Virginia DCR-Natural Heritage Program

Tools for Linking Conservation and Transportation Planning

November 9, 2009

MISSION:

- to conserve Virginia's biodiversity through statewide biological inventory, protection, and stewardship.
- by maintaining a statewide database for conservation planning, project review, land protection for the conservation of biodiversity, and the protection and ecological management of natural heritage resources

Virginia Natural Heritage Program

Created in 1989 – Virginia Natural Area Preserves Act

Focus: Rare plants and animals & exemplary natural communities

Methods: Standardized and refined over past 30 years

Data: Over 20 years of collection and analysis

Virginia Natural Heritage Plan

- **Governs the creation of a system of natural area preserves**

  59 Natural Area Preserves (48,032 acres)

- **Establishes priorities for protection, acquisition, and management**

- **Calls for a needs assessment to guide expenditures of the Virginia Land Conservation Foundation**

Virginia Natural Heritage Plan

Spatial tools used for Natural Heritage Plan needs assessment:

- **Element Occurrences**

  - rare plants and animals & exemplary natural communities, based on fine scale vegetation mapping

- **Conservation Sites, Stream Conservation Units, and Cave/Karst Sites**

  - include occurrences plus necessary habitat and buffer

- **Virginia Natural Landscape Assessment**

  - a statewide ecological network with cores and corridors identified and rank by Ecological Integrity

- **Others: Conservation Lands Database, Wetland Restoration Catalog, VCLNA models, Virginia Priority Conservation Sites, predictive distribution models**

Coarse Filter/Fine Filter Approaches

Coarse filter approaches are designed to conserve high percentages of species by conserving adequate diversity, distribution, and abundance of:

- ecological communities
- ecological land units (e.g. alliances of ecological communities)
- physical environments
- landscape-level ecological phenomena

Fine filter approaches compliment coarse filters by focusing on habitats of individual rare or specialized species

Virginia's Coarse Filter/Fine Filter Approach

Fine: **Natural Heritage Conservation Sites**

- polygons that delineate known occurrences of rare species plus required habitat and buffer
- biodiversity significance ranked

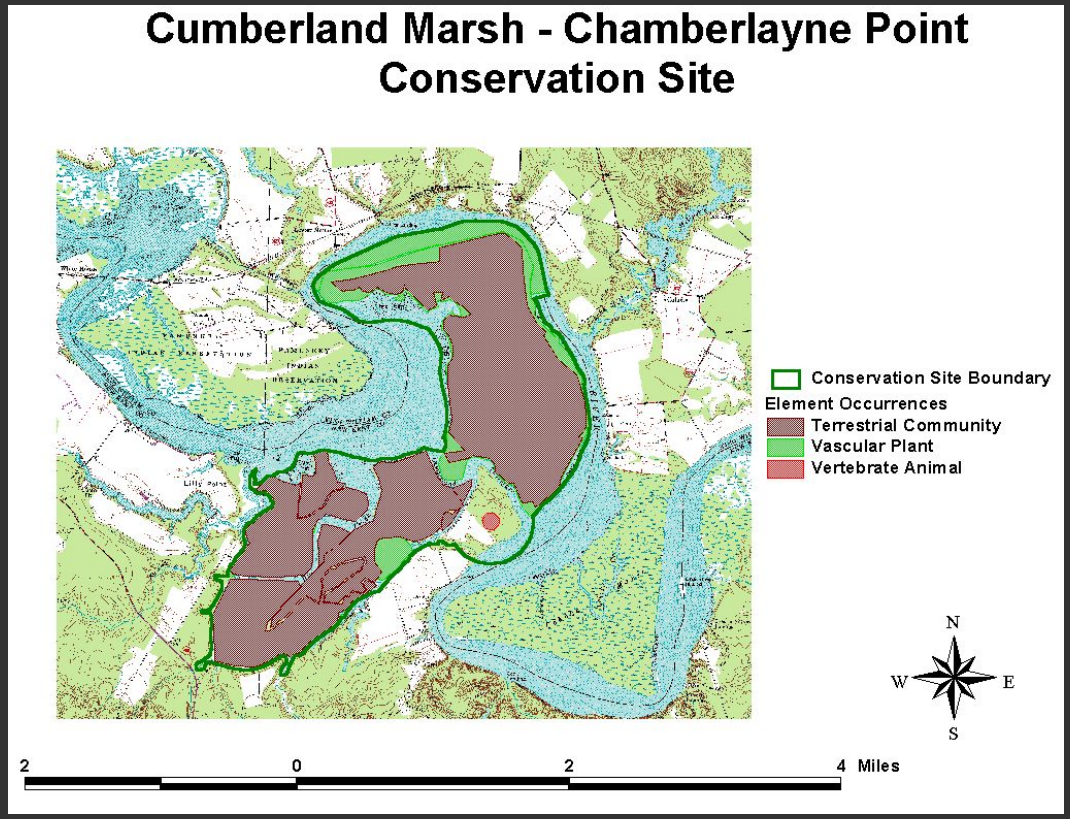
Importance of fine scale approach in realizing advanced mitigation opportunities?

- known rare species locations can indicate habitat not captured in existing mapping products (e.g. existing NVCS-based vegetation maps, NWI)

- advanced mitigation serving multiple benefits of T&E species conservation

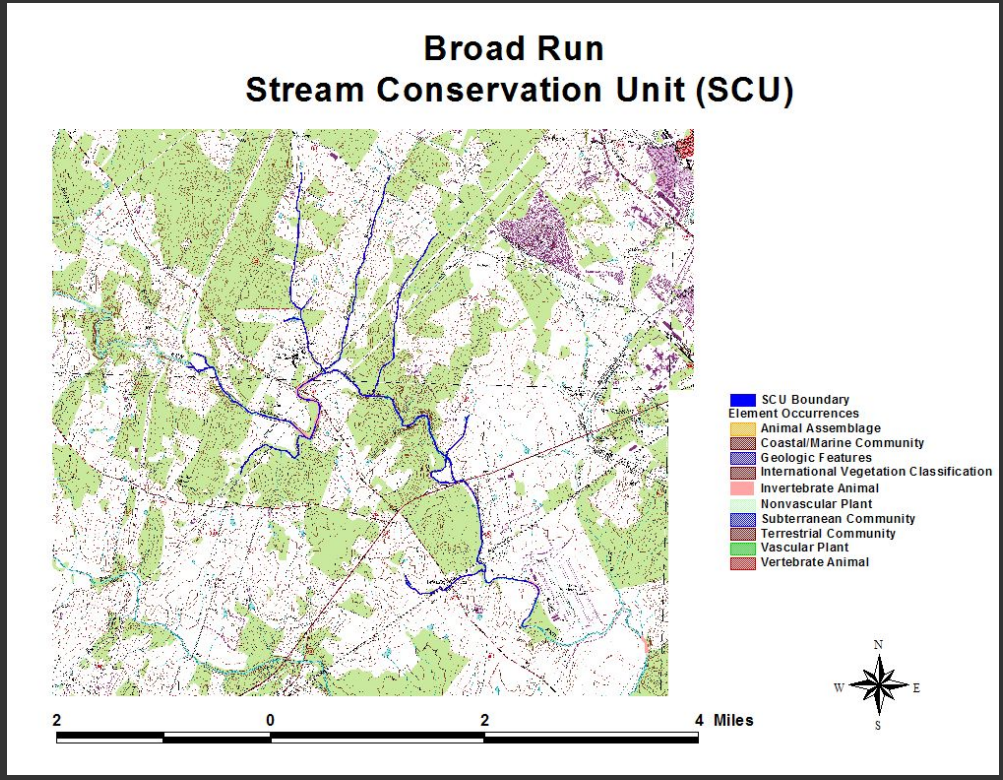
Conservation Sites

- Boundaries that surround:
  - At least one natural heritage resource, and
  - The surrounding habitat or buffer necessary for protection
- Represent land that should be conserved for protection of natural heritage resources.
  - Do NOT represent protected lands
- 1,553 plant and animal species and 105 natural community types



Stream Conservation Units

- Flag presence of aquatic natural heritage resources



- Signify that protection of these aquatic elements should be considered

- 2 miles upstream and 1 mile downstream of documented aquatic natural heritage resources, and all tributaries within this reach

Cave/Karst Sites

- Boundaries of:
  - At least one natural heritage cave resource, and
  - The surrounding habitat or buffer necessary for protection
- Represent land that should be conserved for protection of natural heritage resources.

Biodiversity Significance Ranks

Rate the significance of conservation sites based on:

- **Number of natural heritage resources contained**
- **Global rarity of the species or natural communities contained**
- **Viability of the populations or natural communities contained**

B-ranks

B1 – Outstanding

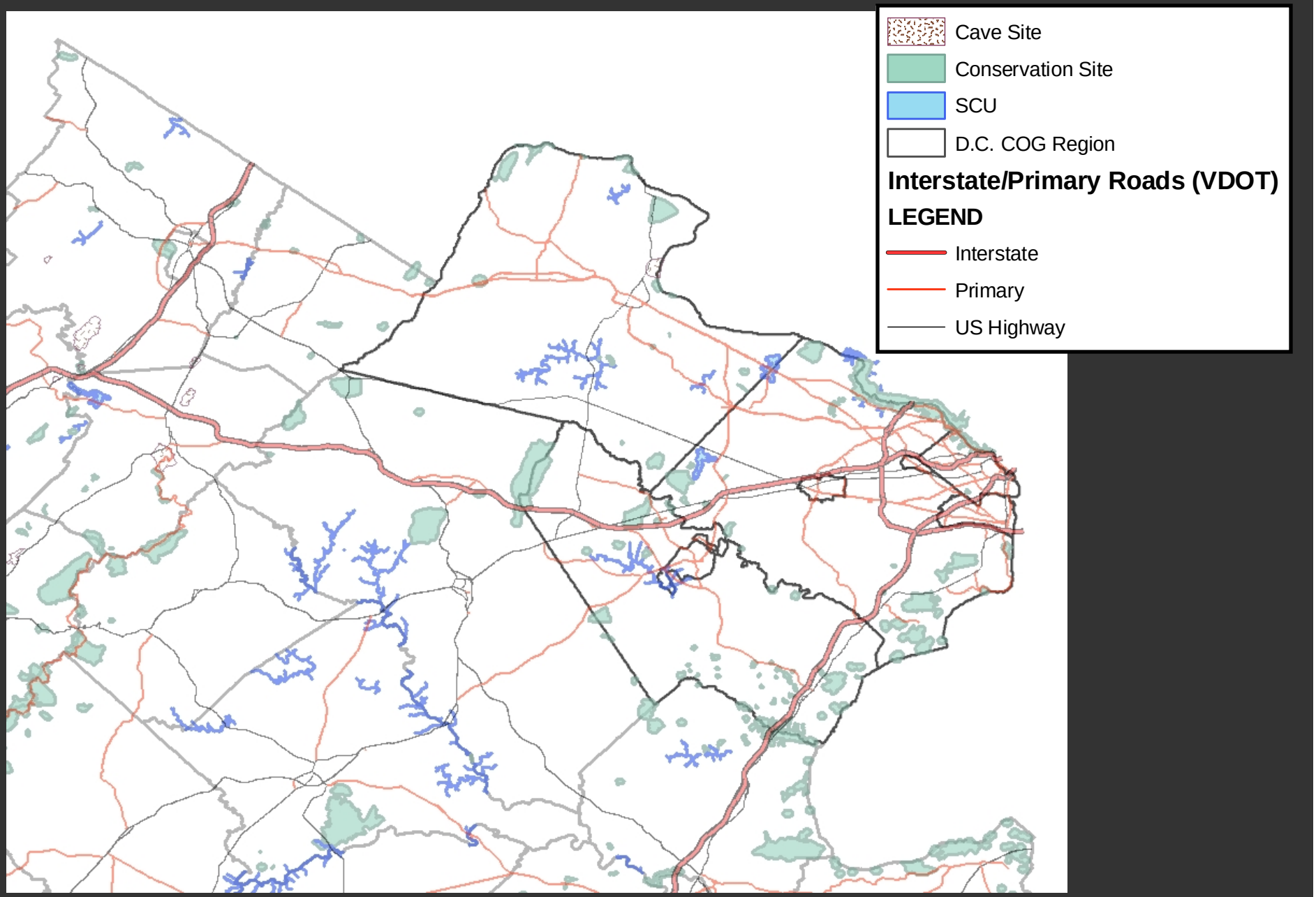
B2 - Very High

B3 – High

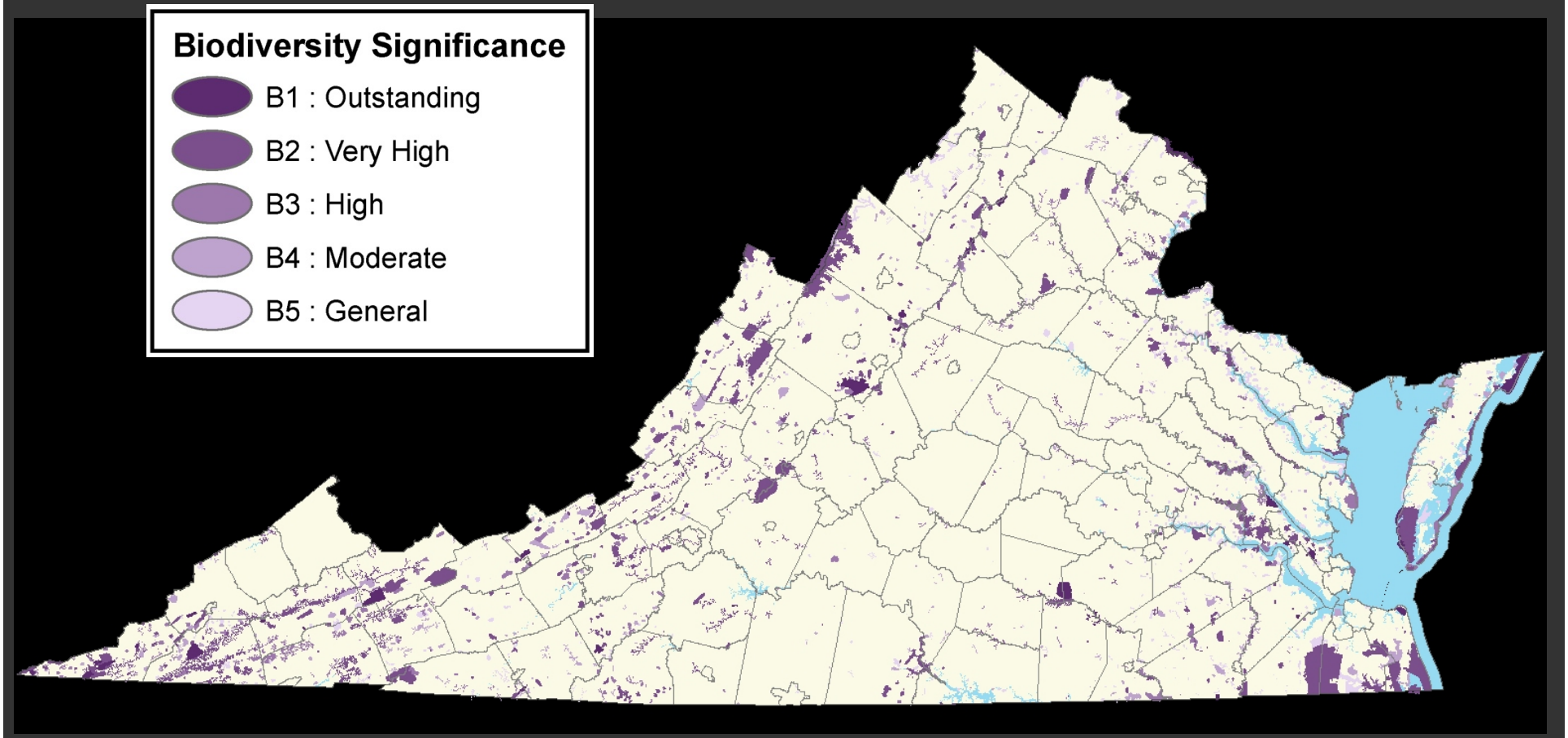
B4 - Moderate

B5 - General

Conservation Sites and SCUs



Conservation Sites by B-rank



Coarse Filter Approaches

Coarse filter approaches are designed to conserve high percentages of species by conserving adequate diversity, distribution, and abundance of:

ecological communities
ecological land units (e.g. alliances of ecological communities)
physical environments
landscape-level ecological phenomena

Conservation Lands database

Virginia Natural Landscape Assessment (VaNLA)

Wetland Restoration Catalog

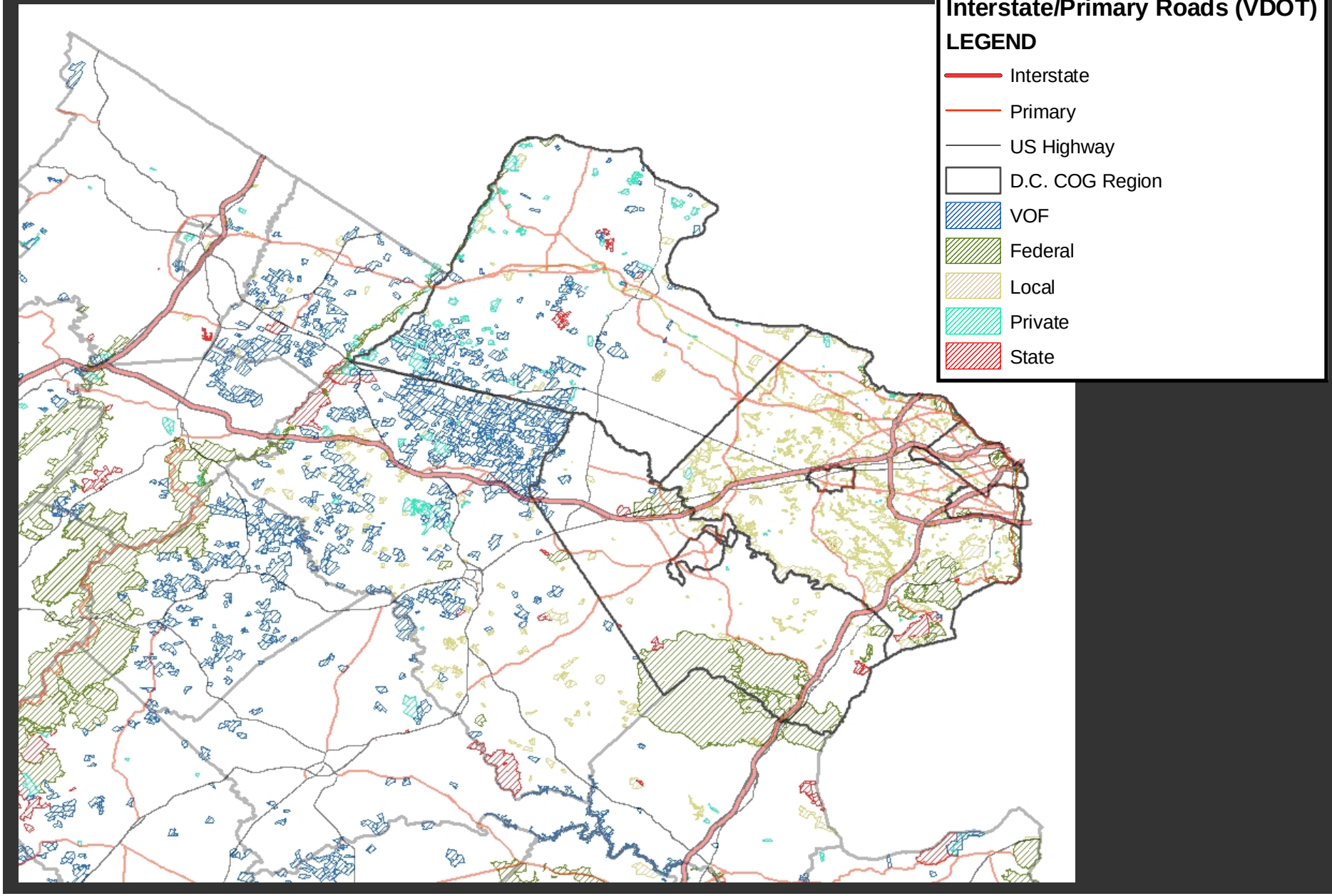
Importance of coarse filter approach in realizing advanced mitigation opportunities?

Landscape level and mindful of connectivity

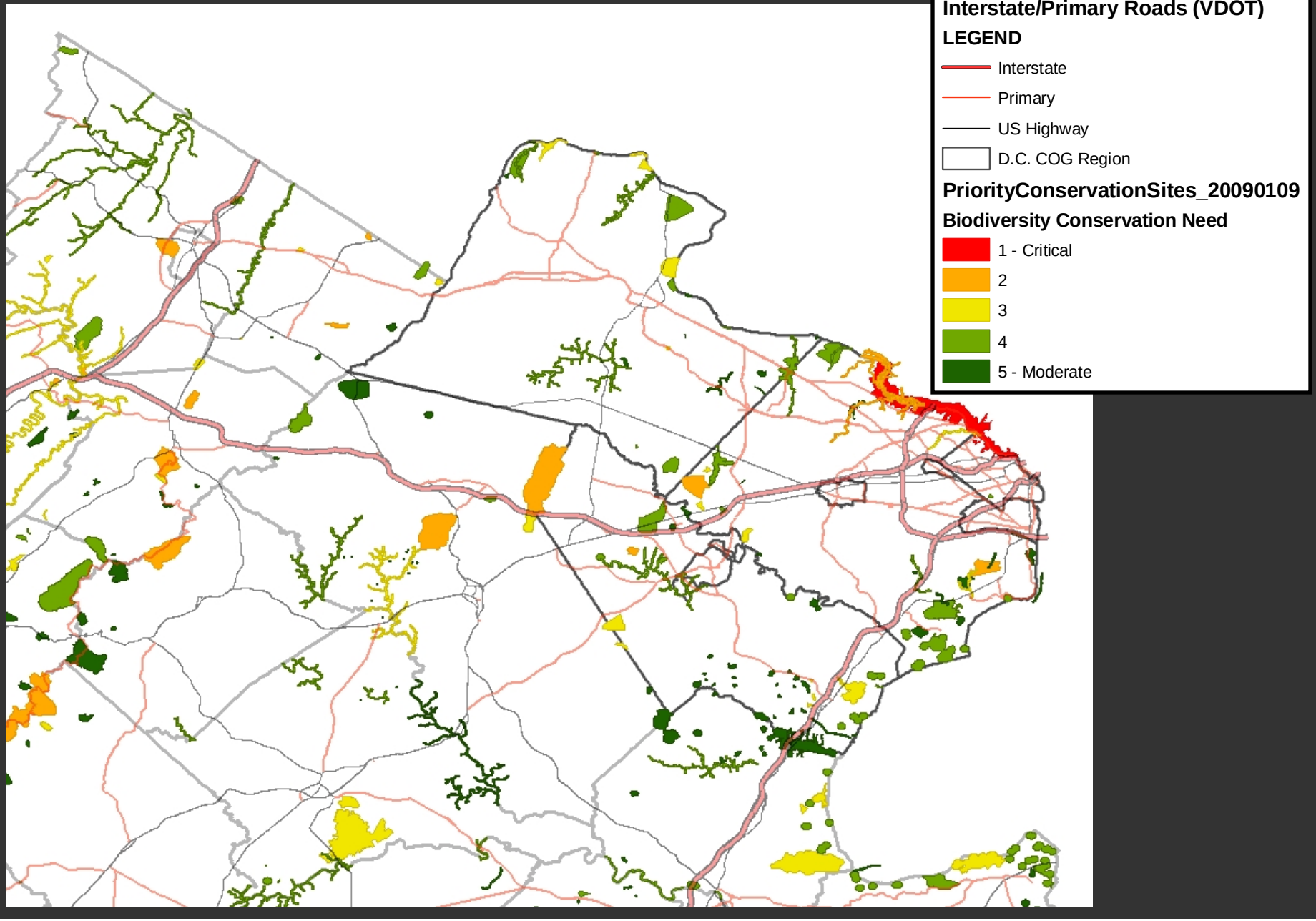
- enables the establishment of area-sensitive species
- increases diversity in microclimate and microhabitat, and thus the habitat available for diverse species populations
- provides a population source for surrounding patch habitats that are subjected to more disturbances
- strengthens metapopulation dynamics by:
  - decreasing chance of local extinctions in smaller, unprotected,unmanaged areas
  - increasing rates of colonization or surrounding patches

Function!

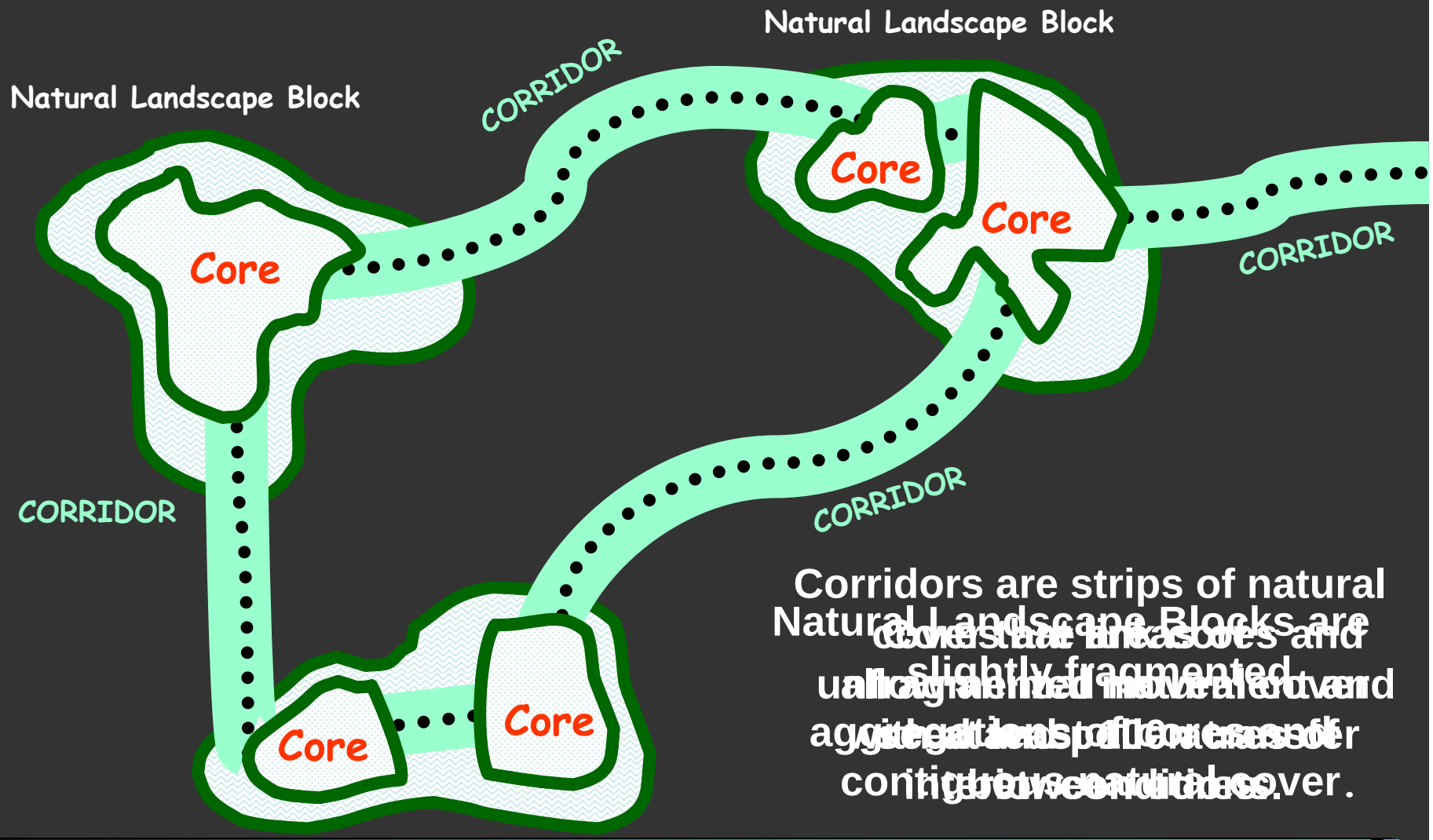
Conservation Lands



Priority Conservation Sites and SCUs



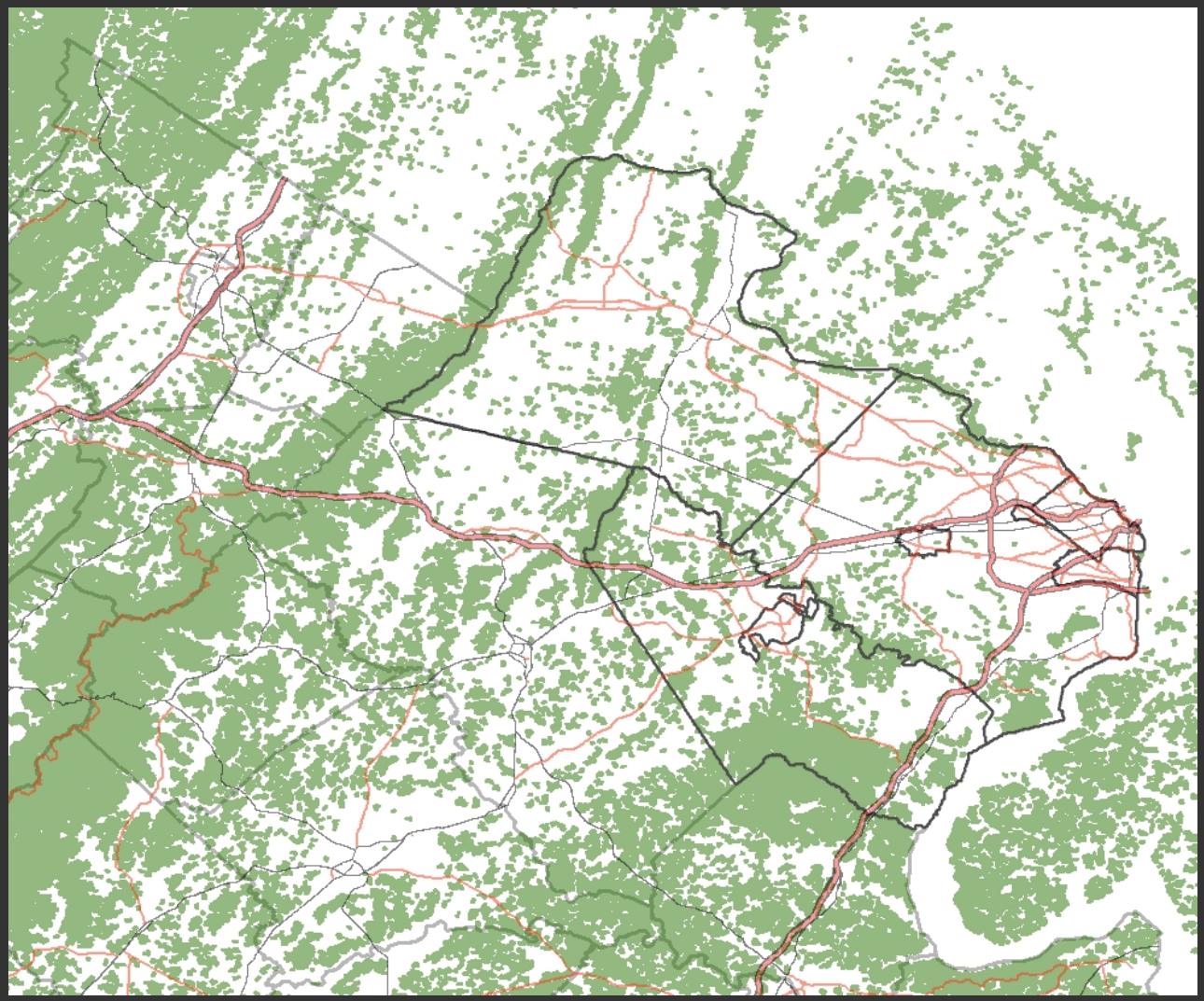
Virginia Natural LandScape Assessment (VaNLA)



Virginia Natural LandScape Assessment (VaNLA)

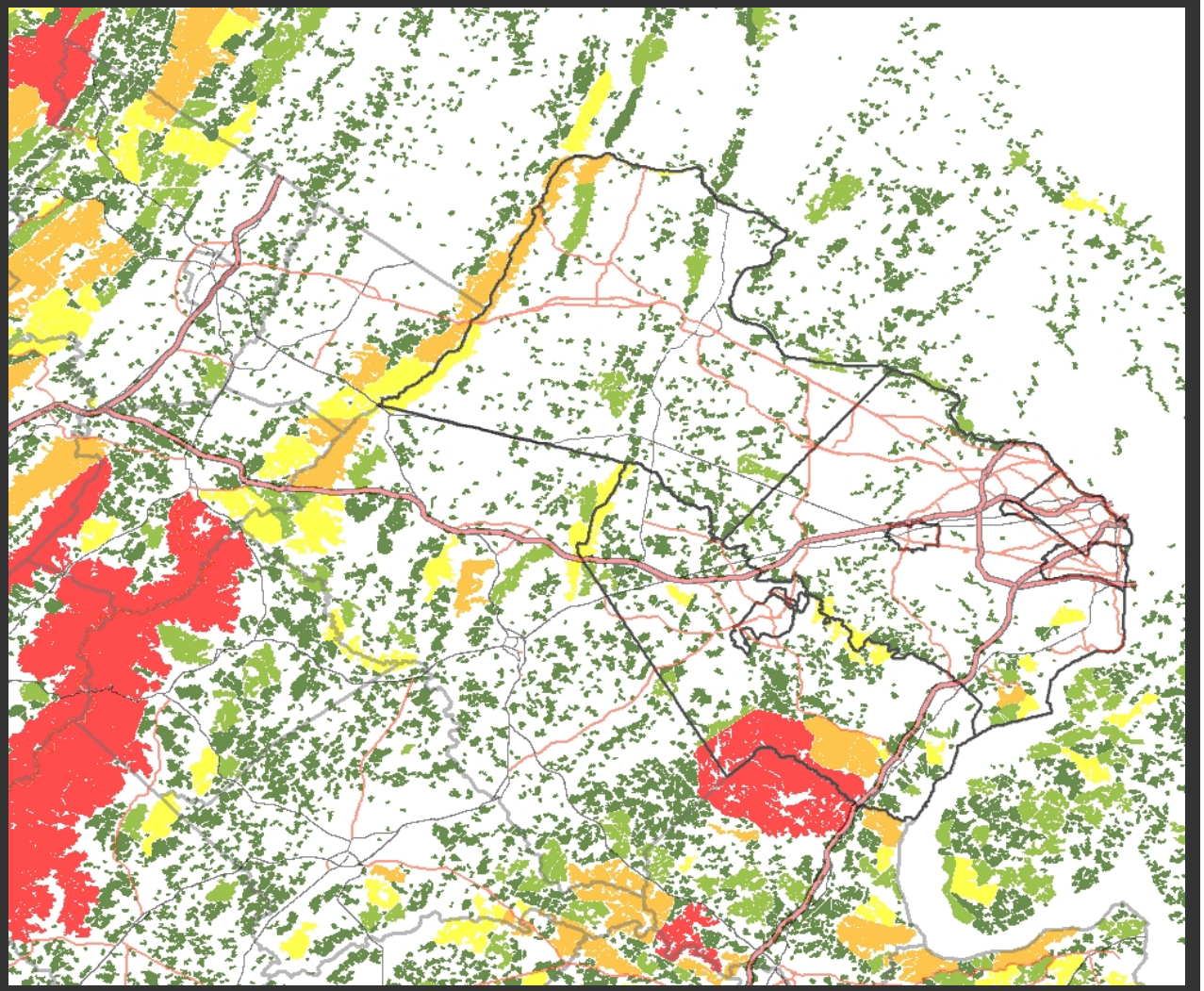
Objective - to identify and rank a network of remaining intact natural habitats remaining in Virginia (a.k.a. cores)

Cores – areas consisting of >= 100 ac. of continuous natural cover



Virginia Natural Landscape Assessment (VaNLA)
Ecological Integrity Model

- to rank core areas based on their contributions to a functional ecological network



Inputs/Methods –

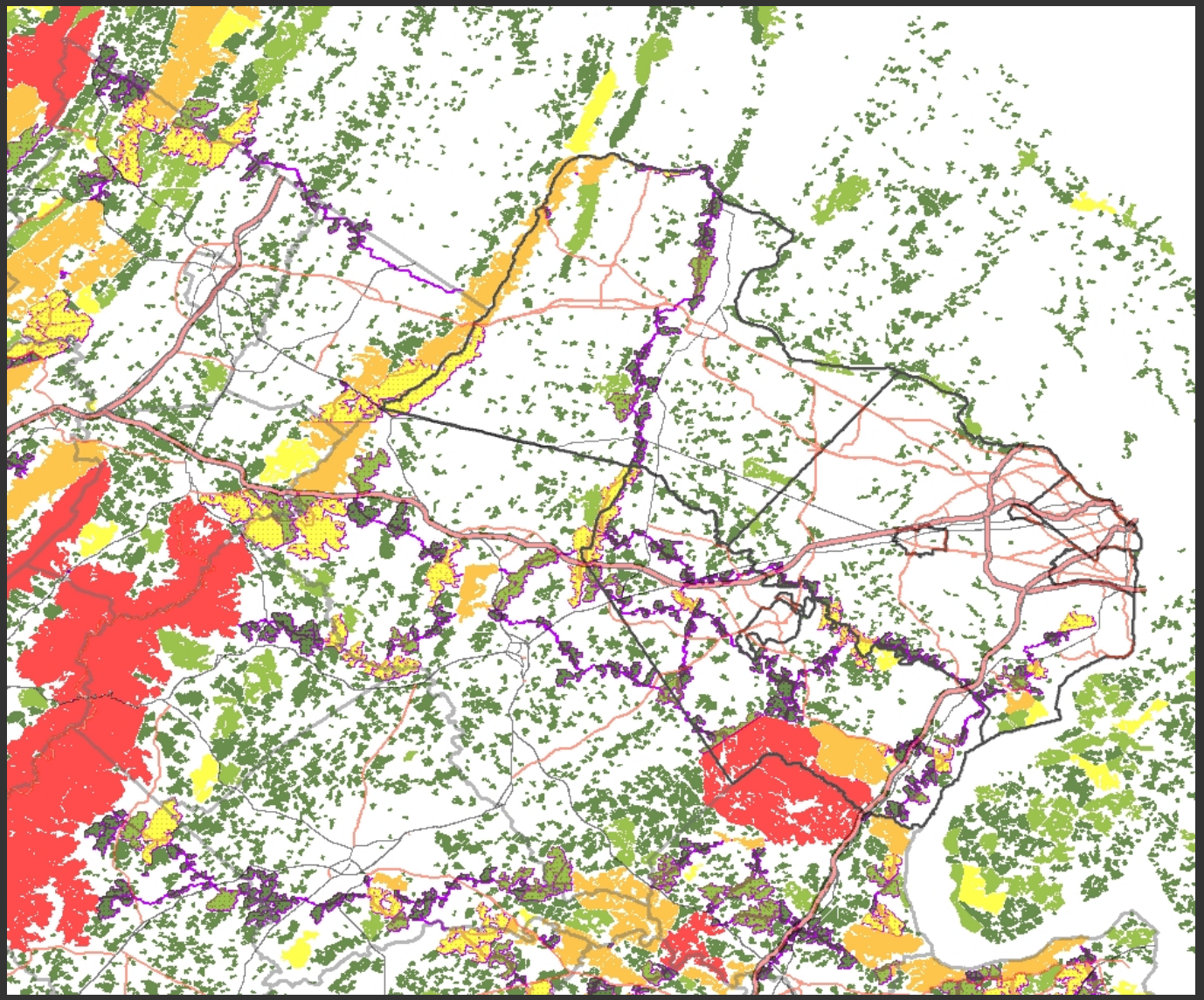
• 53 attributes (e.g. depth of interior habitat, core size, length of interior streams, wetlands abundance and diversity of wetland types, presence of Natural Heritage resources, SWAP SGCN…)

•Narrowed down to 9 with PCA

• Cores ranked from general value (green) to outstanding (red) ecological significance

Virginia Natural Landscape Assessment (VaNLA)
Ecological Integrity Model

Corridors - network connecting highest ranked cores (C1 and C2 cores) for “flow” and function of ecosystem services



Virginia Natural Heritage Wetland Restoration Catalog

•Catalog of potential wetland restorations sites, within or adjacent to Natural Heritage Conservation Sites

•To guide localities and regulatory agencies to appropriate sites for restoration and mitigation activities

Methods:

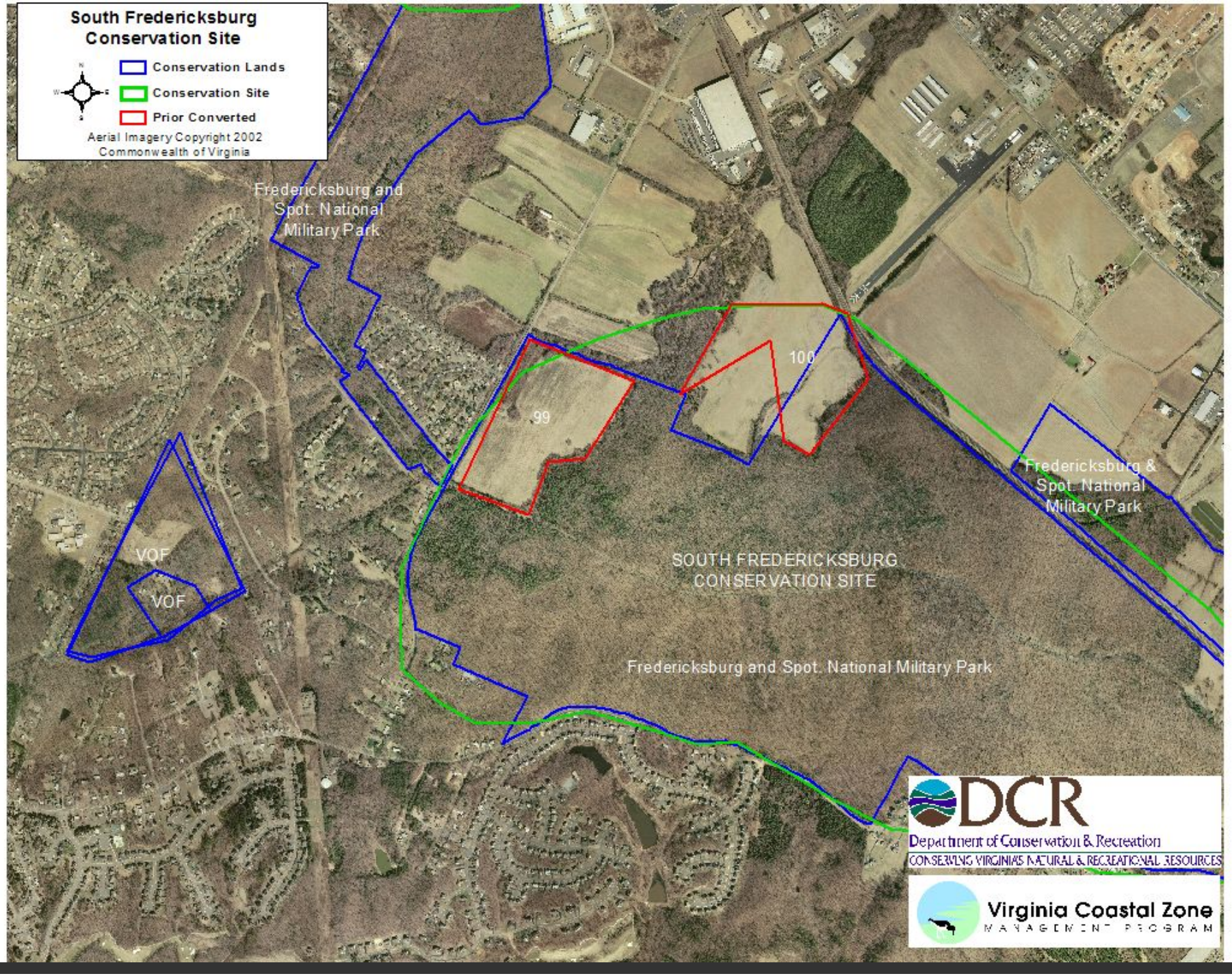
-identified conservation sites larger than 500 acres with biodiversity ranks of B-1 (outstanding) to B-3 (high)

-Assessed alongside 2002 aerial photography, NWI and other GIS datasets

-Delineated prior converted wetland patches occurring on private and public lands

-118 suitable candidate sites for restoration

•Revised this with 2006/7 imagery


South Fredericksburg
Conservation Site
Conservation Lands
Conservation Site
Prior Converted
Aerial Imagery Copyright 2002
Commonwealth of Virginia
Fredericksburg and
Spot. National
Military Park
99
100
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SOUTH FREDERICKSBURG
CONSERVATION SITE
Fredericksburg and Spot. National Military Park
DCR
Department of Conservation & Recreation
CONSERVING VIRGINIA'S NATURAL & RECREATIONAL RESOURCES
Virginia Coastal Zone
MANAGEMENT PROGRAM

Virginia Natural Heritage Wetland Restoration Catalog

Upcoming revision:

-Beyond-NWI wetland datasets (Natural Heritage communities, DEQ data, historic wetlands maps)

-Virginia Conservation Lands
-Improved soils data
-VaNLA
-Predictive distribution models for wetland-dependent species
-2009 Imagery

-Existing restoration sites

-Final product with a goal to identify at least one wetland priority area within each 8 digit HUC watershed in Virginia

Thank You

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