

# VERMONT CONSERVATION DESIGN

## *A VISION FOR AN ECOLOGICALLY FUNCTIONAL LANDSCAPE*



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



Eric Sorenson  
Bob Zaino  
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Doug Morin

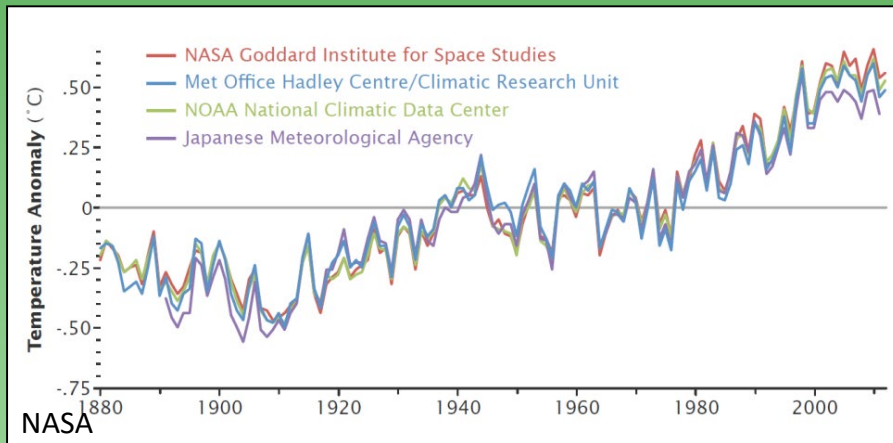
# Vermont Fish & Wildlife Department

*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



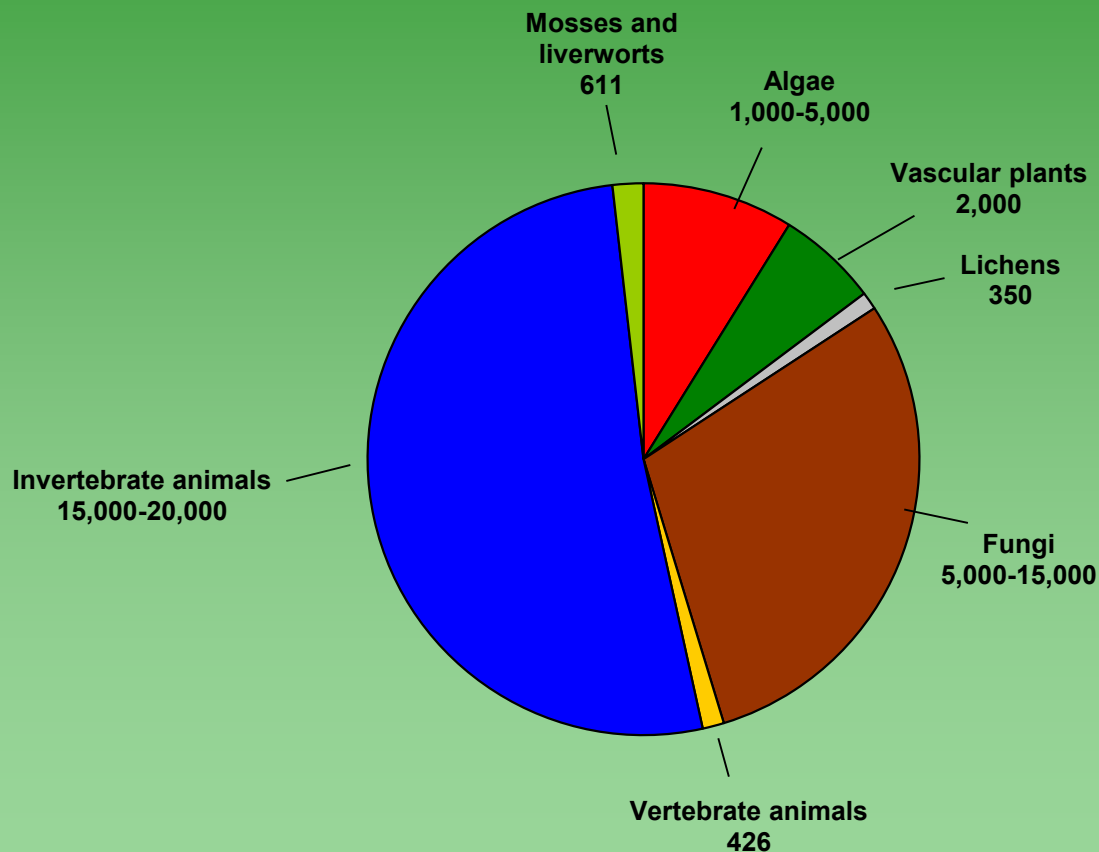
New!





# 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**

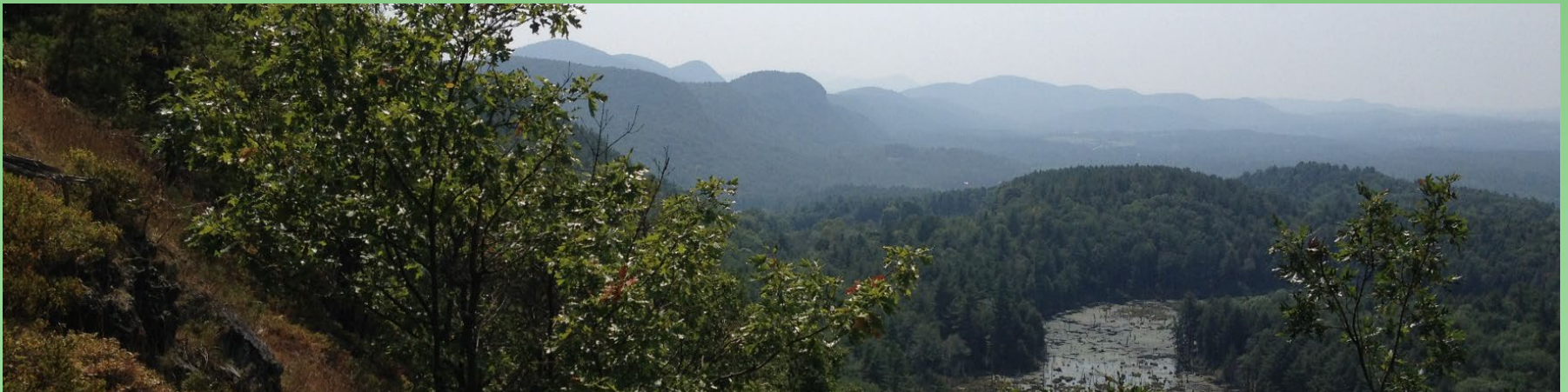




# VERMONT CONSERVATION DESIGN

*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

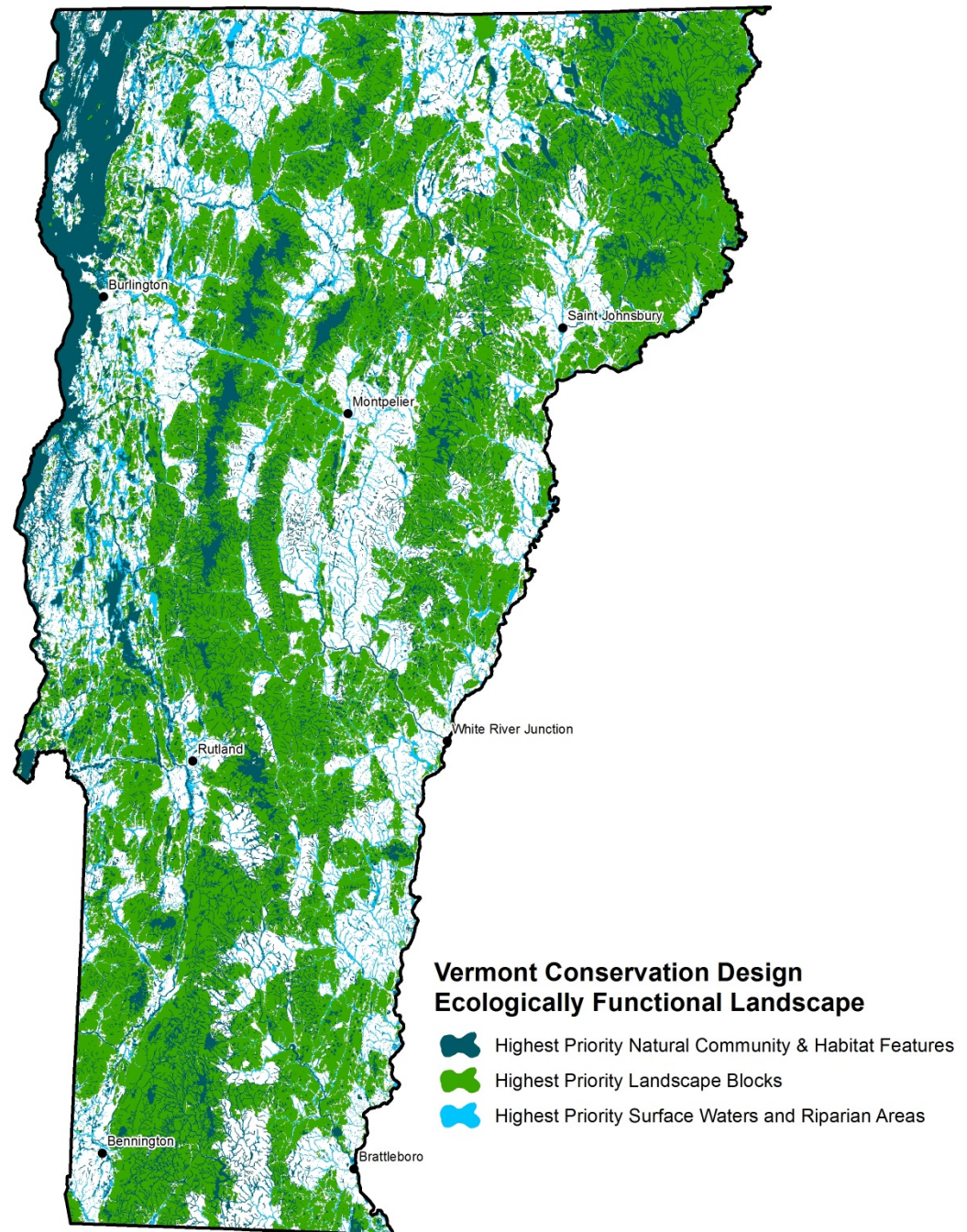




# Ecologically Functional Landscape

- 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

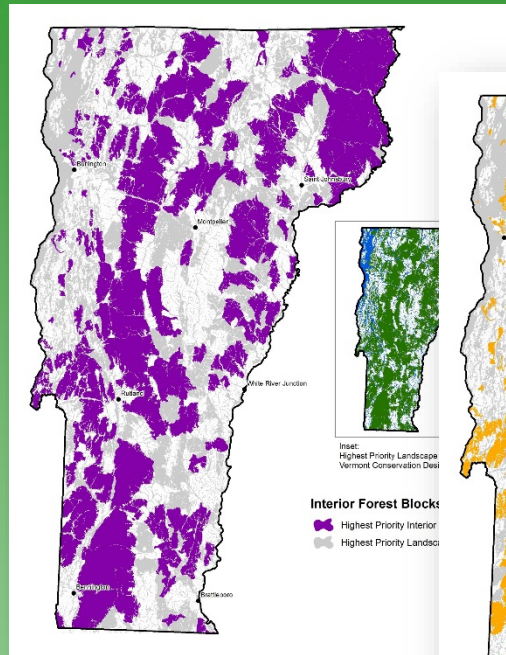
Natural Communities  
Young and Old Forest  
Aquatic Habitats  
Wetlands  
Grasslands/Shrublands  
Underground Habitats

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

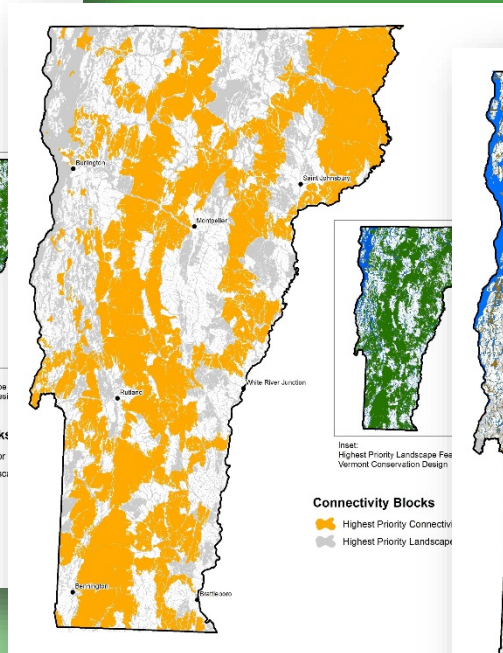


# Intact and Connected Forest Blocks Surface Waters and Riparian Areas

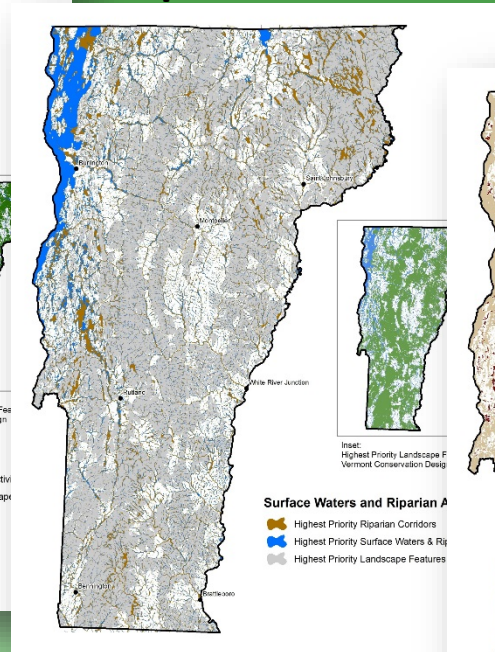
## Interior Forest Blocks



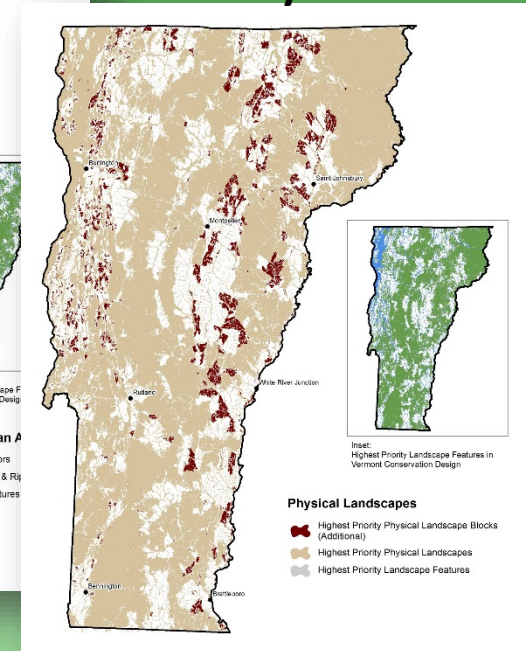
## Connectivity Blocks



## Surface Waters and Riparian Areas



## Physical Landscape Diversity



*Maintain the specific functions of each element*

**Wildlife Road Crossings**



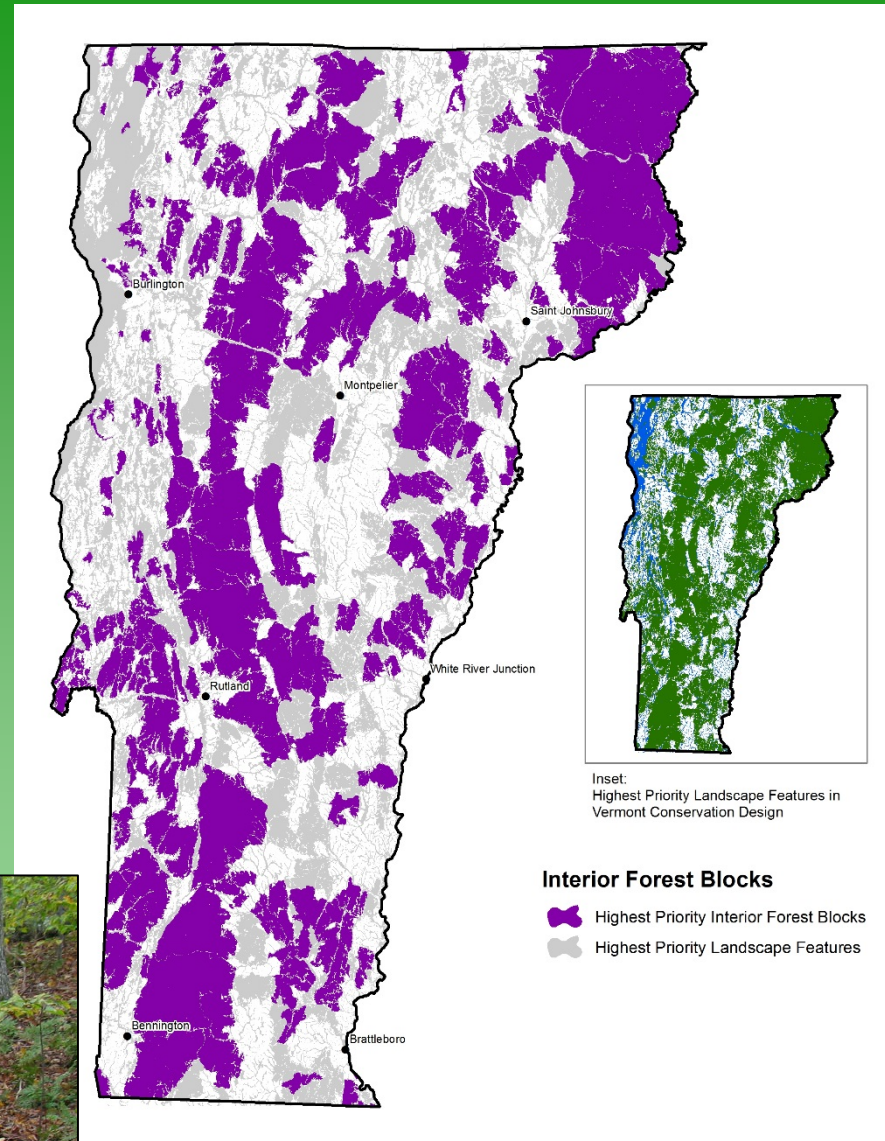
# Interior Forest Blocks

*The best examples of interior forest in each region of Vermont*

*Places where species and ecological process exist with minimal disturbance*

## *Ecological functions:*

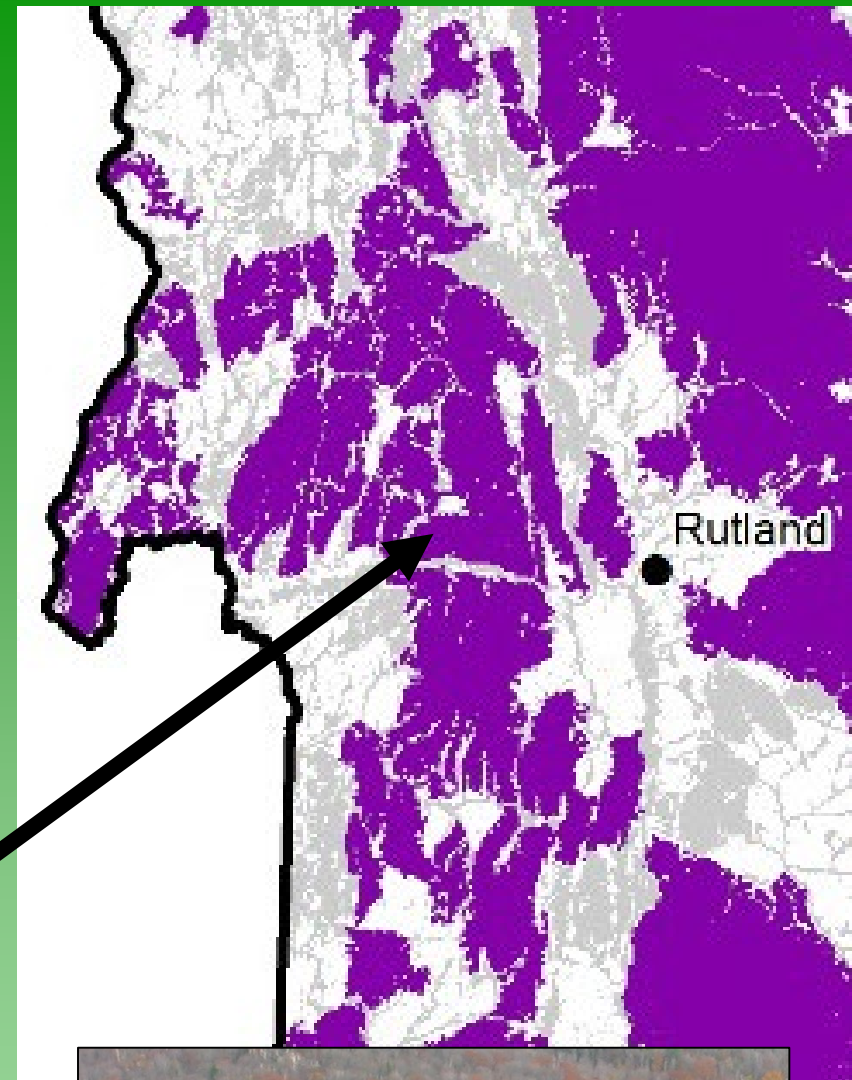
- Interior forest species
- Wide-ranging mammals
- Air and water quality
- Flood resilience
- Ecological processes
- Species can shift and adapt within blocks



# 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





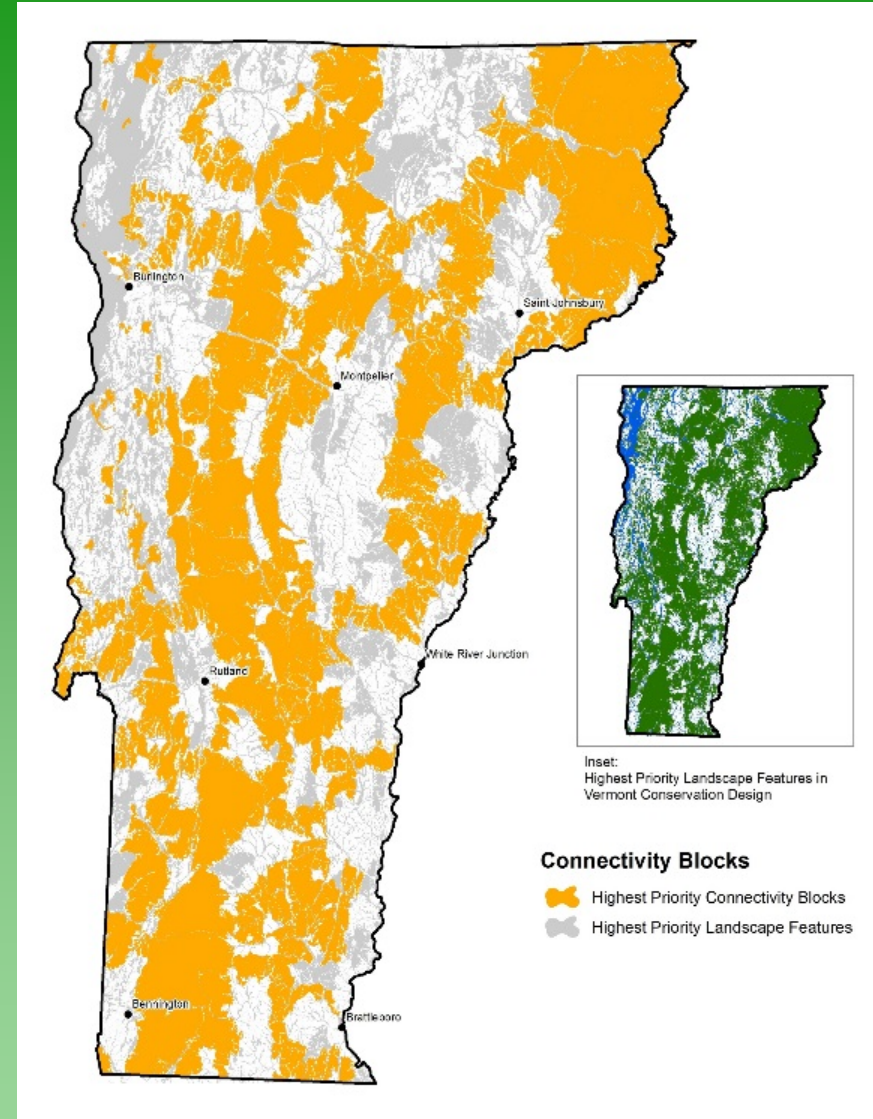
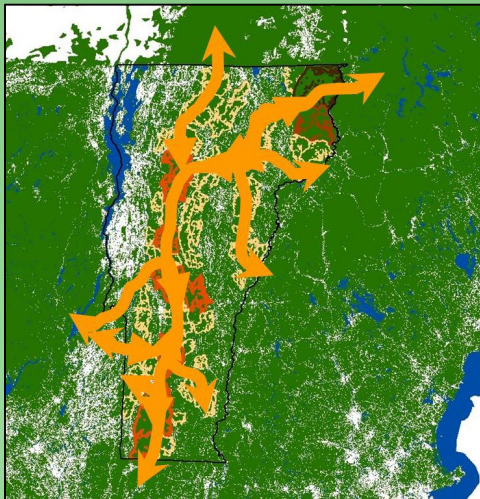
# Connectivity Blocks

*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



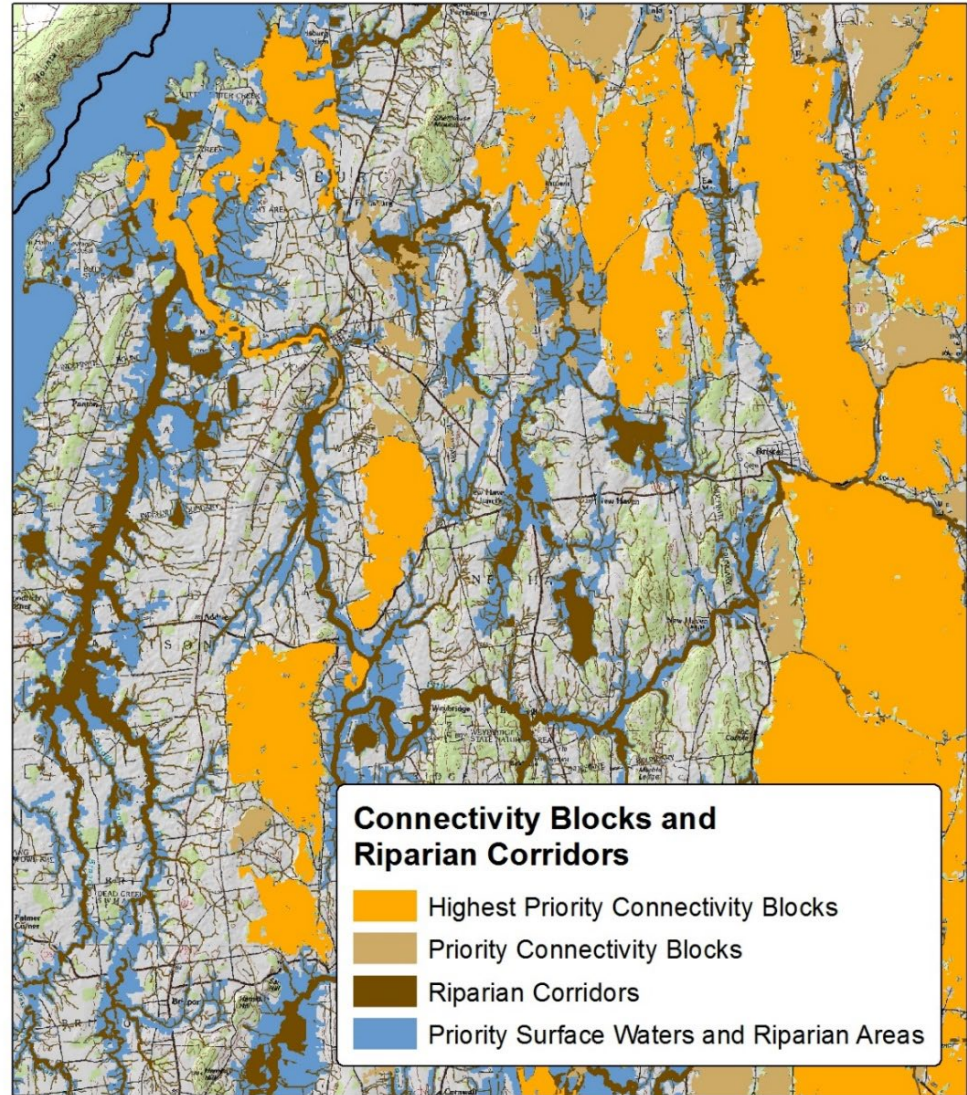


# Riparian Connectivity



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

*We need to restore riparian vegetation.*





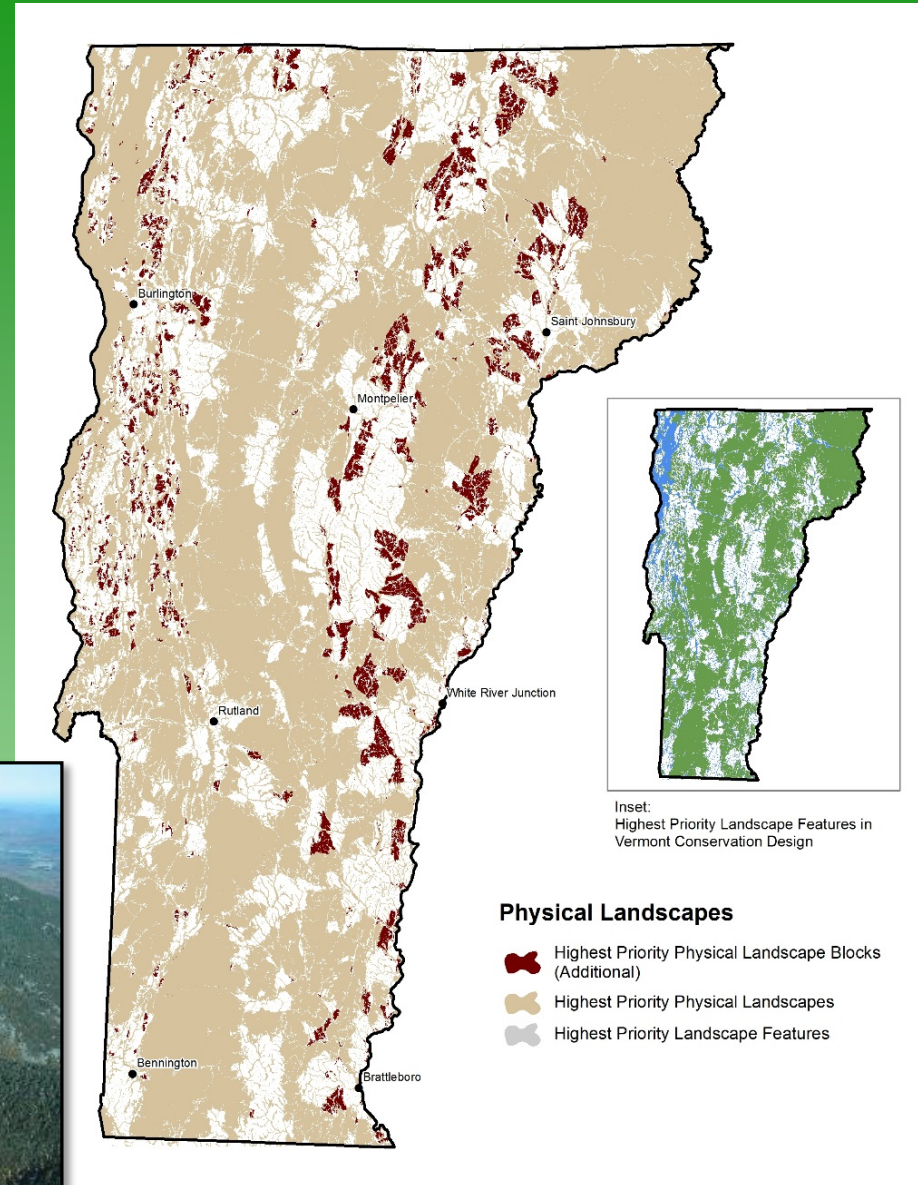
# Physical Landscape Diversity

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

*Critical for climate resilience*

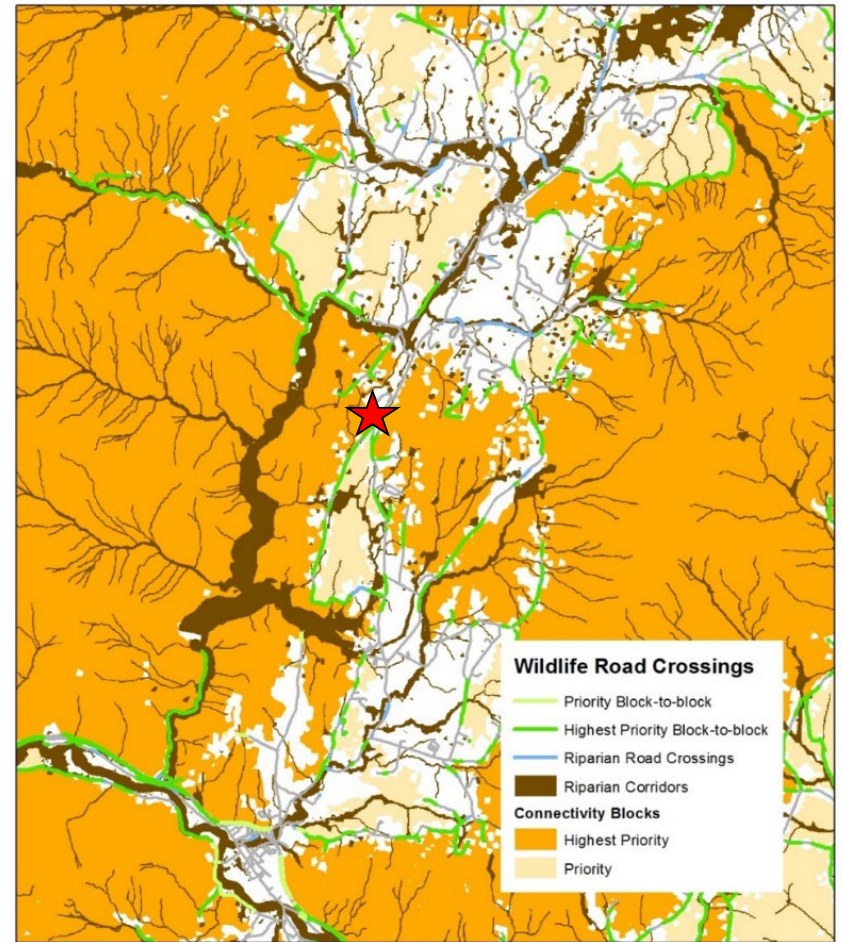
*Ecological functions:*

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



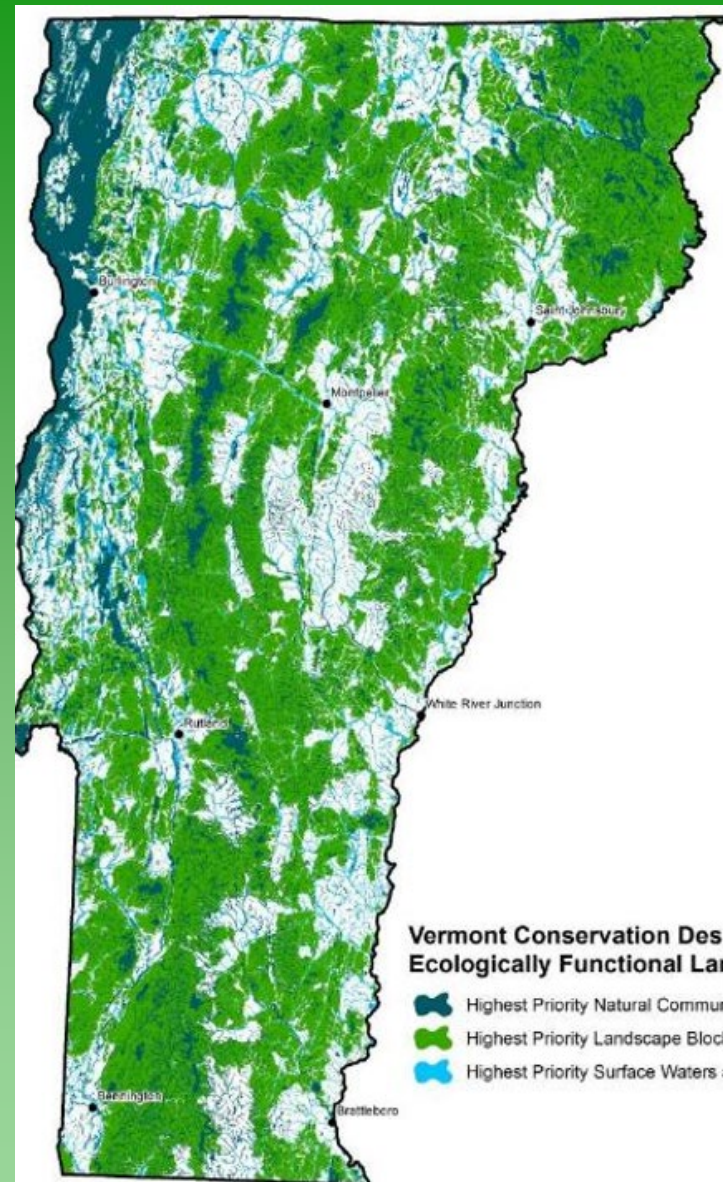
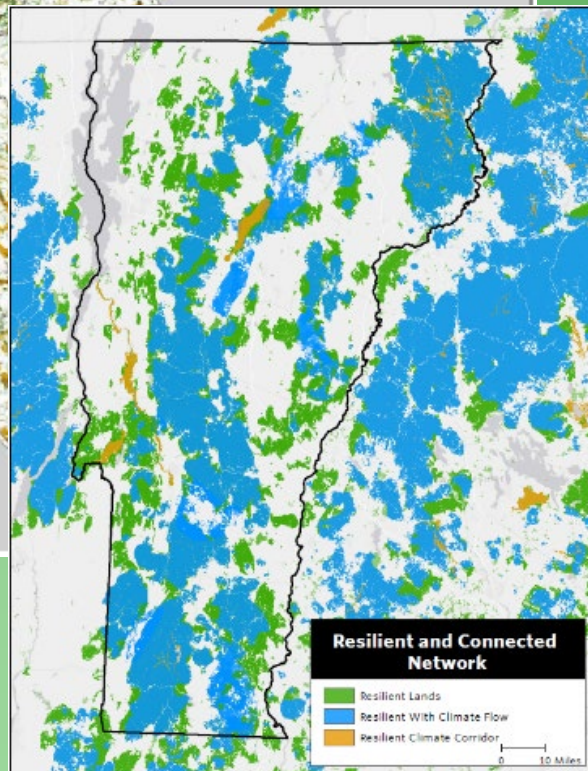
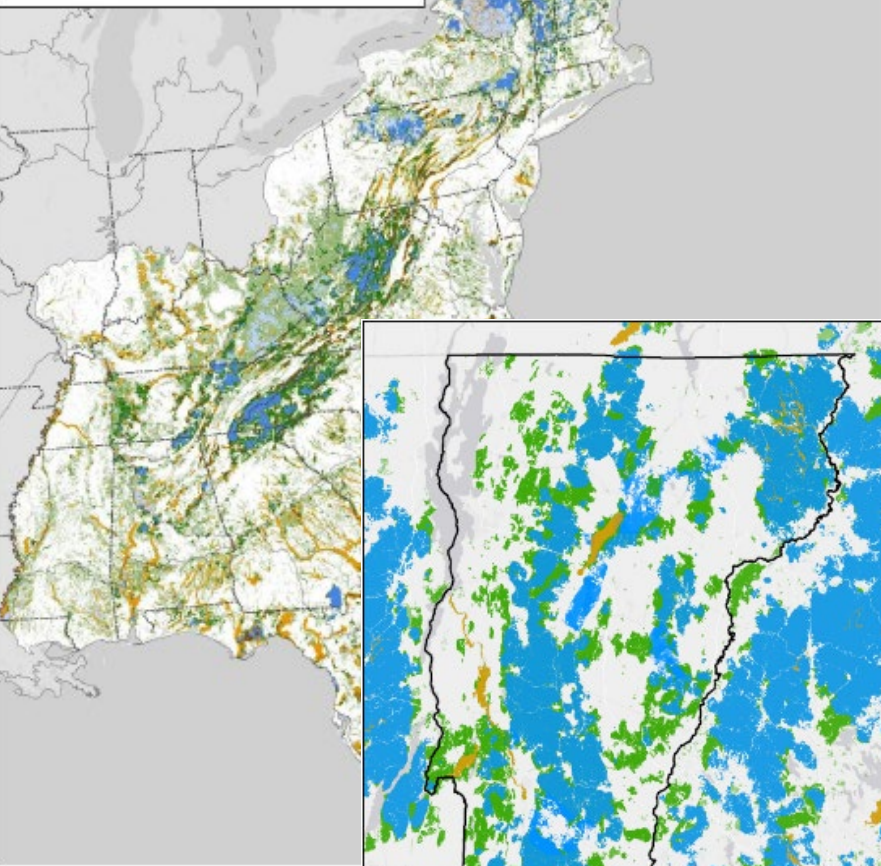
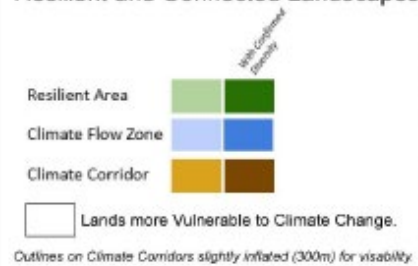


# Wildlife Road Crossings





## Resilient and Connected Landscapes





# Conservation Design at Three Scales

## Landscapes



## Natural Communities



## Species



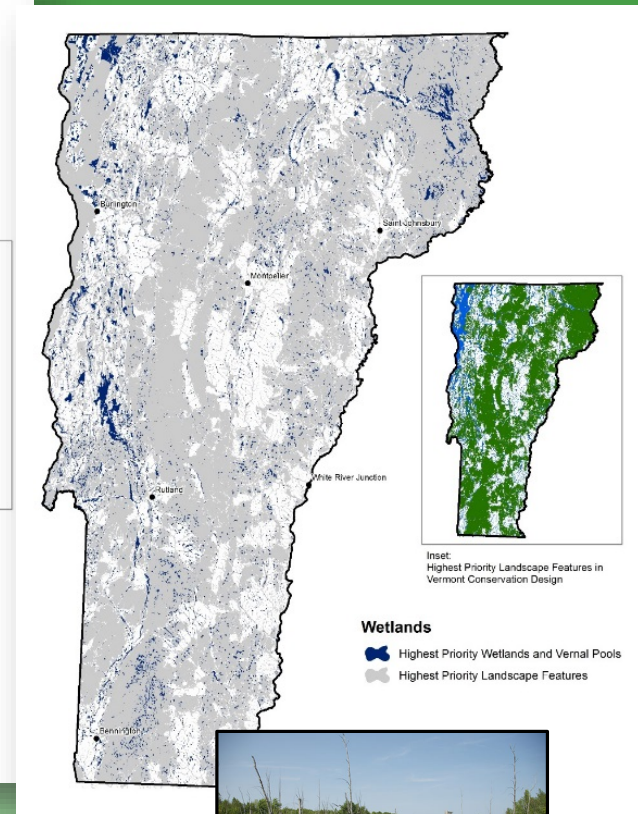
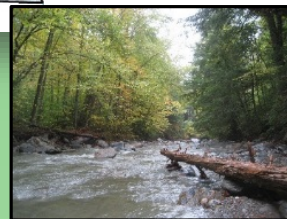
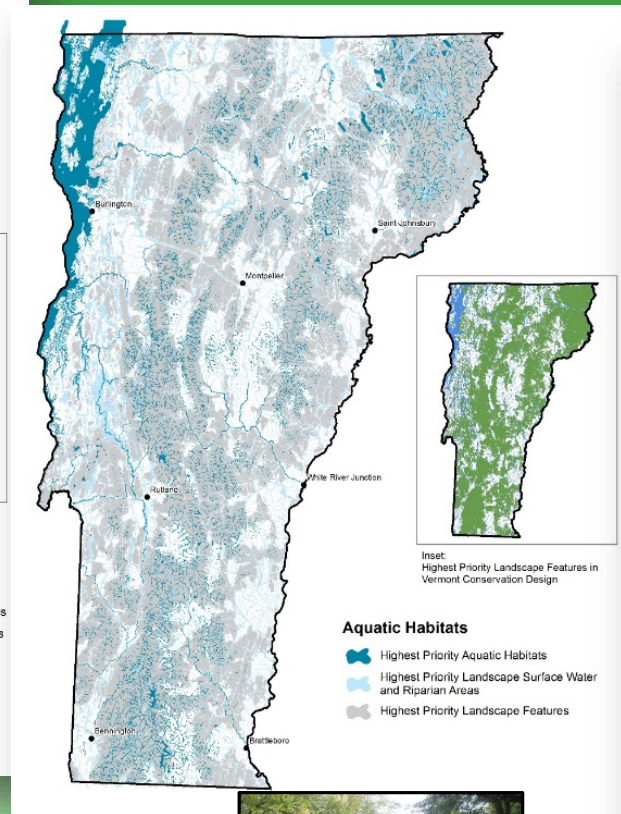
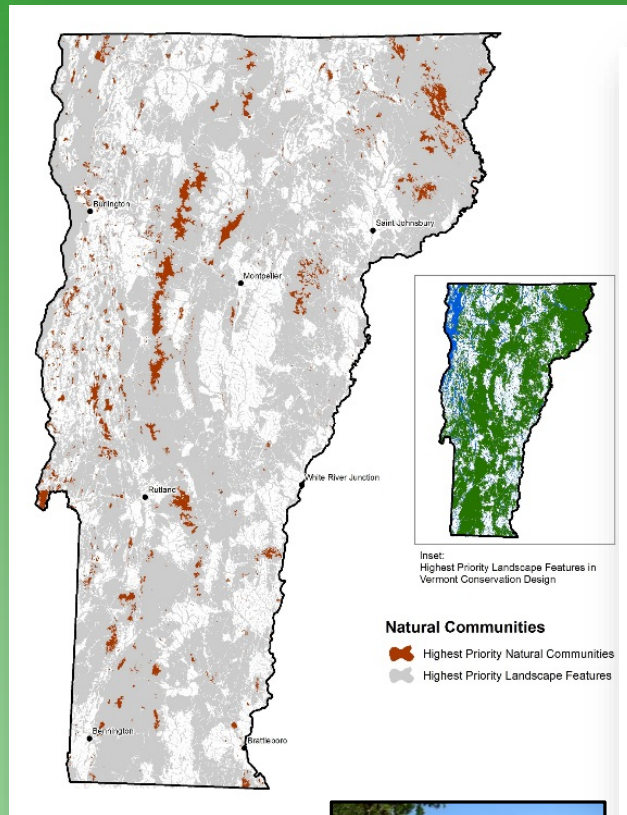
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*Species with very specific biological needs that will likely always require individual attention*



# Terrestrial Natural Communities, Aquatic Habitats, Wetlands, & Caves





# Natural Communities

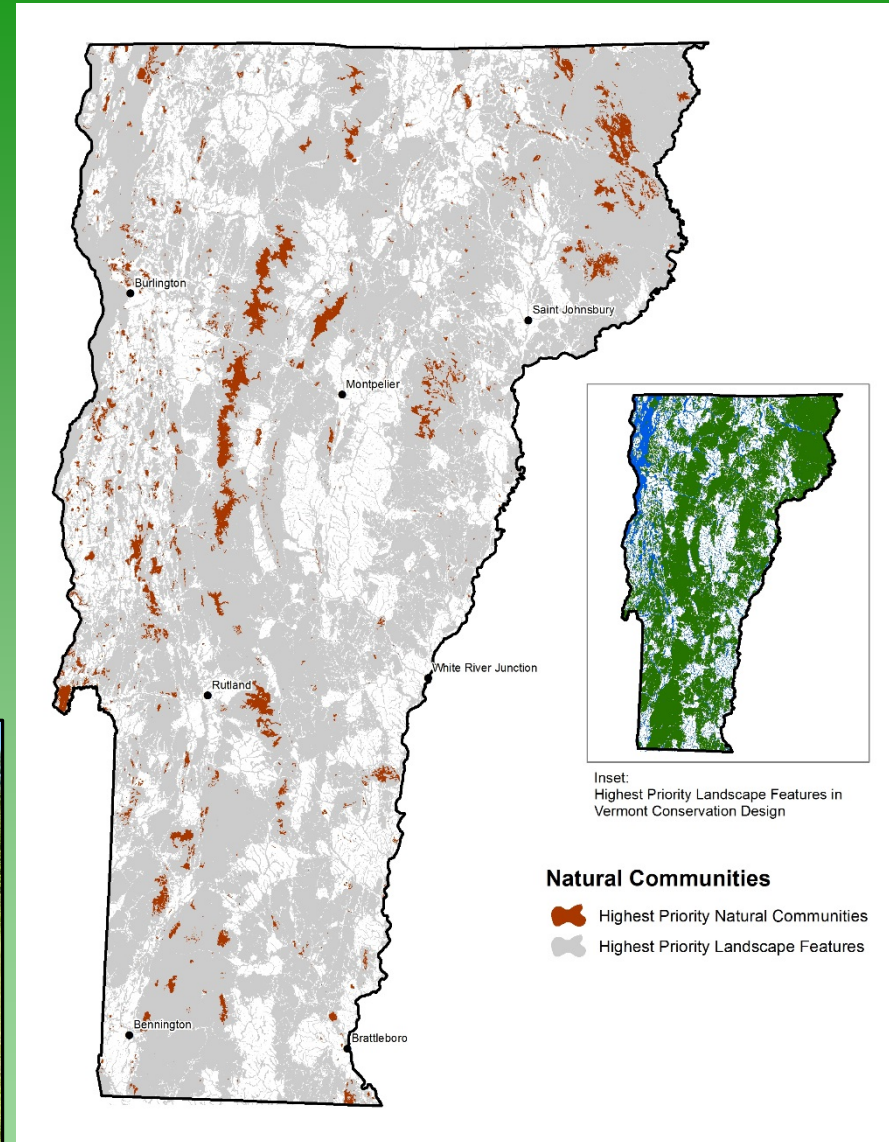
## *Vermont's original natural habitats*

*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

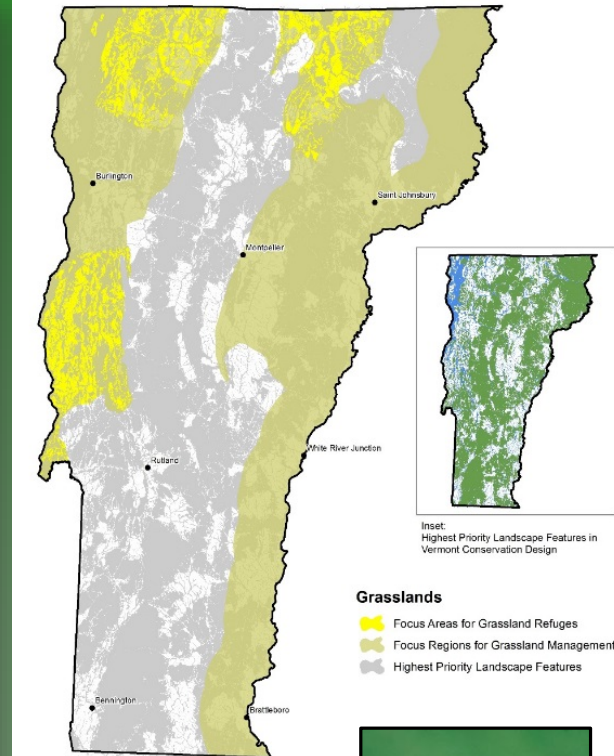
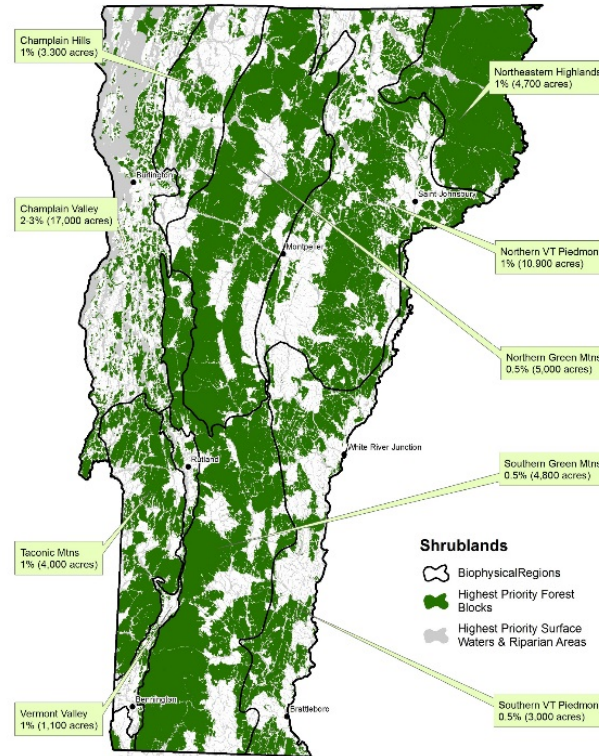
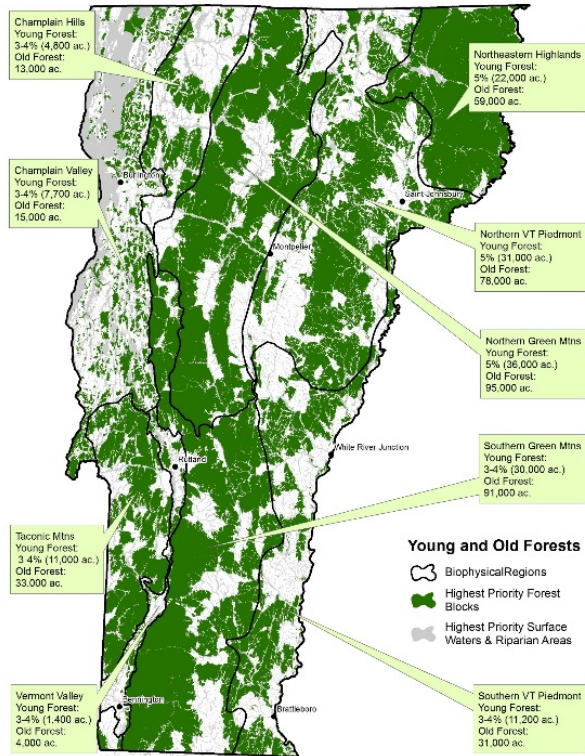








# Young and Old Forests, Shrublands, Grasslands





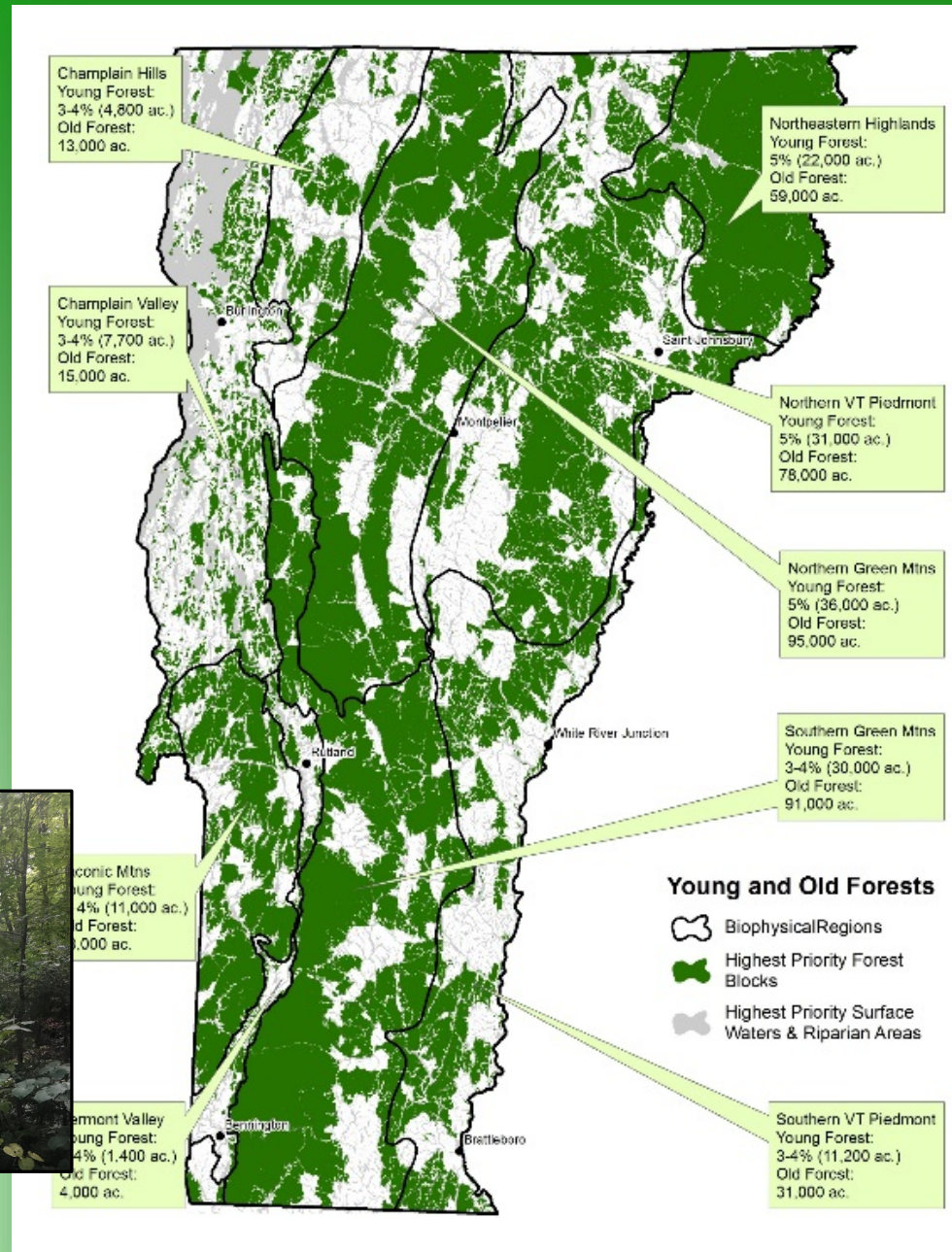
# Young and Old Forests

*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.







Susan Morse Photo



Bryan Pfeiffer Photo

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



Susan Morse Photo

- Carbon sequestration
- Valued for hunting and wildlife watching



# Conservation Design at Three Scales

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## 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**



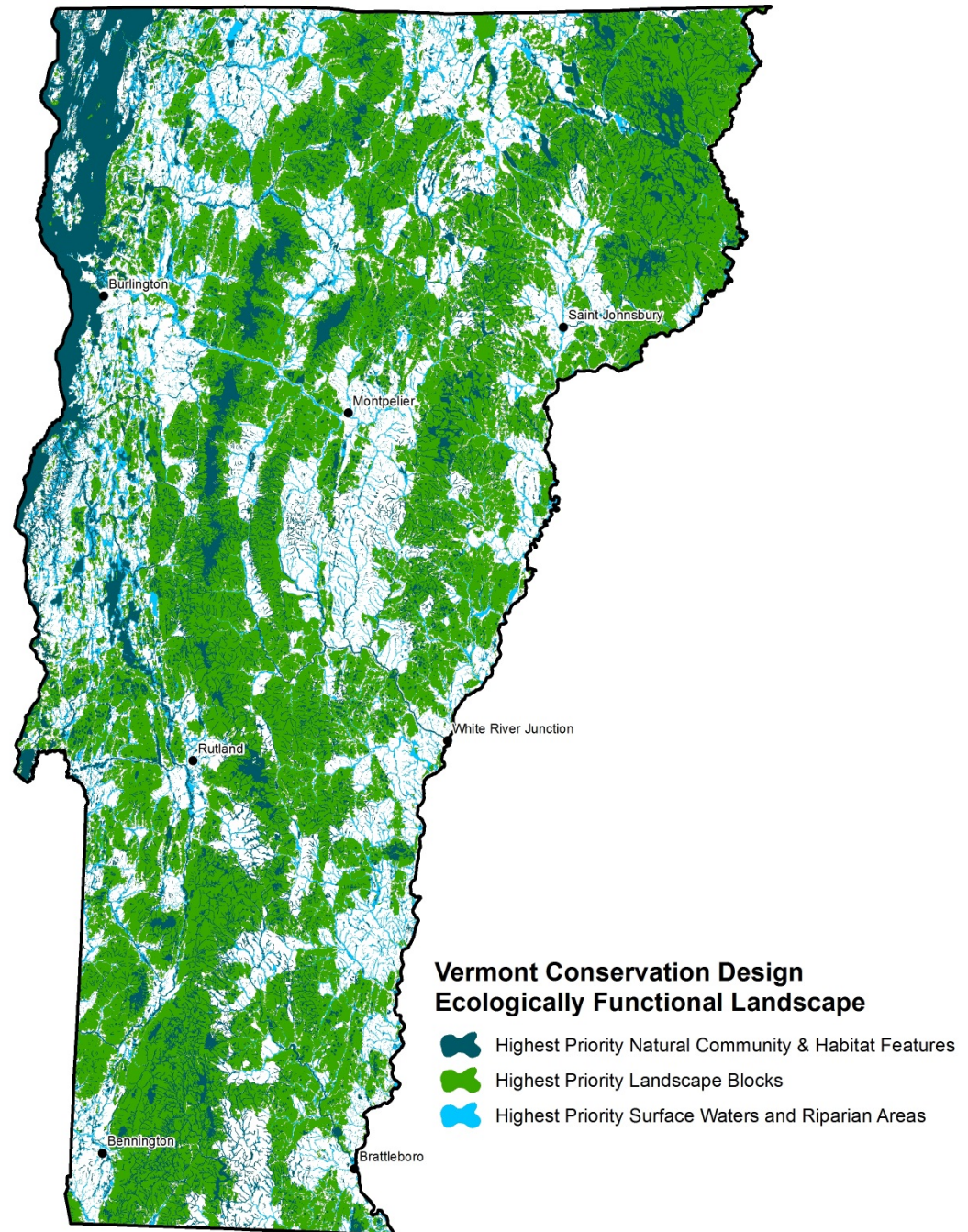


# Vermont Conservation Design

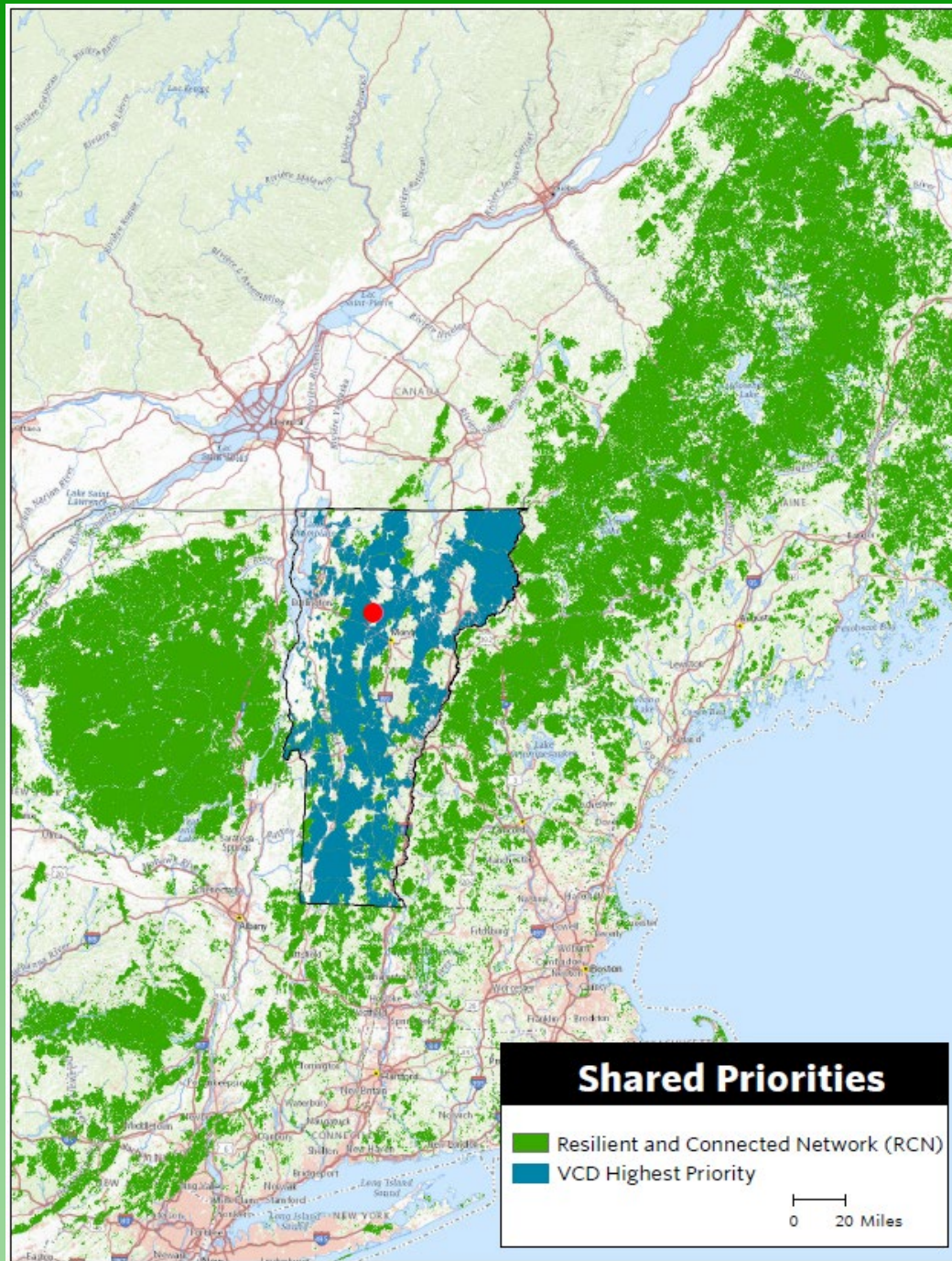
Maintains an intact, connected and diverse natural landscape

Conserves species and natural communities

Allows nature to adapt to a changing climate



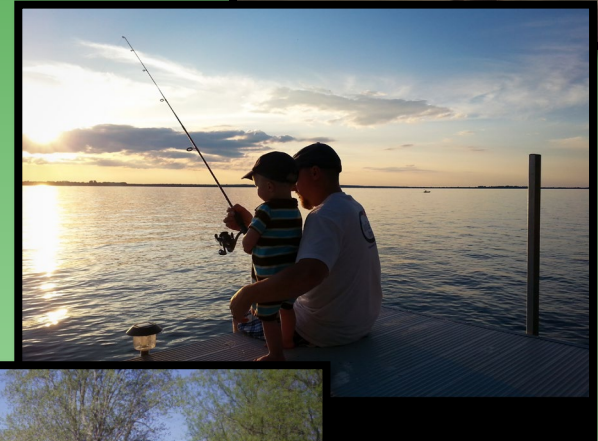






# Sustains more than biodiversity

- 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



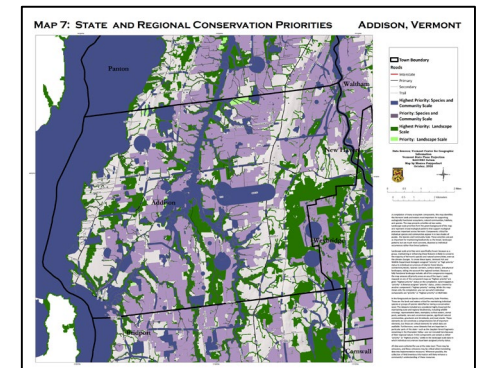
Support for Conservation



Connecting Communities



Understanding ecological  
and community context

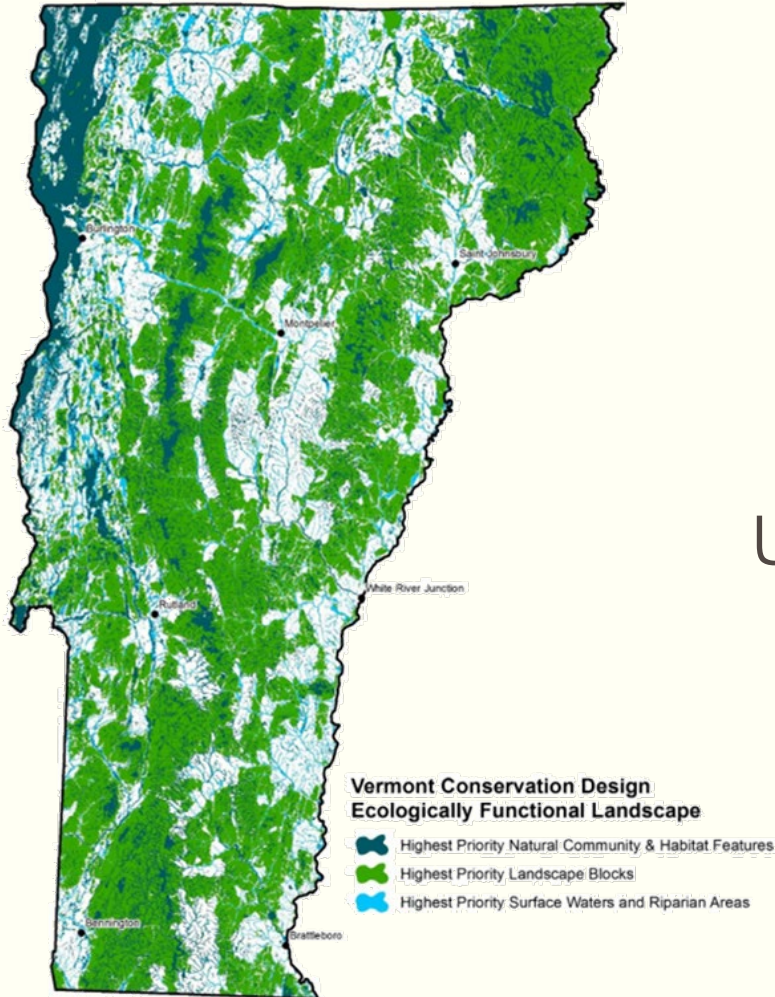


Mapping and  
Interpretation



# Vermont Conservation Design:

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A *PATTERN* on the landscape

- Physical landscape Diversity
- Connected forests
- Aquatic network

Using Multiple conservation tools



# Many Ways of Moving Forward

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## Range of options

### Landowner

Education

Land  
Management

Incentive  
Programs

Management  
Agreements

Conservation  
Easements

Land Acquisition

### Municipal

Education  
& Outreach

Inventory

Town  
Plan

Conservation  
Plan

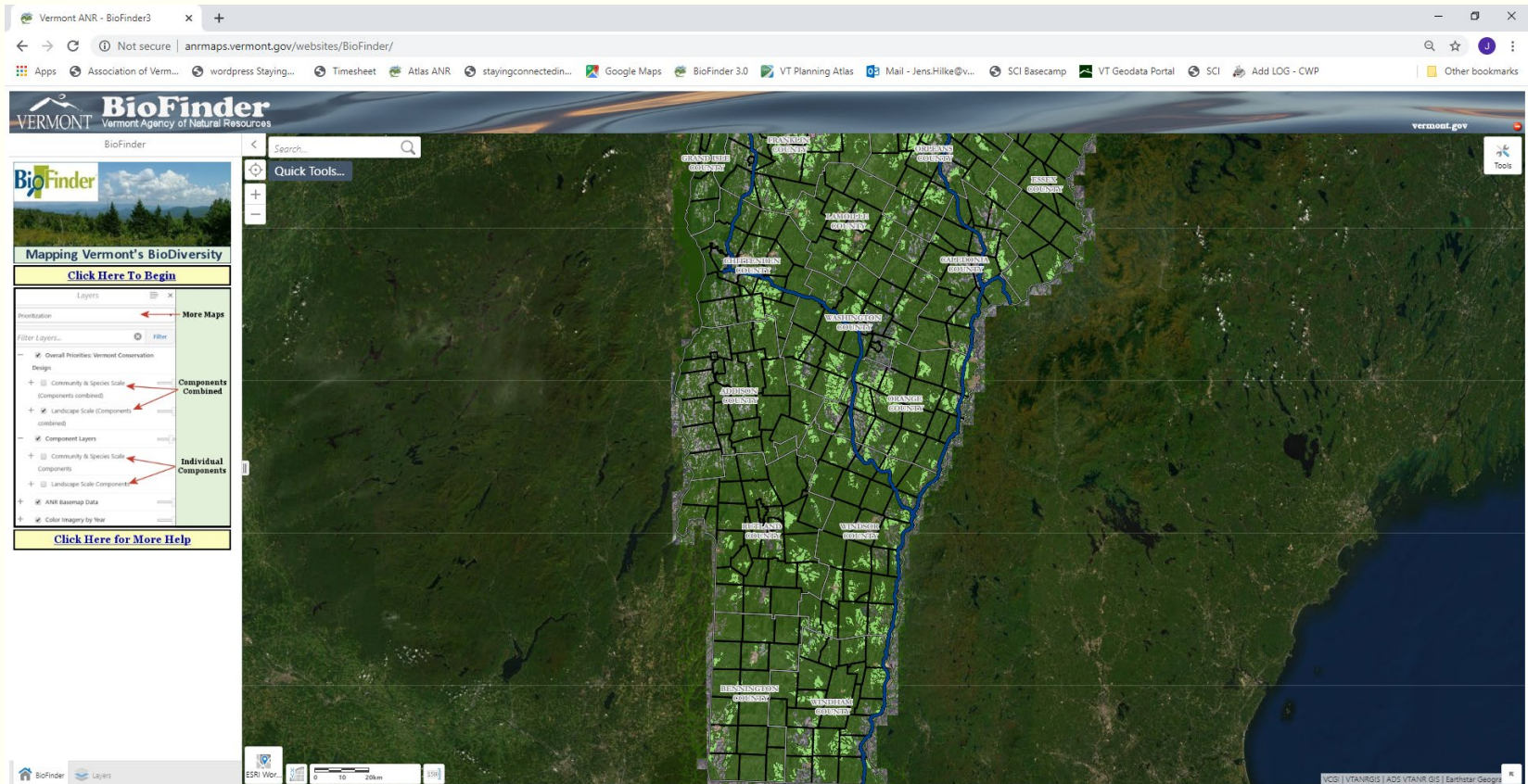
Bylaws

Zoning

No one tool is right for every landowner or town



# Accessing VCD data?



*Accessible to everyone!*

**biofinder.vt.gov/**

# Using Vermont Conservation Design

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Westmore



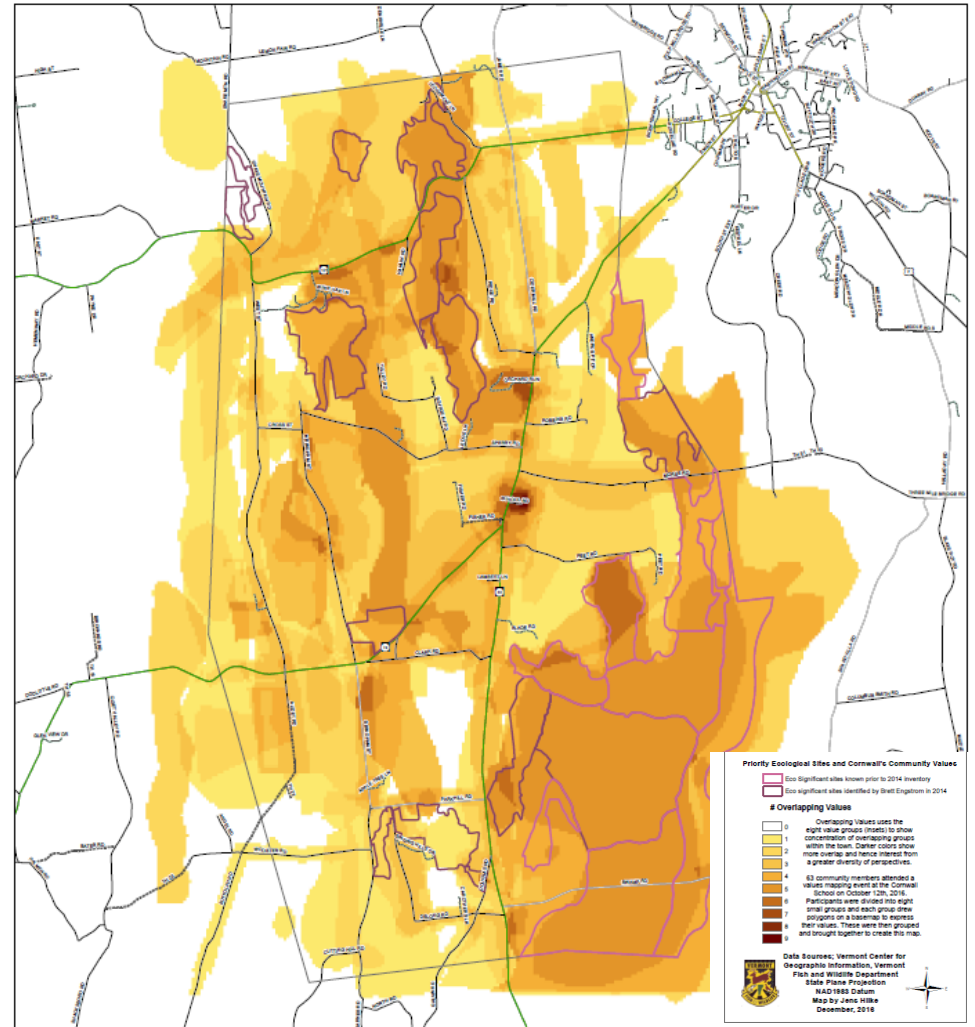
Bridport



# Community Engagement

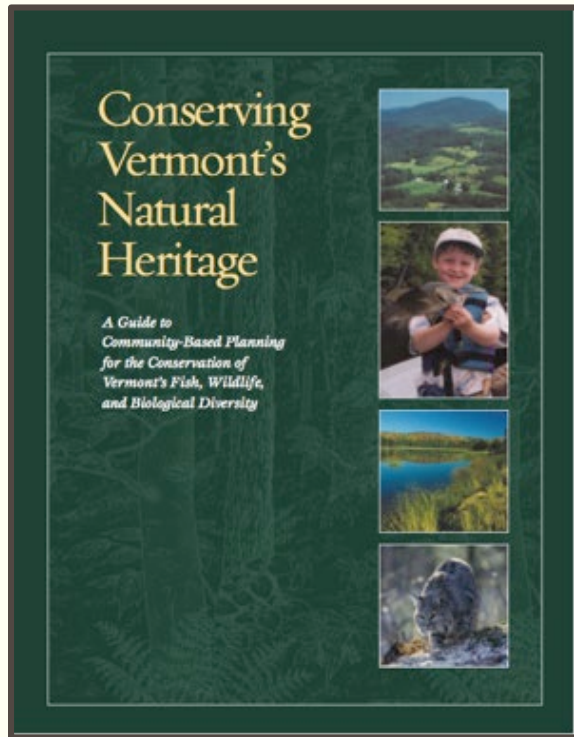


Creating and re-affirming a shared vision

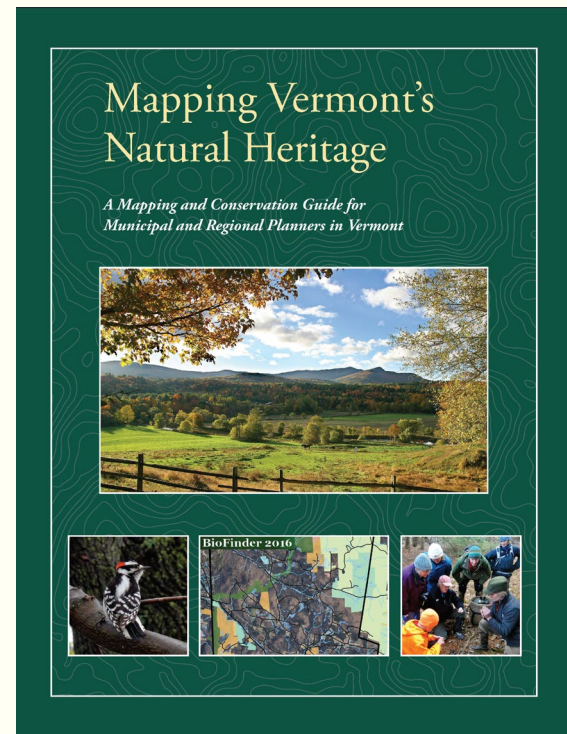


# For More Information

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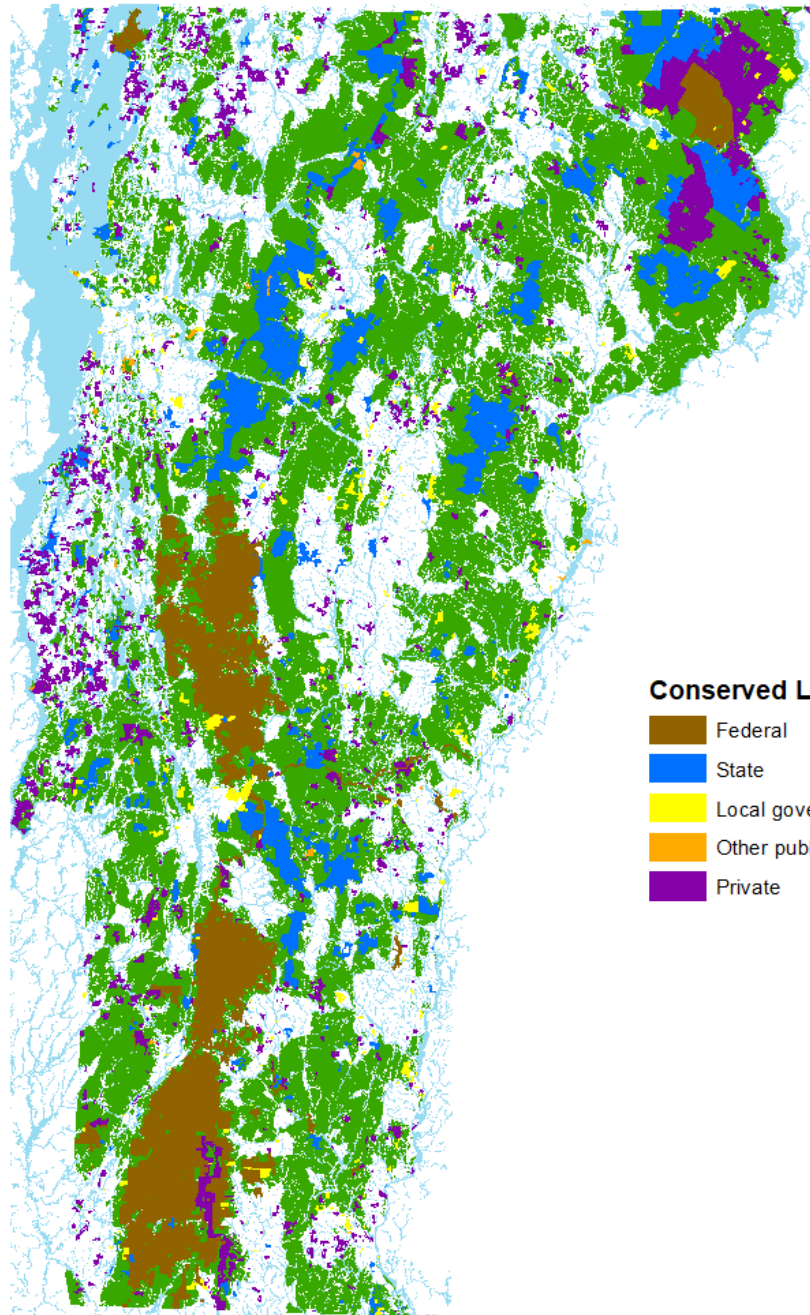


2004 Focuses on a framework



2019 How to use BioFinder for Land Use Planning





### Conserved Lands

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

**Thank you... Questions?**

