

A photograph of a moose standing on a gravel path in a forest. The moose is facing right, with its head turned slightly towards the camera. It has large, dark antlers. The path is made of light-colored gravel and is flanked by green grass and trees. The background is a dense forest with tall trees and green foliage.

# **From Science to Policy to Action: Using Data to Create Policies that Protect Habitat and Resources**

**Northeastern Transportation  
and Wildlife Conference**

**Burlington, VT**

**September 23, 2014**

# Our Illustrious Panel

- Bryan Davis, Chittenden County Regional Planning Commission
- Jamey Fidel, Vermont Natural Resources Council
- Jon Kart, Richmond Conservation Commission
- Jeff Parsons, Arrowwood Environmental
- Jennifer Murray, Town of Jericho

# Chittenden County, VT



## Vermont County Boundaries



The Vermont Center for Geographic Information  
58 South Main Street, Suite 2  
Waterbury, VT 05676  
802-882-3002  
<http://www.vcgi.org>





# Chittenden County, VT



- Jericho
- Richmond
- Bolton
- Huntington

# Background



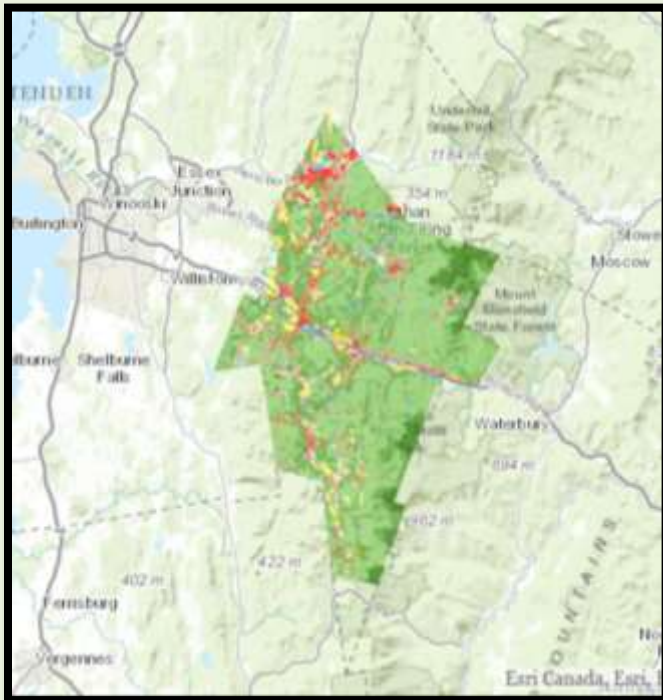
# Process

- Hosted public meetings featuring Sue Morse/Keeping Track
- Partnered Up – VNRC, VT DFW
- Invited Municipalities to Participate
- Applied to ECOS Grant Program
- Conducted Inventory
- Workshop for Realtors and Engineers
- Hosted Walks and Talks Series
- Here we are...



# Objectives

- Inventory
- Technical Assistance
- Education





# Expected Final Products

- A seamless and detailed four-town **natural resource/wildlife habitat inventory map**
- **Draft bylaws** designed to protect and conserve the high priority features identified in each town
- **Technical assistance** that landowner and land managers will use to improve forest management plans to better leverage Use Value Appraisal (Current Use) program incentives
- **Maps of wildlife travel corridors** to inform CCRPC's regional transportation plans
- A better **informed and engaged public**
- A giant step toward **meeting ECOS's goal of managing sustainable growth** in Chittenden County



# The Value of Planning at the Regional or Multi-Town Scale



**JAMEY FIDEL**

**GENERAL COUNSEL/  
FOREST AND WILDLIFE PROGRAM DIRECTOR**

**VERMONT NATURAL RESOURCES COUNCIL**

# VNRC's Role in Science to Action



- Environmental non-profit.
- Focus on research and technical assistance to local municipalities and regional planning commissions.
- Core campaign of reducing forest and habitat fragmentation. This includes promoting connectivity for wildlife.

# Pilot Projects to Promote Multi-Town Conservation Planning



- **Forests, Wildlife and Communities Project in Mad River Valley – Came before Science to Action**
  - ✦ Involved 3 towns focused on promoting large forest blocks and connectivity between habitat blocks.
  - ✦ Steering committee of local officials, state and federal agencies, conservation organizations, land trusts, watershed groups, etc.
  - ✦ Performed ecological inventories in three towns and overlapped the information with community values.
  - ✦ Came up with tiered ecological priorities map.
  - ✦ Provided technical assistance to local planning and conservation commissions.
  - ✦ Science to Action built on this approach.



# Role of Technical Assistance



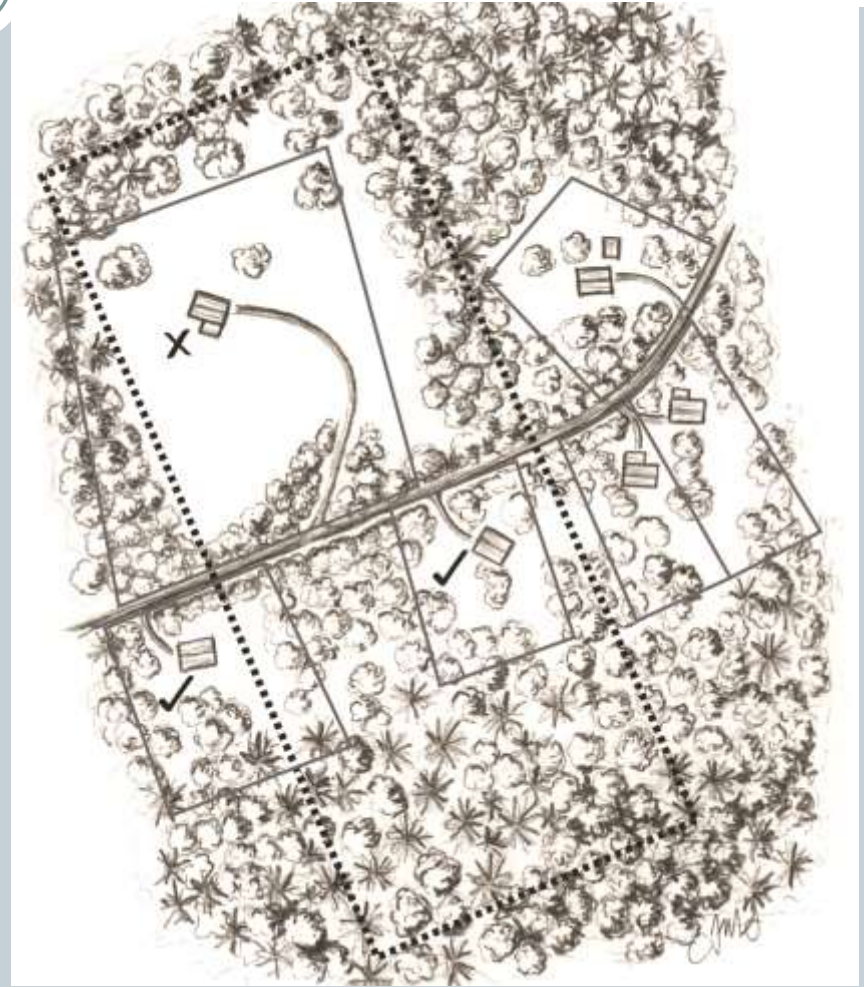
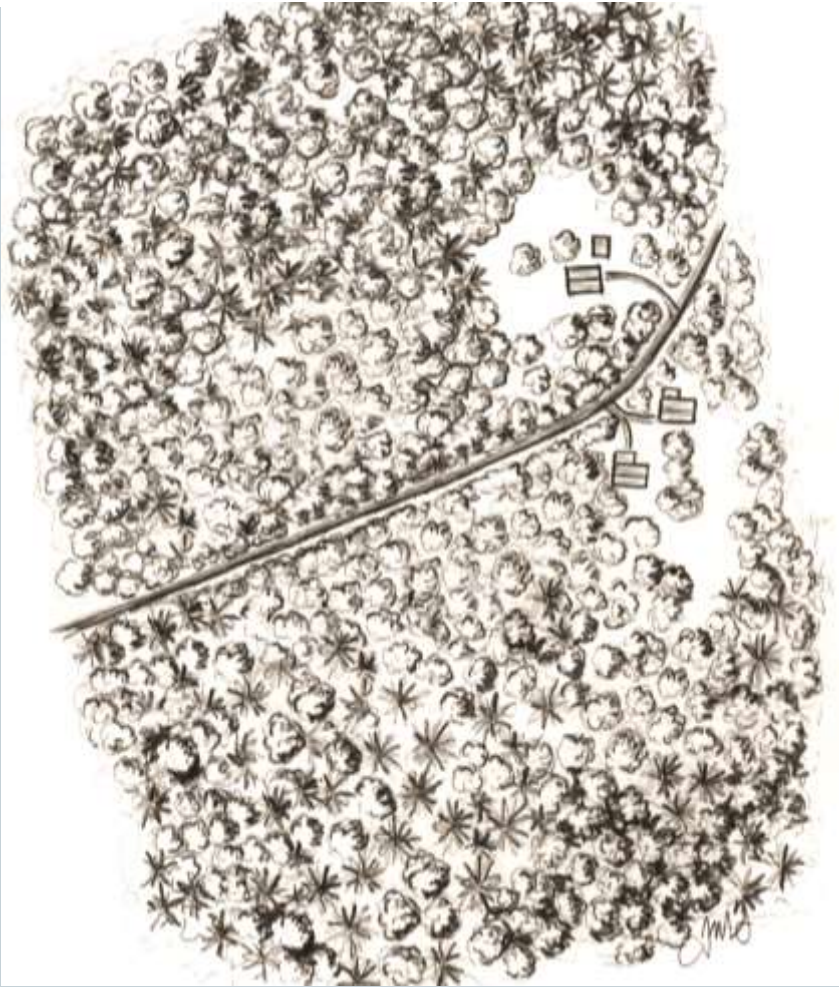
- Many decisions that impact transportation and wildlife occur at the local level.
- Our research shows that most development decisions (such as the placement of new roads/driveways/infrastructure) that impact wildlife occurs at the local level.
- Land use decisions in one town can impact the maintenance of wildlife resources in another town.
- Bringing towns together to plan for wildlife and transportation will ensure better maintenance of natural resource features.

# Role of Technical Assistance

- How land use planning can influence transportation and wildlife resources.
  - Town plan
  - Zoning districts – what uses are allowed
  - Road and trail policies
  - Subdivision design
  - Non-regulatory efforts such as land conservation or conservation planning

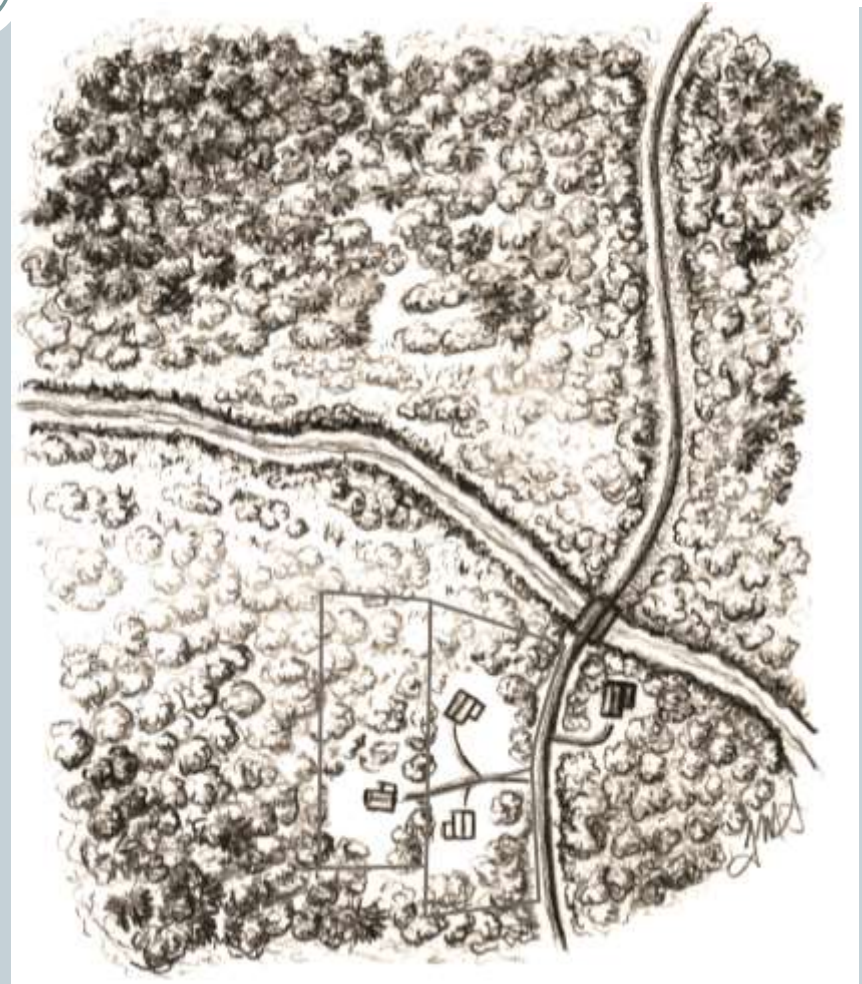
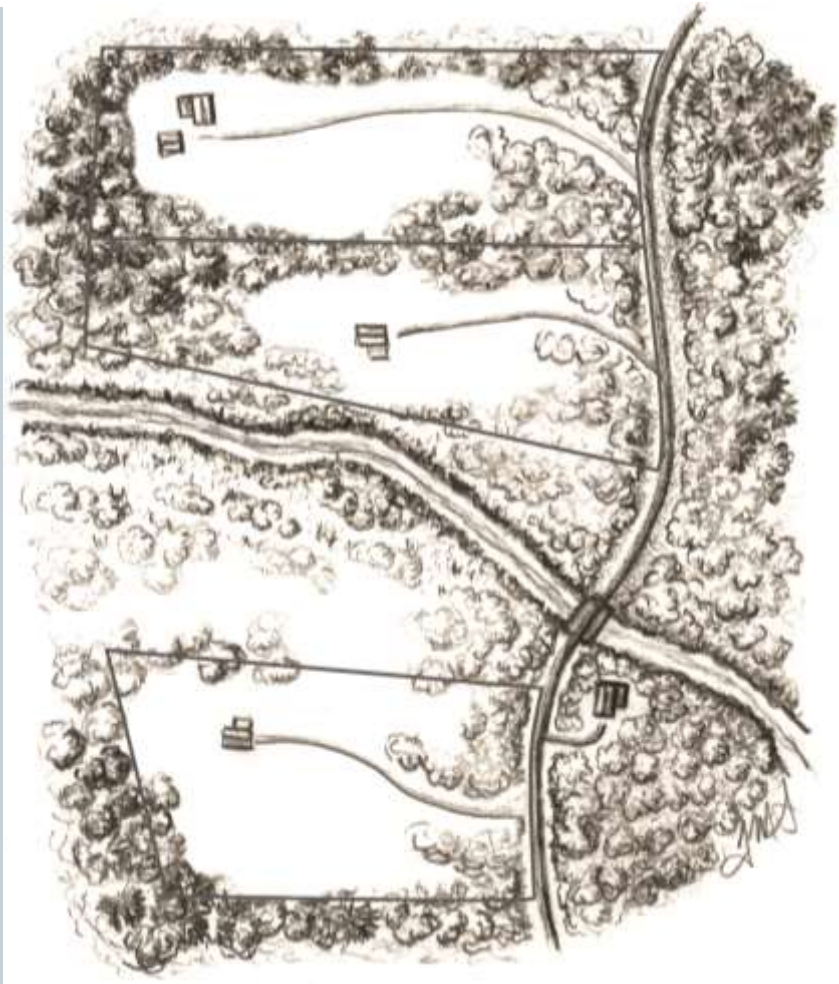


# Developing in a Wildlife Corridor



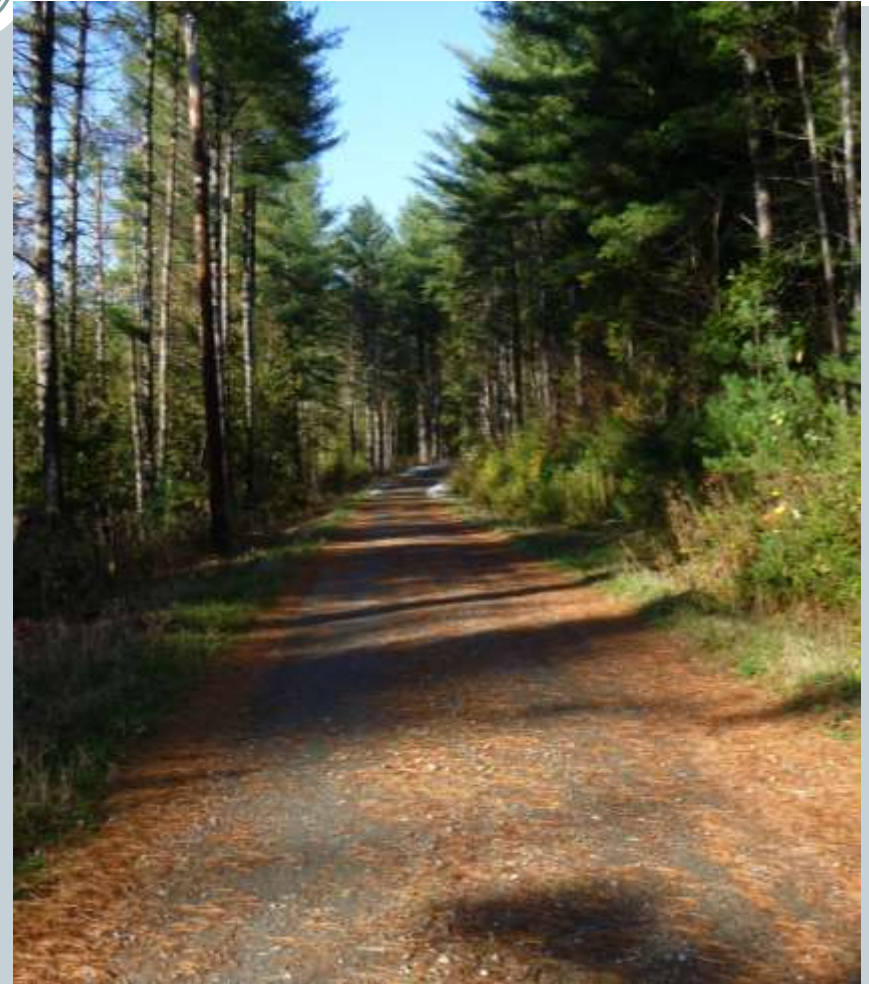


# Subdivision Layout



# Road and Trail Policies

- How roads are classified may impact level of development.
- Frontage requirements can shape development.
- Requiring driveways of a certain length to be subject to review.
- Prohibiting roads of a certain length in important areas.
- Converting trails to roads.
- Sizing culverts.



# Science to Action



- VNRC provided memos to individual towns on ways to strengthen town plans or zoning/subdivision regulations.
- Met with planning commissions to review land use planning recommendations.
- Take home messages:
  - Data increases local confidence in decision making
  - Identifying community values helps to support action
  - Regional action is more compelling
    - ✦ Knowing how resources fit together
    - ✦ Confidence that neighboring town policies will be consistent



# Science to Action



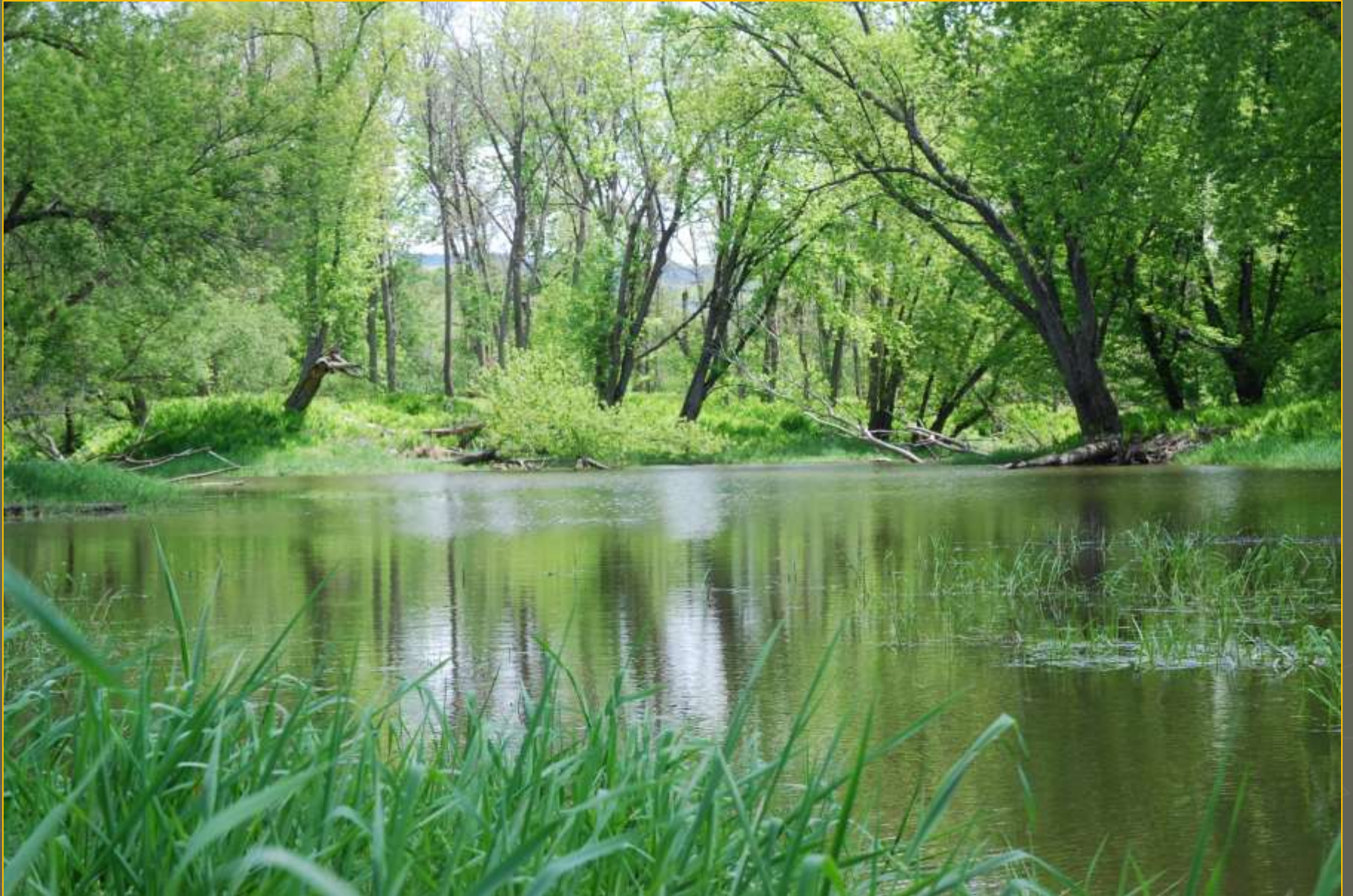


# Science to Action





# Science to Action





# Science to Action





# Nature in Action





# Nature in Action

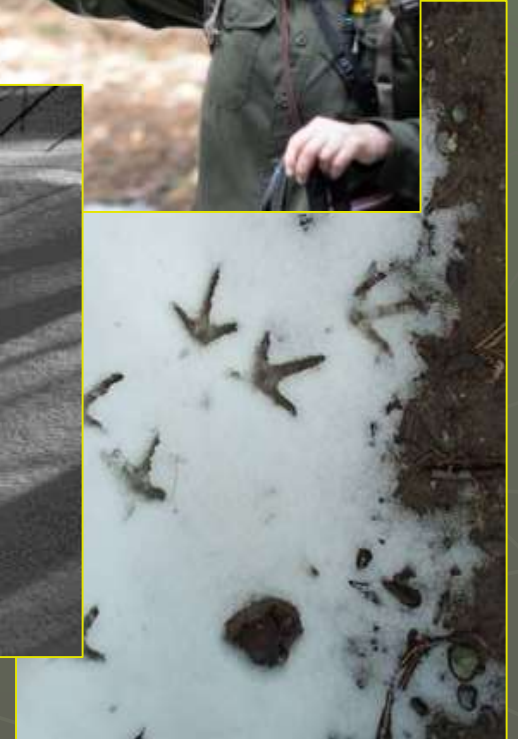
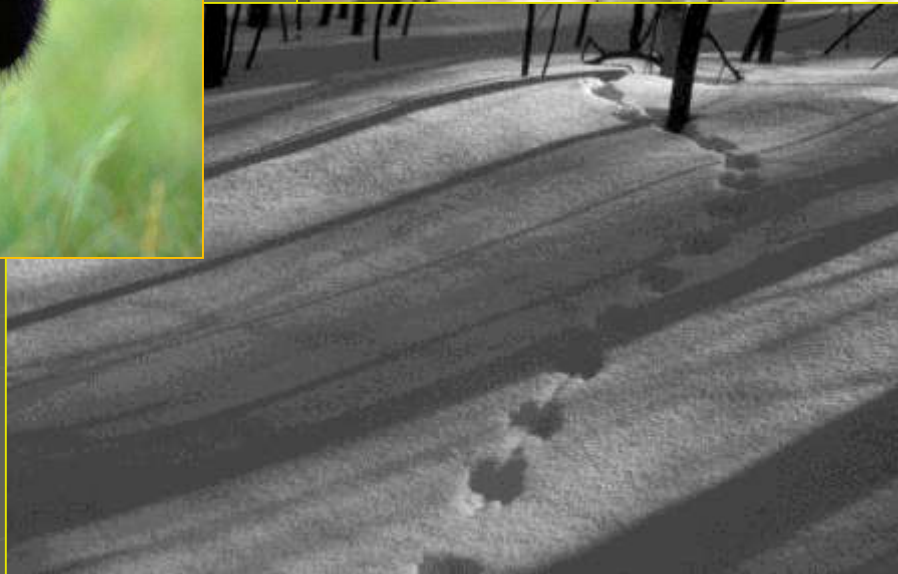


# Science to Action





# Science to Action







# Science to Action





# Science to Action



# Science to Action







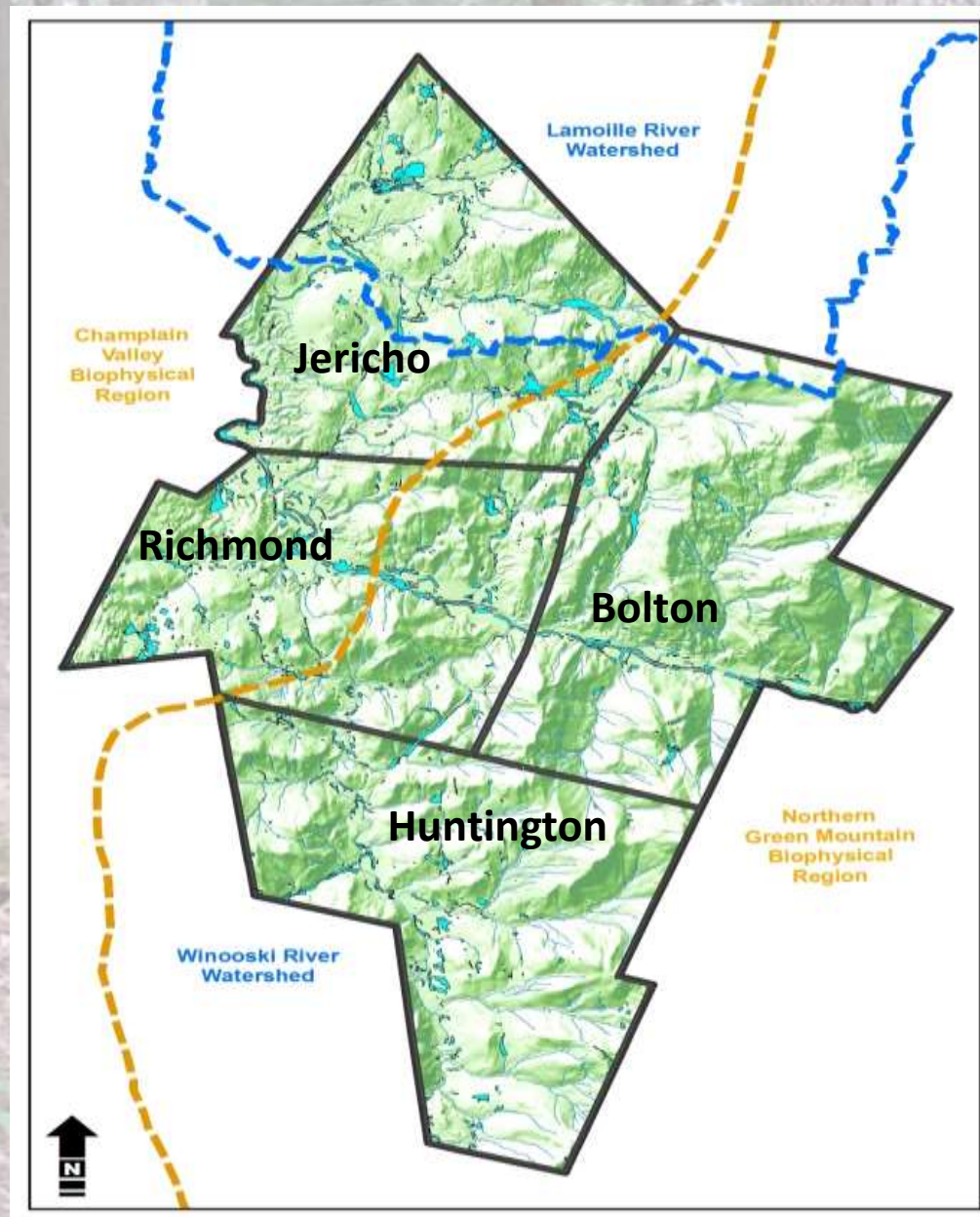


# Science to Action





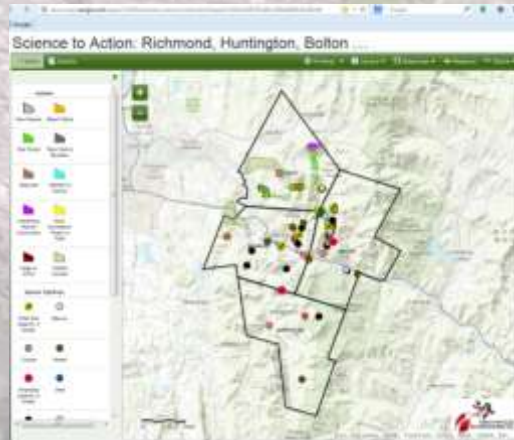
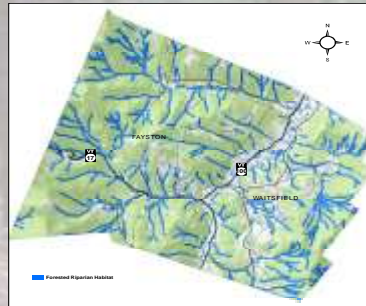
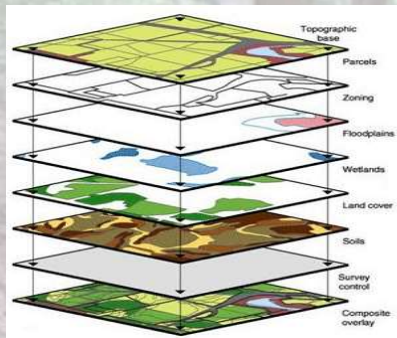
# ECOS - The 4 Town Inventory





# STA Methodology

## (1) Computer-based GIS Mapping and Air Photo Interpretation



## (3) Public Input into Resources

## (2) Gather data from Existing Sources

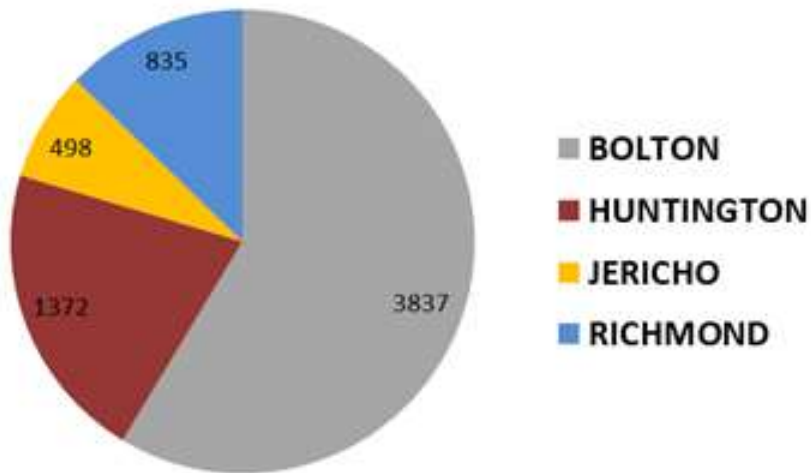


## (4) Field Investigation

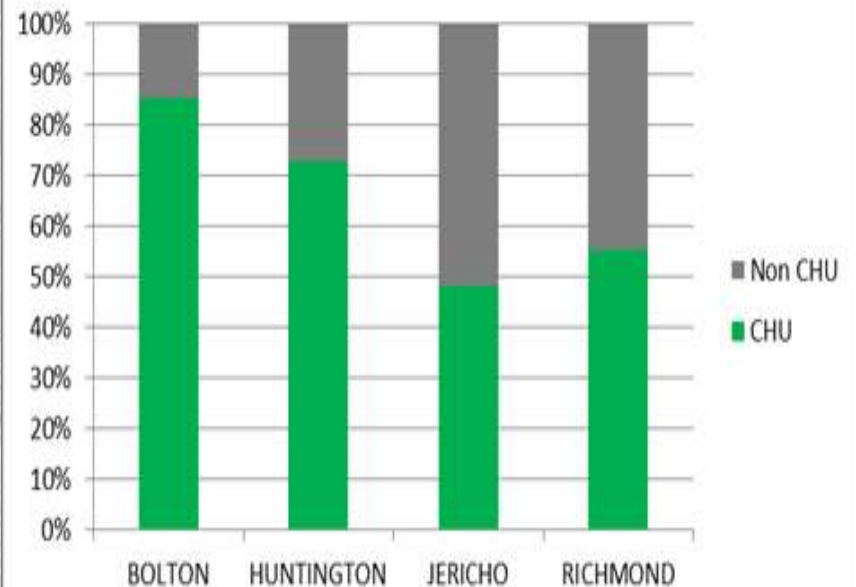


# Wildlife: 4 Towns

**Ave. CHU Size by Town (acres)**



**% of landbase in CHU**



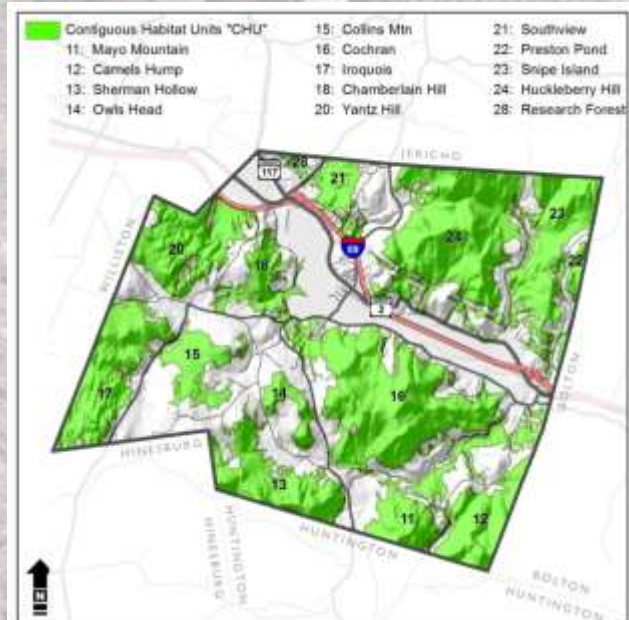
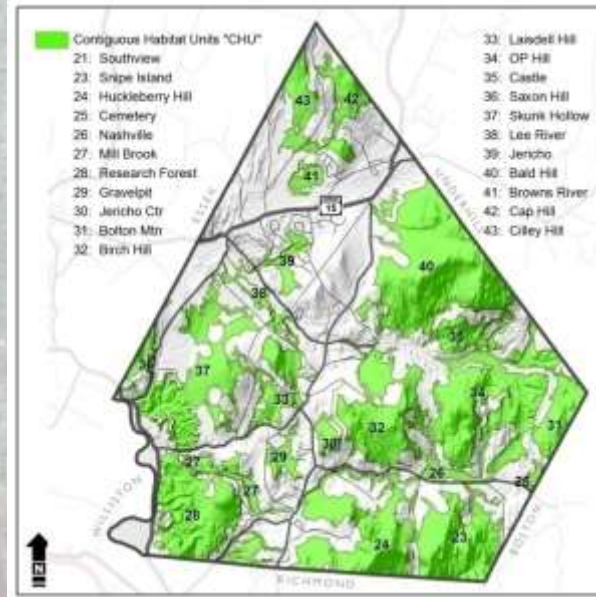


# For each *Contiguous Habitat Unit* the Following Wildlife Habitat Elements were Identified and Assessed

- **Size of Contiguous Habitat (core habitat and overall)**
- **Horizontal Diversity of Core Habitat**
- **Length of Streams & Forested Riparian Habitat**
- **Size of Deer Winter Habitat**
- **Area of Wetlands (forested wetlands and overall)**
- **Presence of Bear Wetlands**
- **Presence of Vernal Pools**
- **Area of Early Succession Habitat**
- **Area of Riparian Corridor**
- **Presence of Mast Stands (oak & beech)**
- **Presence of Ledge**
- **Presence of Locally Significant Natural Communities**
- **Elevation**
- **Aspect**
- **Area of Conserved Land**

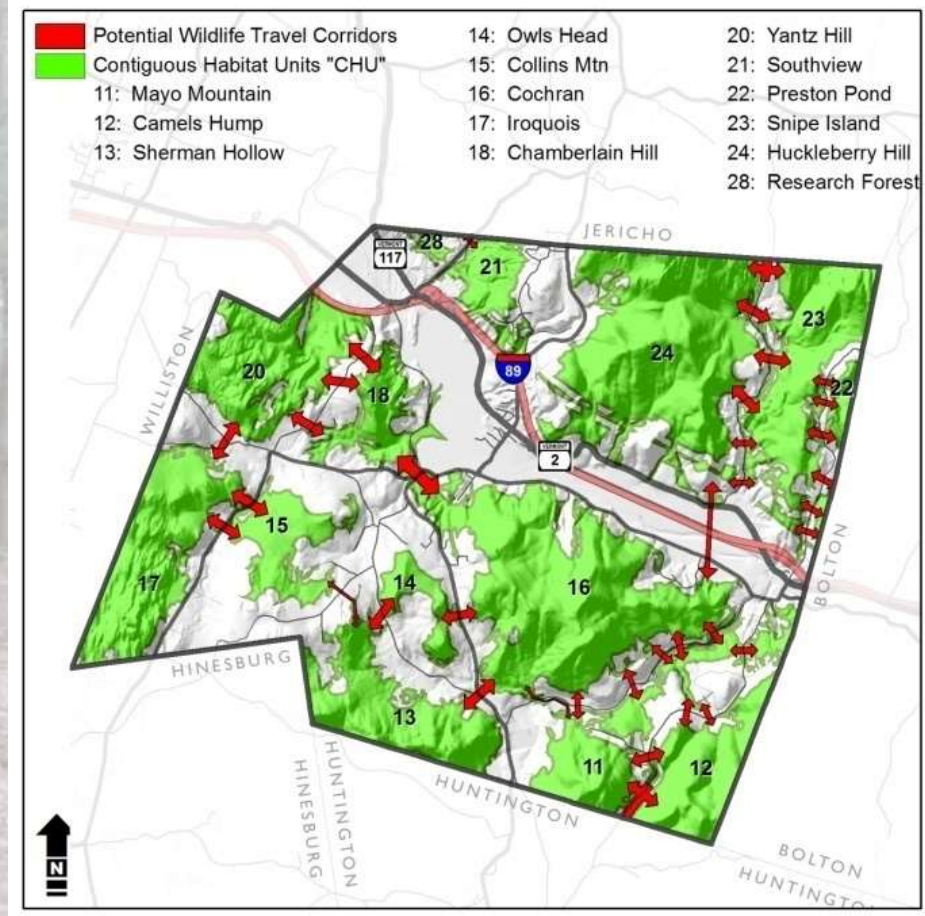
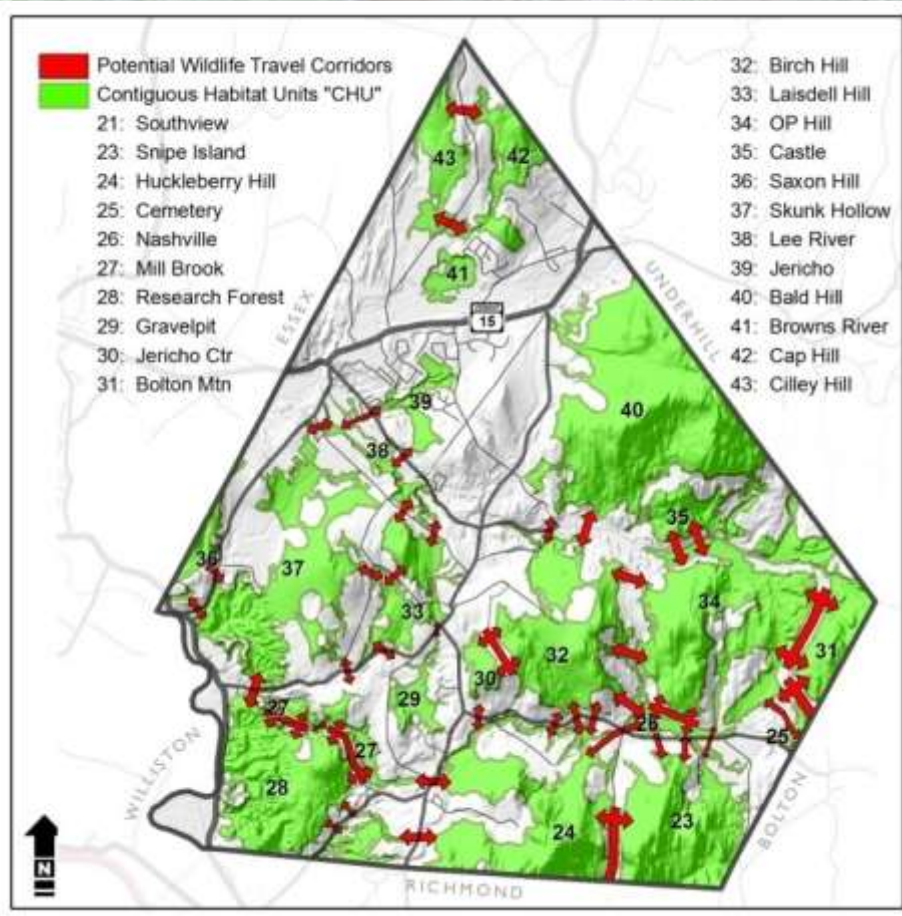


# Contiguous Wildlife Units





# Mapped Potential Wildlife Corridors

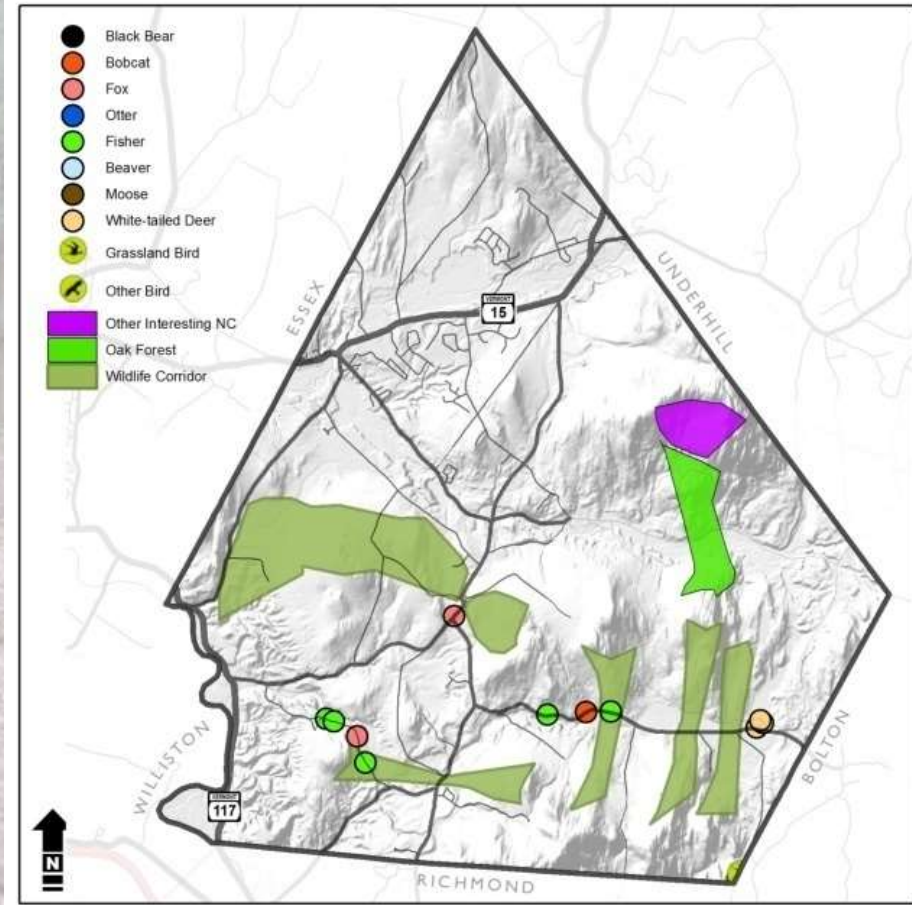
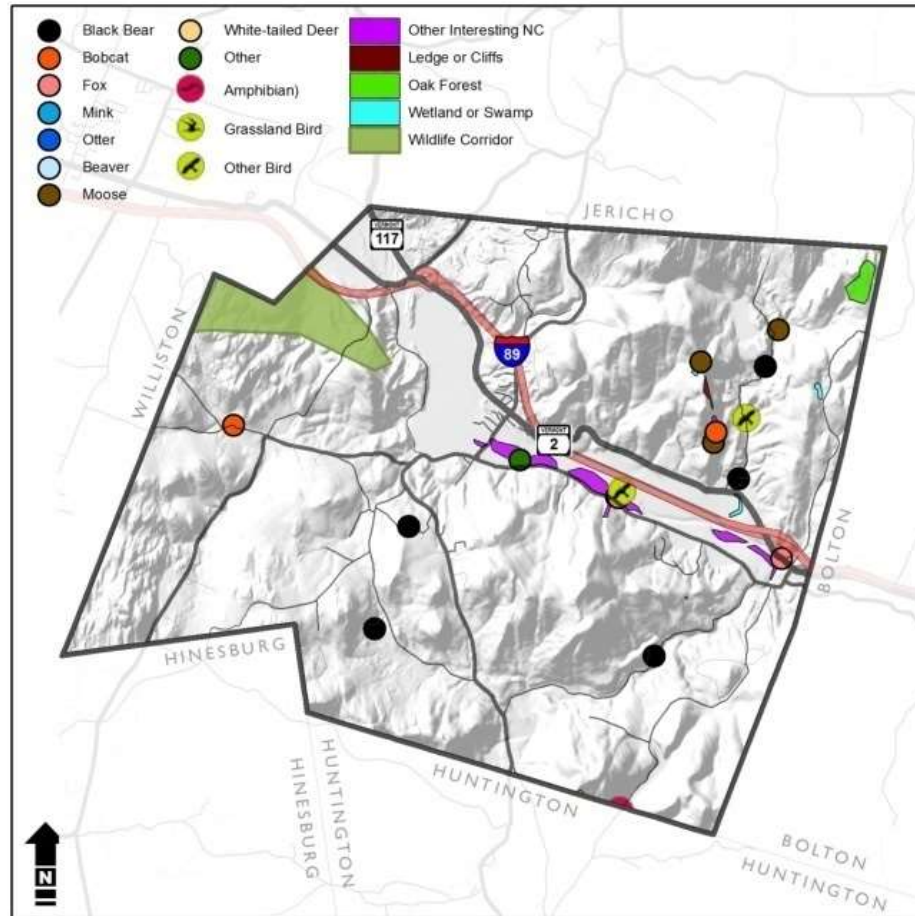


Mapped with Public Input & Land-Use Information



# Citizen Input

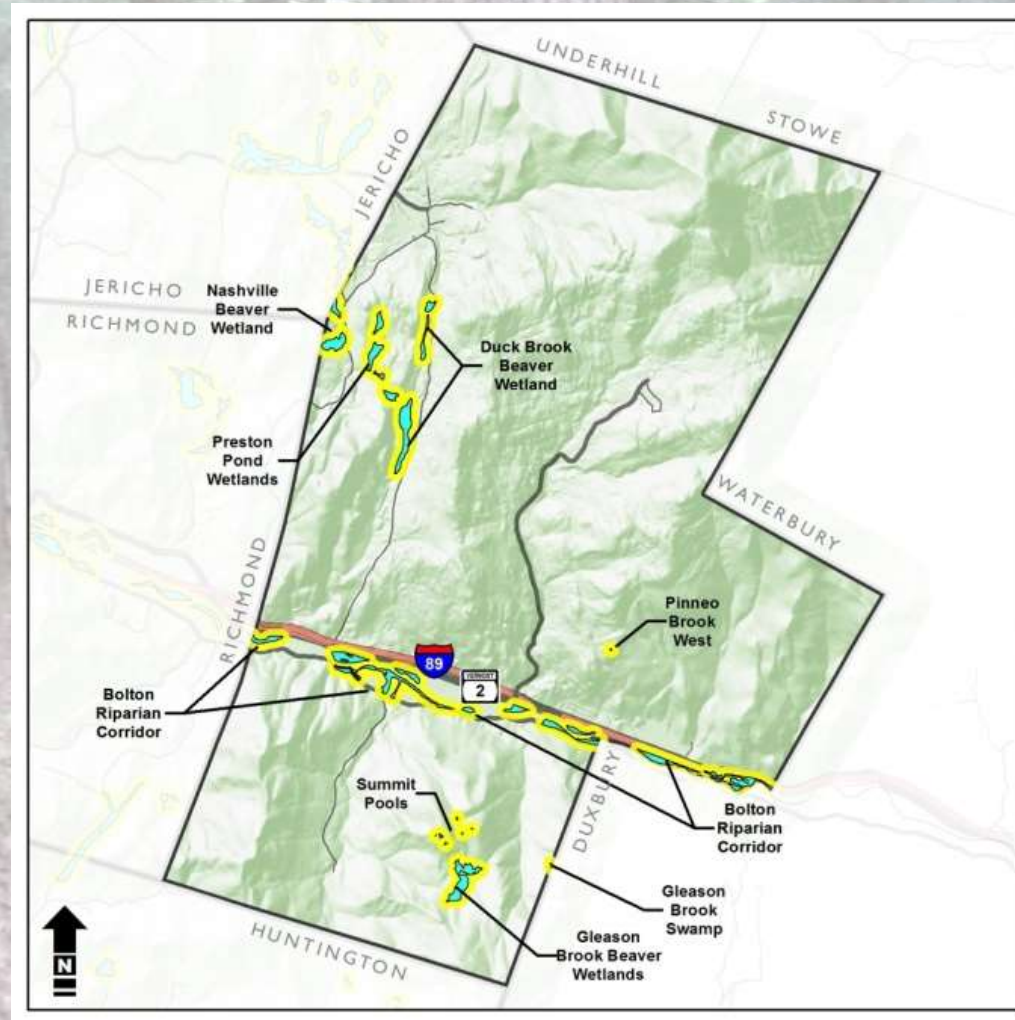
Natural Community/Wildlife Crossing/Wildlife Habitat Information:Online Maps



# Wetlands

Town wide data:

- Mapping
- Function and Value
- Wetlands of Special Significance in each town
- Recommendations for Protection





# Nashville Beaver Wetland Complex

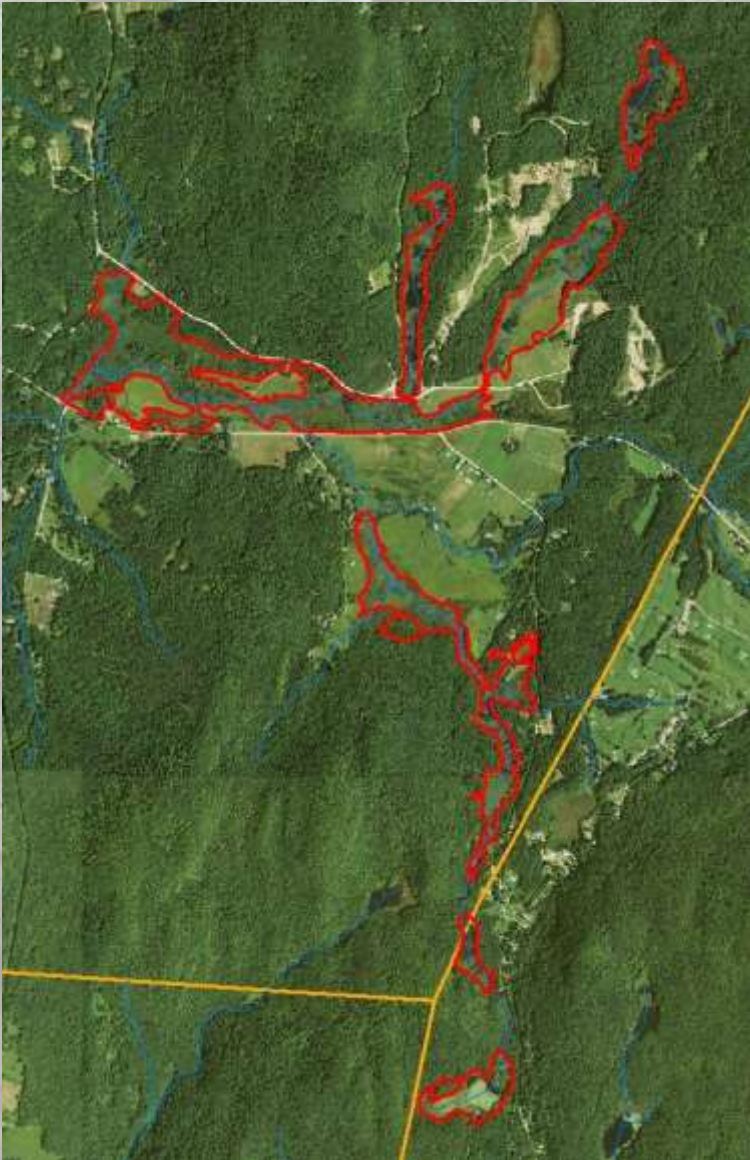
235 acres

**7 different  
wetland  
community types**

- Shallow Emergent Marshes
- Beaver Ponds
- Alder Swamps
- Sedge Meadows
- Cattail Marshes
- Deep Broadleaf Marshes
- Forested Swamps

**Locally Significant  
for Functions and  
Values**

- Wildlife
- Flood Control
- Water Quality
- Fisheries
- Erosion Control
- Exemplary Natural Communities
- Aesthetics



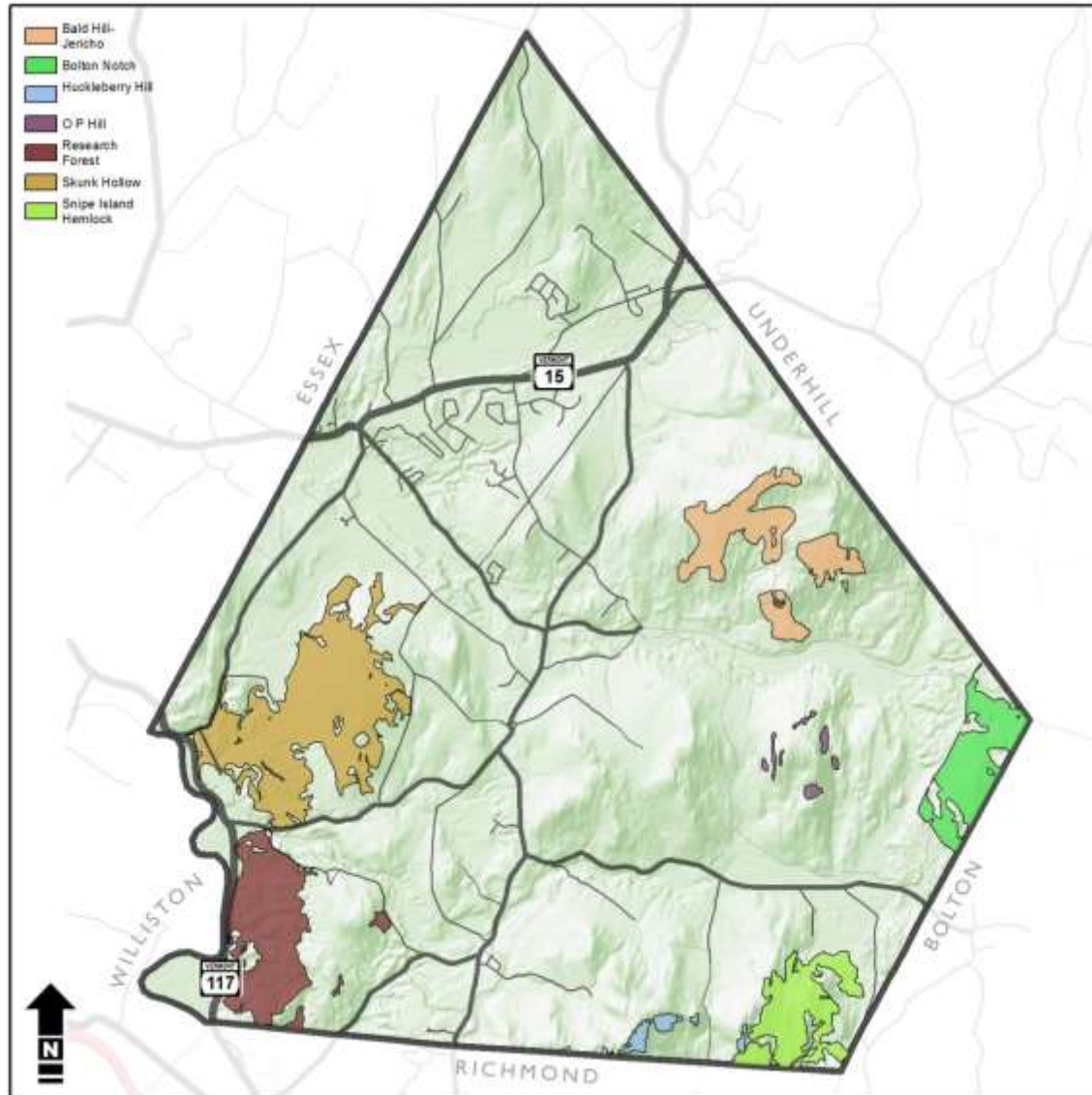


## Jericho Upland Summary

		TOTAL number		TOTAL acreage
	Number	in STA	Acreage	in STA
Dry Oak Forest	8	34	30.4	273.0
Dry Red Oak-Pine Forest	11	59	53.4	539.4
Hemlock Forest	7	30	81.2	314.3
Hemlock-Northern Hardwood Forest	86	350	2738.8	11434.5
Lowland Spruce-Fir Forest	6	10	198.4	230.5
Mesic Maple-Ash-Hickory-Oak Forest	3	4	17.4	70.8
Mesic Red Oak-Northern Hardwood Forest	21	105	746.3	3999.1
Northern Hardwood Forest	189	526	7237.0	40491.6
Northern Hardwood Talus Woodland	1	8	0.5	21.5
Plantation	28	71	177.9	404.6
Red Spruce-Heath Rocky Ridge Forest	4	26	16.3	117.4
Red Spruce-Northern Hardwood Forest	45	202	640.2	2604.5
Rich Northern Hardwood Forest	16	25	65.9	263.6
River Sand or Gravel Shore	31	86	10.8	53.2
Temperate Acidic Cliff	4	43	2.4	37.5
Temperate Acidic Outcrop	1	52	0.1	30.8
White Pine-Northern Hardwood Forest	161	339	2416.6	4828.2
<b>Total</b>	<b>622</b>	<b>2080</b>	<b>14433.5</b>	<b>74,196.5</b>



# Significant Upland Natural Communities in Jericho



## Bald Hill

Red Oak-Northern Hardwood  
Dry Red Oak-Pine  
State & Locally Significant NC

## OP Hill

Rich Northern Hardwood  
State Significant NC

## Snipe Island Hemlock

Hemlock-Northern Hardwood  
State Significant NC

## Huckleberry Hill

Dry Red Oak-Pine  
State Significant NC

## Bolton Notch NH

Northern Hardwood  
State Significant NC

# Town Presentations



The Science/Then The Policy & Implementation  
Where do we go from here ?



# Existing Overlays

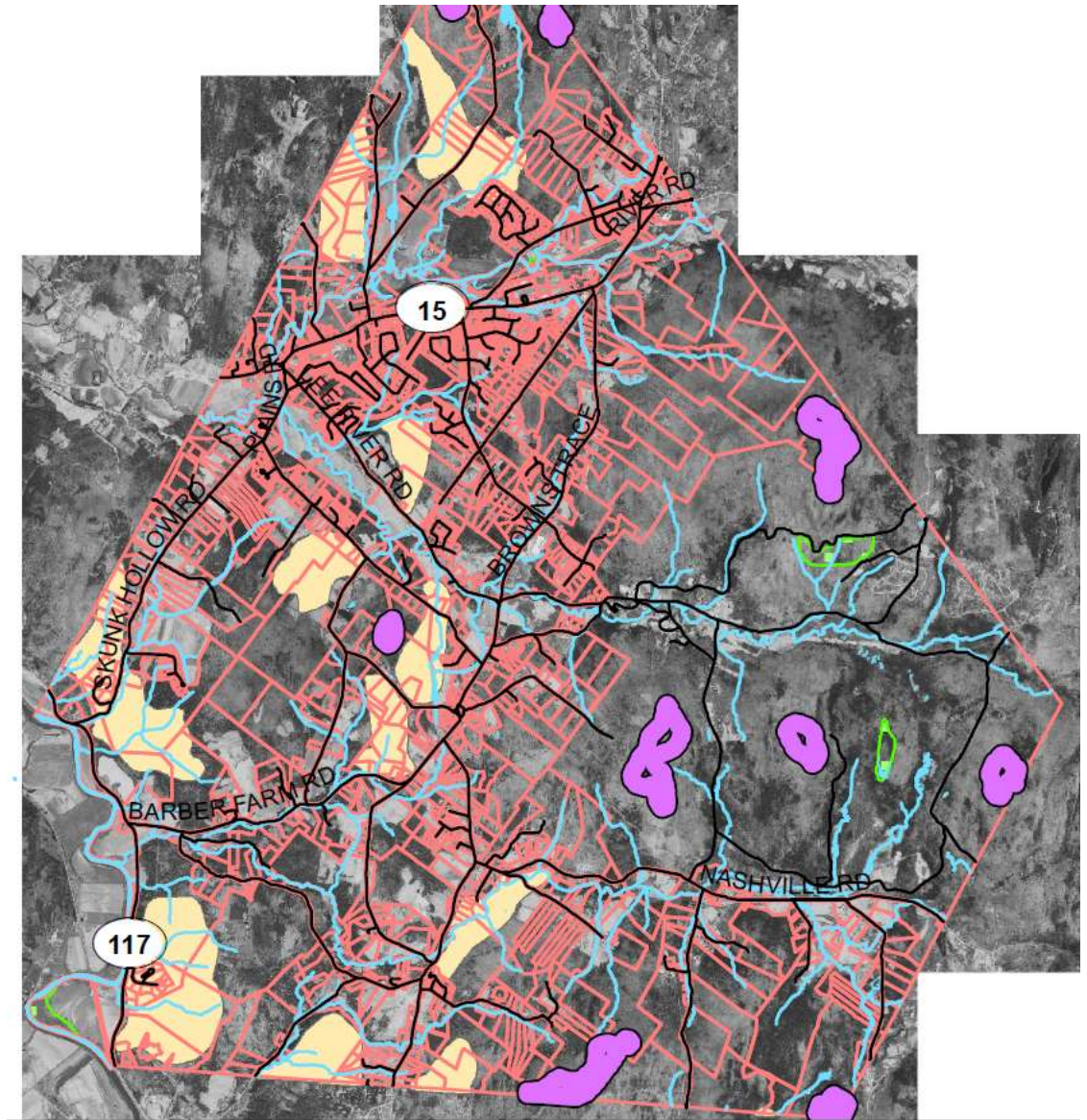
- Natural Resources Overlay
- River Overlay
- Wetlands Overlay

Not explicitly protected-

- Vernal Pools
- Wildlife corridors
- Forest Fragmentation/Large Habitat Blocks

# Natural Resources Overlay

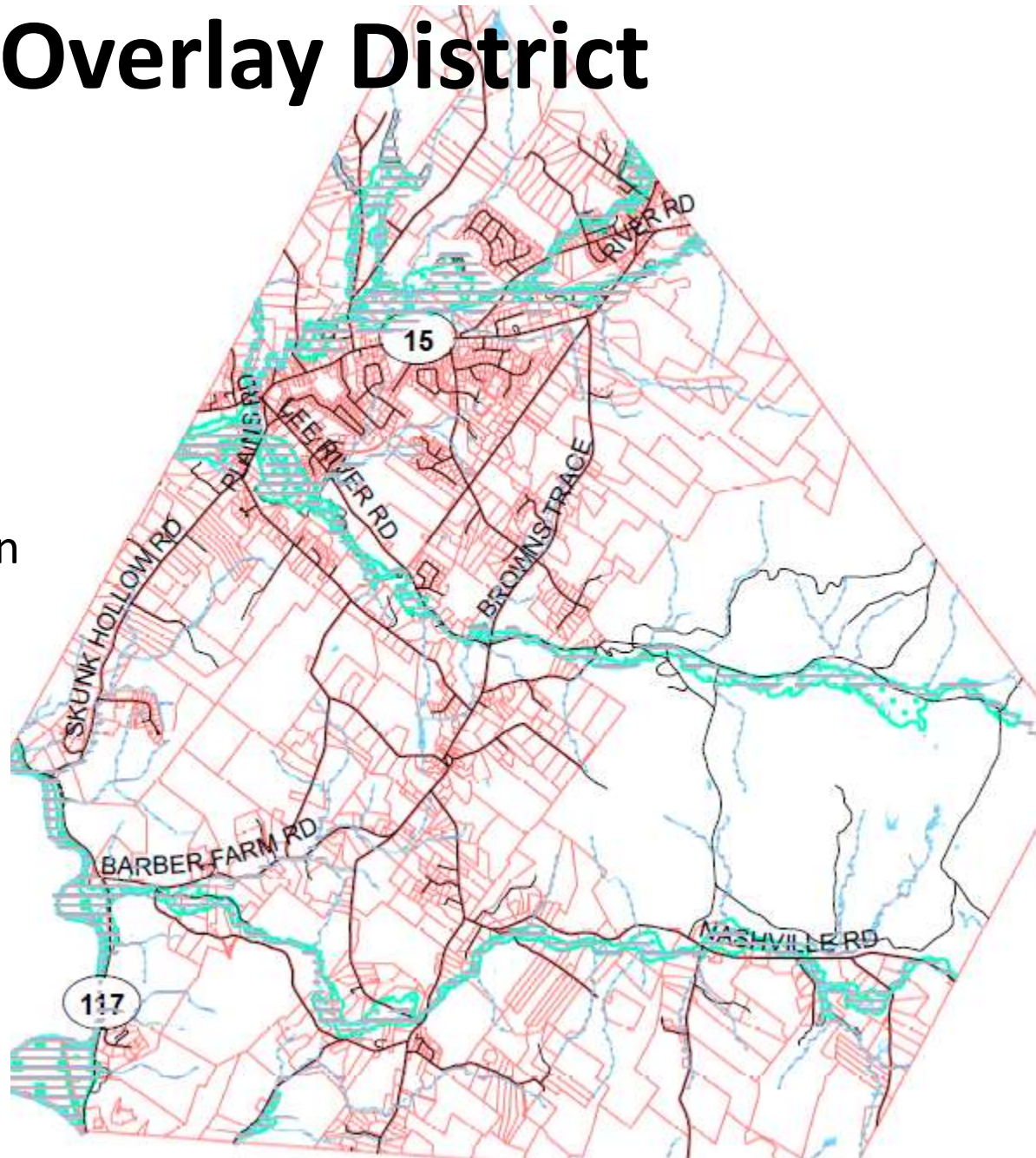
- Protects:
  - Wildlife Habitat
    - 100ft buffer around deeryards
  - Natural areas and natural communities
    - extremely rare biological natural areas
  - Scenic areas
    - ridge tops- top 100ft of peaks over 1000ft
- Various levels of Protection





# River Overlay District

- Protects:
  - Riparian habitat
    - 100ft-50ft-35ft
  - Floodplains
    - 100-yr floodplain areas
    - Fluvial Erosion Hazard areas
- No-build Regulations

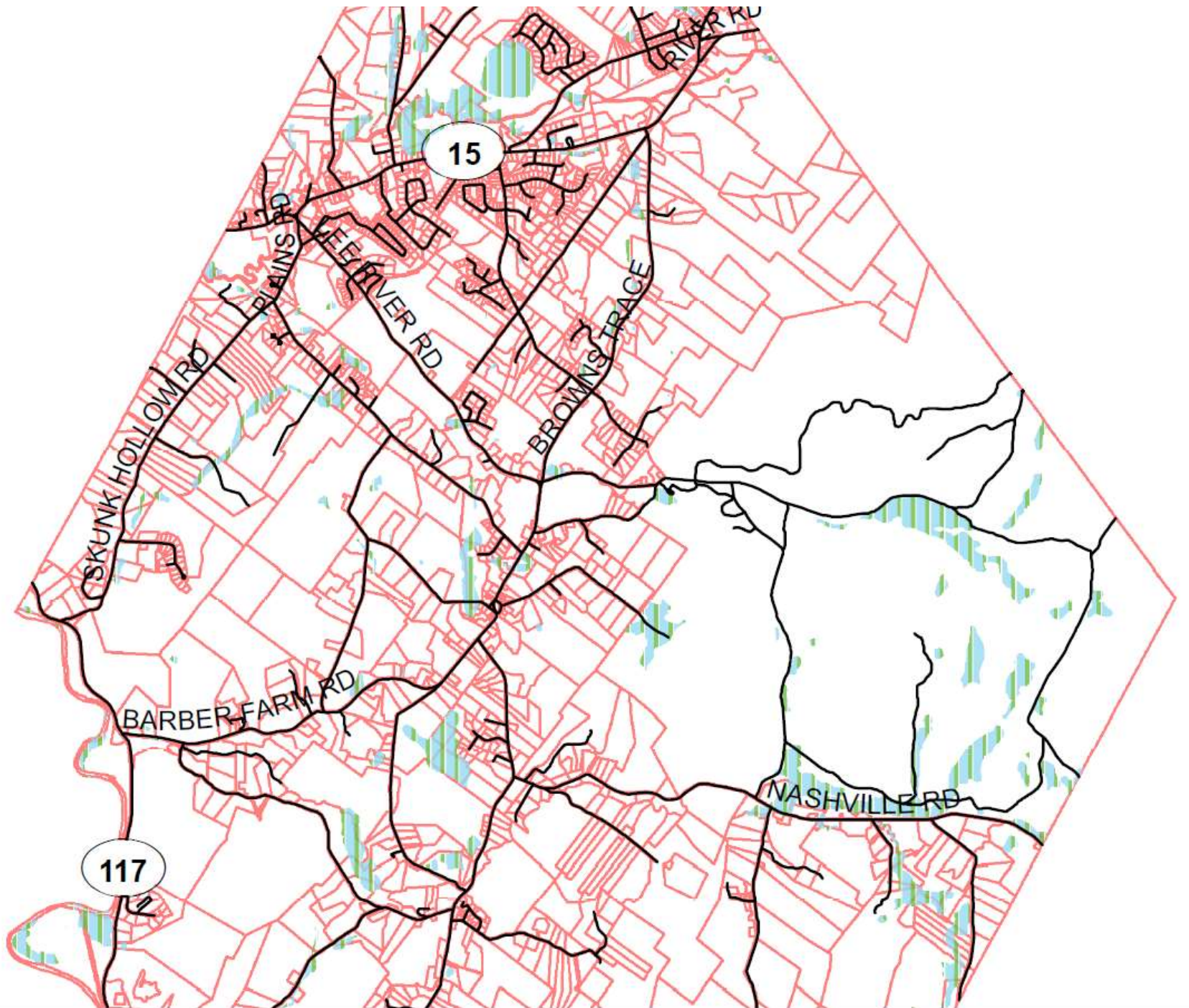


# Wetlands Overlay District

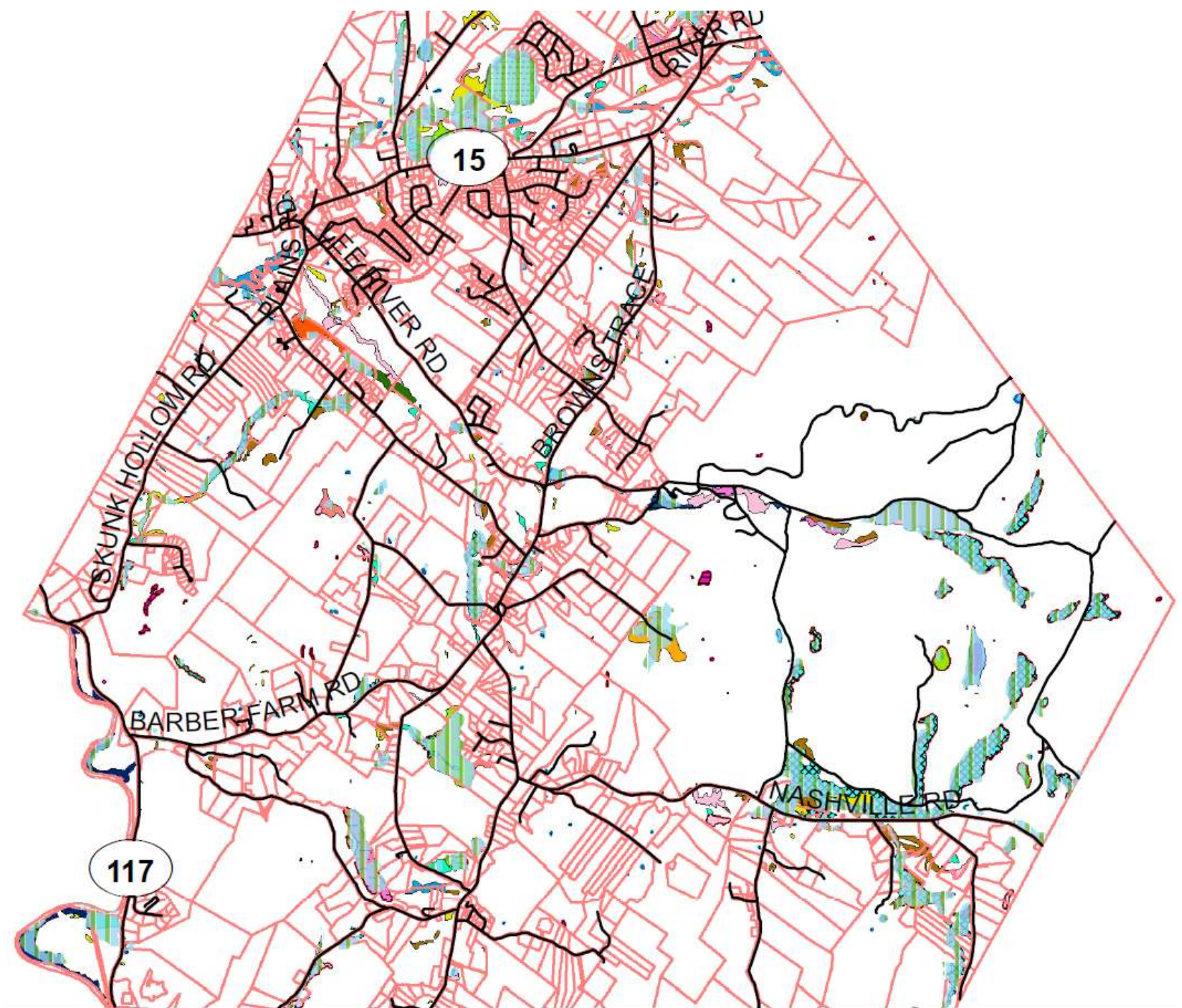
- Protects:
  - Class I and II Wetlands
    - National Wetlands Inventory Mapped
    - 100ft-50ft-25ft
- No-build Regulations





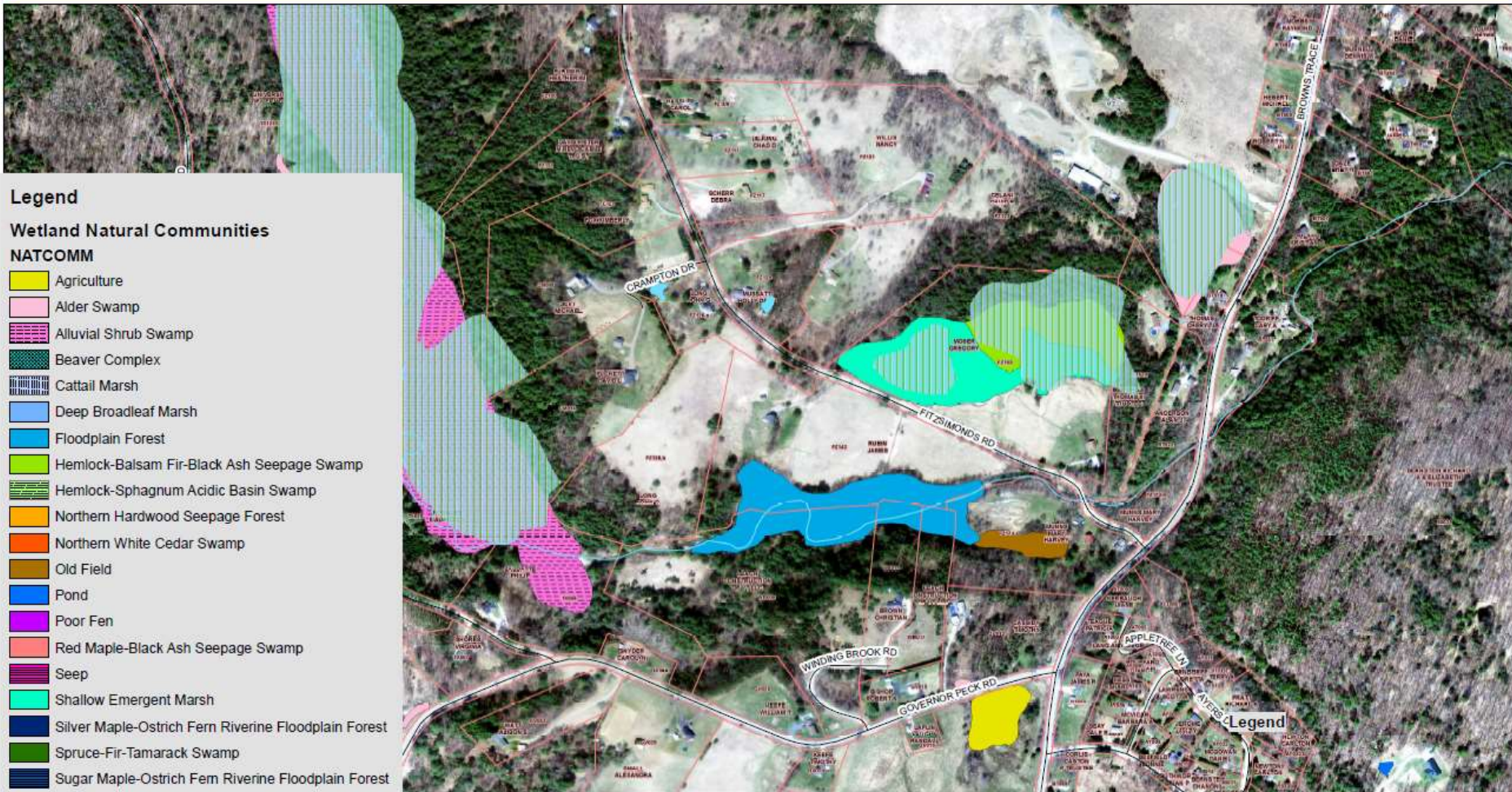








# JERICHO, VERMONT

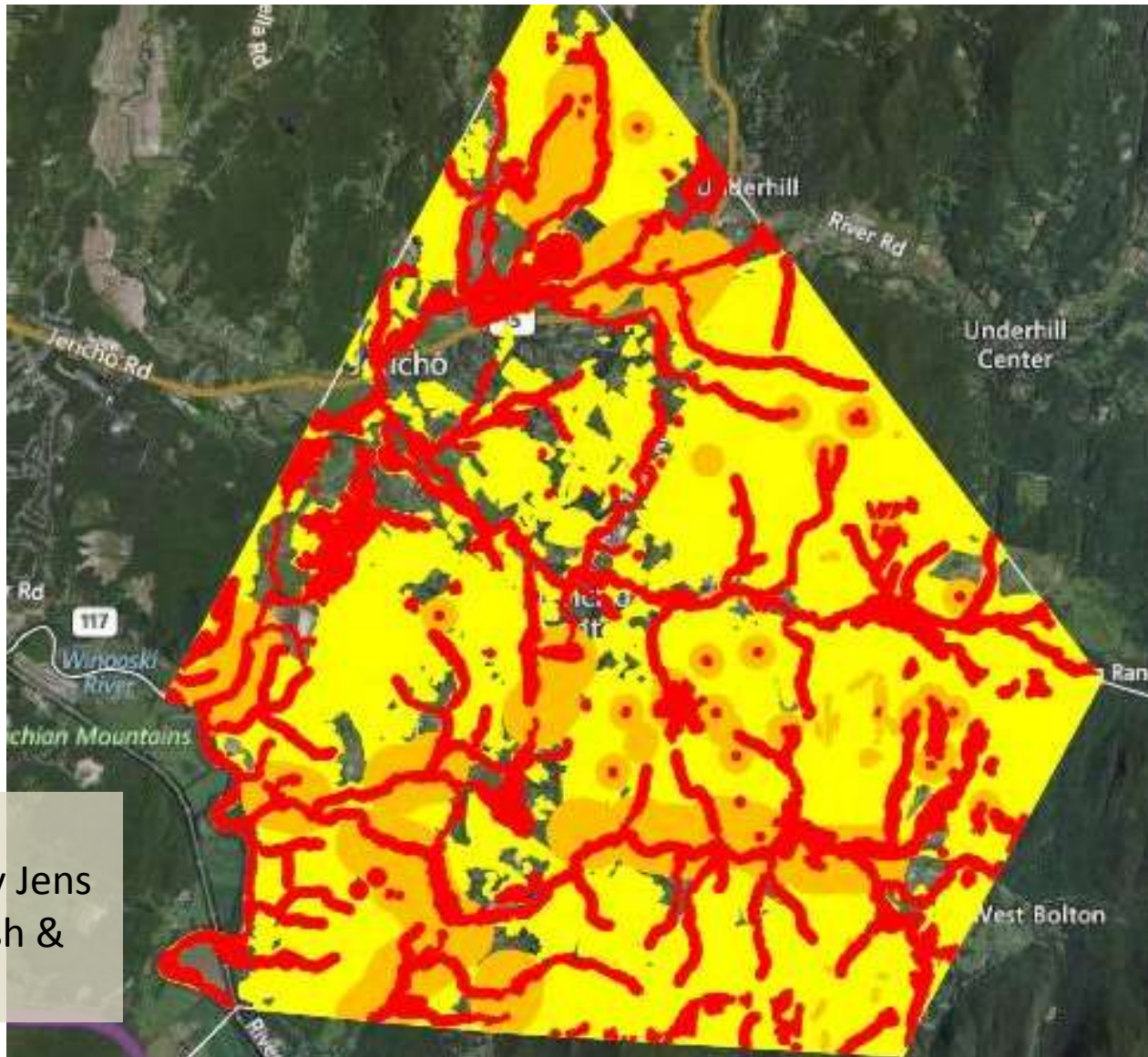


TOWN OF JERICHO  
Planning & Zoning Office  
P.O. Box 39  
Jericho, Vermont 05465  
(802) 899-2287

**Disclaimer:**  
The accuracy of information presented is determined by its sources. Errors and omissions may exist. The Jericho Planning & Zoning Office is not responsible for these. Questions of on the ground locations can be resolved by site inspections and / or surveys by a registered surveyor. This map identifies the presence of features on-the-ground. This map identifies the presence of features, but is not a replacement for surveyed information or engineering studies.



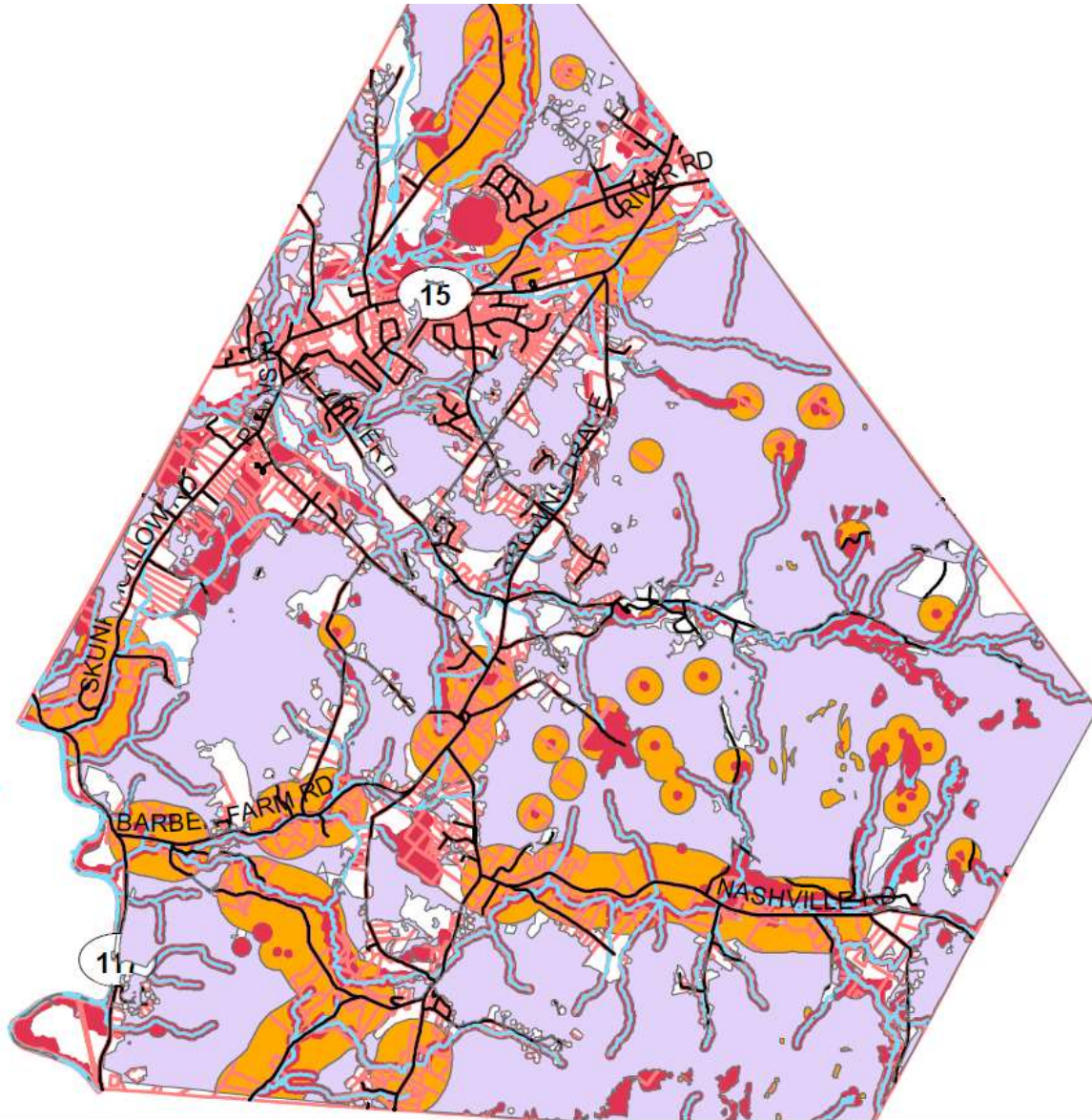
# Tiered Ecological Priorities Mapping



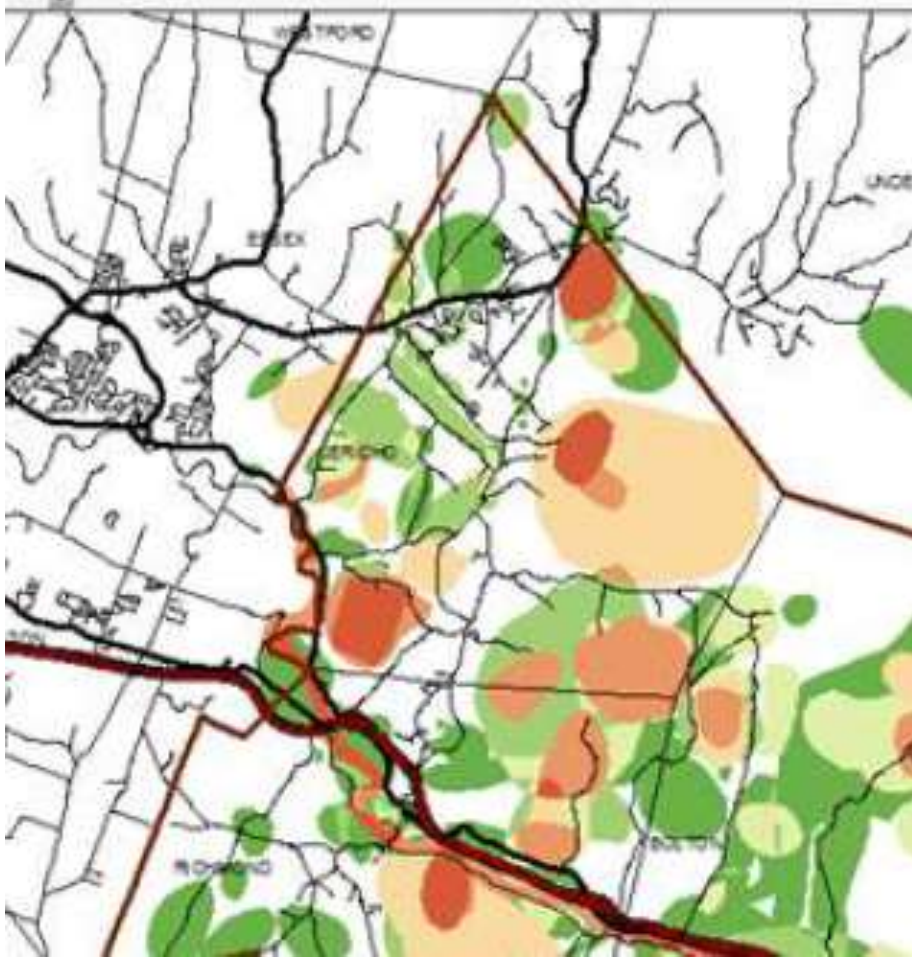
Mapping  
prepared by Jens  
Hilke, VT Fish &  
Wildlife



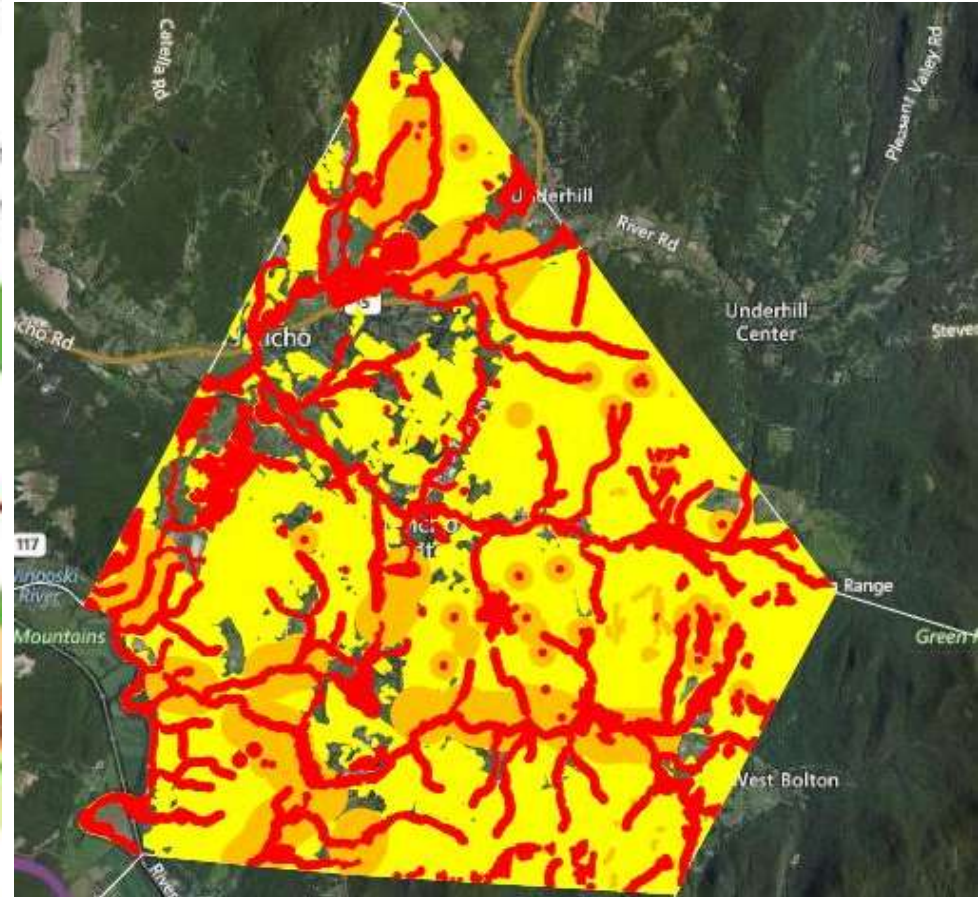
# Tiered Ecological Priorities Mapping



## Community Values Mapping Results



## Tiered Ecological Priorities Mapping





# Primary Conservation Area

Includes:

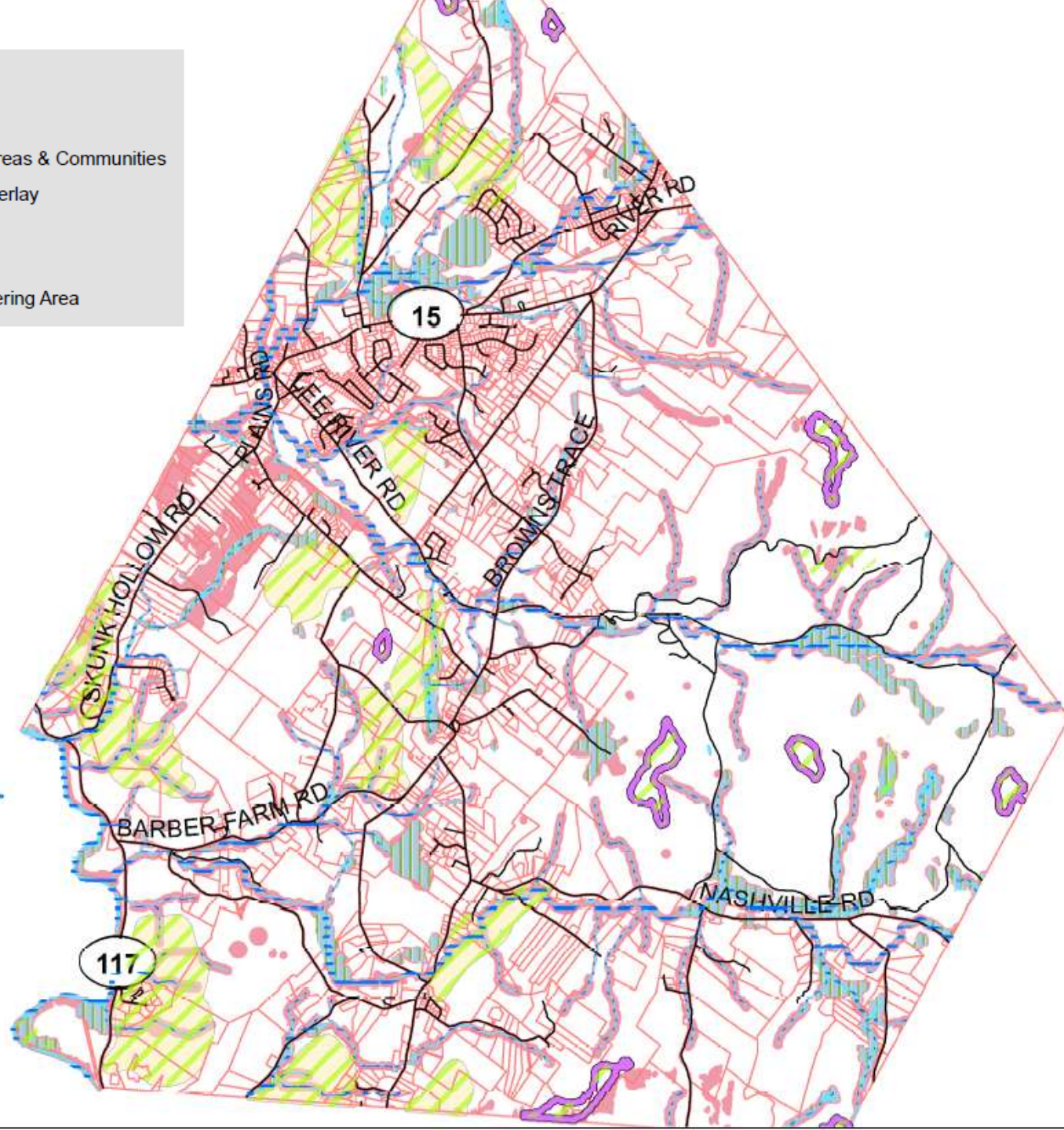
- Vernal pools with 100ft buffer
- Streams and rivers with buffer by stream order (35,50,100)
- All known wetlands, with 100ft buffer (VSWI)
- Rare, threatened and endangered species element occurrences
- Forested riparian habitat, with 150m buffer on stream reaches w/ natural cover
- S1, S2 and S3 (rare) upland natural communities
- S1, S2 and S3 wetland communities mapped by Arrowwood, with 50ft buffer (based on rarity, not condition)

Recommendations:

- No-build zoning overlay?

## Legend

- PCA\_in\_jericho\_v5
- Deeryard, Scenic, Natural Areas & Communities
- Scenic Resource Zoning Overlay
- Stream Buffer - 3/12/07
- Wetlands
- 100 Foot Buffer - Deer Wintering Area





# Secondary Conservation Area

Includes:

- Road crossings with 0.25-mile buffer
  - The data used for road crossings was the data previously collected on behalf of the Jericho conservation commission by Jesse Mohr.
- S4 state-significant natural communities (Arrowwood)
  - These are of significance not because of their rarity, like the S1, S2 and S3 communities included in the primary tier, but because of their size. All are located on the Firing Range
- S4 & S5 wetland natural communities (Arrowwood)
  - See description above; all are located on the Firing Range
- Cliff, ledge and talus (Arrowwood)
- Vernal pools with 600ft buffer, as identified from Arrowwood and BioFinder

Recommendations:

- Require PUDs or other design standards?





# **Tertiary Conservation Area**

Includes:

- S5 natural communities that are state-significant
- All land included in a contiguous habitat unit (of any size) defined by Arrowwood

Recommendations:

- Rules to limit forest fragmentation

# Next Steps

- Compare to build out analysis
- Revise overlays
- Develop low-impact development language
- Create a natural resources map for reference in the regs and inclusion in Town Plan
- Create a Jericho wetlands map for reference in the regs and inclusion in Town Plan

