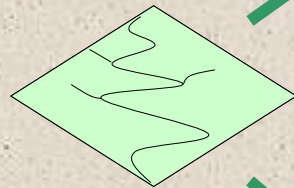


Smart Conservation

- ◆ Original Purpose → Evolution of Purpose
- ◆ Overview of Program Structure

*Ecoregional Surface
Prioritization Maps*



*Ecoregional
Green Infrastructure*



*Web-based
Site Assessment &
Prioritization Tool*



Smart Conservation Components

1. **Ecoregional Surface Mapping Prioritizations**
2. **Ecoregional Ecological Infrastructure & Greenways**
3. **Site to site web-based assessment & prioritization tool, including:**
 - a. **Preliminary assessment (Ph 1)**
 - b. **Detailed assessment (Ph 2)**

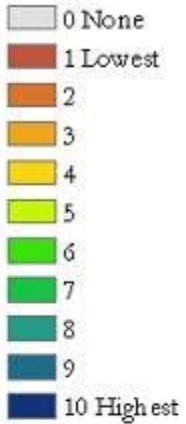


- ONE -

SmartConservation mapping prioritizations

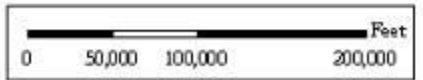
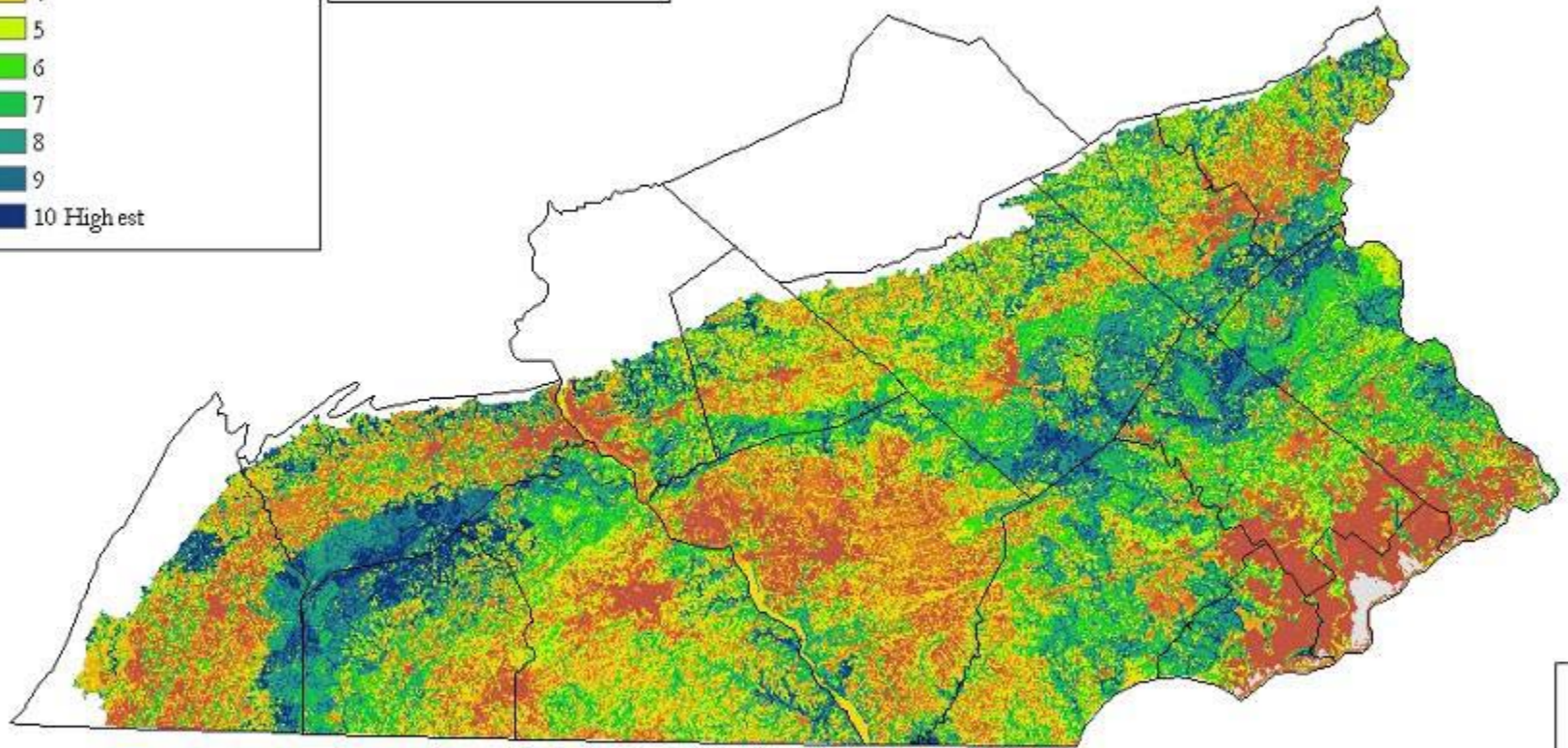


Vertebrates Sub-Group



Conservation Resources Mapped

Vertebrates:
Herps Conservation Value
Fish Conservation Value
Mammals Conservation Value
Birds Conservation Value
Important Bird Areas



SmartConservation™
Expanded Piedmont Ecoregion

Animal Habitat Subgroup

Completed by: CCR

Date: 05/31/01

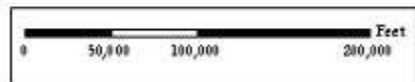
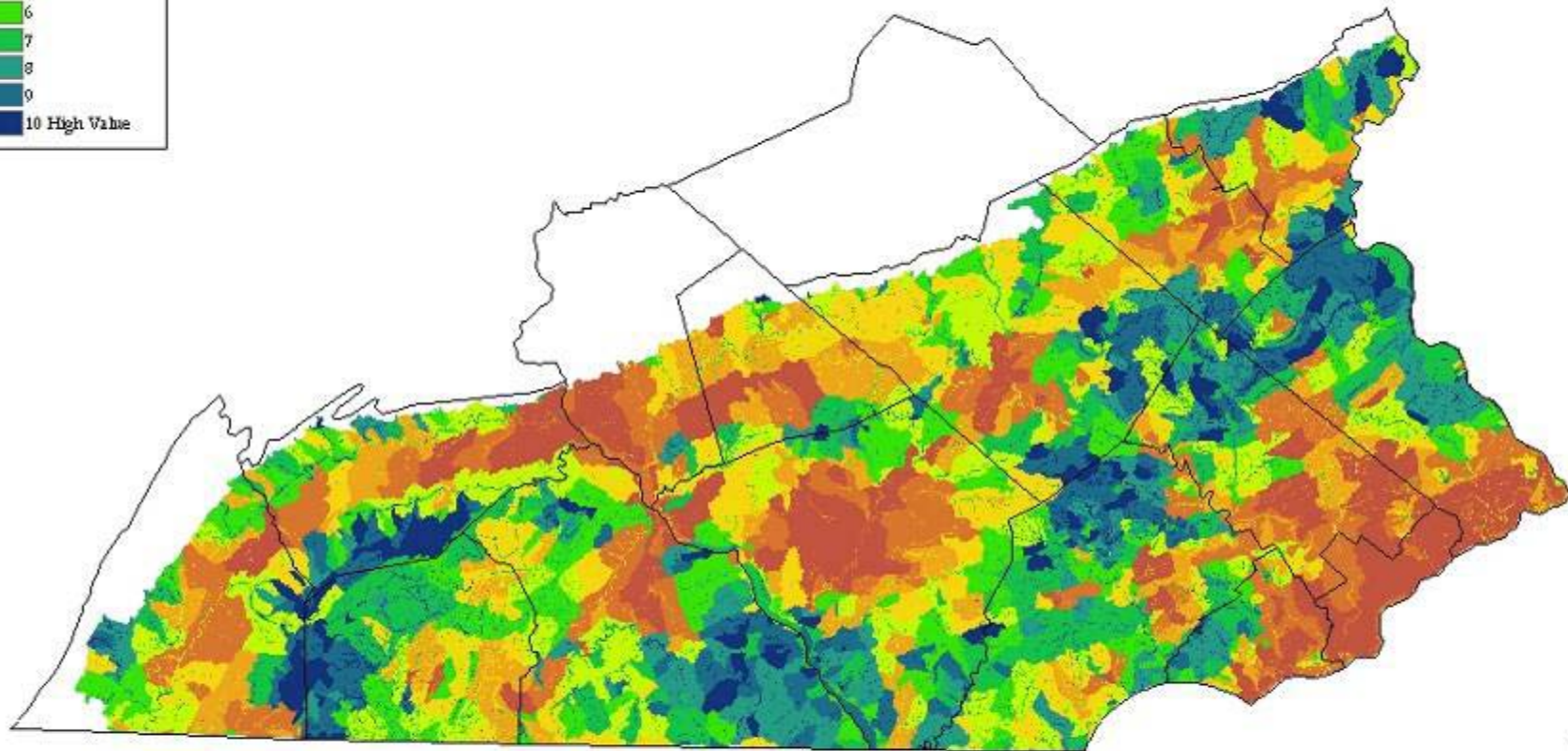
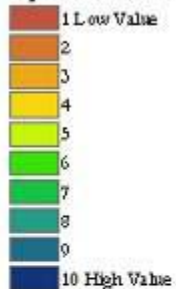
NOTES:

1. This map is a general overview of the region and should not be used for detailed planning or management.
2. Values are based on the SmartConservation™ Value and are not meant to be used as a basis for conservation planning or management.



Natural Lands Trust
11445 E. 1st
10011 Clifton Road
Atlanta, GA 30329
404.753.1327
www.natlndstrust.org

Aquatic Resources



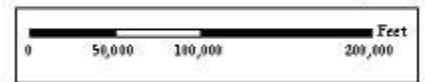
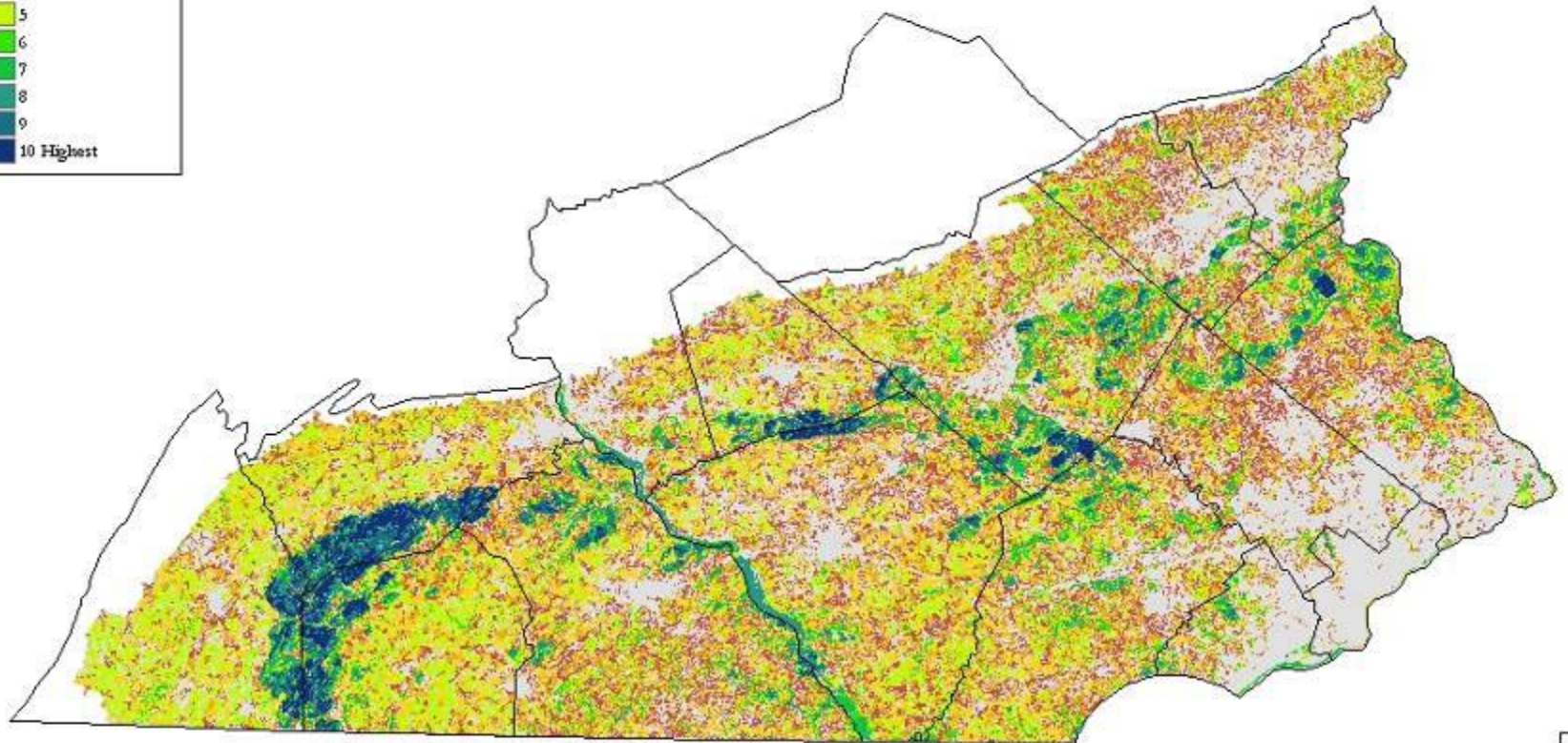
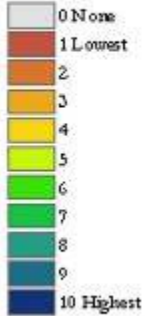
SmartConservation™
Expanded Piedmont Ecoregion

Aquatic Resources Subgroup

Compiled by: DCR
Date: 02/04/04
A group of watersheds located along the upper and middle
reaches of the Roanoke River.
D. Pamphlet, State Park, 1991, Piedmont River Quality
Assessment Program, 8 pages. DCR, 2004. Pamphlet
Order and Information Center. 800-288-8888.
Based on State Department of Conservation and
Natural Resources data.

Natural Lands Trust
1001 Pittman Hill Road
Auburn, TN 38823
615-753-3327
www.naturalands.org

Terrestrial Resources



SmartConservation™
Expanded Piedmont Ecoregion

Terrestrial Resources Subgroup

Compiled by: DCR
NCEM

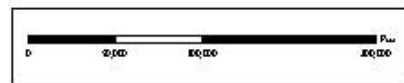
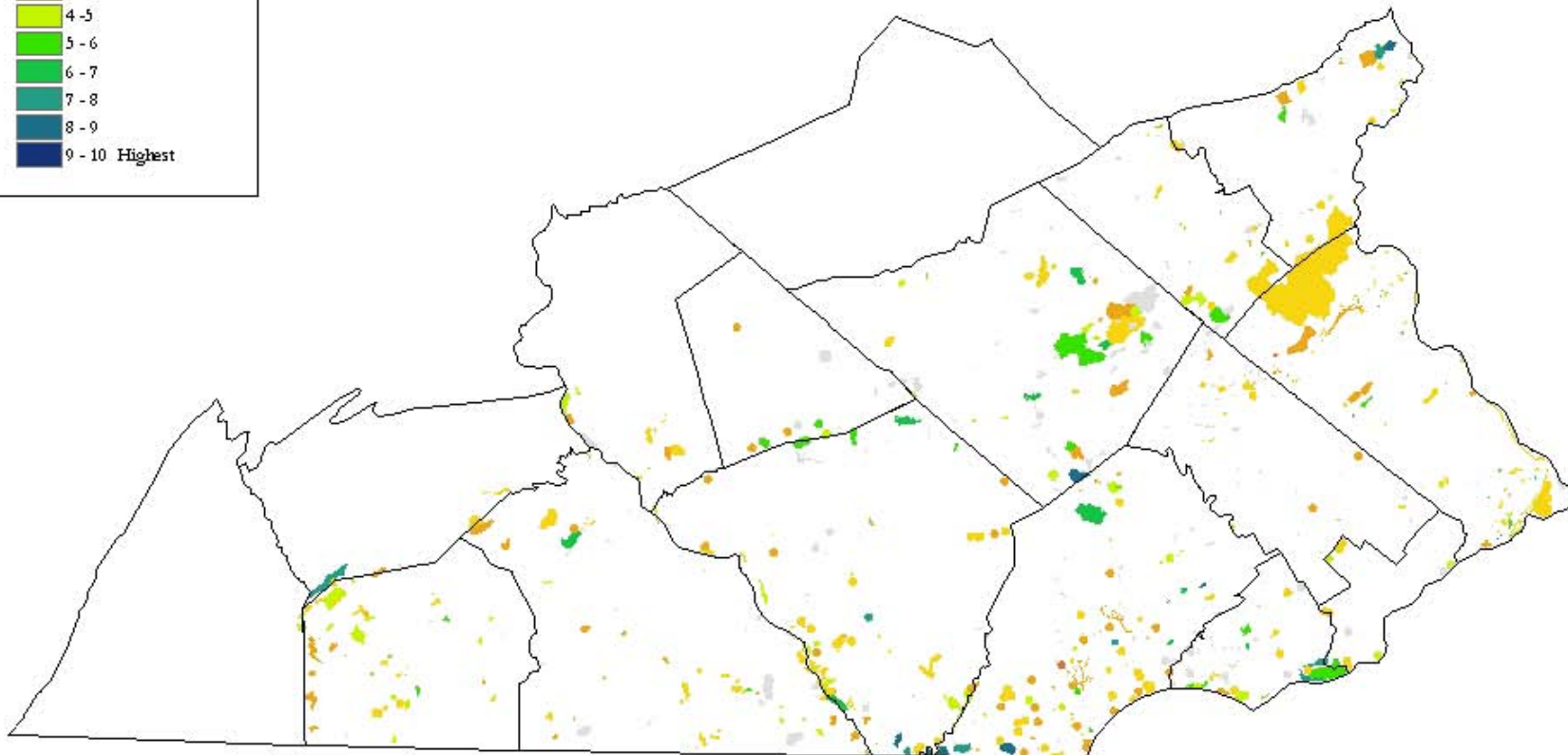
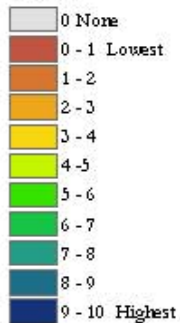
Date: 02/05/06

This map has been prepared through a partnership between the Virginia Department of Conservation and Forestry, Virginia Wildlife, Ducks, Geese and Cranes, and the Virginia Department of Transportation. It is a product of the Smart Conservation program and is intended for informational purposes only.



Natural Lands Trust
Hobby Farm
1031 Folsom Hill Road
Rocks, PA 17083
610-955-5127
www.natlant.org

FNDI



SmartConservation™
Expanded Piedmont Ecoregion

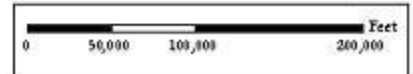
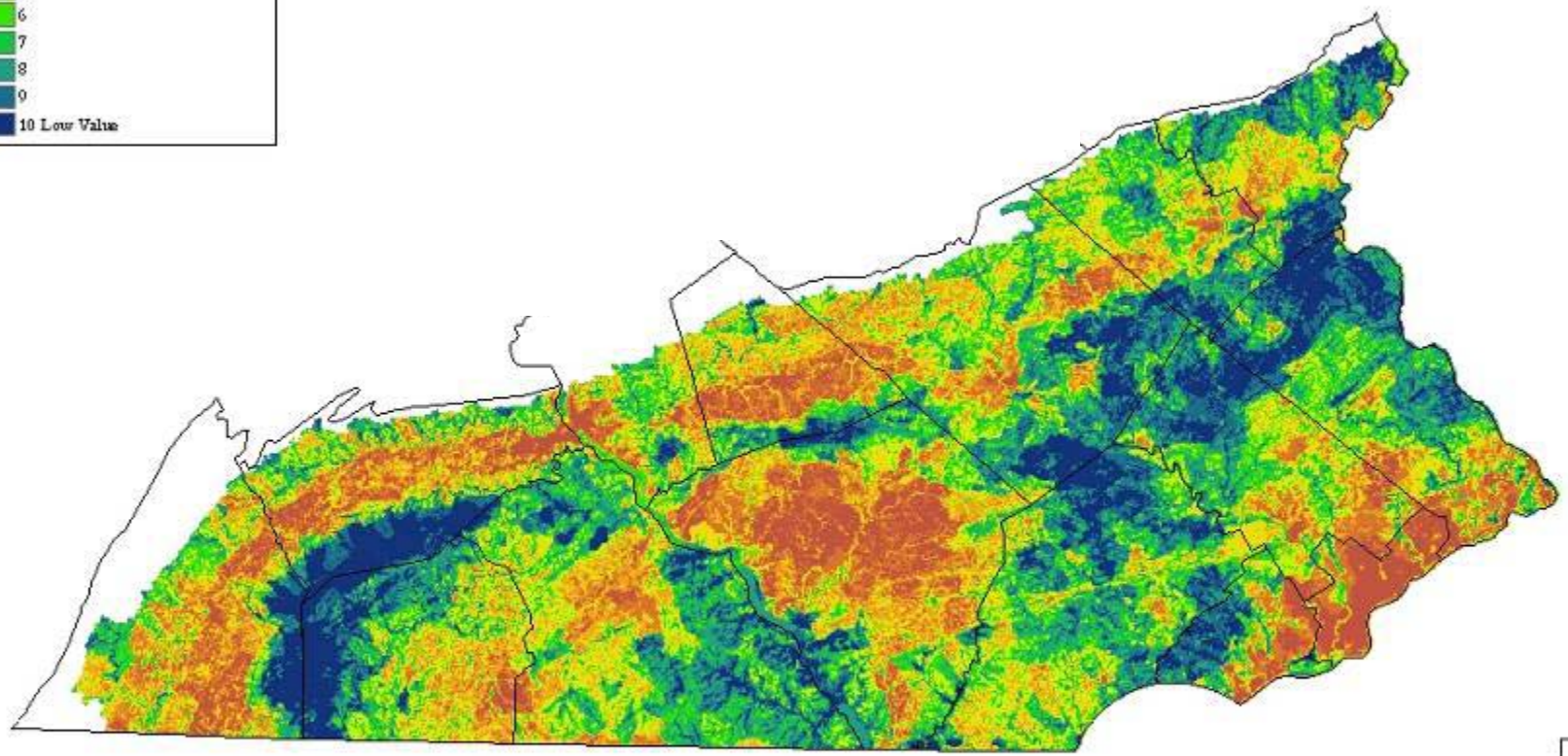
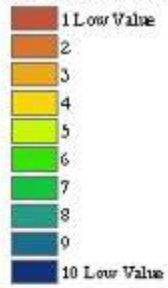
Rarity
(CNAI - 2002)

Compiled by: DCR
Date: 04/07/03
NOTES:
1. Camp boundaries derived from Google Earth and DoD
2. No warranty is made, expressed or implied, for the
use of this data for purposes not intended by the
Natural Lands Trust.



Natural Lands Trust
Hiding Farm
1031 Flanders Hill Road
Falls, VA 22033
610-313-1307
www.natl.org

Interim Conservation Resources



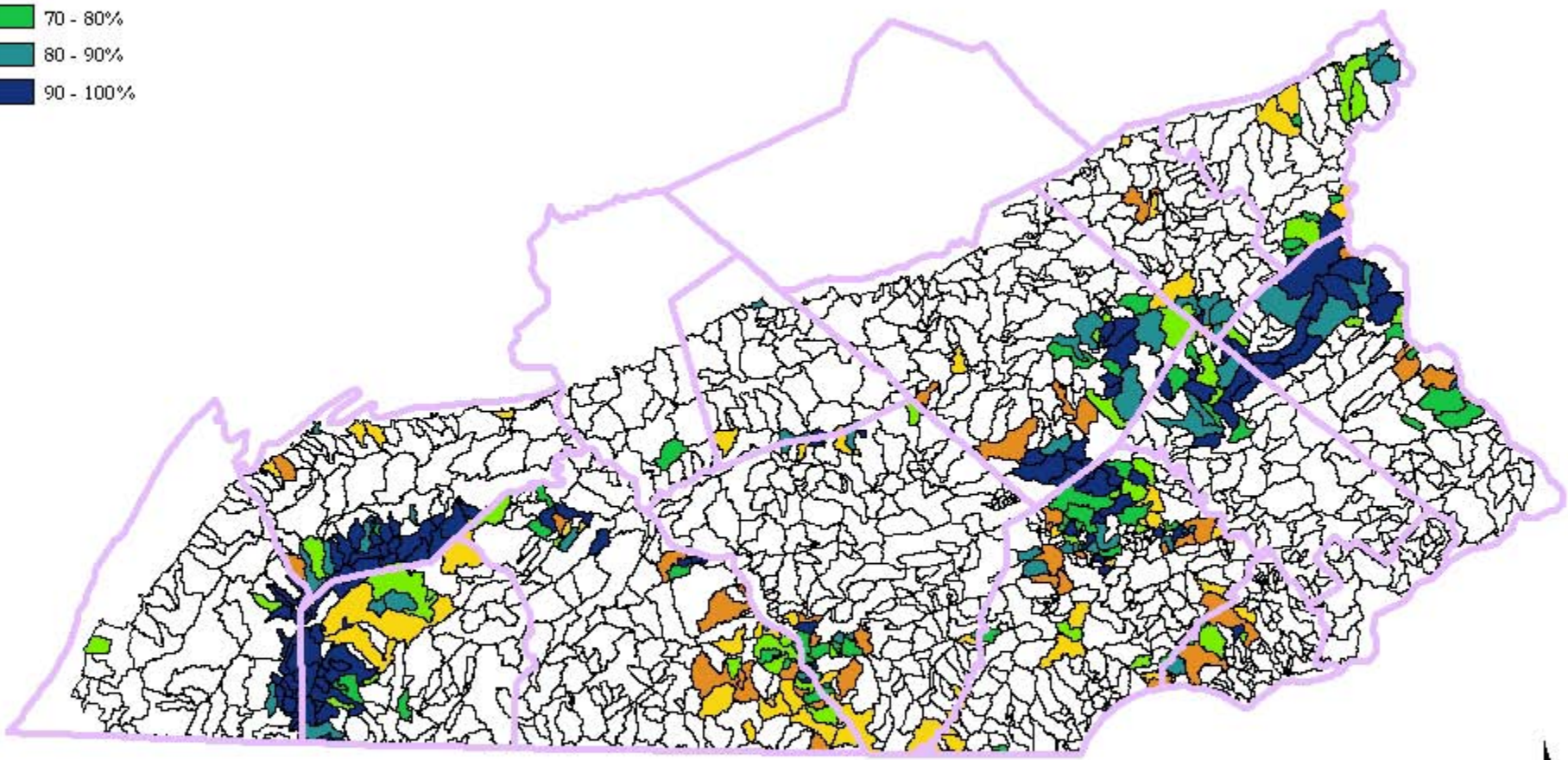
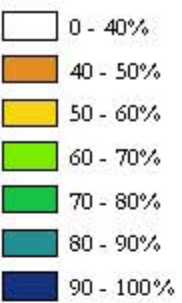
SmartConservation™
Expanded Piedmont Ecoregion

Composite Conservation Resources

Compiled by: CCRK Date: 01/08/09
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Natural Lands Trust
Hobby Farm
10311 Strickland Road
Aubrey, TX 75009
610-755-1277
www.naturalands.org

Watershed Priorities (Top 20% SC Resources by PA Small Watershed - 40-100% Cover)

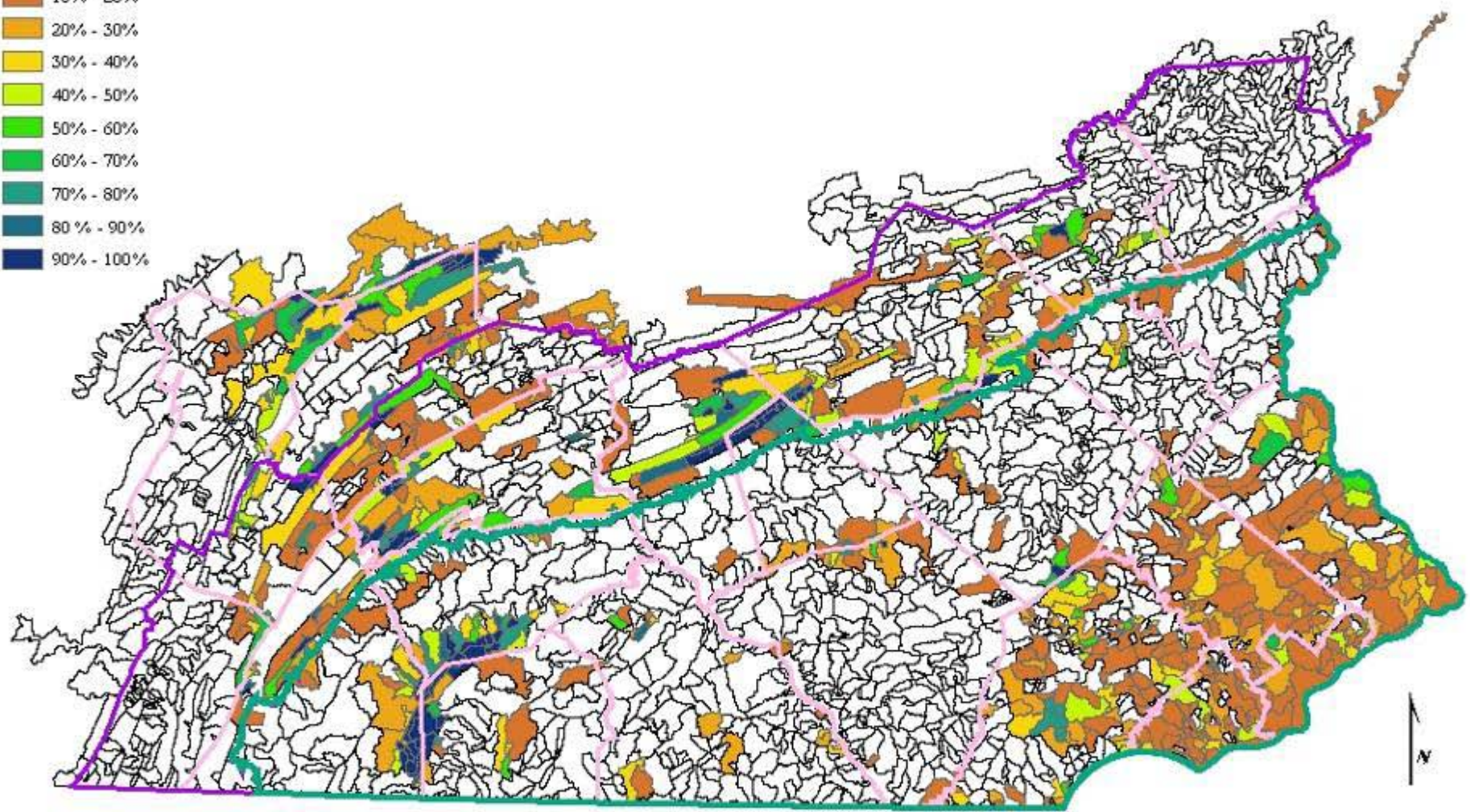


NLT Expanded Piedmont Ecoregion

Central Apps Ecoregion (portion of)

Percent Protected Land Within Watersheds

- 0 - 10%
- 10% - 20%
- 20% - 30%
- 30% - 40%
- 40% - 50%
- 50% - 60%
- 60% - 70%
- 70% - 80%
- 80% - 90%
- 90% - 100%



SmartConservation
Expanded Piedmont Ecoregion

Protection Status of Watersheds

Compiled by: CLB Date: 10.14.04
Notes:

Natural Lands Trust
Hobby Farm
1000 Pittman Park Road
Reno, NV 89503
616-755-5207
www.naturalands.org



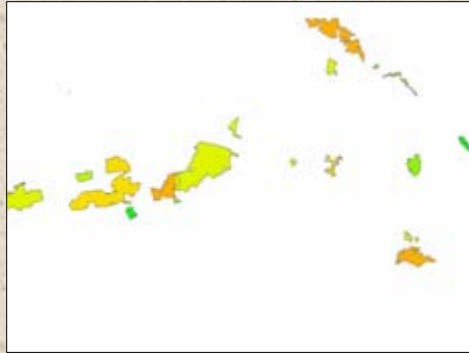


Smart Conservation

**Ecoregional
Ecological Infrastructure
Greenways**



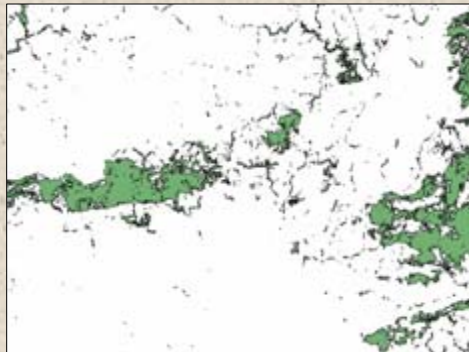
Creating Nodes



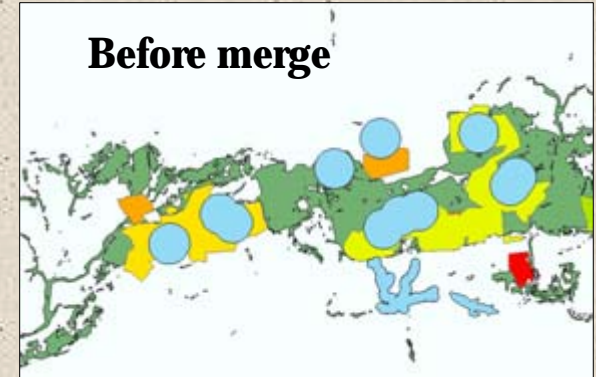
**Protected
Lands**



Rarity



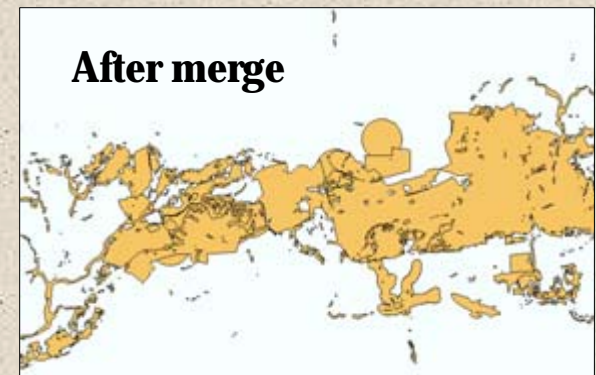
**Best Regional
Cons. Resources**



Before merge

merge

**Merged Nodes
RANKED 0-10**



After merge

Barrier Type & Density

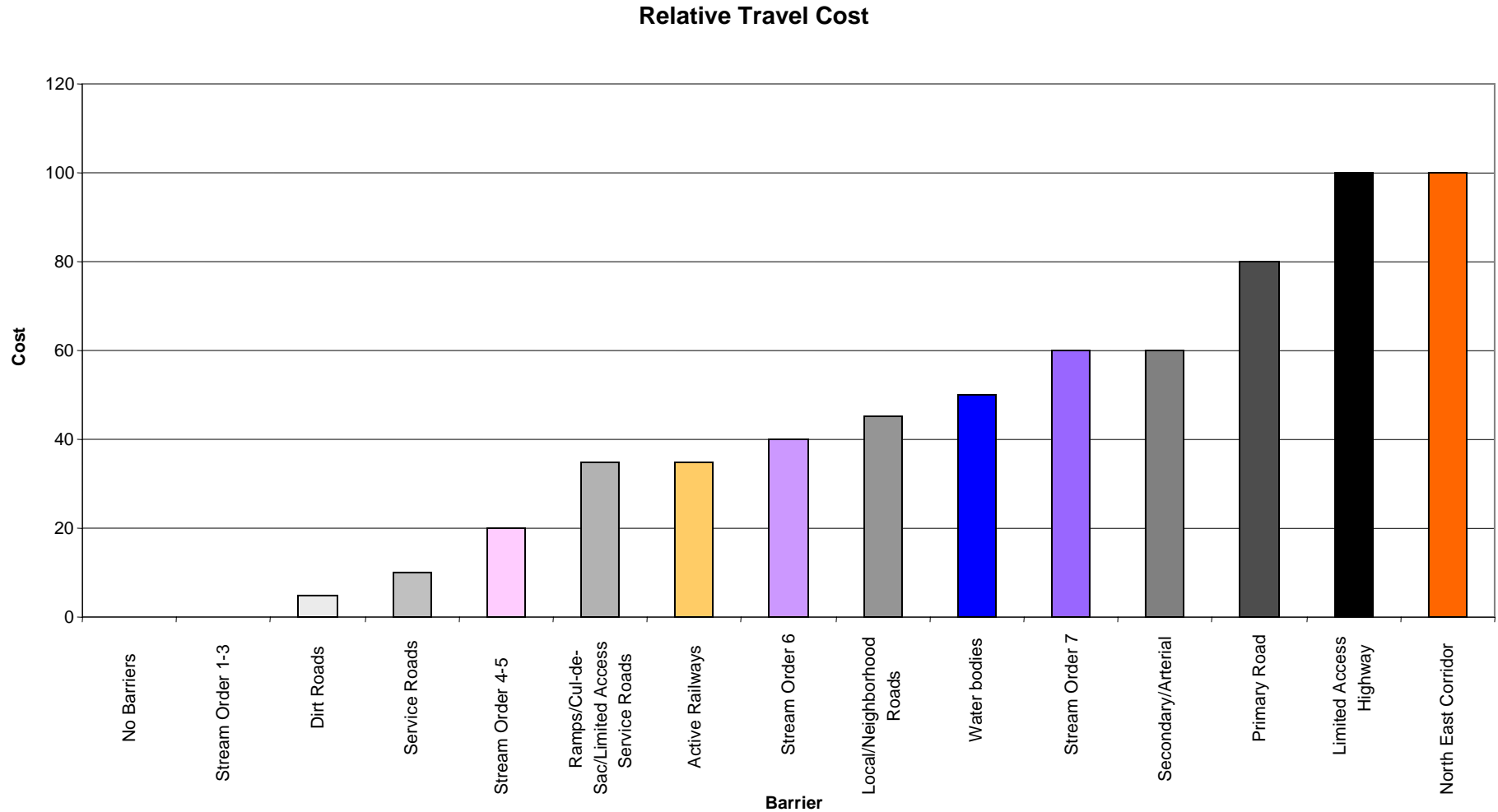
1. Roads
2. Active Railways
3. Streams
4. Waterbodies

**Barrier Type and Density
each contributes 50% towards the
Barrier Cost Surface**

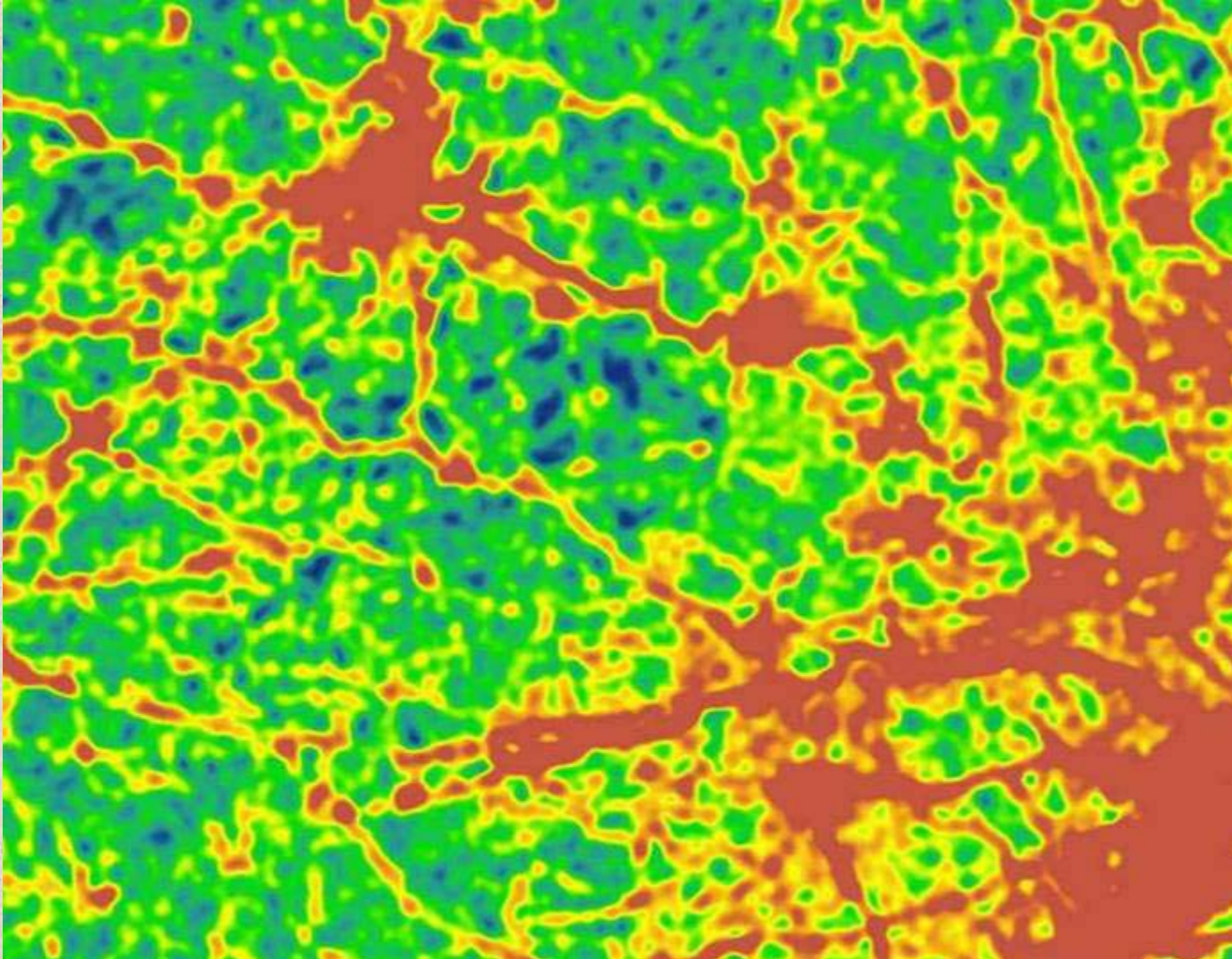


Travel Cost (Barriers)

by Type & Class



Barrier Density



Barrier Density
calculation
with 1,000m
Smoothing

(note that each of
the corridor
hierarchies uses
the corresponding
density barrier
layer:

e.g. 1000-acre nodes
analysis uses 1000m
density, 500-acre node
analysis uses 500m
barrier density, etc.)



So Far, So Good... But The Real Work is

Greenway Corridor

Development

- ◆ How can we connect the nodes?
Where are the corridors?
- ◆ How do we find and use the
Highest Conservation Values,
Lowest Barrier Values &
Attraction of Nodes?

**Best Corridor
Routes**

=

Barriers

-

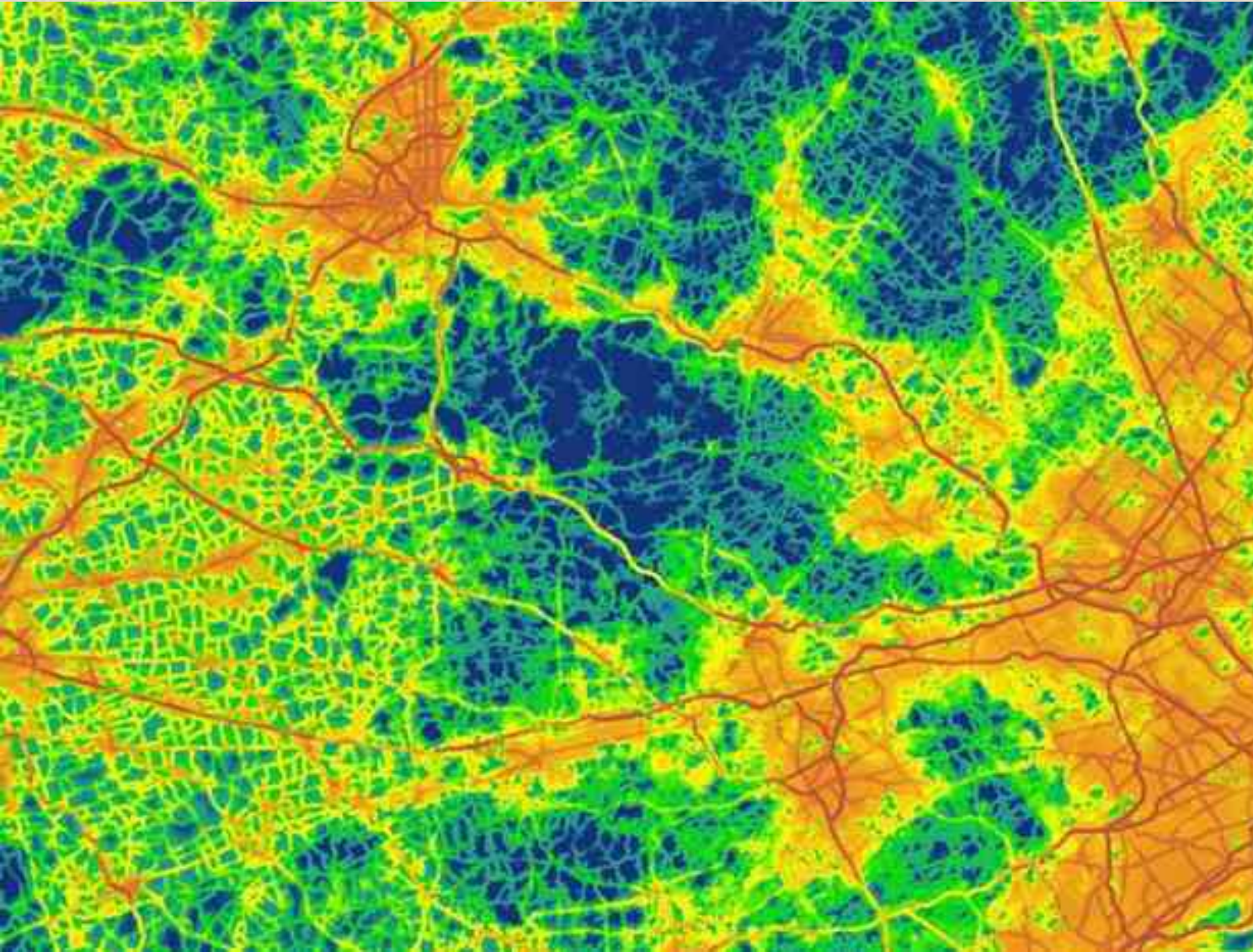
**(Conservation
Value**

+

**Node
Proximity**

)

Modified Cost Surface



Modify
the cost surface by
taking the maximum
value across
10 cells (1000-ft)
(NeighborhoodMax)
- so values
across the entire
RECOMMENDED
corridor width
are used to establish
the Least Cost Path
- not just the value
of one cell (100-ft)

—

SNOW PLOUGH
VS
SNOW SHOVEL

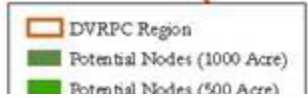
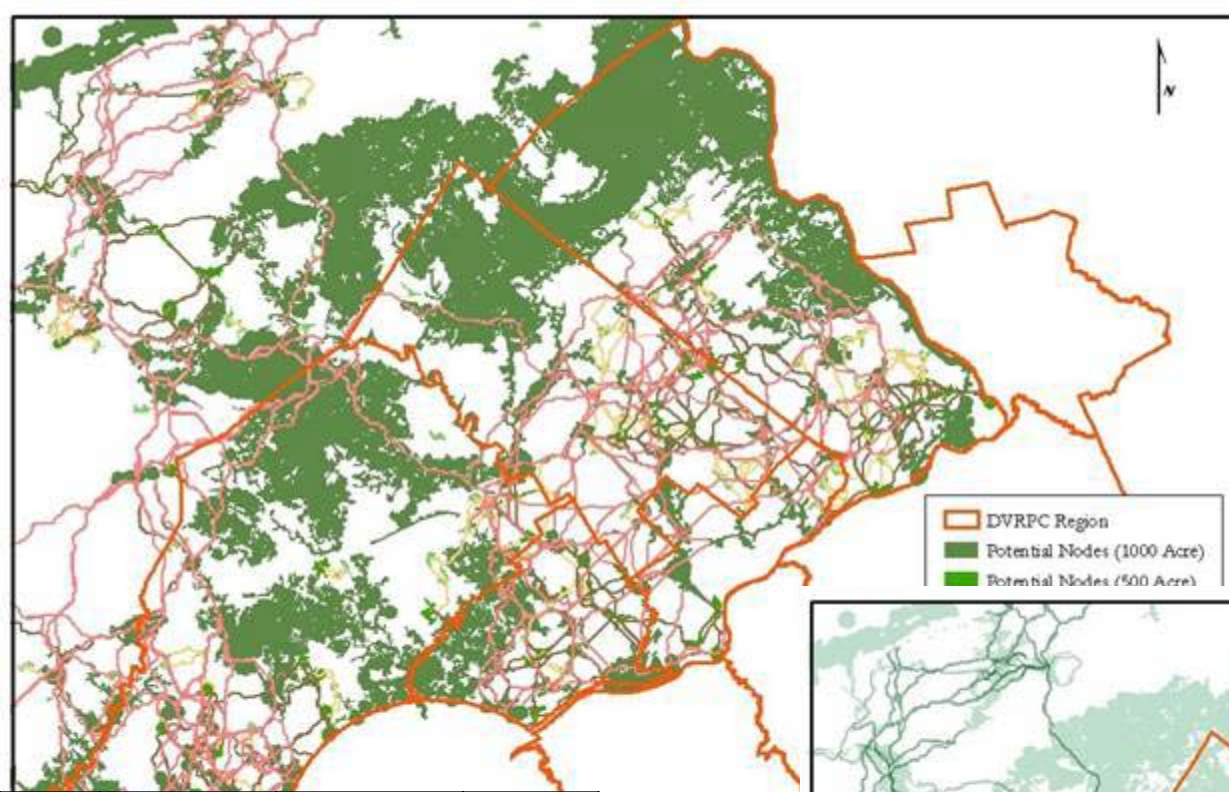


Regional Ecological Corridor Network

Concept - Corridor Network Hierarchy

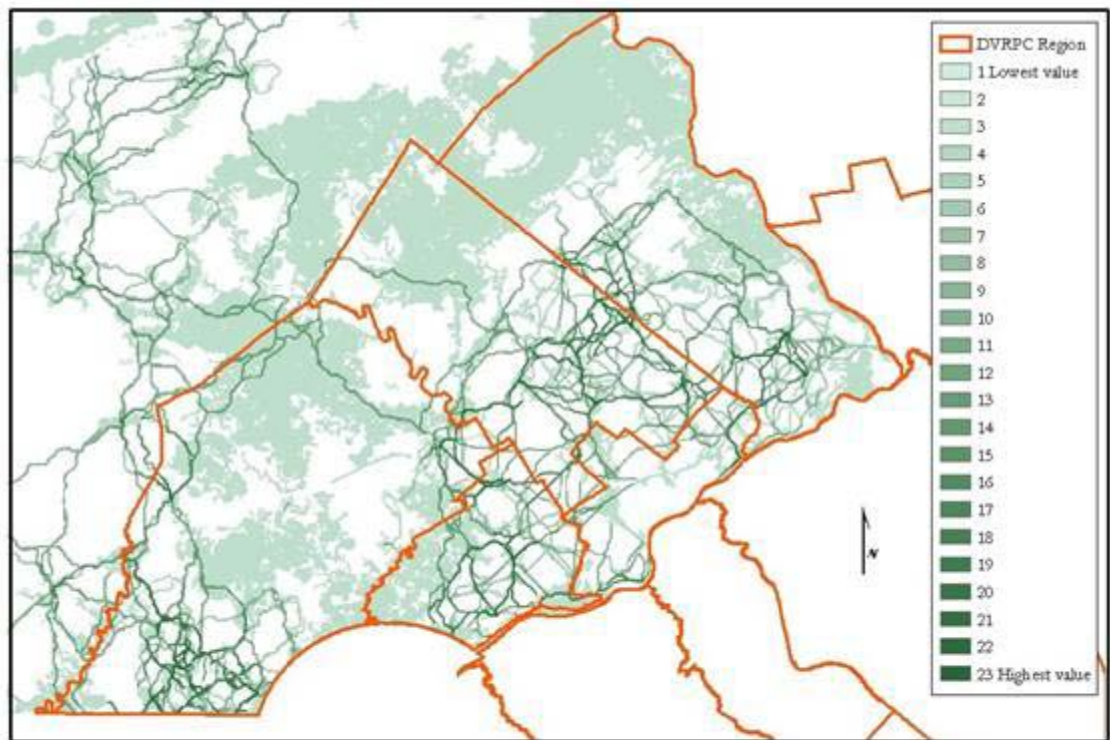
Establish corridors between connecting nodes of various sizes.

Network Hierarchy	Node Size	Search Radius/ Analysis Zone
Regional	>1000 acres	20 miles
Sub-Regional	>500 acres	8 miles
Local	>250 acres	4 miles



	Corridors	Cost Corridors	Nodes
0			
1			250a
2		250a	500a
3		500a	1000a
4	250a		
5		1000a	
6	500a		
7			
8			
9			
10	1000a		

Ecological Green Infrastructure
Preliminary NLT Recommendations



Regional Ecological Corridor Network

Enhancements - Manual Upgrades & Refinements

1. Restoration Corridors

sited where gaps in automated network considered too large biologically

2. Aquatic Corridors

3. Substitution Recommendations - Potential Barrier Crossings

4. Prioritizing Nodes & Corridors

e.g.



Least critical

Most critical

nodes

broadest cost corridor

narrowest cost corridors

corridors w/1000ft buffer only

5. Rank Corridors

- i. By number of times corridor selected between different nodes
- ii. By corridor value

6. 'Edge Effects' of analysis need to be acknowledged

SmartConservation

Site-to-Site Assessments & Prioritizations

as well as data distribution/housing

“SmartConserver”





Step 1: Define Site Boundary

To define the boundary of your site, follow these steps:

1. Enter a County as a starting point.
2. Select a municipality from the map.
3. Using the next map that follows, find the area in which you are interested. Several map layers are provided as context - these can be turned on and off with the 'Change Layers' button.
4. Draw the site polygon.
5. Close and Save the polygon.
6. Proceed to the next steps (defining a site name)

- Logout
- Start New Site Assessment
- Update Existing Site
- Search Other Site Results
- Help
- Administer Users
 - View All Users
 - E-Mail All Users
 - Grant User Access
 - Revoke User Access
 - Add a New User
 - Update an Existing User
 - View User Activity
 - View Site Activity
- About Smart Conservation
- Software Utilities

Version 0.96 5/8/2003

i Note: Data that you enter is stored in a centralized server located at PASDA. You may log out of any session and return at a later date without risk of losing your data.

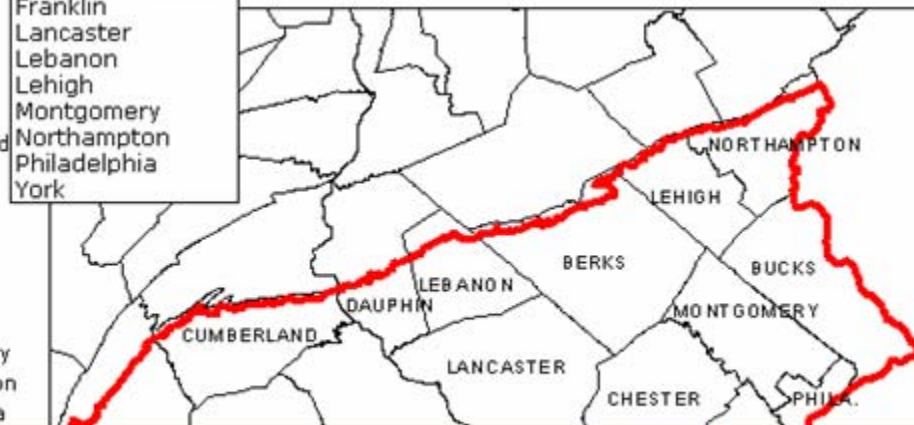
i [*] indicates required information

* Site Name:	<input type="text" value="Site Name for Testing"/>
* County:	-- Select One --

Locating the Site

Note: While several of the counties are currently only available for the entire Commonwealth of Pennsylvania, the model is currently only available for the following counties:

- Adams
- Bucks
- Berks
- Chester
- Cumberland
- Dauphin
- Delaware
- Franklin
- Lancaster
- Lebanon
- Lehigh
- Montgomery
- Northampton
- Philadelphia



Define a Site Boundary - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address <http://cegis4.cas.psu.edu/scm/scmSiteDefineBoundary2.asp?Cmd=zoomIn&MinX=475107.4155606958&MinY=4483898.3185059428&MaxX=481802.134825318768&MaxY=4441>

- Project Boundary
- Municipalities
- Counties
- ~ Stream Network
- HUC-8 Watersheds
- USGS Quad Maps

LOWER MERION GOSHAM HAYCOCK

SPRINGFIELD BUCKS NOCKMIRON

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Change Layers

Smart Conservation is being hosted by Pennsylvania Spatial Data Access (PASDA), the official geospatial data clearinghouse for the Commonwealth of Pennsylvania. PASDA is a collaborative effort of the Pennsylvania Department of Environmental Protection and the Pennsylvania State University with funding provided by PADEP.

The Smart Conservation Model was developed by Natural Lands Trust with advice from the Southeast Pennsylvania conservation community and additional funding from:
 PA Dept. of Conservation and Natural Resources, William Penn Foundation, and PA Dept. of Environmental Protection
 Copyright Notice: ©1999-2003 Natural Lands Trust. All rights reserved.



Smart Conservation Site Definition - Change Layers - Microsoft Internet Explorer

Cancel Apply Changes

Layer Name		Show
USGS Quad Maps		<input checked="" type="checkbox"/>
Orthophotography (1999)		<input type="checkbox"/>
MRLC Land Cover (1992)		<input type="checkbox"/>
Conservation Value - Birds		<input type="checkbox"/>
Conservation Value - Fish		<input type="checkbox"/>
Conservation Value - Herps		<input type="checkbox"/>
Conservation Value - Mammals		<input type="checkbox"/>
Interior Forest Habitat		<input type="checkbox"/>
Threats - 5 County only		<input type="checkbox"/>
HUC-8 Watersheds		<input checked="" type="checkbox"/>
HUC-14 Watersheds		<input type="checkbox"/>
Stream Network		<input checked="" type="checkbox"/>
Counties		<input checked="" type="checkbox"/>
State Parks		<input type="checkbox"/>
State Forests		<input type="checkbox"/>
State Gamelands (1996)		<input type="checkbox"/>
National Wetland Inventory		<input type="checkbox"/>
Floodplains (1995)		<input type="checkbox"/>
Conservation Stewardship Lands (1998)		<input type="checkbox"/>
Active Railways		<input type="checkbox"/>
Inactive Railways		<input type="checkbox"/>
State Roads		<input type="checkbox"/>
Local Roads		<input type="checkbox"/>
Municipalities		<input checked="" type="checkbox"/>
Census Tracts		<input type="checkbox"/>
Zipcodes		<input type="checkbox"/>
State House Districts		<input type="checkbox"/>
State Senate Districts		<input type="checkbox"/>
Congressional Districts		<input type="checkbox"/>

Cancel Apply Changes

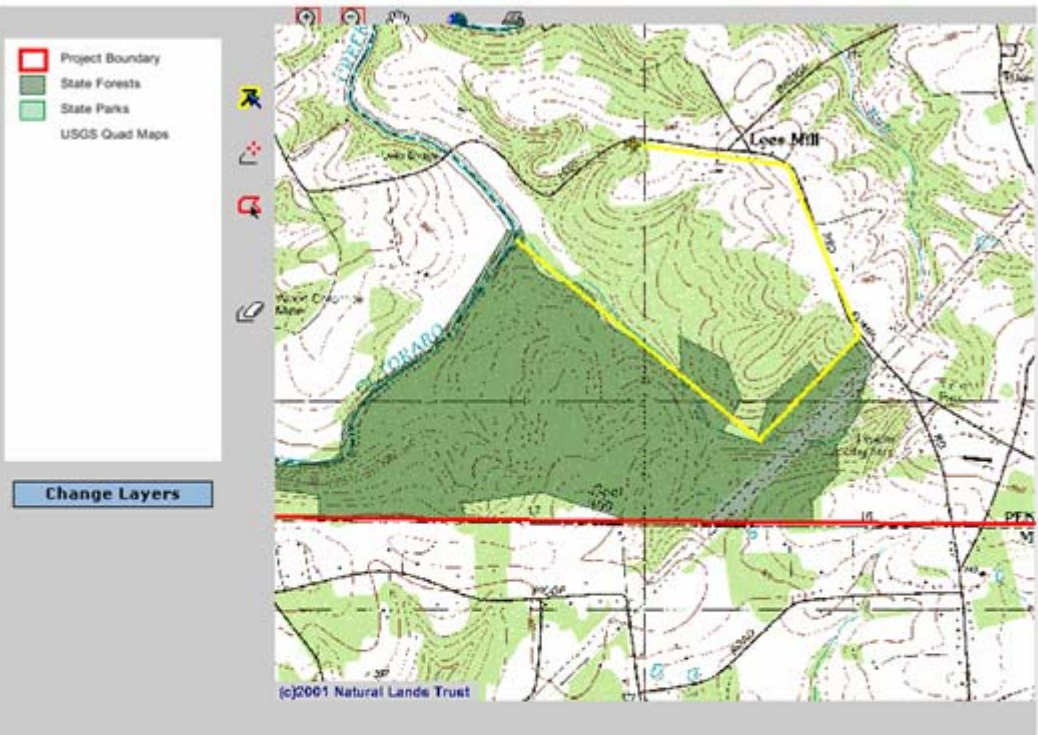
Not all layers will appear at all scales.

Define a Site Boundary - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites History Print

Address [gon_add_point&MinX=404558.3562807415&MinY=4396936.706114948&MaxX=408199.2540433805&MaxY=4400173.059681738&MapX=406378.8051620618&MapY=4398554.882898335](#) Go Links



Project Boundary
State Forests
State Parks
USGS Quad Maps

Change Layers

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*Draw
Boundary
Around Your
Site*

—










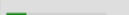













*Over the
Web !*

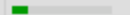






















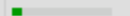

SmartConservation Phase 1 – Groundtruthing fieldwork – 1 day - \$1.5K per site

SmartConservation Phase 2 – Expert Groundtruthing fieldwork – \$15K per site

SmartConservation Lite – GIS analysis only – NO FIELDWORK – *coming soon!*

Review Model Weights & Scores

Model Component	Weight [1-100]		Score [1-10]
Mammals	15		4.496
Potential Habitat Size	17		0.010
Potential Habitat Shape	13		5.506
Special Habitat	13		7.000
Landscape Matrix	23.5		5.613
Interest Level	10		9.000
Potential Species Richness	13.5		2.764
Potential Conservation Value	10		2.764
Plants	20		5.472
Non-disturbance	17.2		7.777
Human	33.3		10.000
Invasive Plant	33.3		3.330
Deer	33.3		10.000
Community Diversity	10.3		10.000
Potential Habitat Size	12.1		0.010
Potential Habitat Shape	3.5		5.506
Landscape Matrix	8.6		3.109
Birds	15		2.164
Landscape Matrix	25		3.118
Potential Habitat Size	25		0.010
Potential Species Richness	25		2.764
Potential Conservation Value	25		2.764

Aquatics	15		4.321
Riparian Corridor Cover	10		5.165
1st and 2nd Order	62.5		4.692
3rd, 4th and 5th Order	31.25		7.143
6th+ Order	6.25		0.000
Riparian Corridor Fragmentation	10		3.464
1st and 2nd Order	62.5		2.552
3rd, 4th and 5th Order	31.25		5.981
6th+ Order	6.25		0.000
Watershed Land Use	8		3.677
Aquatic Community Health	9		10.000
Location of Site in Watershed	9		1.147
Potential Species Richness	9		2.764
Potential Conservation Value	9		2.764
Wetland Inventory	9		5.033
Floodplains	9		0.980
Forested Water Quality	9		8.222
Steep Slopes	9		4.243
Reptiles and Amphibians	10		2.764
Potential Species Richness	50		2.764
Potential Conservation Value	50		2.764
Landscape Ecology	10		5.000
Stewardship Land Distance	50		5.000
Stewardship Land Density	50		5.000
Rarity	15		0.000

Customization – COMING SOON!



Site Details

- Logout
- Start New Site Assessment
- Update Existing Site
 - Define Site Boundary
 - Define Site Properties
 - Enter Field Data
 - Plant Community Health
 - Adjust Land Cover Values
 - Aquatic Cmmnty. Health
 - Other Model Calculations
 - Set Model Weights
 - Assessment Results
- Search Other Site Results
- Help
- Administer Users
- About Smart Conservation™
- Additional Calculators

Version 1.40 10/9/2003

Note: You do not need to save. Data that you enter is automatically stored in a centralized server located at PASDA. You may log out of any session and return at a later date without risk of losing your data.

Site Properties	
Site ID:	45
Owner:	cбилетт@natlands.org (Clare Billett)
Organization:	BIG CHEESE, Natural Lands Trust
Name:	TEST0001
Area:	103.47 acres
Address:	
City:	NORTH COVENTRY
County:	CHESTER
State:	PA
Postal Code:	19464
Description:	KJHDFKJXCJVB.ZMXXNV
Final Score:	5.73 out of 10
Development Threat Evaluation:	1.00 out of 10
Start Date:	7/23/2003 9:37:22 AM
Last Update Date:	11/11/2003 5:43:45 PM
Final Score Date:	8/1/2003 1:47:57 PM
Map Gallery:	View Map Gallery
Site Shapefile:	Download Polygon as Shapefile



View Results



Search Other Site Results

To find other sites, fill out one or more of the following search options.

Note: All search options have an 'AND' relationship with each other, so, for example, if you fill out the Area and County items, you will be looking for all sites with that area AND in the selected County.

- Logout
- Start New Site Assessment
- Update Existing Site
- Search Other Site Results**
- Administer Users
 - View All Users
 - Grant User Access
 - Revoke User Access
 - Add a New User
 - Update an Existing User
 - View User Activity
 - View Site Activity
- About Smart Conservation

Version 0.21 1/7/2002

Search Options	Values
Dates:	<input type="text" value="mm/dd/yy"/> - <input type="text" value="mm/dd/yy"/>
Site Scores [0-10]:	<input type="text" value="5"/> - <input type="text" value="10"/>
Site Area:	<input type="text"/> Acres - <input type="text"/> Acres
Sites in County:	-- Select One --
Sites in Zipcode:	<input type="text"/>
Sites within:	<input type="text"/> Ft from Site # <input type="text"/>
Sites entered by:	<input type="text"/>

The Smart Conservation Model was developed by Natural Lands Trust with advice from the Southeast Pennsylvania conservation community and additional funding from: PA Dept. of Conservation and Natural Resources, William Penn Foundation, and PA Dept. of Environmental Protection
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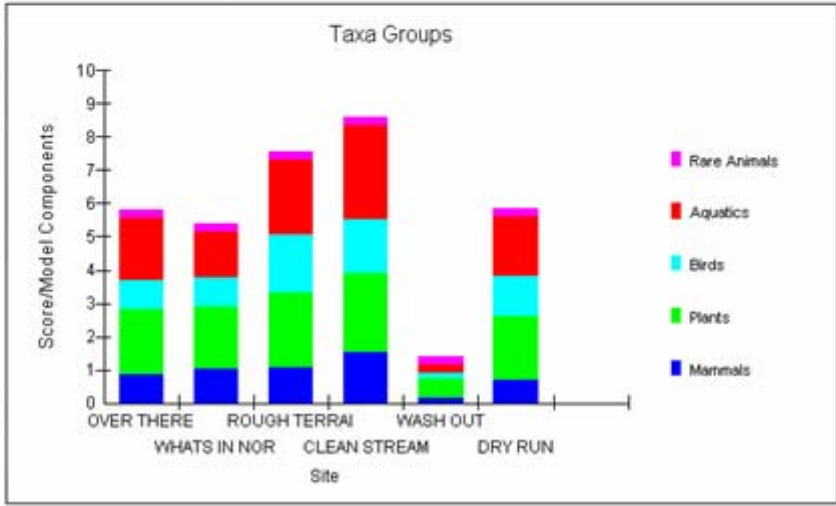
*Search Database
for other Sites to Compare*



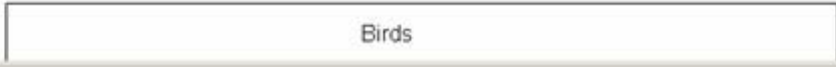
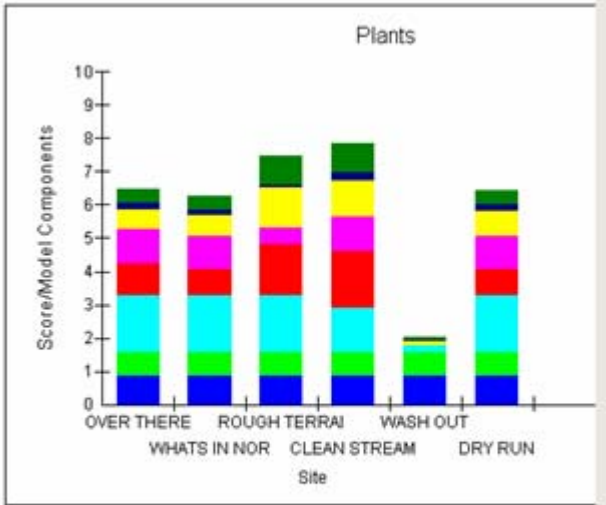
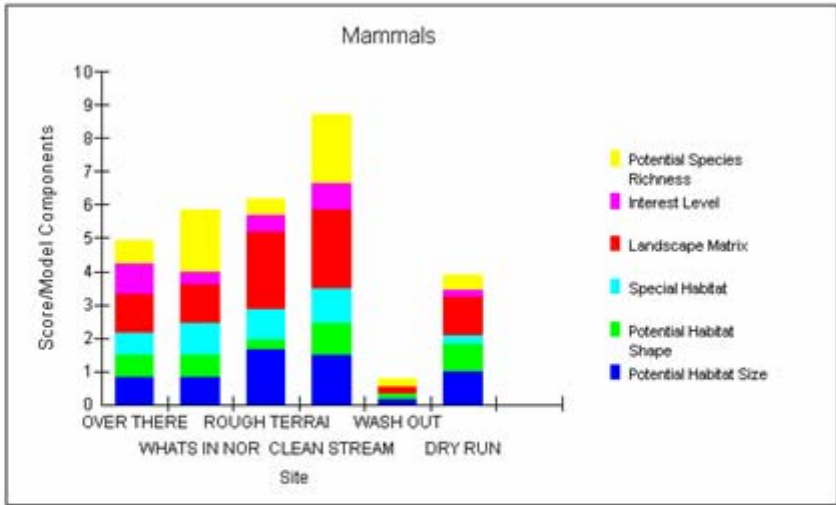
Site Comparison Charts

- Logout
- Start New Site Assessment
- Update Existing Site
- Search Other Site Results
- Administer Users
 - View All Users
 - Grant User Access
 - Revoke User Access
 - Add a New User
 - Update an Existing User
 - View User Activity
 - View Site Activity
- About Smart Conservation

Version 0.21 1/7/2002



*Compare
Site Values
For Searched Sites*



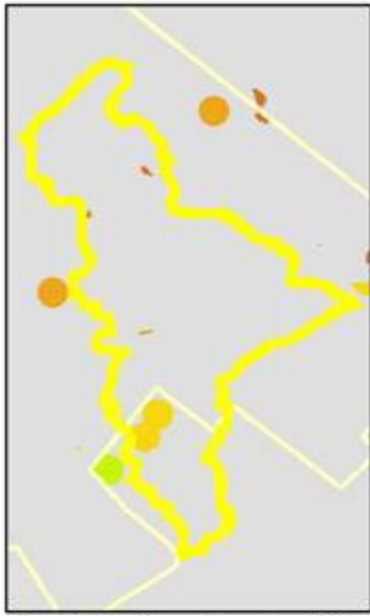


SmartConservation
mapping prioritizations

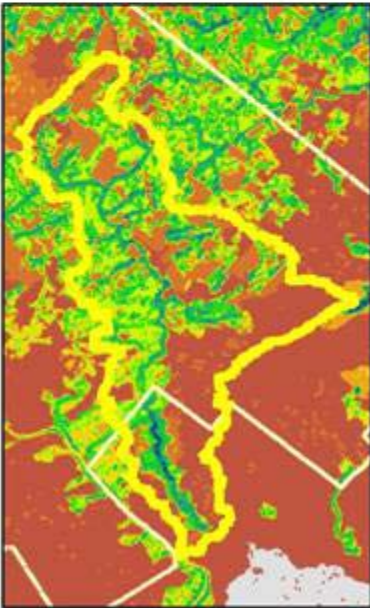
**APPLIED &
IMPLEMENTED
LOCALLY**



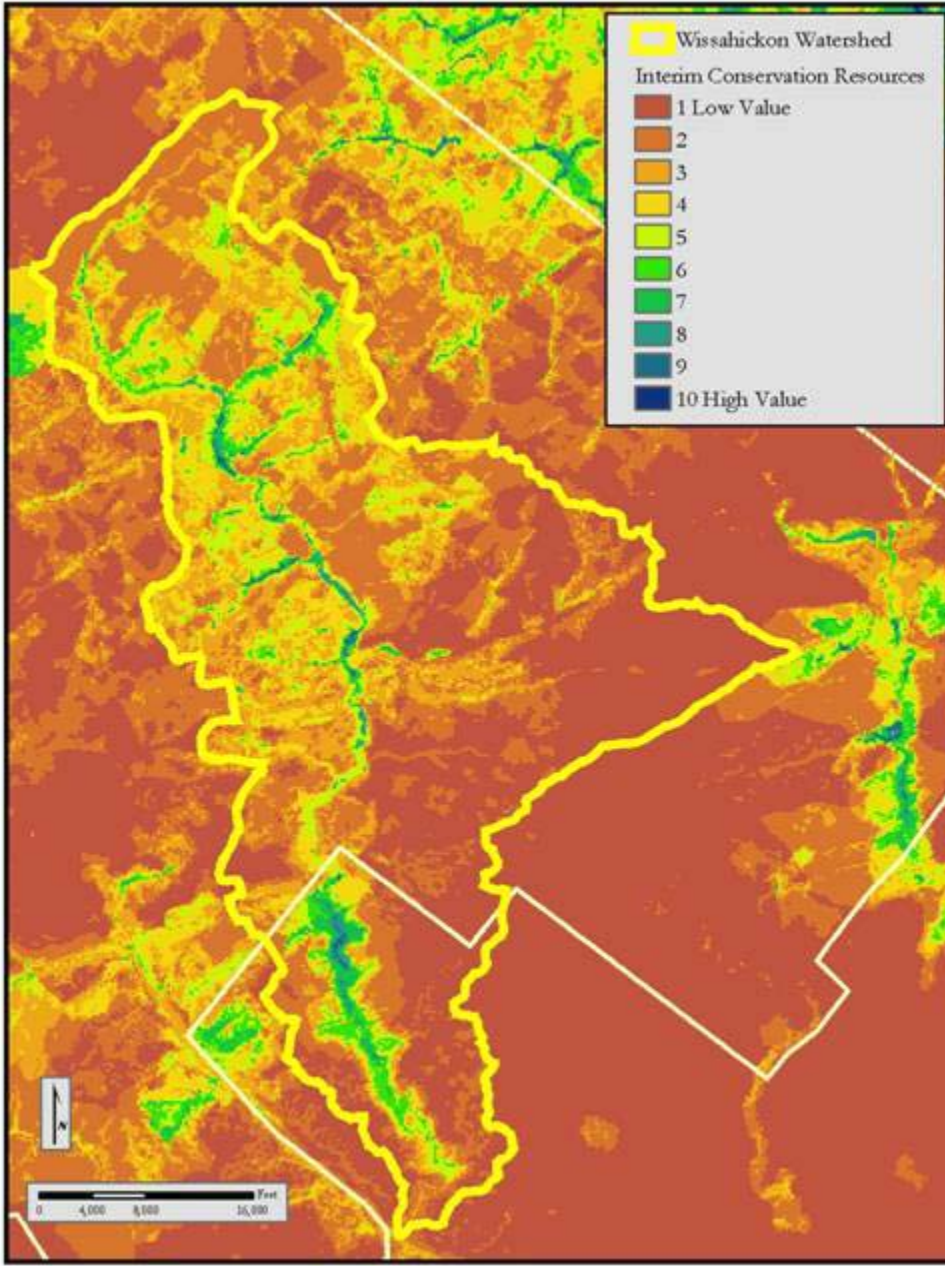
Smart
Conservation



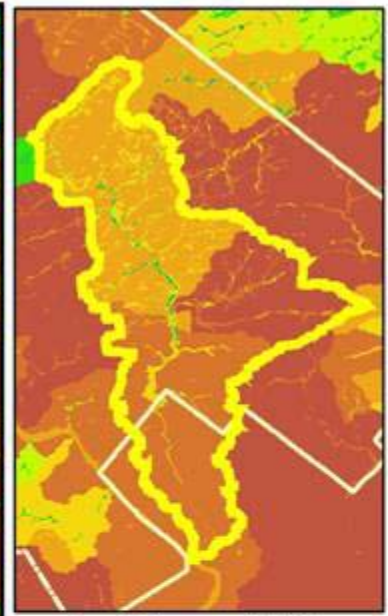
County Natural Areas Inventory (20%)



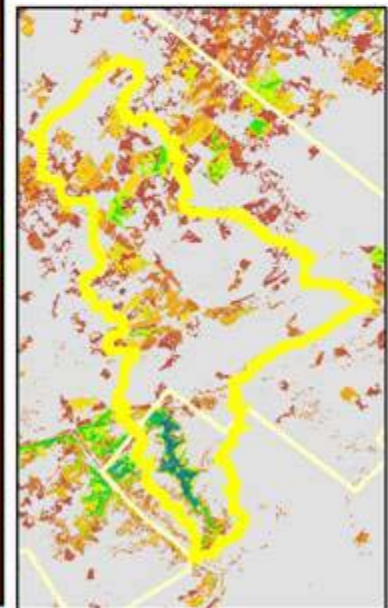
Potential Vertebrate Habitat (22.34%)



SmartConservation™ Interim Conservation Resources

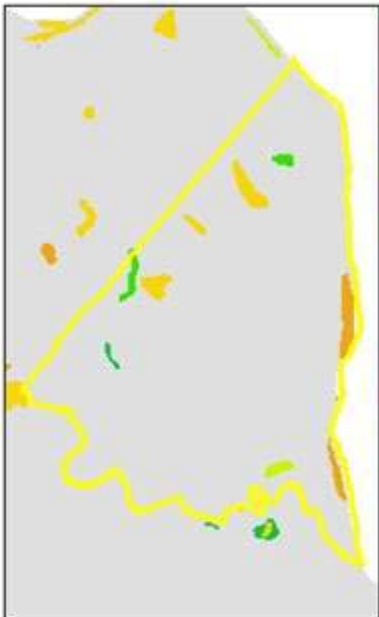


Aquatic Resources (40.52%)

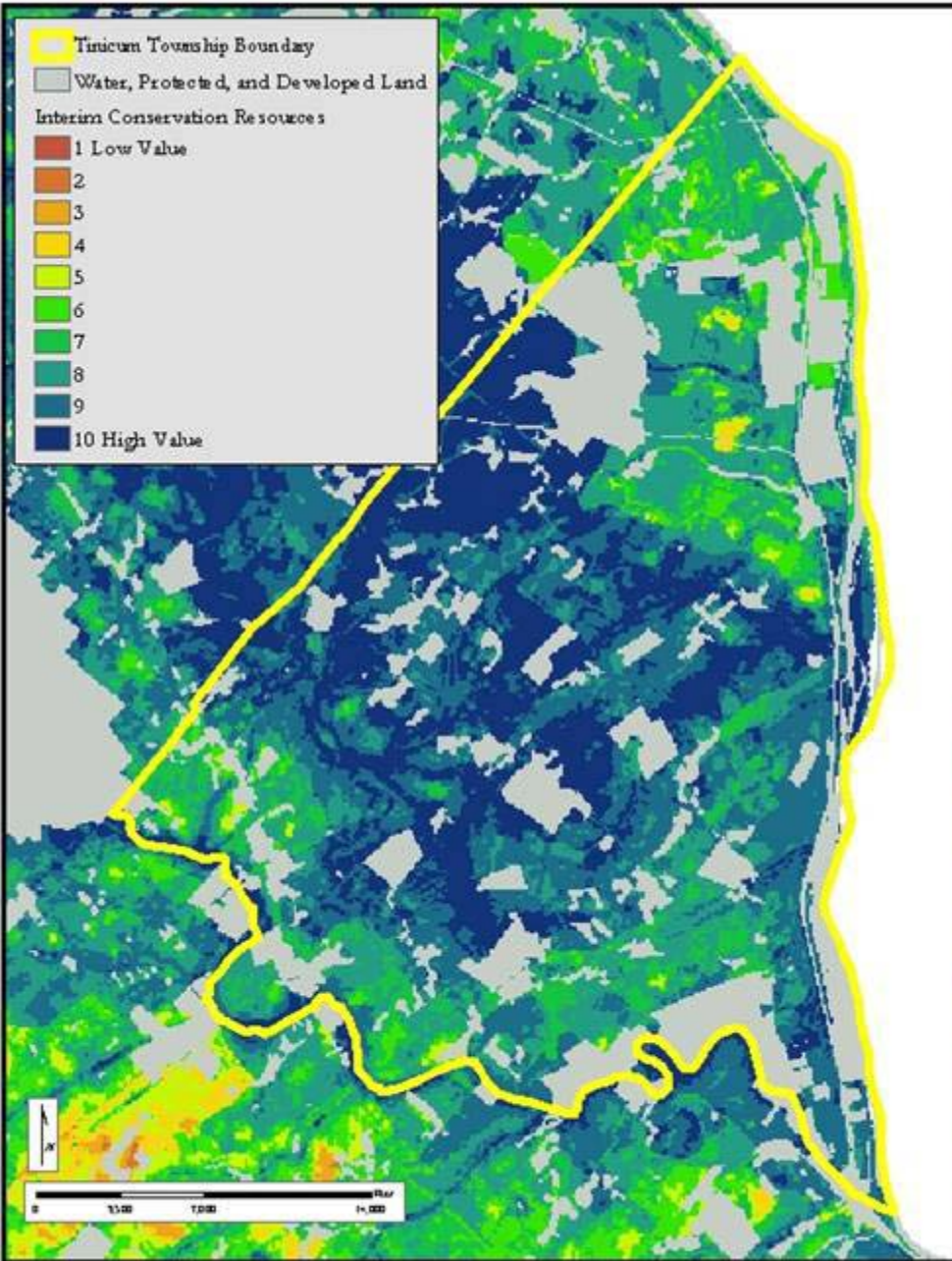


Terrestrial Resources (17.14%)

Wissahickon – INFERRED as a regional restoration priority watershed



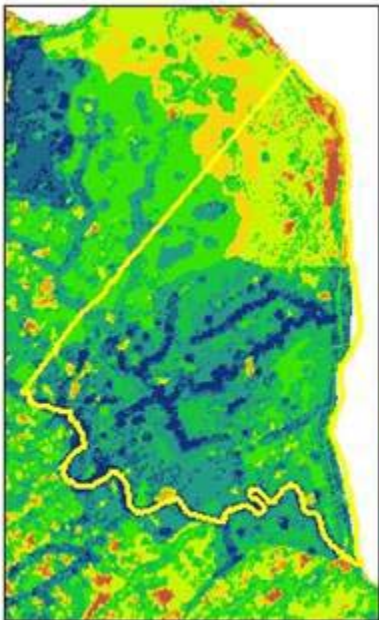
County Natural Areas Inventory (20%)



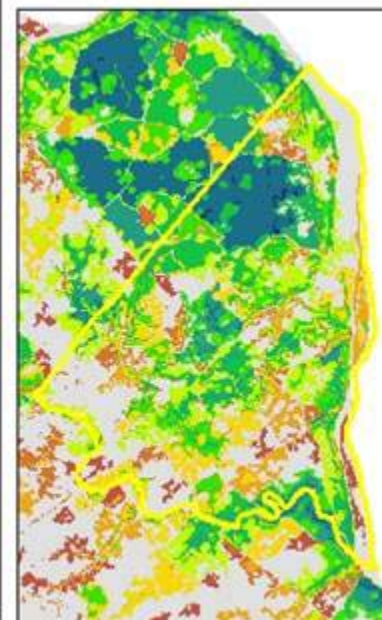
SmartConservation™ Interim Conservation Resources



Aquatic Resources (37.12%)

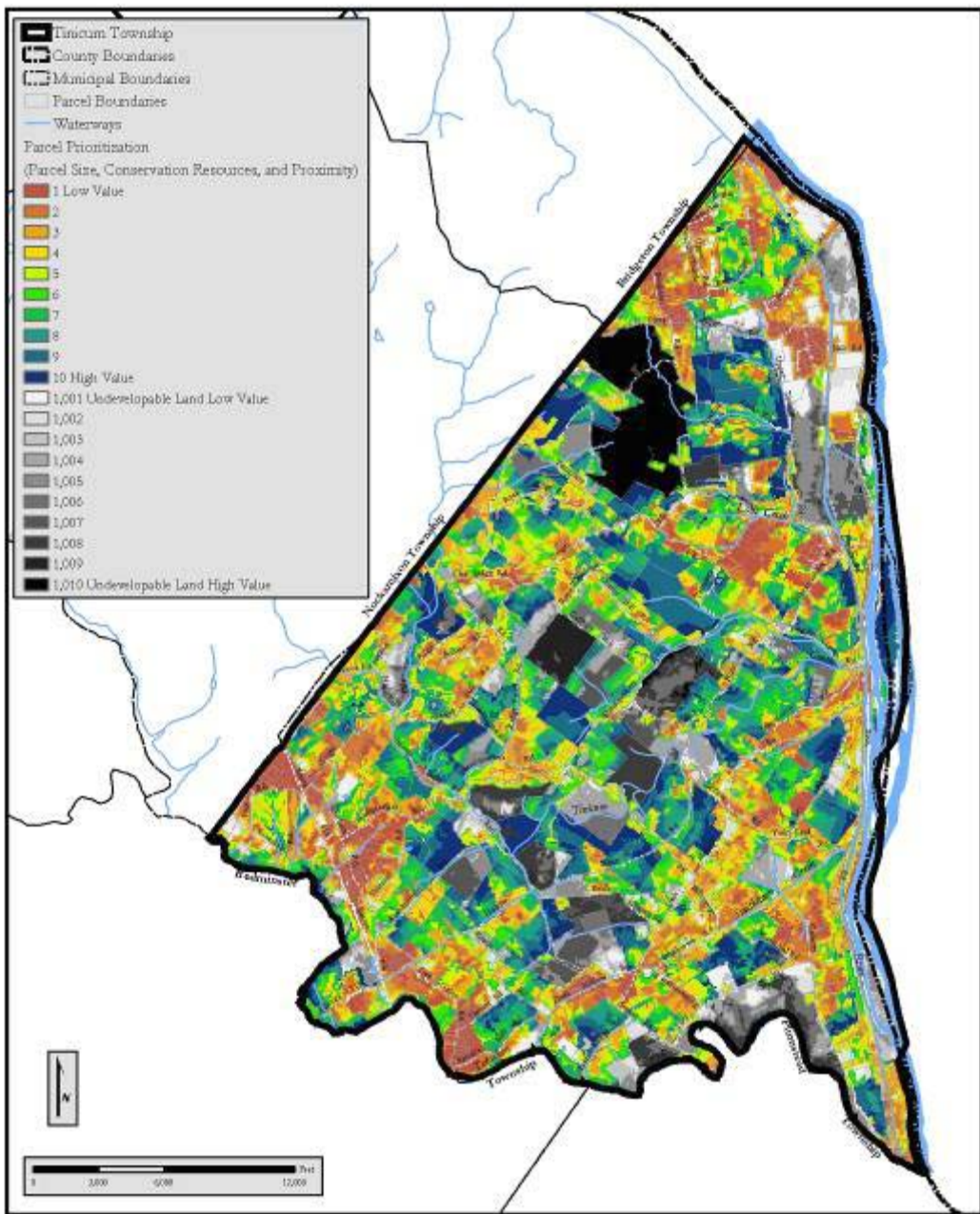


Potential Vertebrate Habitats (27.52%)



Terrestrial Resources (15.36%)

Tincum Twp – an Ecoregionally-significant protection priority



*Additional Local
 Prioritizations:*

Parcel Size

*Proximity to
 Protected Lands*

*SmartConservation
 Resources*

&

*Protected/Unprotected
 Status*

SmartConservation Benefits

- ◆ Establishes *approximate* relative values for targeting scarce resources
- ◆ Reveals key resource information, in a consistent way
- ◆ Provides site and regional context
- ◆ Builds regional database of assessed sites
 - Higher Value → implies Protection
 - Lower Value → implies Restoration
- ◆ Works at multiple scales
- ◆ Provides both top-down mapping priorities & bottom-up implementation tools – all in one web-based application
- ◆ Reduces the need for *LOCAL & desktop* GIS resources & expertise
- ◆ Has the potential for simplified, user-friendly and site-specific value-added GIS data distribution & download through a clip-zip-ship feature built into the website.
- ◆ *Future:* Phase 2 Empirical Rapid Bioassessment database can provide spatial & temporal trend analysis and indicators/threshold benchmarks.





Smart Conserver

online

www.smartconservation.org

Questions?

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