

Conservation Status of Fish, Wildlife and Natural Habitats in the Northeast and Mid Atlantic Region

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Arlene Olivero Sheldon





Photo by Brian Harris

Project Overview



Monitoring the Conservation of Fish and Wildlife in the Northeast

A Report on the Monitoring and Performance Reporting Framework for the Northeast Association of Fish and Wildlife Agencies



Prepared and compiled by: Foundations of Success

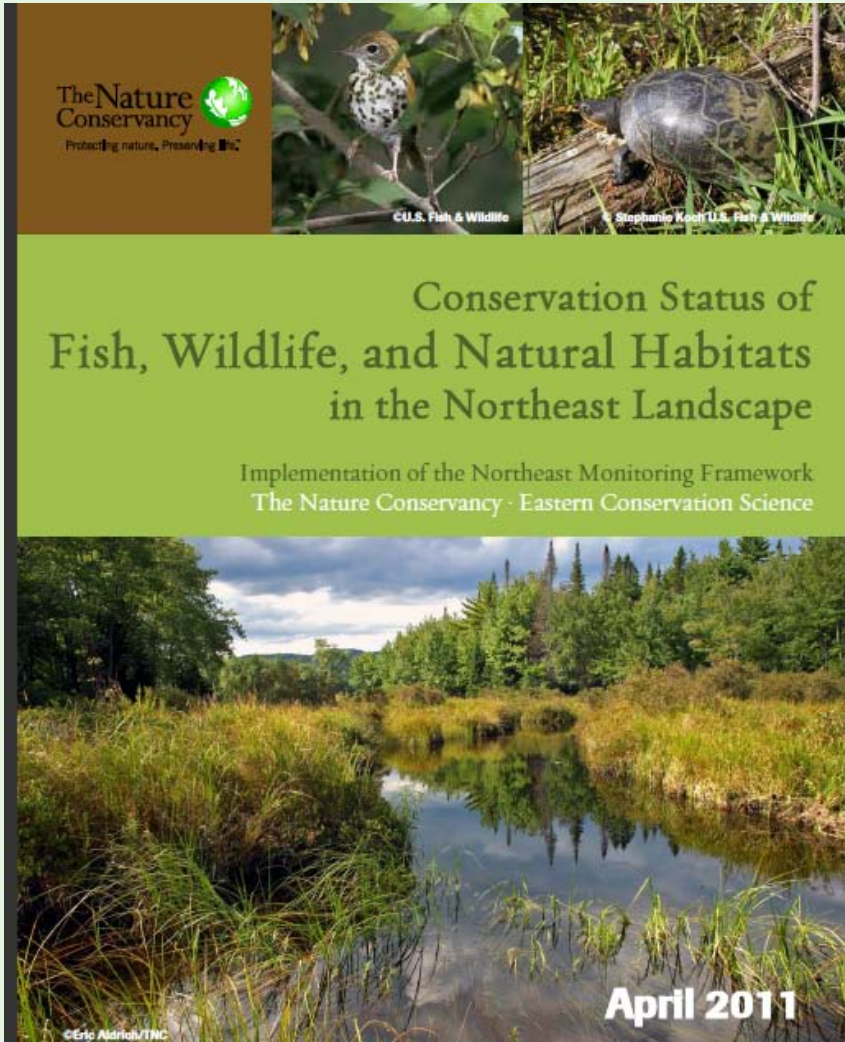


Technical materials developed by state and federal wildlife agency staff and partners across the Northeast

September 2008

- ❖ Guiding Document
- ❖ Advisory Committee
- ❖ Secured Lands
- ❖ Habitats & Species
 - Forest
 - Wetland
 - Unique habitats
 - Rivers and Streams
 - Lakes and Ponds
 - SGCN Species.

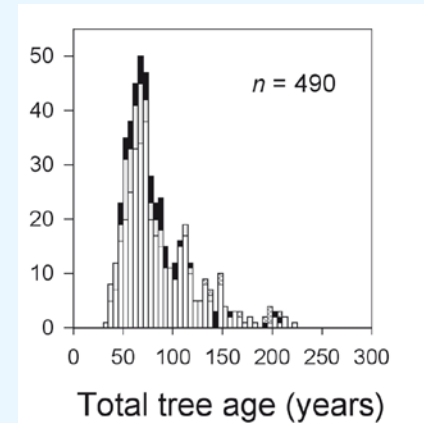
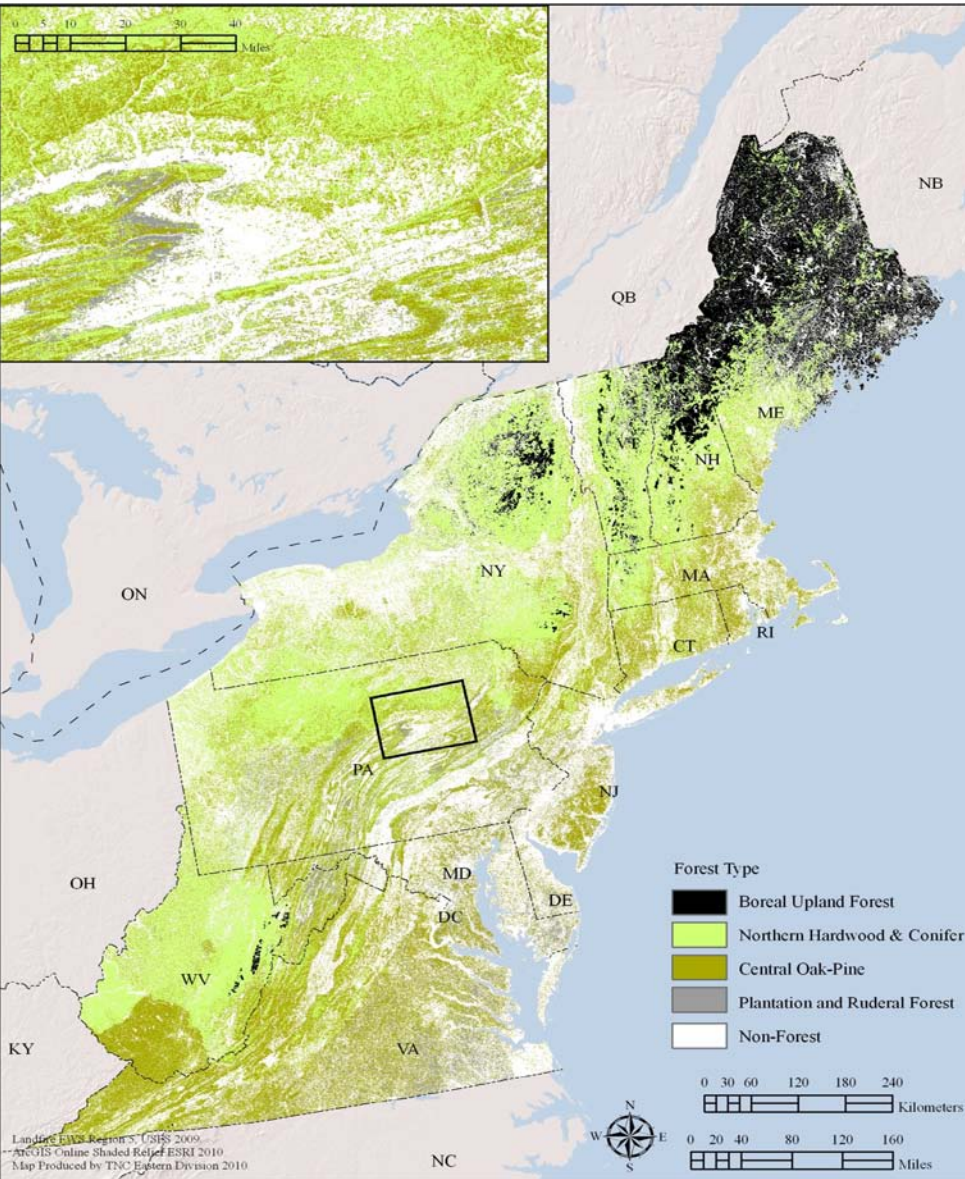
Report and Advisory Committee



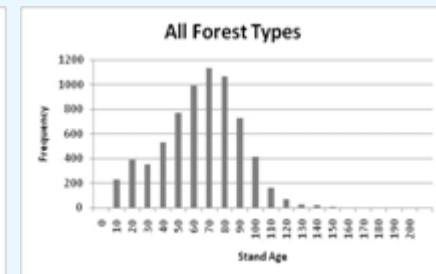
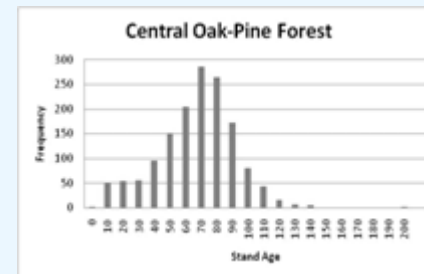
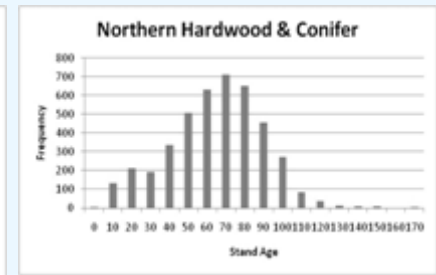
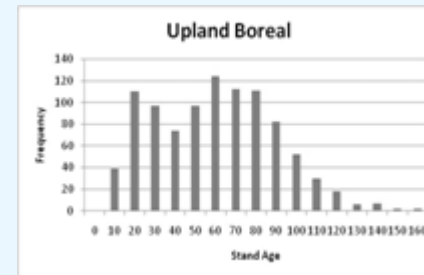
Representatives from every State

- ❖ Jenny Dickson and Rick Jacobson of CT DEP;
- ❖ Robert Coxe and Kevin Kalasz of DE DFW;
- ❖ John O'Leary and Thomas O'Shea of MA DFW;
- ❖ Glenn Therres, Lynn Davidson, Scott Stranko, and Dana L.Limpert of MD DNR;
- ❖ George Matula and Sandy Ritchie of ME DIFW;
- ❖ Jim Oehler, John Kanter, Matt Carpenter, Steve Fuller, and John Tash of NH DFG;
- ❖ Dave Jenkins, Kris Schantz, and Miriam Dunne of NJ DFW,
- ❖ Tracey Tomajer, Greg Edinger, Dan Rosenblatt, and Erin White of NY DEC;
- ❖ Dan Brauning and Lisa Williams of PA GC,
- ❖ Dave Day of PA FBC,
- ❖ Jeffrey Wagner of PA WPC/NHP;
- ❖ Jon Kart and Rod Wentworth of VT DFW; Gary Foster of WV CNR; Becky Gwynn of VA DGIF,
- ❖ Dave Tilton, Genevieve Pullis LaRouche, Ron Essig, and Ken Sprankle of USFWS;
- ❖ Don Faber-Langendoen of NatureServe,
- ❖ Dan Lambert of American Bird Conservancy,
- ❖ Dave Chadwick of the AFWA, Mary Anne Theising of USEPA,
- ❖ James McKenna of USGS.

Example: Forests: Age Structure

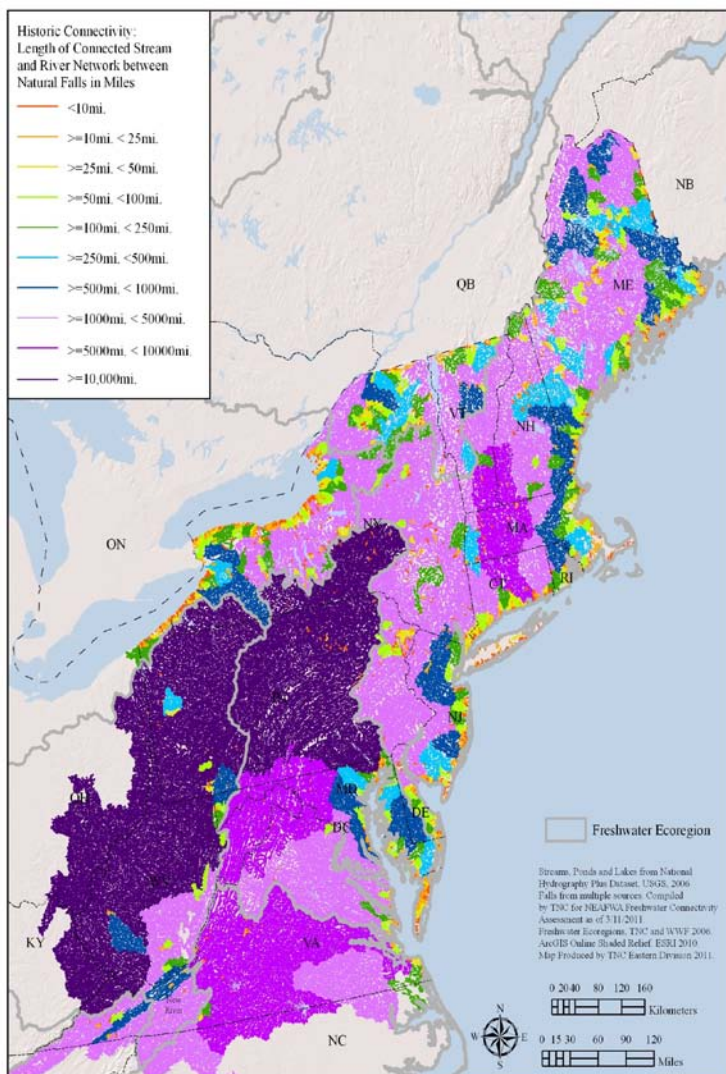


LANDFIRE MAP
FIA data
6952 stands



Example: Rivers: Connected Networks

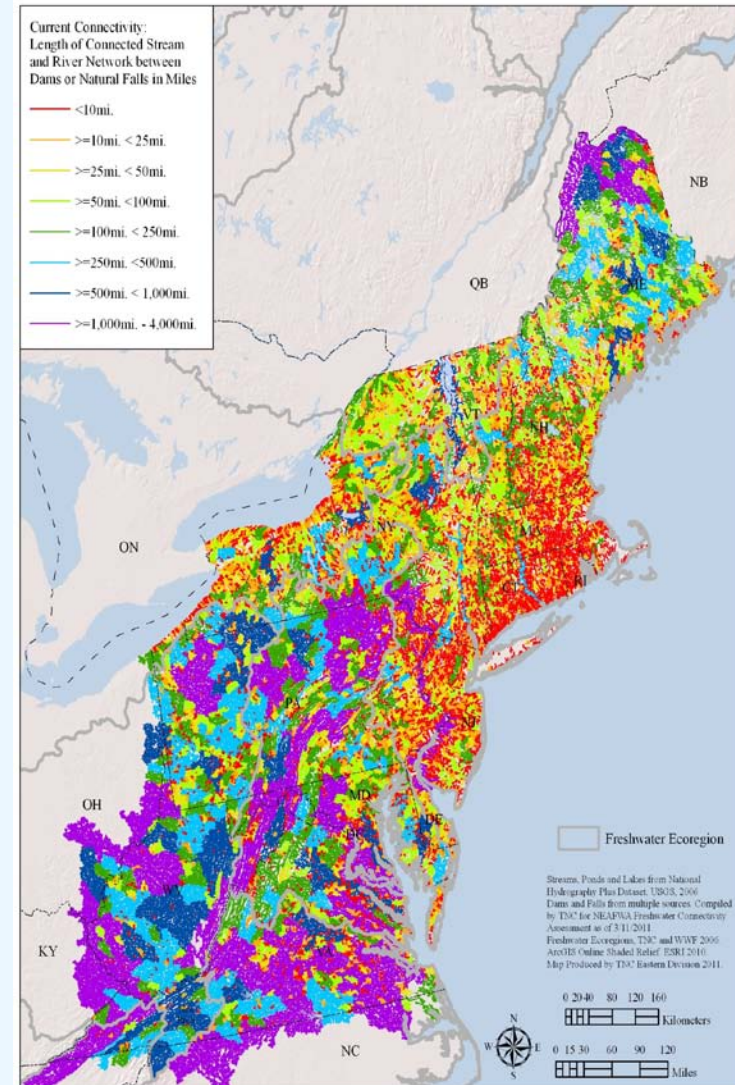
Original State: falls only



Original =
41 % in
networks over
5,000 miles
Current =
0 %

Original =
3 % in
networks 1-
25 miles
Current =
23 %

Current State: falls and dams





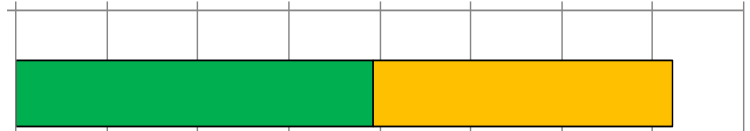
Example: Securement by Category

Concern trumps
Responsibility?

■ % GAP 1-2 ■ % GAP 3

0% 5% 10% 15% 20% 25% 30% 35% 40%

Widespread Concern, Low Responsibility (80)



Limited Distribution, High Responsibility (26)



High Concern, Low Responsibility (36)



High Concern, High Responsibility (5)



Widespread Concern, High Responsibility (28)



Moderate Concern, High Responsibility (2)





Photo by Brian Harris

Mapping Terrestrial Habitats

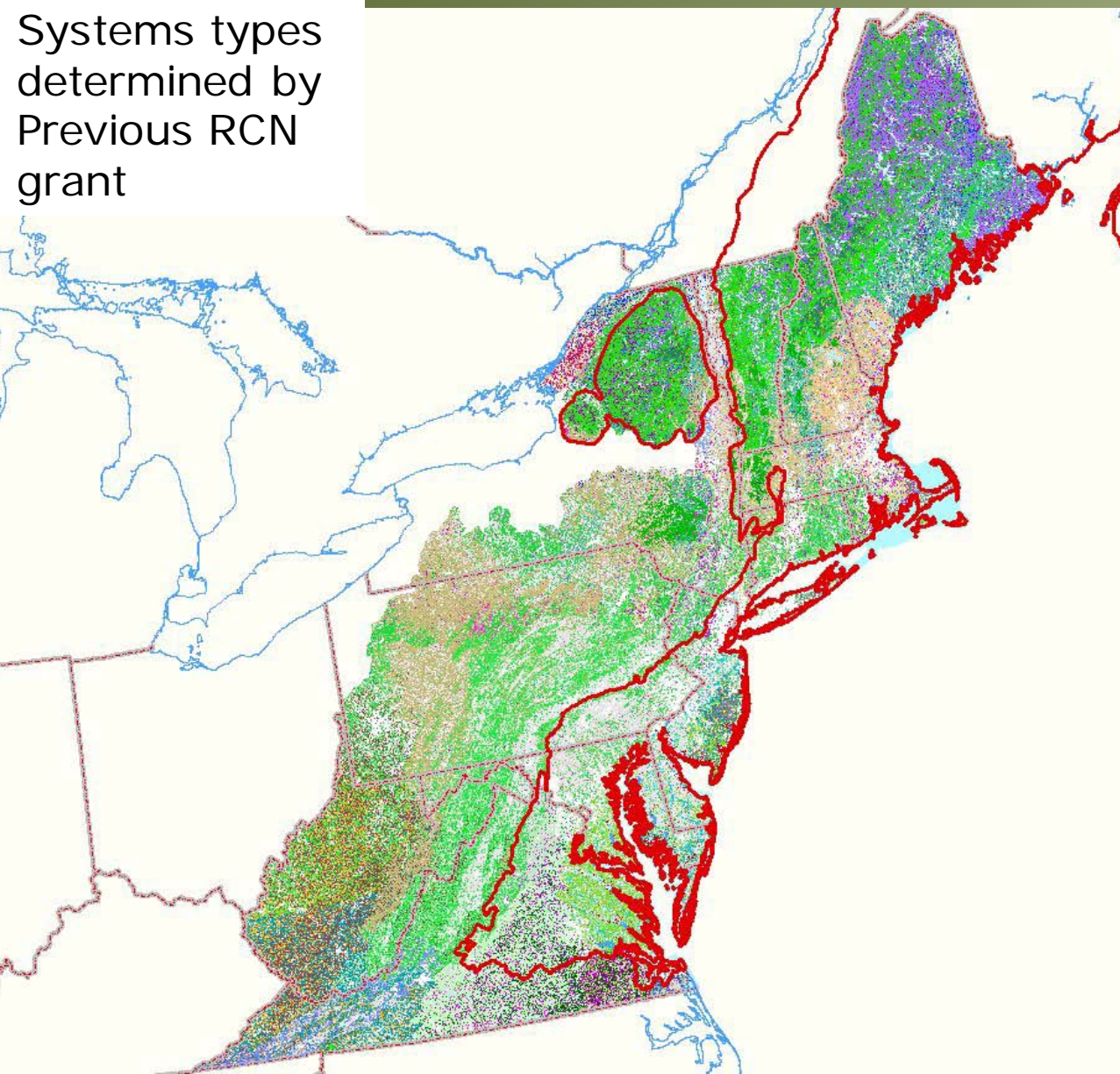
Base on NatureServe Ecological Systems



each

Terrestrial Habitats

Systems types determined by Previous RCN grant



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 W et 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
- Mbx system: Acad-Appal Montane Spr-Fir-Hwd Forest
- LP/SP system: Acadian Sub-boreal Spruce Flat
- Mbx system: Acadian Low-Elev Spr-Fir-Hwd Forest
- Mbx system: L-A N. Hwd Forest, typic
- Mbx system: L-A N. Hwd Forest, high conifer
- Mbx system: L-A Red Oak-N. Hwd Forest
- Mbx system: L-A N. Hwd Forest, moist/cool
- Mbx system: L-A Pine-Hem-Hwd Forest, typic
- Mbx 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 mbx: Mesic Clayplain Forest

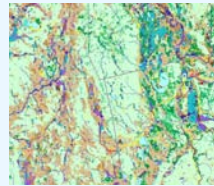
- NLCD-NHD open water
- NLCD agricultural classes 81-82
- NLCD developed classes 21-24 & 31

Data Driven:

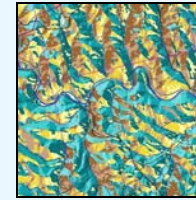
Wall to wall grids and confirming points



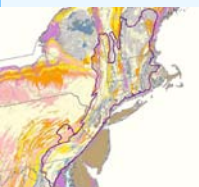
Elevation



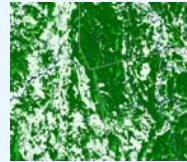
NWI
Wetland



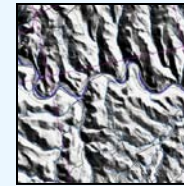
Categorical
Aspect



Geology



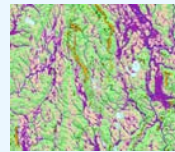
Canopy
closure



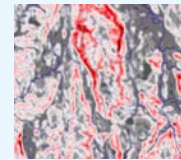
Shaded
Relief



Landcover



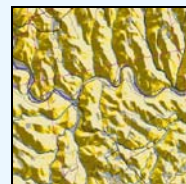
Landforms



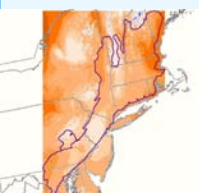
Rugosity



Solar
radiation



Aspect



Precipitation

Over 10,000
FIA and NHP
data points

UPLAND

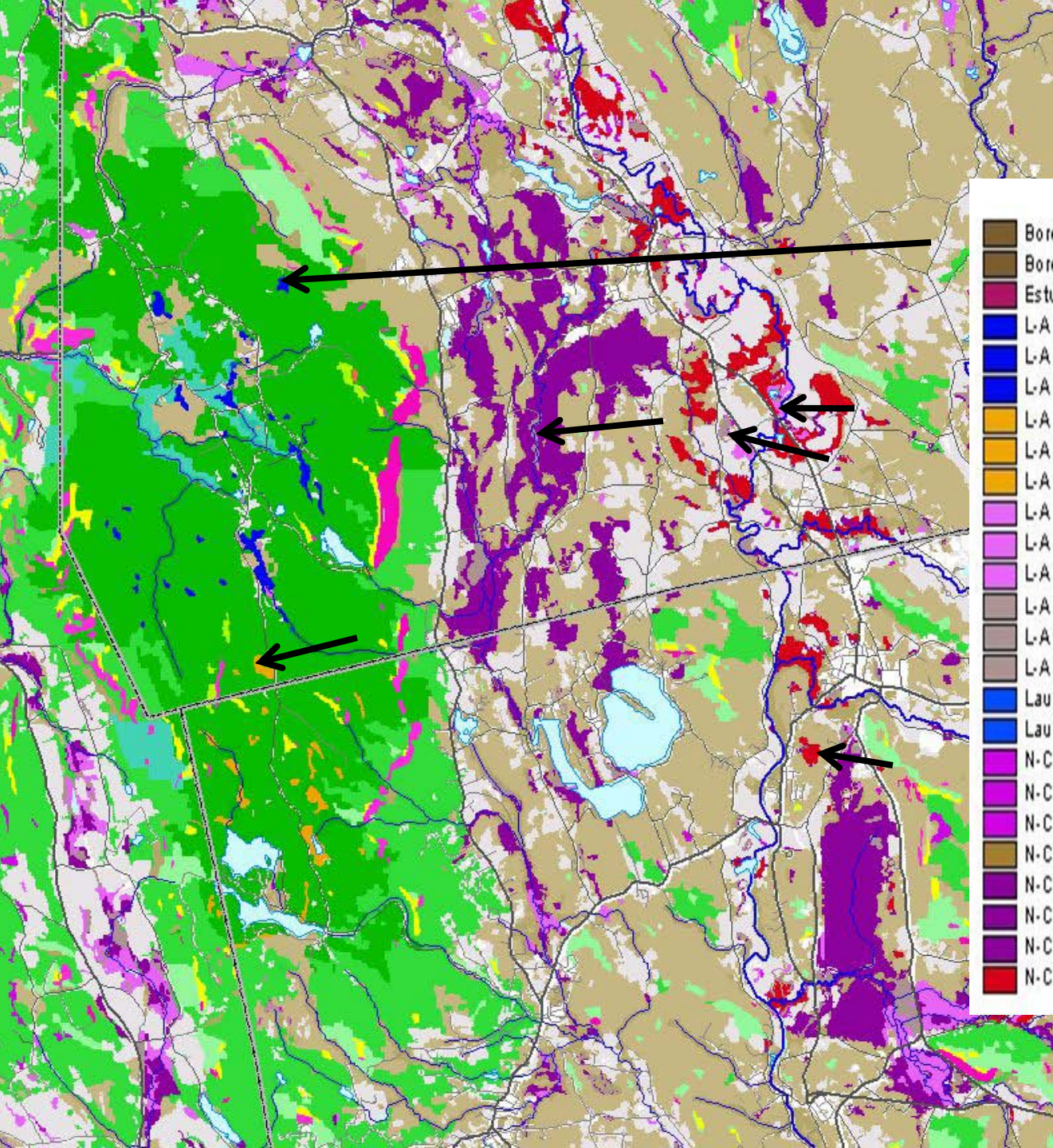
- SP system: Acad-Appal Montane Spruce-Fir-Hwd Forest: 201.566
- SP system: Central App Pine-Oak Rocky Woodland: 202.600
- SP system: N Appal-Acad Rocky Heath Outcrop: 201.571
- SP system: Eastern Serpentine Woodland: 202.347
- SP system: L-A Acidic Cliff and Talus: 201.569
- SP system: L-A Calcareous Cliff & Talus: 201.570
- SP system: N-Central Appal Acidic Cliff and Talus: 202.601
- SP system: N-Central Appal Circumneut Cliff & Talus: 202.603
- SP system: NE Interior Pine Barrens: 202.590

- mtx system: Appal Hem-N. Hwd Forest, drier
- mtx system: Appal Hem-N. Hwd Forest, moist/cool
- mtx system: Appal Hem-N. Hwd Forest, typic
- mtx system: Central Appal Dry Oak-Pine Forest
- mtx system: Laurentian-Acadian N. Hwd Forest, moist/cool
- mtx system: Laurentian-Acadian N. Hwd Forest, typic
- mtx system: Laur-Acad Pine-Hem-Hwd Forest, moist/cool
- mtx system: Laur-Acad Pine-Hem-Hwd Forest, typic
- mtx system: NE Coastal & Interior Pine-Oak Forest
- mtx system: NE Interior Dry-Mesic Oak Forest, moist/cool
- mtx system: NE Interior Dry-Mesic Oak Forest, typic

- Water
- Developed
- Agriculture

Underlying patterns
Related to physical
Features.

WETLAND



- Boreal-Laurentian-Acadian Acidic Basin Fen: isolated
- Boreal-Laur-Acad Acidic Basin Fen: smaller stream riparian
- Estuarine units (185) along brackish shores in NY/NJ/MD
- L-A Alkaline Conif-Hwd Swamp: bigger river fldpln
- L-A Alkaline Conif-Hwd Swamp: isolated
- L-A Alkaline Conif-Hwd Swamp: smaller stream riparian
- L-A Conif-Hwd Acid Swamp: bigger river fldpln
- L-A Conif-Hwd Acid Swamp: isolated
- L-A Conif-Hwd Acid Swamp: smaller stream riparian
- L-A Freshwater Marsh: bigger river fldpln
- L-A Freshwater Marsh: isolated
- L-A Freshwater Marsh: smaller stream riparian
- L-A Wet Meadow-Shrub Swamp: bigger river fldpln
- L-A Wet Meadow-Shrub Swamp: isolated
- L-A Wet Meadow-Shrub Swamp: smaller stream riparian
- Laur-Acad Alkaline Fen: isolated
- Laur-Acad Alkaline Fen: smaller stream riparian
- N-Central Appal Acidic Swamp: bigger river fldpln
- N-Central Appal Acidic Swamp: isolated
- N-Central Appal Acidic Swamp: smaller stream riparian
- N-Central Int and Appal Acidic Peatland
- N-Central Int and Appal Rich Swamp: bigger river fldpln
- N-Central Int and Appal Rich Swamp: isolated
- N-Central Int and Appal Rich Swamp: smaller stream riparian
- N-Central Interior Wet Flatwoods

Next Step: A Geospatial Condition Analysis of each Habitat

Terrestrial Systems

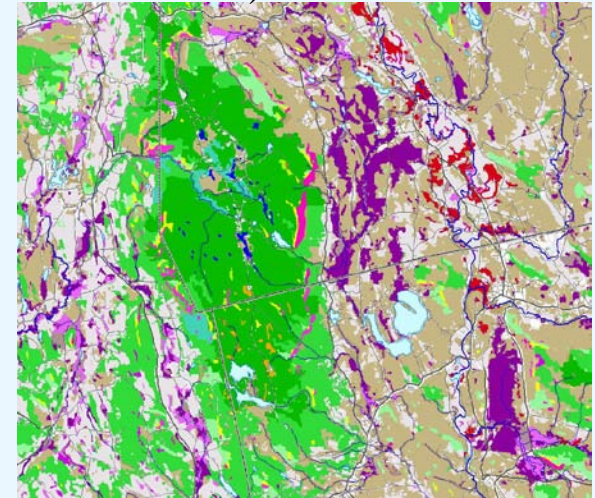
- Land cover and Canopy closure (MRLC 2001)
- Large unfragmented landscapes and forest blocks (TNC 2007)
- Conservation land parcels (TNC 2008)
- Housing density projections through 2050 by census block (Theobald 2006)
- Roads and fragmenting features (Various sources) ,
- Existing and proposed infra-structure features (TBD)
- Changed in canopy cover (CCAP)(
- Patch size and distribution (FRAGSTATS McGarigal 200)

Patch diversity metrics

- Number and type of rare species locations (NHP 2009)
- Bedrock and Surficial Geology types (TNC 2007)
- Landform diversity base on a topographic model (TNC 2007)
- Climate and elevation zones (WORLDCLIM)
- Regional Habitat maps, Streams networks, Lakes, Ponds (Various sources)
- Regionally compiled Wetlands (NWI)

Landscape context and natural land units

Connectivity between patches of habitat (Resistant kernel analysis –Compton 2007)



Mapping Rivers Systems

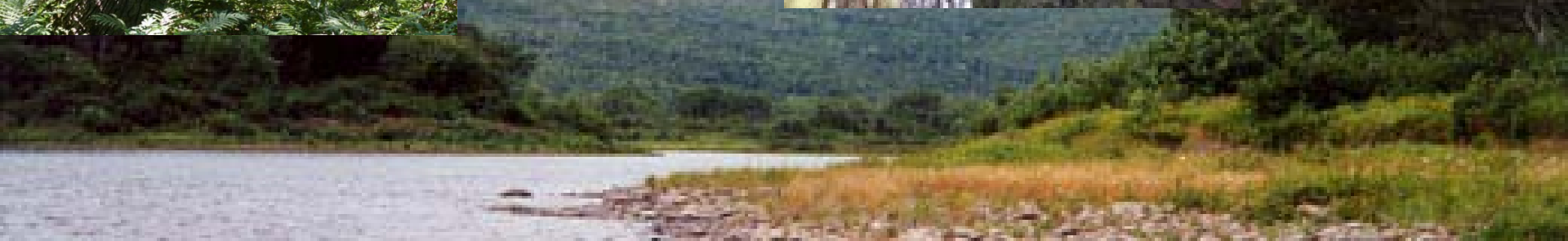
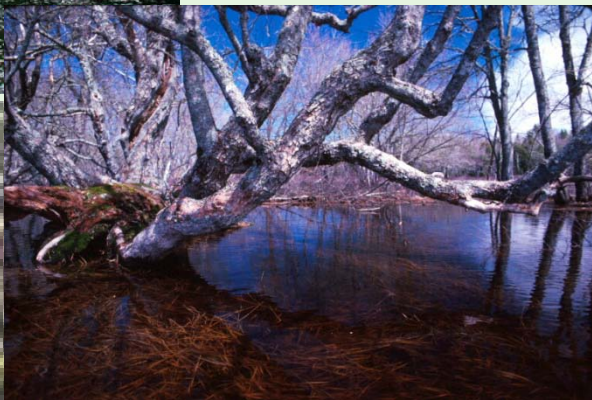
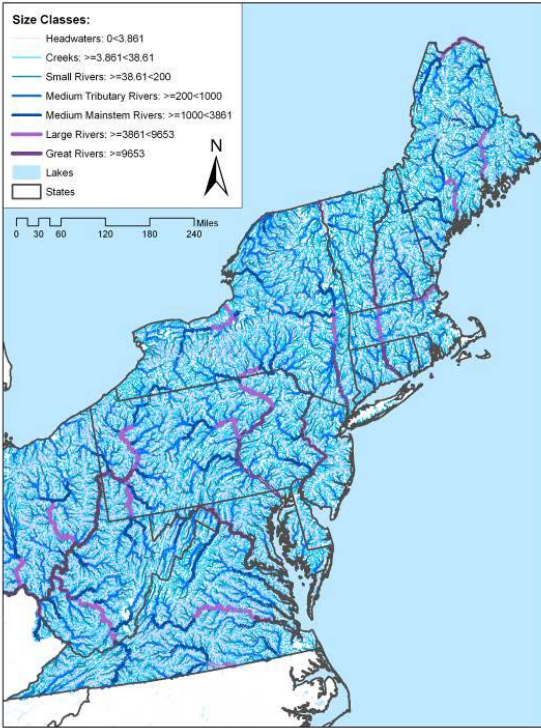




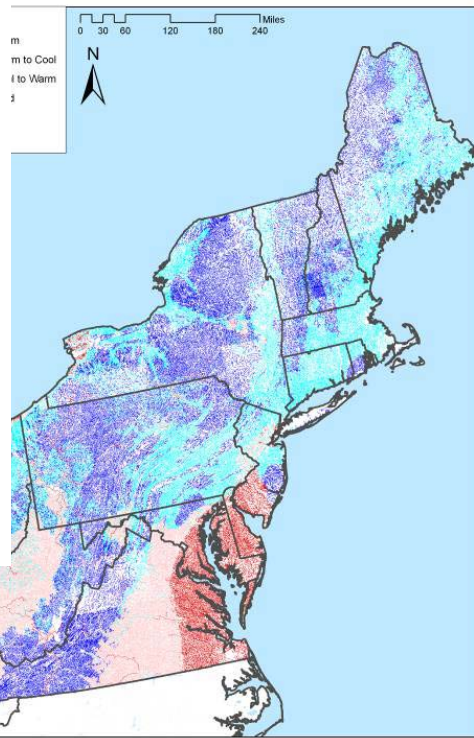
Photo by Brian Harris

Key Habitat Variables

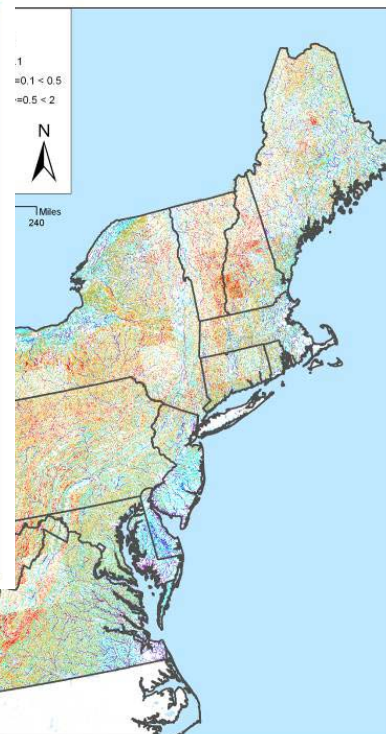
SIZE (Drainage Area)



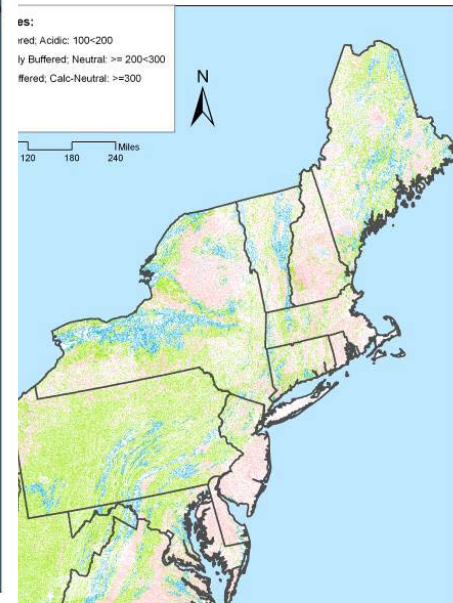
Temperature



Gradient



Geology (pH)



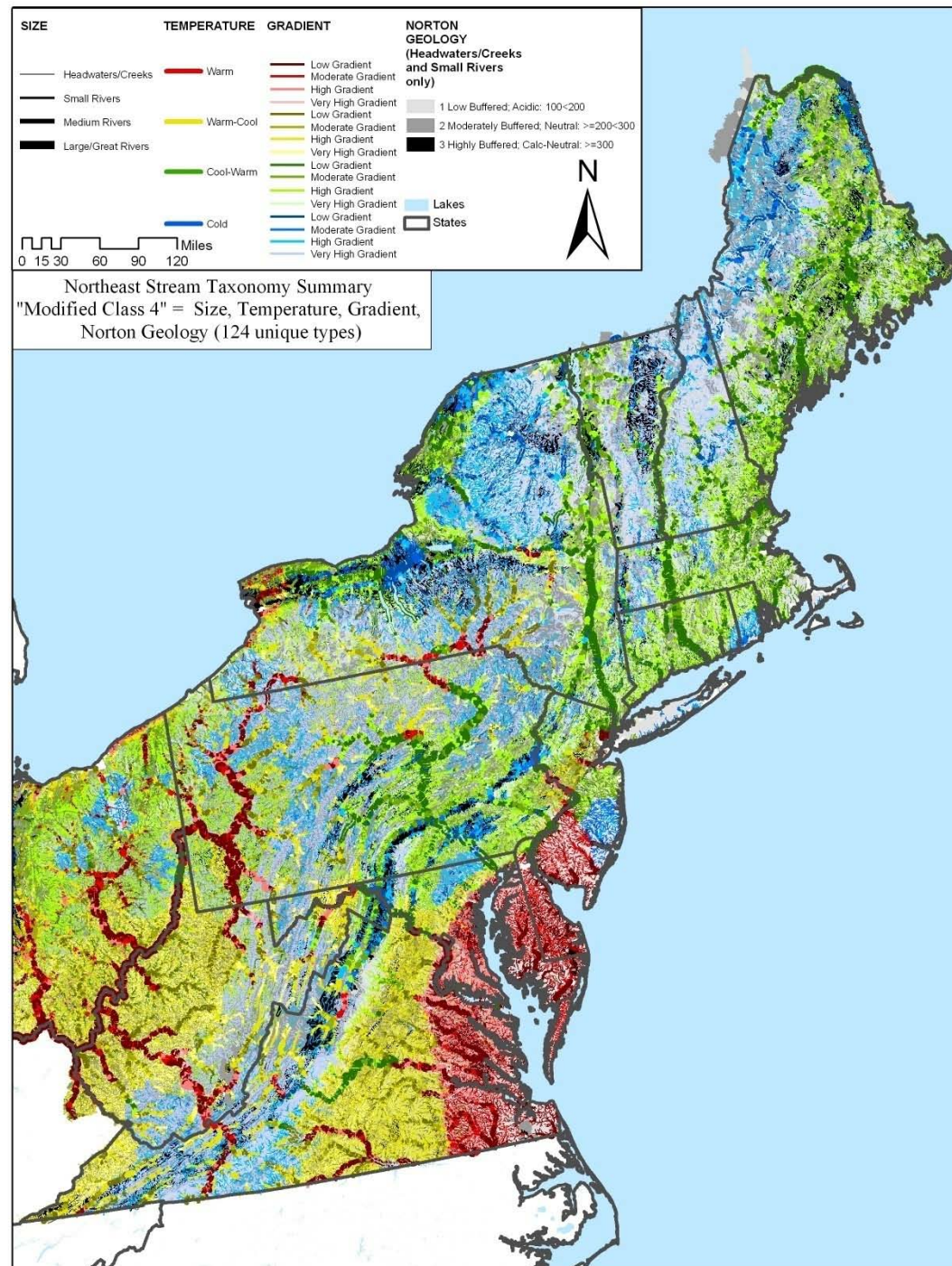
Results
NEAFWA Stream Classification
includes 257 types,

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



High gradient acidic cold headwater stream.

Regional Size Class (1b): Northeast Headwaters

Regional Gradient Class

(5): High

Regional Norton Geology Class

(1): Low Buffering Capacity, Acidic

Regional Temperature Class

(1): Cold

1b511:

High gradient acidic cold headwater stream

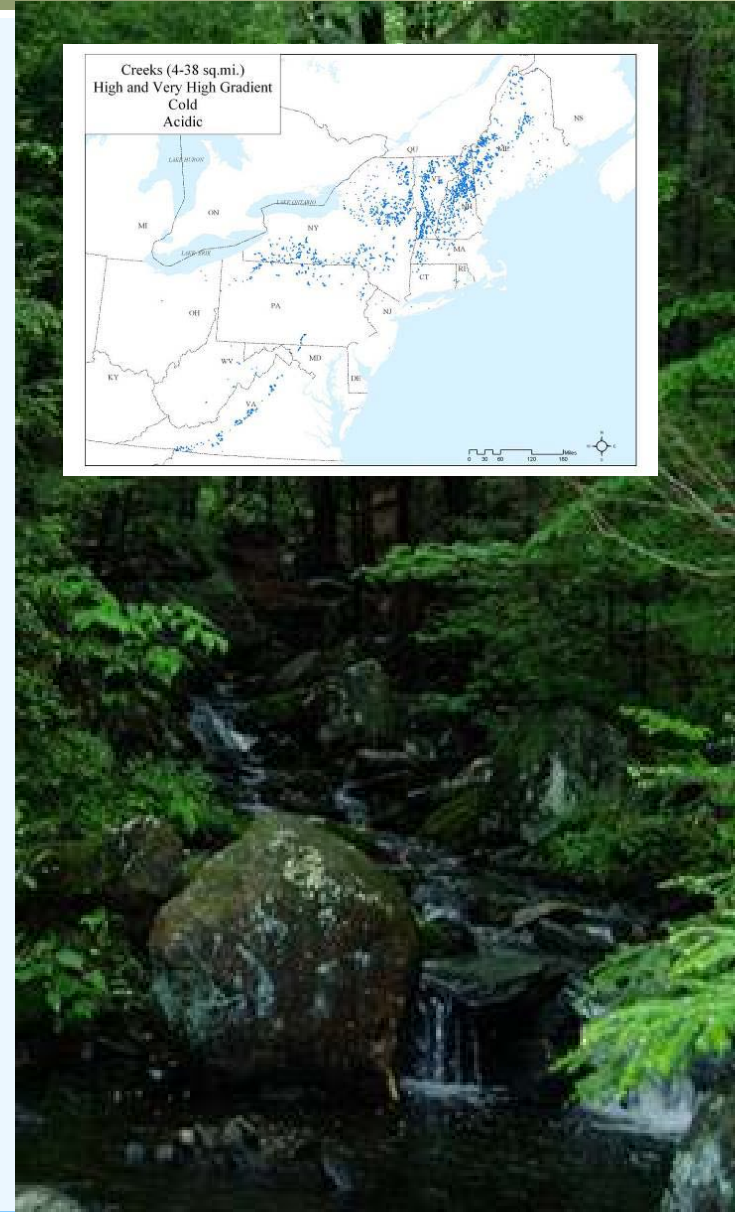
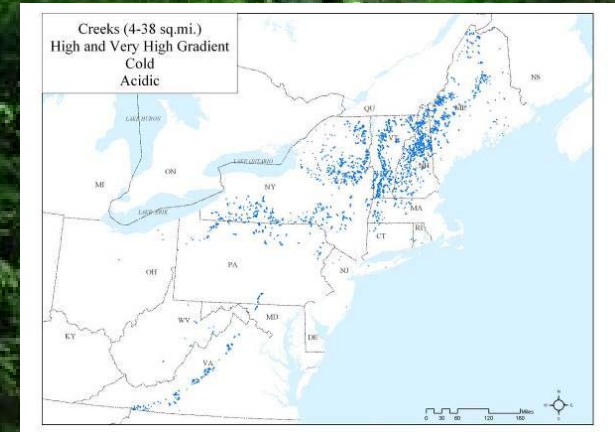
Linked State Names:

MA Small Streams,

VT Cold headwater acidic streams,

NY Coldwater Stream,

CT Coldwater Stream,



An aerial photograph of a river system. In the foreground, a large, dark, still reservoir is visible. A dam with multiple spillways crosses the river in the middle ground, creating a smaller reservoir upstream. The background shows a residential area with houses and a green bridge crossing the river. The surrounding landscape is lush with green trees and vegetation.

NEAFWA Aquatic Connectivity

Colin Apse & Erik martin,
The nature conservancy

Purpose

This project endeavors to produce a tiered list of dams in the Northeast US based on their potential ecological benefit if remediated for fish passage, and develop a tool that allows managers to re-rank dams at multiple spatial scales



Montsweag Brook, ME, before Montsweag Dam removal



Montsweag Brook after. Photos by Dan Creek

- ❖ Dams and other barriers to the free movement of fish and other aquatic organisms have had a negative impact on the health and viability of these populations for well over a century in the eastern United States.
- ❖ Removing or otherwise mitigating dams can improve the health of aquatic ecosystems and allow fish populations to recover.
- ❖ Given the financial and organizational obstacles to dam removal projects, it is critical that managers focus their efforts and resources where they can have the greatest ecological impact.



Methods

❖ Data Collection & Preparation

- Dams, waterfalls, anadromous fish habitat collected from states & other sources, processed, iteratively reviewed with state contacts

❖ Metrics calculated in GIS for every dam. Metrics grouped in 5 categories. The Barrier Analysis Tool (BAT), an ArcGIS plug-in developed for this project, was used to calculate many of the metrics.

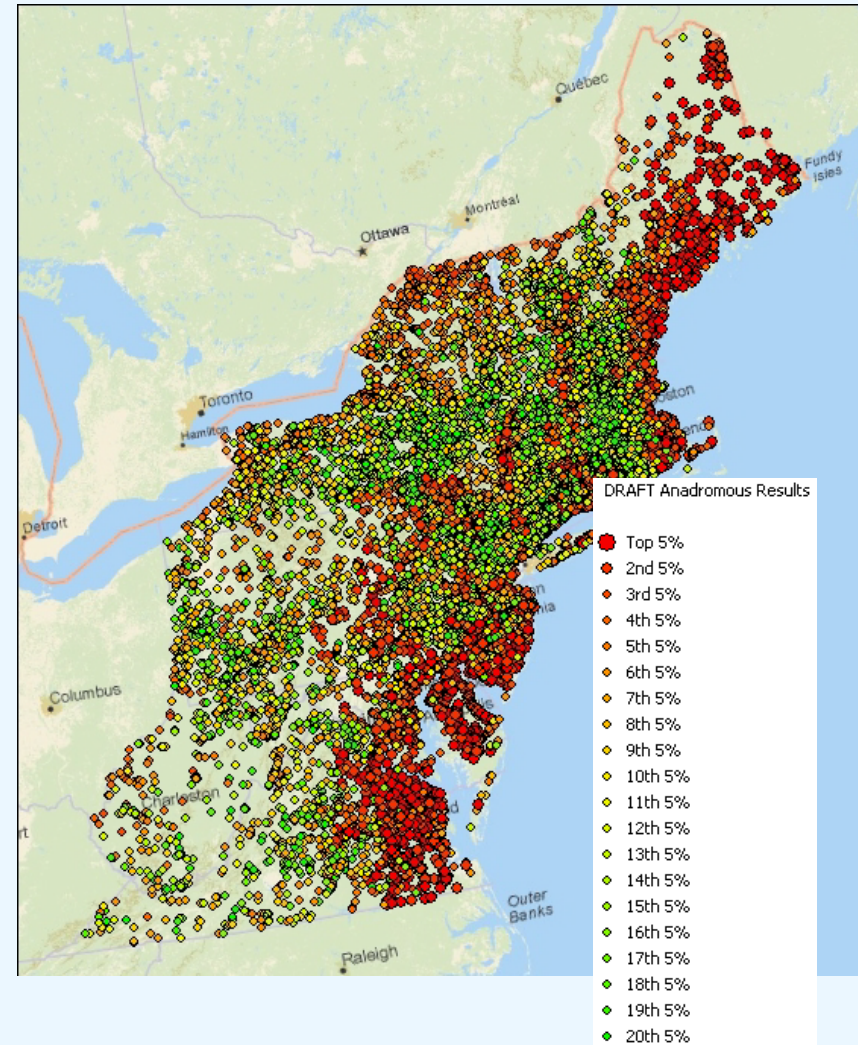
- Connectivity Status
- Connectivity Improvement
- Watershed & Local Condition
- Ecological
- Size Class

❖ Ranking

- Dams ranked based on the metrics calculated in GIS and weighted based on relative weights developed by workgroup for anadromous fish and resident fish scenarios

Status & Utility

- ❖ 2nd draft of results are currently being reviewed by state workgroup participants
- ❖ Final results: end of August
- ❖ Potential utility of results (as suggested by workgroup participants)
 - Project evaluation
 - Communicating with owners/funders
 - Grant writing
 - Justifying projects during funding allocation
 - Bring attention to new projects that may not have been looked at before
 - Developing basin-level plans
 - Local-level communication
 - Inform advocacy efforts
 - Stimulate proactive action rather than opportunistic removals



Species Resilience

Regionally Significant Species of Greatest Conservation Need



Responsibility and Concern

	Low Responsibility	High Responsibility		
	Found in 4+ states	Found in 2-3 states	Found in 4+ states	Total
Low Concern			Low concern, High responsibility (39:7:0)	
Moderate Concern		Limited distribution, High responsibility (53:26:26)	Moderate concern, High responsibility (22:10:2)	
High Concern	High concern, Low responsibility (78:54:36)		High concern, High responsibility (15:9:5)	
Widespread Concern	Widespread concern, Low responsibility (117:98:80)		Widespread concern, High responsibility (36:31:28)	
Total Species	195:152:116	53:26:26	112:57:35	360: 235: 177

360 Species > 1 state

Level of Regional Concern: SWAPS

Low concern = listed in < 25% of states that contained it.

Moderate = 25-50%,

High = 50-75%,

Widespread >75%

Level of Regional Responsibility:

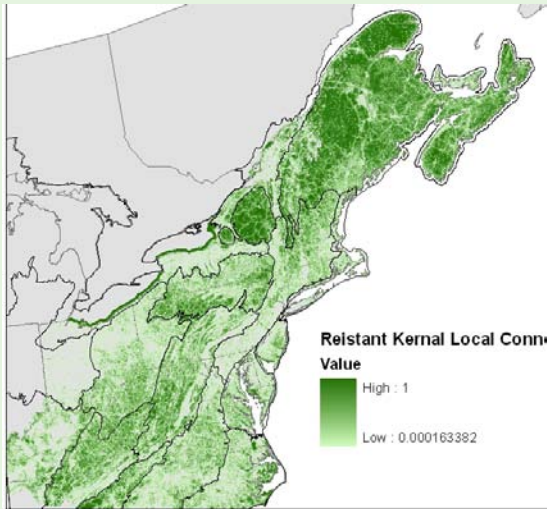
High responsibility = \geq 50 percent of the U.S. distribution in the 13 states

Low responsibility = \leq 50 percent of the U.S. distribution in the 13 states

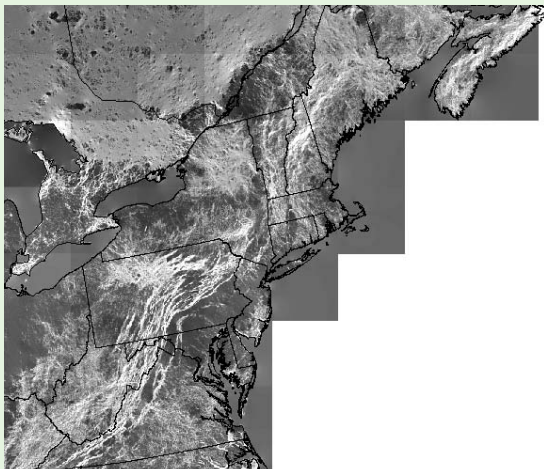


Situational Resilience: 1

Local Connectedness

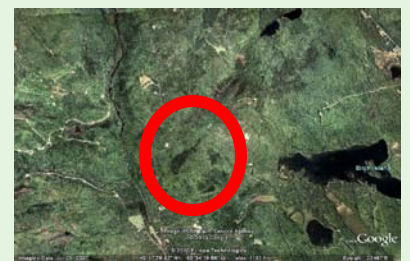
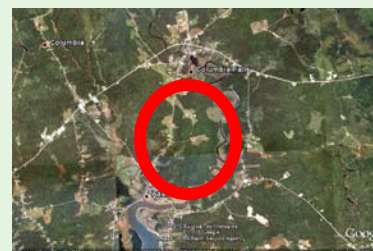
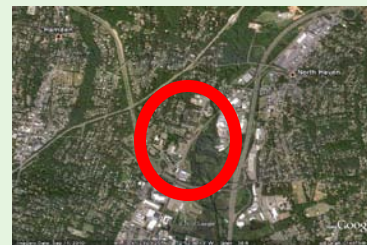


Flow Concentrations



Landscape Permeability

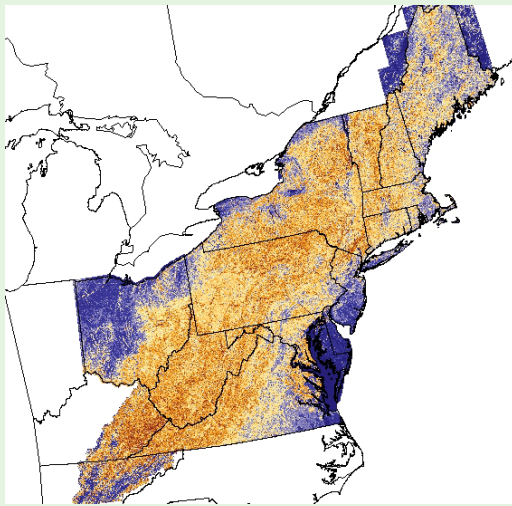
Measures of the resistance of the direct neighborhood surrounding the location (1) or of the potential concentration of flows through the location point (2).



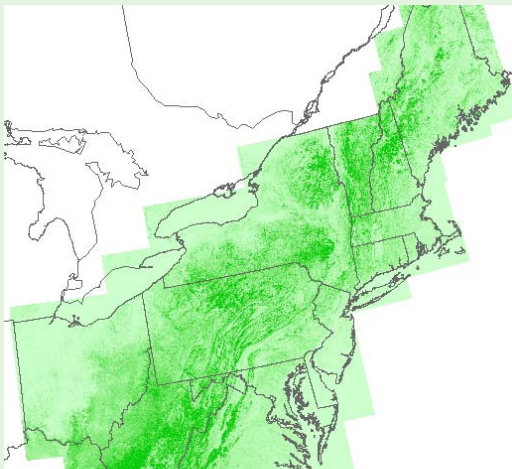


Situational Resilience: 2

Landform Diversity



Elevation range



Landscape Diversity

Measures of the topographic , elevation diversity, and wetland density in the direct neighborhood surrounding the location

What are the options for species to rearrange at the site level





Example Results: Resilience Scores compared to Regional Mean

