Climate Change Adaptation for Natural Resources in the North Atlantic Region

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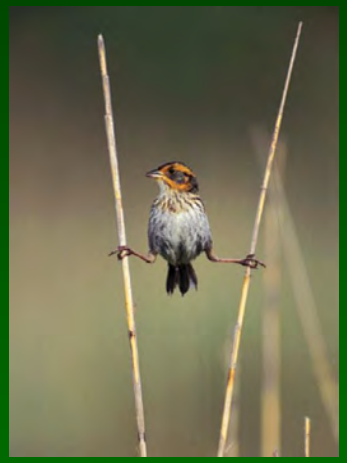
U.S. Fish and Wildlife Service

Preparing New Jersey for Climate Change:
A Workshop for Decision Makers,
November 29, 2011

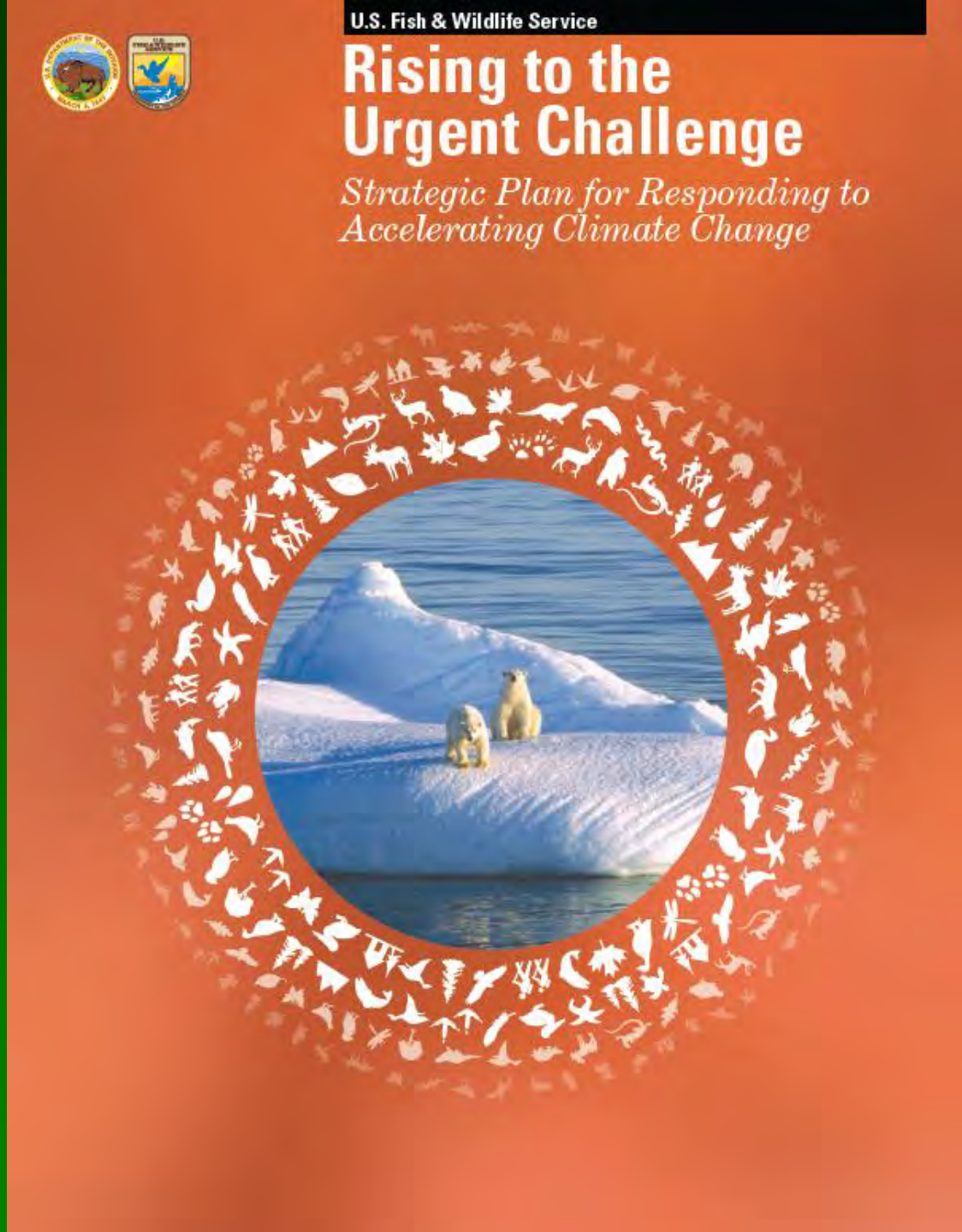
Climate Change Adaptation for Natural Resources

- Landscape Conservation Cooperatives
  - Background and purpose
  - What is going on nationally and regionally
- How we need to address adaptation
  - Multiple scales
  - Incorporating all major stressors
  - Science and tools useful for making good conservation decisions
    - Examples of science and tools that are being developed

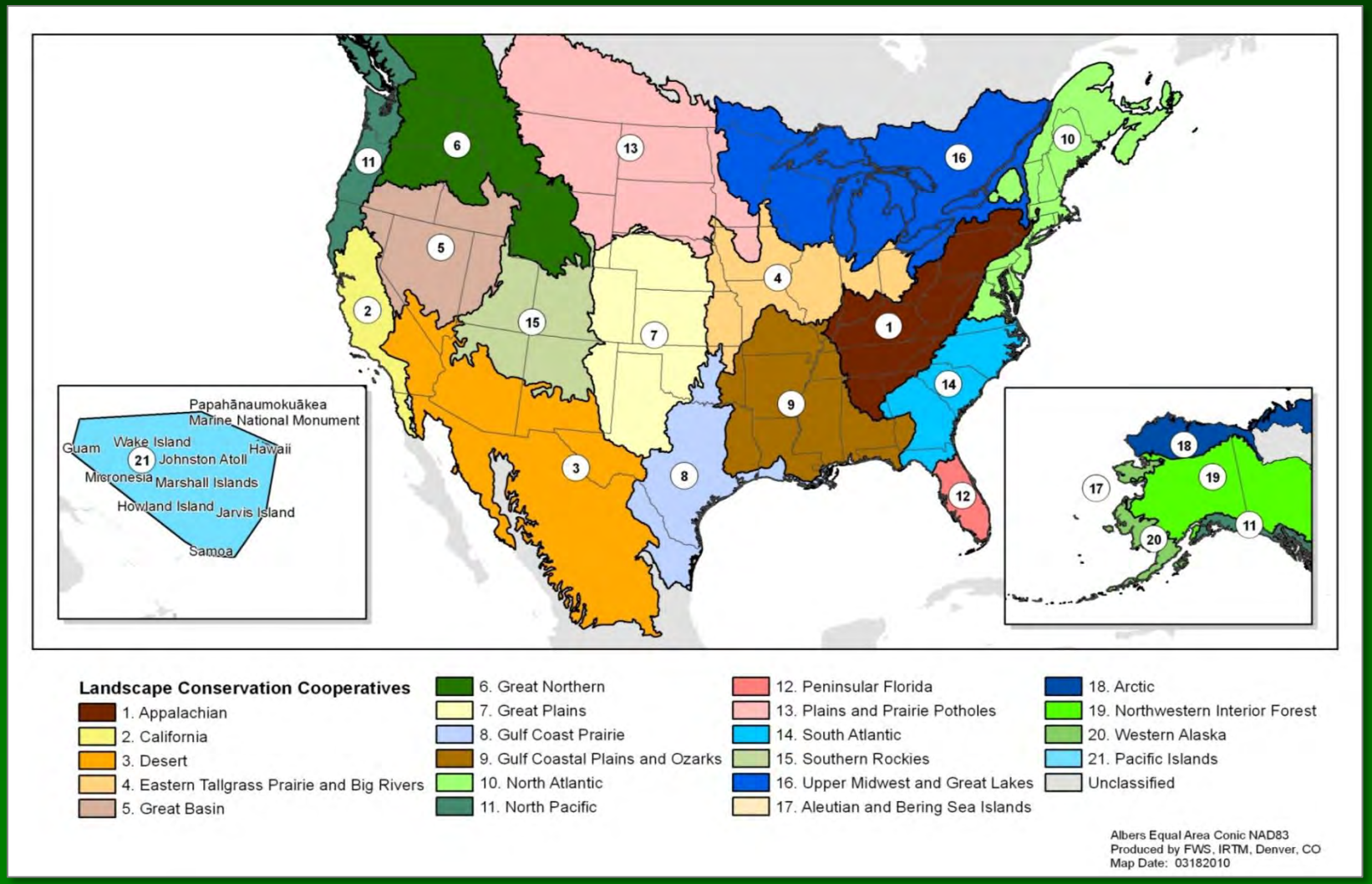


U.S. Fish and Wildlife Service Climate Change Strategic Plan

- Focus on Adaptation
- Landscape scale partnerships



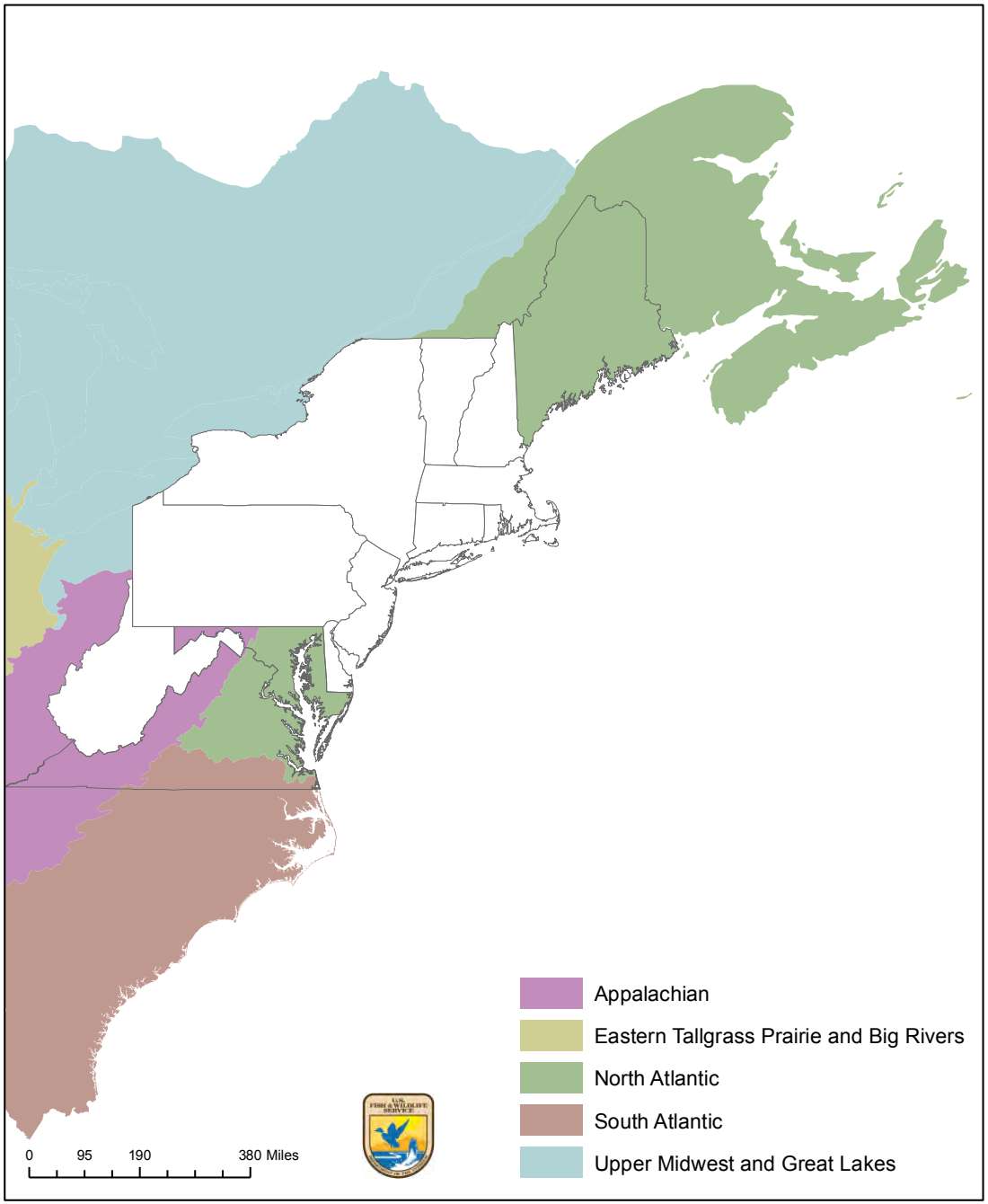
Landscape Conservation Cooperatives: Geographic Areas



Northeast Region LCCs

Two in New Jersey

- North Atlantic
- Appalachian



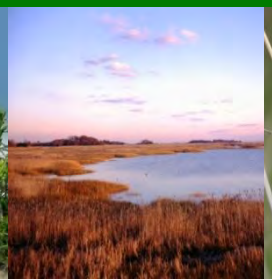
North Atlantic LCC - Mission

The North Atlantic Landscape Conservation Cooperative provides a partnership in which the conservation community works together to **address increasing land use pressures and widespread resource threats and uncertainties amplified by a rapidly changing climate.**

The partners and partnerships in the cooperative address these regional threats and uncertainties by agreeing on common goals and jointly developing the **scientific information and tools needed to prioritize and guide more effective conservation actions** by partners toward those goals.

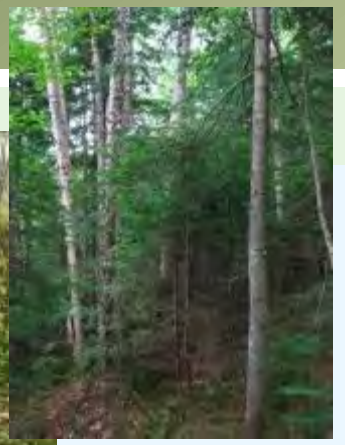


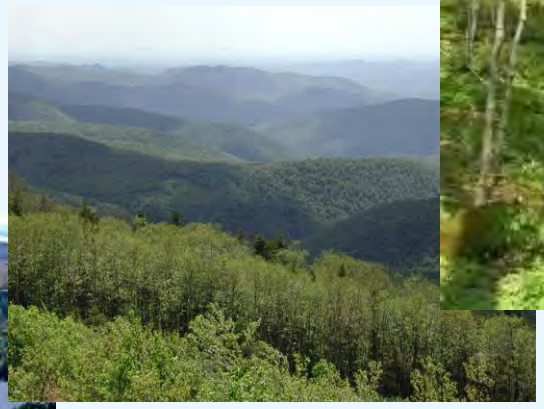




Mapping Northeast Terrestrial Habitats

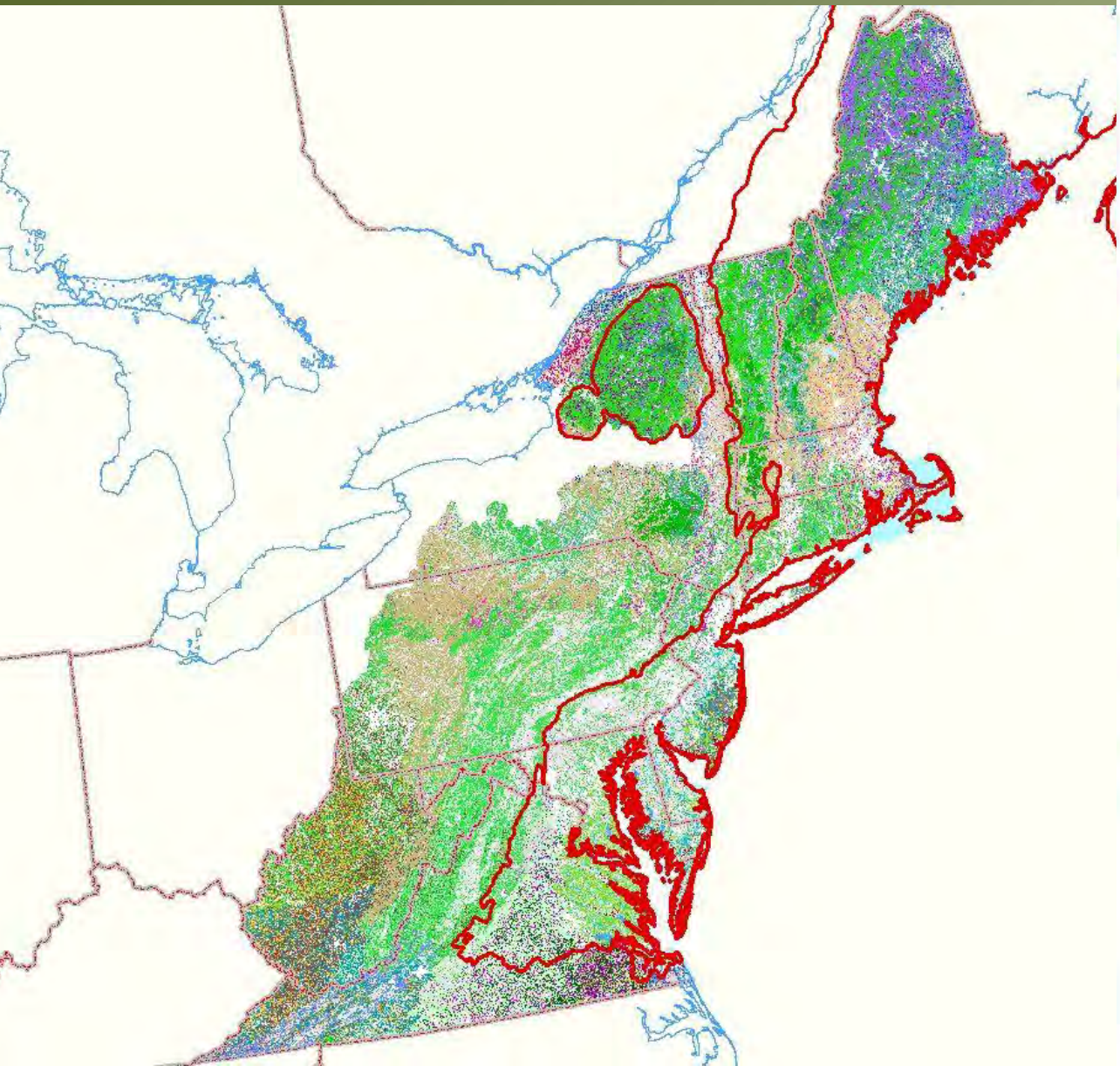
Based on NatureServe Ecological Systems








Terrestrial Habitats



Ecological Systems/Habitats: Wetland, U

- Laurentian-Acadian Conifer-Hwd Acid Swamp
- N-Central Appalachian Acidic Swamp
- Laur-Acad Alkaline Conifer-Hwd Swamp
- Laurentian-Acadian Freshwater Marsh
- Laur-Acad Wet Meadow-Shrub Swamp
- Boreal-Laur-Acadian Acidic Basin Fen
- N-Central Interior and Appal Acidic Peatland
- N-Central Int Wet Flatwoods (wet Clayplain Forest)
- Acadian Coastal Salt Marsh & Estuary Marsh
- Acadian Maritime Bog
- Boreal-Laurentian Bog
- Laurentian-Acadian Floodplain Forest
- Eastern Boreal Floodplain

- SP system: N Appal-Acad Rocky Heath Outcrop
- SP system: Laur-Acad Calcareous Rocky Outcrop
- SP/LP system: Central Appal Dry Oak-Pine Forest
- SP system: Central App Pine-Oak Rocky Woodland
- SP system: L-A Acidic Cliff & Talus
- SP system: L-A Calcareous Cliff & Talus
- SP system: N-Central Appal Acidic Cliff & Talus
- SP system: N-Central Appal Circumneut Cliff & Talus
- SP system: NE Interior Pine Barrens
- LP/SP system: Great Lakes Alvar
- LP/SP system: Laurentian Acidic Rocky Outcrop
- SP system: Great Lakes Dune: 4 small occ's

- SP/LP system: Acadian-Appalachian Alpine Tundra
- Mtx system: Acad-Appal Montane Spr-Fir-Hwd Forest
- LP/SP system: Acadian Sub-boreal Spruce Flat
- Mtx system: Acadian Low-Elev Spr-Fir-Hwd Forest
- Mtx system: L-A N. Hwd Forest, typic
- Mtx system: L-A N. Hwd Forest, high conifer
- Mtx system: L-A Red Oak-N. Hwd Forest
- Mtx system: L-A N. Hwd Forest, moist/cool
- Mtx system: L-A Pine-Hem-Hwd Forest, typic
- Mtx system: L-A Pine-Hem-Hwd Forest, moist/cool
- LP/SP system: Appal Hem-N. Hwd Forest, typic
- LP/SP system: Appal Hem-N. Hwd Forest, moist/cool
- LP/SP system, former mtx: Mesic Clayplain Forest

- NLCD-NHD open water
- NLCD agricultural classes 81-82
- NLCD developed classes 21-24 & 31

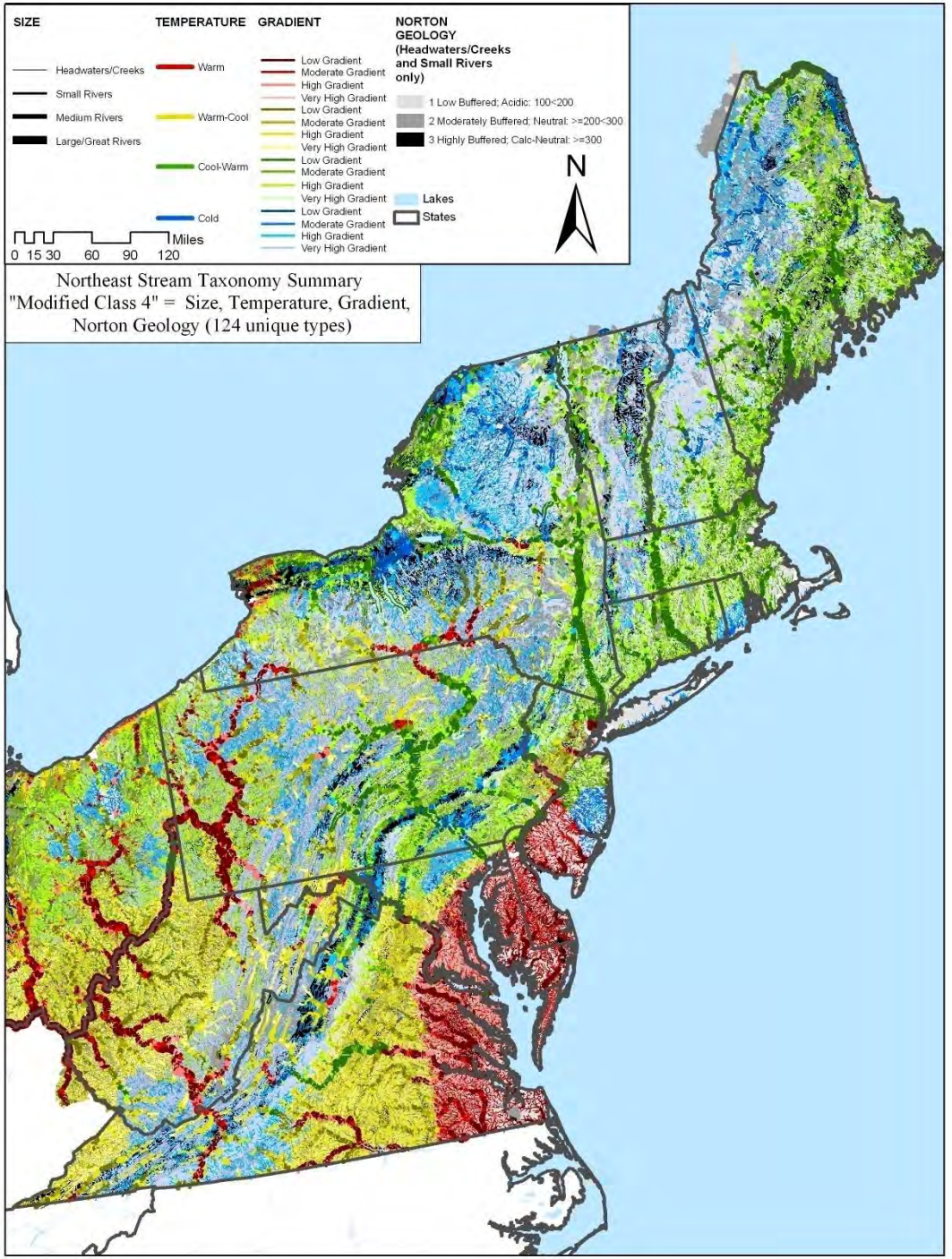
Northeast Aquatic Habitat Classification and Map

This simplified map groups them into 96 types.

From
Very high gradient, acidic, cold headwater creek
(1a_6_1_1)

To
Very low gradient, calcareous, warm Great River
(5_1_3_3)

Code =
Size, Gradient, Geo, Temp

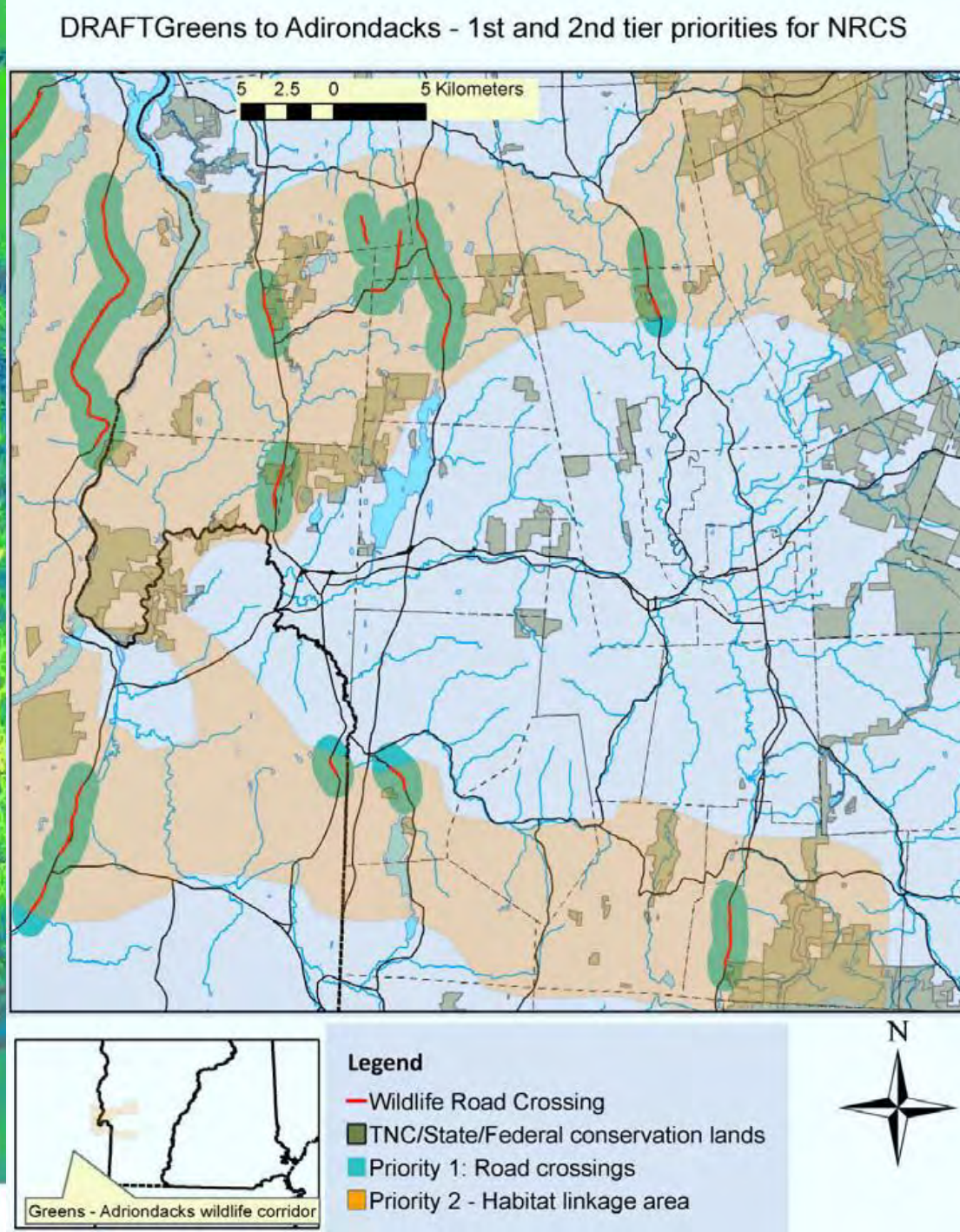


Vulnerabilities to Climate Change of Northeastern Fish and Wildlife Habitats

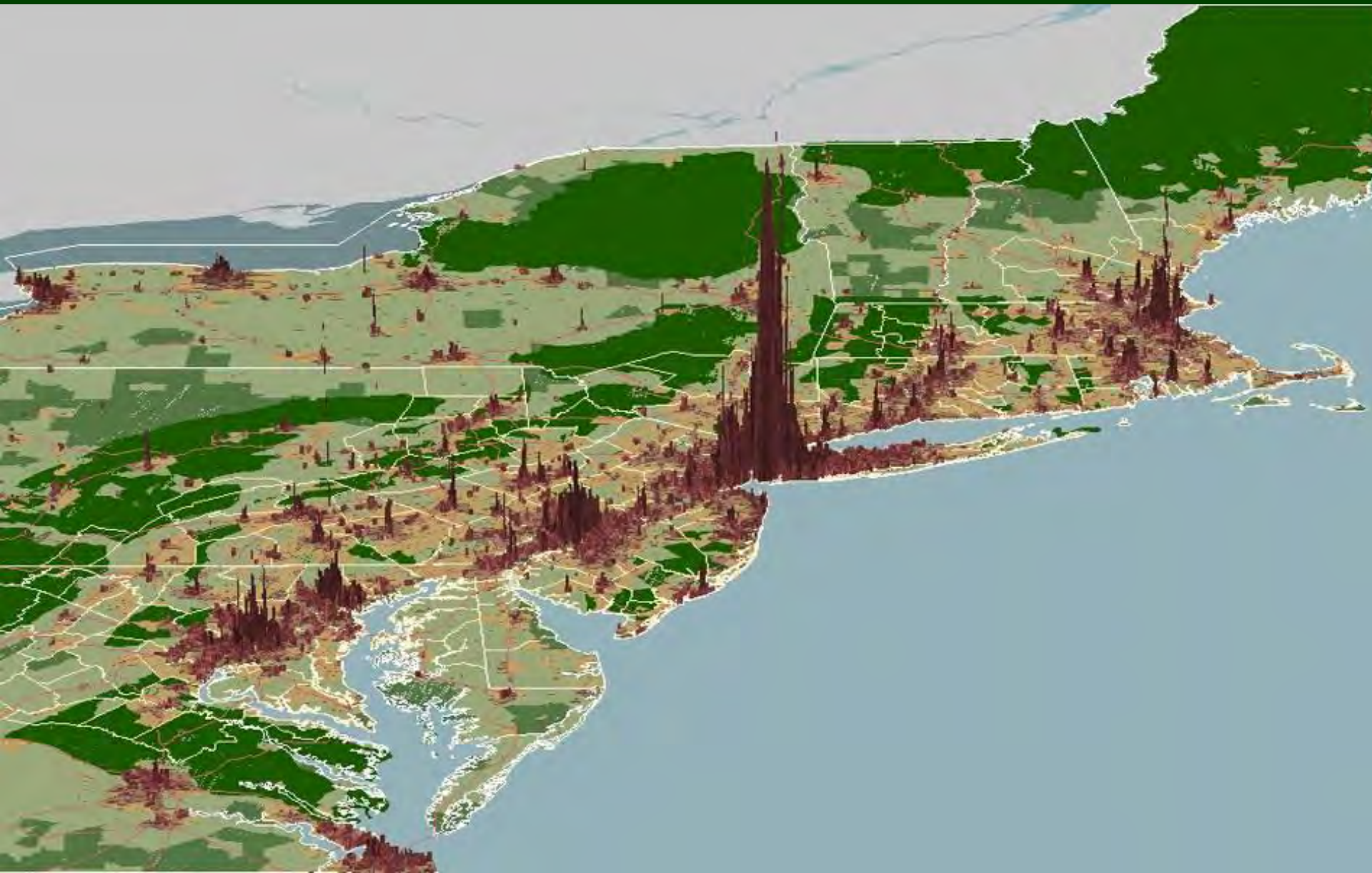
- A expert-driven predictive model of habitat vulnerability has been built
- This model will be consistently applied to selected habitats across the Northeast
- Results will provide basis for mapping geographical variation in vulnerability

Connectivity:

Network Connectivity

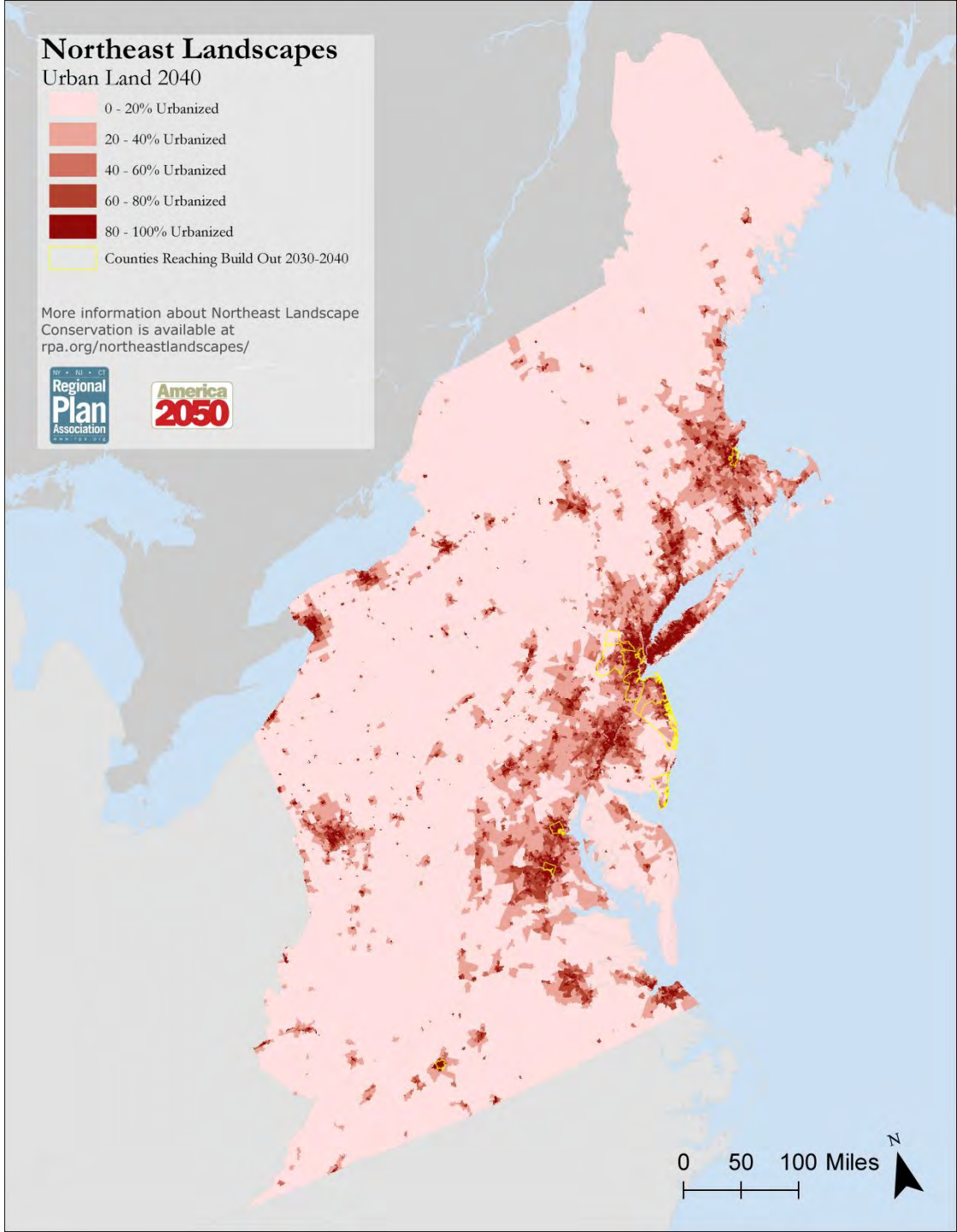


Human Population Density by County



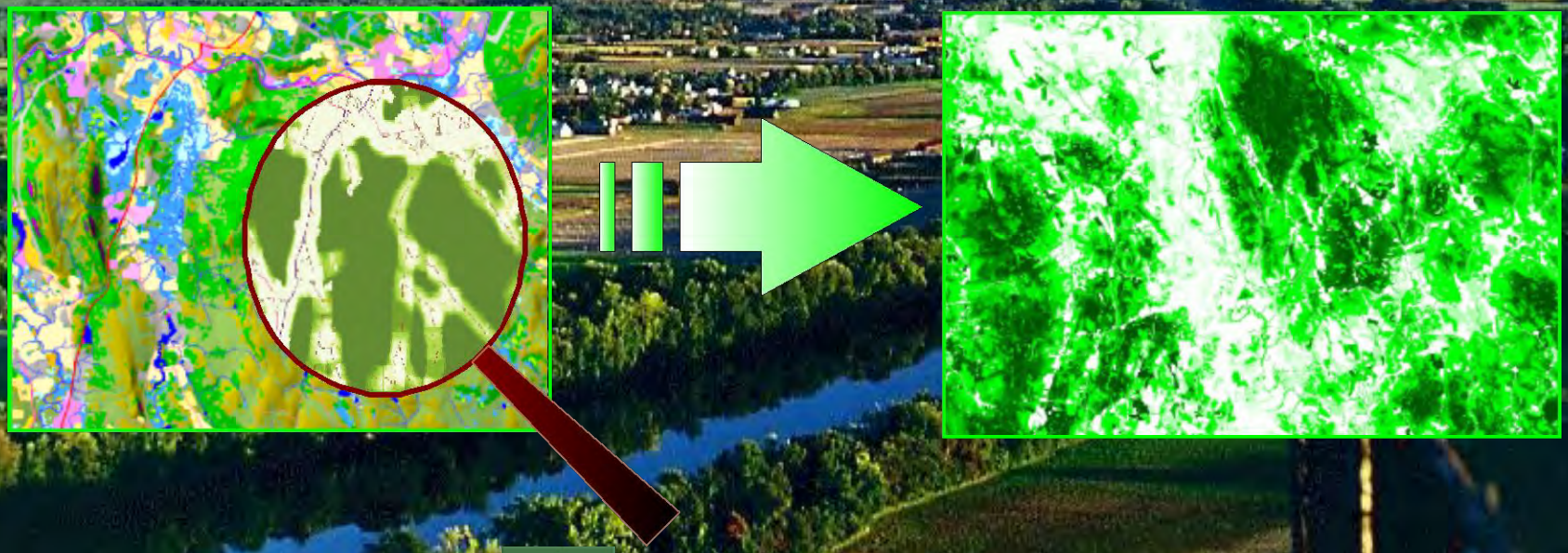
Northeast Region Urban Growth

1990
2000
2010
2020
2030
2040



Regional Plan Association, 2011

Designing Sustainable Landscapes for Wildlife
Decision-Support Tools for Conservation



North Atlantic Landscape Conservation Cooperative

The Nature Conservancy
Protecting nature. Preserving life.™

NatureServe

In the face of major threats the **objective** is to maximize the quantity, quality, and connectivity of habitats and ecological systems, subject to the real world socio-economic constraints of development

- Design landscapes to ensure connectivity

- Minimize forces of habitat degradation

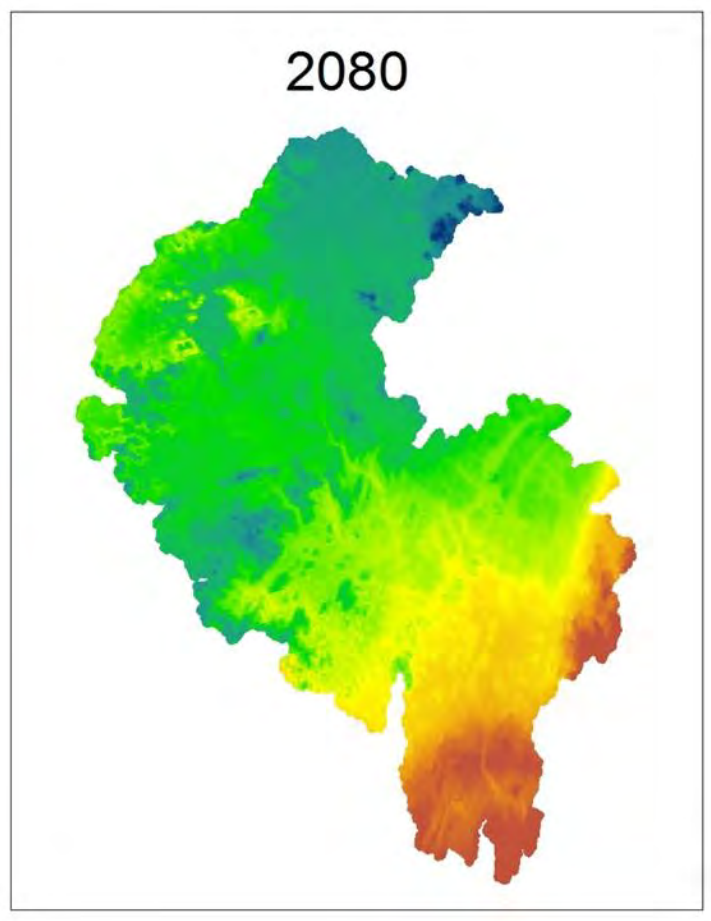
- Protect, manage & restore habitat in the right places

Utilizing complementary **fine-** and **coarse-filtered approaches**

Landscape change models

Now building a **landscape change model** to predict changes in *ecological integrity* and *habitat capability* driven by urban growth, climate change and other anthropogenic (e.g. timber harvest) and natural disturbances (e.g., fire)

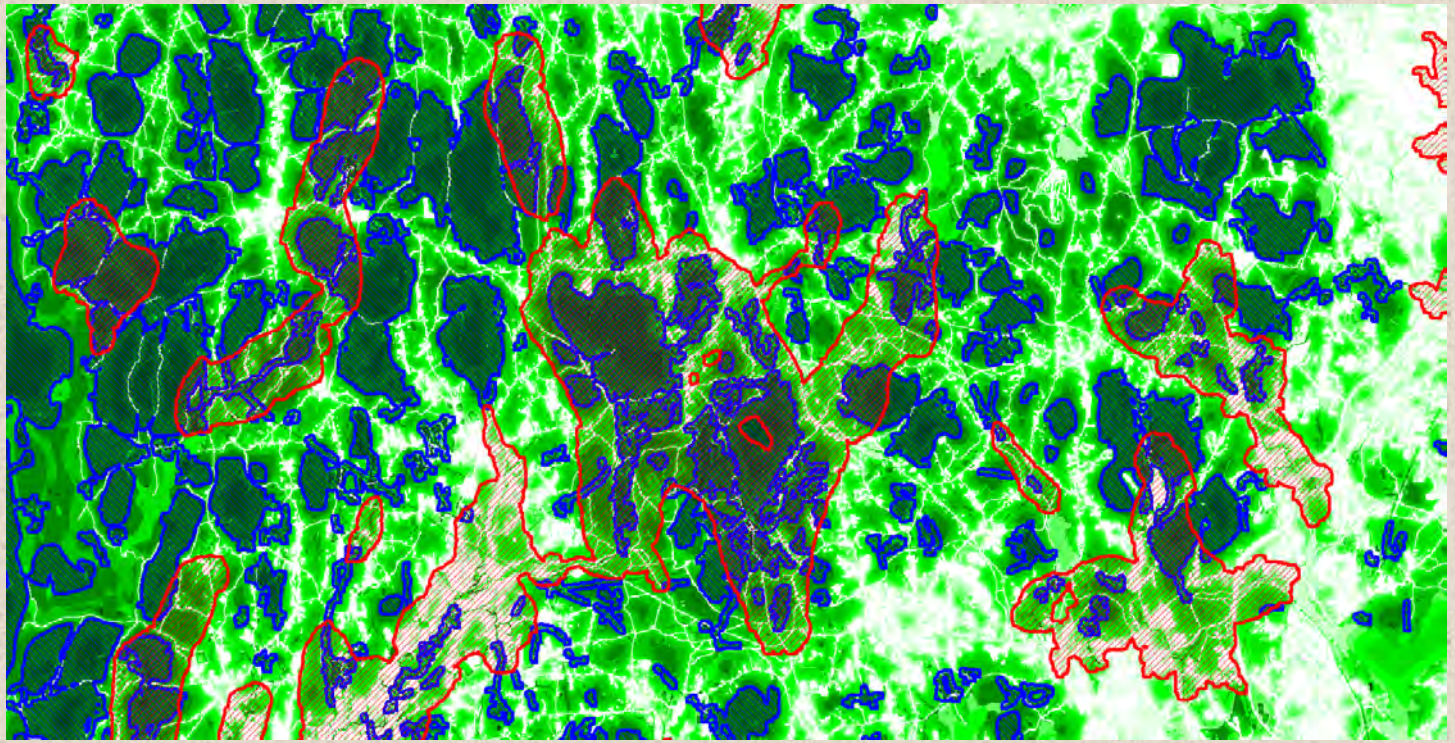
Projected min January temp, Kennebec watershed, SRES A2 scenario



Model outcomes: *Strategies for maximizing habitat and integrity*

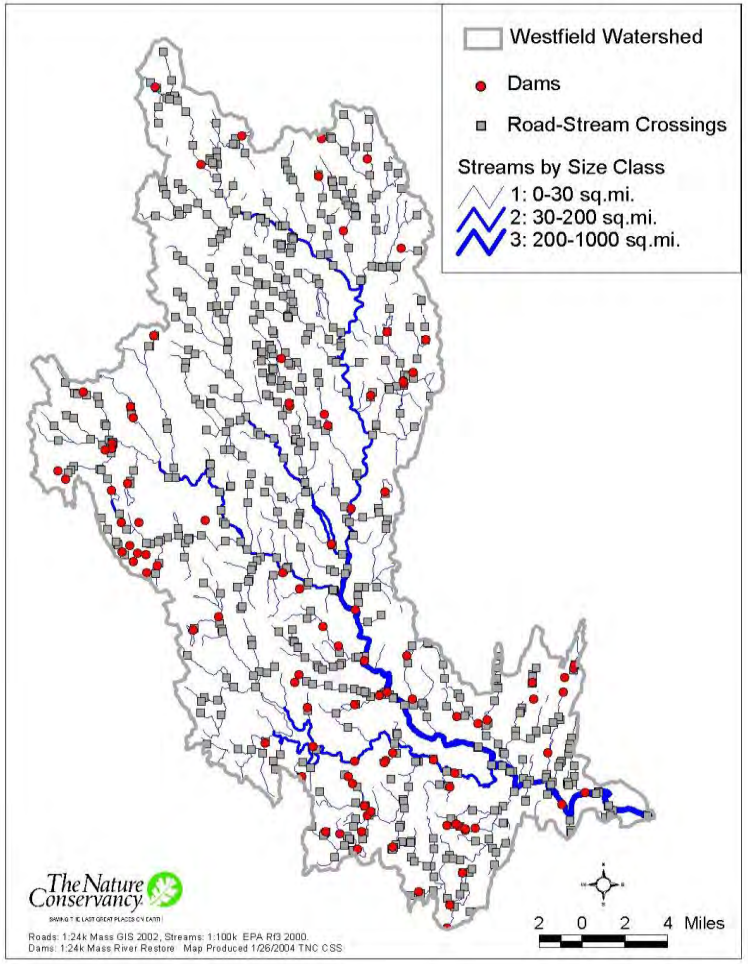
Top 20% (plus buffer) wood turtle habitat

Top 20% ecological integrity



Threats to Aquatic Systems and Species

- Habitat fragmentation
  - Isolated populations
- Water withdrawals
  - Seasonal effects of stream flow
- Land use/land change
  - Riparian buffer, impervious surfaces
- Climate change
  - Air temperature and precipitation affecting:
    - Stream flow and temperature
- Interactions

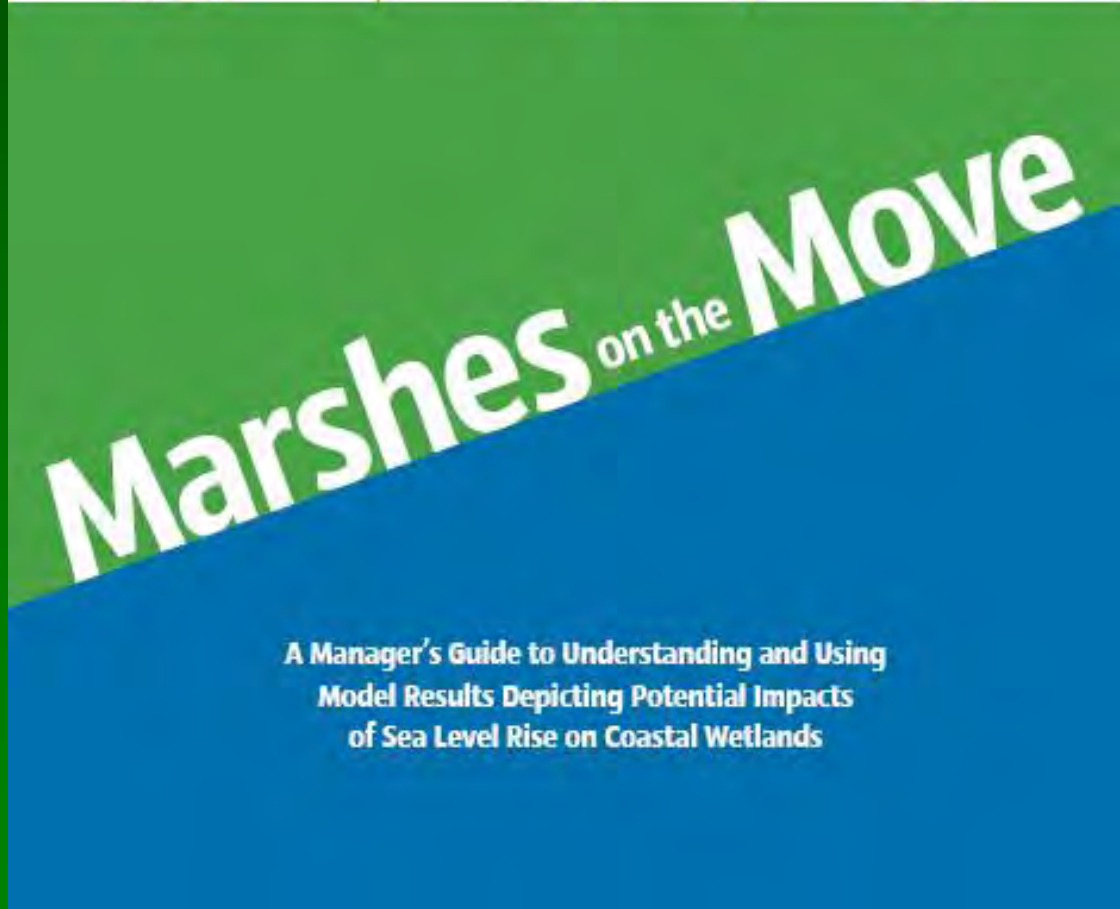


Piping plover habitat and sea level rise

- Understand impacts of sea level rise on beach habitats (sea level rise models)
- Relate these changes to plover populations (locally and regionally) (plover species habitat models)
- Inform current and near-term decisions regarding coastal stabilization (scenarios)

Science Translation

- Science and tools at scale and in format that is useful to managers
- Guidance to increase understanding and use



Adaptation Planning and Actions for Natural Resources

- Local and state scales informed by regional scale
- Plan for systems, habitats and species
- Incorporate multiple drivers (e.g. climate change and urban growth)
- Science and tools developed and available to managers

Goal: landscapes that sustain natural resources and human uses in the future




Thank You

North Atlantic LCC

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Appalachian LCC

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