Eco-Logical Webinar Series

# Vermont's Staying Connected Initiative: A Partnership to Advance Landscape-Scale Conservation


Presenters

**Mike Ruth,** Federal Highway Administration, Office of Project Development and Environmental Review

**Jens Hilke,** Vermont Fish and Wildlife Department

**Gina Campoli,** Vermont Agency of Transportation

**Paul Marangelo,** The Nature Conservancy, Vermont Chapter

**James Brady,** Vermont Agency of Transportation


May 21, 2015

(Learn more about Eco-Logical at the FHWA website)


Volpe The National Transportation Systems Center

U.S. Department of Transportation
Federal Highway Administration

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# What is Eco-Logical?

- An ecosystem methodology for planning and developing infrastructure projects
- Developed by eight Federal agency partners and four State DOTs
- Collaboration between transportation, resource, and regulatory agencies to integrate their plans and identify environmental priorities across an ecosystem
- For more information, visit the Eco-Logical Website

# What is Staying Connected?

- The Staying Connected Initiative is a visionary partnership working to restore and enhance landscape connections for the benefit of people and wildlife across the Northern Appalachian/Acadian region of the eastern U.S. and Canada.

# How Staying Connected fits into Eco-Logical

**Eco-Logical Step 1:**

Build and strengthen collaborative partnerships

- Staying Connected has two dozen public and private partners, with many others supporting the work.

**Eco-Logical Step 4:**

Assess effects on conservation objectives

- Staying Connected focuses on:
  - Conservation science
  - Land use planning
  - Key road sections
  - Land protection

# How Staying Connected fits into Eco-Logical

**Eco-Logical Step 5:**

Establish and prioritize ecological actions

Staying Connected provides communities with tools and resources to determine what conservation actions are most important.

# Staying Connected's matches Eco-Logical's purpose

Encourages Federal, State, Tribal and local partners involved in infrastructure planning, design, review and construction to make infrastructure more sensitive to wildlife and their ecosystems:

- Integrates plans across agency and political boundaries
- Promotes open public and stakeholder involvement
- Provides time and cost savings and better environmental outcomes

# Making Eco-Logical Work for Your Agency

- The Integrated Eco-Logical framework is intended to be flexible – FHWA supports agencies working on integrated, advanced, landscape-scale planning, under any name.
- Staying Connected is a prime example of working with partners to set joint environmental priorities, completing Eco-Logical in a way that makes sense for the region.

Eco-Logical
Webinar Series

# Vermont's Staying Connected Initiative: A Partnership to Advance Landscape-Scale Conservation

(Learn more about Eco-Logical at the FHWA website)


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- **Gina Campoli**, Vermont Agency of Transportation (gina.campoli@state.vt.us)
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# The Staying Connected Initiative -

*An International Collaboration*
*to Conserve, Restore and Enhance Landscape Connectivity*
*Across Vermont and the Northern Appalachian-Acadian Region*

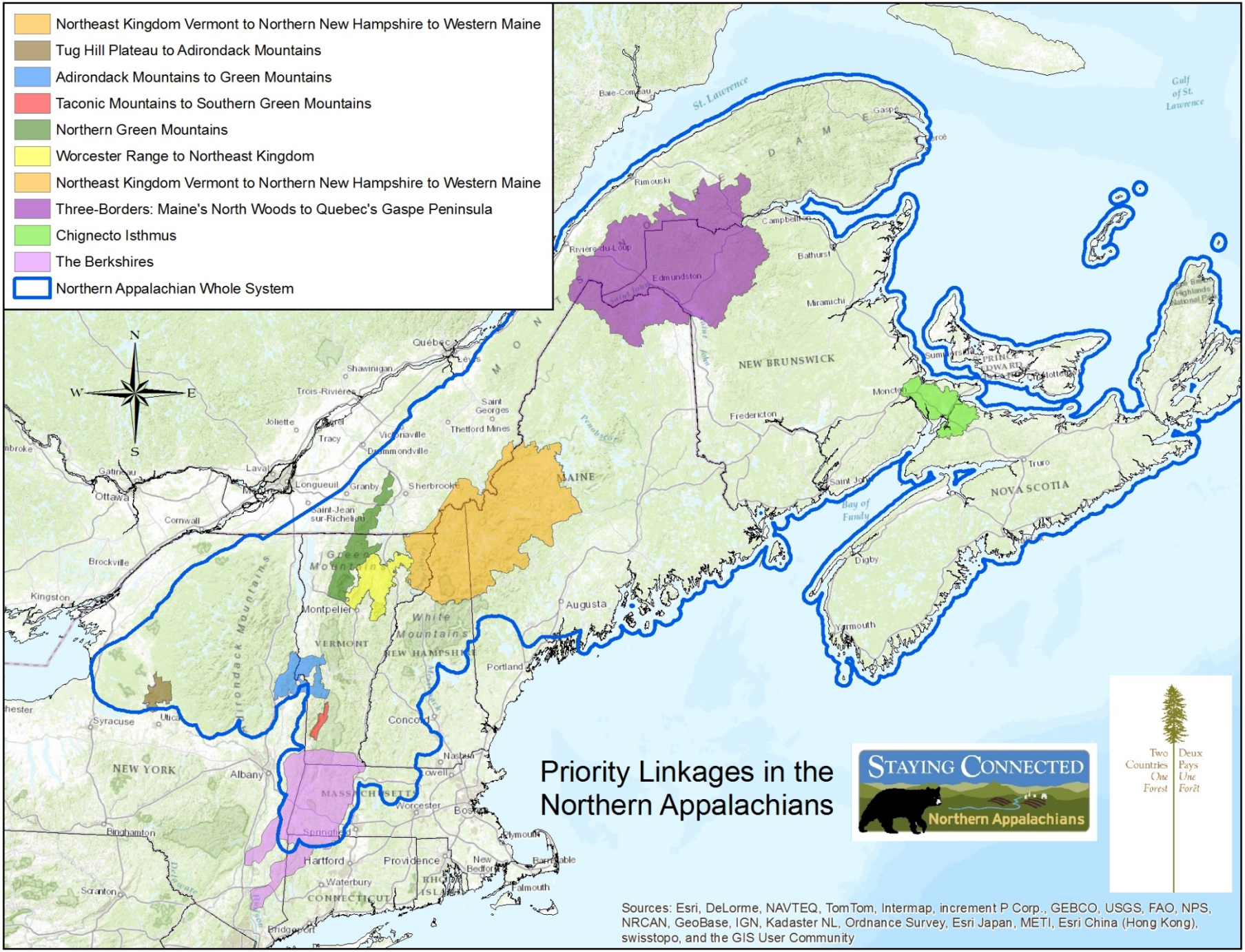
Staying Connected
Northern Appalachians

Jens Hilke

VT Fish & Wildlife Department

# SCI Mission

"The mission of the Staying Connected Initiative (SCI) is to conserve, restore, and sustain critical landscape connections across the Northern Appalachian-Acadian region for the benefit of nature and people. Sustaining these linkages will help safeguard native wildlife and plants from the impacts of habitat fragmentation and climate change, and support human activities and values that are tied to the forested landscape. We work across borders and at multiple scales to address these challenges."


Northeast Kingdom Vermont to Northern New Hampshire to Western Maine
Tug Hill Plateau to Adirondack Mountains
Adirondack Mountains to Green Mountains
Taconic Mountains to Southern Green Mountains
Northern Green Mountains
Worcester Range to Northeast Kingdom
Northeast Kingdom Vermont to Northern New Hampshire to Western Maine
Three-Borders: Maine's North Woods to Quebec's Gaspe Peninsula
Chignecto Isthmus
The Berkshires
Northern Appalachian Whole System
Priority Linkages in the Northern Appalachians
STAYING CONNECTED
Northern Appalachians
Two Countries One Forest
Deux Pays Une Forêt
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, and the GIS User Community

# A Big Network of Partners – at Multiple Scales

## Eco-Regional Steering Committee Members

- Canadian Parks and Wilderness Society
- Maine Audubon
- Maine Department of Inland Fisheries and Wildlife
- National Wildlife Federation
- Nature Conservancy Canada (QC, NB, NS)
- New Hampshire Fish and Game Department
- New York Department of Environmental Conservation
- New York Department of Transportation
- North Atlantic Landscape Conservation Cooperative
- Nova Scotia Department of the Environment
- The Nature Conservancy (NY, VT, NH, ME, MA)
- Trust for Public Land
- Tug Hill Commission
- Two Countries, One Forest
- Vermont Agency of Transportation
- Vermont Department of Fish and Wildlife
- Wildlife Conservation Society – Adirondack Program
- Wildlife Conservation Society – Canada

## Example: Vermont State-Specific Partners

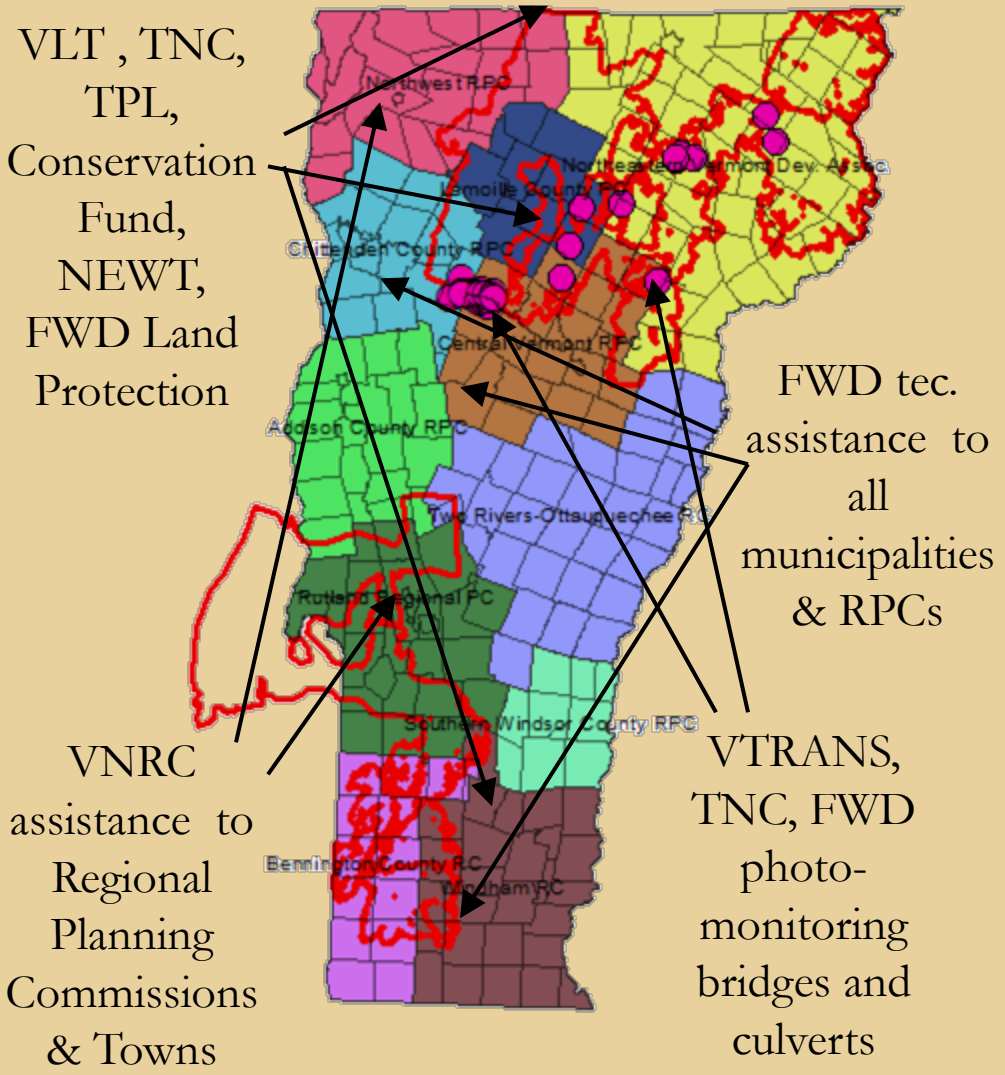
- The Conservation Fund
- National Wildlife Federation
- Northeast Wilderness Trust
- The Nature Conservancy (VT)
- Trust for Public Land
- Vermont Agency of Transportation
- Vermont Fish & Wildlife Department
- Vermont Natural Resources Council
- Vermont Land Trust

## Example: Greens to Adirondacks Linkage-Specific Affiliates

- Brandon Planning Commission
- The Conservation Fund
- Friends of Hawk Hill
- Hubbardton Battlefield Association
- Middletown Springs Conservation Commission
- The Nature Conservancy (VT)
- New York Department of Environmental Conservation
- New York Department of Transportation
- Poultney Conservation Commission
- Rutland Regional Planning Commission
- Vermont Agency of Transportation
- Vermont Fish & Wildlife Department
- Vermont Land Trust
- Vermont Natural Resources Council
- Wildlife Conservation Society – Adirondack Program

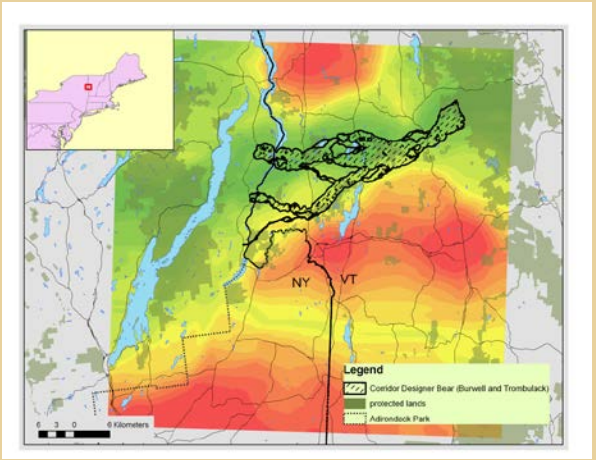
# Multi-pronged approach

- Conservation Science
- Key Road Sections
- Land Use Planning
- Land Protection
- Outreach & Education



# Conservation Science & Planning

- Linkage-specific GIS modeling
- Wildlife tracking
- Game cameras
- Citizen science
- Sharing results
- Measures framework & baseline

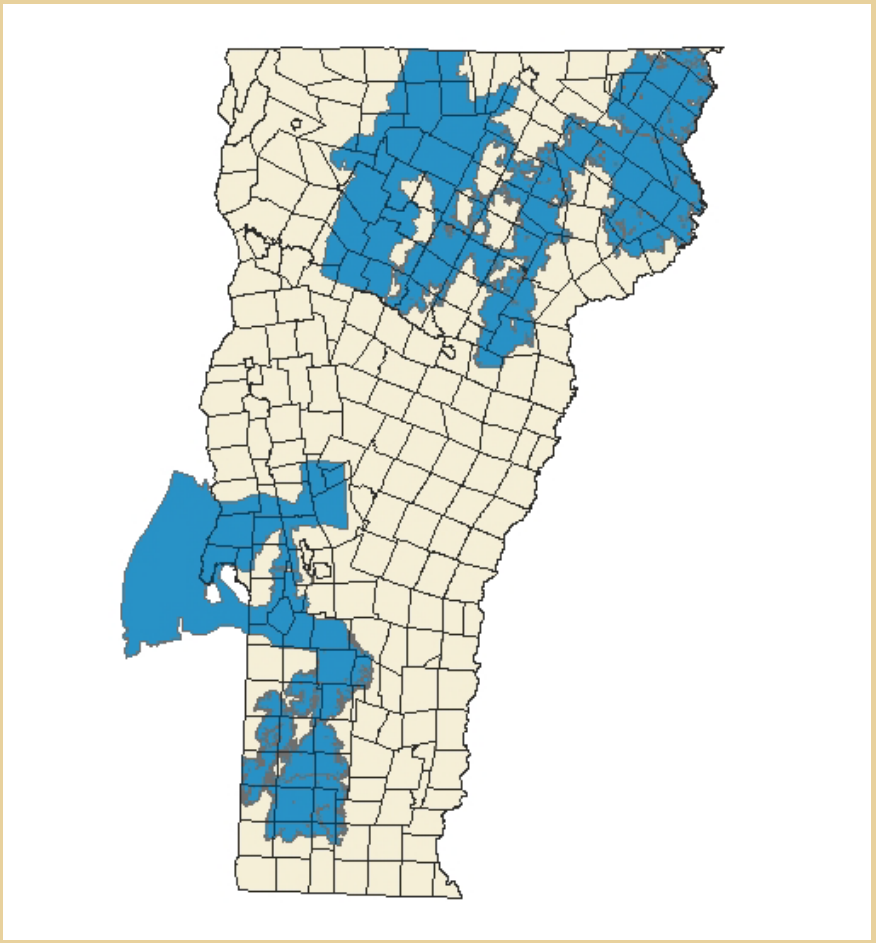




# Linkage areas in VT

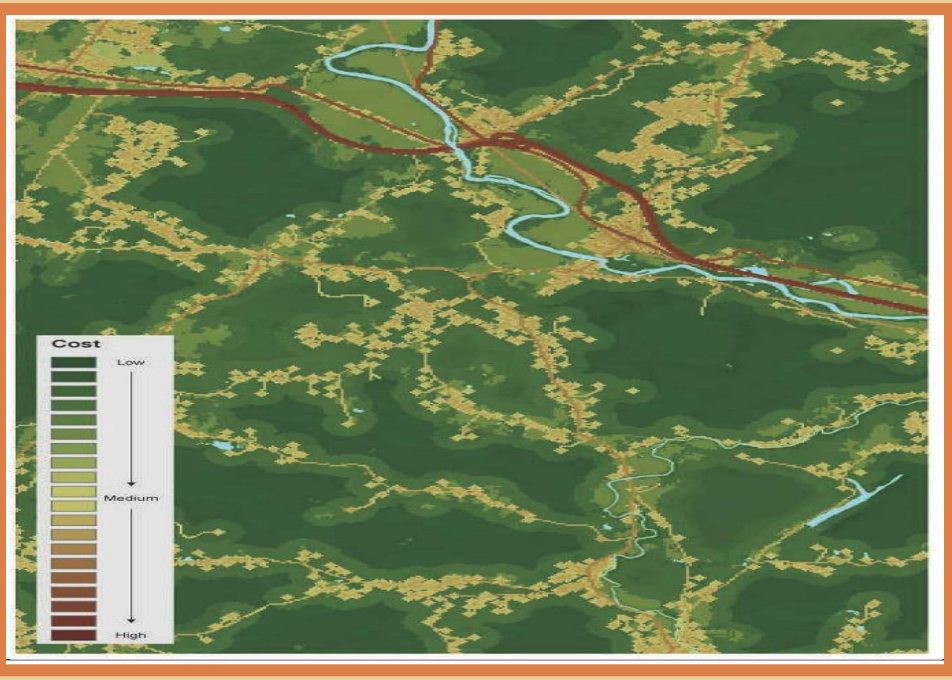
## Basis for all SCI work

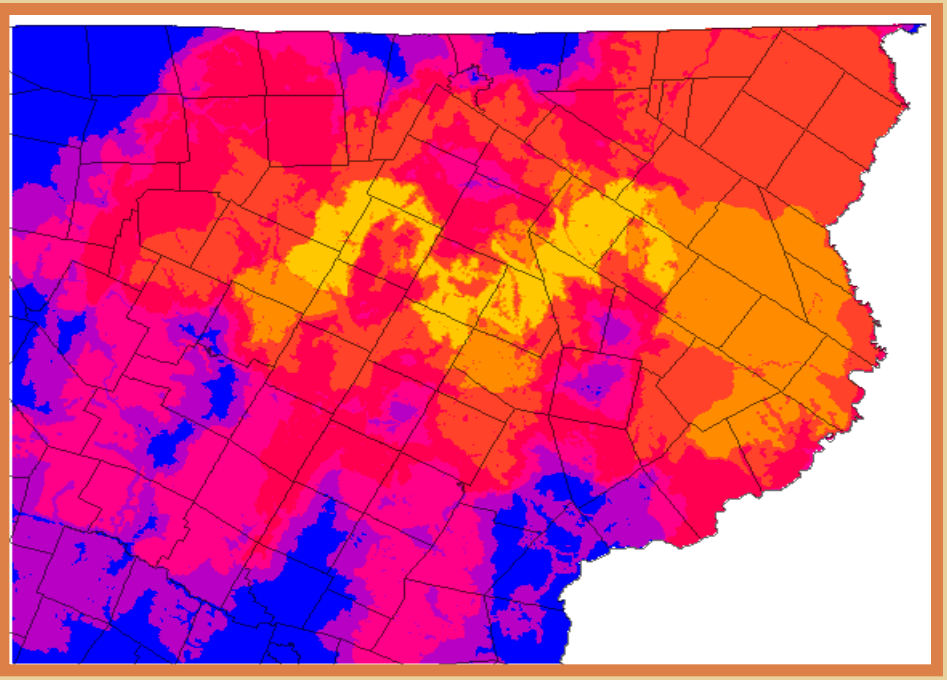
- Different data available in each linkage
- Different models in each linkage
- Different landscape context
- Least cost path
- Cost-weighted distance analysis



# Conservation science

## Worcesters to Kingdom Modeling

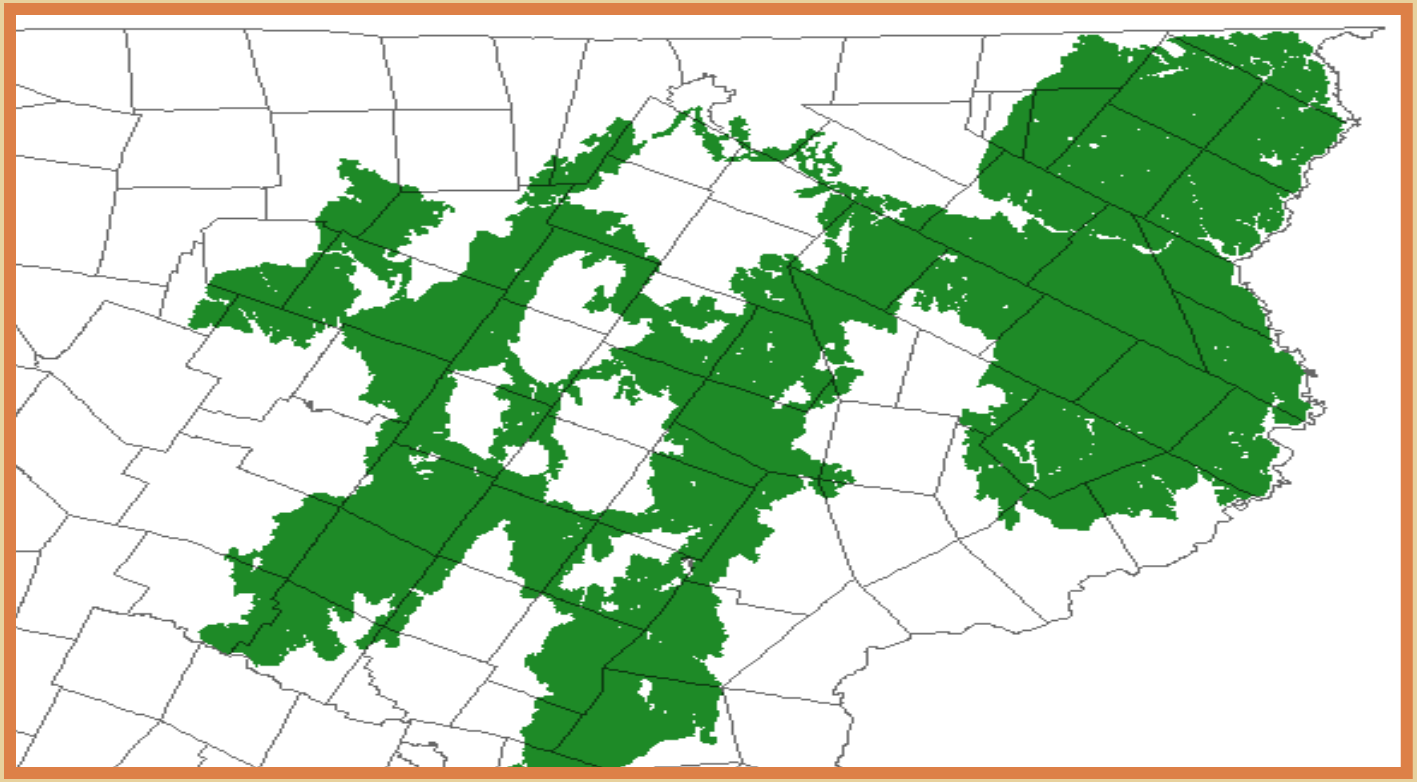


Vermont cost-surface developed in 2010

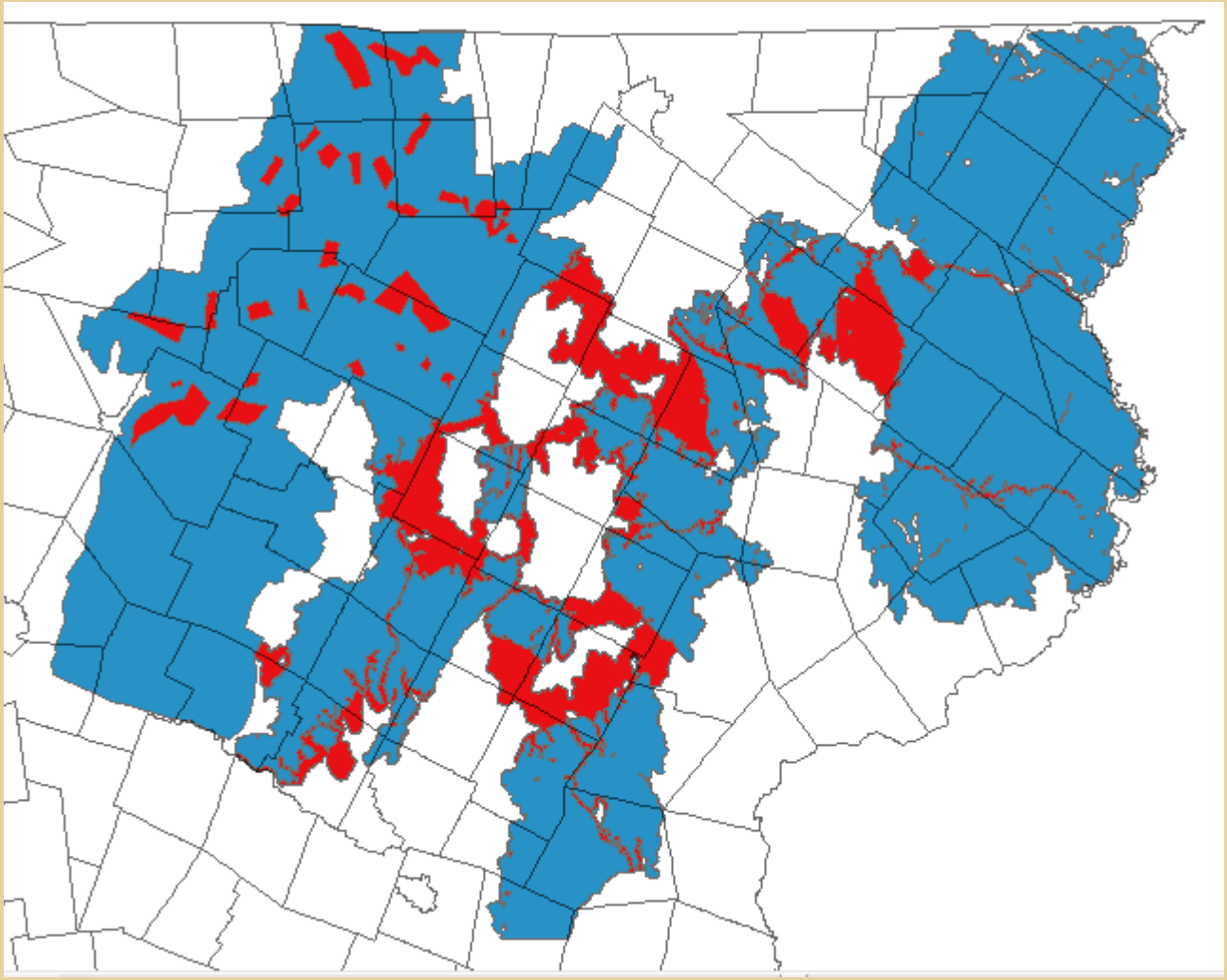
Cost surface used for separate runs from anchor to anchor

# Conservation science



**Aggregated Network Developed**

# Conservation science



## Structural Pathways

# Making Roads More Wildlife-Friendly

- Identification of priority road segments
- Wildlife tracking & camera monitoring
- Data sharing
- VT Transportation and Connectivity Guidance Document
- Trainings for DOTs
- Northeast Transportation and Wildlife Conferences

# Land Protection

- 80+ permanent protection projects completed - > 300,000 acres
- Model easement provisions
- Connectivity in criteria for federal cost-share programs (VT)

# Land Use Planning

## Technical assistance to:

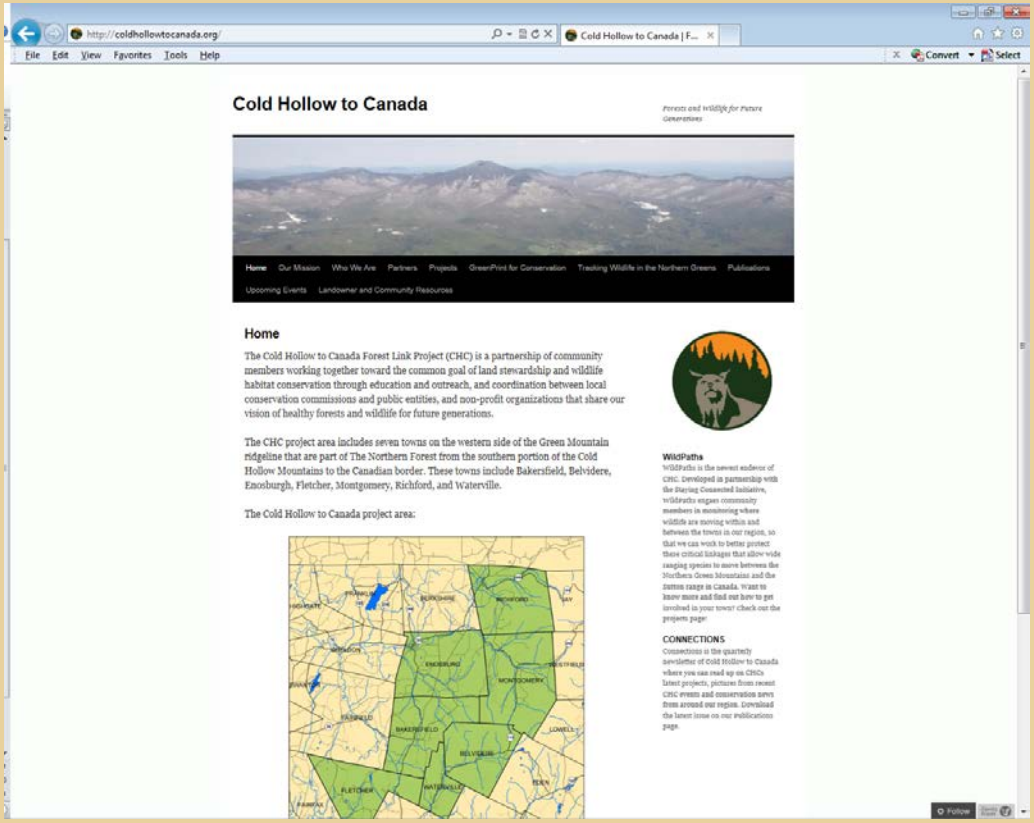
- 41 communities
- Seven regional planning commissions (RPCs)

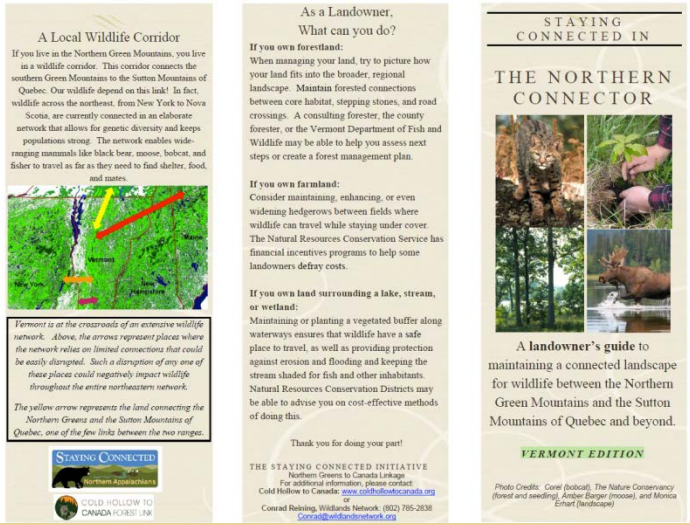
## Outcomes:

- 13 town plans (5 in works)
- Six zoning and subdivision codes
- One regional plan (3 in works)
- Two new Conservation Commissions
- One new Conservation Fund

# Local Engagement – Northern Green Mountains

## Cold Hollow to Canada (CHC)

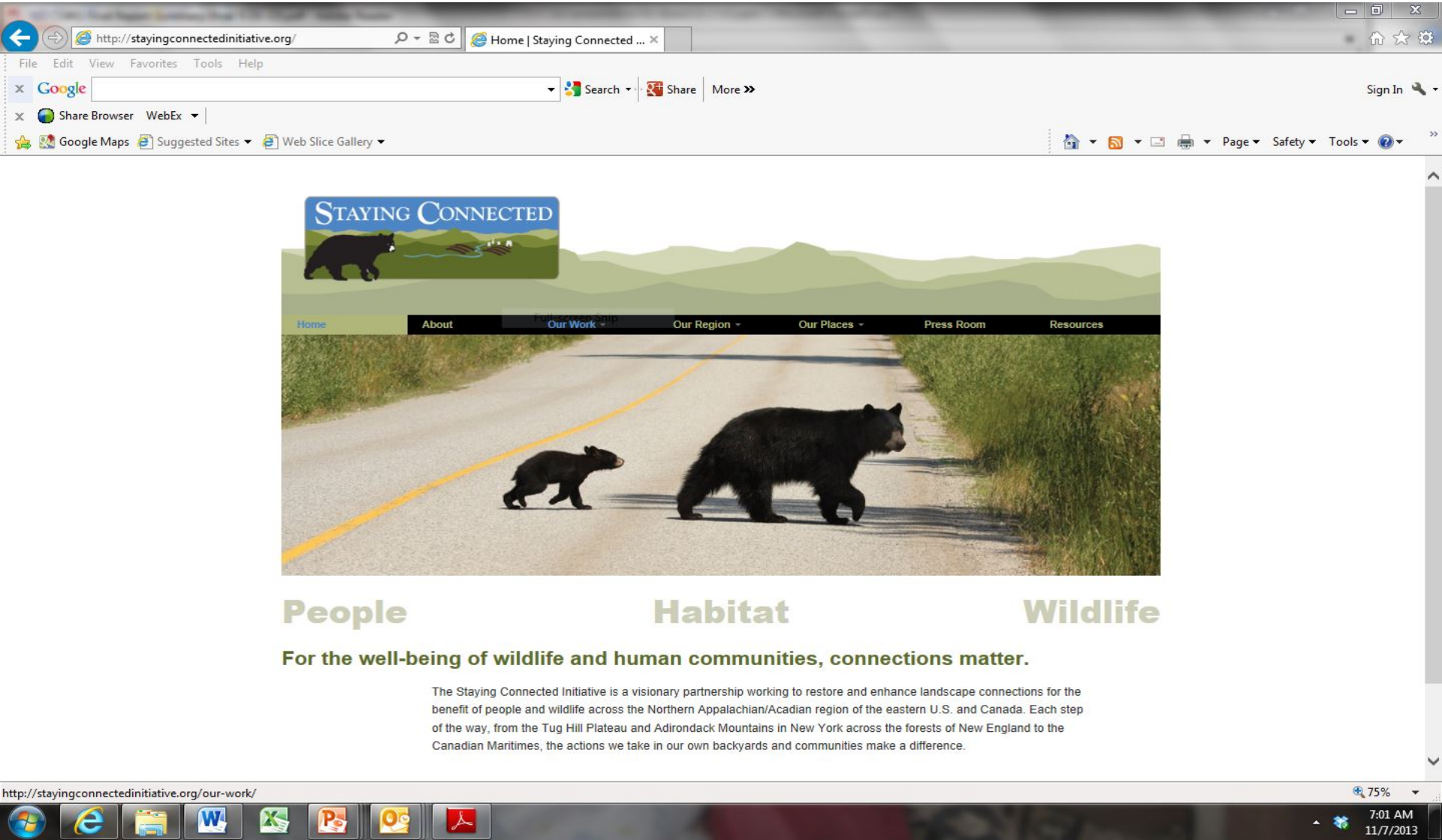


# A Public-Private Partnership

- Benefits to State Agencies
  - Expands capacity of technical assistance & land protection
  - Expands spectrum of activity (through multi-pronged approach)
  - Provides eco-regional context
  - Encourages local empowerment

# Website – www.stayingconnectedinitiative.org



# VTrans and Staying Connected

Staying Connected Northern Appalachians

Gina Campoli, Environmental Policy Manager

VTrans Working to Get You There
Vermont Agency of Transportation

# VTrans and Staying Connected

**VTrans Strategic Mission**: Provide for the safe and efficient movement of people and goods

**Vision**: A safe, reliable and multimodal transportation system that promotes Vermont's quality of life and economic wellbeing

**Strategic Goals and Agency-wide Objectives**:

**Goal #2:** Preserve, maintain and operate the transportation system in a cost effective ***and environmentally responsible manner***

# VTrans and Staying Connected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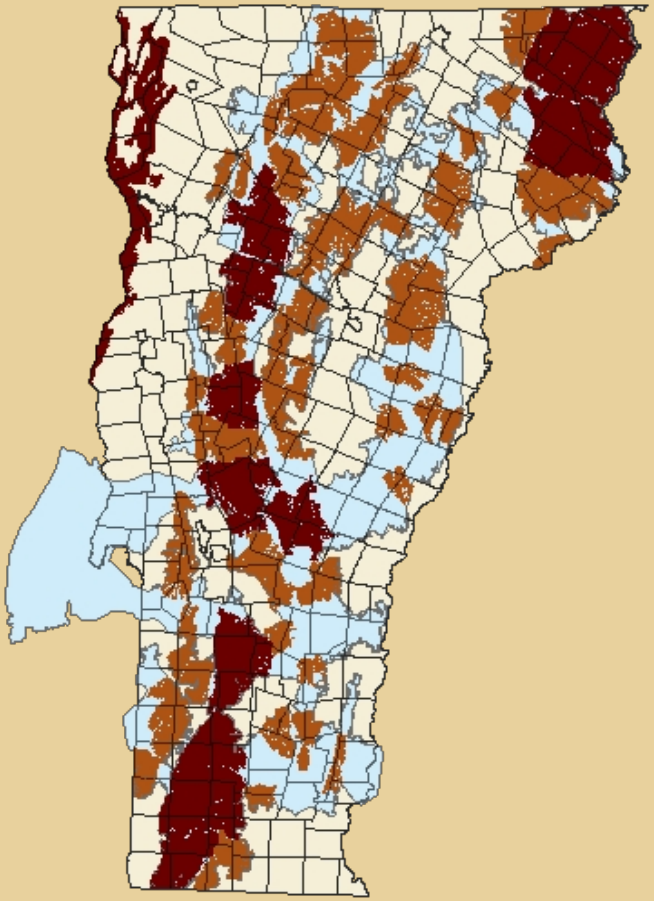
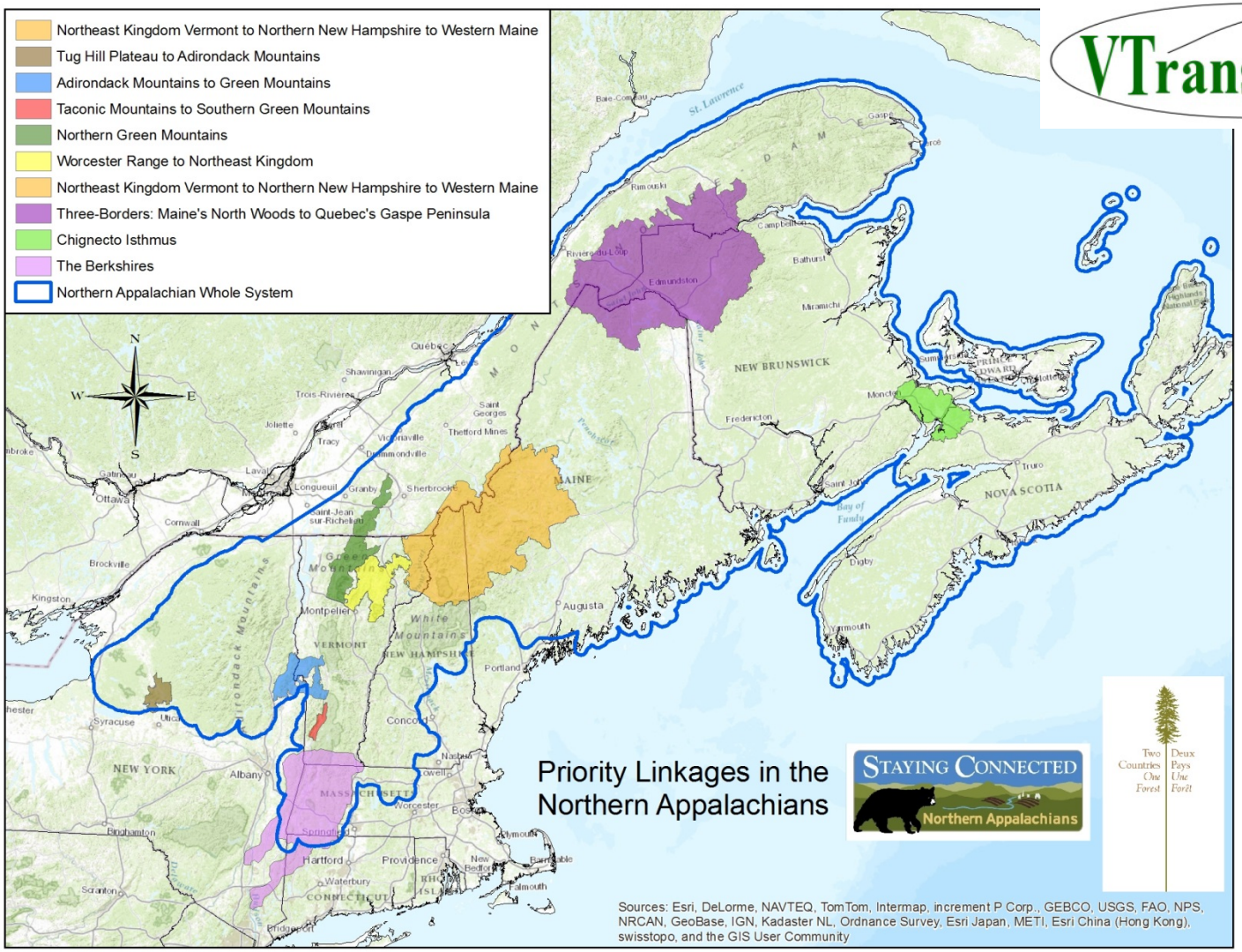


Staying Connected Network of Connected Lands

# VTrans and Staying Connected

# VTrans and Staying Connected




# Identifying the Most Important Transportation Structures for Maintaining/Restoring Wildlife Connectivity

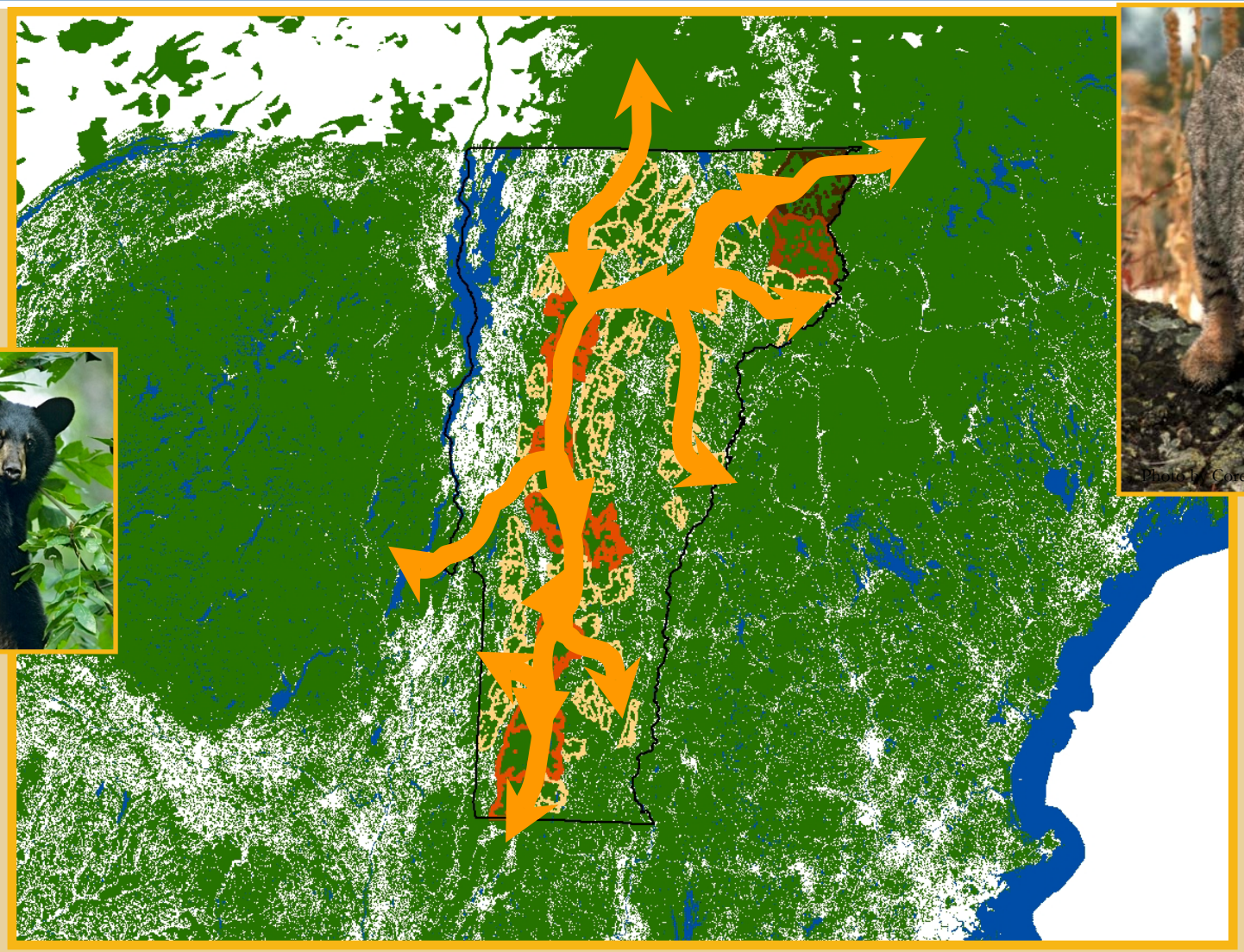
UVM Transportation Research Institute

National Wildlife Federation

Paul Marangelo, Vermont Chapter

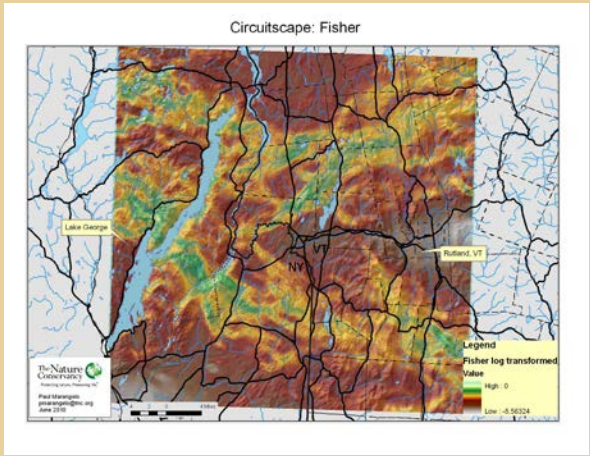
The Nature Conservancy
Protecting nature. Preserving life.™

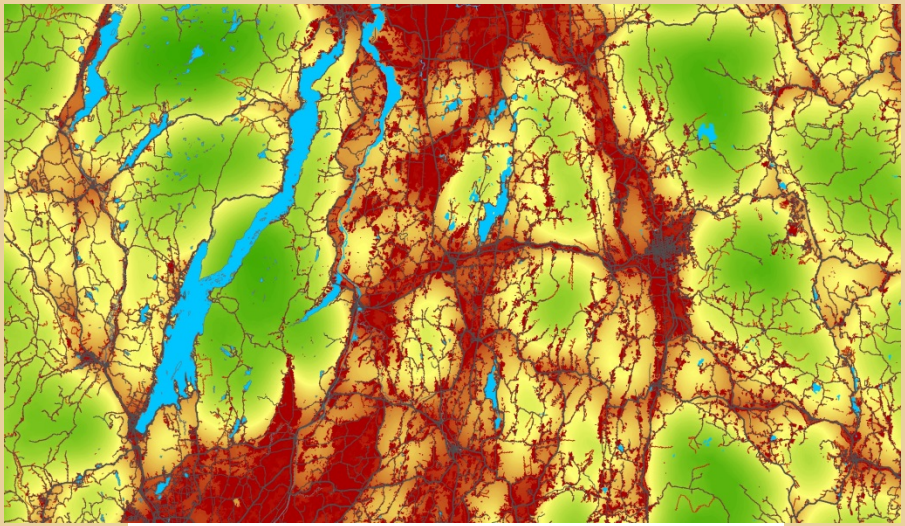
# Vermont is the “Crossroads”



# Conservation Science

- Structural Connectivity
  - GIS modeling
  - Interpreting results (identifying spatial priorities)

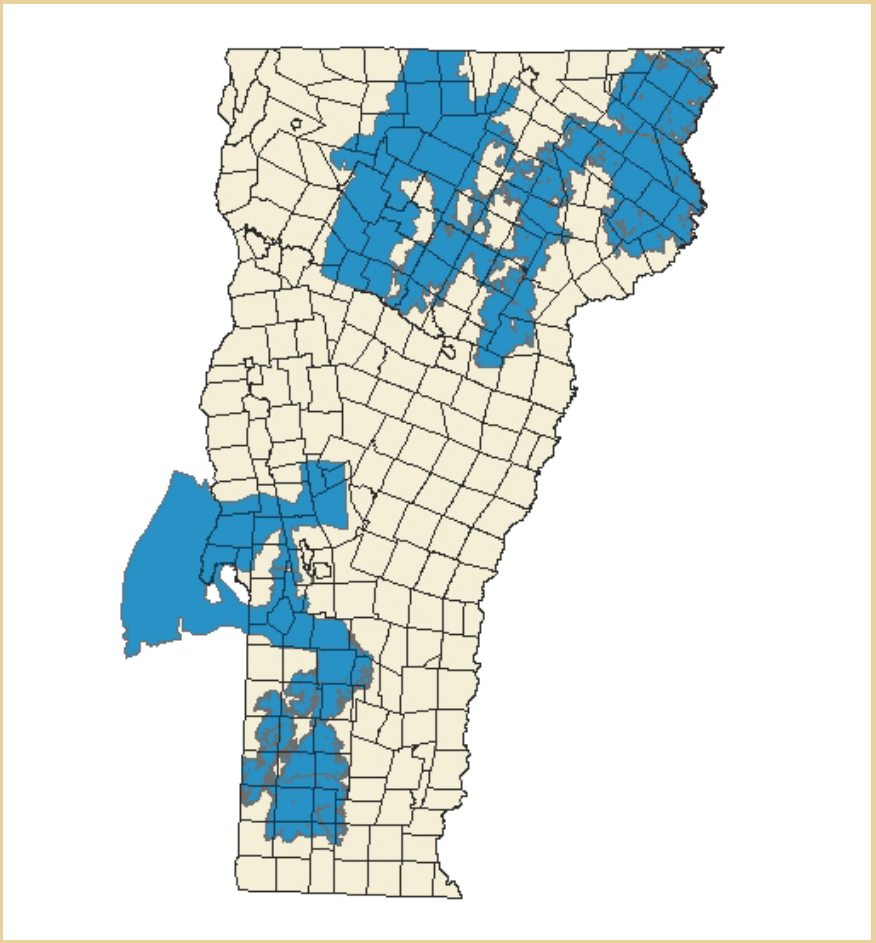


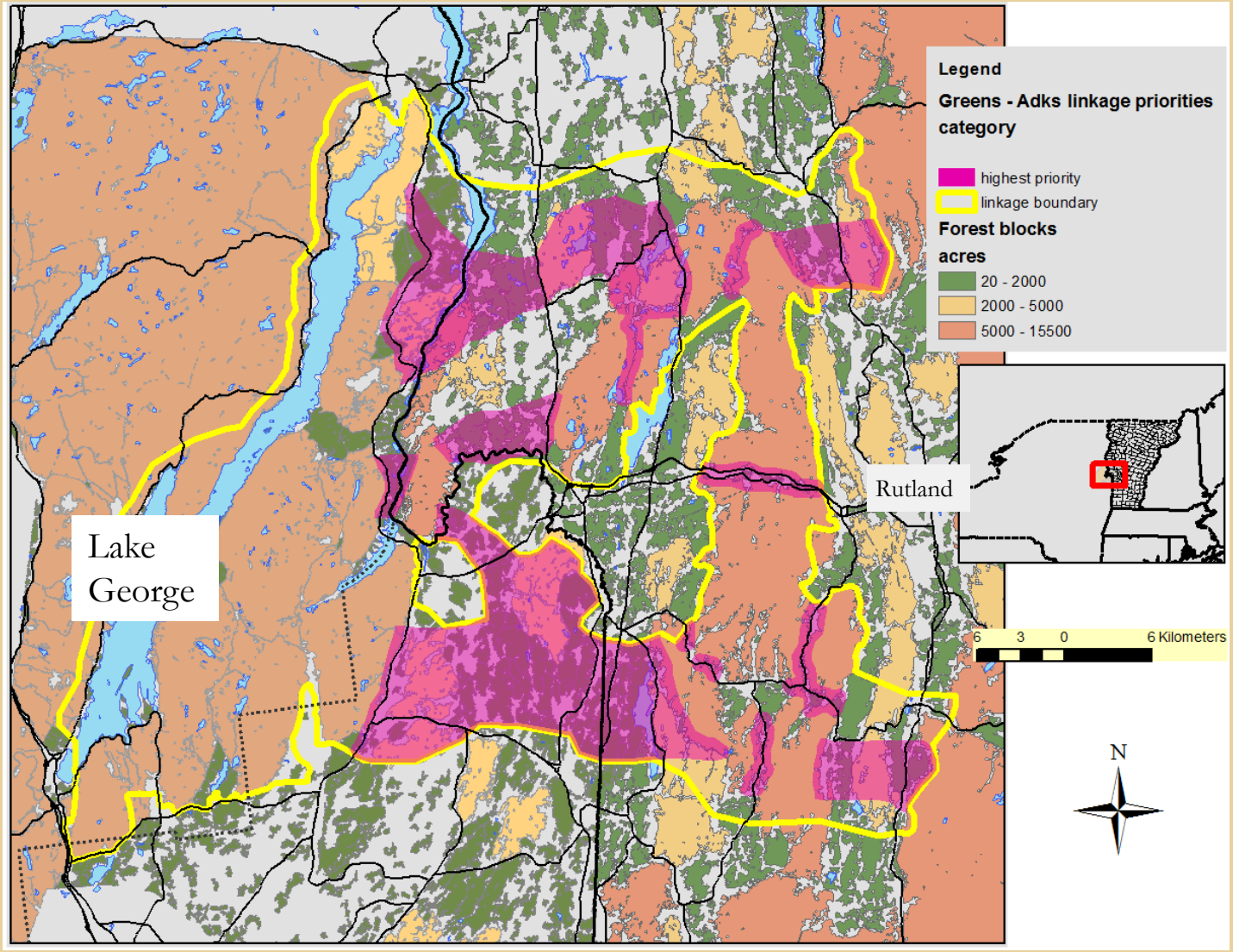
**Priorities derived from modeling exercises are hypothetical**

# Linkage areas in VT

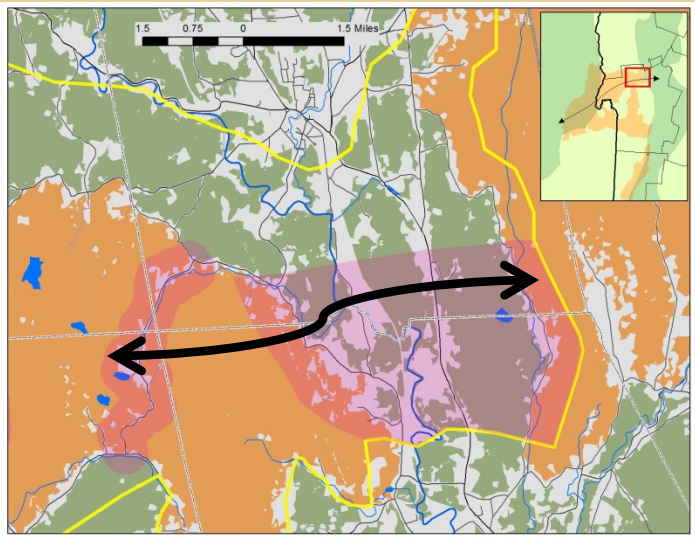
- Derived from different models in each linkage
- Habitat blocks and links between habitat blocks
  - Cross major road corridors



# Linking large forest blocks



# Where to restore/enhance road permeability?

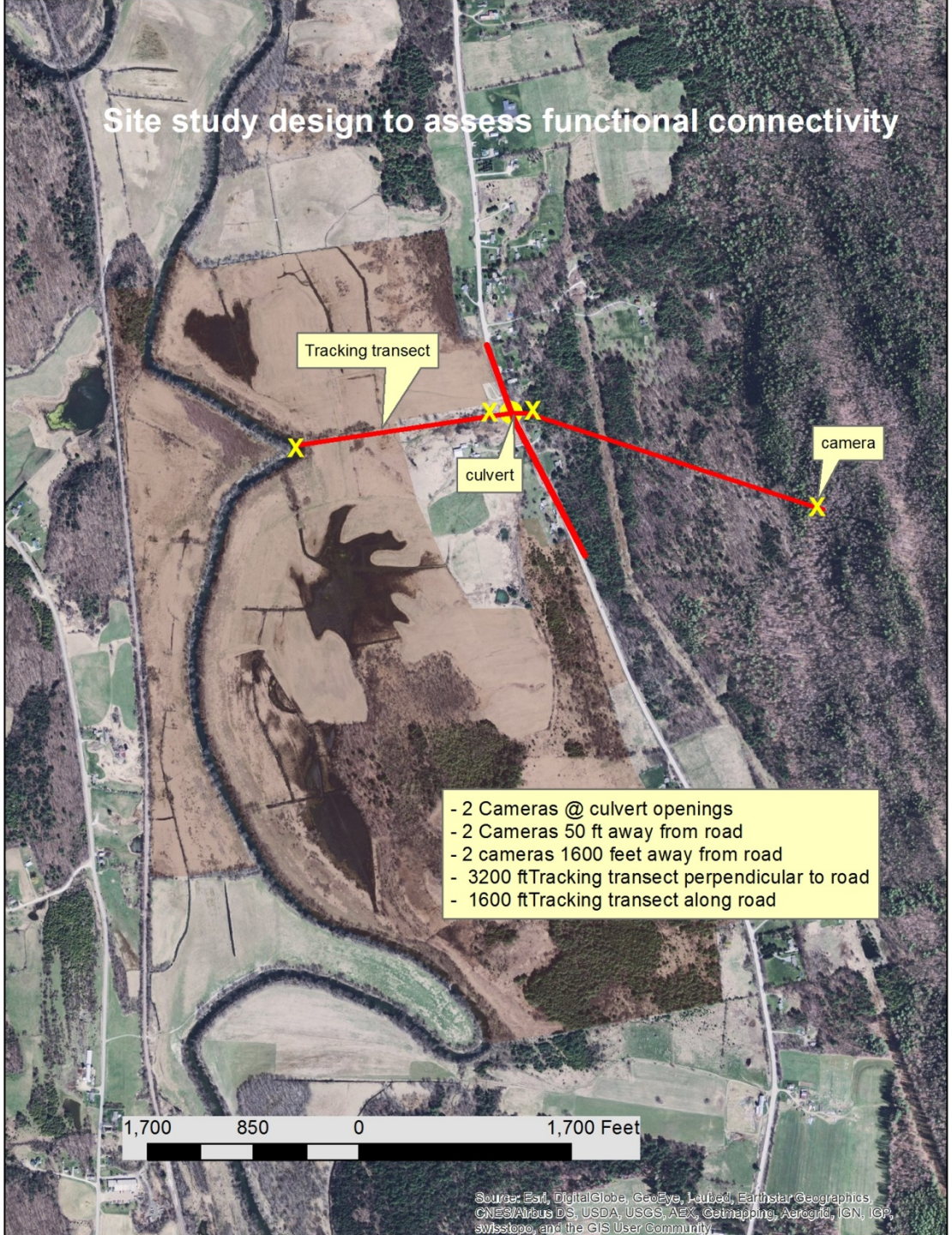



Identifying critical road segments:

- GIS connectivity modeling (multiple scales)
- Connecting forest blocks
- Local habitat characteristics along road corridors that bisect forest blocks

**Assessing functional connectivity:**

- **Focus on best available habitat along road segments**
- **Game Camera research**
- **Winter tracking (along roads and in adjacent habitat)**


Site study design to assess functional connectivity
Tracking transect
culvert
camera
- 2 Cameras @ culvert openings
- 2 Cameras 50 ft away from road
- 2 cameras 1600 feet away from road
- 3200 ftTracking transect perpendicular to road
- 1600 ftTracking transect along road
1,700 850 0 1,700 Feet
Source: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

# Game Cameras at structures

- Characterize wildlife use of transportation structures in key road segments.
- What structural characteristics makes wildlife use more likely? (dry surfaces, low ratio bankful width to structure width, openess ratio, species specific preferences, etc)

# Results So far:

- Between May and December 2014: 197 camera days of data collection at each of 11 sites (2,167 camera days total).
- 10 of 11 structures used at least once by wildlife.
- 41 passage events of focal species (bear, bobcat, coyote, fisher, mink, otter, fox, skunk, weasel, deer)

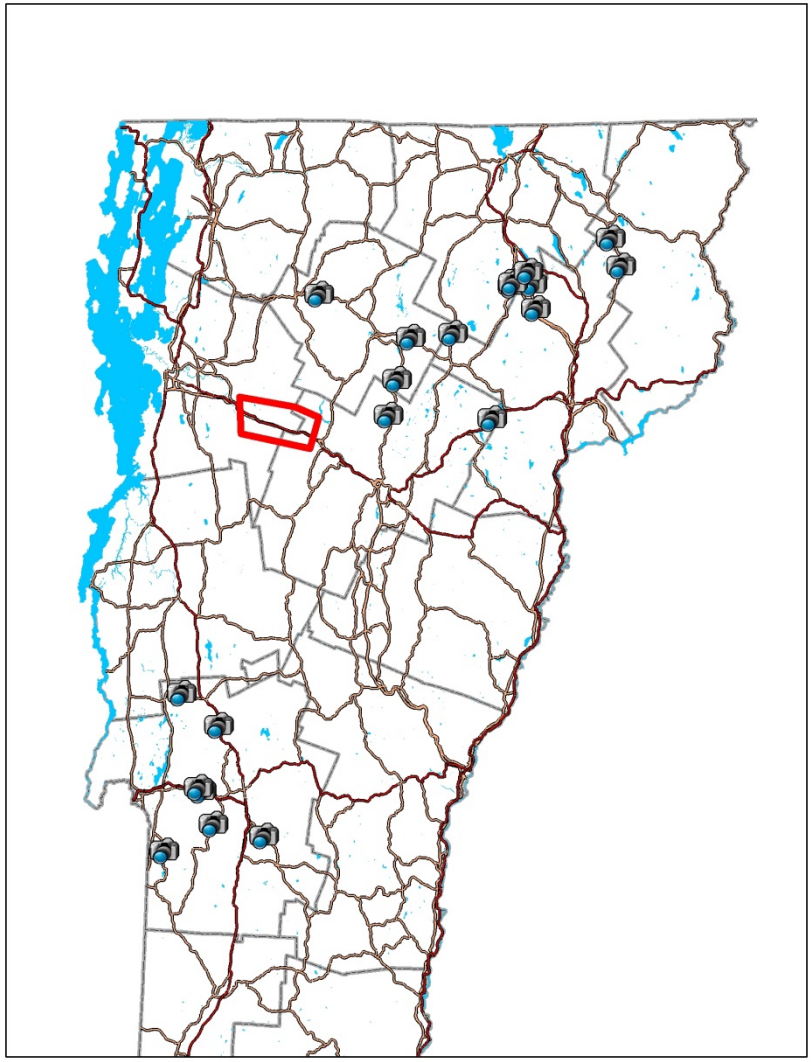

# Anticipated outcomes:

- Most important locations on major roads for wildlife-friendly transportation structures.
- Recommendations on characteristics to incorporate into structure design.
- Wildlife use of structures vs. over-road crossing vs. adjacent habitat use.


# Ongoing projects:

- 124 cameras/ 3 distinct projects
  - US 2/I-89 (VTRANS/VTF&W)
  - VTRANS/UVM Transportation Research Institute/VTF&W/TNC
  - TNC/VTRANS/VTF&W /National Wildlife Federation

**Approximately 26 sites total across Vermont**



# Project Review Considerations

## VT Agency of Transportation

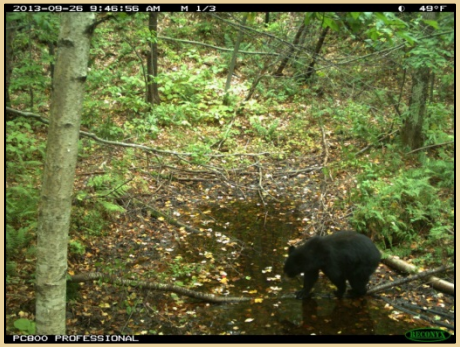
Staying Connected
Northern Appalachians


**James Brady**
Environmental Specialist

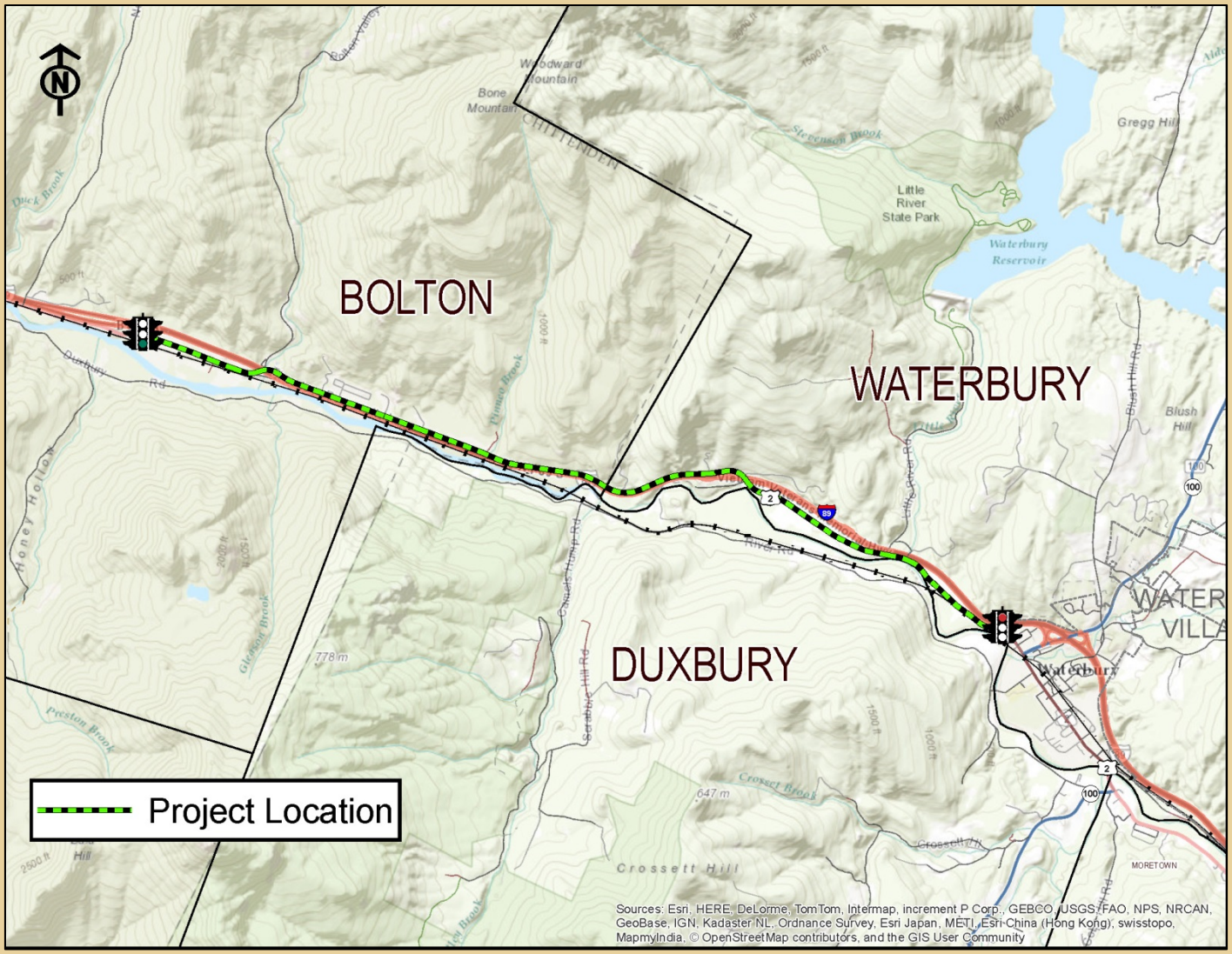

VTrans Working to Get You There
Vermont Agency of Transportation

# From Structural to Functional: VTrans and SCI

- The Staying Connected Initiative has helped institutionalize the relationship between VTrans, VT F&W, and other SCI partners
- Wildlife connectivity has become integrated into VTrans transportation project reviews
- Models and studies have helped VTrans Environmental staff pin-point important areas for wildlife connectivity
- VTrans now has a vehicle to share wildlife connectivity project experiences with neighboring states, provinces and NGOs




# From Structural to Functional: VTrans and SCI



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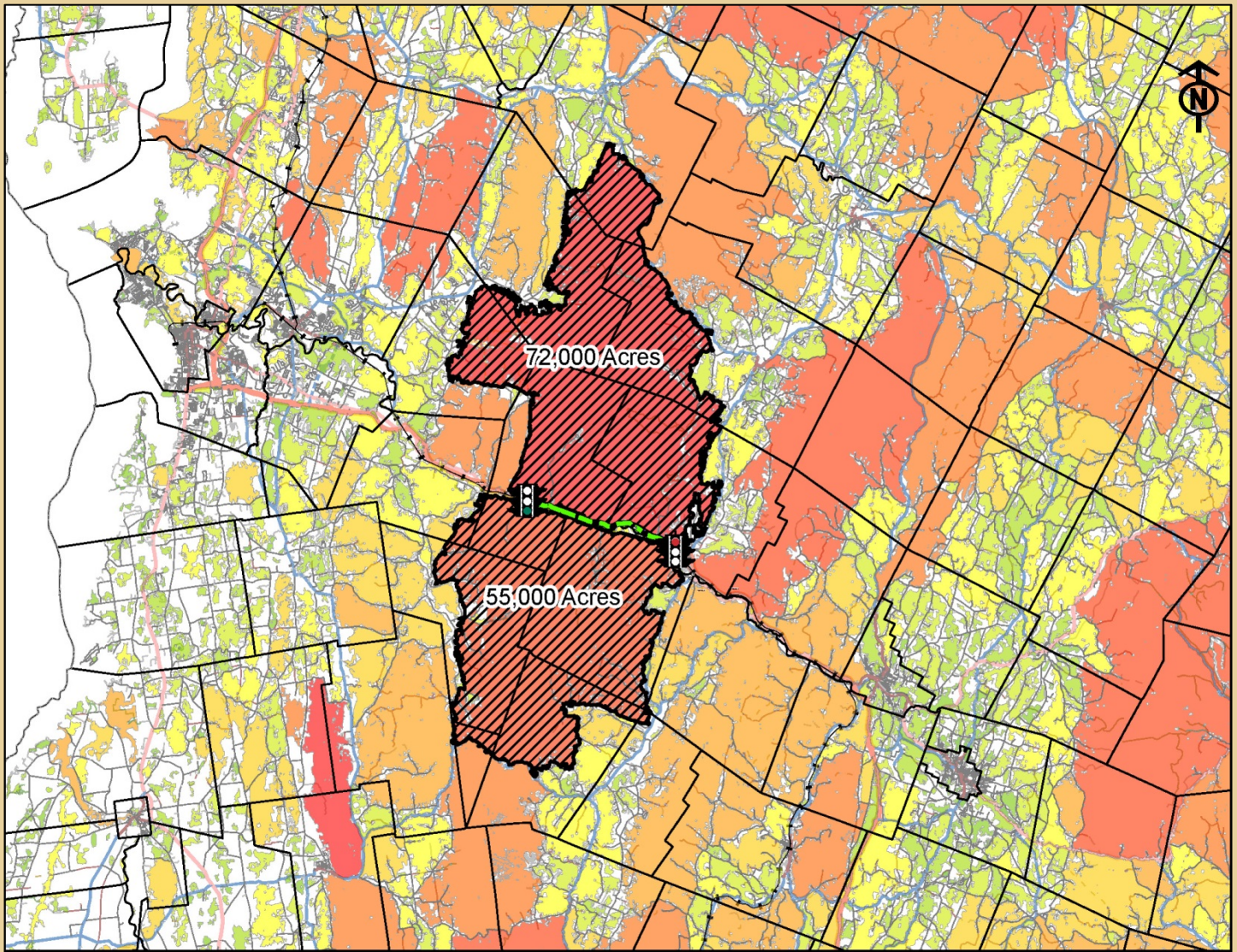

# From Structural to Functional: VTrans and SCI

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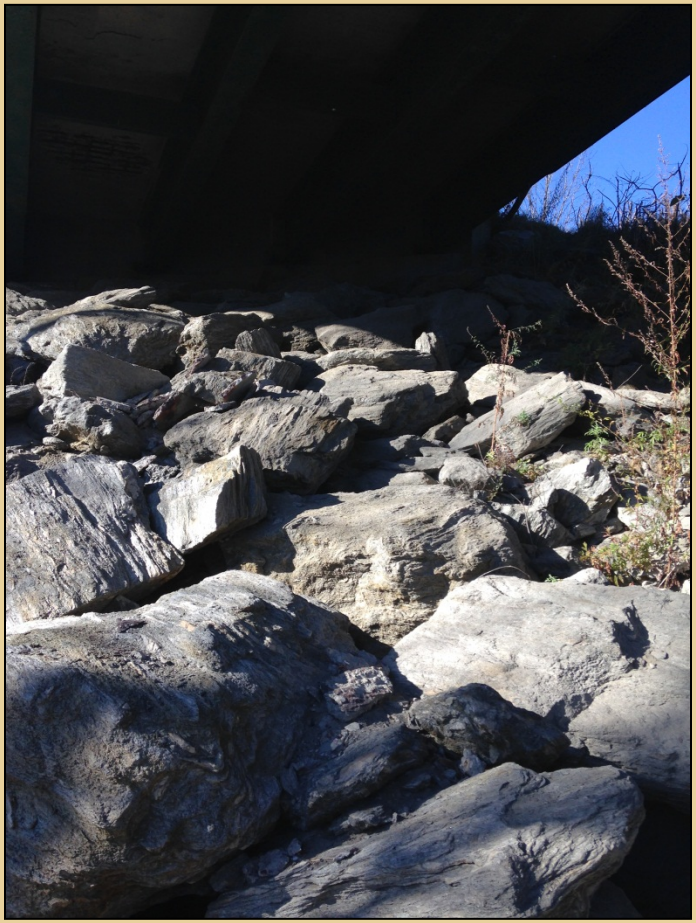

# Q&A / Discussion