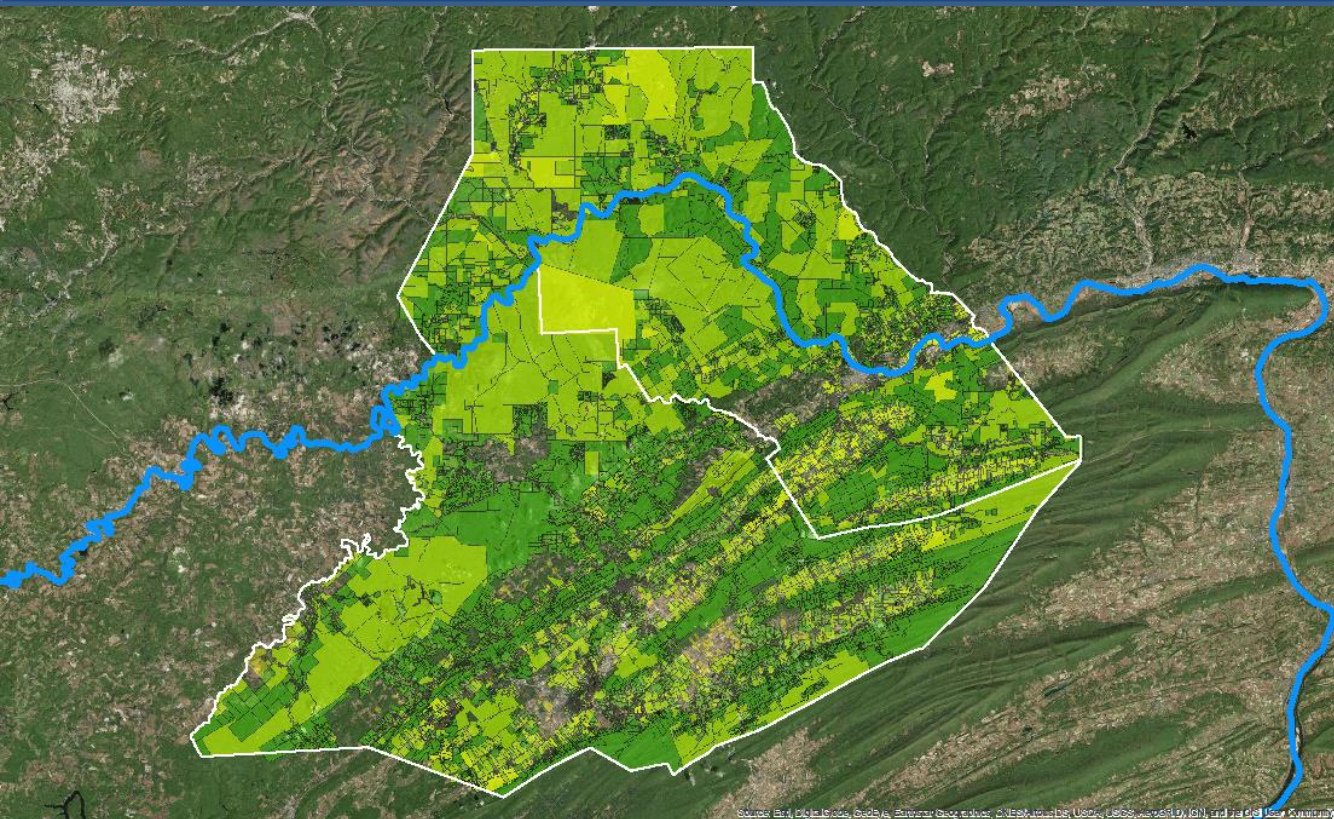


Adam Smith, USFWS



Phil Thomas, TU

Partner priorities



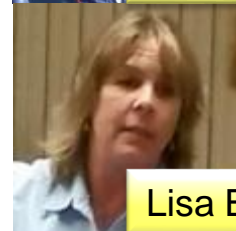
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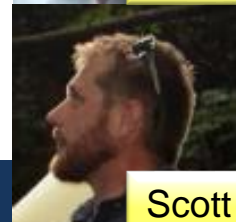
Frank Rohrer, CBF



Jason Fellon, DEP

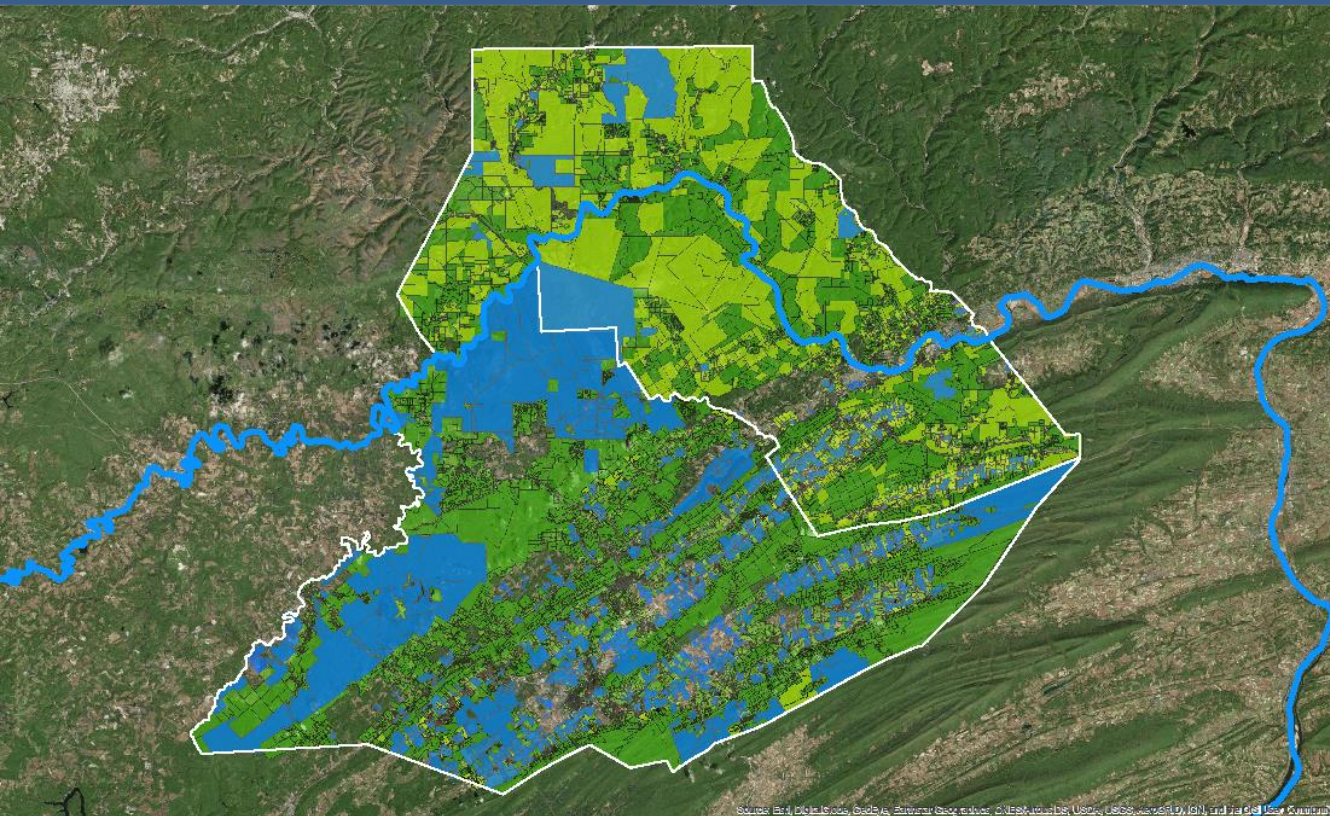


Lisa Blazure, Centre CD



Scott Koser, Centre CD

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Andrea Ferich, PVCA



Colleen DeLong, CWC



Tim Cole, DCNR



Lin Greenaway, DCNR

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<ul style="list-style-type: none">Identified 268 high priority parcels on which to focus collaborative efforts	<ul style="list-style-type: none">To determine cost effectiveness, consider the human dimensions, including collaboration among partners and working on large projects with a single landowner.

RESTORATION REPORTS

Precision conservation for your property

Restoration Reports details specific locations on your land where you can install best management practices.

Parcel ID: No ID available
In the Spring Creek watershed

Restoration on your Property

This report identifies locations on your property where restoration could be most effective. The highest restoration priorities are areas next to streams without trees, shrubs, or wetlands. We suggest planting riparian forest buffers in these areas to filter water before it enters a stream. If there are no streams on your property, planting native trees and shrubs can provide many of the same benefits described in this Restoration Report because rainwater that falls onto your property ends up in nearby streams.

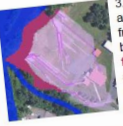
Example: Identifying restoration areas



1. Land cover includes: forests, shrubs, and wetlands; impervious surfaces (structures, driveways, and roads); low vegetation (lawns, farm fields); and barren (exposed dirt). **Low vegetation and barren are most readily restorable.**



2. We focus on flow paths, or where rainwater accumulates and travels downslope before a stream is formed and continues as the stream itself.



3. Areas along flow paths that are restorable can filter water from upstream drainage areas before it enters a stream. These flow path restoration areas are the highest priority for riparian forest buffer restoration.

Acres of land cover within your parcel					Most readily restorable		Total acres
Tree canopy	Canopy over impervious	Shrub or wetland	Water	Impervious	Low vegetation	Bare	
51.95	0.47	0	1.20	2.48	229.57	0	285.67
					7.42		

Restorable land within a 35 ft. distance of flow paths intersecting your parcel are called **Flow Path Restoration Areas**



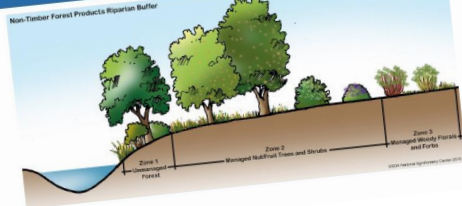
The 7.42 acres of flow path restoration area intersecting your property have a total drainage area of 256.68 acres from your property and your neighbors' property, including 0 acres of bare earth, 8.06 acres of impervious surface, and 212.30 acres of low vegetation.

Riparian Forest Buffers

Riparian forest buffers are the strips or multiple-row plantings of trees, shrubs, and grasses along waterways.

Typical trees: black willow, redbud, silver maple

Typical shrubs: serviceberry, mountain laurel, rosebay rhododendron



Species

Plants or animals that may harm your property, or human health.

Damage crops, livestock, etc.

Prevent unwanted invasive species from entering your land.

Products

Fertilizers, pesticides, nuts, and other products that may harm plants or animals in a forest buffer.



Woody florals

Use fencing with caution to prevent erosion.

Minimize fertilizer use and leaching into the stream.

Use mulch to reduce erosion and improve soil health.

Use native plants to improve habitat.

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RESTORATION REPORTS

Precision conservation for your property

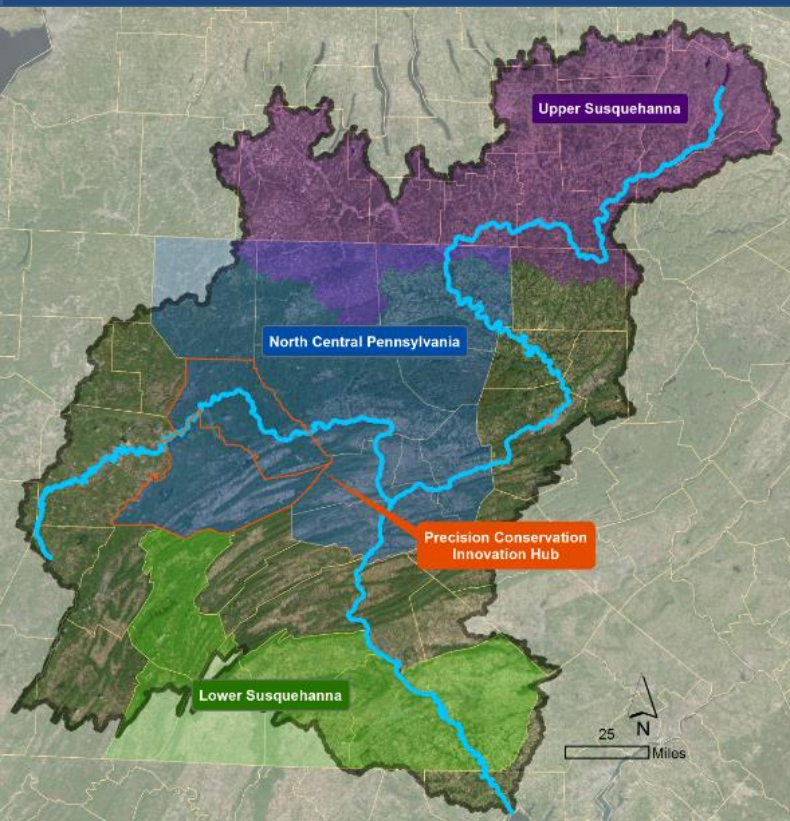


Achievements

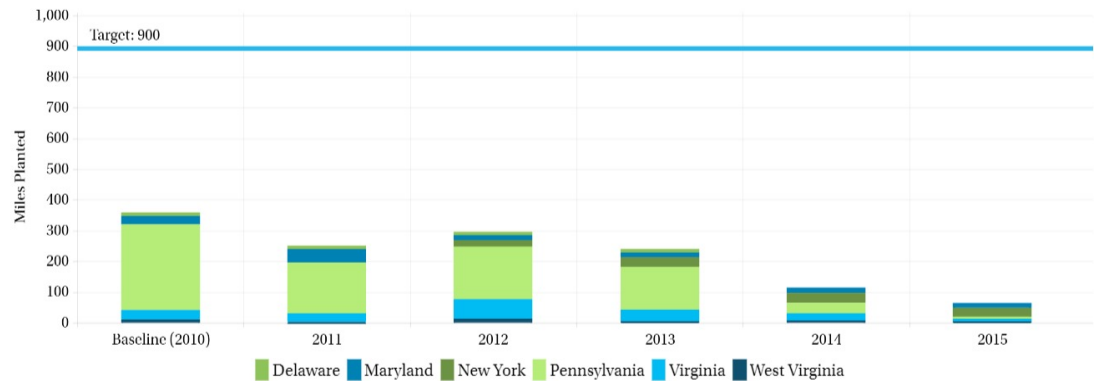
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<ul style="list-style-type: none">Created a web-based tool to communicate restoration to partners and landowners	<ul style="list-style-type: none">Identify and address the community's pinch pointsCommunity takes ownership of the process

Scaling up



Forest Buffers Planted (Annually) (2010-2015)



Thank you to our supporters: The Richard King Mellon Fndn, The Fndn For Pennsylvania Watersheds, Charles B. Degenstein Fndn, North Atlantic Landscape Conservation Cooperative through an agreement with the Wildlife Management Institute and the US Fish and Wildlife Service, York County Community Foundation, Bancroft Foundation, Richard King Mellon Foundation, Kinsley Foundation

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