

VERMONT CONSERVATION DESIGN

A VISION FOR AN ECOLOGICALLY FUNCTIONAL LANDSCAPE



**Senate Committee on Natural
Resources and Energy**
February 5, 2019

Eric Sorenson
Bob Zaino
Jens Hilke
Doug Morin



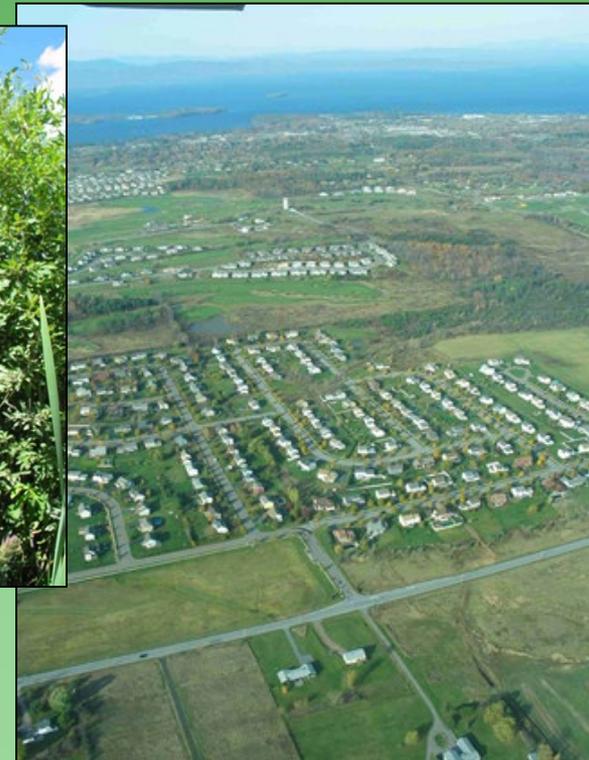
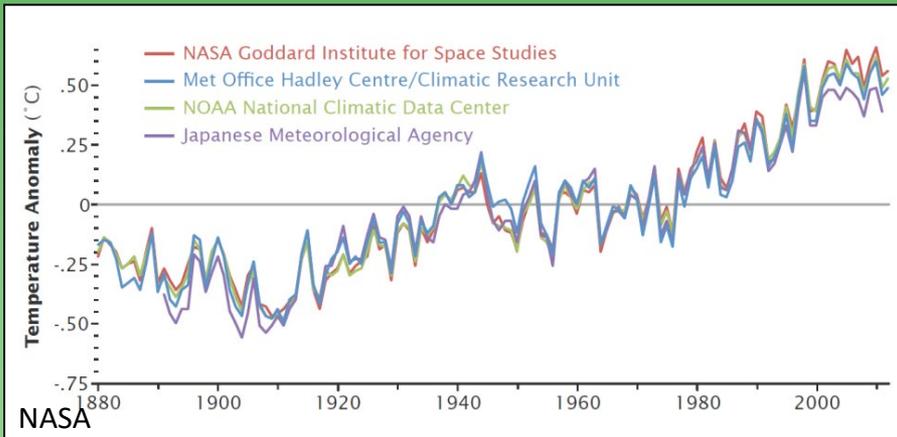
Vermont Fish & Wildlife Department

The mission of the Vermont Fish & Wildlife Department is the conservation of our fish, wildlife, plants, and their habitats for the people of Vermont.



Threats to Biological Diversity

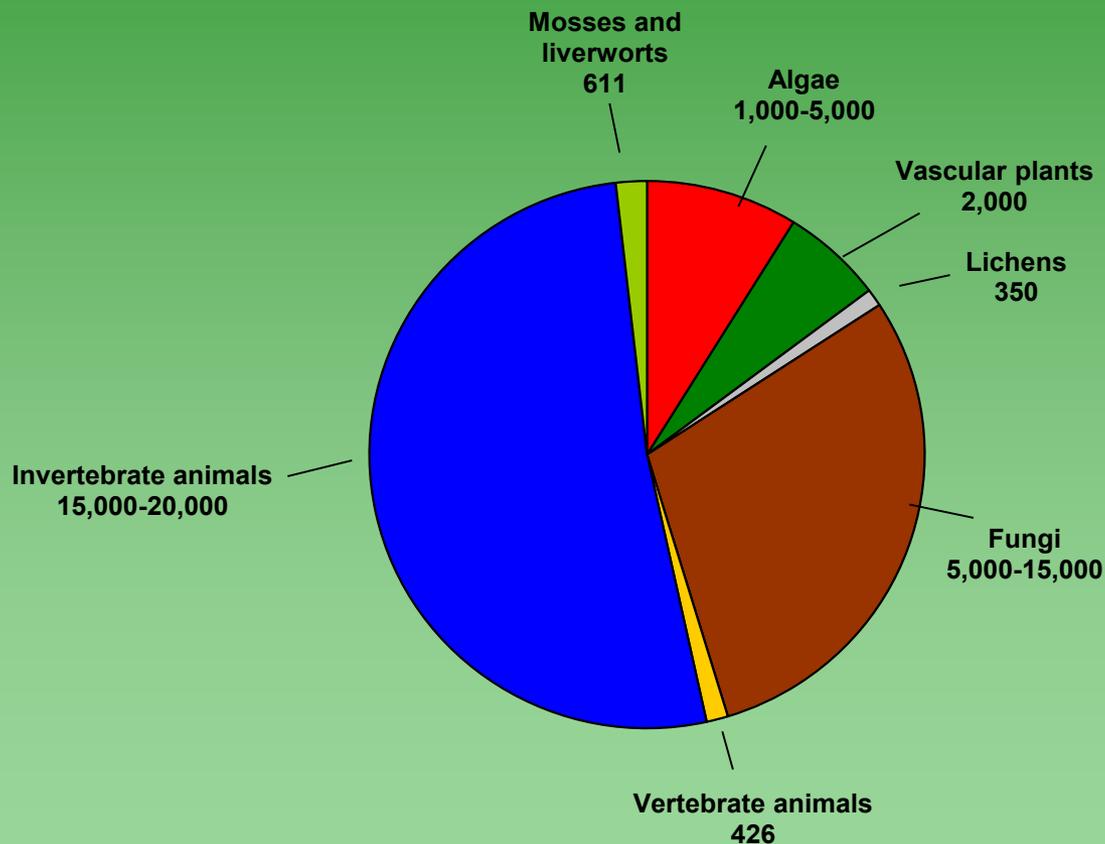
- Population growth
- Habitat loss
- Habitat fragmentation
- Non-native, invasive species
- Climate change – direct and compounding effects



New!

An estimated 24,000 to 43,500 species in Vermont!

How do we protect them all?



Elfin
Skimmer

Coarse filter/fine filter approach to conservation

- *Well-recognized, efficient approach to conservation*
- *Originally a combination of natural communities & species conservation efforts*



We need coarser filters



VERMONT CONSERVATION DESIGN

A practical, scientific vision for sustaining Vermont's ecologically functional landscape for the future.

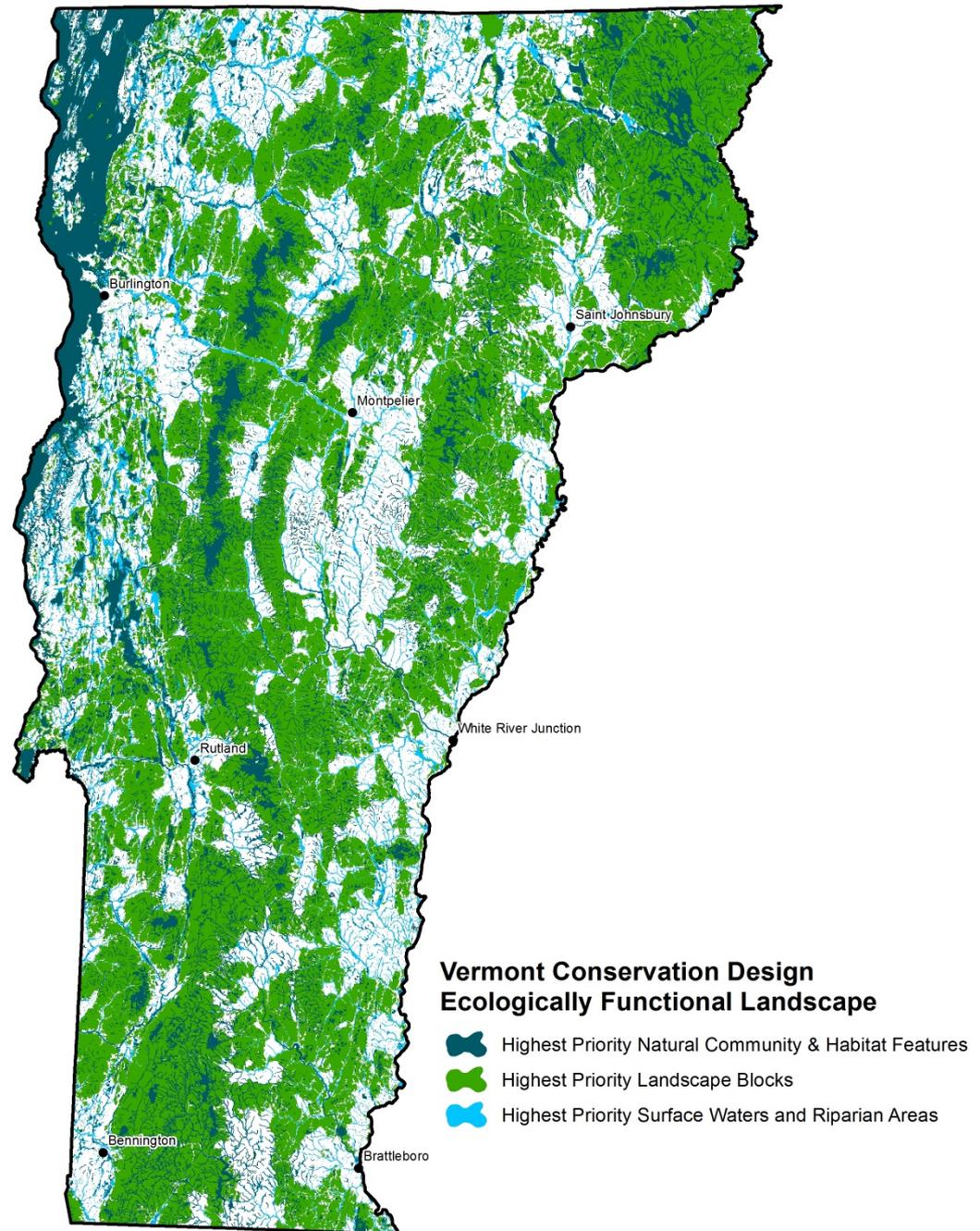
- Applies the coarse filter-fine filter approach
- Uses simple, recognizable features
- Depends on thoughtful stewardship and management



Ecologically Functional Landscape

- Intact
- Connected
- Diverse

A set of coarse-filter features which, if appropriately conserved and managed for their ecological functions, offer high confidence in maintaining biological diversity and ecological processes into the future.



Conservation Design at Three Scales

Landscapes



Natural Communities



Species



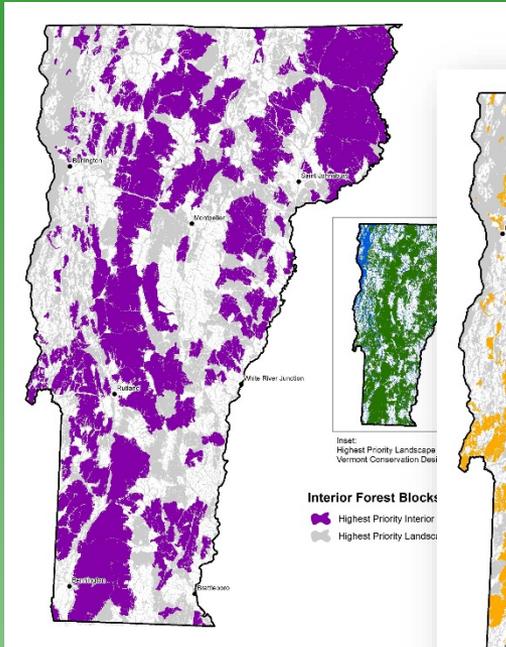
Interior Forest Blocks
Connectivity Blocks
Surface Waters and Riparian Areas
Riparian Areas for Connectivity
Physical Landscapes
Wildlife Road Crossings

Natural Communities
Young and Old Forest
Aquatic Habitats
Wetlands
Grasslands/Shrublands
Underground Habitats

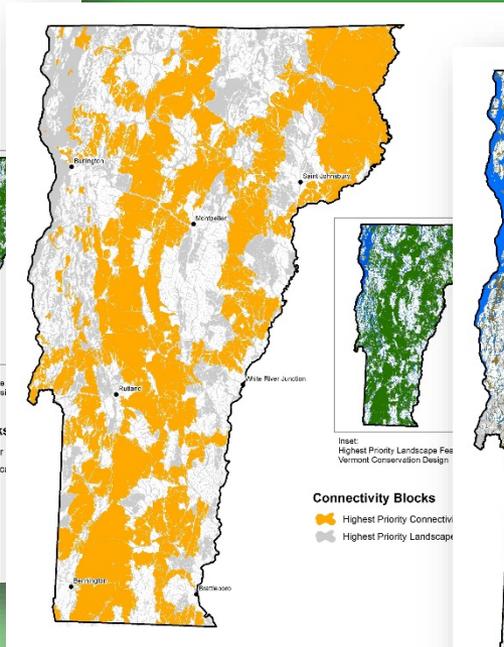
Species with very specific biological needs that will likely always require individual attention

Intact and Connected Forest Blocks Surface Waters and Riparian Areas

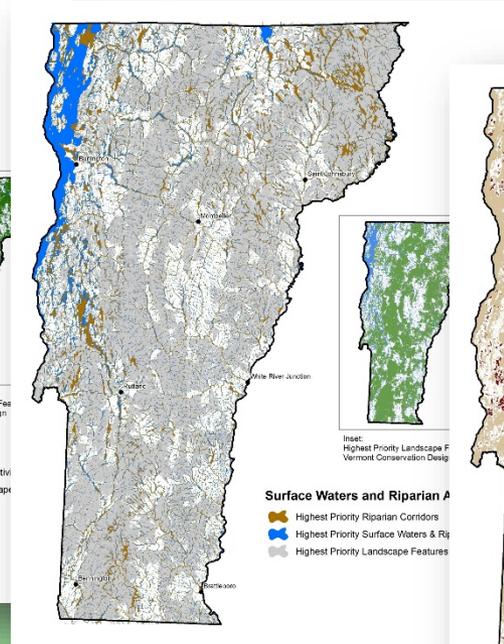
Interior Forest Blocks



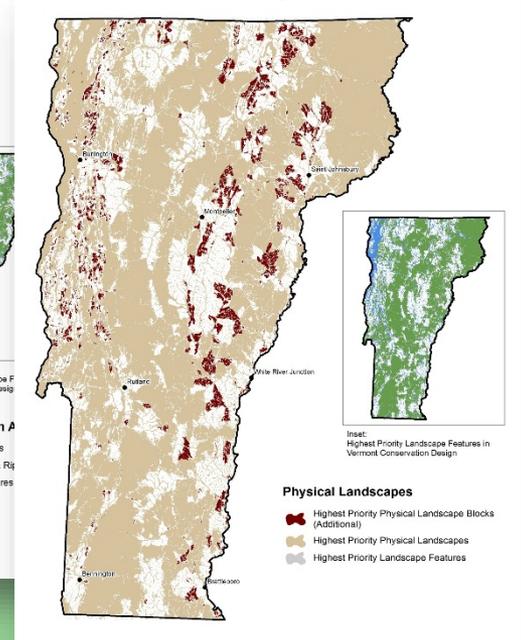
Connectivity Blocks



Surface Waters and Riparian Areas



Physical Landscape Diversity



Maintain the specific functions of each element

Wildlife Road Crossings

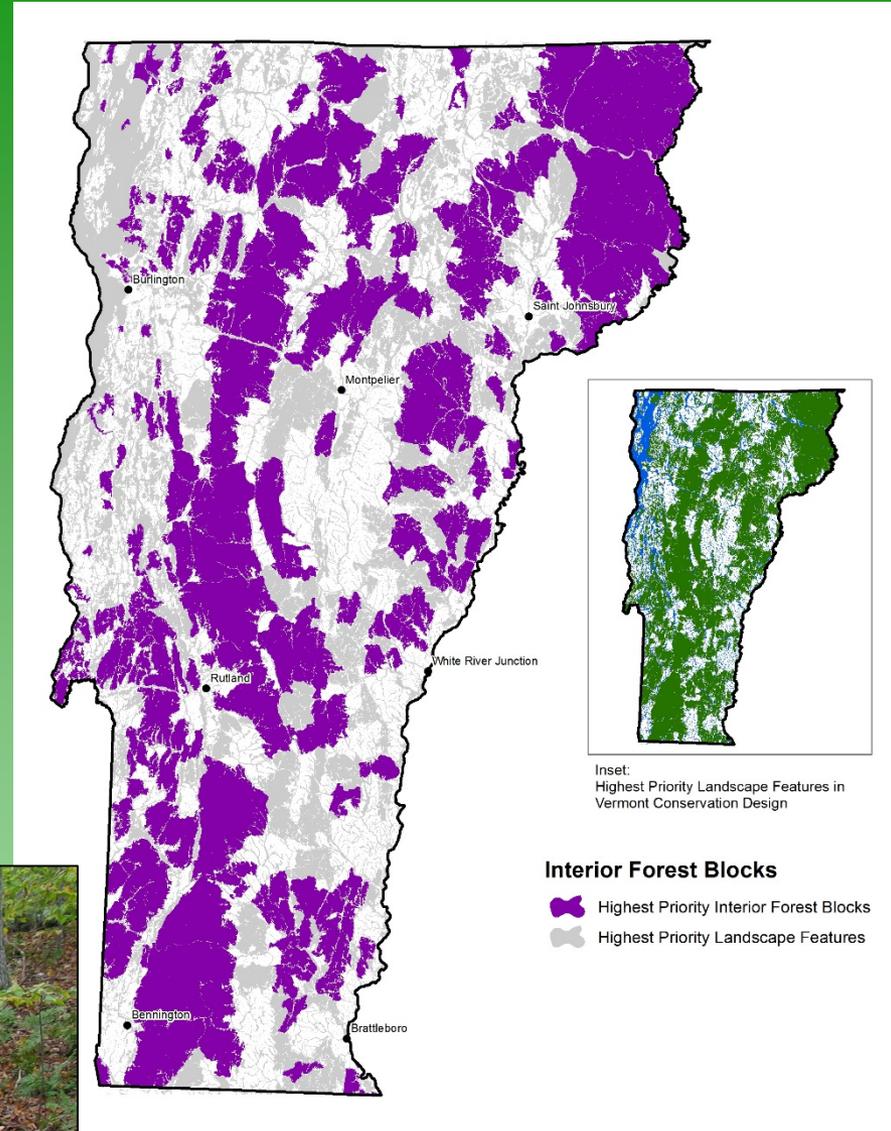
Interior Forest Blocks

The best examples of interior forest in each region of Vermont

Places where species and ecological process exist with minimal disturbance

Ecological functions:

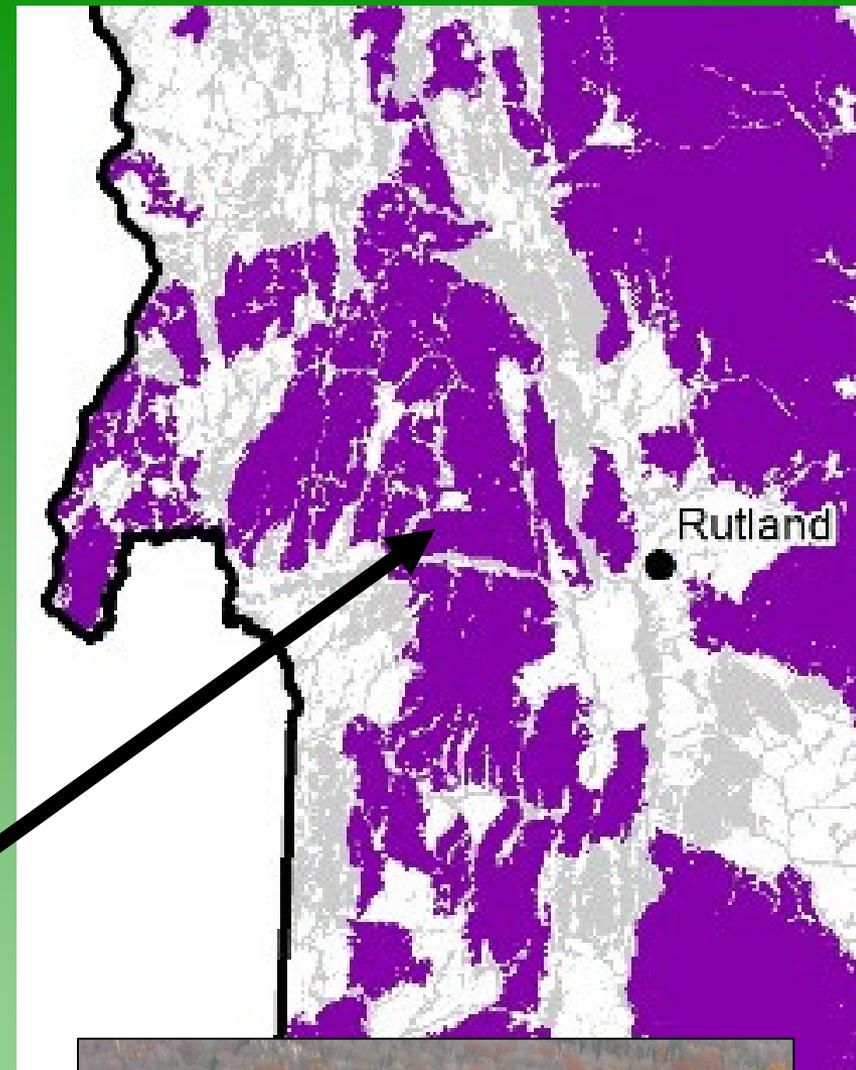
- Interior forest species
- Wide-ranging mammals
- Air and water quality
- Flood resilience
- Ecological processes
- Species can shift and adapt within blocks



Interior Forest Blocks

Guidelines for Maintaining Ecological Function:

- Avoid permanent interior fragmentation
- Limit development to the margins
- Maintain forest structure & distribution of age classes
- Minimize invasive species



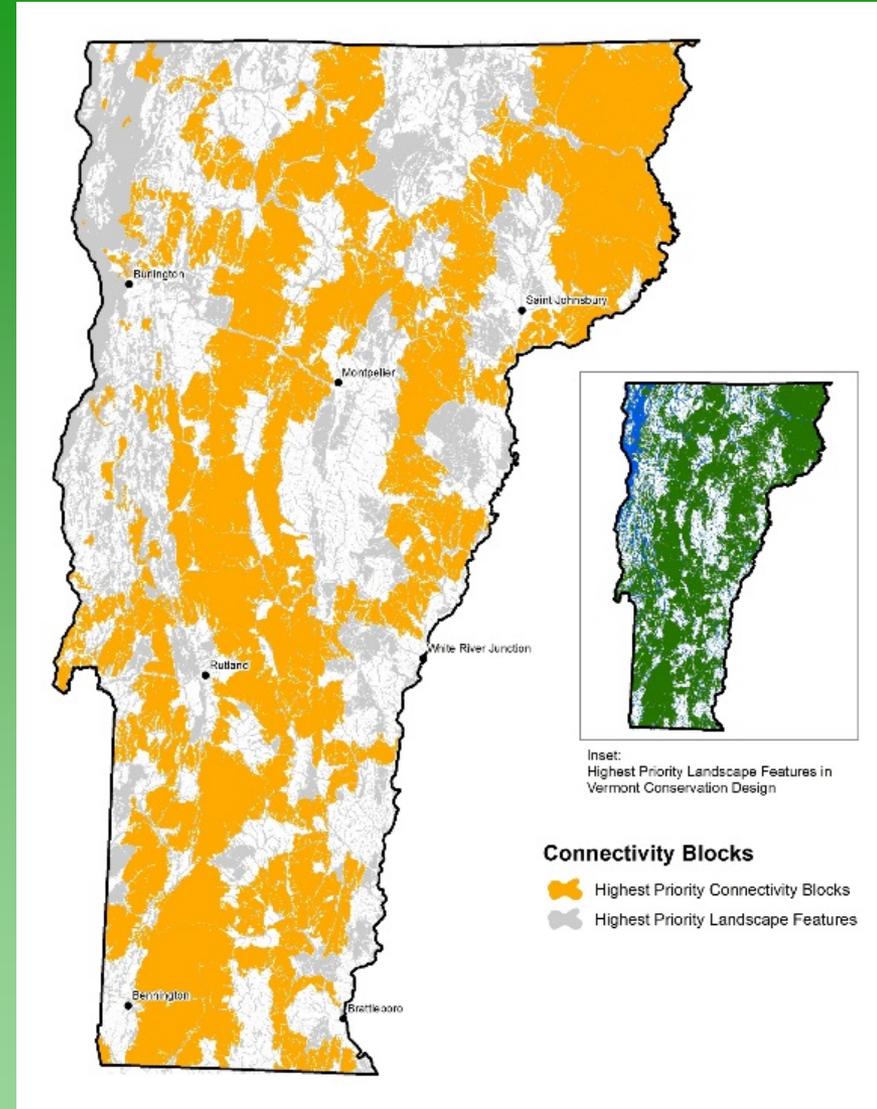
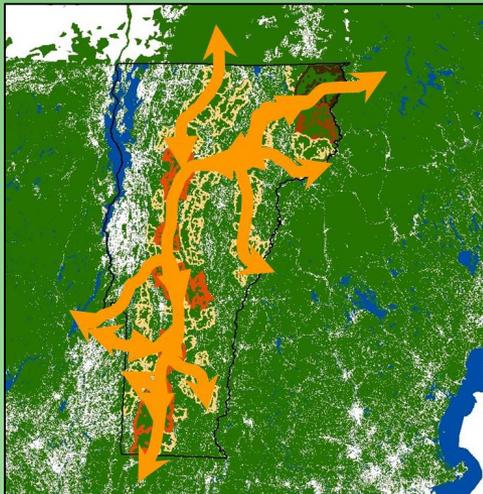
Connectivity Blocks

The network of forest blocks that are critical for wildlife movement and species ranges shifts

Connects within Vermont and to adjacent states and Québec

Ecological Functions:

- Wildlife movement and dispersal
- Habitat for wide-ranging mammals
- Genetic exchange
- Plant and animal range shifts in response to climate change
- Reduces extinction risks

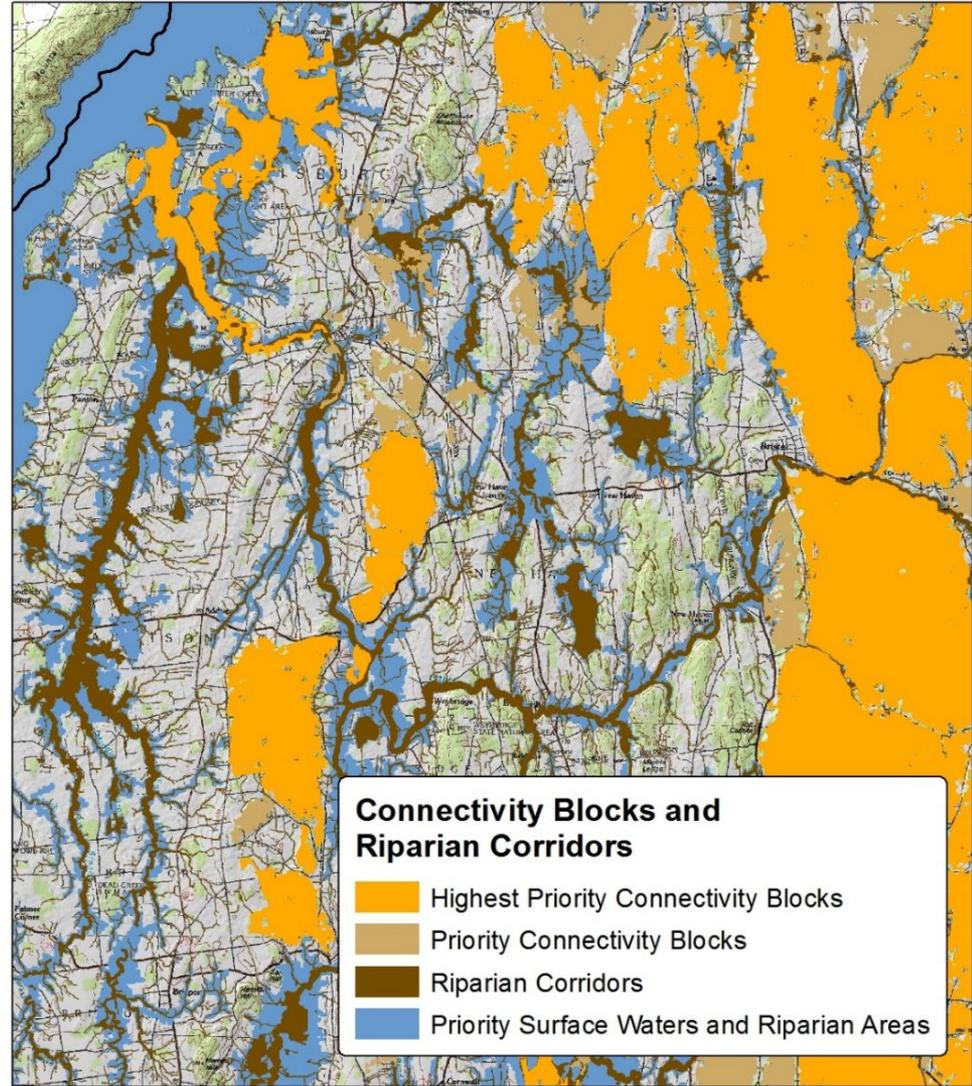


Riparian Connectivity



In parts of the state, riparian areas are the only connections between forest blocks

We need to restore riparian vegetation.



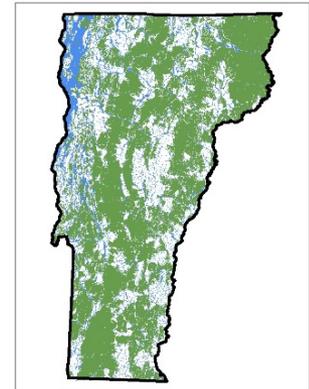
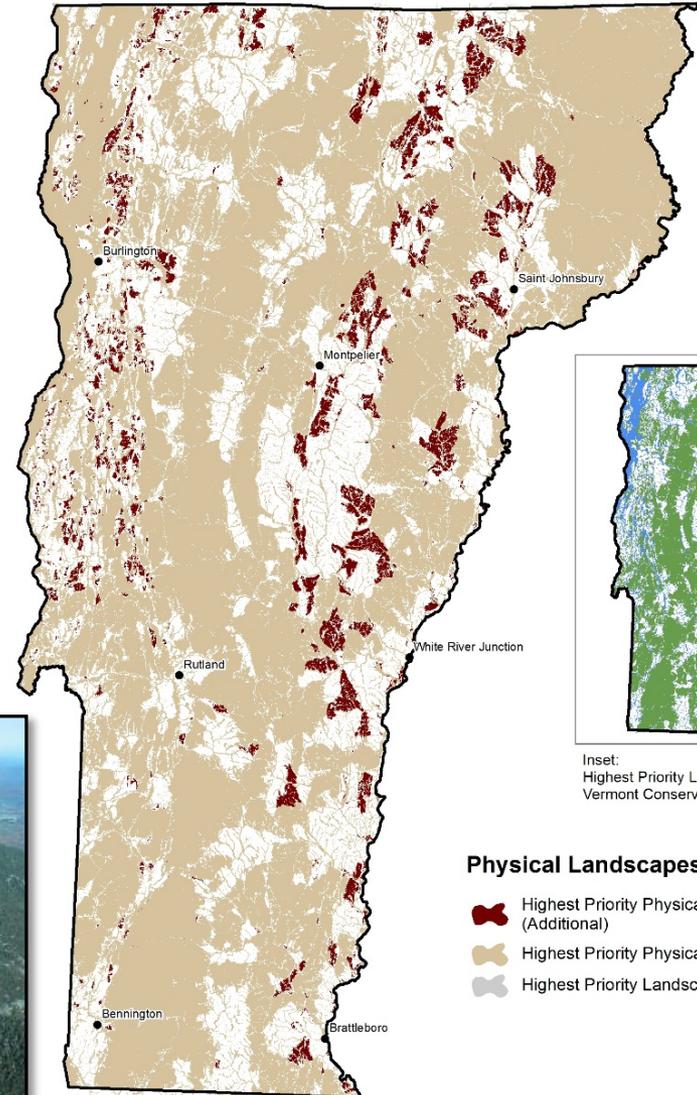
Physical Landscape Diversity

Represents Vermont's full diversity of elevation, geology, and landforms

Critical for climate resilience

Ecological functions:

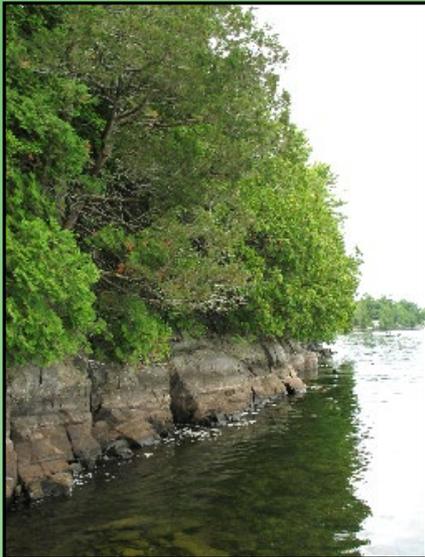
- Meets current and future habitat needs
- Species can shift ranges in response to climate change



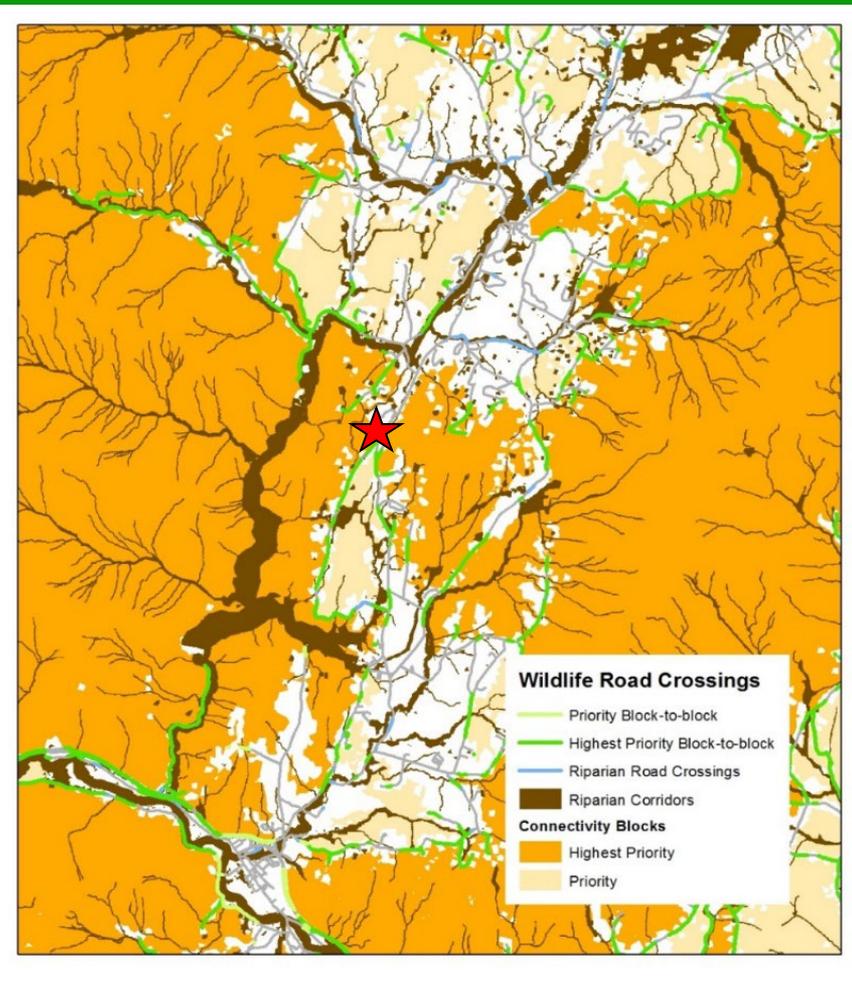
Inset:
Highest Priority Landscape Features in
Vermont Conservation Design

Physical Landscapes

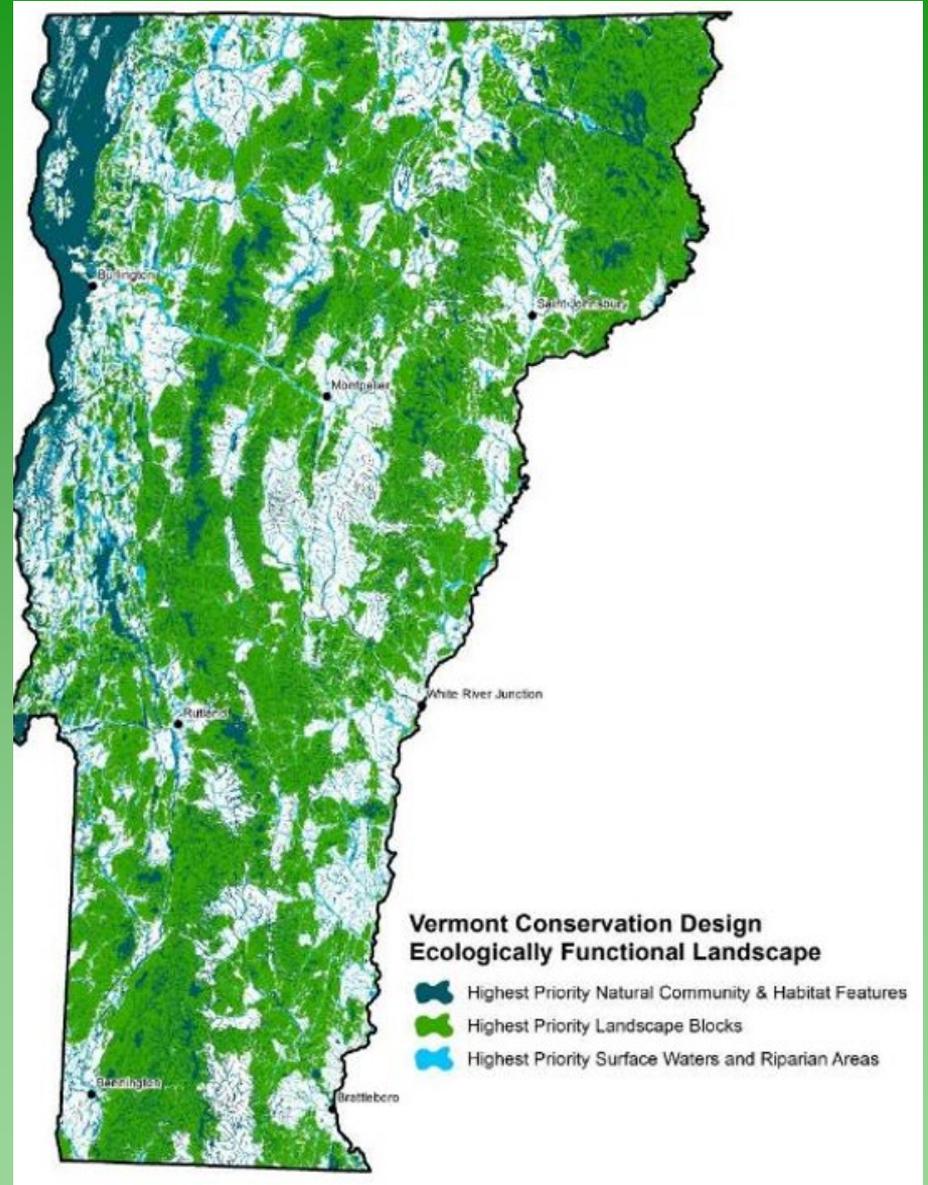
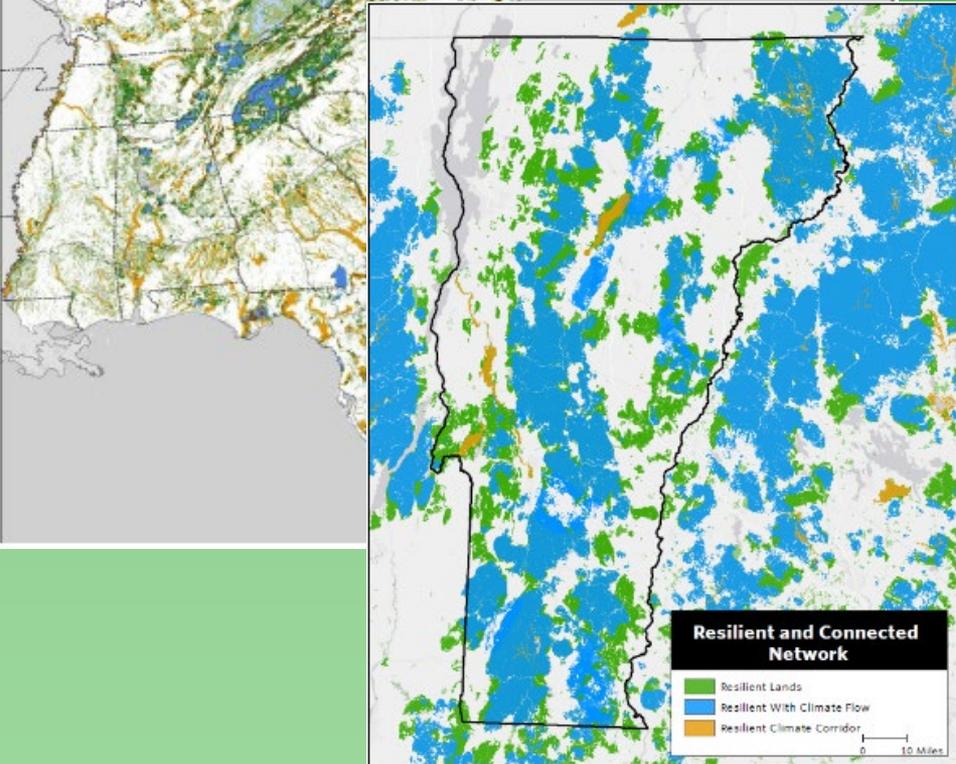
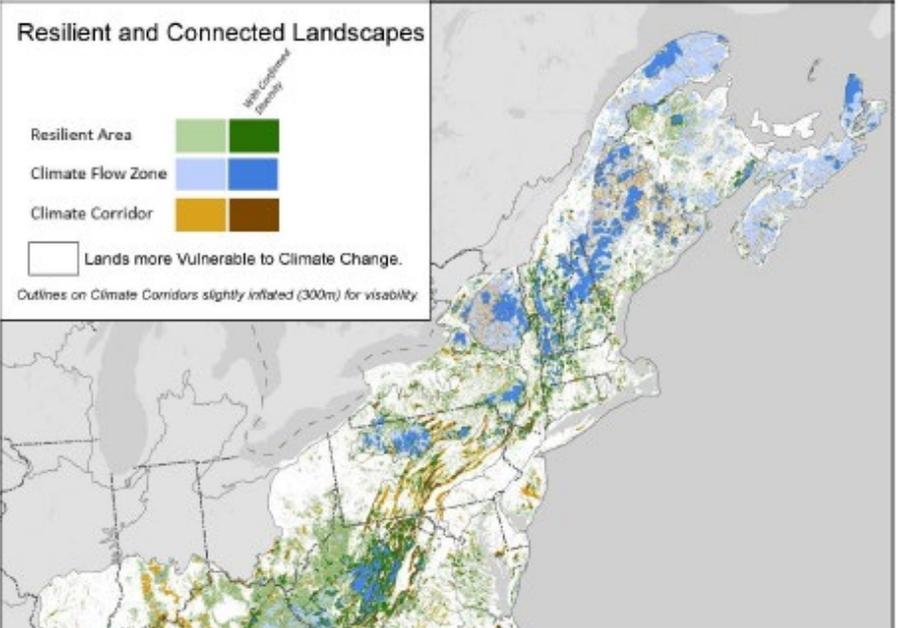
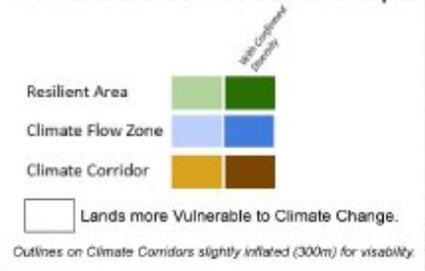
- Highest Priority Physical Landscape Blocks (Additional)
- Highest Priority Physical Landscapes
- Highest Priority Landscape Features



Wildlife Road Crossings



Resilient and Connected Landscapes



Conservation Design at Three Scales

Landscapes



Natural Communities



Species

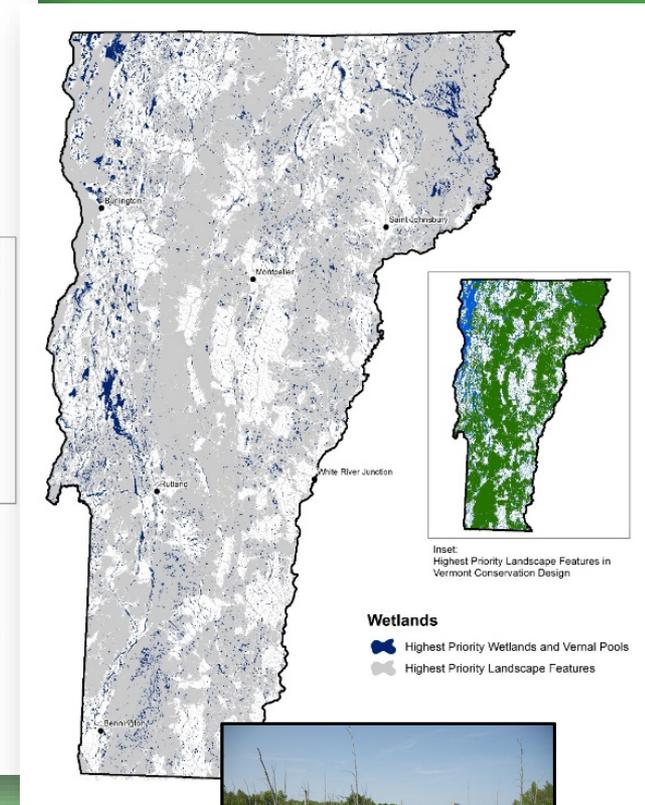
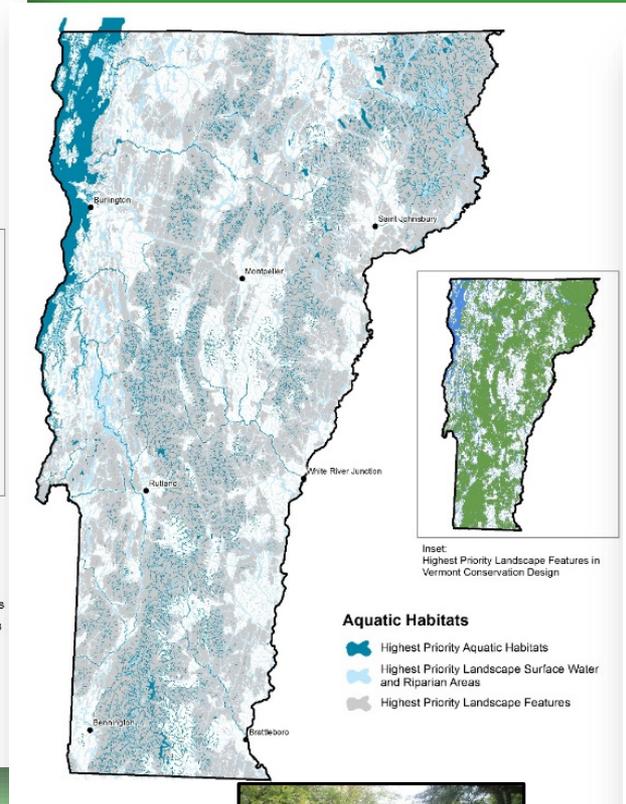
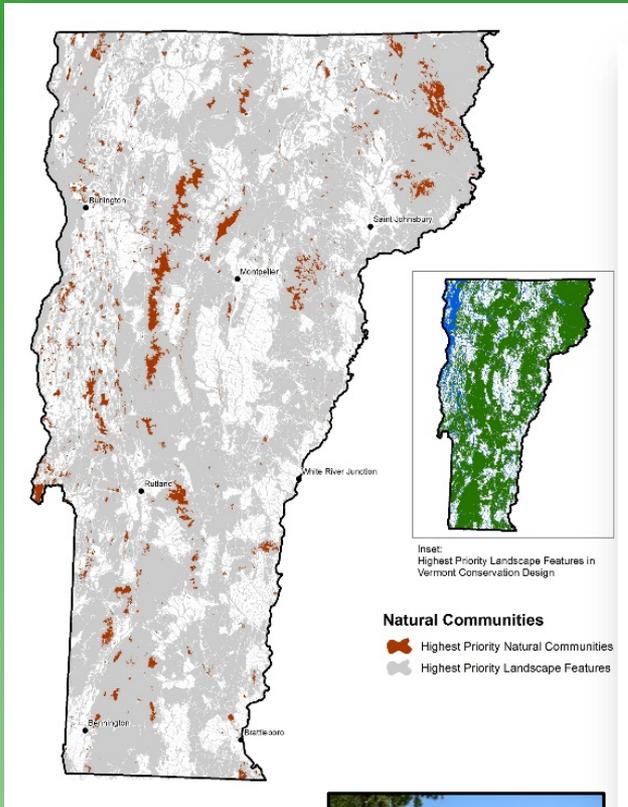


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Natural Communities
Young and Old Forest
Aquatic Habitats
Wetlands
Grasslands/Shrublands
Underground Habitats

Species with very specific biological needs that will likely always require individual attention

Terrestrial Natural Communities, Aquatic Habitats, Wetlands, & Caves



Natural Communities

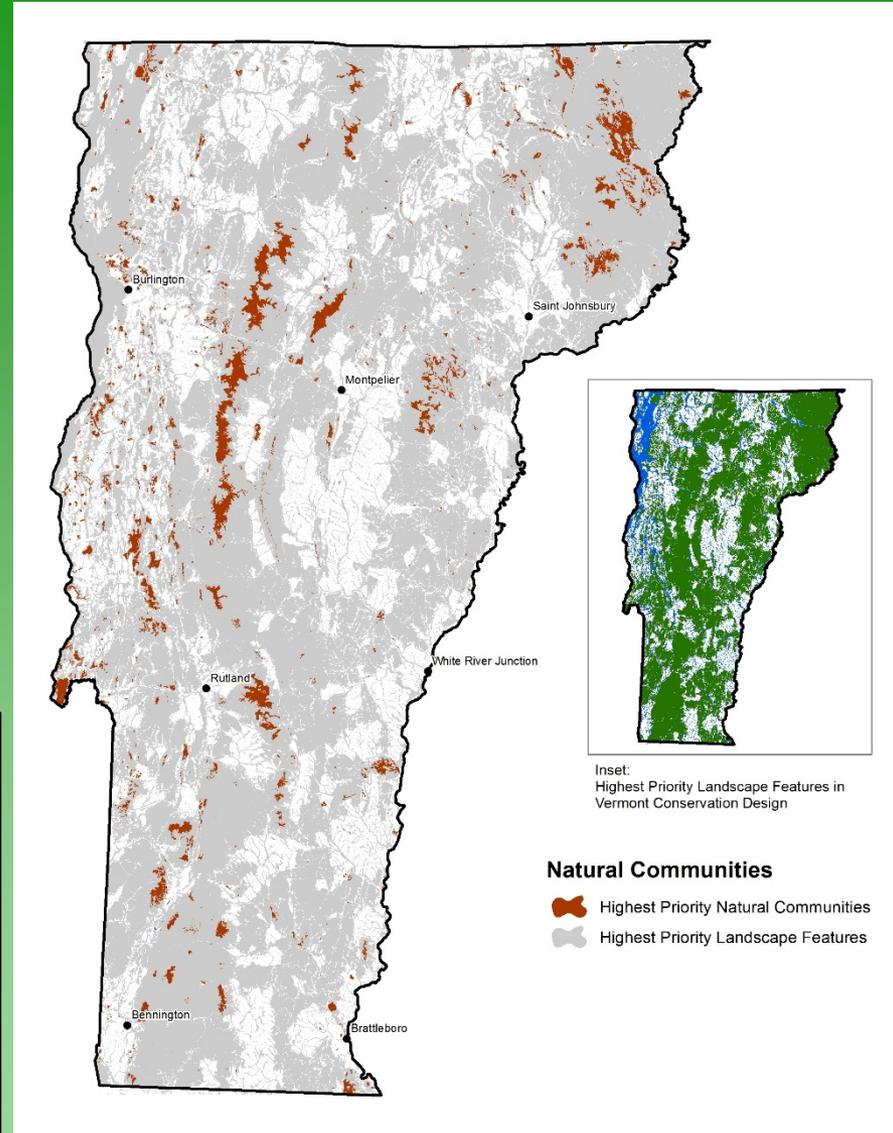
Vermont's original natural habitats

All examples of rare types and 50% of the examples of more common types

Matrix forests conserved by forest blocks and old forests

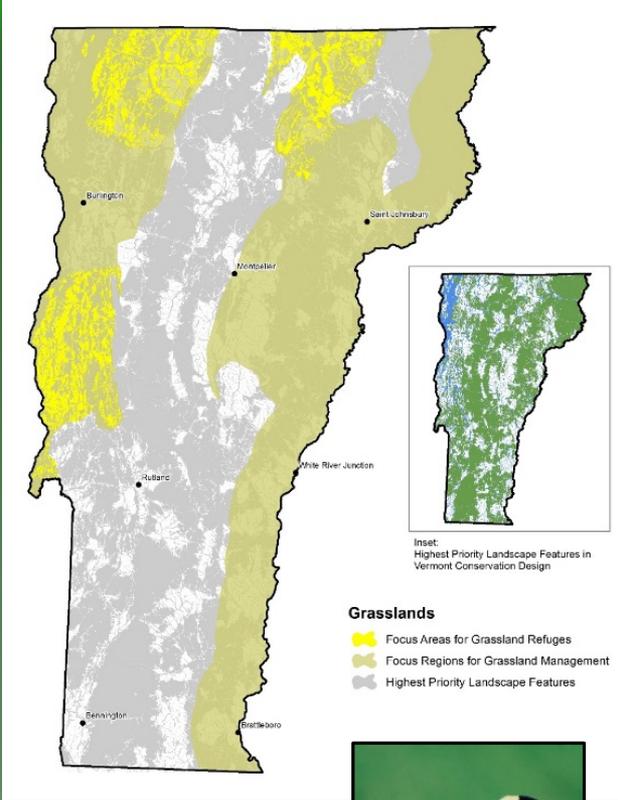
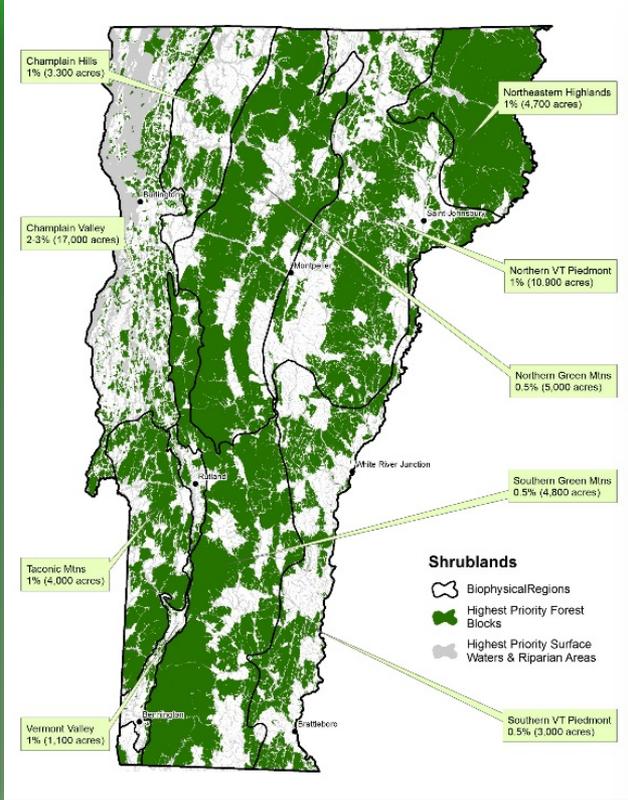
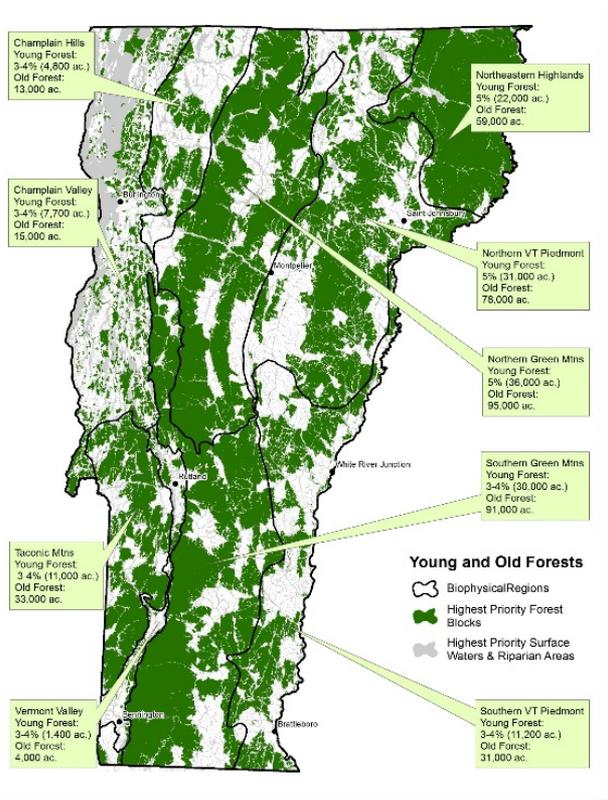
Ecological Functions:

- Coarse filters for most of our native plants and animals
- Places that will always support unique assemblages of biodiversity, even in a changing climate





Young and Old Forests, Shrublands, Grasslands



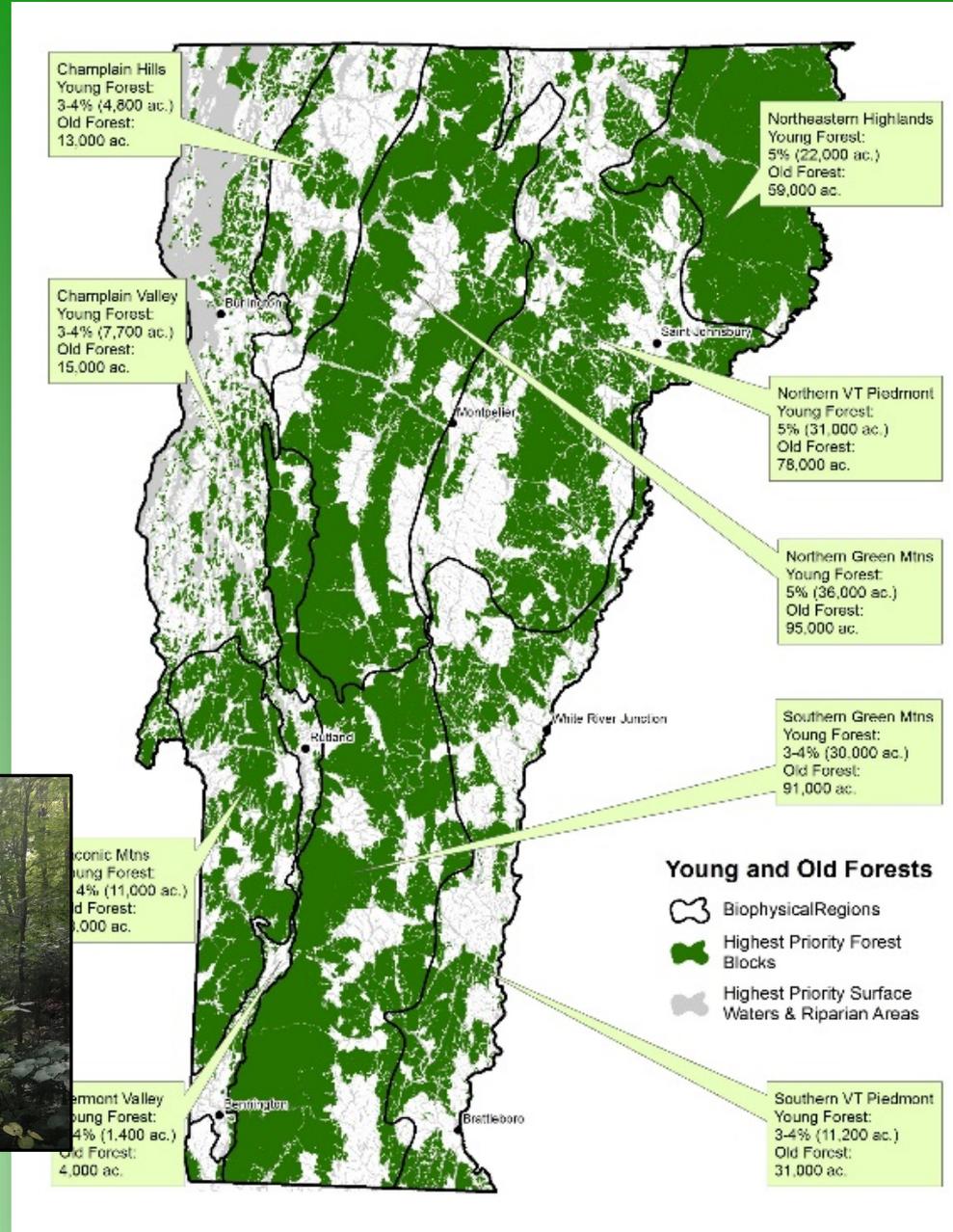
Young and Old Forests

Young and old forests support a great diversity of species and ecological processes

Target of 3-5% young forest and 10% old forest, distributed across Vermont and proportional to matrix forest types

Ecological Functions:

- Young forests are habitat for many wildlife species, especially birds.
- Old forests have complex and diverse habitats, contribute to clean air and water, and are particularly resilient to change.





- Carbon storage
- Water quality
- Resilient to change and disturbance



- Carbon sequestration
- Valued for hunting and wildlife watching

Conservation Design at Three Scales

Landscapes



Natural Communities



Species



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Forest Structures
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Species with very specific biological needs that will likely always require individual attention

Northern pale painted cup



Spiny softshell turtle

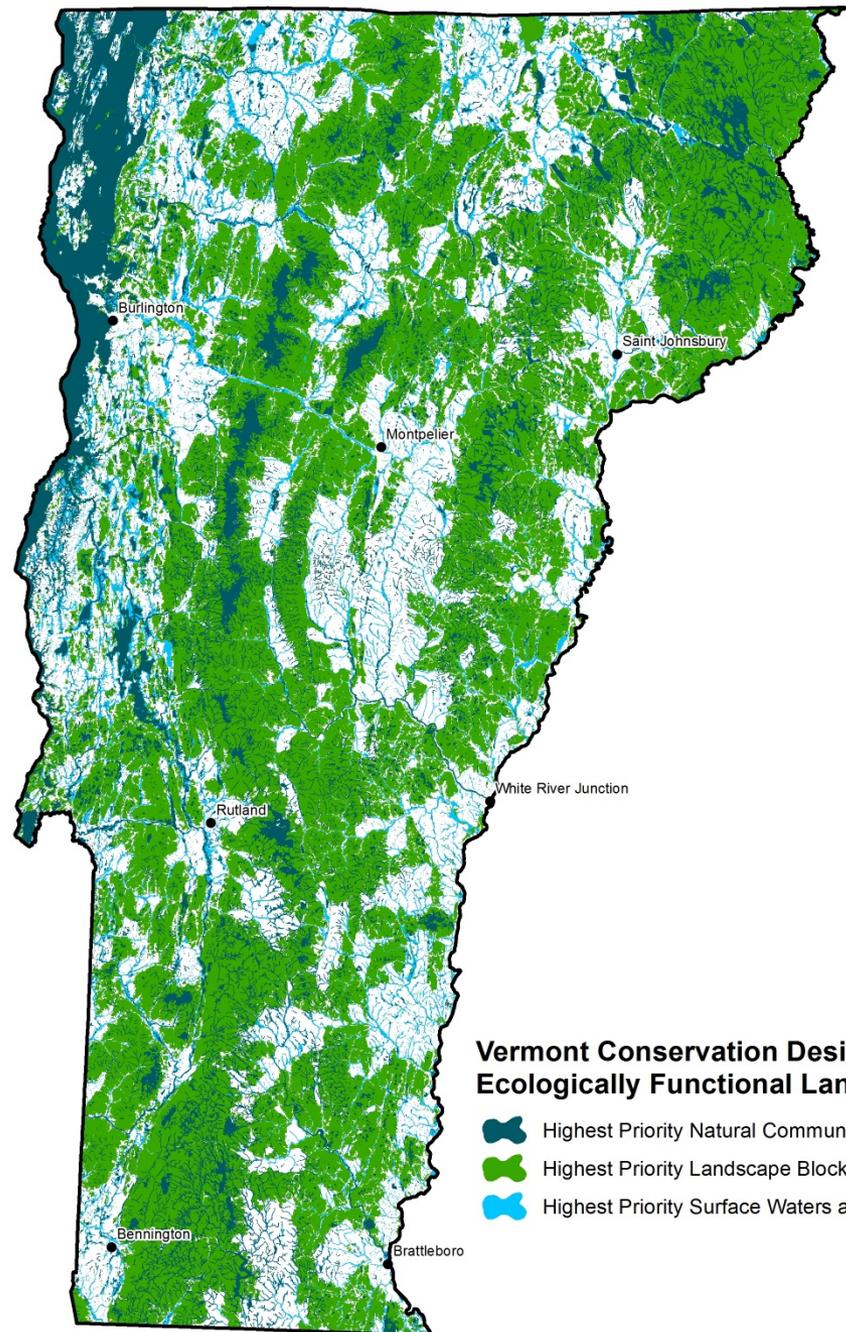


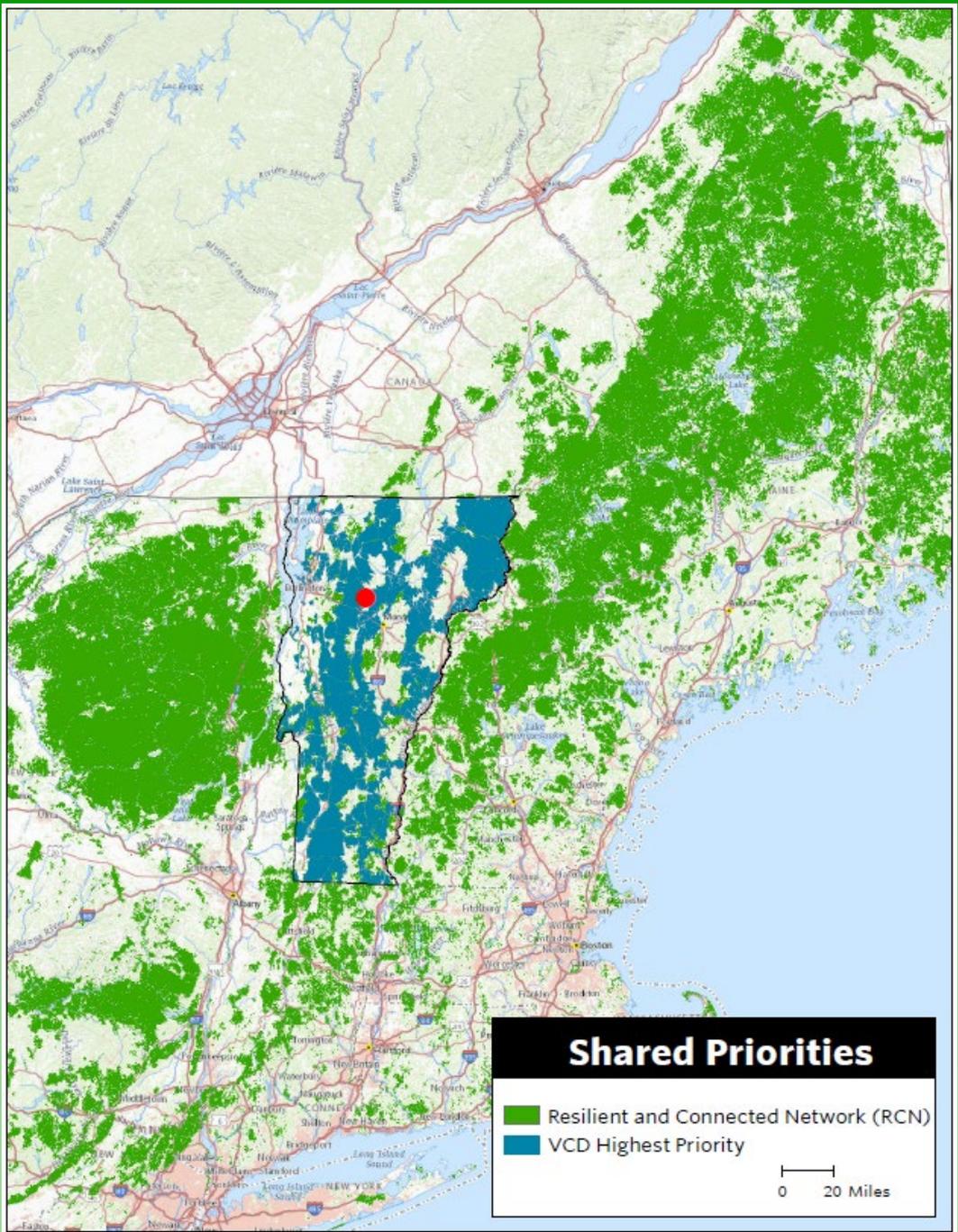
Vermont Conservation Design

Maintains an intact, connected and diverse natural landscape

Conserves species and natural communities

Allows nature to adapt to a changing climate





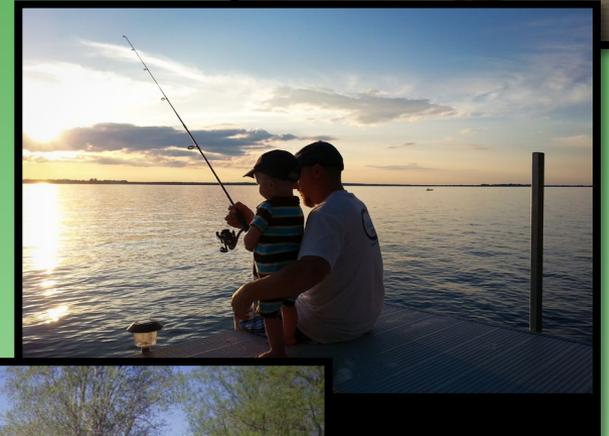
Shared Priorities

- Resilient and Connected Network (RCN)
- VCD Highest Priority

0 20 Miles

Sustains more than biodiversity

- Outdoor recreation
- Clean water
- Sense of place and rural character
- Working farms and forests
- Nature's benefits



Some Thoughts and Perspectives

- Landowners and their decisions are key to success.
- All the features are needed for ecological function.
- Unifies many aspects of conservation, without being prescriptive.
- Supports Vermont's social and economic values.



Photo by
Susan
Morse

Vision for the future of Vermont

- Vermont still has intact and connected nature.
- We can sustain our plants and animals, forests and waters into a changing future.
- It's Vermont's choice.





USING VERMONT CONSERVATION DESIGN FOR LAND USE PLANNING

Jens Hawkins-Hilke
Conservation Planning Biologist
Vermont Fish & Wildlife Department

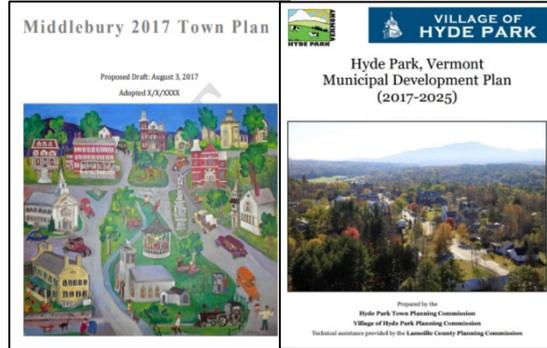




Community Wildlife Program



Presentations & Workshops



Support for Planning



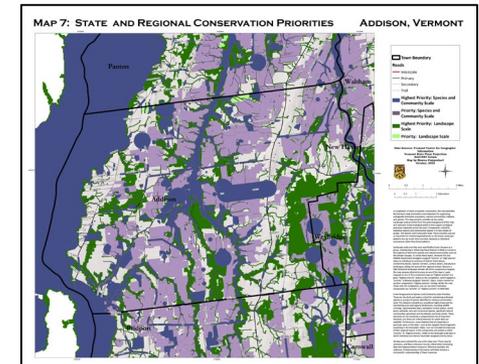
Support for Conservation



Connecting Communities

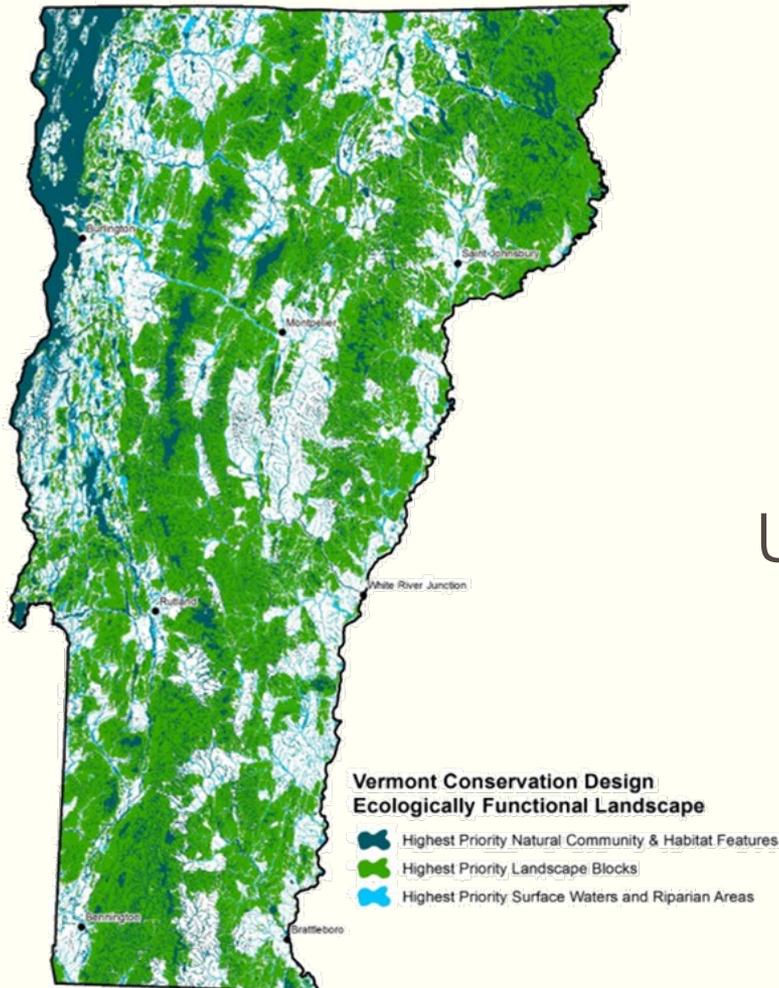


Understanding ecological and community context



Mapping and Interpretation

Vermont Conservation Design:



A *PATTERN* on the landscape

- Physical landscape Diversity
- Connected forests
- Aquatic network

Using Multiple conservation tools

Many Ways of Moving Forward

Range of options

Landowner

Education

Land
Management

Incentive
Programs

Management
Agreements

Conservation
Easements

Land Acquisition

Municipal

Education
& Outreach

Inventory

Town
Plan

Conservation
Plan

Bylaws

Zoning

No one tool is right for every landowner or town

Accessing VCD data?



A screenshot of the BioFinder web application. The browser address bar shows "anmaps.vermont.gov/websites/BioFinder/". The page header includes the Vermont state logo and "BioFinder Vermont Agency of Natural Resources". The main content area displays a satellite map of Vermont with county boundaries and various data layers overlaid in green and blue. A sidebar on the left contains a "Layers" panel with a tree view of data layers, including "Overall Priorities: Vermont Conservation", "Design", "Community & Species Scale", "Landscape Scale", and "ANR Basemap Data". A "Quick Tools..." section is visible above the map. The bottom of the page features a scale bar and a copyright notice for "VCGI | VTANR GIS | ADS VTANR GIS | Earthstar Geographics".

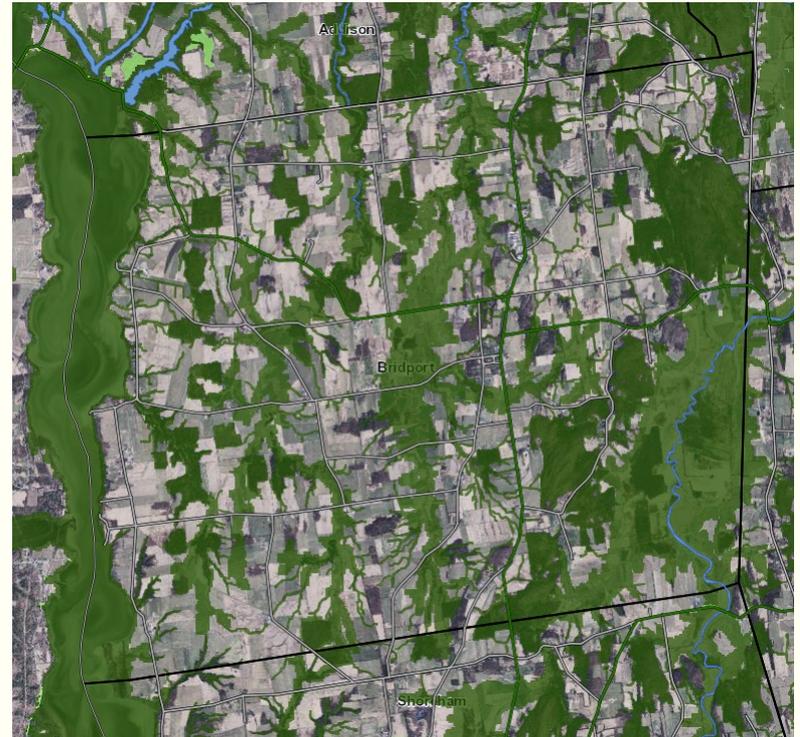
Accessible to everyone!

biofinder.vt.gov/

Using Vermont Conservation Design



Westmore

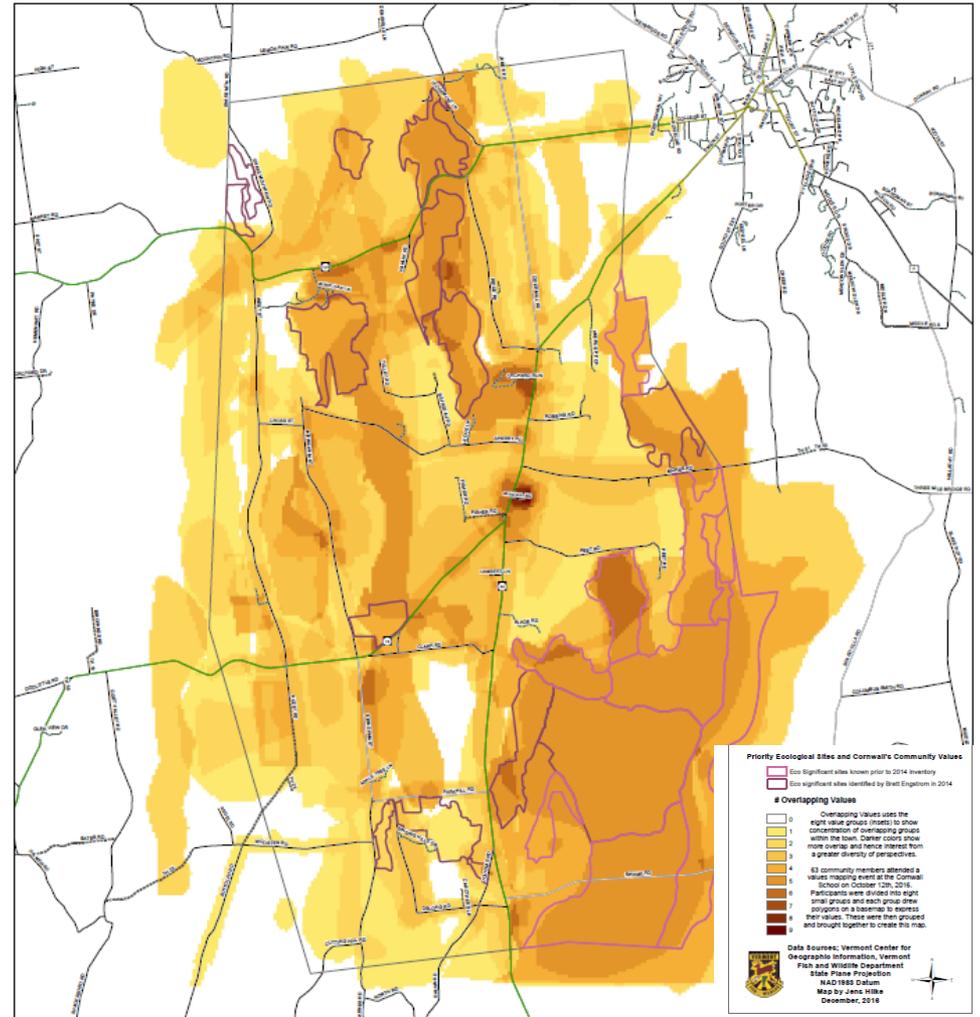


Bridport

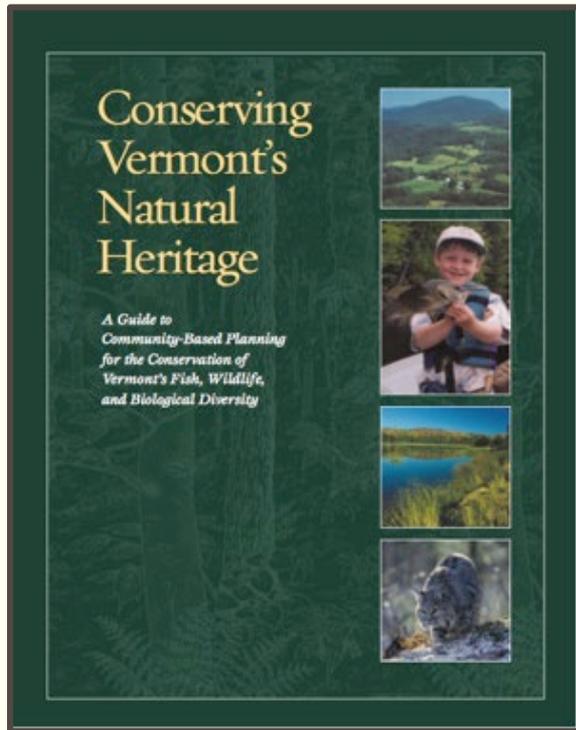
Community Engagement



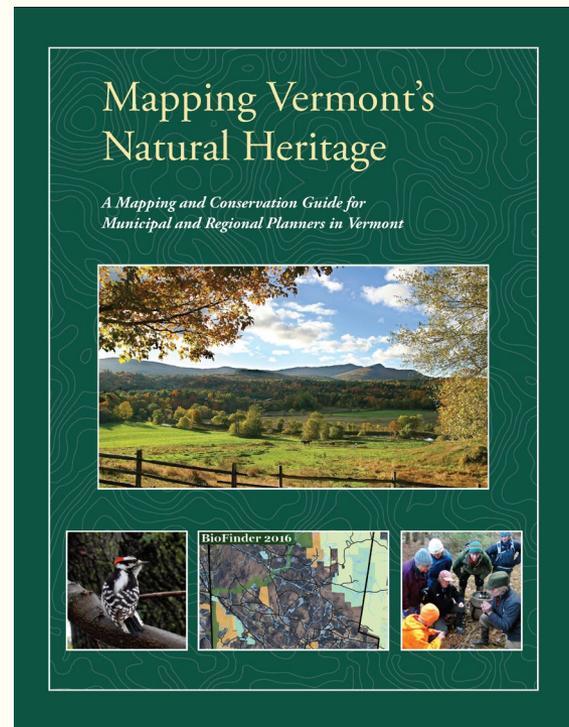
Creating and re-affirming a shared vision



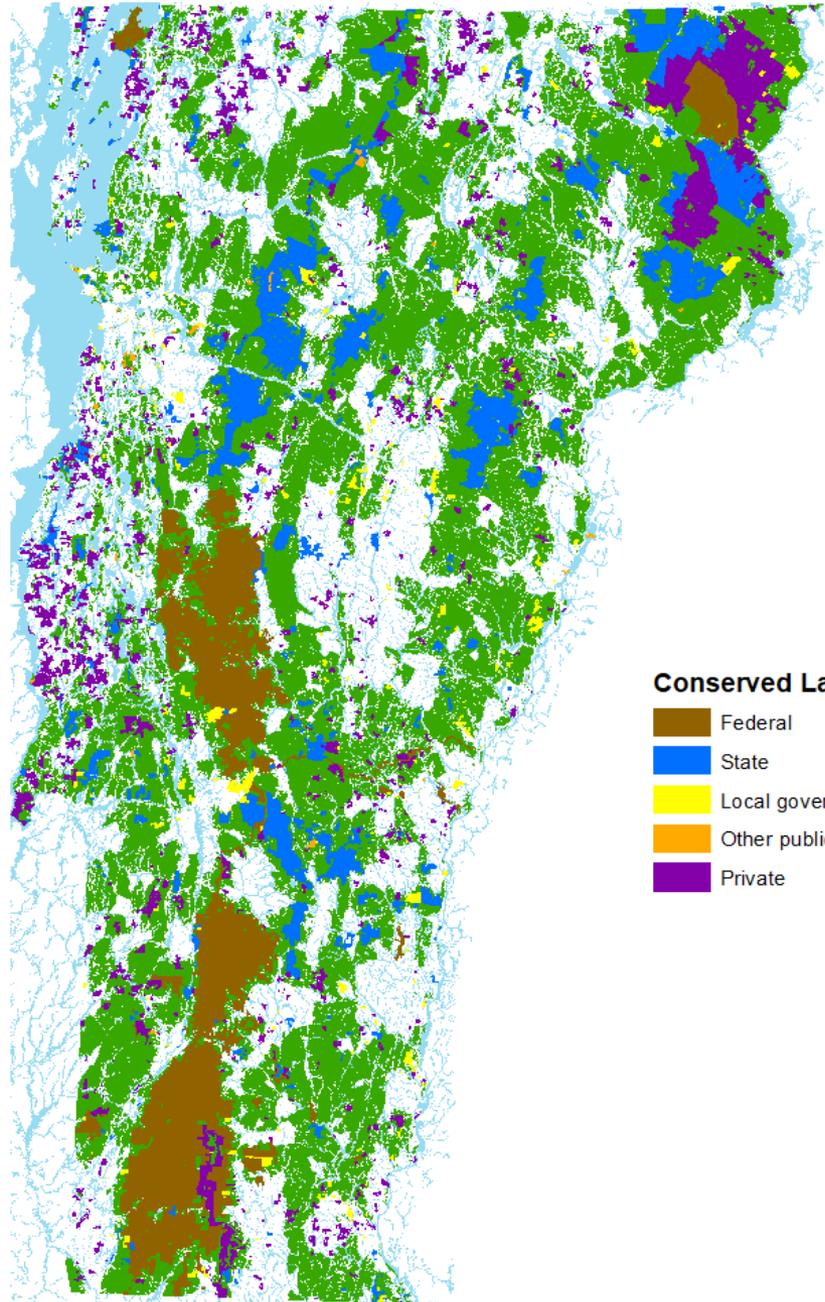
For More Information



2004 Focuses on a framework



2019 How to use BioFinder for Land Use Planning



Conserved Lands

- Federal
- State
- Local government
- Other public
- Private

Thank you... Questions?

