# University of Virginia Biodiversity Analysis

Rickie White, Lynn Scharf, Patrick Crist, Jessica Dyson
NatureServe

With assistance from Williamsburg Environmental Group and Virginia Natural Heritage Program.

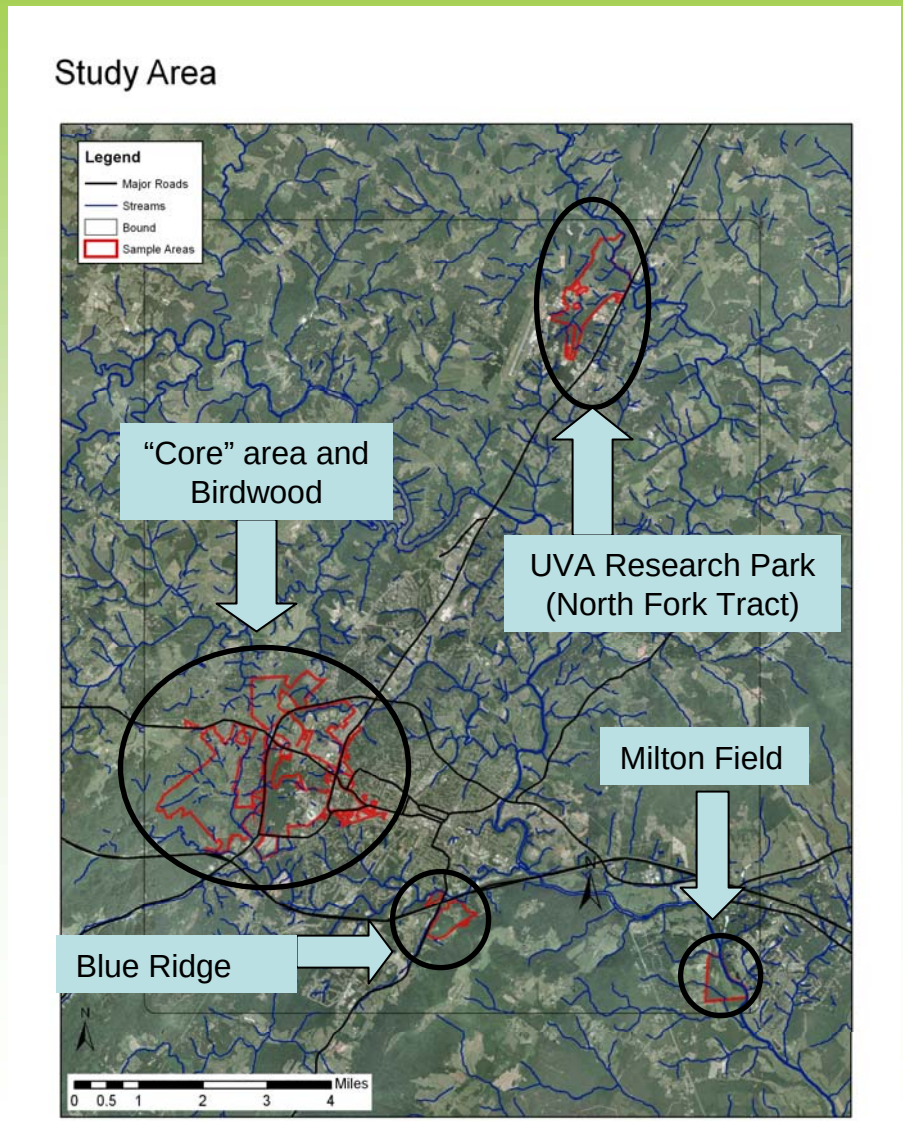
NatureServe
A Network Connecting Science With Conservation

# Presentation Summary

- What is this analysis about?
- Why NatureServe?
- How does this relate to the Grounds plan?
- Deliverables for project
- Data used for project
- Landscape integrity
- Pathways for analysis
  - Conservation Value Summaries
  - Scenarios
- Summary

# What is this analysis about?

To assist in the Grounds planning process, NatureServe has assembled existing and new information to create a comprehensive biodiversity analysis of University and Foundation lands.



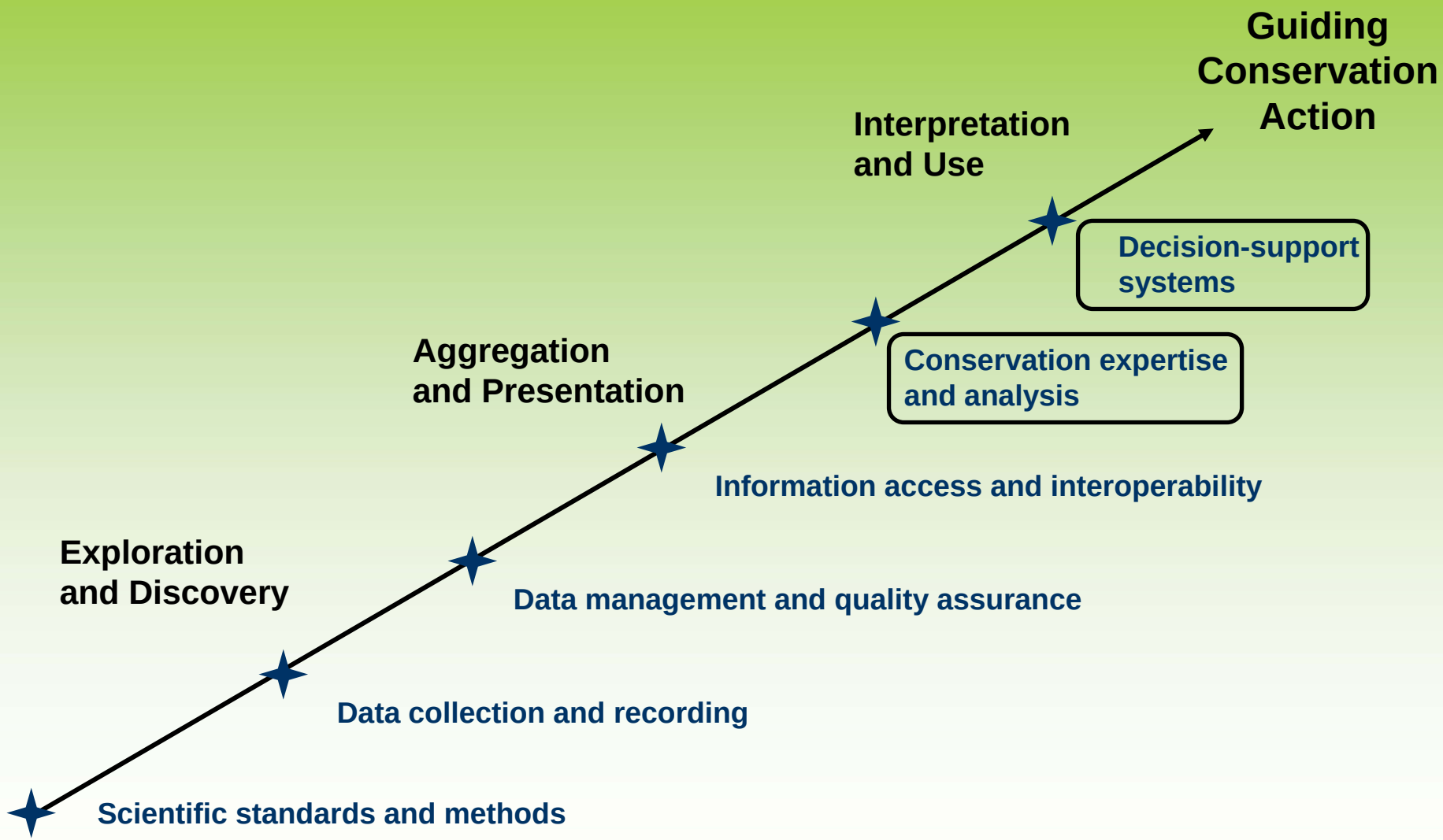
# Why NatureServe?

The mission of NatureServe is to provide the scientific basis for effective conservation action.

***Chris Hobson,***
***Virginia Div. of Natural Heritage***
*Photo by Lynda Richardson*

# Information Value Chain

## Connecting Science with Conservation



# How does this project relate to the Grounds Plan?

Biodiversity inventory and analyses address conflicts with regulated species and habitats, maintain the natural heritage of the University and Commonwealth, and enhance the environmental health and quality of life for the University community and the region.

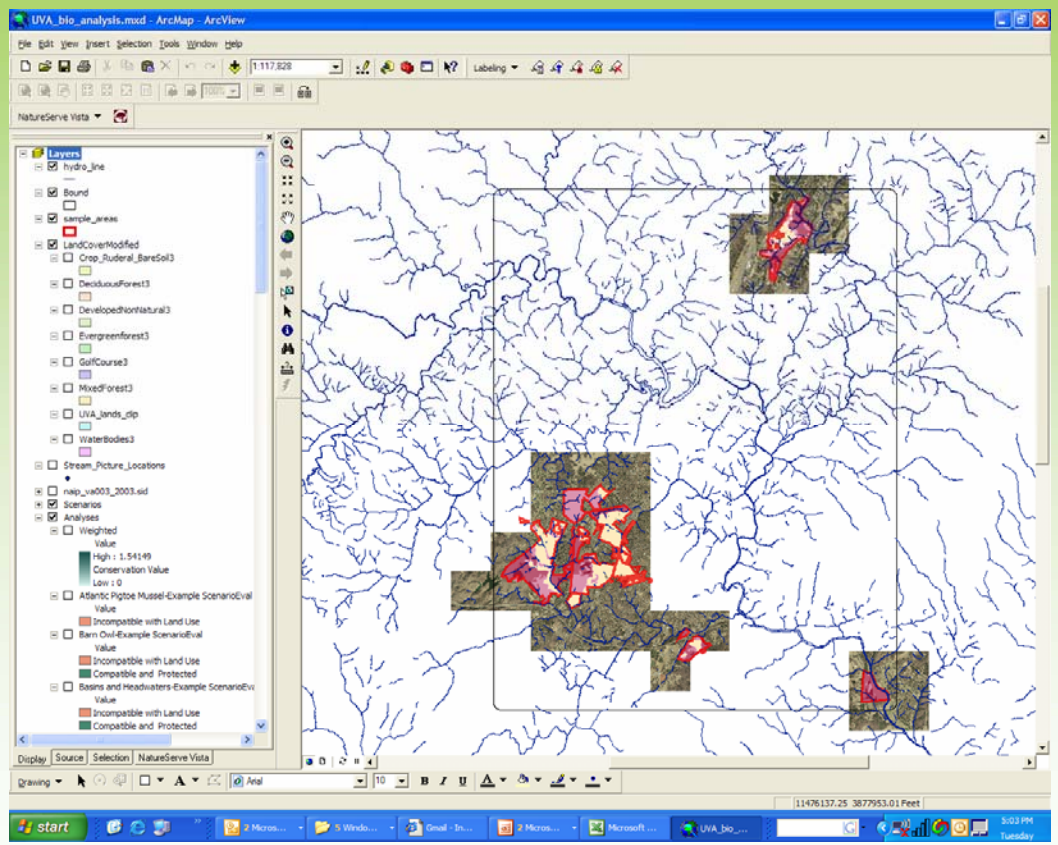
# Deliverables for Project

**University of Virginia**

**Biodiversity Analysis:**

**Data Acquisition and Development, Analysis, and Conservation Assessment**

**for**
**The University of Virginia**
**by**
**NatureServe**
**1101 Wilson Blvd 15th Floor**
**Arlington VA 22209**
**October 2006**



# Overview of VISTA project

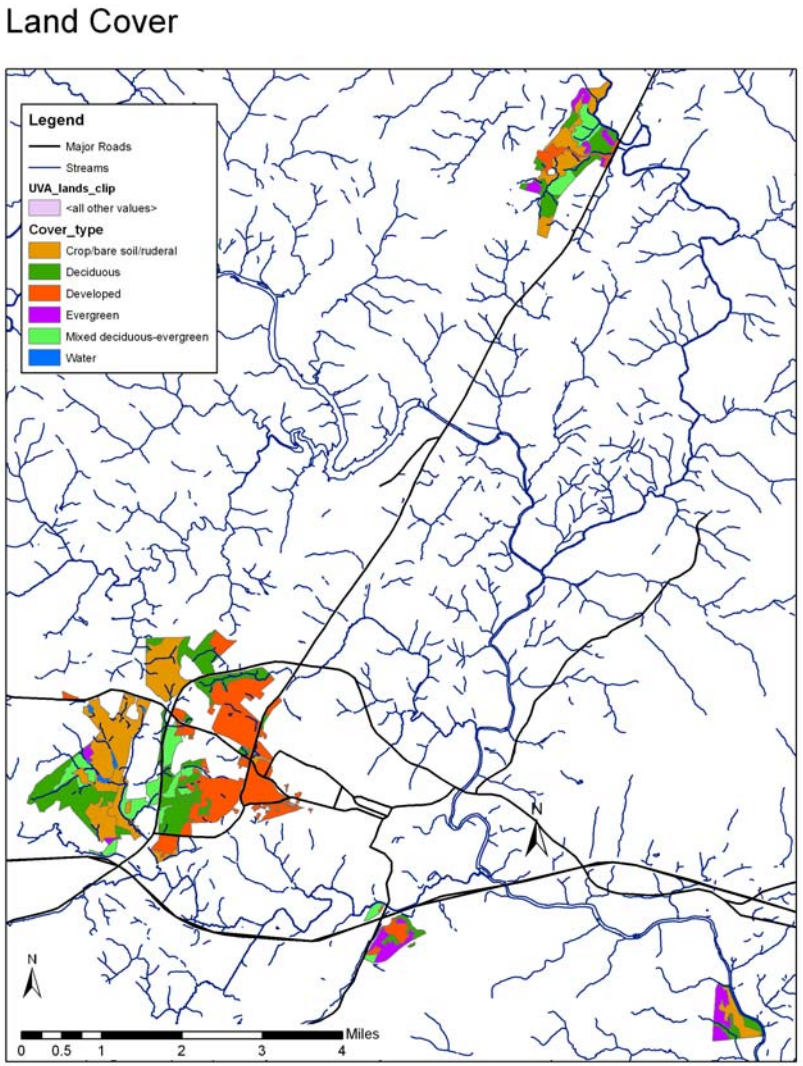
- Data used as part of the study
- Landscape Integrity Layer
- Pathways for Analysis
  - Creating a Conservation Value Summary
    - Weighting factors according to conservation relevance
  - Creating Alternate Scenarios
    - Setting conservation goals (according to UVA's priorities

# Data Used: Species Occurrences (Spotted Salamander)

The IUCN Red List lists this as a species of concern and suggests a 200-250 meter buffer area around breeding ponds to sustain a viable population of this species (Hammerson 2004).

*Photo of Spotted Salamander. Credit: Geoff Hammerson*

# Data Used: Land Cover

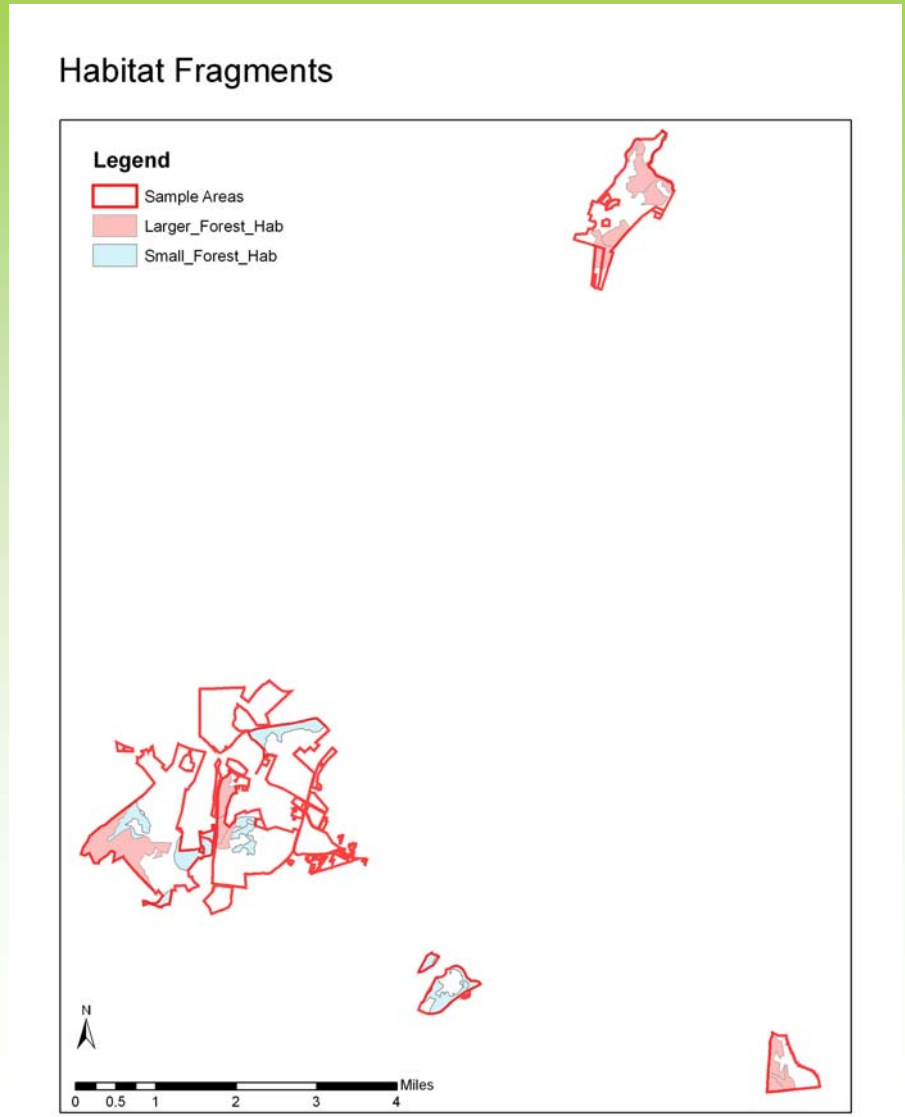



Based on 2005 aerial photography, the land cover map includes the following categories:

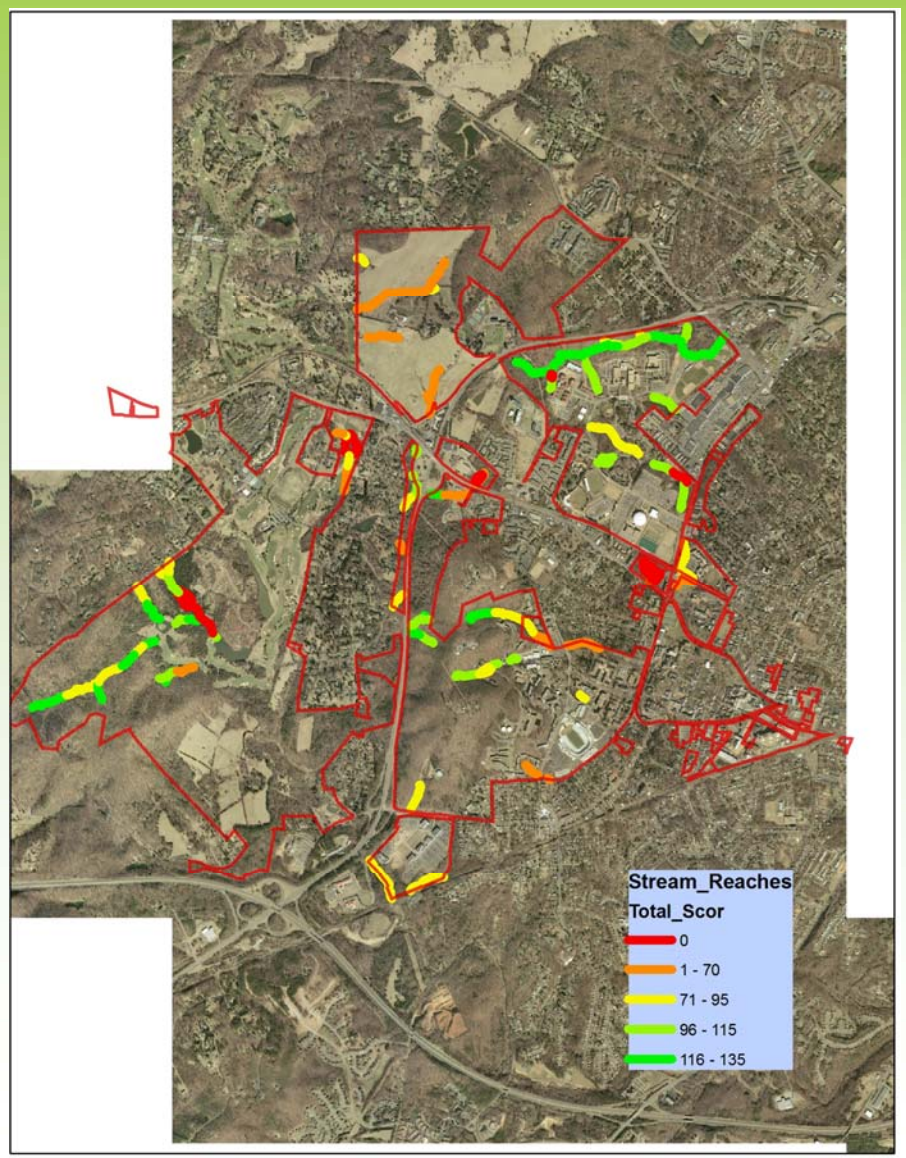
- Deciduous forest
- Mixed evergreen-deciduous forest
- Evergreen forest
- Water bodies
- Crop/ruderal/bare soil
- Golf course

# Data Used: Species Habitat

Some forest bird species require medium to large tracts of continuous forest cover to breed and sustain populations. We created a layer to capture medium and large tracts of forest as a proxy for breeding bird habitat.



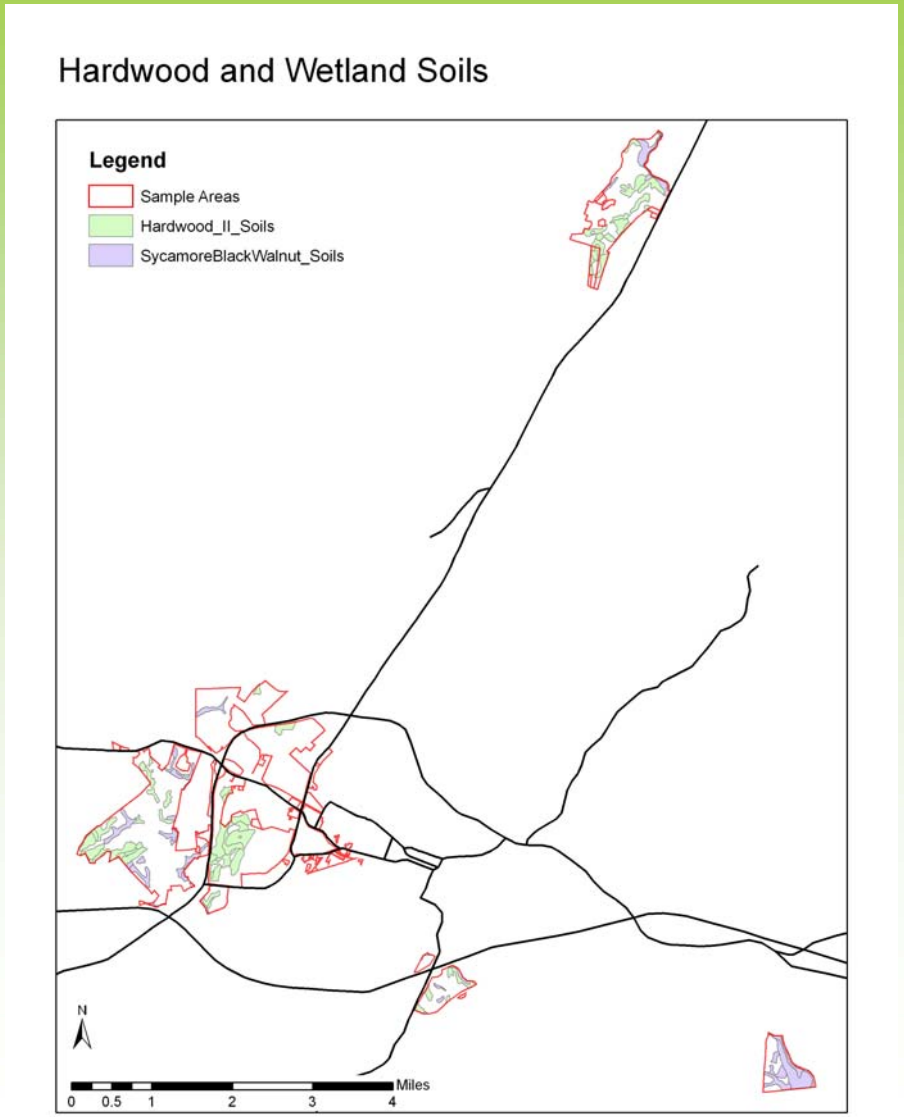
# Data Used: Water Quality




Stream quality was assessed throughout the “core” tract and related tracts and given a score translating roughly into high quality, medium quality, and low quality streams.

# Data Used: Soils

Soils data is available for all of the study area. We used soils that are good “wetlands” indicators to locate forested wetlands. We used another layer to locate steep slopes.

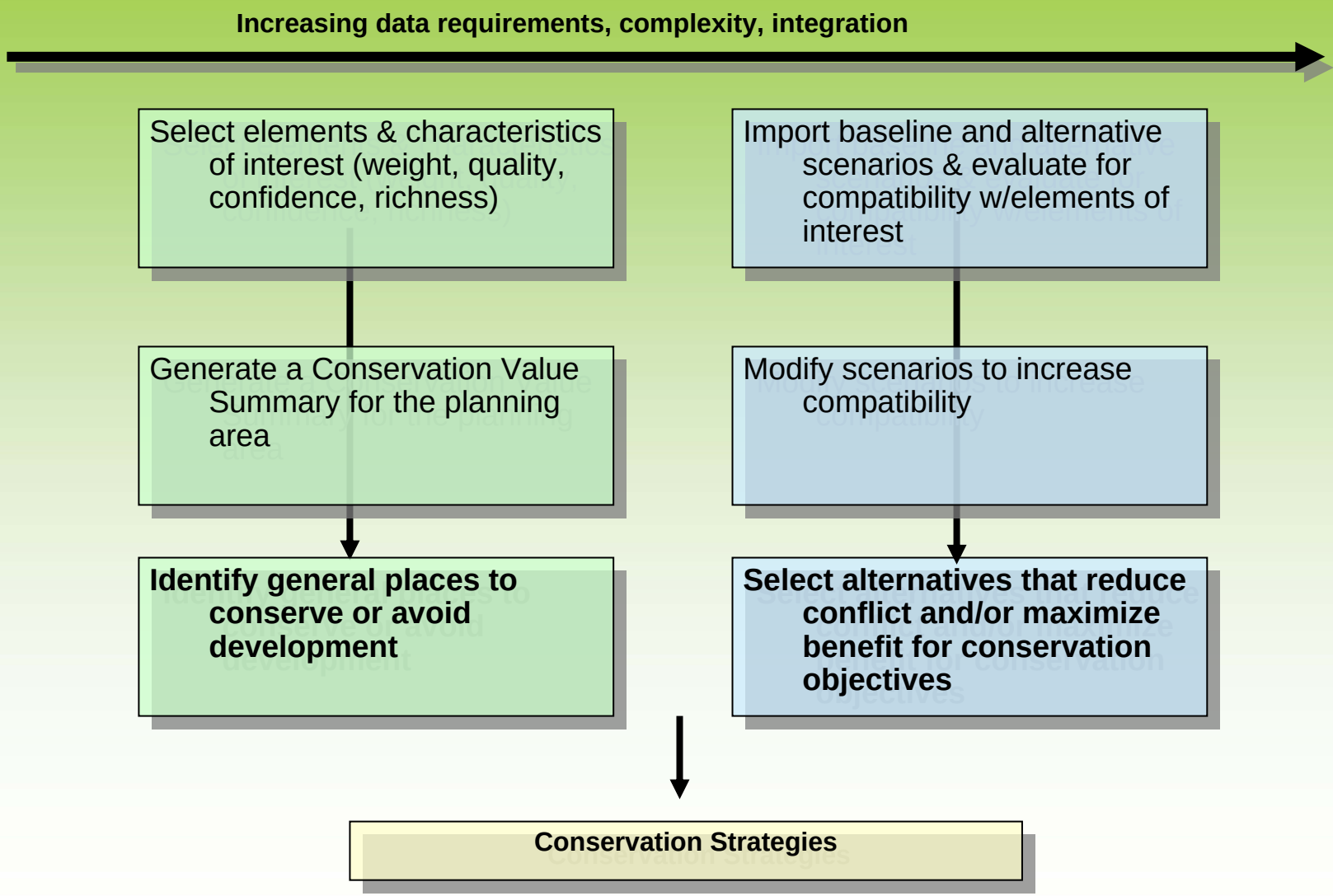


# Landscape Integrity


*Landscape Integrity* characterizes the degree to which a landscape contains natural features that are likely to persist or not persist under current conditions.

| Description | Weight |
|---|---|
| Roads | 10 |
| Pavement | 6 |
| Rooftops | 6 |
| Bare soil | 4 |
| Resident | 4 |
| Crops | 3 |

# Pathways for Analysis of Data

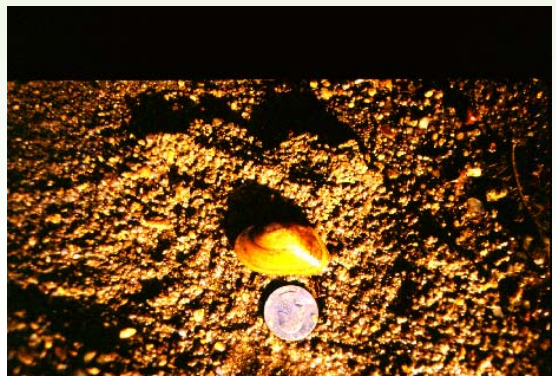


# Analysis Method 1: Conservation Value Summary

The conservation value of individual targets can be combined to produce an overall summary or index of conservation value across the landscape according to user-defined values.

# WEIGHTING

| Name of element | Weight (from 0 to 1) |
|---|---|
| SPECIES ELEMENTS | |
| Hoary bat | 0 |
| northern green frog | 0.2 |
| barn owl | 0 |
| gray treefrog | 0.1 |
| northern dusky salamander occurrence | 0.4 |
| northern dusky salamander buffer | 0.1 |
| red-backed salamander | 0.3 |
| red-spotted newt occurrence | 0.3 |
| red-spotted newt buffer | 0.1 |
| spotted salamander occurrence | 0.8 |
| spotted salamander buffer | 0.7 |
| Atalntic pigtoe mussel | 1 |
| James spinymussel | 1 |
| bluehead chub | 0 |
| LAND COVER | |
| Deciduous forest | 0.8 |
| Mixed deciduous-evergreen forest | 0.5 |
| Evergreen forest | 0.2 |
| HABITAT FRAGMENTS | |
| Large forests (>84 acres) | 0.5 |
| Medium forests (14-86 acres) | 0.1 |
| Old fields (> 15 acres) | 0.3 |
| WETLAND QUALITY | |
| Basins and headwaters of ponds | 0.1 |
| High quality stream stretches | 0.8 |
| Ponds and wide river stretches | 0.4 |
| UNIQUE SOILS | |
| Wetland soils | 0.8 |
| Unique ag lands | 0.5 |
| REGIONAL CONTEXT | |
| High GAP richness | 0.3 |
| Medium GAP richness | 0.2 |
| Low GAP richness | 0.1 |

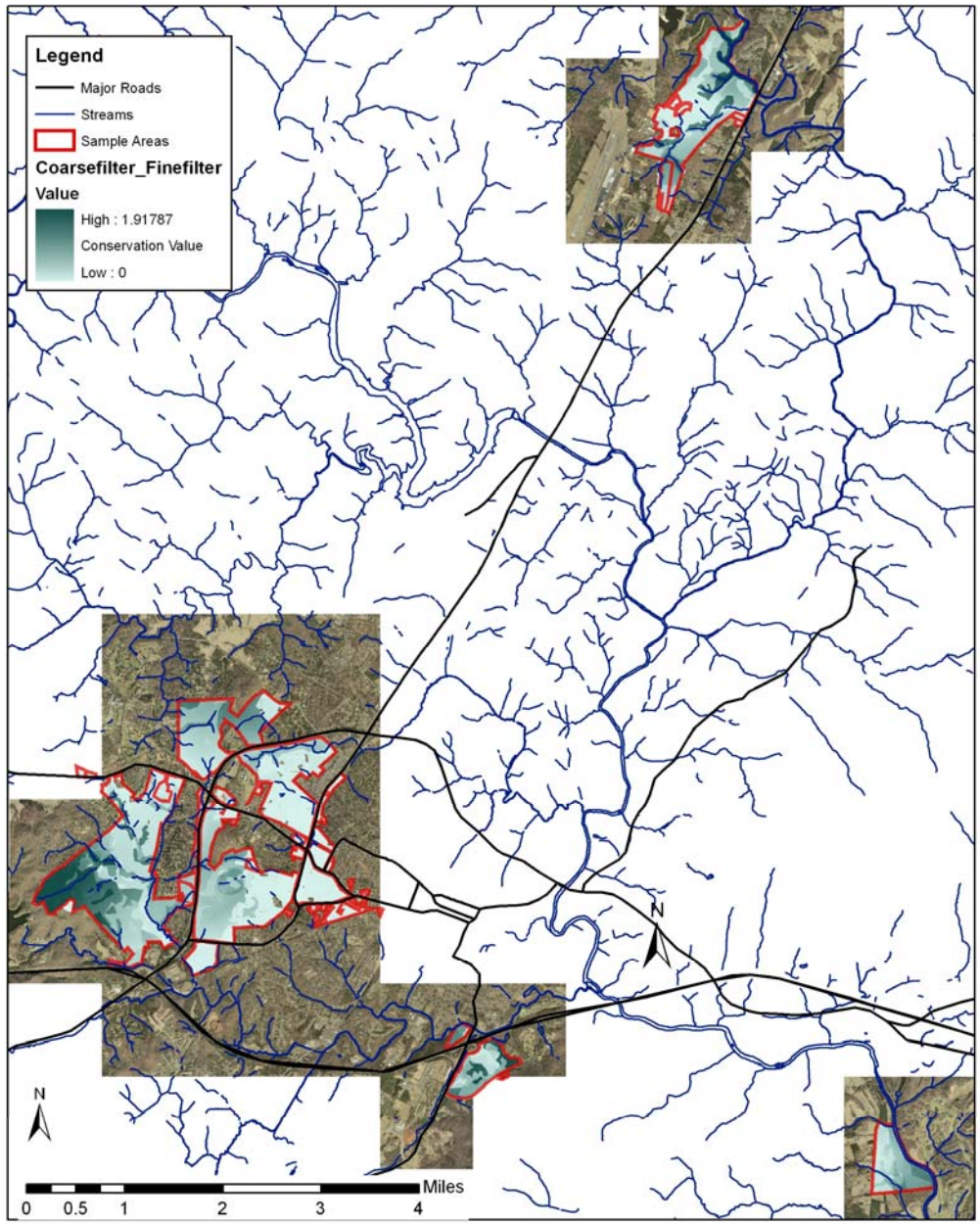


# Coarse Filter /Fine Filter

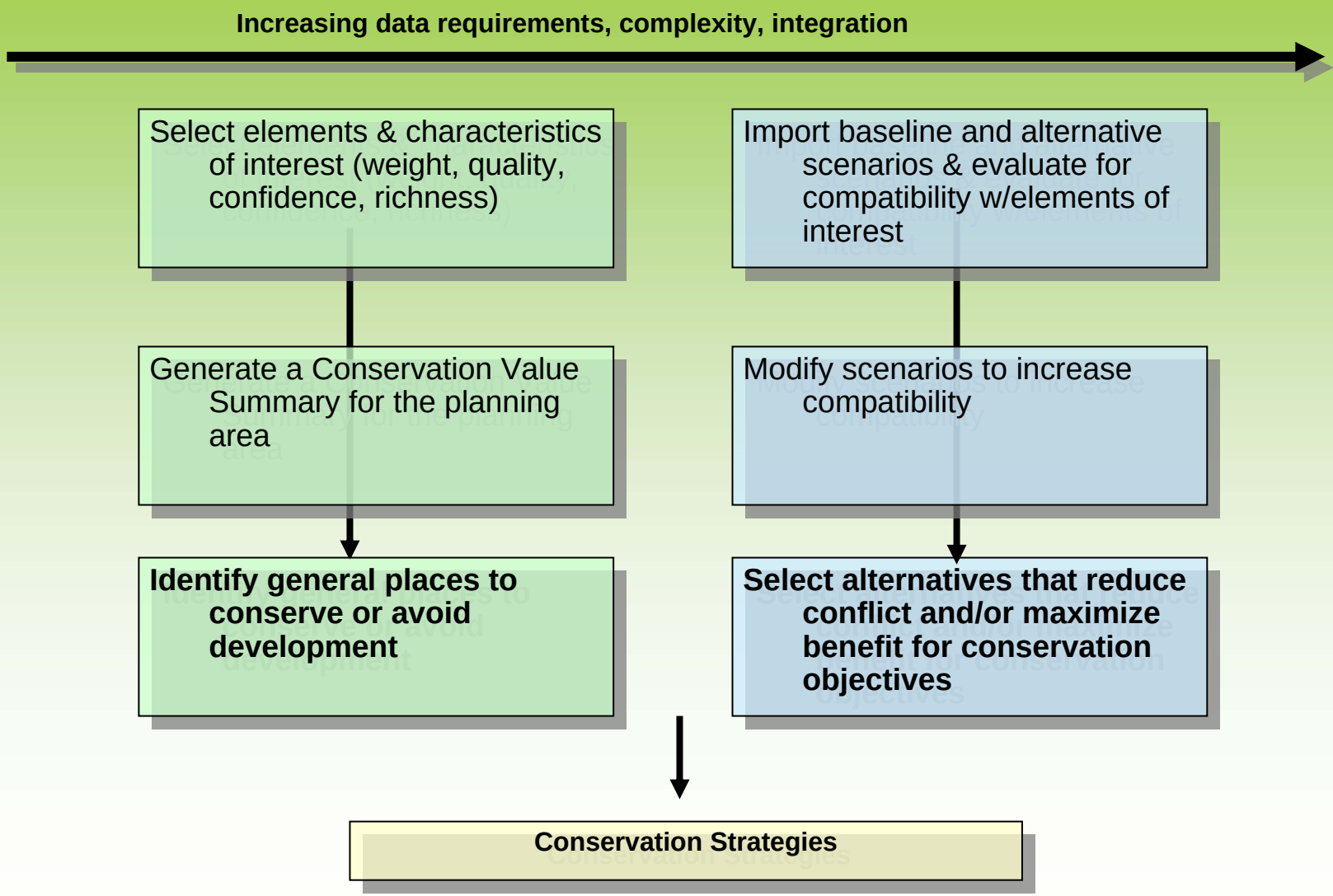
Coarse Filter =  keeping common species common.

Fine filter = keeping rare species and species of note from “blinking out”

# Conservation Value Summary



# Pathways for Analysis of Data



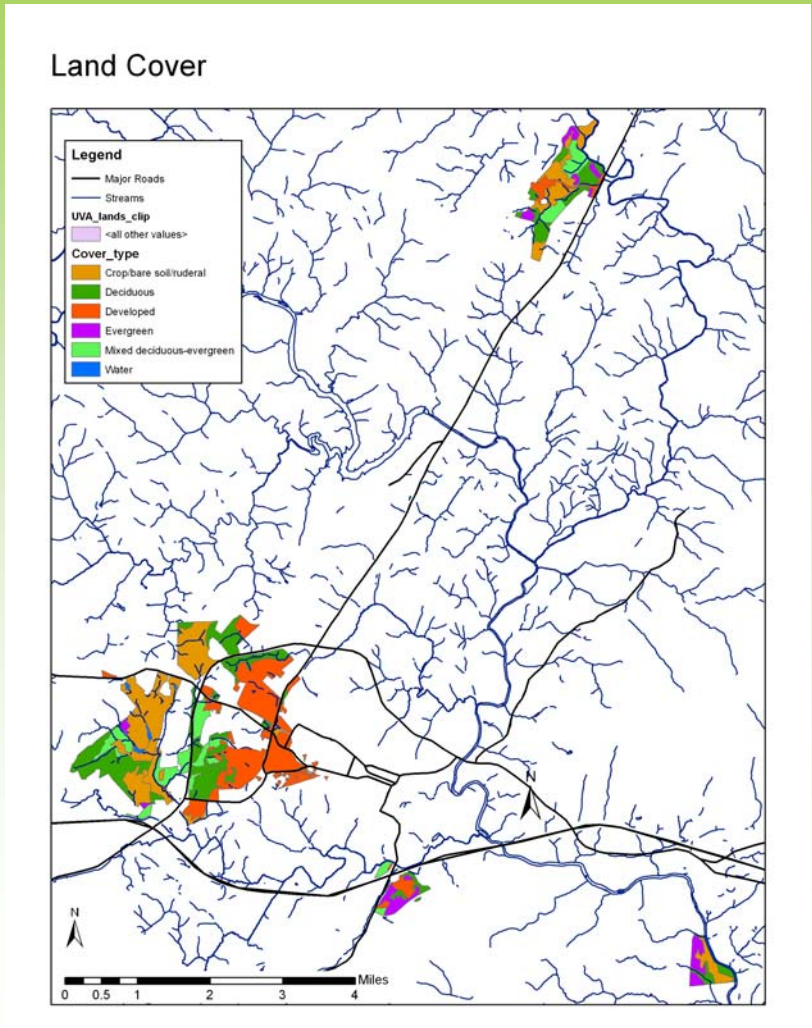
# Analysis method 2: Goal setting and Scenario Development

How much of each conservation ”element” is enough?

How do your current plans mesh with any conservation goals you’ve set?

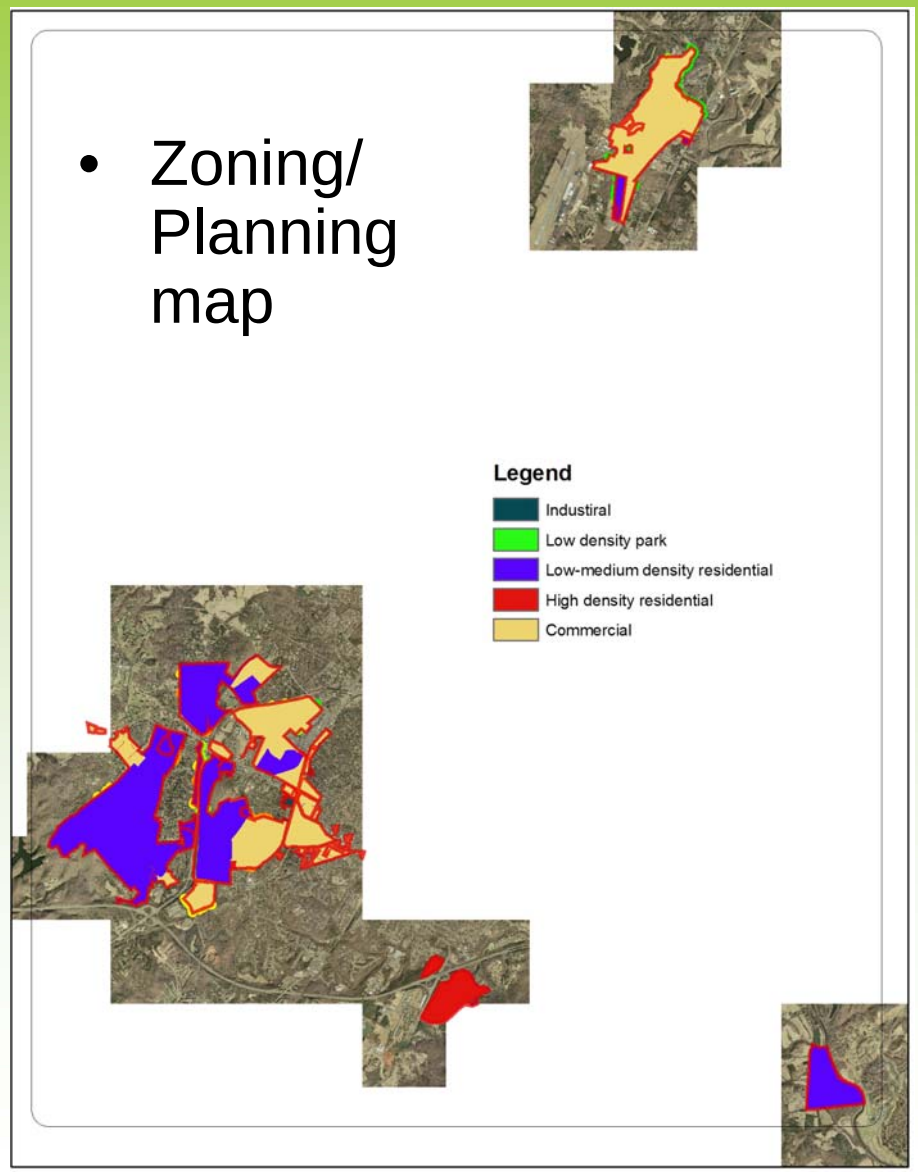
# Goals

| Element | Goal | Type |
|---|---|---|
| High Gap Richness | 0% | area |
| Med Gap Richness | 0% | area |
| Lower Gap Richness | 0% | area |
| Evergreen Forest | 10% | area |
| Deciduous Forest | 75% | area |
| Mixed Evergreen-Hardwood Forest | 10% | area |
| Habitat Fragments (moderate) | 75% | occurrences |
| Basins and Headwaters | 90% | area |
| Old Fields | 50% | area |
| Hoary Bat | 0% | occurrences |
| Dusky Salamander | 100% | occurrences |
| Green Frog | 0% | occurrences |
| Barn Owl | 0% | occurrences |
| Gray Tree Frog | 0% | occurrences |
| Red-backed Salamander | 0% | occurrences |
| Red-spotted Newt Buffer | 0% | occurrences |
| Spotted Salamander buffer | 90% | area |
| Habitat Fragments (min) | 50% | area |
| Atlantic Pigtoe Mussel | 100% | occurrences |
| James Spiny Mussel | 100% | occurrences |
| Bluehead Chub | 0% | occurrences |
| Spotted Salamander EO | 100% | occurrences |
| Red-Spotted Newt EO | 0% | area |
| Dusky salamander buffer | 90% | area |
| Ponds_widerivers | 100% | area |
| High Quality Streams | 100% | area |
| WetlandSoils | 100% | area |
| Unique Ag Lands | 0% | area |

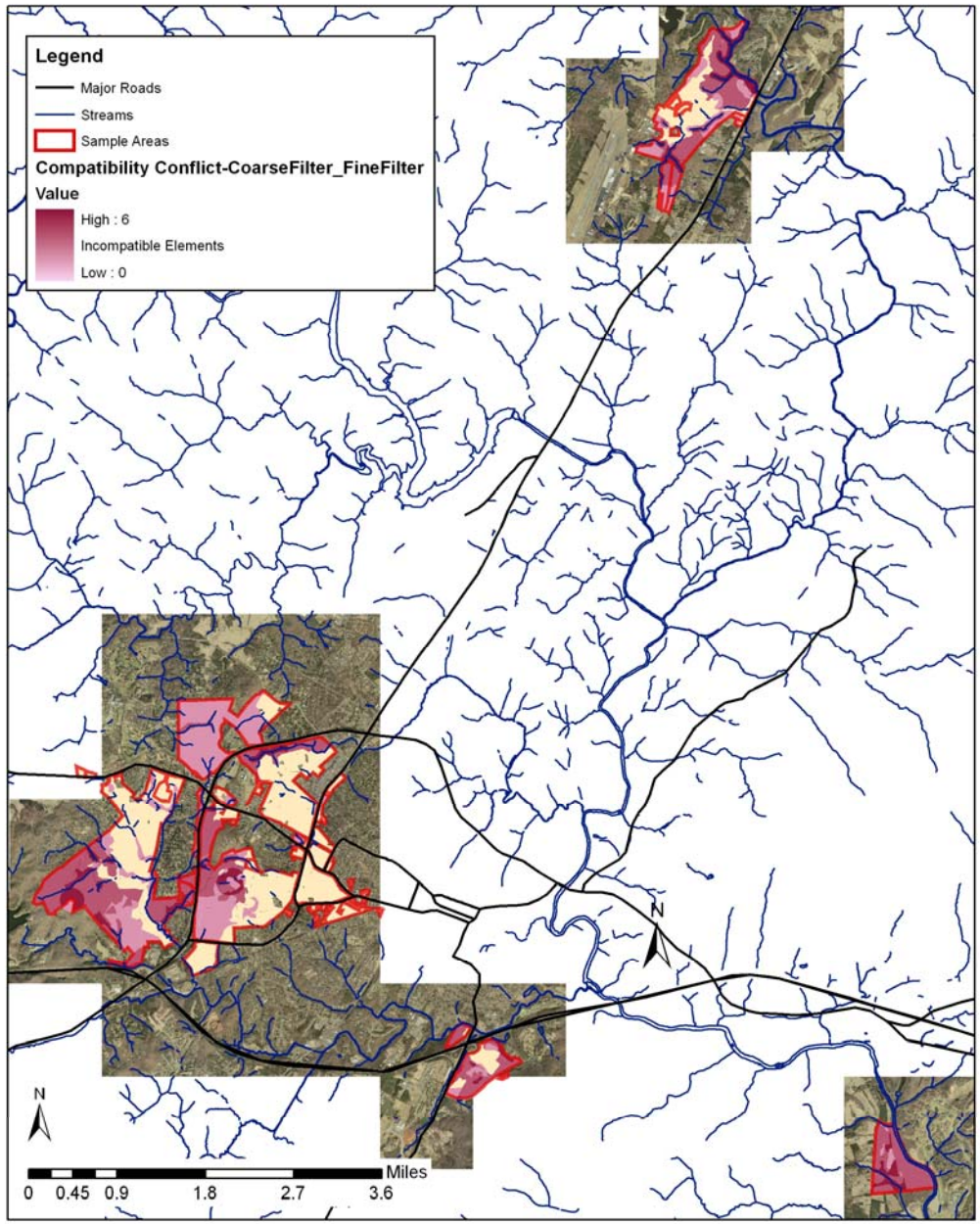


# Alternate Land Use Scenarios

- Zoning/ Planning map



# Scenario Evaluation



# Summary

- The most valuable product for this project is the NatureServe VISTA tool itself.  Our goal is to make it easy for partners to become proficient enough in this tool that they need minimal support from our organization to incorporate biodiversity into planning decisions
- The tool is only as good as the data that is input into it.  New data will greatly improve this project.

# Summary (continued)

- Note that most of the “Grounds” are not high priority conservation areas according to the conservation value summary.  Why is this?