

# Eco-Logical Webinar Series



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

Presenters

May 21, 2015

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

[\(Learn more about Eco-Logical at the FHWA website\)](#)

**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



U.S. Department of Transportation  
**Federal Highway Administration**

# Steps to Ensure Optimal Webinar Connection

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- Close all background programs
- Use a wired internet connection, if possible
- Do not use a Virtual Private Network (VPN), if possible
- Mute their webroom audio (toggle is located at the top of webroom screen) and use phone audio only

# 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

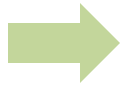


- Staying Connected focuses on:
  - Conservation science
  - Land use planning
  - Key road sections
  - Land protection

# 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.

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[\(Learn more about Eco-Logical at the FHWA website\)](#)

- **Mike Ruth**, Federal Highway Administration ([mike.ruth@dot.gov](mailto:mike.ruth@dot.gov))
- **Jens Hilke**, Vermont Fish and Wildlife Department ([jens.hilke@state.vt.us](mailto:jens.hilke@state.vt.us))
- **Gina Campoli**, Vermont Agency of Transportation ([gina.campoli@state.vt.us](mailto:gina.campoli@state.vt.us))
- **Paul Marangelo**, The Nature Conservancy, Vermont Chapter ([pmarangelo@tnc.org](mailto:pmarangelo@tnc.org))
- **James Brady**, Vermont Agency of Transportation ([james.brady@state.vt.us](mailto:james.brady@state.vt.us))

# THE STAYING CONNECTED INITIATIVE -

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



Jens Hilke



VT Fish &  
Wildlife  
Department



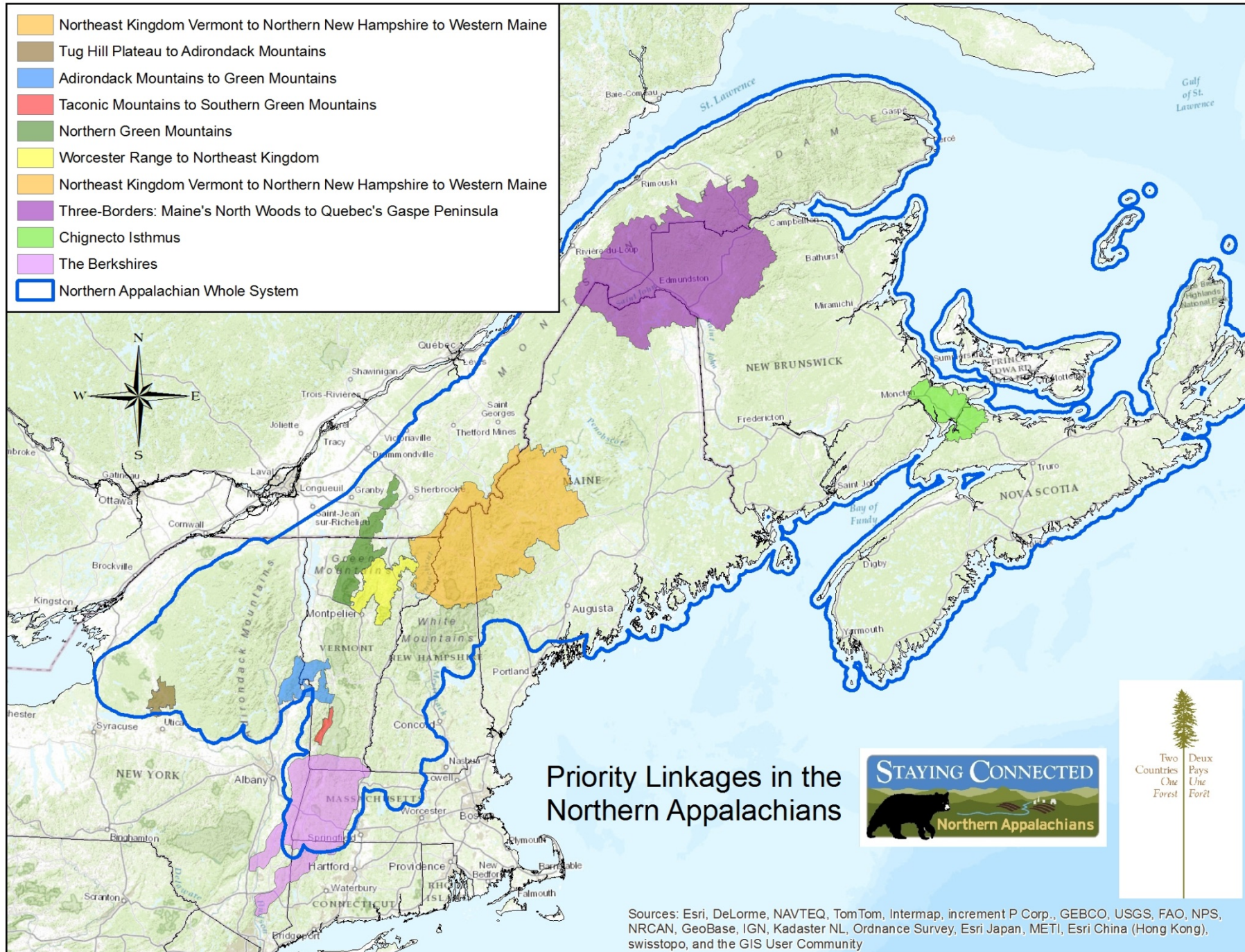


# SCI Mission

“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 Gaspé Peninsula
- Chignecto Isthmus
- The Berkshires
- Northern Appalachian Whole System



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

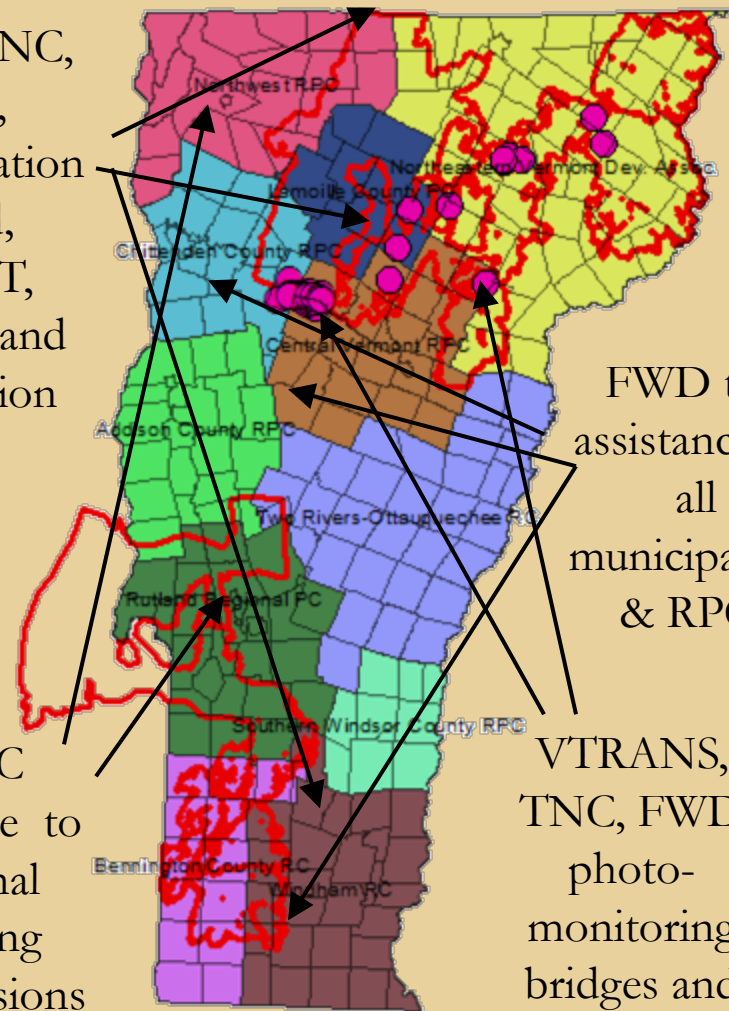
# Multi-pronged approach



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

VLT, TNC,  
TPL,  
Conservation  
Fund,  
NEWT,  
FWD Land  
Protection

VNRC  
assistance to  
Regional  
Planning  
Commissions  
& Towns

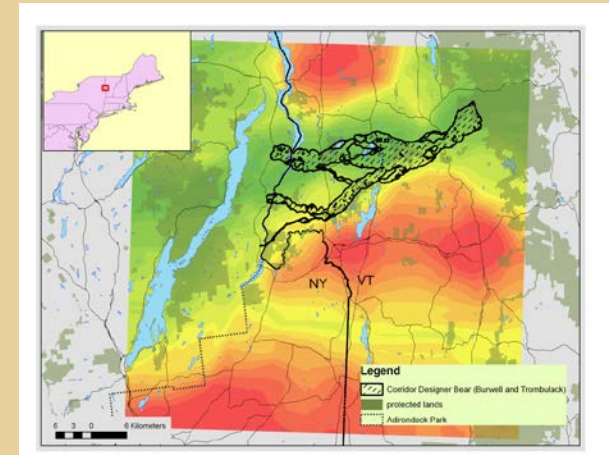


FWD tec.  
assistance to  
all  
municipalities  
& RPCs

VTRANS,  
TNC, FWD  
photo-  
monitoring  
bridges and  
culverts

# Conservation Science & Planning

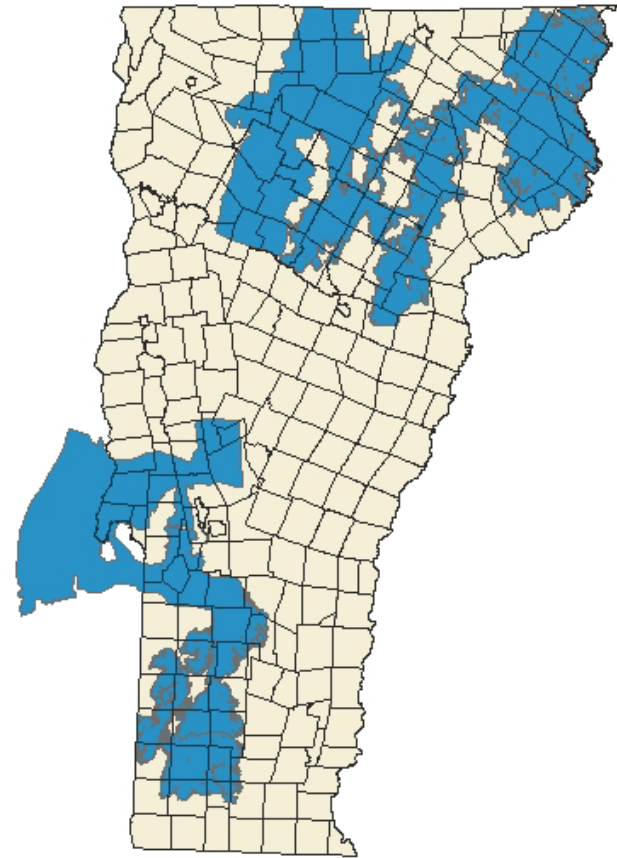
- Linkage-specific GIS modeling
- Wildlife tracking
- Game cameras
- Citizen science
- Sharing results
- Measures framework & baseline



# 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

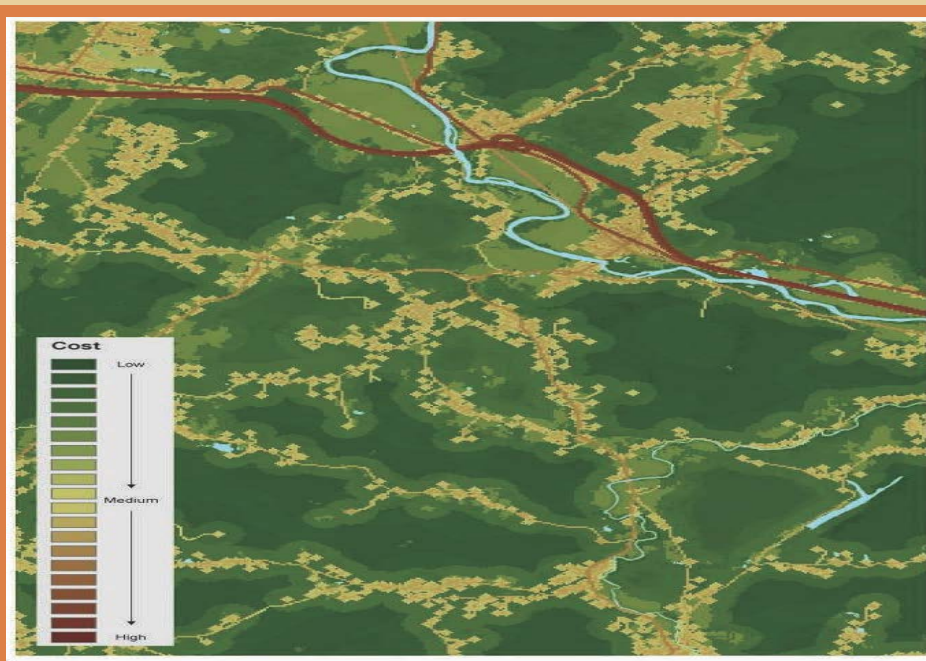




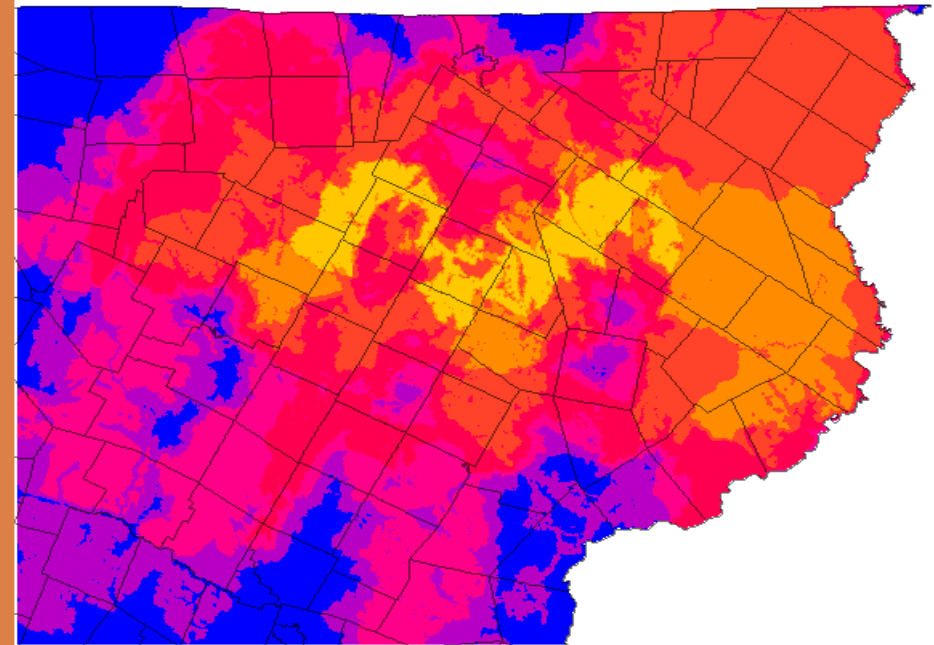
# Conservation science



## Worcesters to Kingdom Modeling

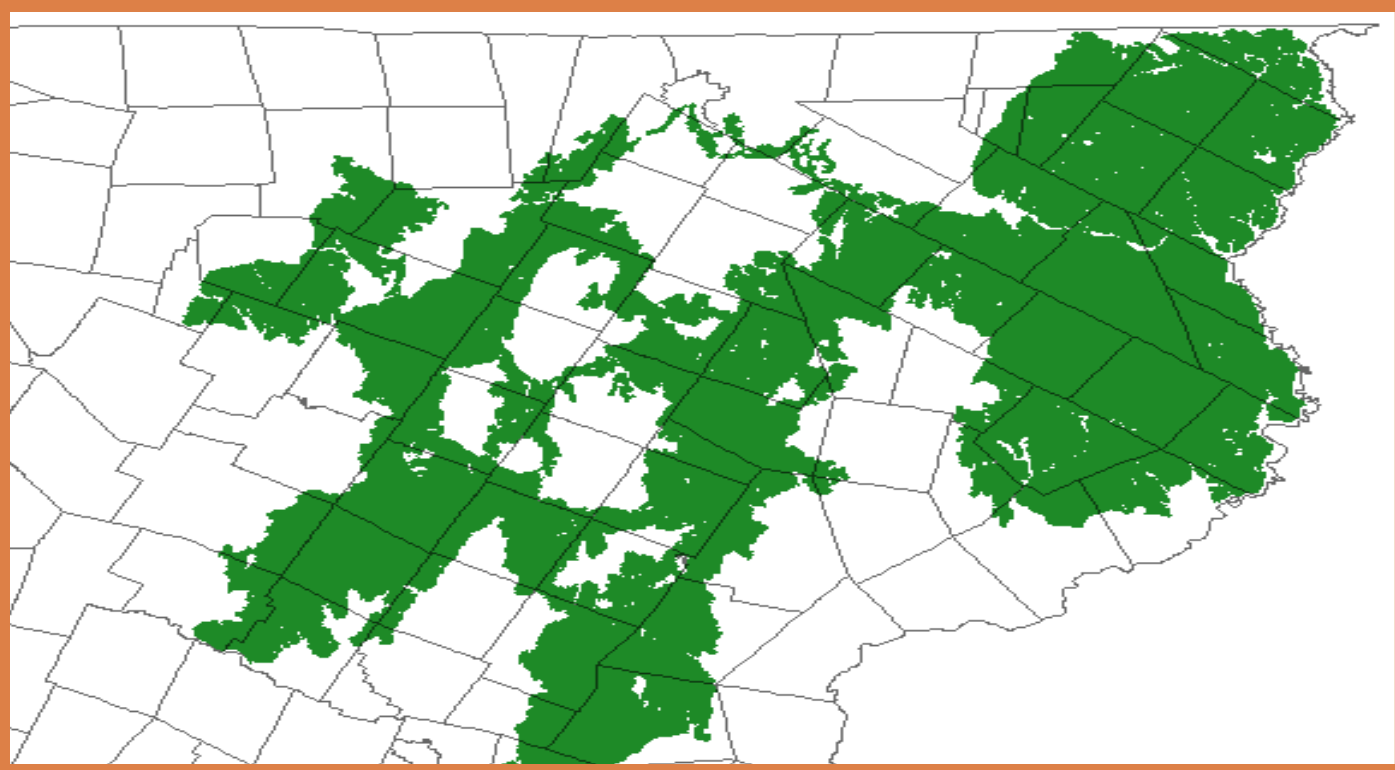


Vermont cost-surface  
developed in 2010



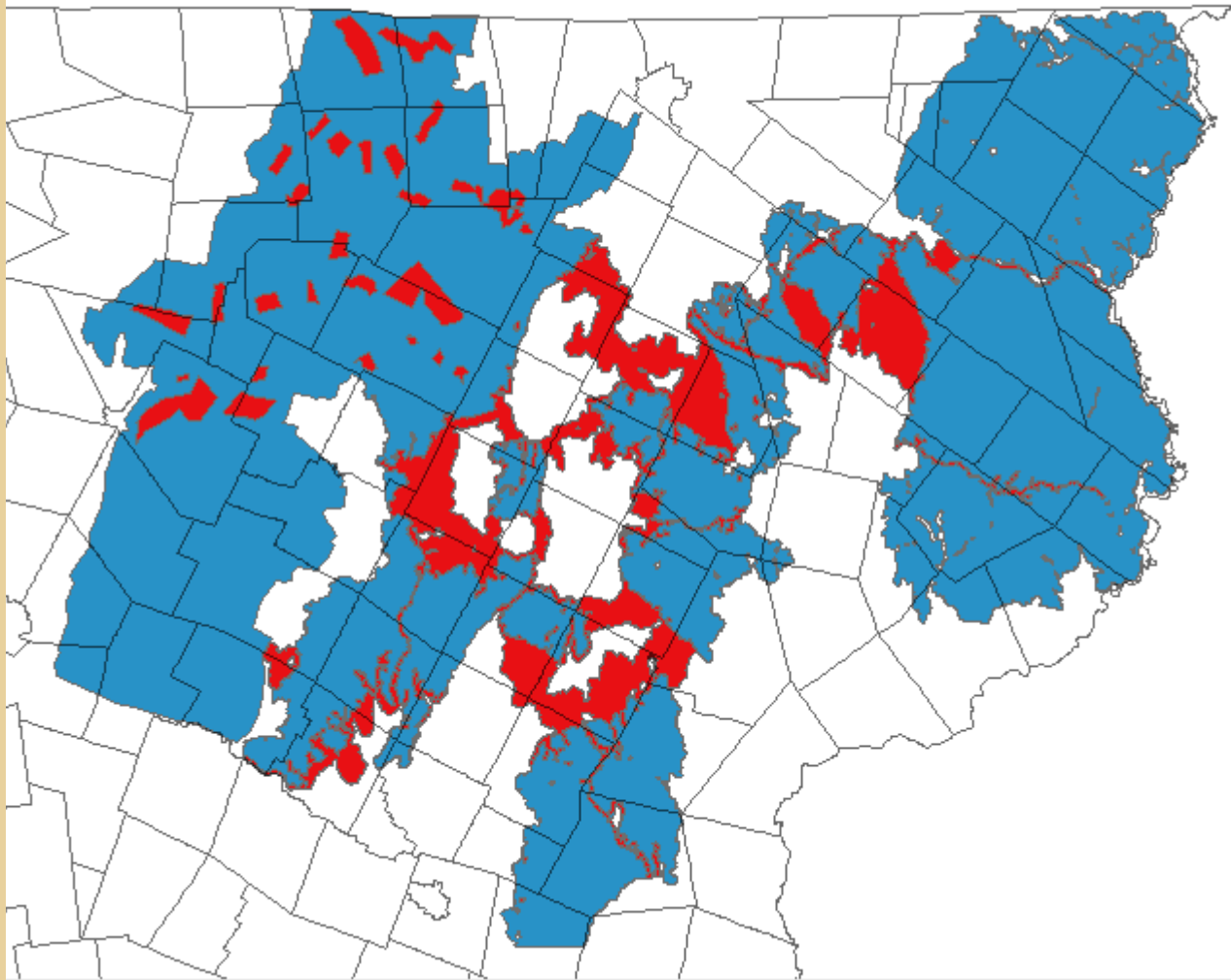
Cost surface used for separate  
runs from anchor to anchor

# 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)

**Cold Hollow to Canada**  
Forests and wildlife for future generations

Home Our Mission Who We Are Partners Projects GreenPrint for Conservation Tracking Wildlife in the Northern Greens Publications  
Upcoming Events Landowner and Community Resources

**Home**  
The Cold Hollow to Canada Forest Link Project (CHC) is a partnership of community members working together toward the common goal of land stewardship and wildlife habitat conservation through education and outreach, and coordination between local conservation commissions and public entities, and non-profit organizations that share our vision of healthy forests and wildlife for future generations.

The CHC project area includes seven towns on the western side of the Green Mountain ridge line that are part of The Northern Forest from the southern portion of the Cold Hollow Mountains to the Canadian border. These towns include Bakersfield, Belvidere, Enosburgh, Fletcher, Montgomery, Richmond, and Waterville.

The Cold Hollow to Canada project area:

**WildlifePatha**  
WildlifePatha is the current endeavor of CHC. Developed in partnership with the Staying Connected Initiative, WildlifePatha engages community members in monitoring where wildlife are moving within and between the forests in our region, so that we can work to better protect these critical linkages that allow wide ranging species to move between the Northern Green Mountains and the Adirondacks in Canada. Visit to learn more and find out how to get involved in your town! Click over the project page.

**CONNECTIONS**  
Connections is the quarterly newsletter of Cold Hollow to Canada where you can read up on CHC latest projects, pictures from recent CHC events and conservation news from around our region. Download the latest issue on our publications page.



**STAYING CONNECTED IN**  
**THE NORTHERN CONNECTOR**

**A Local Wildlife Corridor**  
If you live in the Northern Green Mountains, you live in a wildlife corridor. This corridor connects the southern Green Mountains to the Sutton Mountains of Quebec. Our wildlife depend on this link! In fact, wildlife across the northeast, from New York to Nova Scotia, are currently connected in an elaborate network that allows for genetic diversity and keeps populations strong. The network enables wide-ranging mammals like black bear, moose, bobcat, and fisher to travel as far as they need to find shelter, food, and mates.

**As a Landowner, What can you do?**  
If you own a forestland:  
When managing your land, try to picture how your land fits into the broader, regional landscape. Mountain forested connections between core habitat, stepping stones, and road crossings. A consulting forester, the county forester, or the Vermont Department of Fish and Wildlife may be able to help you assess next steps or create a forest management plan.

If you own a farmstead:  
Consider maintaining, enhancing, or even widening hedgerows between fields where wildlife can travel while staying under cover. The Natural Resources Conservation Service has financial incentives programs to help some landowners defray costs.

If you own land surrounding a lake, stream, or wetland:  
Maintaining or planting a vegetated buffer along waterways ensures that wildlife have a safe place to travel, as well as providing protection against erosion and flooding and keeping the stream shaded for fish and other inhabitants. Natural Resources Conservation Districts may be able to advise you on cost-effective methods of doing this.

Thank you for doing your part!

**THE STAYING CONNECTED INITIATIVE**  
Northern Greens to Canada Linkage  
For additional information, please contact:  
Cold Hollow to Canada: [www.coldhollowtoCanada.org](http://www.coldhollowtoCanada.org)  
or  
Conrad Reiving, Wildlands Network (802) 765-2838  
[Conrad@adiforestnetwork.org](mailto:Conrad@adiforestnetwork.org)

**VERMONT EDITION**  
Photo Credits: Carol (bobcat), The Nature Conservancy (forest and seedling), Amber (banger (moose)), and Monica (fisher) (blackberry)



# A Public-Private Partnership

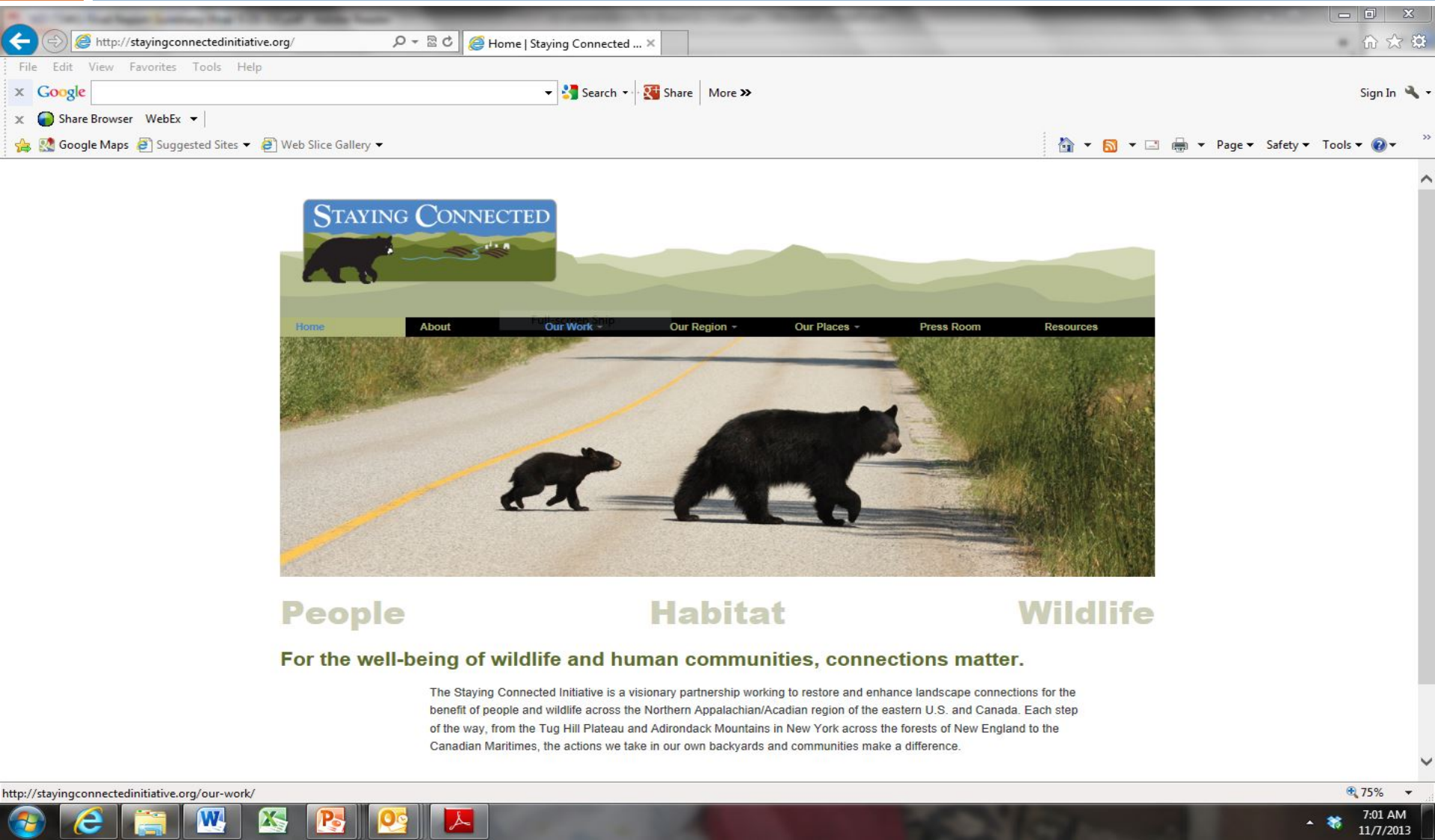
- Benefits to State Agencies
  - Expands capacity of technical assistance & land protection
  - Expands spectrum of activity (through multi-pronged approach)
  - Provides eco-regional context
  - Encourages local empowerment





# Website –

## www.stayingconnectedinitiative.org



# VTrans and Staying Connected



Gina Campoli, Environmental  
Policy Manager





# 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

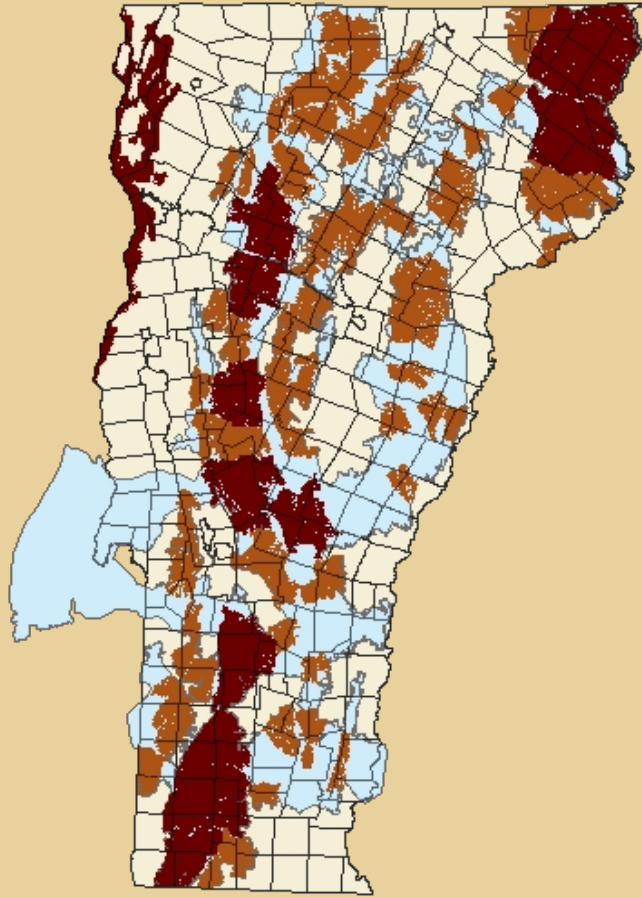




# VTrans and Staying Connected



# VTrans and Staying Connected



Staying Connected Network of  
Connected Lands



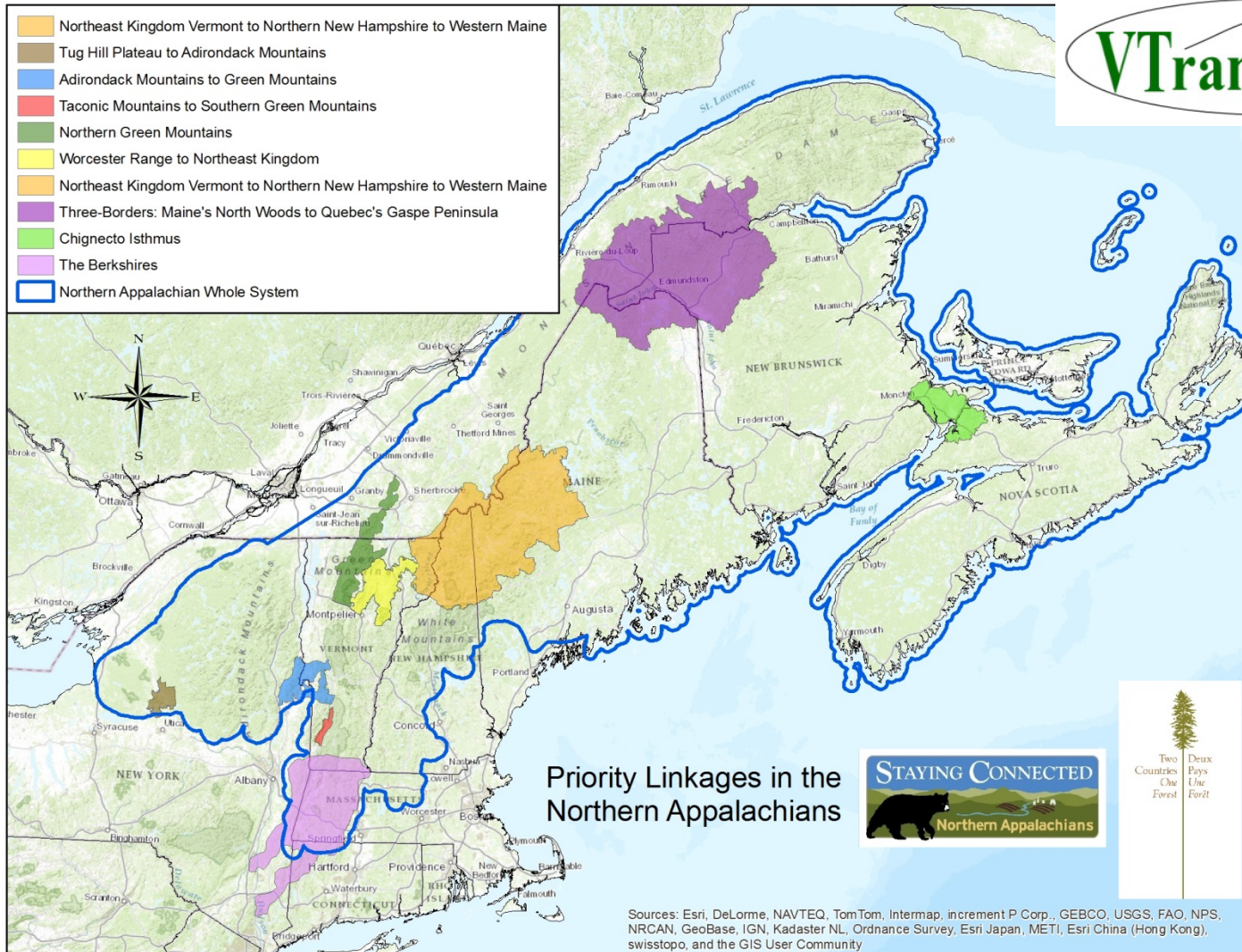


# VTrans and Staying Connected





# VTrans and Staying Connected



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



UVM Transportation Research  
Institute

National Wildlife Federation

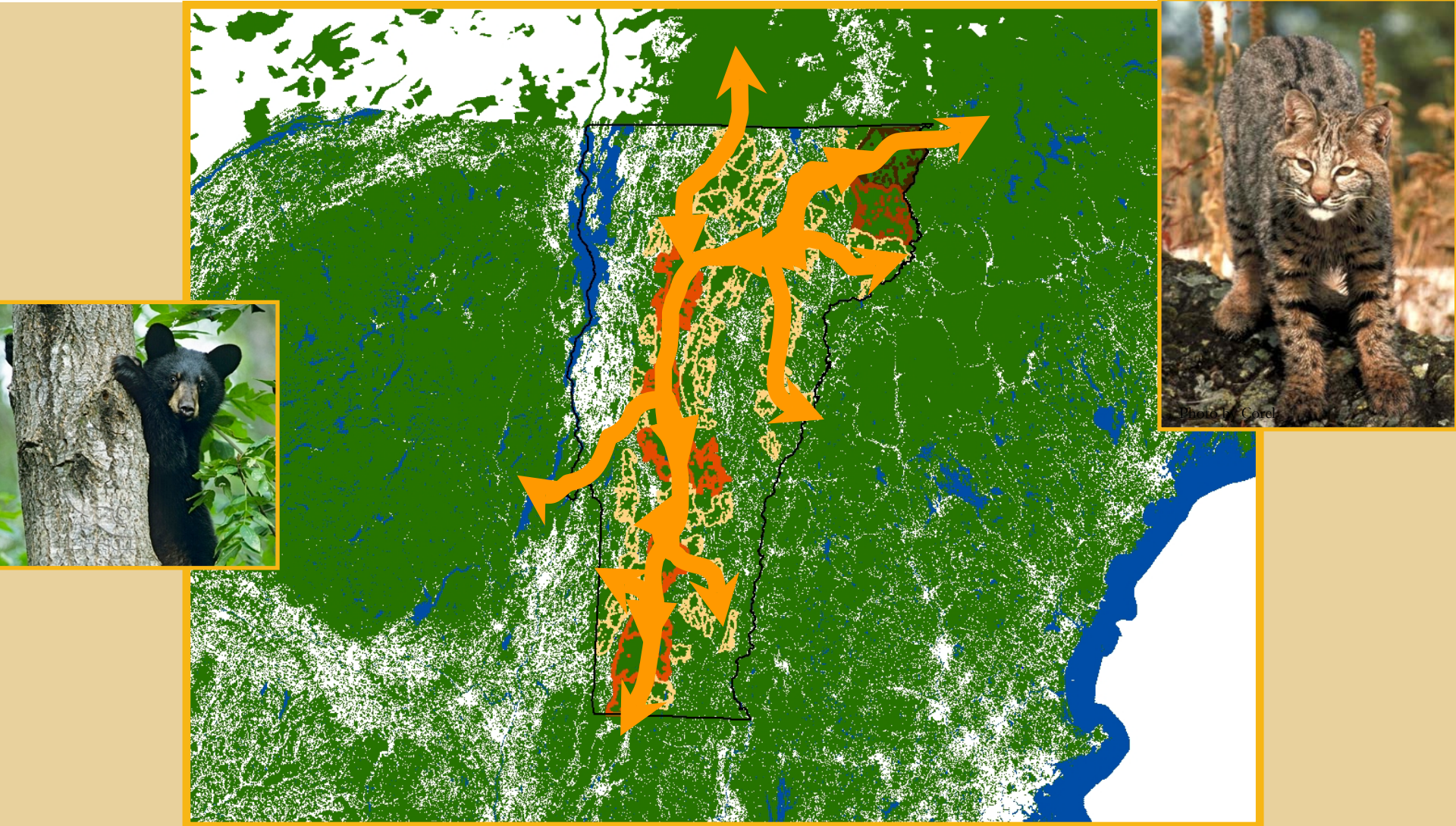
# Identifying the Most Important Transportation Structures for Maintaining/Restoring Wildlife Connectivity

Paul Marangelo, Vermont Chapter





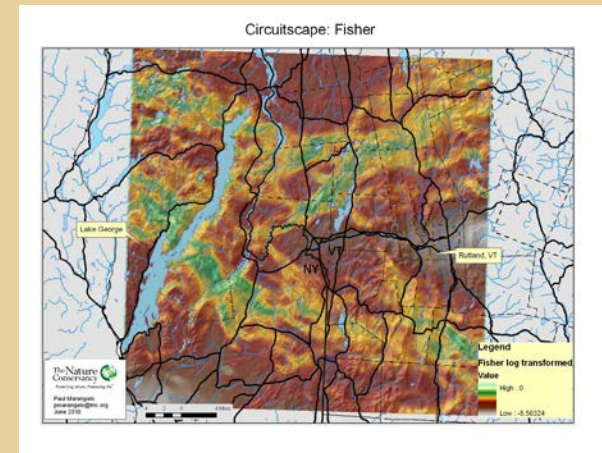
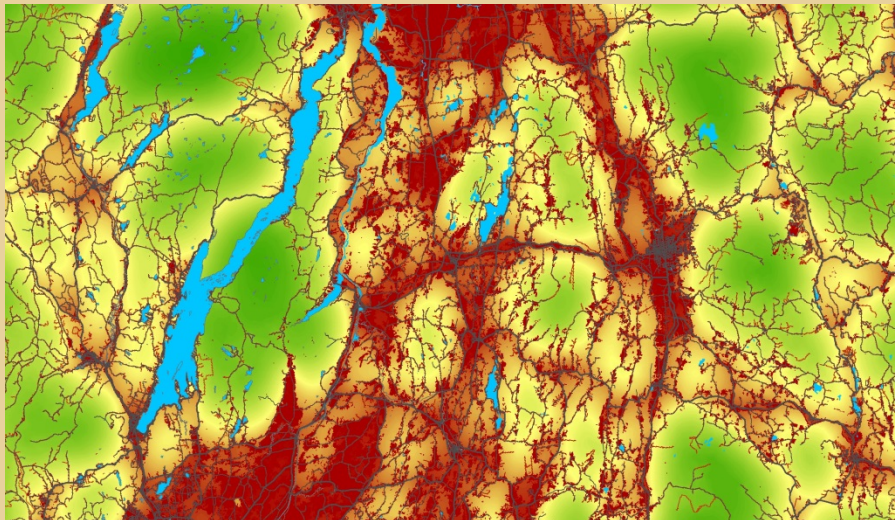
# Vermont is the “Crossroads”





# Conservation Science

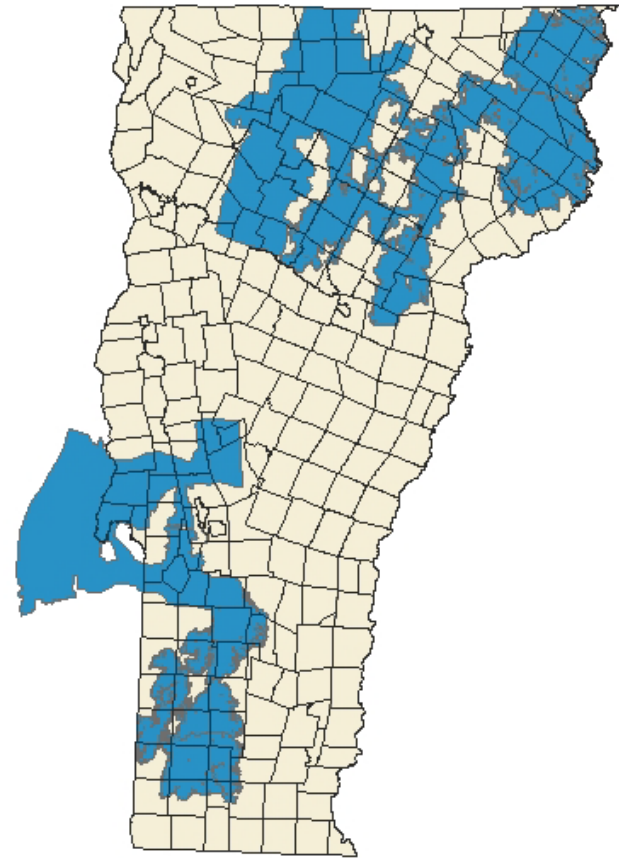
- Structural Connectivity
  - GIS modeling
  - Interpreting results (identifying spatial priorities)



Priorities derived from modeling exercises are hypothetical

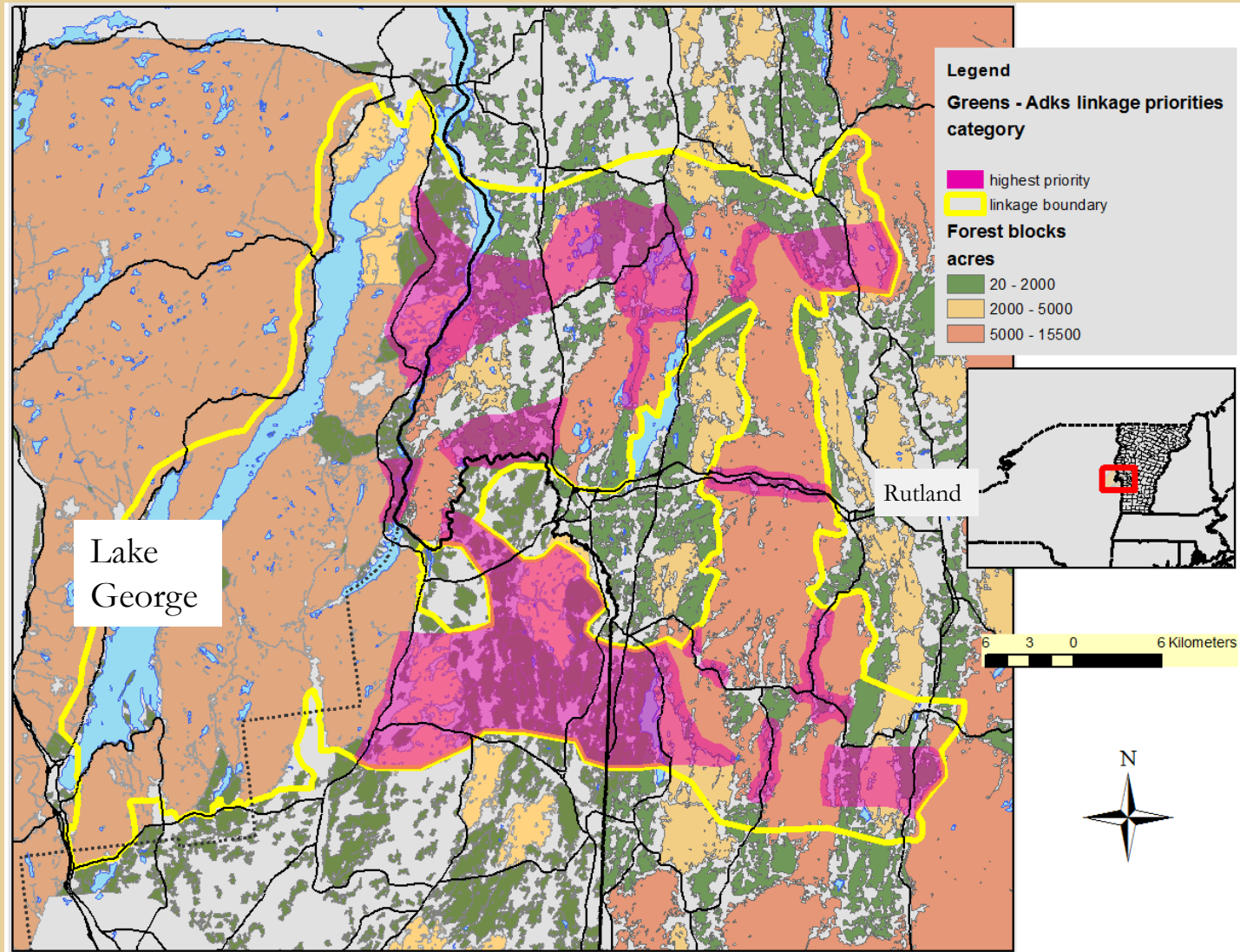
# Linkage areas in VT

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





# Linking large forest blocks

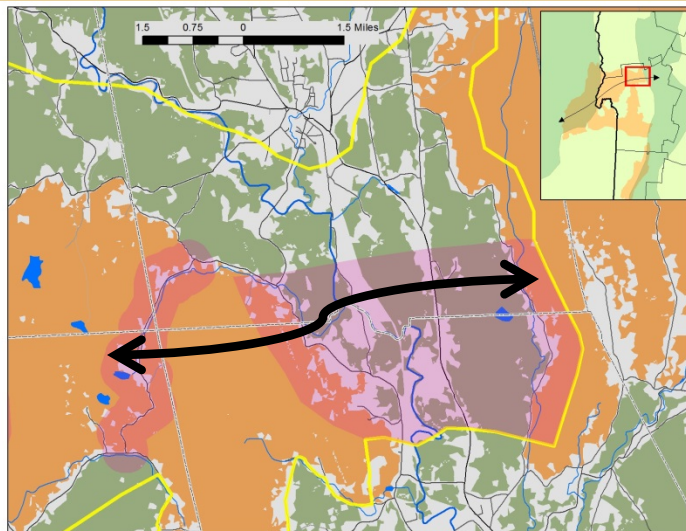


# Where to restore/enhance road permeability?



## Identifying critical road segments:

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

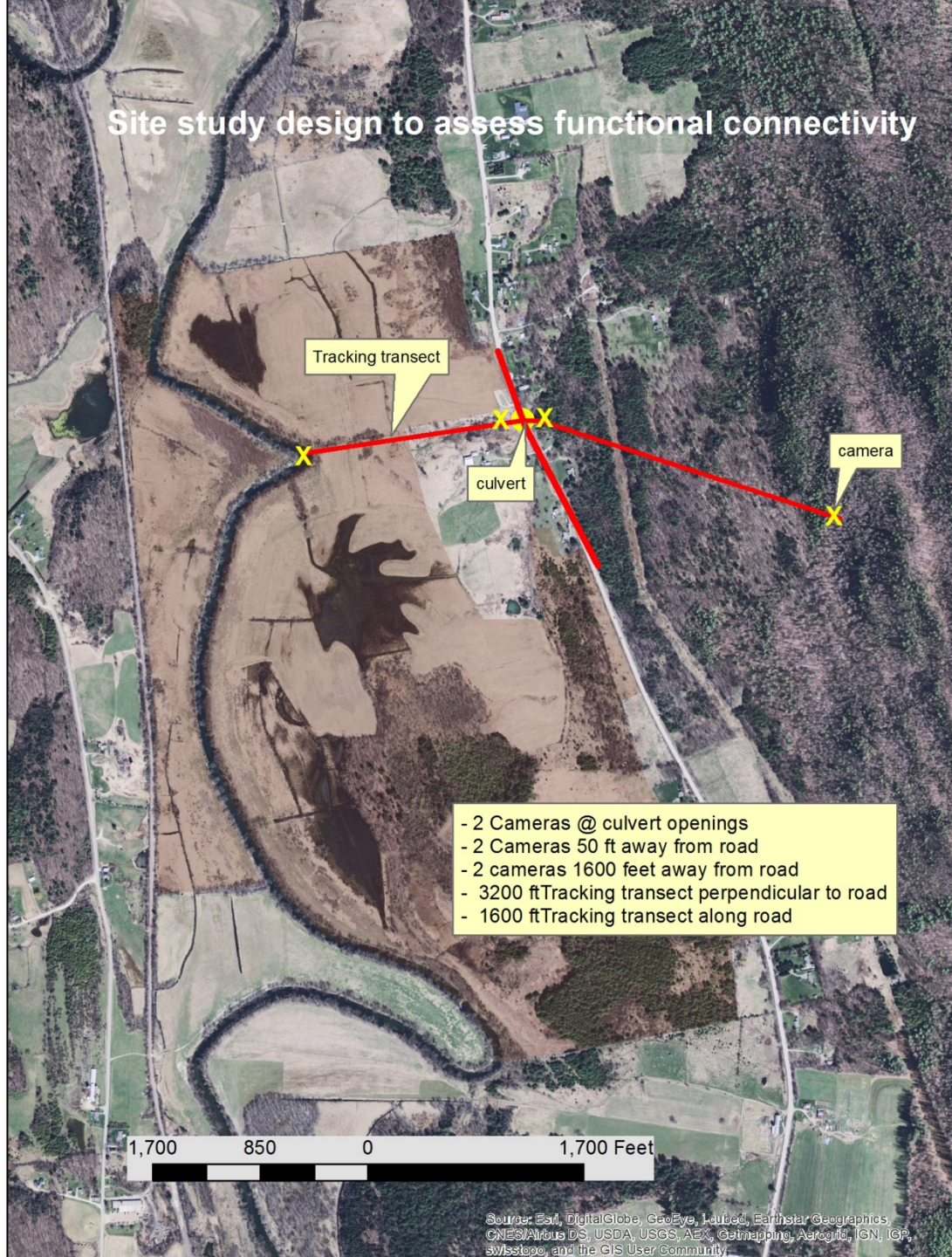


## Assessing functional connectivity:

- 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





# 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, openness 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:

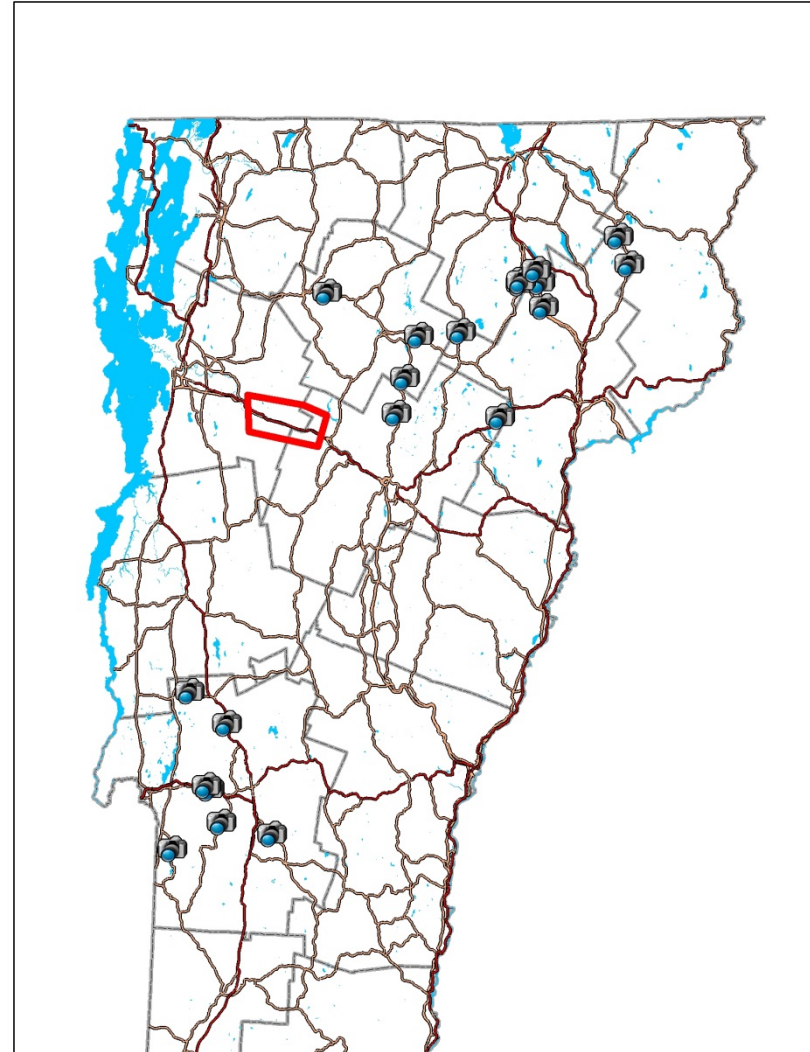
- Most important locations on major roads for wildlife-friendly transportation structures.
- Recommendations on characteristics to incorporate into structure design.
- Wildlife use of structures vs. over-road crossing vs. adjacent habitat use.



# 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



James Brady  
Environmental Specialist

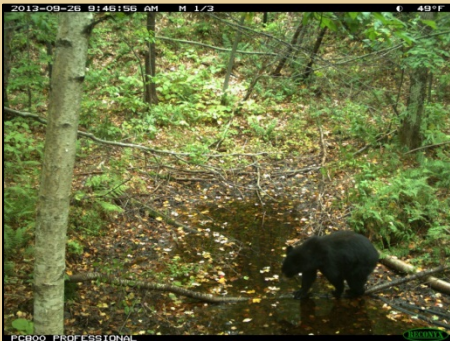


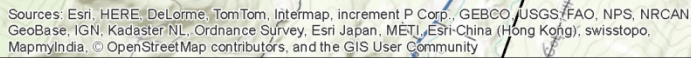




# From Structural to Functional: VTrans and SCI

- 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 pinpoint important areas for wildlife connectivity
- VTrans now has a vehicle to share wildlife connectivity project experiences with neighboring states, provinces and NGOs

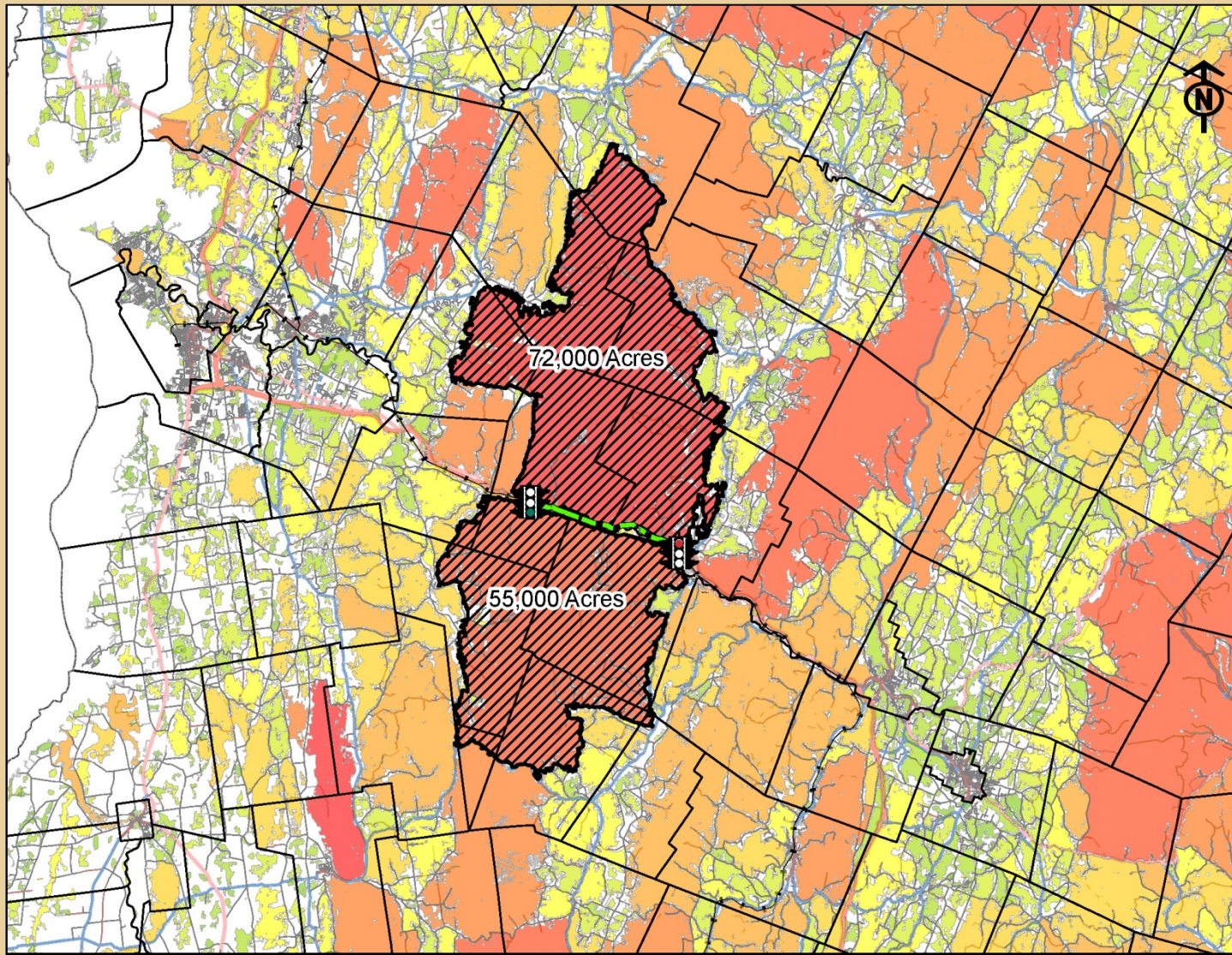








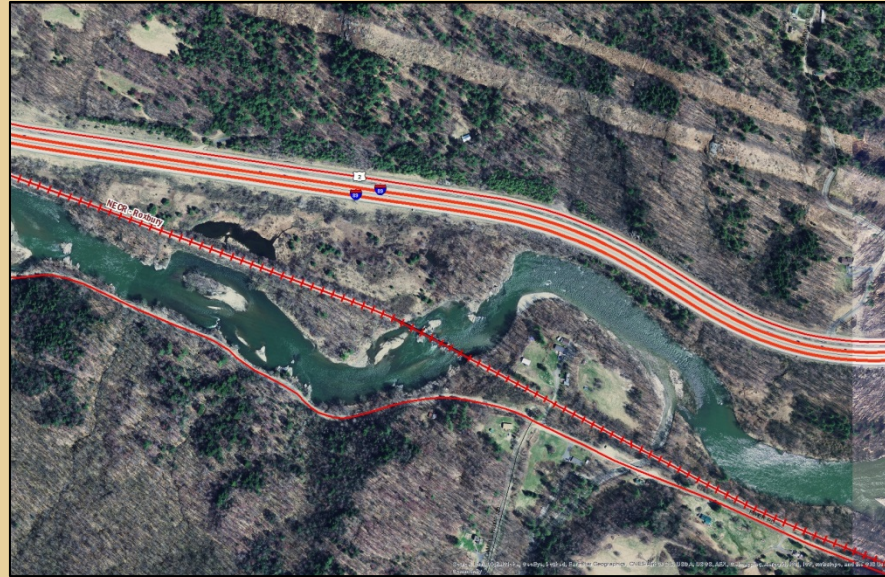
# From Structural to Functional: VTrans and SCI







# From Structural to Functional: VTrans and SCI







# From Structural to Functional: VTrans and SCI





# Q&A / Discussion

