



Planning Lasting Conservation

Joshua Royte - October 23, 2013

The Nature Conservancy's mission
is to conserve the lands and
waters on which all life depends.

To solve critical challenges, The Nature Conservancy aims to
improve the health of important natural systems that also
enhance the lives of people around the world.

An aerial photograph of a winding river in a lush green landscape. The river flows from the top right towards the bottom left, forming a large loop. The surrounding land is covered in dense green vegetation, with some patches of lighter green and brown. In the bottom left corner, there is a small body of water, likely Iliamna Lake.

The Nature Conservancy has
helped protect
>119M acres of land &
>100 marine projects
worldwide.

the largest
network of private
preserves located in
50 States & >30
countries

TNC has >3,500
employees & >400 are scientists.

A painting of autumn leaves and a flower on water. The background is a dark, textured blue and green, suggesting a body of water. In the foreground, several large, yellow and orange leaves are floating on the water. A small, red flower is visible in the lower left corner. The text is overlaid on the right side of the image.

What are the most promising ways
to sustain & improve the Maine's ecological
wealth in light of climate change,
while enhancing
the lives of people?

Planning Top Down and Bottom Up



Major Habitat Assessment (global)



Ecoregional Assessment (NE Region and Gulf)



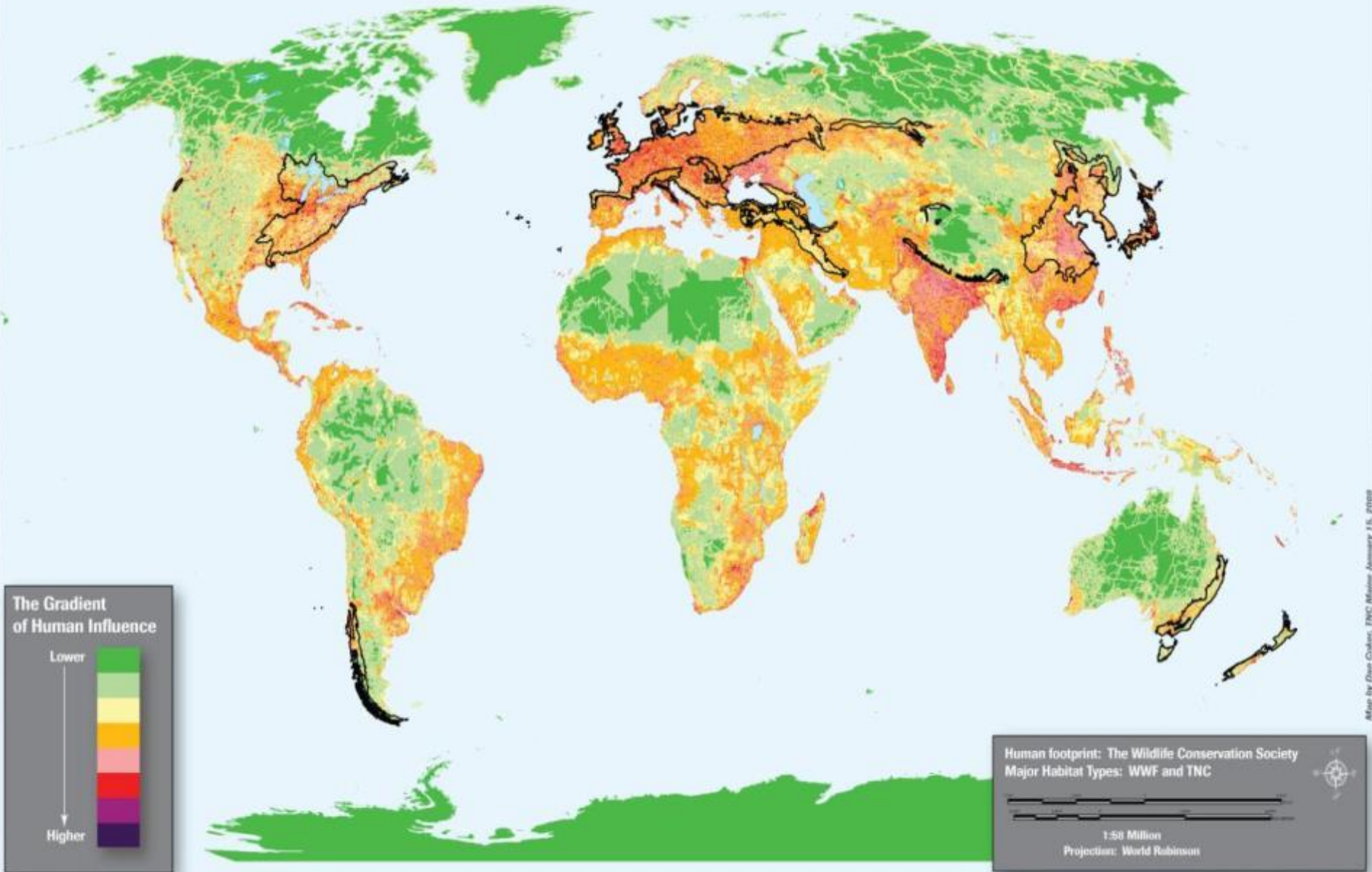
Conservation Action Planning (Site specific)

To develop priorities and evaluate opportunity:

Major Habitat Types → Ecoregions → Maine's ecological regions

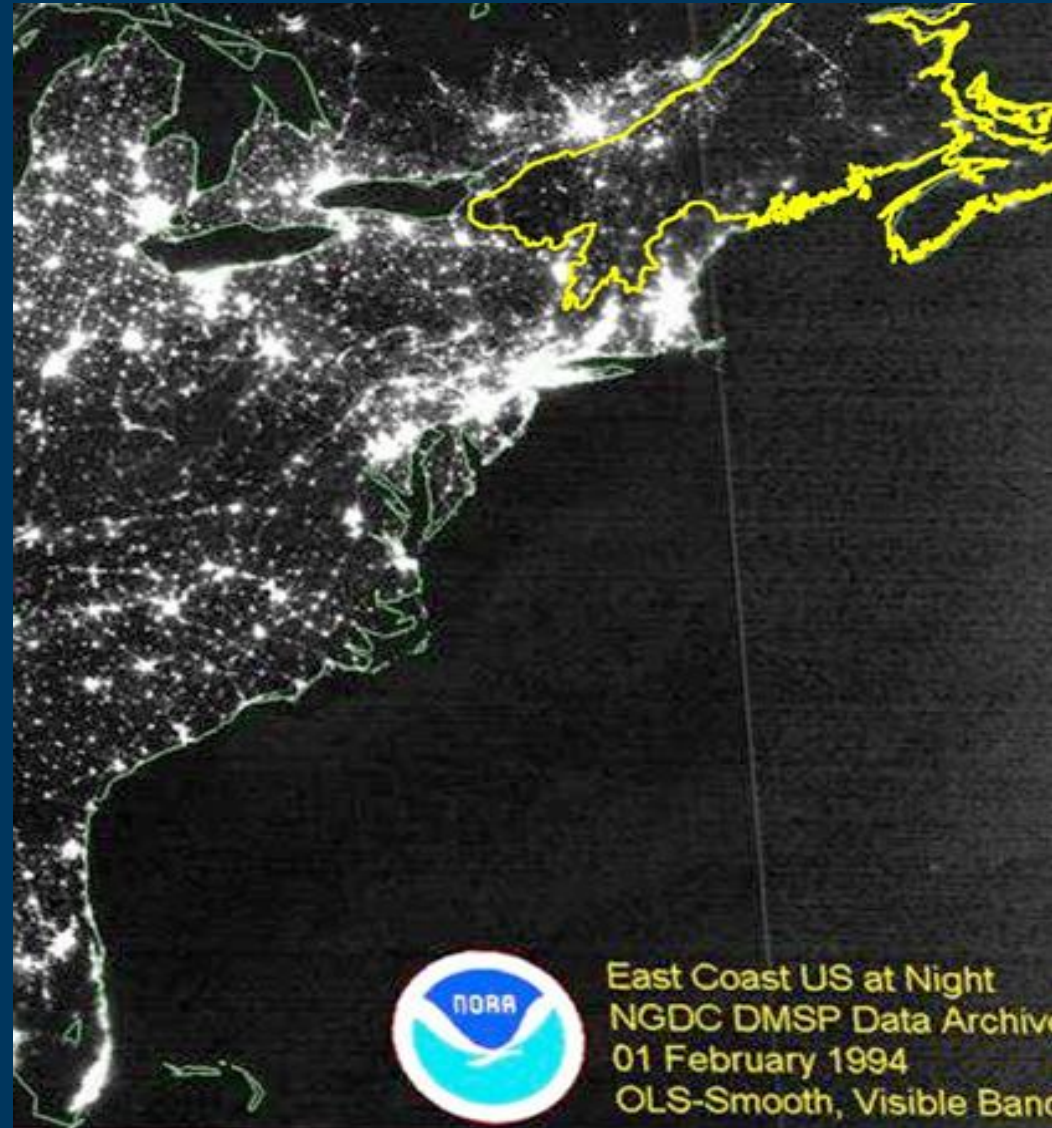
Then on-the-ground conservation:

- 1) ensure protection,
- 2) restore & reduce threats,
- 3) manage consistently and
- 4) measure success (strategies, threats, systems)

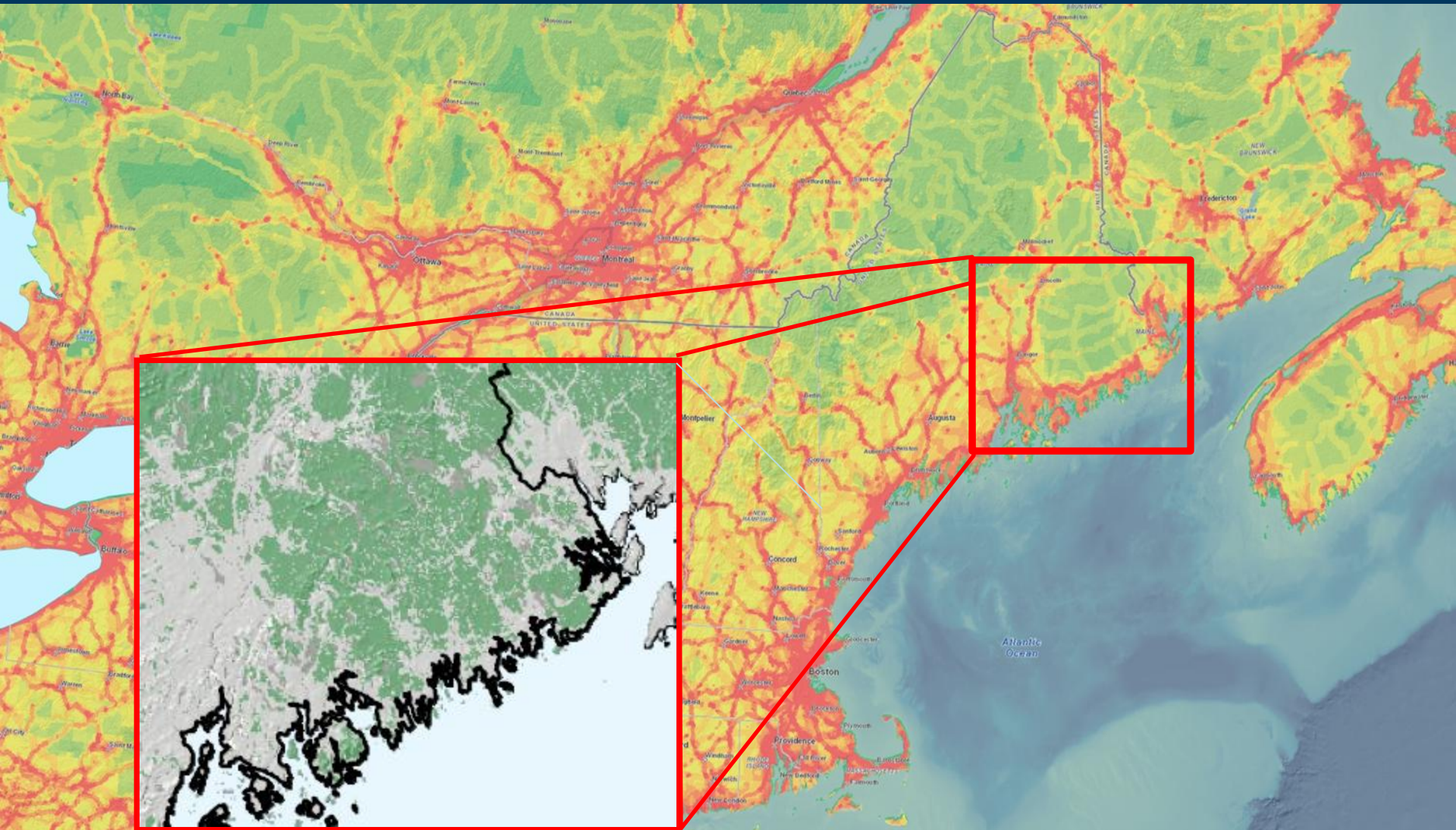


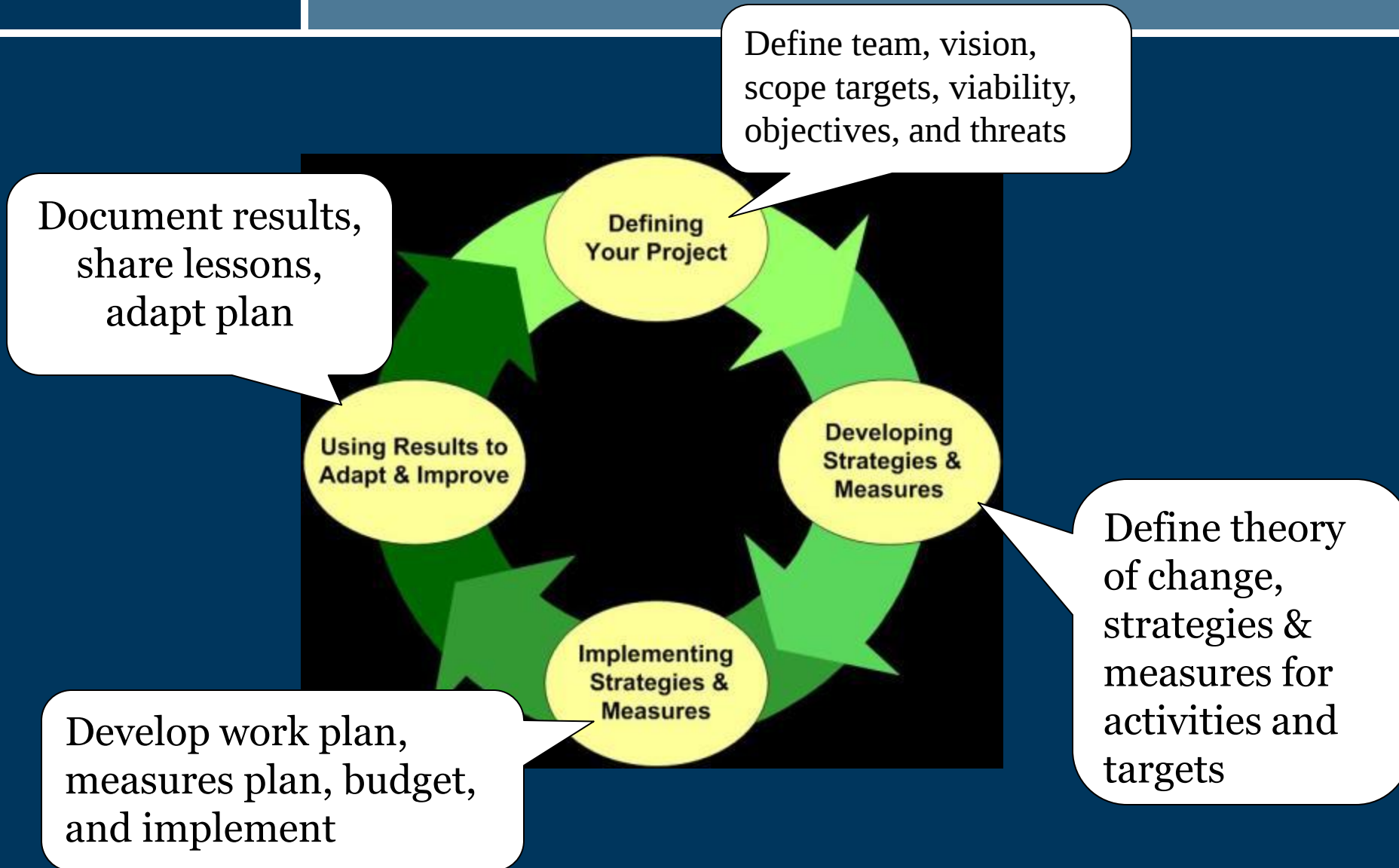
As conservationists
do we have some
larger
responsibilities?

Also - use latest imagery



Prioritize at regional scale





Windows Internet Explorer

https://miradi.org/

View Favorites Tools Help

onPro ConserveOnline ftp.tnc.org Google MEFOweb Remote Email TNC Intra Yarmouth WebEx Site

Miradi

 **MIRADI™**
Adaptive Management Software for Conservation Projects

Contact Us

Home About Miradi Software Features Open Standards Download Miradi FAQs Contact

Miradi has the potential to transform the practice of conservation.

- Easy Step-by-Step Interview Wizard
- Threat Prioritization
- Development of Objectives and Actions
- Selection of Monitoring Indicators
- Planning and Financial Views

Working Together

The Miradi software program is a joint venture between the Conservation Measures Partnership (CMP) and Benetech.

CMP
The Conservation Measures Partnership

[The Conservation Measures Partnership](#) is a consortium of conservation NGOs committed to improving the practice of conservation.

Benetech

Welcome to Miradi

Miradi - a Swahili word meaning "project" or "goal" - is a user-friendly program that allows nature conservation practitioners to design, manage, monitor, and learn from their projects to more effectively meet their conservation goals. The program guides users through a series of step-by-step interview wizards, based on the [Open Standards for the Practice of Conservation](#). As practitioners go through these steps, Miradi helps them to define their project scope, and design conceptual models and spatial maps of their project site. The software helps teams to prioritize threats, develop objectives and actions, and select monitoring indicators to assess the effectiveness of their strategies. Miradi also supports the development of workplans, budgets, and other tools to help practitioners implement and manage their project. Users can export Miradi project data to donor reports or, in the future, to a central database to share their information with other practitioners.



- >100 org's & agencies
- >130 countries

What does it help with?

- Defining goals
- Describing & ranking threats
- Measures for strategies, targets, & threats
- Timelines & budgets
- Keeping track of the parts

- Protected Areas: >25,000 acres of unfragmented
(or *in several nearby chunks*)

- Diversity of habitats, species, landscapes

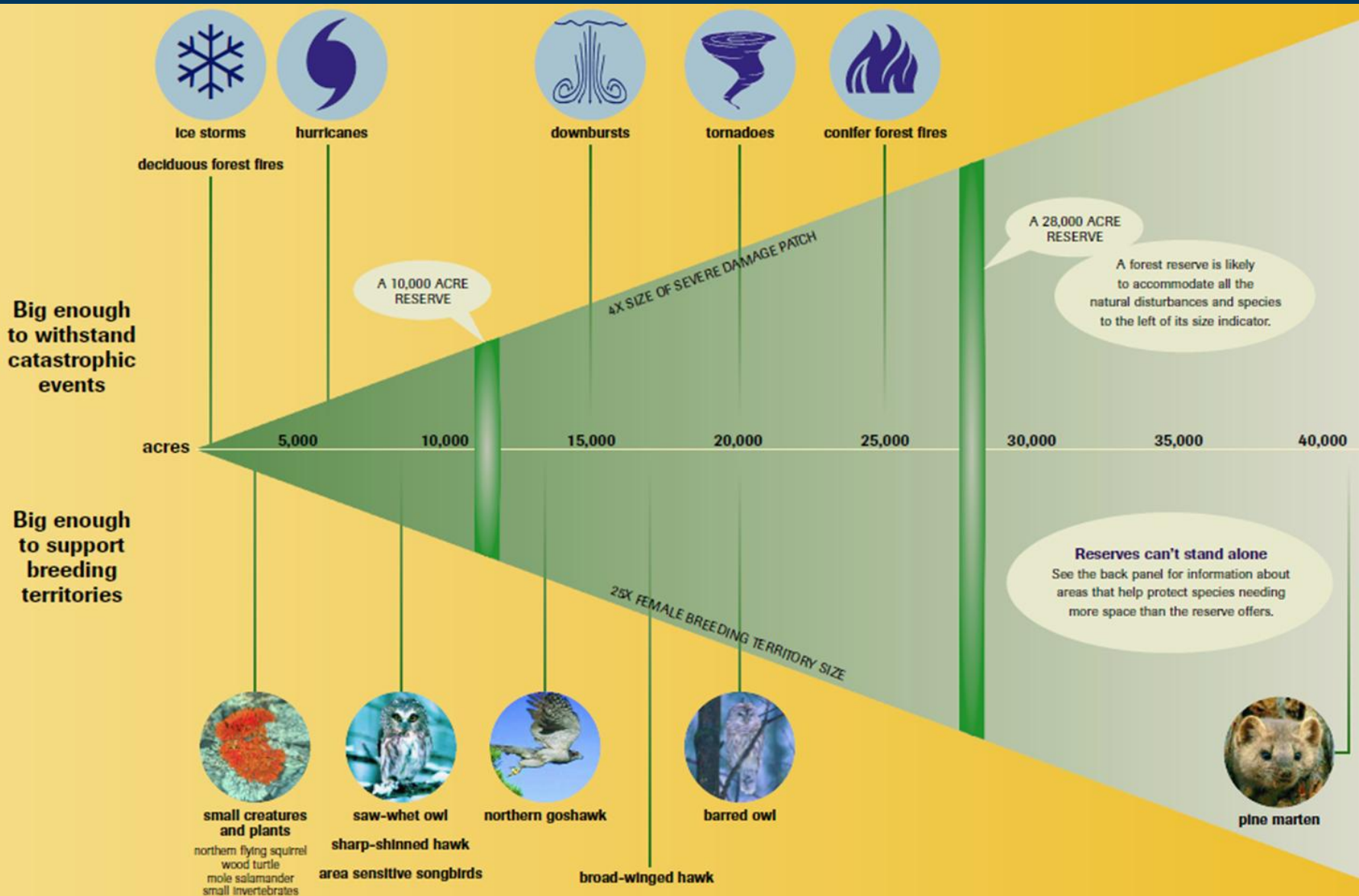
Streams & Lakes: streams and lakes fully connected

>60 connected miles of large & small streams & ponds

Surrounding Forest:

- Broad (1/4 mile?) connections to conservation Lands
- Buffered streams and forested watersheds

How Big should forest reserves be? (to maintain function over long time periods)



Boundaries are large enough to be
Resilient + Resistant = Adaptive

Diversity of Underlying Building Materials:

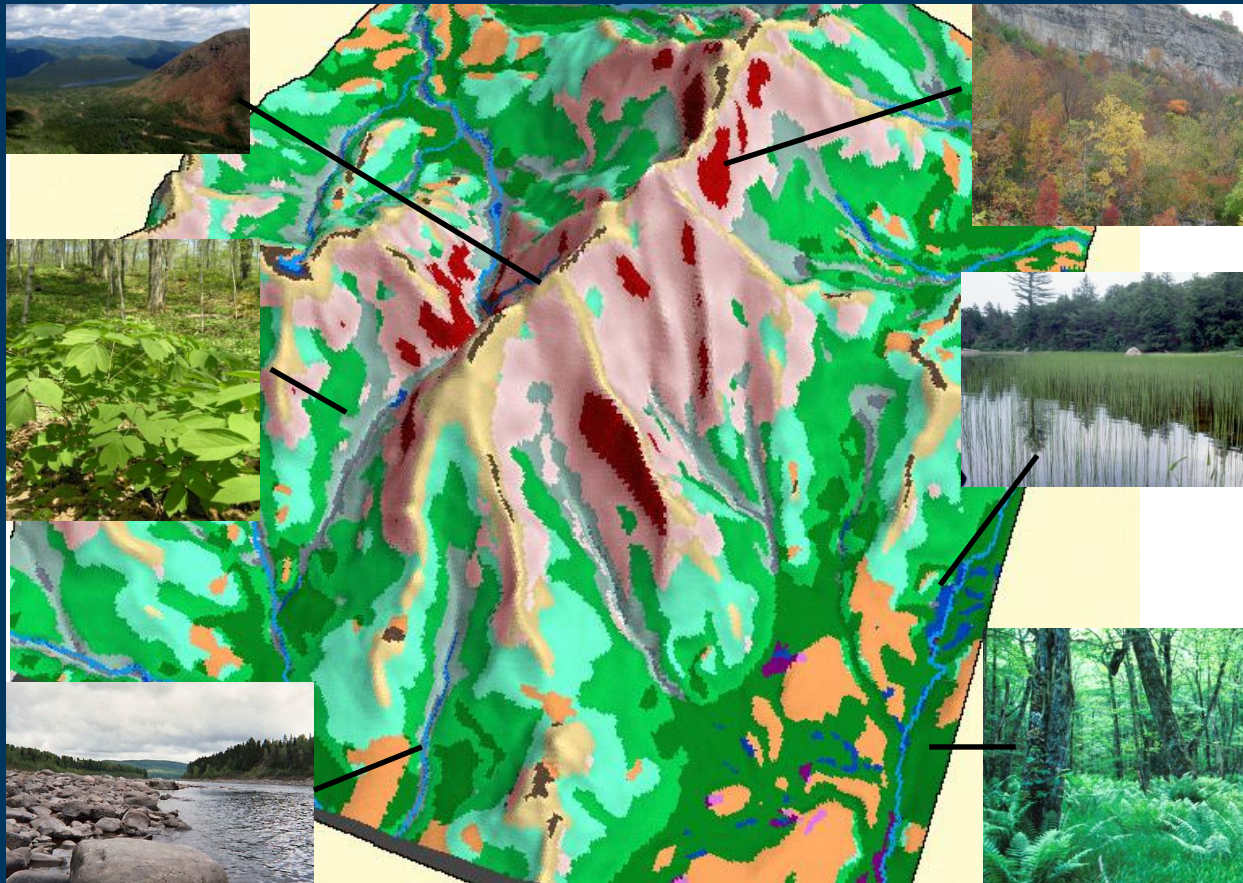
- Elevational gradients
- Topographic diversity
- Geologic diversity



Connectivity of Terrestrial and Aquatic Ecosystems

- Local Connectedness
- Regional pinch points

Moisture, nutrients, impacts of weather & climate



More options for
species & communities

Ridges
Summits
Side-slopes
Toe-slopes
Flats
Cliffs
Coves
Valleys
Wetlands
N,S,E,W slopes



Ecological Landscape Model

- Elevation
- Landform
- Surficial & Bedrock Geology

More Connected = Healthier

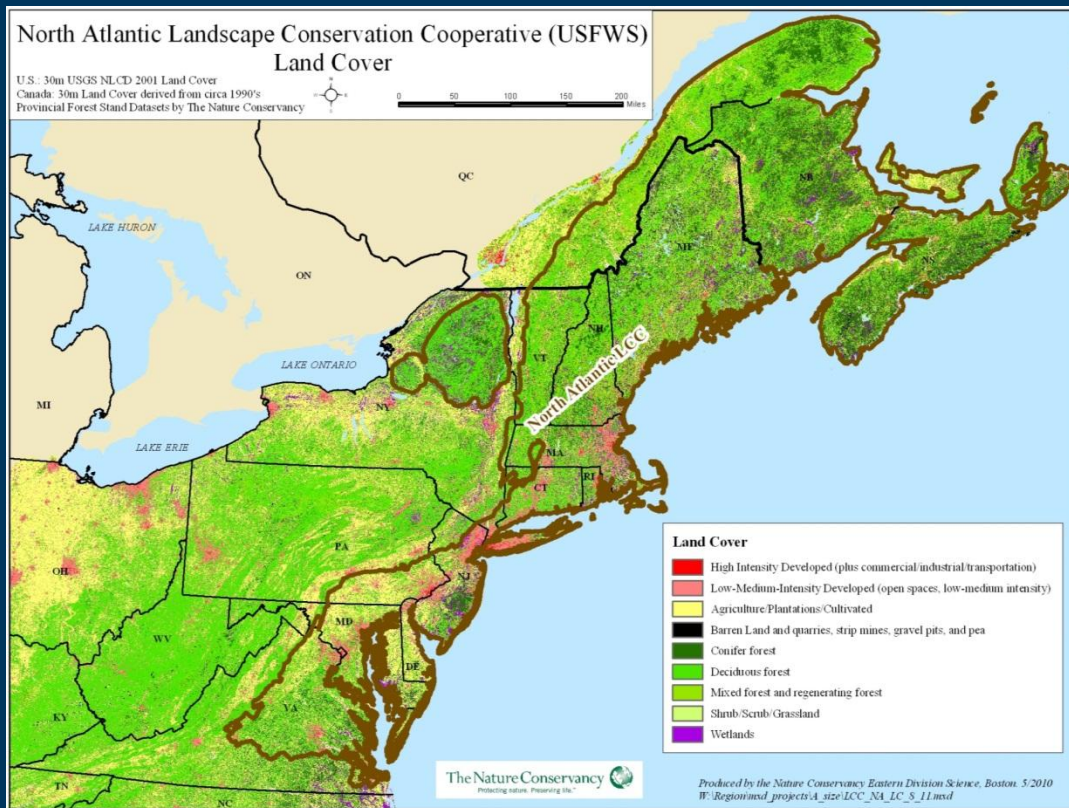
DEGREE OF CONTRAST

Developed/Roads

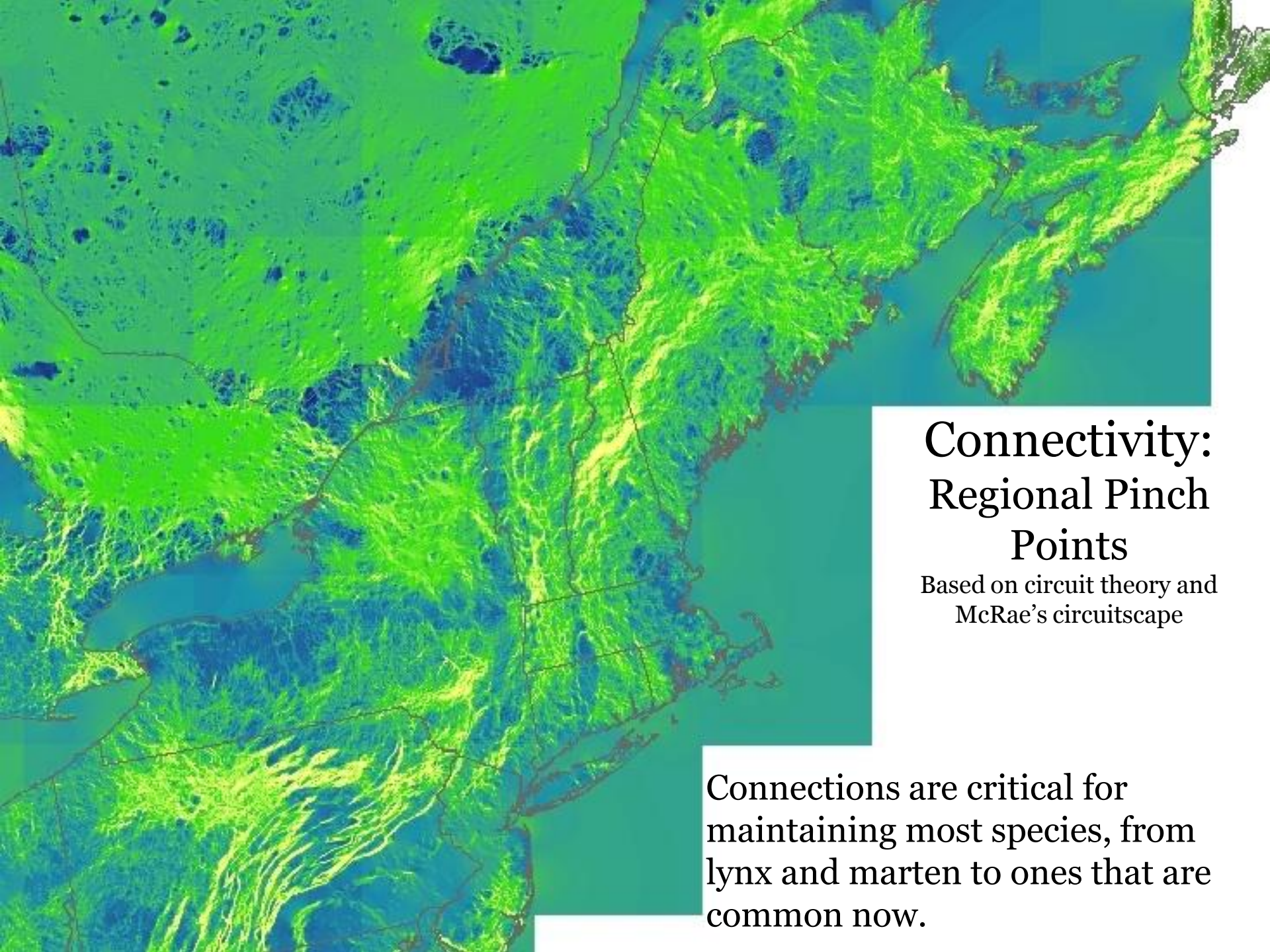
Agriculture

Water

Forest



	Structure	Degree of Development
Deciduous Forest	10	1
Conifer Forest	10	1
Mixed Forest	10	1
Deciduous Forest w/minor road	10	1
Conifer Forest w/ minor road	10	1
Mixed Forest w/minor road	10	1
Open Water	8	1
Shrub/Scrub	8	1
Wetlands	8	1
Open Water w/minor road	8	1
Shrub/Scrub w/minor road	8	1
Wetlands w/road	8	1
Barren Land	5	8
Agriculture	5	8
Barren Land w/minor road	5	8
Agriculture w/minor road	5	8
Minor Roads	1	8
Low Density Developed	1	10
High Density developed	1	10
Roads	1	10
Low Density Developed w/minor road	1	10
High Density developed w/minor road	1	10



Connectivity: Regional Pinch Points

Based on circuit theory and
McRae's circuitscape

Connections are critical for
maintaining most species, from
lynx and marten to ones that are
common now.

Conservation priority areas in Downeast Maine

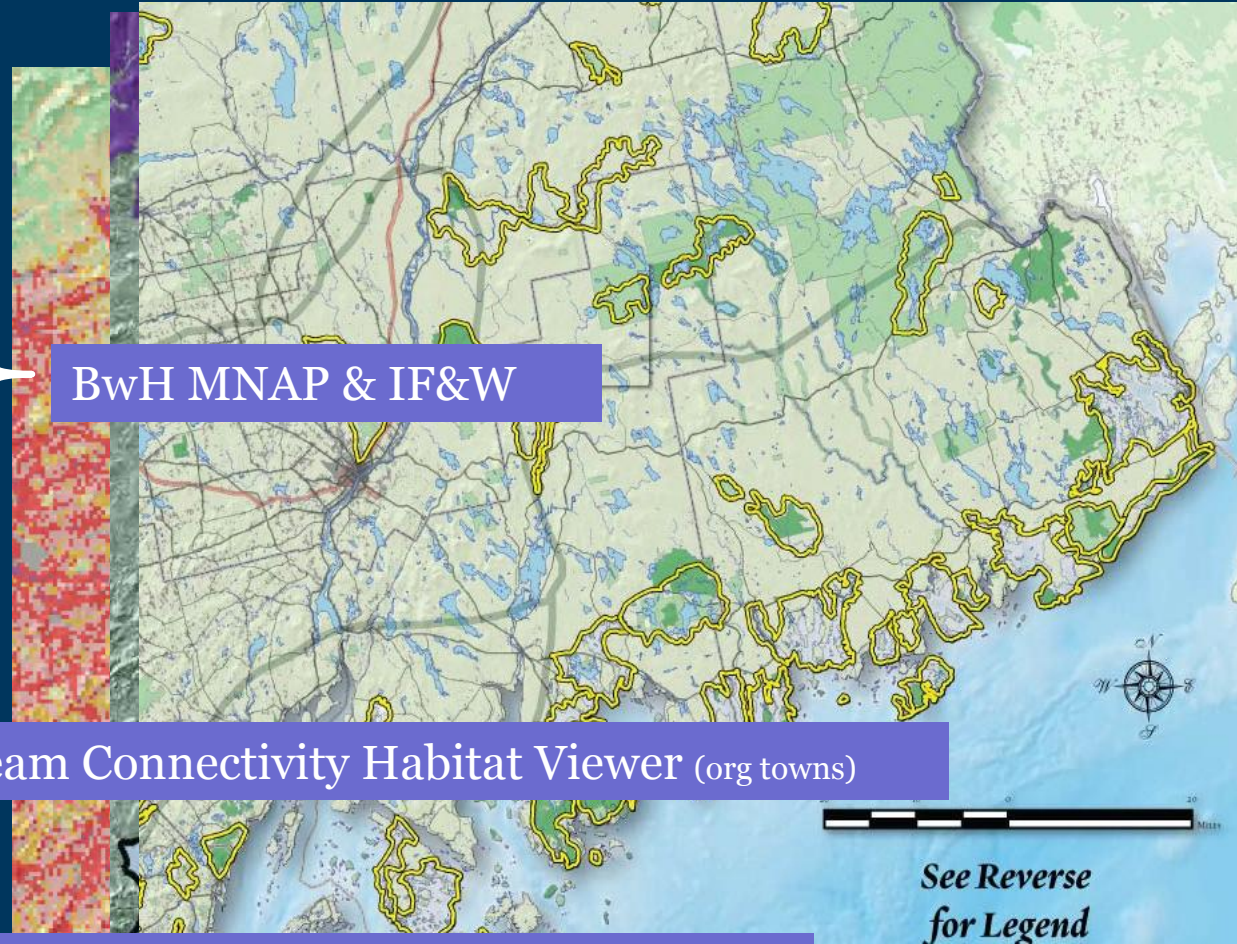
Great existing data

- Rare plant & animals
- Best example ecosystems
- Deer wintering areas
- Waterfowl/Wadingbird
- Brook Trout
- Salmon
- Alewives
- American eel
- Invasive fish
- Best condition

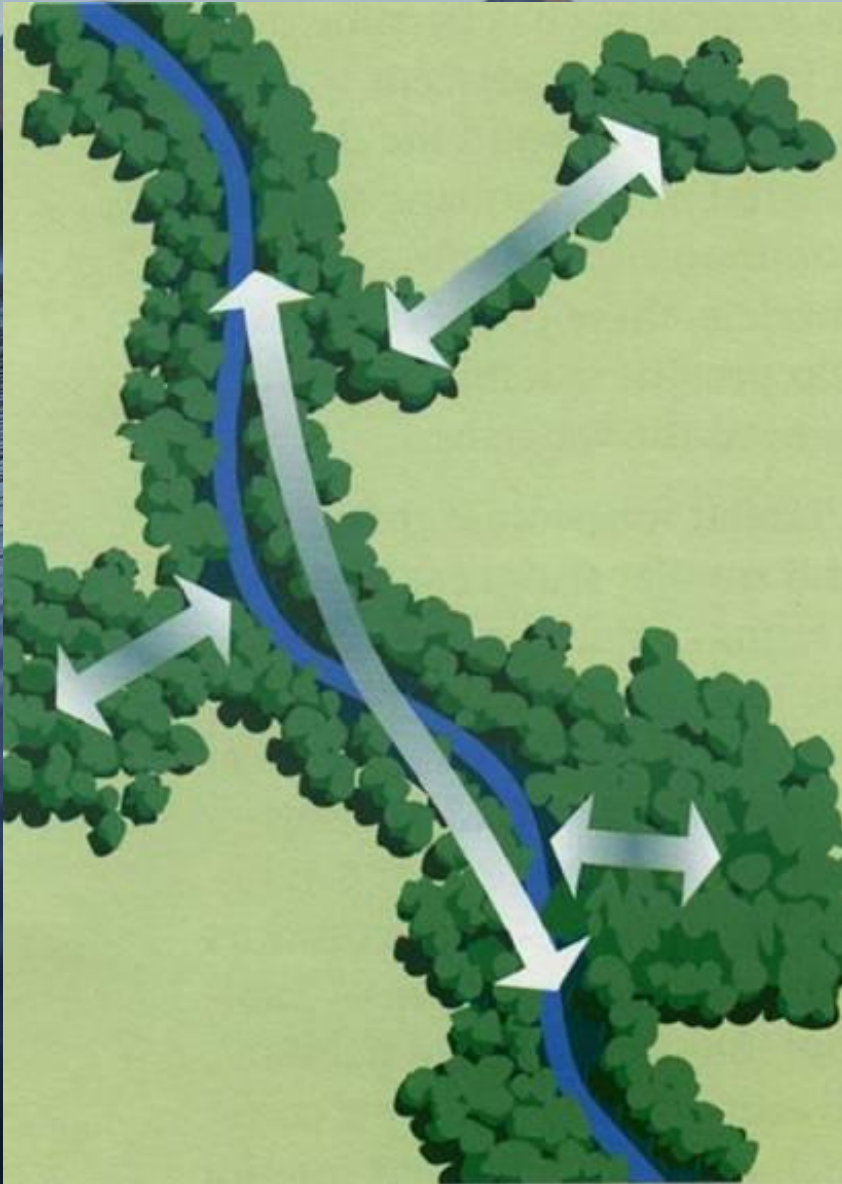
BwH MNAP & IF&W

Stream Connectivity Habitat Viewer (org towns)

Recent aerials, GoogleEarth, TM Imagery,
Lighthawk , stand maps, ground & water
reconnaissance



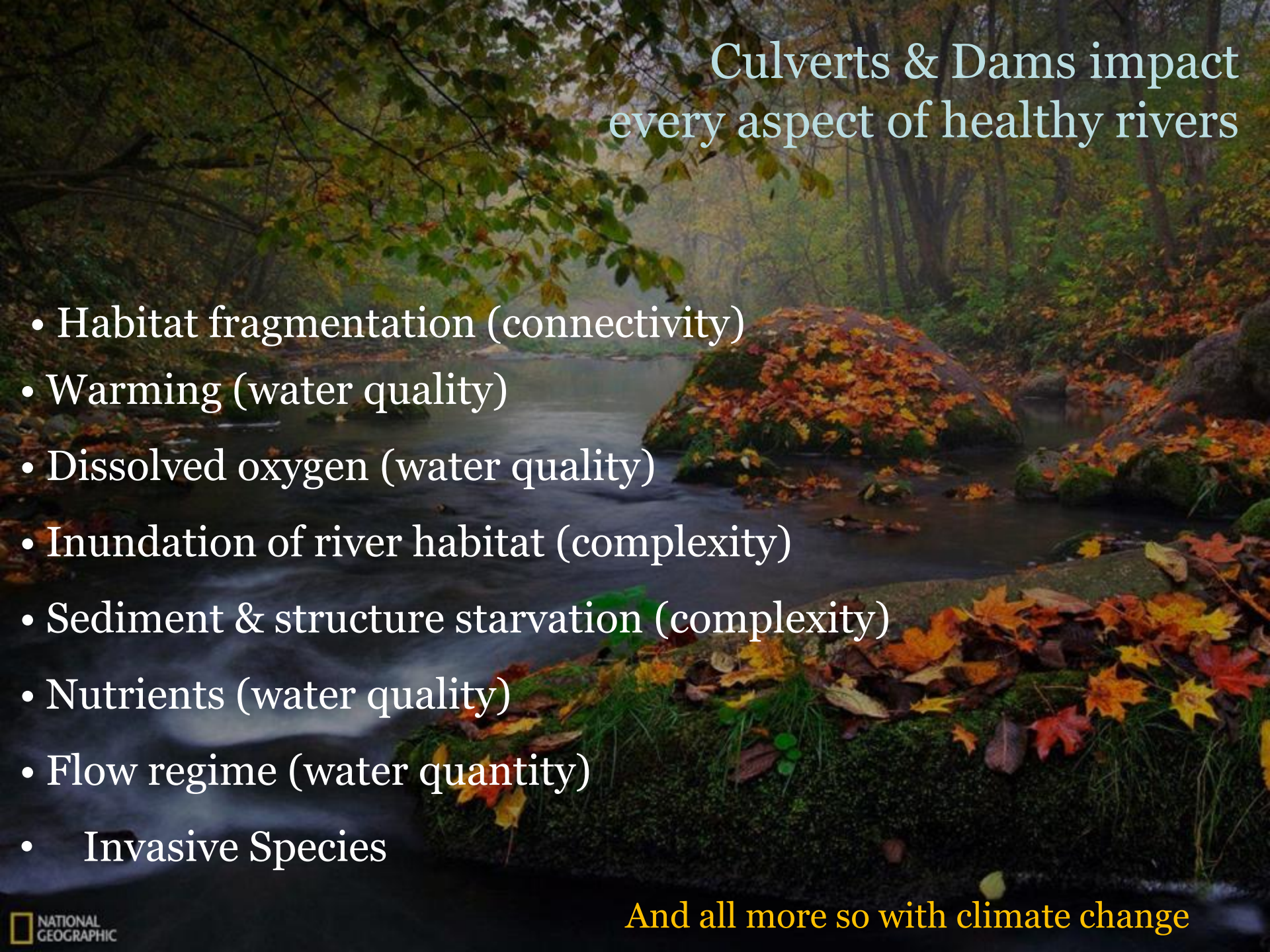
Connection for watery things:



Functional conservation needs to ensure links between terrestrial, riparian, freshwater, and marine habitats.

Healthy streams are connected and like healthy people are more **resistant** and **resilient** to harm





Culverts & Dams impact every aspect of healthy rivers

- Habitat fragmentation (connectivity)
- Warming (water quality)
- Dissolved oxygen (water quality)
- Inundation of river habitat (complexity)
- Sediment & structure starvation (complexity)
- Nutrients (water quality)
- Flow regime (water quantity)
- Invasive Species

And all more so with climate change



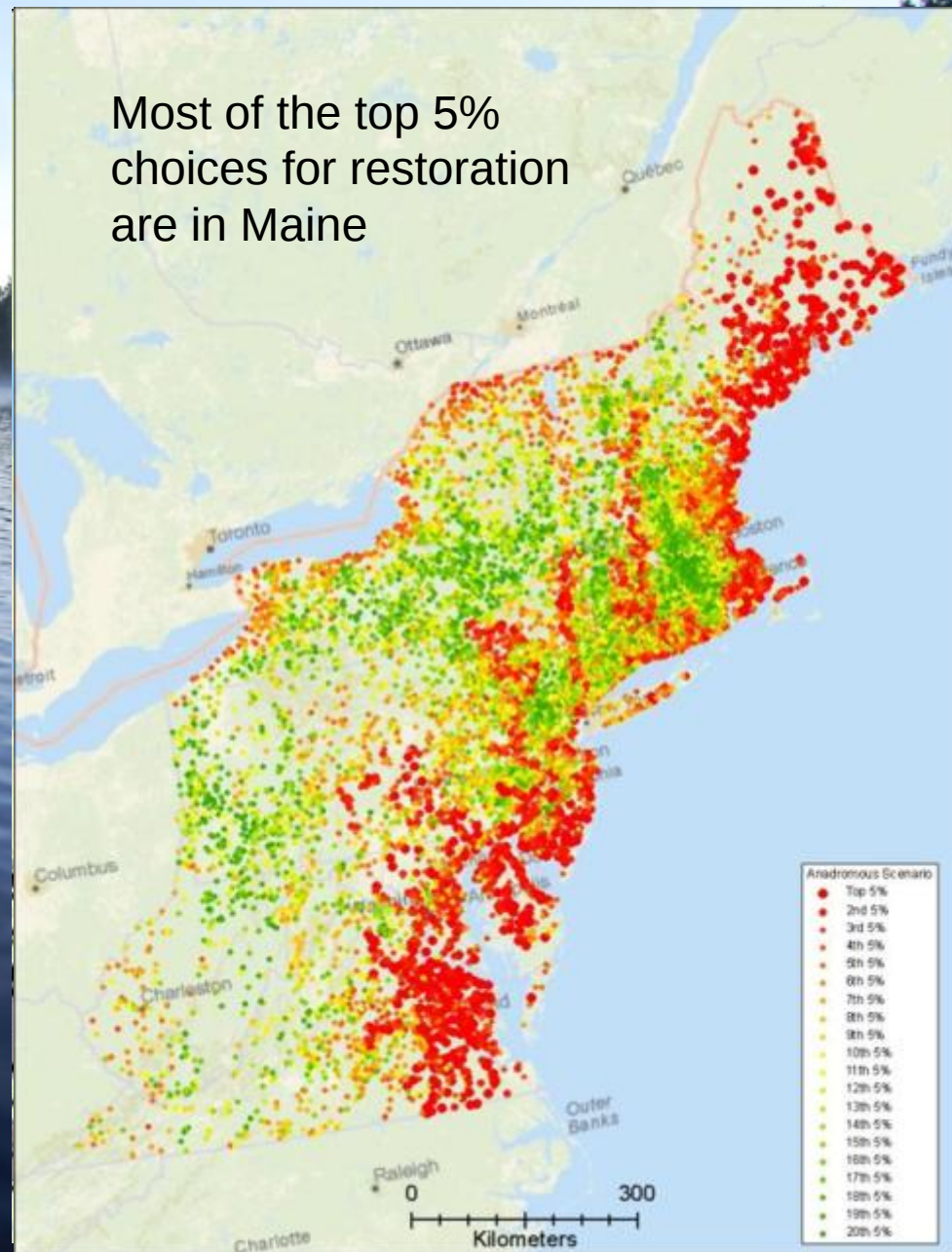
The Nature Conservancy & Northeast Association of Fish and Wildlife Agencies

Northeast Aquatic Connectivity

An Assessment of Dams on Northeastern Rivers

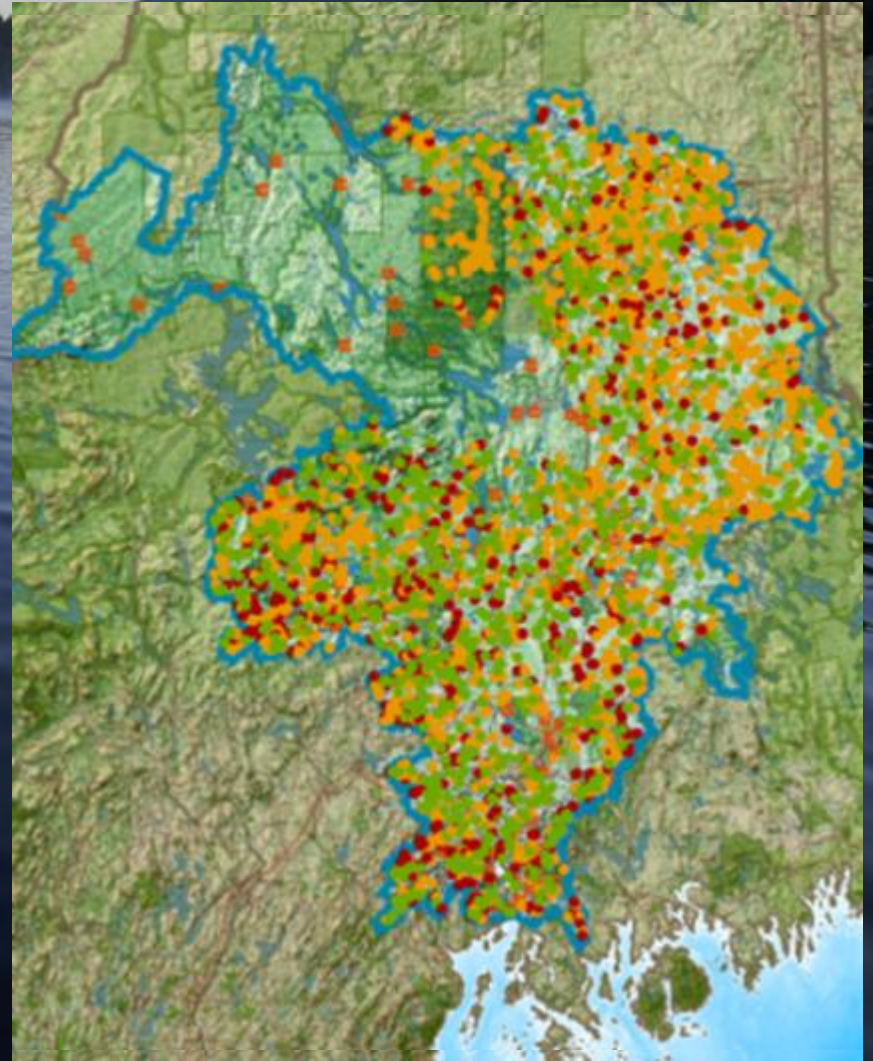


Most of the top 5% choices for restoration are in Maine



Connectivity analysis

- Ranking tools
- Resident & searun fish
- Habitat quality
- Quality of watershed
- Dams region-wide
- Culverts w/USFWS



>11,500 crossings assessed

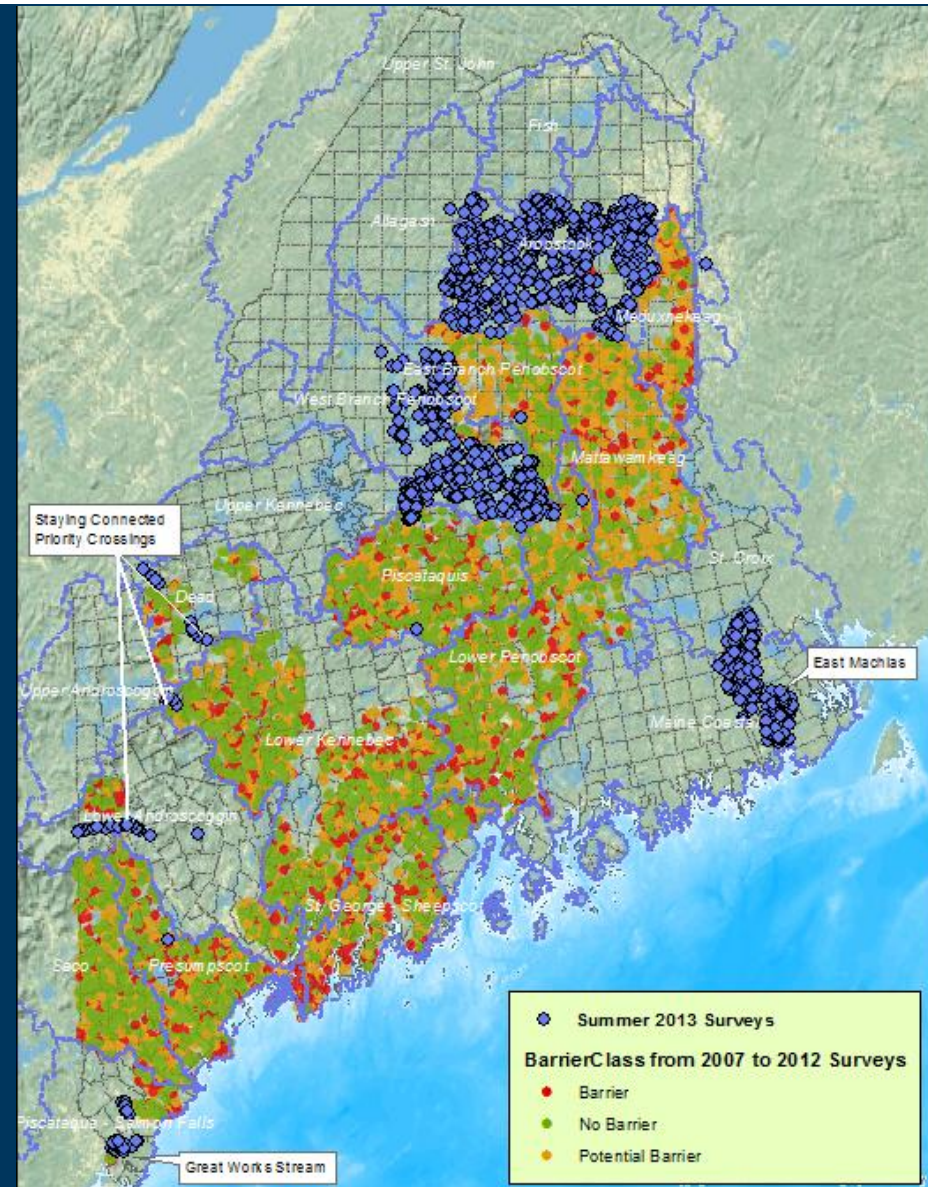
How problematic?

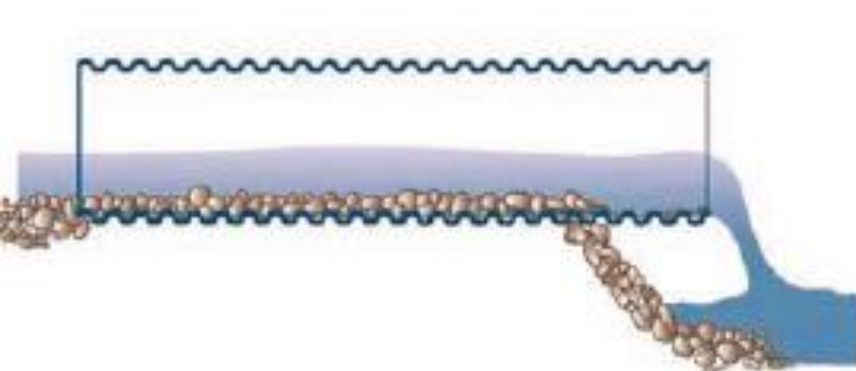
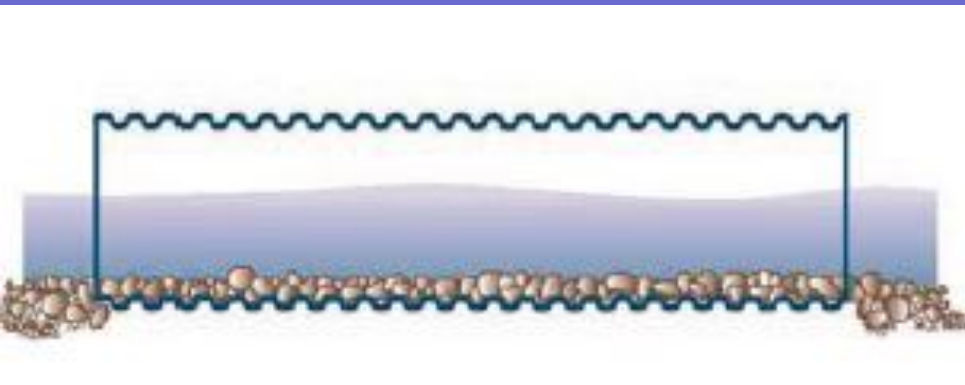
- >17% of timberland Xings
- >40% of public road crossings
- >90% of all culverts

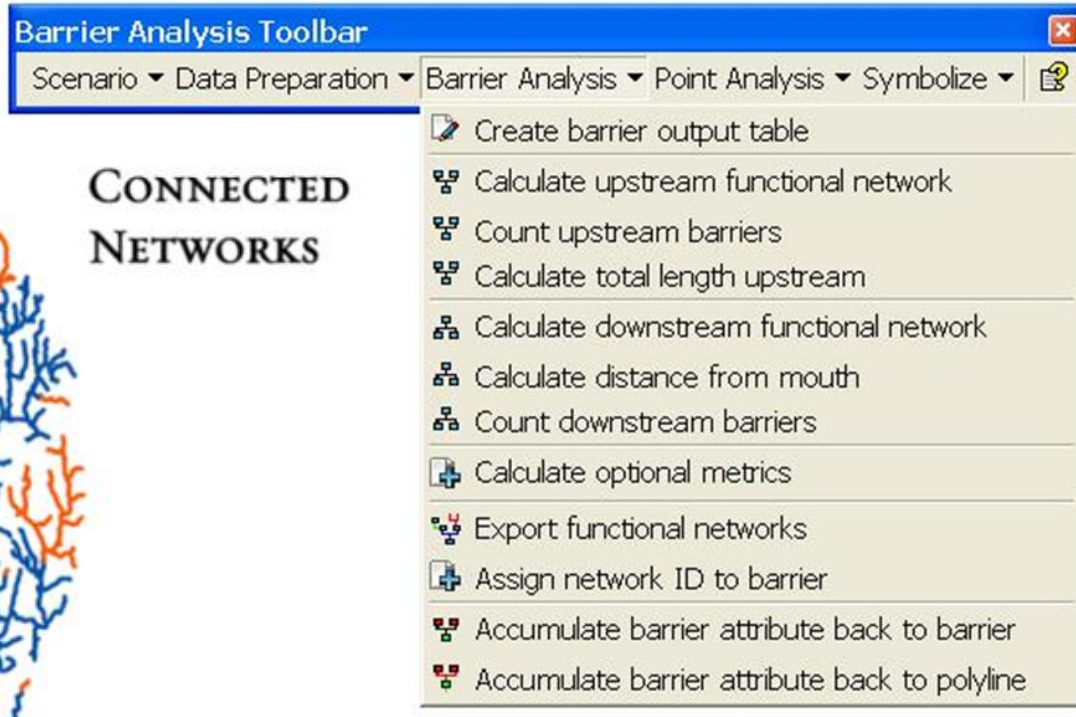
Data helps:

- Prioritize action (us and others)
- Funding
- Focus additional work

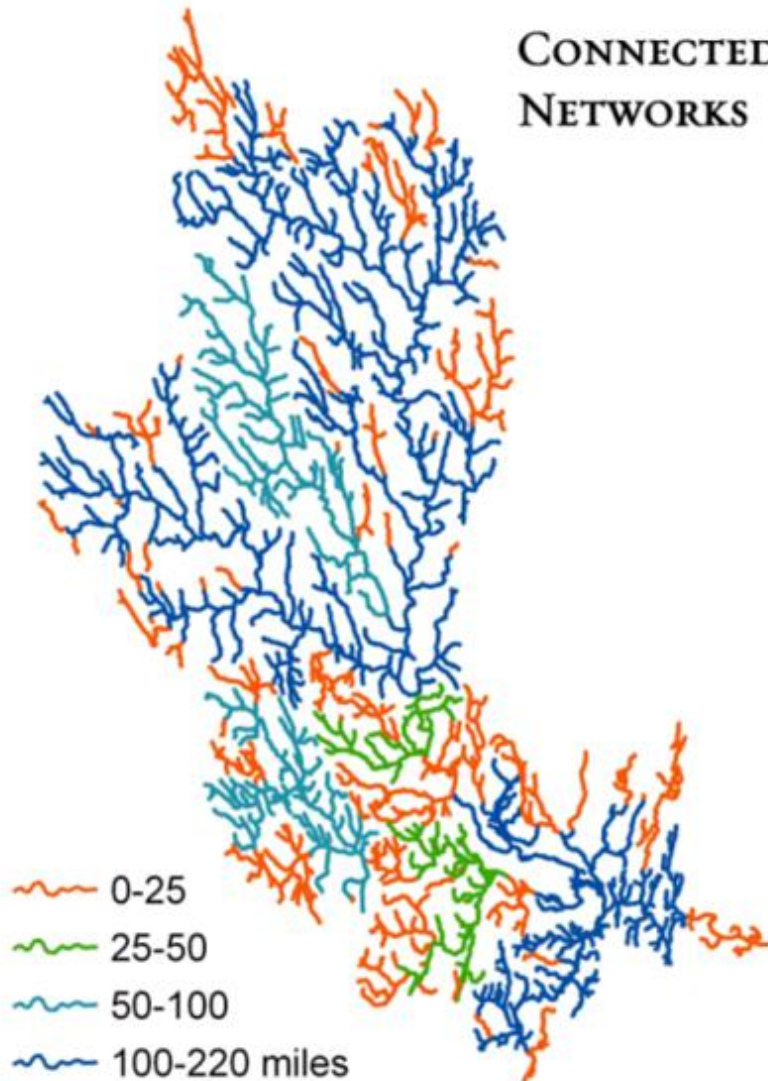
Volunteers needed for more watersheds!





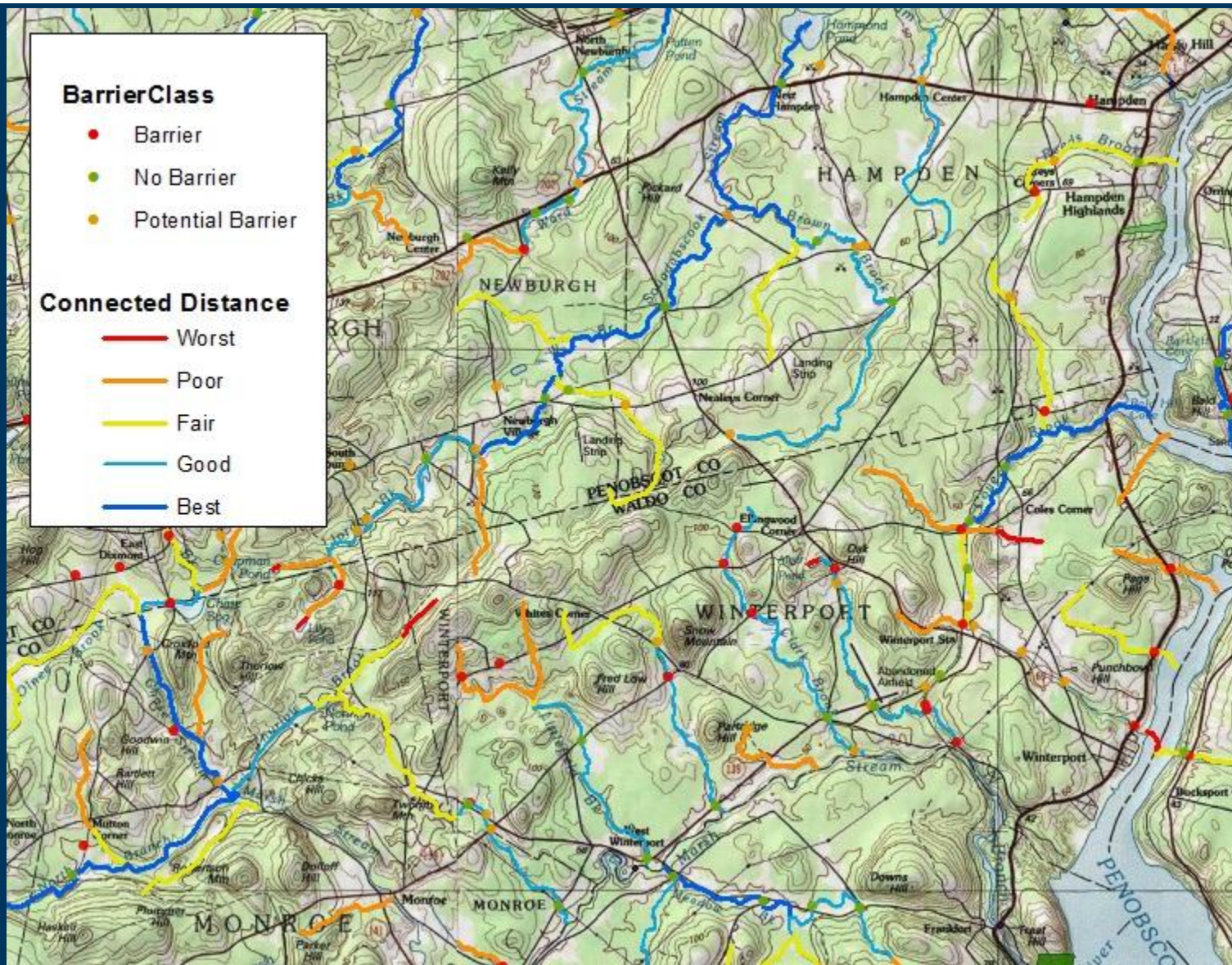


CONNECTED NETWORKS



- Most & best in-stream habitat
- Best condition watersheds
- Fish present in networks
- Local infrastructure needs

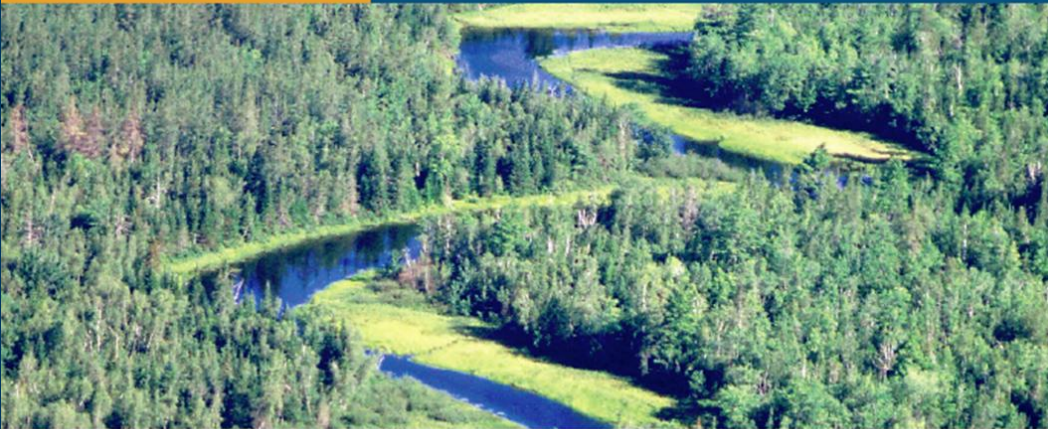
Allocate resources to areas with best potential



3) Implement smaller restoration projects



April 2008



THE ACTIVE RIVER AREA

A Conservation Framework for Protecting Rivers and Streams



Look at places through the lens of natural river processes

- Ecological
- Physical
 - Flow for
 - Sediment
 - Nutrients
 - Structure

Floodplains are highly productive Habitats



Fish without floodplain access

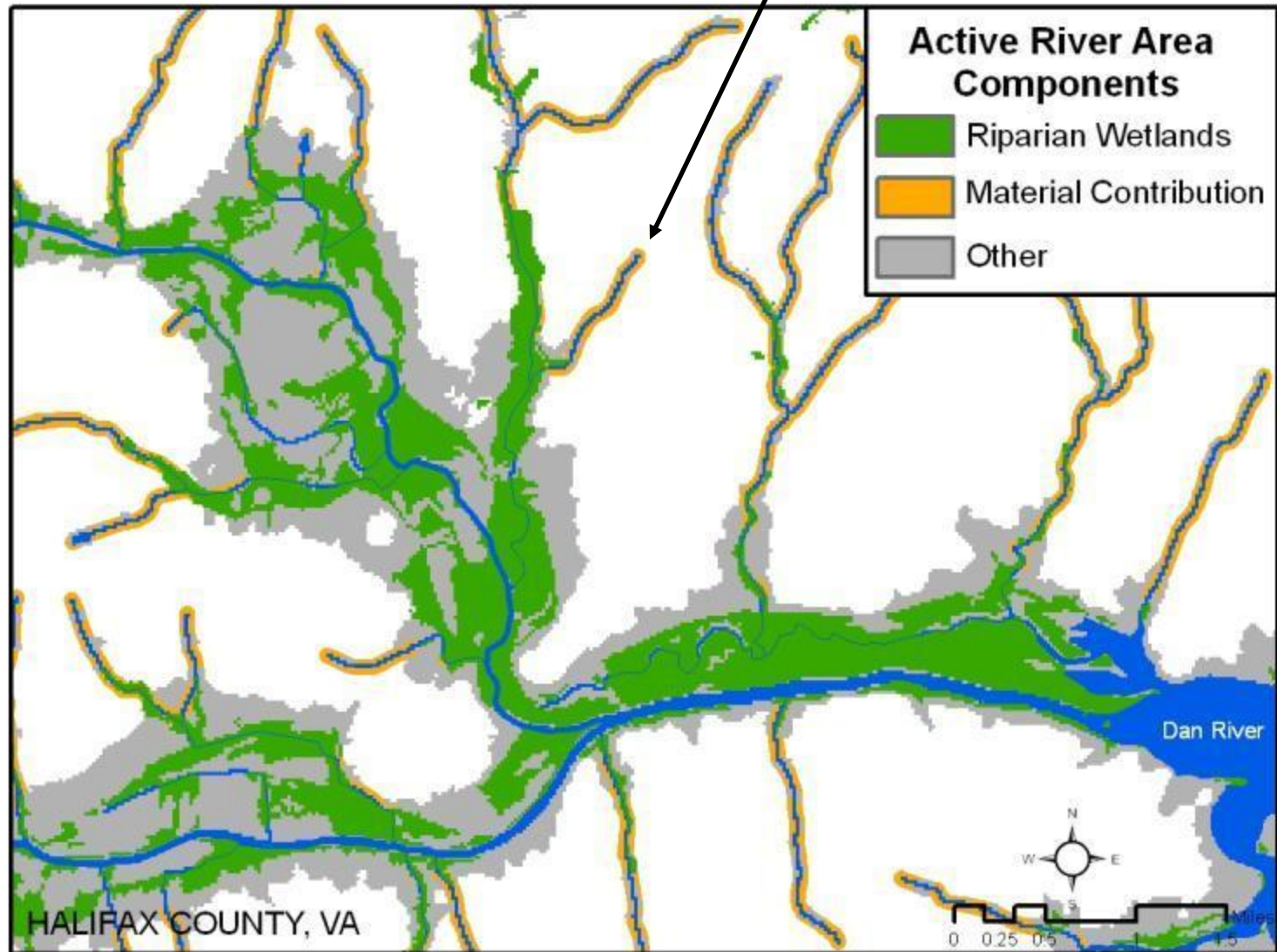
Fish with floodplain access

Wood contributions shape headwater and mid-reach stream habitat

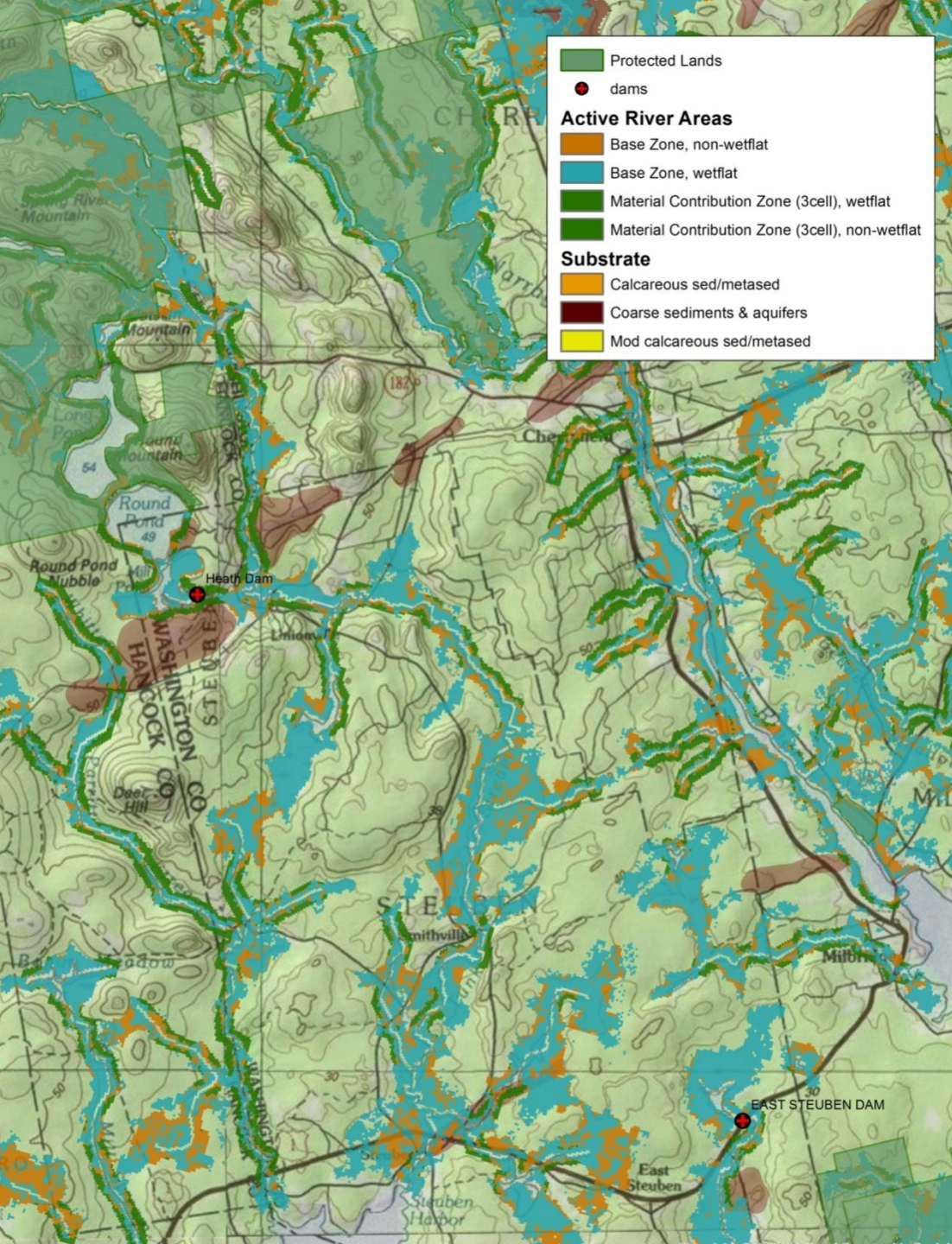


Material Contribution Riparian Areas

Add 90m area along reaches not in base zone



Important places around rivers and lakes



- Floodplain areas
- Streamside contribution areas
- Meander terraces
- Add aquifers
- Add calcareous

How to get things done? → Collaborate!

Guess who can help with what



Project SHARE



Funders Networks

Foundations

EBTJV
MNRCP
CWRP





Clean Water and Safe Communities Act
proposed \$50 million bond
to invest in **natural and built infrastructure**
that provides water-related benefits
for communities all around Maine.

Land protection & Infrastructure Upgrades

Maine
Municipal
Association



SARGENT
CORPORATION
Excellence for Generations

ACEC

AMERICAN COUNCIL OF ENGINEERING COMPANIES
OF MAINE

Maine COLA

Maine Congress of Lake Associations



MWUA
Maine Water Utilities Association
Organized 1925

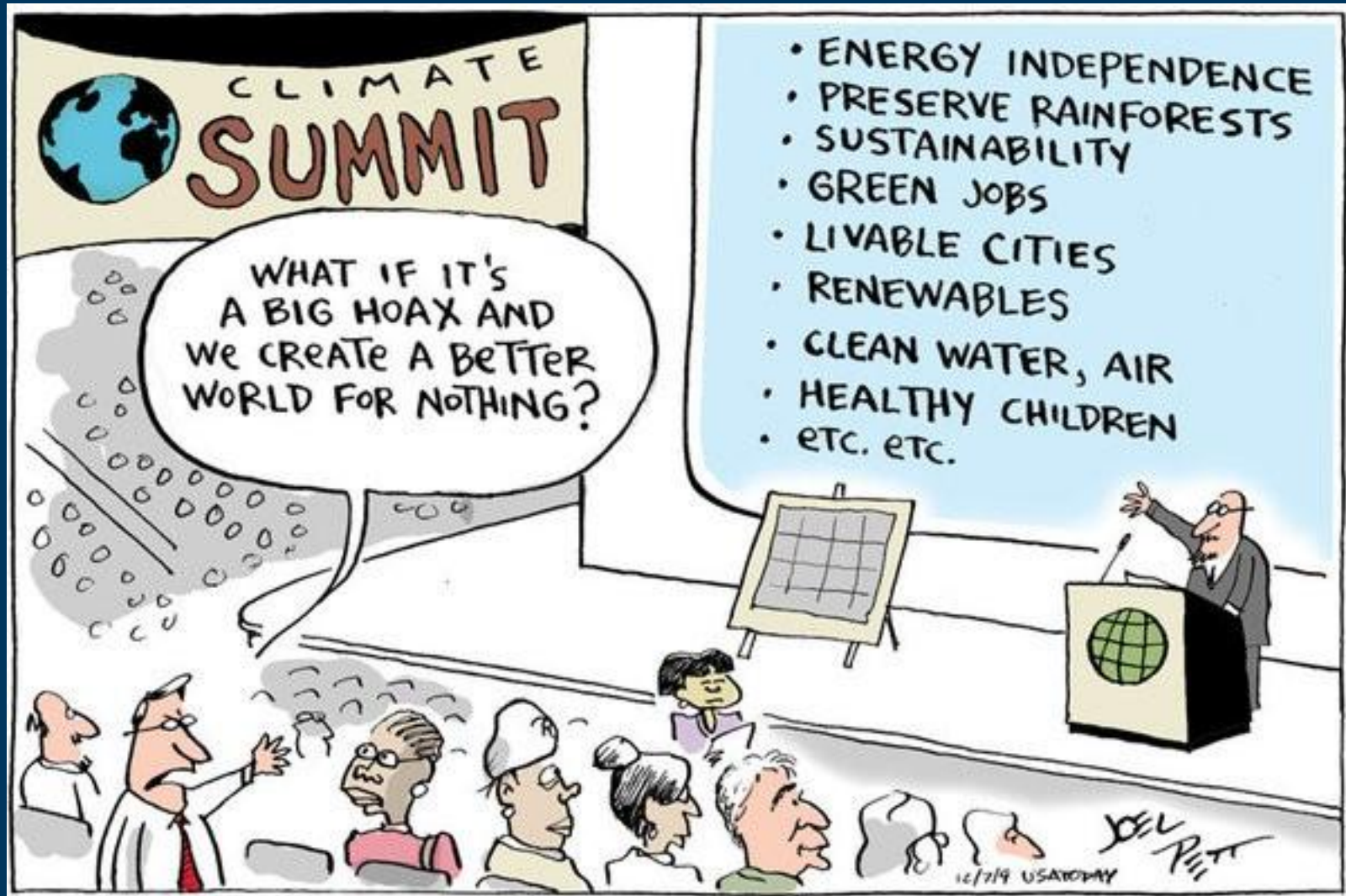

GrowSmart
MAINE

MAINE 
AUDUBON



The Nature
Conservancy 
Protecting nature. Preserving life.™





Thank you

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