



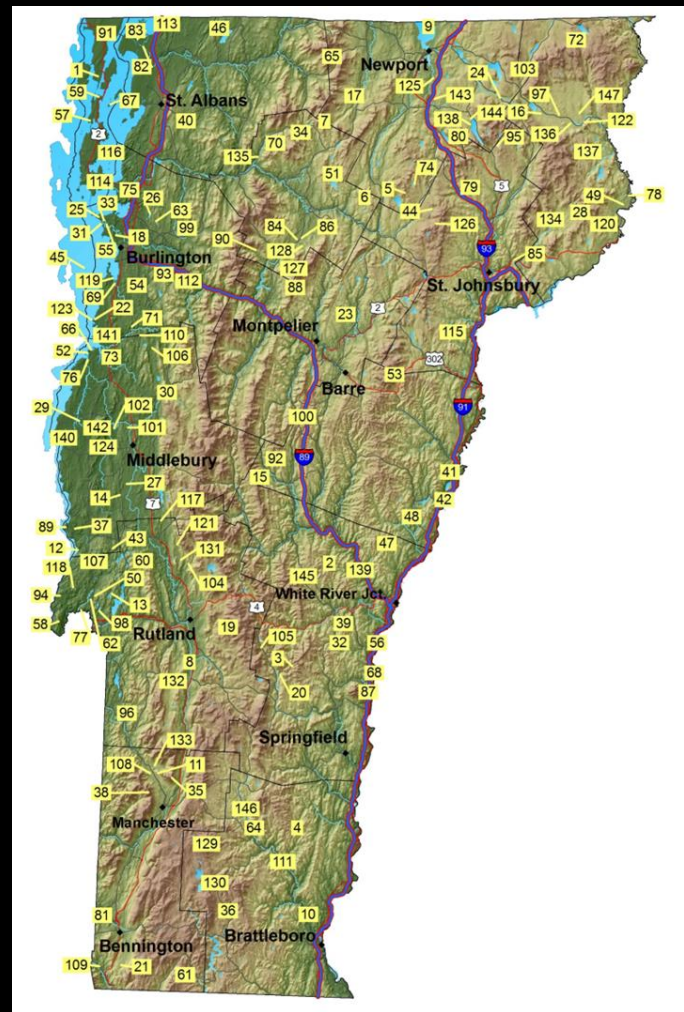
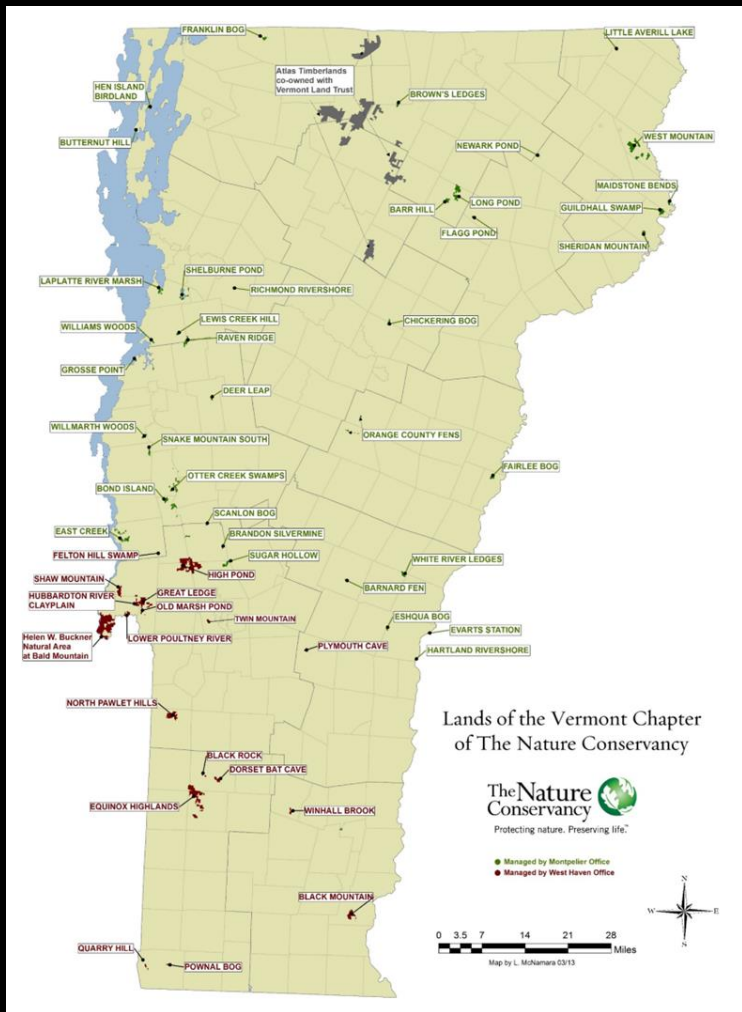
Biodiversity and Ecological Integrity

**Presentation for House
Committee on Environment**

January 15, 2025

Gus Goodwin
The Nature Conservancy in VT







Biodiversity: the variety of life in all its forms and the interactions between living things and their environment.



Ecological Integrity: the ability of an ecosystem to support and maintain its composition, structure, and function

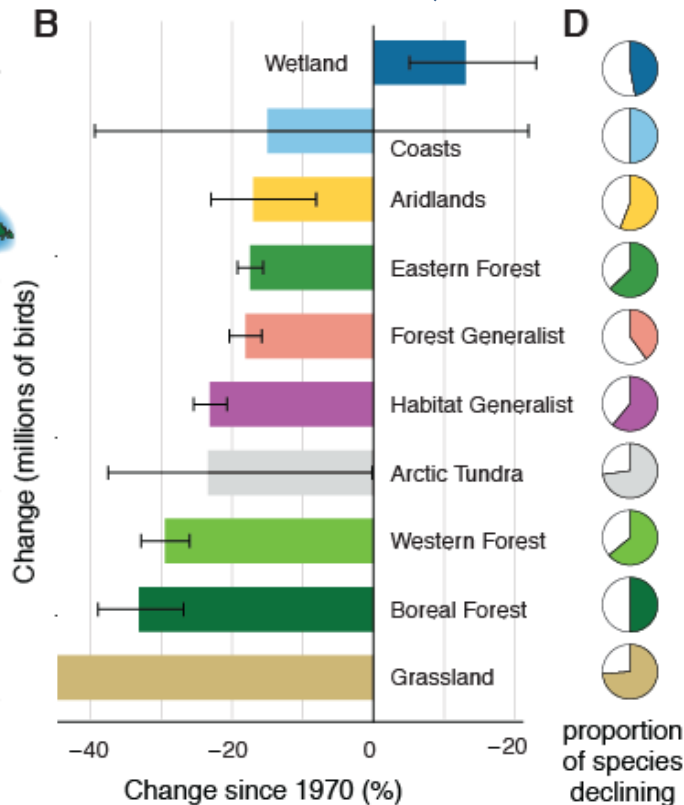
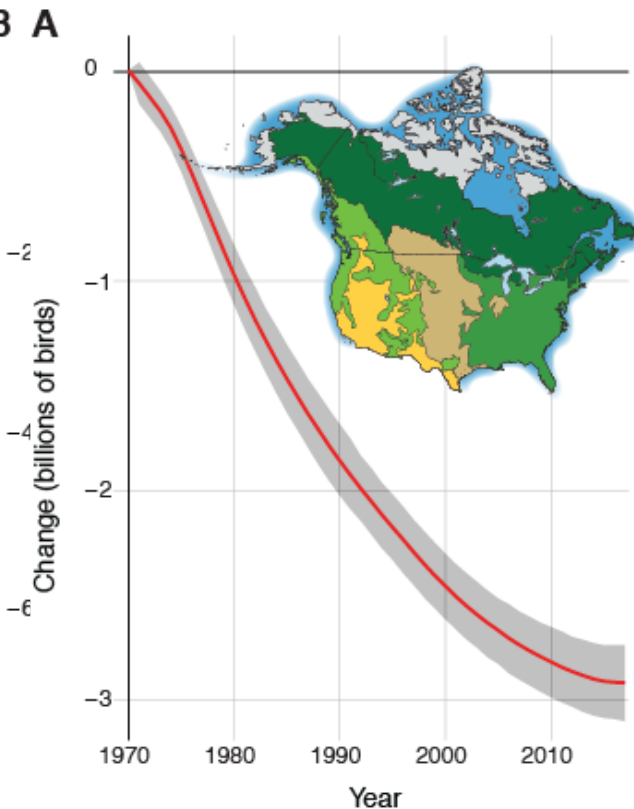
Composition



Abundance Crisis

Mammals : Global biomass down 82%
Amphibians: 30% now T & E
Butterflies: Abundance down 35%/ 40 yr
NA Birds: Abundance down 29%
 or 3 Billion birds since 1970

Wetland Birds Up: Thanks to Adaptive Harvest Management and billions \$ on wetland protection and restoration



Status of Composition in Vermont

Total Number of Species is 23,000-43,000

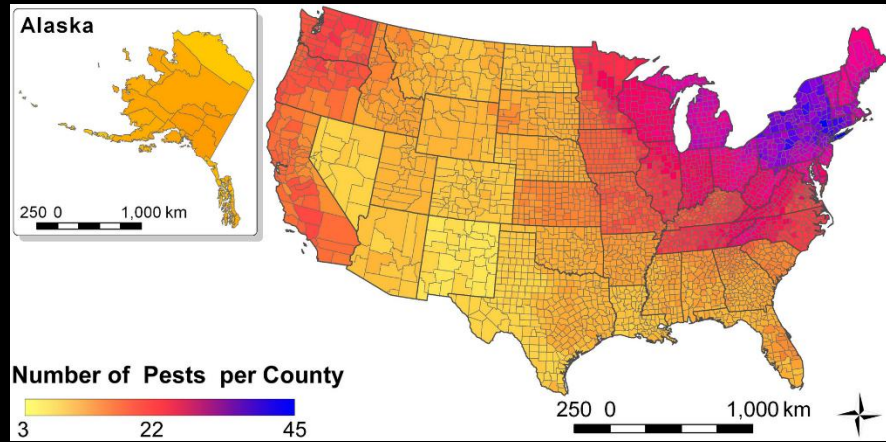
	Number of Species in Vermont	Species of Greatest Conservation Need	Percent
Vertebrates	470	134	29%
Plants	~1,500	645	43%
Invertebrates	~21,000	198	1%



	Rare and Uncommon	State Endangered	State Threatened	State Extinct (or Possibly Extinct)
Vascular Plant	~630	71	93	39
Animals	623	37	16	24
Bryophyte	~380	3		69

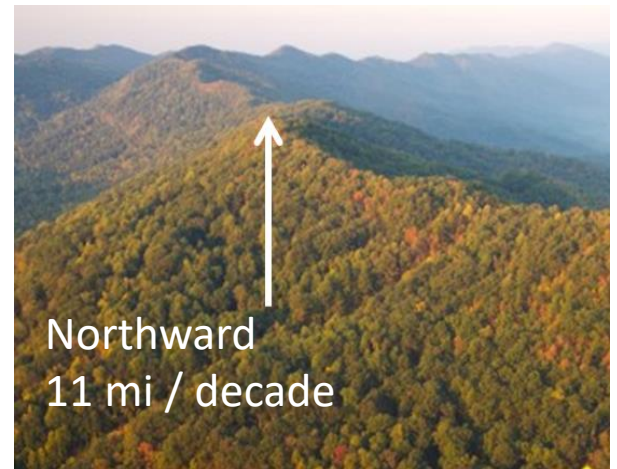
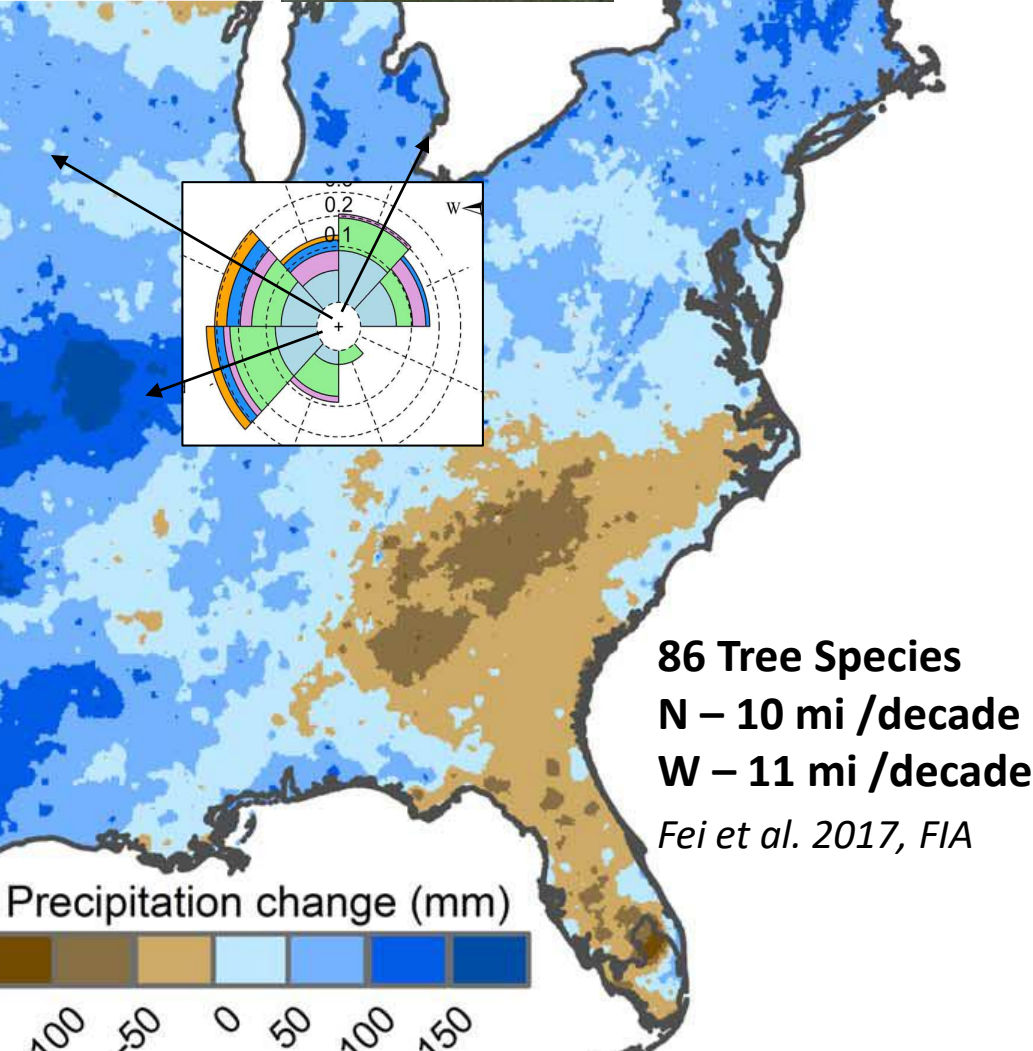


Stressors on Composition in Vermont



Climate Change

Distance moved
(km/decade)



*Chen et al. 2015, Science,
Review of 51 studies,
encompassing nearly 1,000
species*

Structure



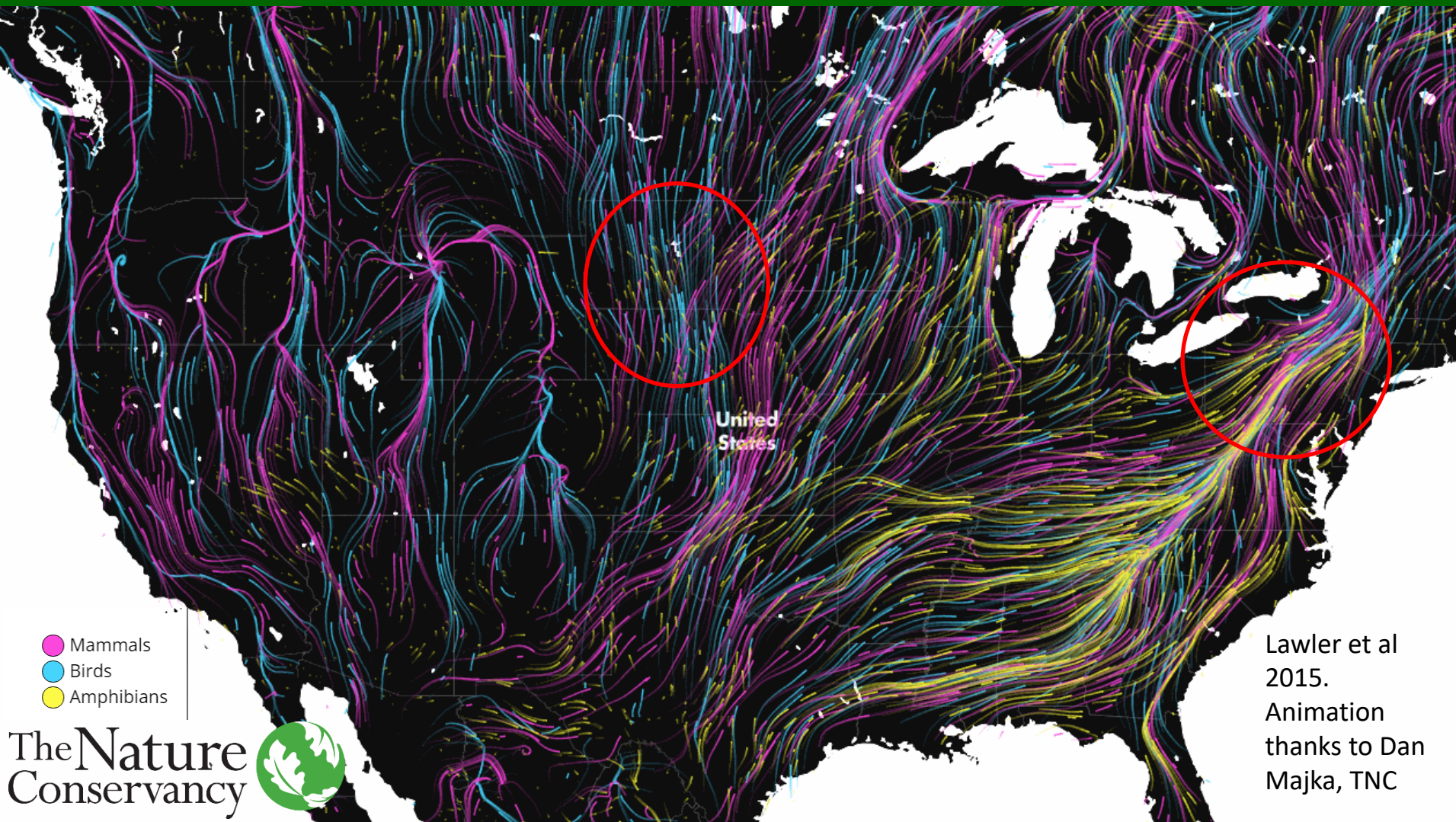
Structure



Function



Connectivity and Climate Change



The gradual movement of populations across the landscape in response to climate change

Current Rates: 11 mile per decade North 36 feet per decade Upslope

Connectivity in the Northeast



What's next?

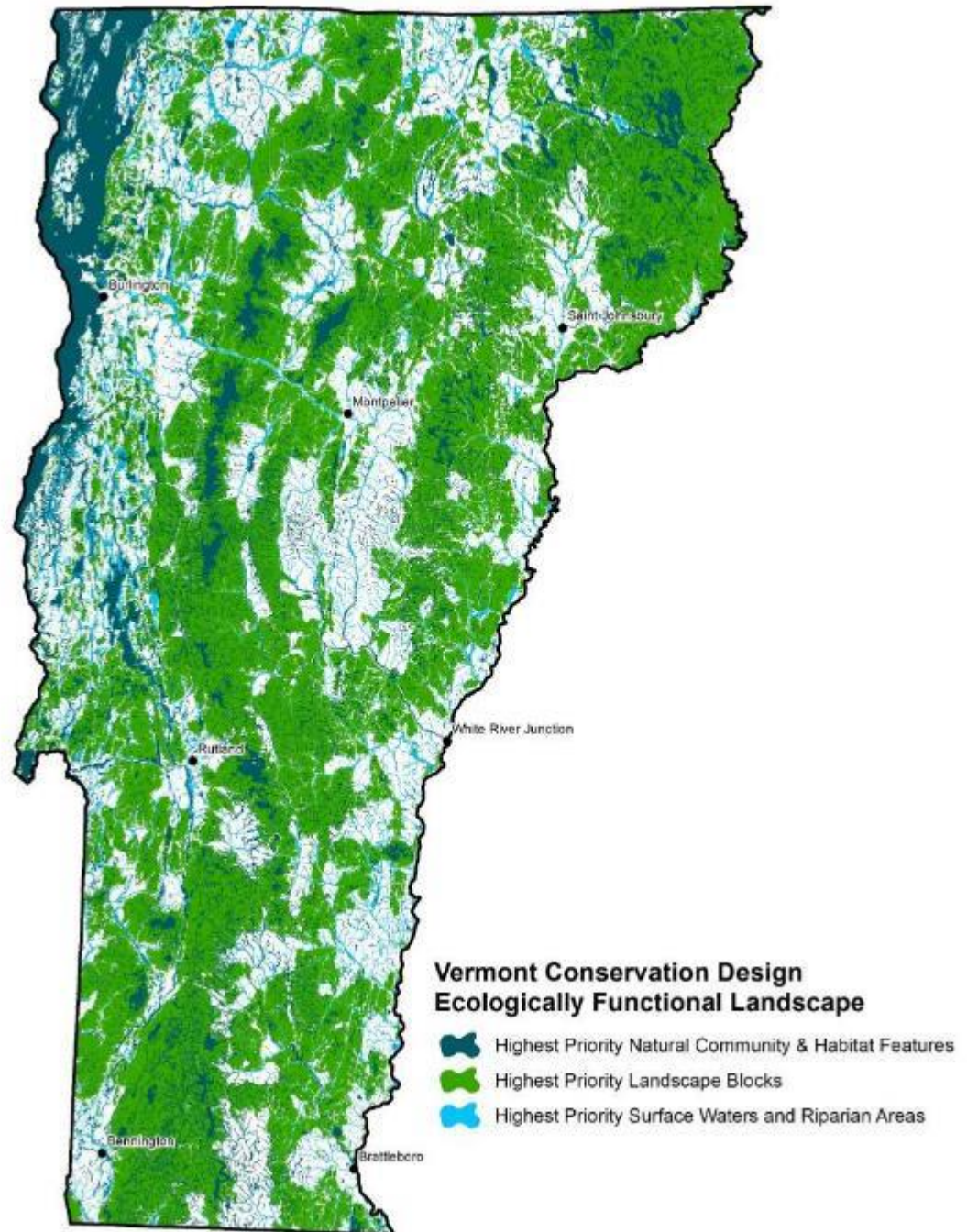


Vermont Conservation Design

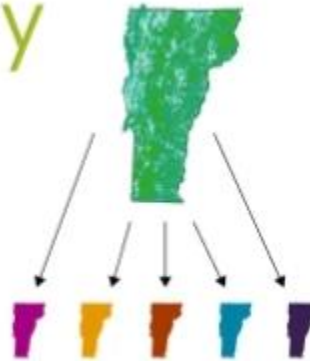
Ecologically Functional Landscape

- Intact
- Connected
- Diverse

A set of features where we need to maintain or restore ecological function, using conservation in all its forms.



The Ecologically Functional Landscape



The components below are added together to create the Ecologically Functional Landscape

INTERIOR FOREST

Highest Priority

The largest forest blocks in each biophysical region. These are areas of contiguous forest and other natural communities and habitats (such as wetlands, ponds, and LFPs) that are unfragmented by roads, development, or agriculture.

CONNECTING FOREST

Highest Priority

The network of forest blocks that together provide regional connectivity of the regional scale (across Vermont and to adjacent states and Québec) and connectivity with surface waters and areas of geological diversity.

GEOLOGICAL DIVERSITY

Highest Priority

A set of forest blocks that reflect the full diversity of Vermont's bedrock, soils, elevations, and landforms. Features such as ridges, ridges, flats, and coasts. Diversity in the physical landscape is linked to biological diversity, and places that contribute to physical diversity will be important for biological diversity under climate change.

SURFACE WATERS & RIPARIAN AREAS

Highest Priority

The network of all lakes, ponds, rivers, and streams, their associated riparian zones, valley bottoms, and low corridors to which geographical processes occur.

NATURAL COMMUNITIES, HABITATS & SPECIES

Highest Priority

All the mapped community and species scale components: Natural Communities, Aquatic Habitats, Rare Plant, Wetlands, Wildlife Road Crossings, and Rare, Threatened & Endangered Species.





Parting Thoughts

- The definition of biodiversity matters for decision makers.
- *Vermont Conservation Design* is the guide for conserving biodiversity in Vermont.
- An ecologically functional landscape is essential to sustain biodiversity and human well-being.