August 2011: Proposal Submitted Jointly by ACFHP, SARP, and EBTJV

October 2011: Received letter from AFWA noting that the proposal could be funded for one year at a reduced amount

Mid to late December 2011: Will receive notification from USFWS if we've been selected for funding.

Collectively advance each partnership's habitat assessments through identification of mutual data needs, data acquisition and landscape-level-analysis techniques for the benefit of fish, mussels, and other aquatic animals.

Assist the National Fish Habitat Science and Data Committee in improving the 2015 status report by filling major data gaps with regional-specific fish population, habitat, and human impact monitoring data.

Coordinate ACFHP, SARP, and EBTJV partner engagement and outreach activities to strengthen and expand an already robust base of on-the-ground conservation partners. Assess the structure and function of the three FHPs and identify and implement strategies to enhance their organizational capacity.

Sub-objective 2.1: Develop and implement a streamlined communications strategy and outreach products for the three Eastern U.S. Fish Habitat Partnerships that highlights both synergies and distinguishing characteristics across the individual FHPs, and identifies FHP needs that would be best served individually and those that would benefit from a collective message.

Sub-objective 2.2: Assess the structure and function of the three FHPs; identity strengths and weaknesses with current delivery of the FHPs; and provide recommendations to enhance the effectiveness and capacity of the FHPs to achieve their missions and goals.

Sub-objective 2.3: Build sufficient organizational capacity within and across the three Eastern U.S. Fish Habitat Partnerships to fully implement the Sustainable FHP Program and Plan (i.e. Sub-objective 2.2)

Retain and enhance critical capacity to implement each of the individual FHP's Partnership Strategic Plans by facilitating completion of prioritized, on-the-ground, partner-led fish habitat conservation projects that achieve measurable results towards National Fish Habitat Action Plan goals and interim strategies and are easily communicated and understood.

Sub-objective 3.1: Support regular meetings of the individual FHPs to engage with partners, identify opportunities to implement the FHP Strategic Plans, and prioritize actions toward protection and restoring function of eastern aquatic habitats.

Sub-objective 3.2: Enhanced capacity of the ACFHP, EBTJV, and SARP to implement design, construction, and monitoring phases of on-the-ground aquatic habitat conservation projects and aquatic habitat education efforts.

Sub-objective 3.3: By December 31, 2013, develop and implement a consistent mechanism for evaluating and reporting the benefits of fish habitat conservation projects to a wide range of audiences by monitoring region-specific variable(s) that will inform and add to the National Fish Habitat Action Plan tracking effort.

- Outputs/Milestones (Most of which are time-bound)
- Outcomes
- Measures

- If funding is only available for 2012, ASMFC would accept the grant award, with the understanding that the scope of objectives would be reduced. Note full operational support for the three FHPs will require supplemental funding from sources other than MSCGP.

- Funds will be split among each of the three eastern Partnerships in accordance with unmet needs and other available partner support.

- By June 30, 2012, regular webinar meetings of the Science and Data Committees of the three FHPs will be established to enable them to share, identify and assemble existing data pertaining to threats to fish habitats.

- By December 31, 2012, develop a written list of action items resulting from the joint Science and Data Committee webinars that will be the focus of the efforts of the committees.

- By December 31, 2013, produce refined conservation focus area maps and list of priority criteria for each FHP based on latest habitat assessment information and best available data.

- By March 30, 2013, the FHPs will actively contribute data and participate in the development and refinement of the National Fish Habitat Assessment (coastal and freshwater) and Decision Support tools.

- By December 31, 2013, the FHPs and LCCs will collaboratively develop effective methods of collecting, compiling, and managing regional fish population and aquatic habitat data that will provide a platform to

1) advance knowledge of fish population ecology and habitat relationships,
2) develop consistent decision support tools for aquatic habitat restoration and conservation actions, and
3) evaluate and improve the effectiveness and efficiency of FHPs and habitat conservation actions regionally.

- Starting within three months of project approval and continuing throughout the project period, joint FHP Communications and Outreach meetings will be held quarterly via conference call and/or WebEx with coordinators and/or appointed staff from the partner FHPs to provide regular, focused coordination of overall communications and outreach efforts.

- By June 31, 2012, develop individual FHP and joint messaging strategies that would identify key target audiences and generate core messages for members of the partnerships to communicate clearly and consistently with those audiences.

- By December 31, 2012, develop content for and the design of an “Implementing the NFHAP from Whitewater to Bluewater” program web page and Facebook page

- By June 31, 2013 and continuing on a semi-annual timeframe, develop and send to partners, legislators, state and federal agencies a “Whitewater to Bluewater” electronic update or newsletter that highlights the work being conducted by the Eastern FHPs

- A representative from each FHP will attend at least one conference or other meetings to give presentations/updates either individually or jointly where possible, to various conservation audiences, to inform attendees of FHP purpose and activities, and gain support.

- Throughout the project period, FHPs will maintain their individual websites and outreach materials (e.g. fact sheets, feature article(s) in partner newsletters and other available outlets, existing social networking tools, etc.) that will be dovetailed, where appropriate, with the other Eastern FHPs resources and efforts.

- ACFHP, EBTJV, & SARP develop Terms of Reference (ToR) or Request for Proposals (RFP) for services to evaluate the structure and function of the three FHPs and make recommendations to improve their organizational capacity by October 1, 2011.

- The FHPs select a qualified applicant by January 1, 2012.

- FHPs in collaboration with the successful applicant complete a review of the FHPs external/internal environment and the past performance to create a detailed understanding of current strategic position and organizational capacity by April 1, 2012.

- Based on the capacity assessment, the FHPs develop Sustainable FHP Plans, outlining organizational capacity objectives and begin to implement those plans by December 31, 2012.

- Each of the FHPs will designate member(s) to serve as part of a collaborative organizational capacity network.

- The successful applicant (noted in Objective 2.2) will host one training workshop with approximately three pre-workshop webinars. FHP representatives will prepare/complete homework assignments in preparation for the workshop/webinars, which will train these individuals to begin implementing their Sustainable FHP Plan by October 1, 2013.

- By June 30, 2012, an EBTJV coordinator is hired and effectively working with the EBTJV Committees and partners;

- By March 31, 2013, hold at least one all-partner joint meeting of the ACFHP, EBTJV, and SARP to facilitate inter-FHP exchange of successes and challenges and foster “Whitewater to Bluewater” collaboration;

- By December 31, 2013, hold one all-partner meeting each for ACFHP, EBTJV, and SARP to review progress toward objectives and update strategic plans;

- By December 31, 2013, updated strategic or implementation plans are available for ACFHP, EBTJV, and SARP

- Each FHP will fund three or more on-the-ground and at least one communication/ outreach project annually;

- By December 31, 2013, ACFHP, EBTJV, and SARP have implemented strategies to improve delivery of FHP as identified in Objective 2

- By September 30, 2012, identify and vet among the science and data partners for ACFHP, EBTJV, and SARP potential monitoring / reporting measures that may serve to track progress of FHPs, including consideration of current measures used to report accomplishments achieved with existing federal NFHAP funds.

- By March 1, 2013, evaluate candidate measures and select measures for implementation

- By June 30, 2013, incorporate selected measures as part of all project evaluation and reporting and report on these measures for previously-implemented projects

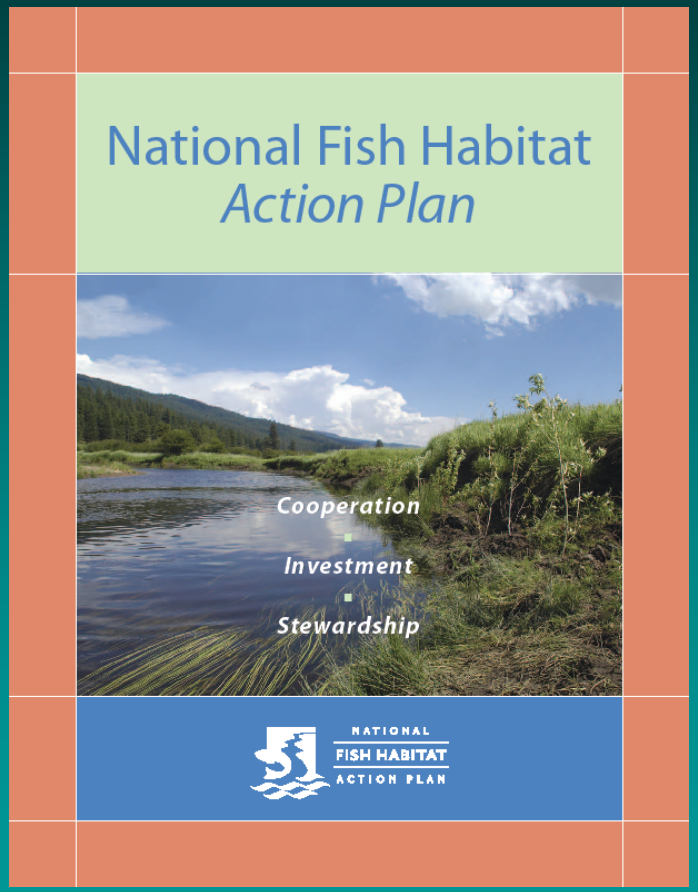
- By December 31, 2013, evaluate the effectiveness of these measures and report on the compilation of these measures for the “Whitewater to Bluewater” collaboration

Sustaining Fisheries and Human Communities: Refining the Vision of the National Fish Habitat Action Plan: ACFHP Summary

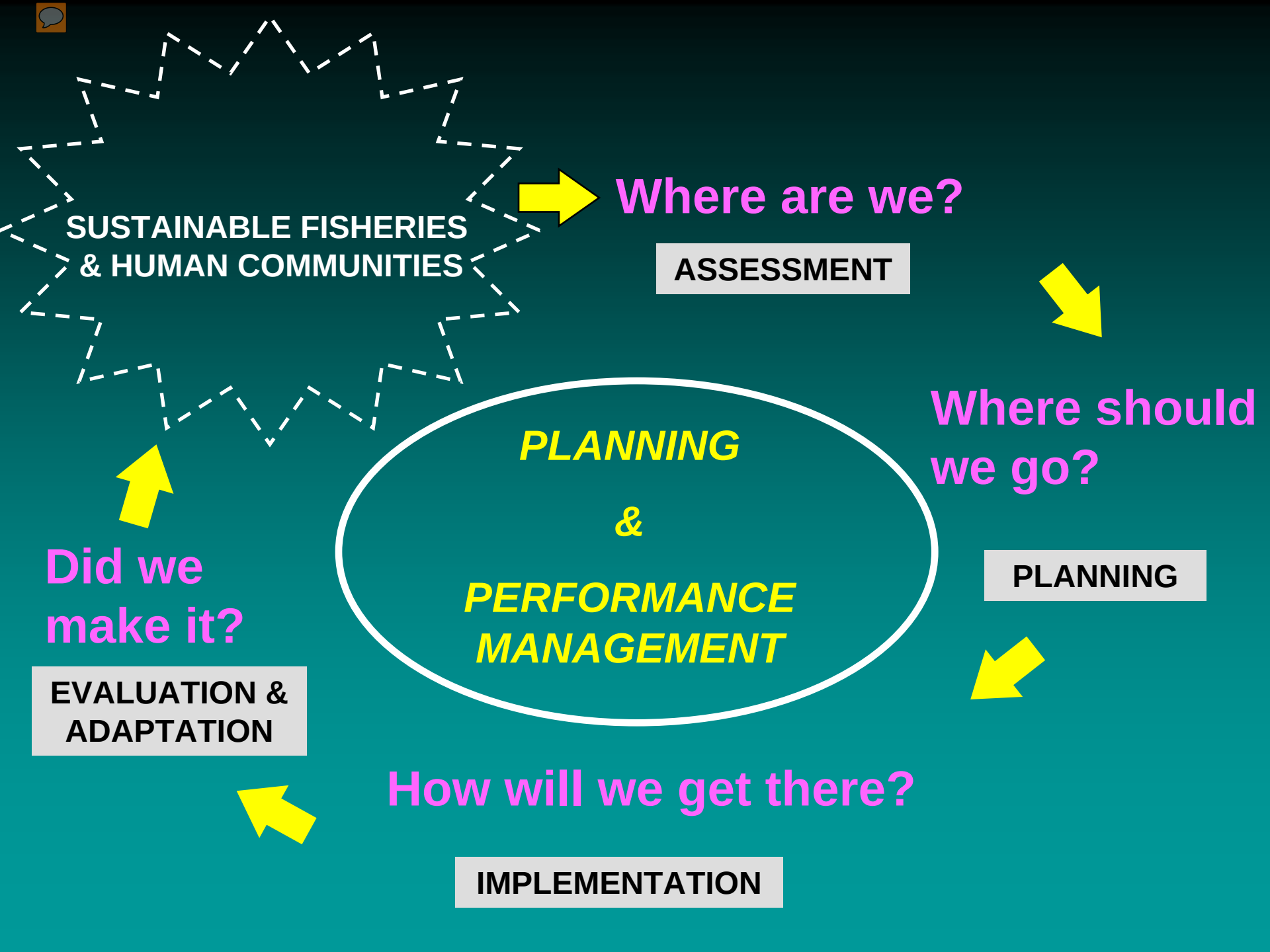
Paul Pajak, U.S. Fish and Wildlife Service, Hadley, MA

Andrea C. Ostroff, U.S. Geological Survey, Reston, VA

National Fish Habitat Action Plan
MISSION



"...to protect, restore and enhance the nation's fish and aquatic communities through partnerships that foster fish habitat conservation and improve the quality of life for the American people."


SUSTAINABLE FISHERIES
& HUMAN COMMUNITIES
Where are we?
ASSESSMENT
Where should we go?
PLANNING
How will we get there?
IMPLEMENTATION
Did we make it?
EVALUATION & ADAPTATION
PLANNING
&
PERFORMANCE MANAGEMENT

Symposium Objectives:

1) Assess progress toward 2006 NFHAP goals

2) Examine scientific efficacy of 2010 national habitat condition analysis and status report

3) Explore efforts of FHPs to build on and contribute to a nationally integrated approach

4) Review major limiting factors to sustainable fisheries in North America and implications for the NFHAP

5) Provide insights to update 2011 Action Plan

Where are we?

ASSESSMENT

NFHAP Objectives: 2011 PROGRESS

- ✓ National habitat condition analysis
- ✓ Priority fish habitats identified
- ✓ 17 Fish Habitat Partnerships
- ✓ "Status of Fish Habitats in the U.S." report

5) Protect all healthy and intact fish habitats by 2015?

6) Improve the condition of 90% of priority habitats and species targeted by Fish Habitat Partnerships by 2020?

Where should we go?

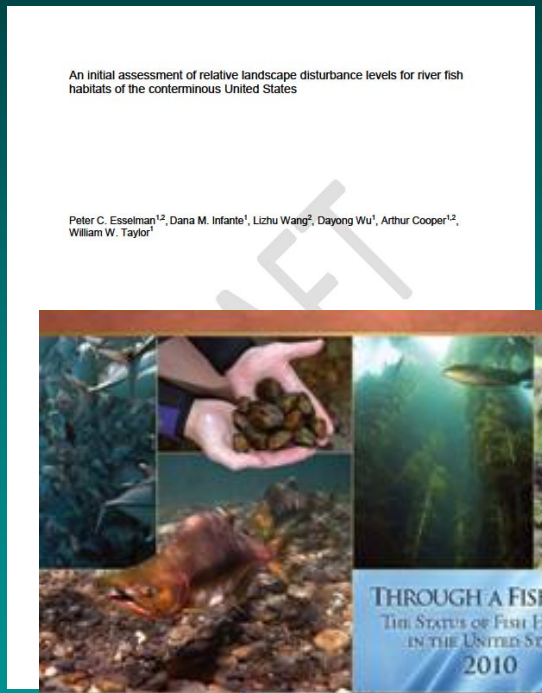
PLANNING

"BIG PICTURE" REMINDER: The "Case for Action" in 2006

"Healthy waterways and robust fish populations are vital to the well-being of our society. They provide clean water and sustainable fisheries. They also are vital for less tangible reasons ..."

Symposium questions & insights ...

SCIENTIFIC EFFICACY?
National Assessment & Reporting


An initial assessment of relative landscape disturbance levels for river fish habitats of the conterminous United States

Peter C. Esselman[1,2], Dana M. Infante[1], Lizhu Wang[2], Dayong Wu[1], Arthur Cooper[1,2], William W. Taylor[1]

DRAFT

- Not one, but five methods; driven by data availability; AK & HI separate
- Underestimates degradation in some areas
- Need to relate ecological process variables to fish & habitat conditions
- Need additional data & coverage (e.g. NHD+, fish, AK, etc.)
- Improve public access & understanding for decision-making

Regional Fish Habitat Partnerships

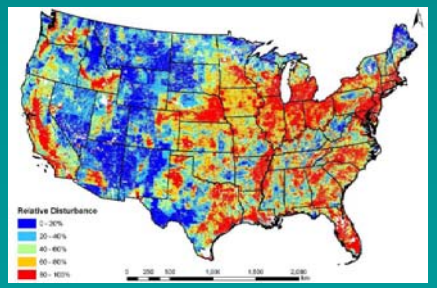
NATIONALLY INTEGRATED APPROACH?

- Differences in species/habitat focus; & data availability, quality & methods
- Need agreed upon variables and sampling, data acquisition strategies
- Need greater investment in information science to:
  - bridge local & national assessments
  - improve data sharing & link assets
  - reduce duplicate efforts & costs
  - enhance coordination & targeted implementation
- Need to quantify & validate relationships between inland, estuarine & coastal assessments

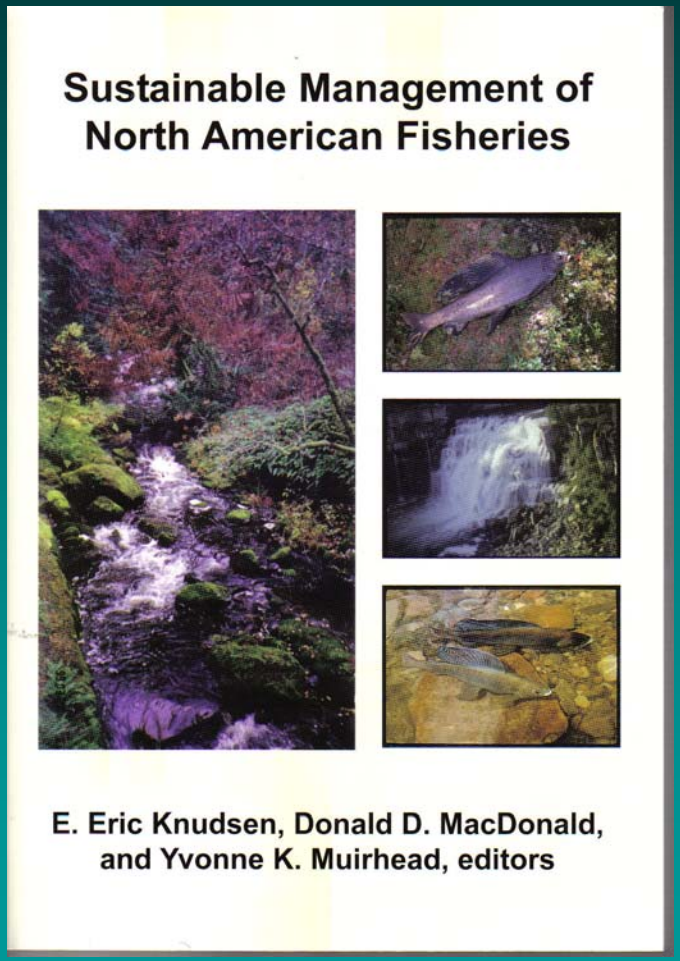
? ? ?

NATIONAL FISH HABITAT ACTION PLAN

? ? ?



Factors Limiting SUSTAINABLE FISHERIES?

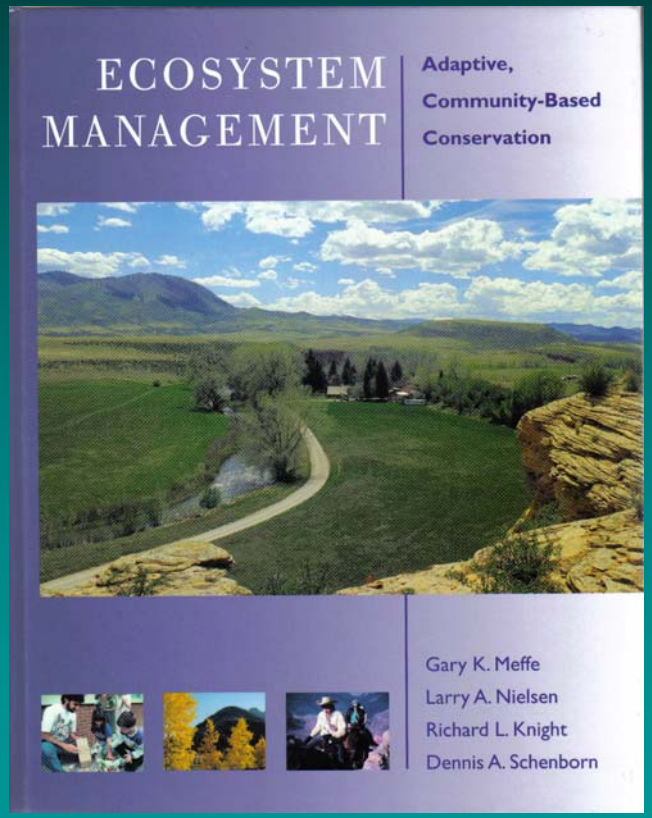


- Habitat loss, alteration & degradation
- Invasive species
- Over-exploitation
- Urbanization (landscapes & human values)
- Competing social priorities
- Inadequate decision support
- Climate change

How do we get there?

IMPLEMENTATION

SUSTAINABILITY:
A Comprehensive & Unifying Goal?

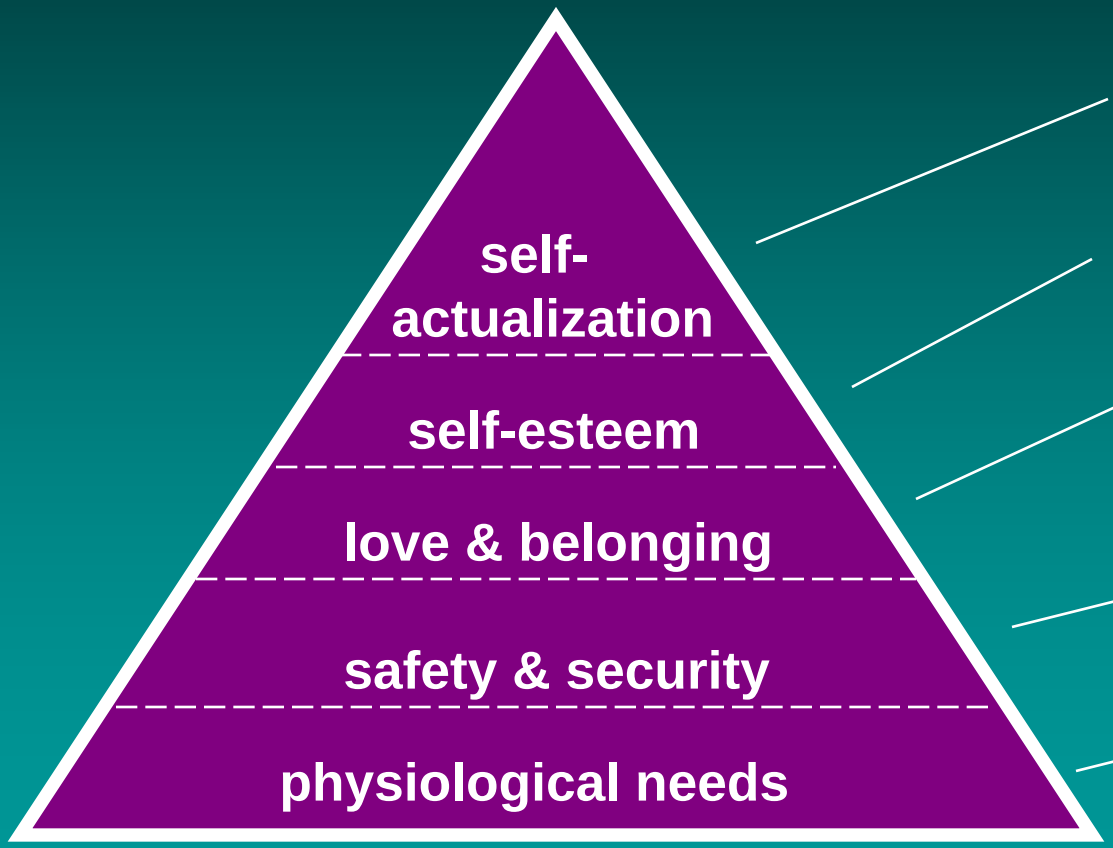


"...to meet the <u>needs</u> of the present generation without compromising the ability of future generations to meet their own needs."

Brundtland Commission 1987

BASIC HUMAN NEEDS

VOTER ISSUES



Jobs, Economy

Education

Marriage, Family

Terrorism, Taxes

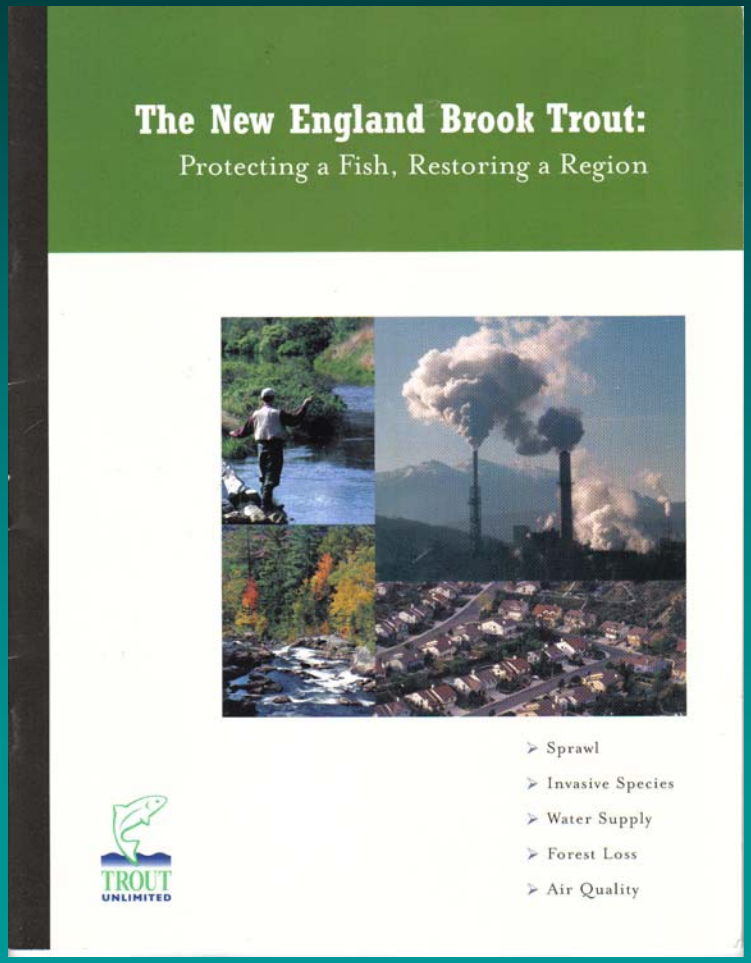
Life Issues, Health Care

??? ENVIRONMENT, FISH ???

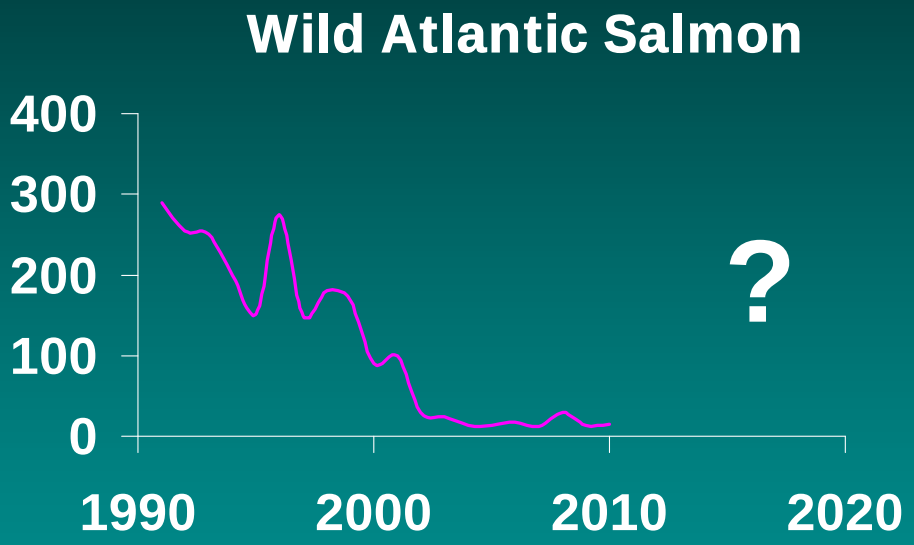
FISH & HUMAN ACTIVITY

"Beginning with New England's first mill dams, … virtually every human activity in New England has affected brook trout habitat."

Trout Unlimited 2004



SUSTAINABILITY? Strategic Role of Fisheries Professionals & the NFHAP?



"Rivers are the lifelines of a continent, reflecting the condition of the surrounding landscape…"

James R. Karr

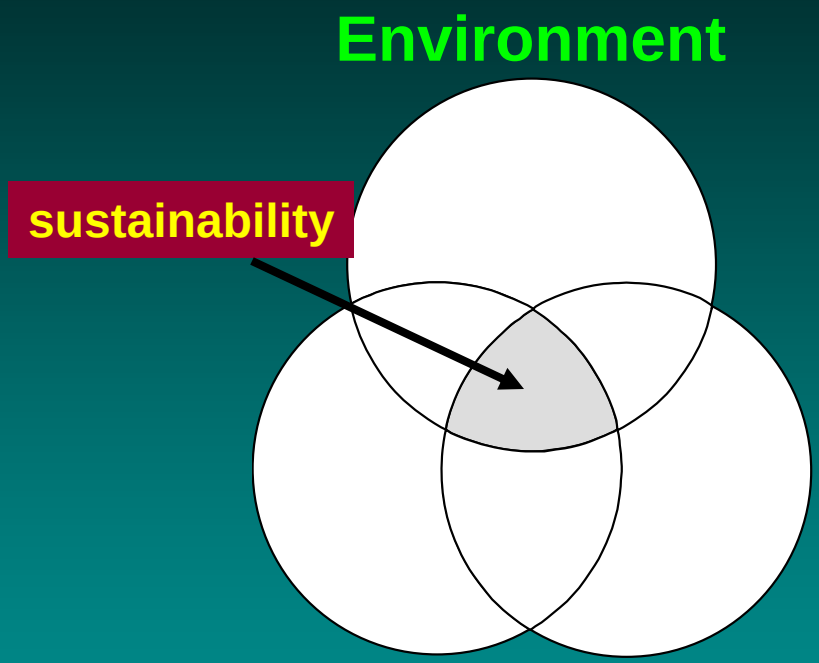
Did we make it?

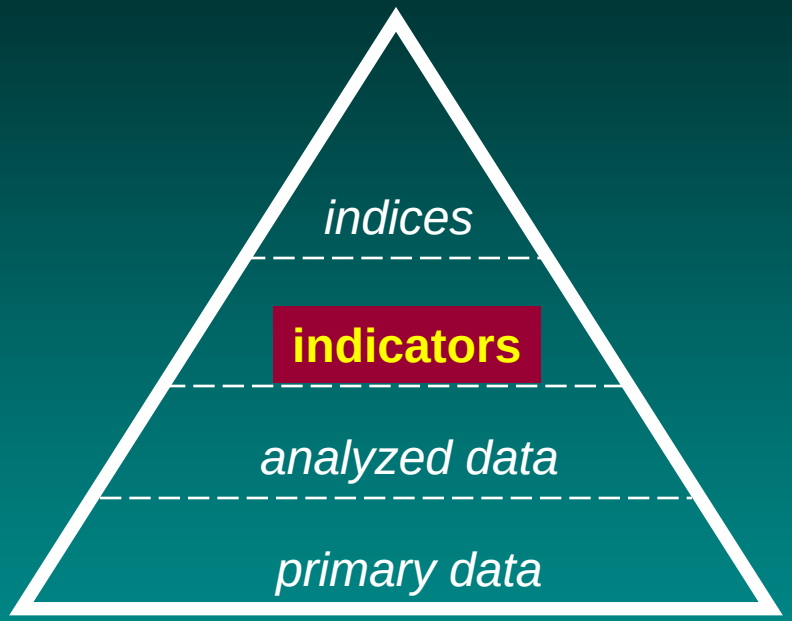
EVALUATION & ADAPTATION

MANY ASSESSMENTS !?!

ECOSYSTEM-BASED MANAGEMENT

INFORMATION PYRAMID





SUSTAINABILITY INDICATORS

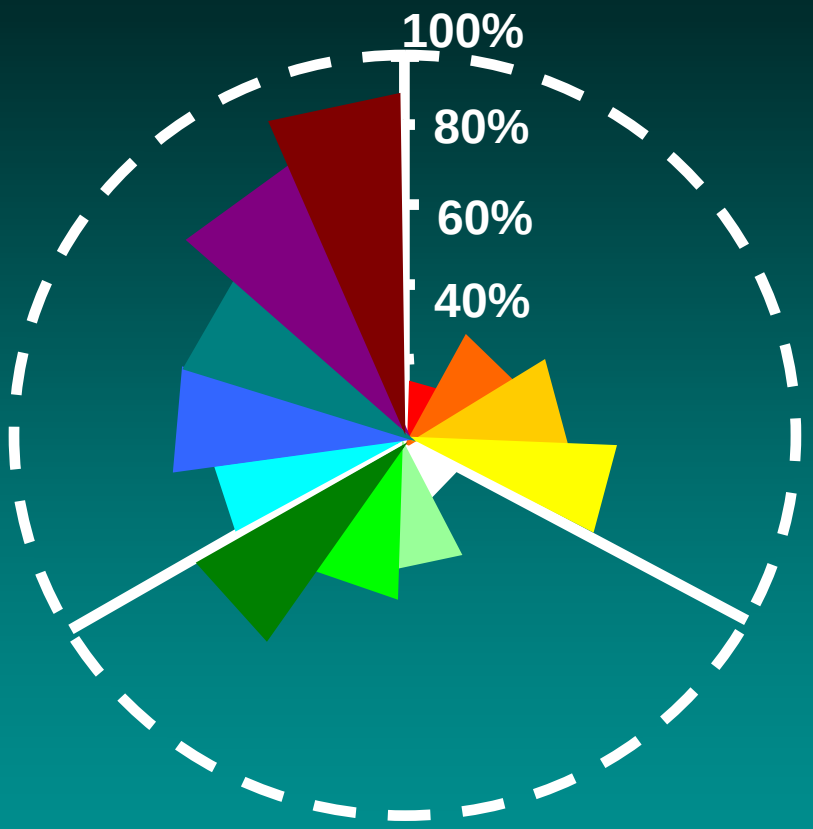
Sustainability-Based “Report Cards”

Society

- self - actualization
- self - esteem
- love & belonging
- safety & security
- physiological needs

Institutions

- results - oriented
- consent - based
- truth - seeking
- adaptable



Environment

- disturbance
- diversity
- productivity
- chemical cycling

0%

100%

Executive Order 13508

Strategy for

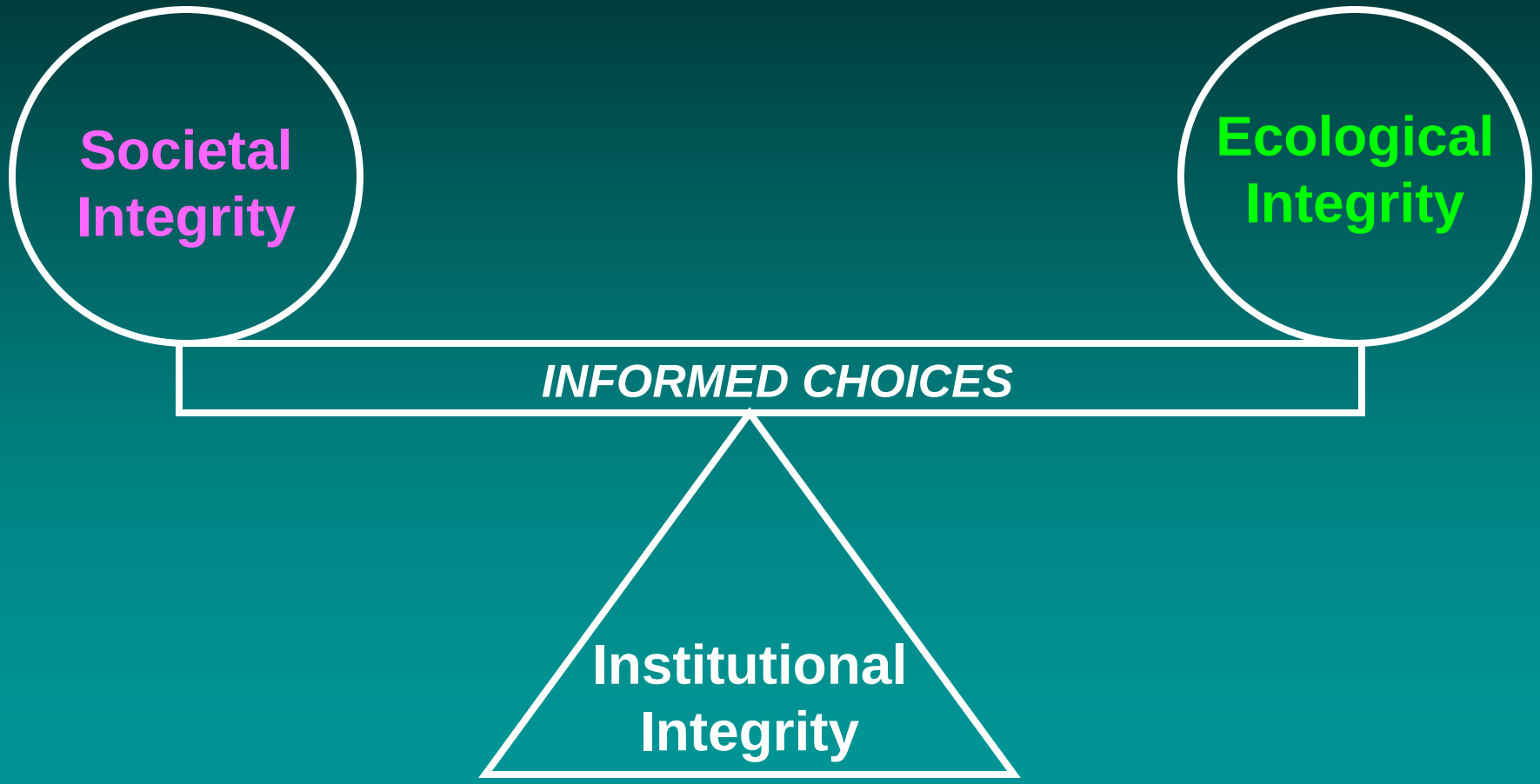
Protecting and Restoring the Chesapeake Bay Watershed

May 12, 2010

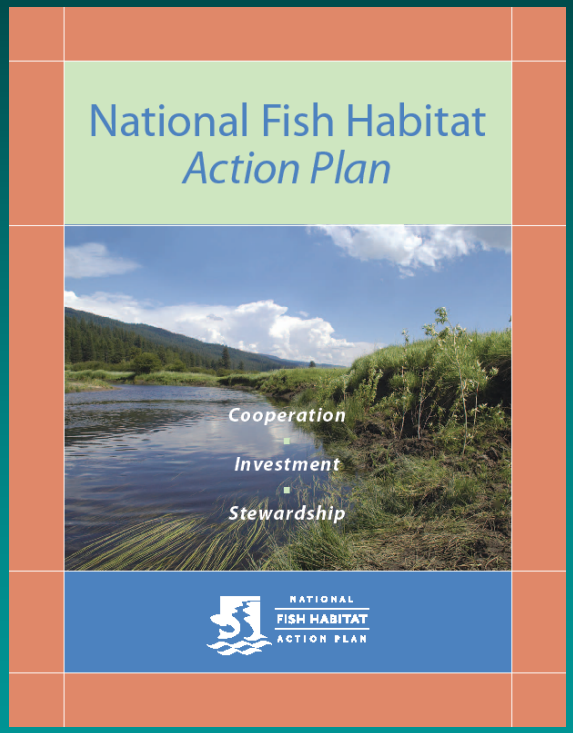
Sustainability “Gap Analysis”

	EBM Domain			Element	CBP Goal	State Indicators	Monitoring	Assessment	Research	Communication Products	Information Management	Model/Forecast
Sustainability	Ecological	Diversity & Productivity	Biodiversity	Fish/Shellfish Abundance								
				Fish/Shellfish Diversity								
				Fish/Shellfish Health								
				Phytoplankton/ Zooplankton								
				Wildlife Abundance								
				Wildlife Diversity								
				Wildlife Health								
			Habitat	Wetlands								
				SAV								
				Fish Passage & Streams								
			Land Use	Impervious Surface								
				Forest								
				Agriculture								
		Chemical Cycling	Water Quality	Nutrients								
				Sediments								
				Toxic pollutants								
			Air Quality	Particulates								
				Ozone								
				CO2								
				Acidity								
			Geochemical Processes									
		Natural Disturbance	Climate Variability	Sea Level								
				Water Temperature								
				Salinity								
				Rainfall								
			Episodic events	Fire								
				Hurricanes/Storms								
				Flood								
				Tides								
				Streamflow/Drought								
	Societal	Physical Well-being	Human health	Water supply and protection								
				Food Safety								
			Safety and Security	Swimable waters								
		Socioeconmomic well-being	Sense of Community	Public Access								
				Cultural Heritage								
			Quality of Life	Education								
				security								
				Social & economic value								
	Institutional	Objective assessment	Sound Science									
		Consent-based	Partnerships, NEPA	Community Engagement								
		Results-oriented	Shared vision	Accountable								
		Adaptable										

Decision-Support: Balancing Present & Future Needs



2011 Action Plan Update: RECOMMENDATIONS



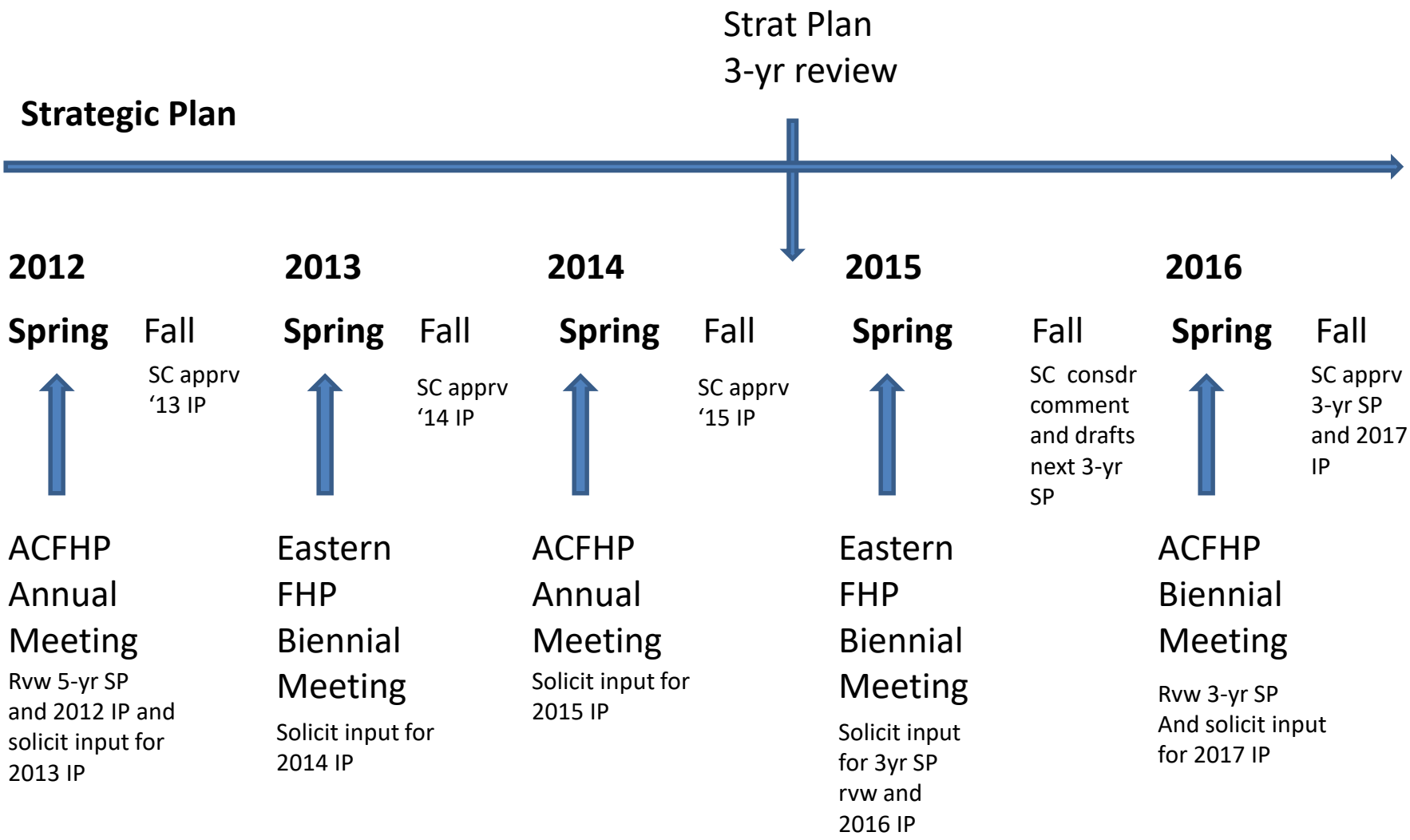
- **Ensure scientifically valid, standardized & integrated ASSESSMENTS (spatially, temporally, ecologically)**
- **Better incorporate ecological & socioeconomic sustainability components in future GOALS & communication strategies**
- **Implement & reward efforts that are OUTCOME-BASED and mission-aligned**
- **Improve national & FHP monitoring & decision-support systems to ensure timely, long-term ADAPTIVE MANAGEMENT**
- **Eastern Fish Habitat Partnerships (ACFHP, EBTJV, SARP) – NEXT STEPS?**

References

Pajak, P. 2000. Sustainability, ecosystem management and indicators: thinking globally and acting locally in the 21st century. Fisheries 25 (12):16-30.

Pajak, P. 2004. Elevating social concern for sustainability in fisheries and aquatic resource management. Pages 257-270 in E.E. Knudsen et al., editors. Sustainable management of North American fisheries. AFS Symposium 43, Bethesda, MD.

Meffe, G.K.,L.A. Nielsen, R.K. Knight and D.A. Schenborn. 2002. Ecosystem management: adaptive, community-based conservation. Island Press, DC.


Strat Plan
3-yr review
Strategic Plan
2012
Spring
Fall
SC apprv '13 IP
ACFHP Annual Meeting
Rvw 5-yr SP and 2012 IP and solicit input for 2013 IP
2013
Spring
Fall
SC apprv '14 IP
Eastern FHP Biennial Meeting
Solicit input for 2014 IP
2014
Spring
Fall
SC apprv '15 IP
ACFHP Annual Meeting
Solicit input for 2015 IP
2015
Spring
Fall
SC consdr comment and drafts next 3-yr SP
Eastern FHP Biennial Meeting
Solicit input for 3yr SP rvw and 2016 IP
2016
Spring
Fall
SC apprv 3-yr SP and 2017 IP
ACFHP Biennial Meeting
Rvw 3-yr SP And solicit input for 2017 IP

Implementation Update
NE Climate Science Center

Rachel Muir
Interim Center Director
NE Climate Center
ACFHP, , November 7, 2011
Boston MA

U.S. Department of the Interior
U.S. Geological Survey

National Climate Change & Wildlife Science Center – The Big Picture -- Mission

- Provide **natural resource managers** with the **tools and information** they need to **develop and execute management**

- **Strategies** that address the impacts of **climate change on fish, wildlife, and their habitats**

NORTHEAST CLIMATE SCIENCE CENTER (NE-CSC)

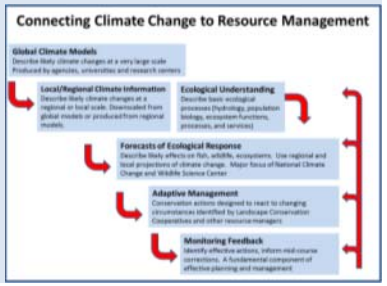
- Vision
  - A stakeholder driven, interdisciplinary, and geographically distributed team that
    - Empowers decision makers with appropriate climate information and knowledge
    - Supports resource conservation for climate adaptation and mitigation
    - Operates with a high level of transparency and engagement (hope you visited the website)

Big Picture – Goals

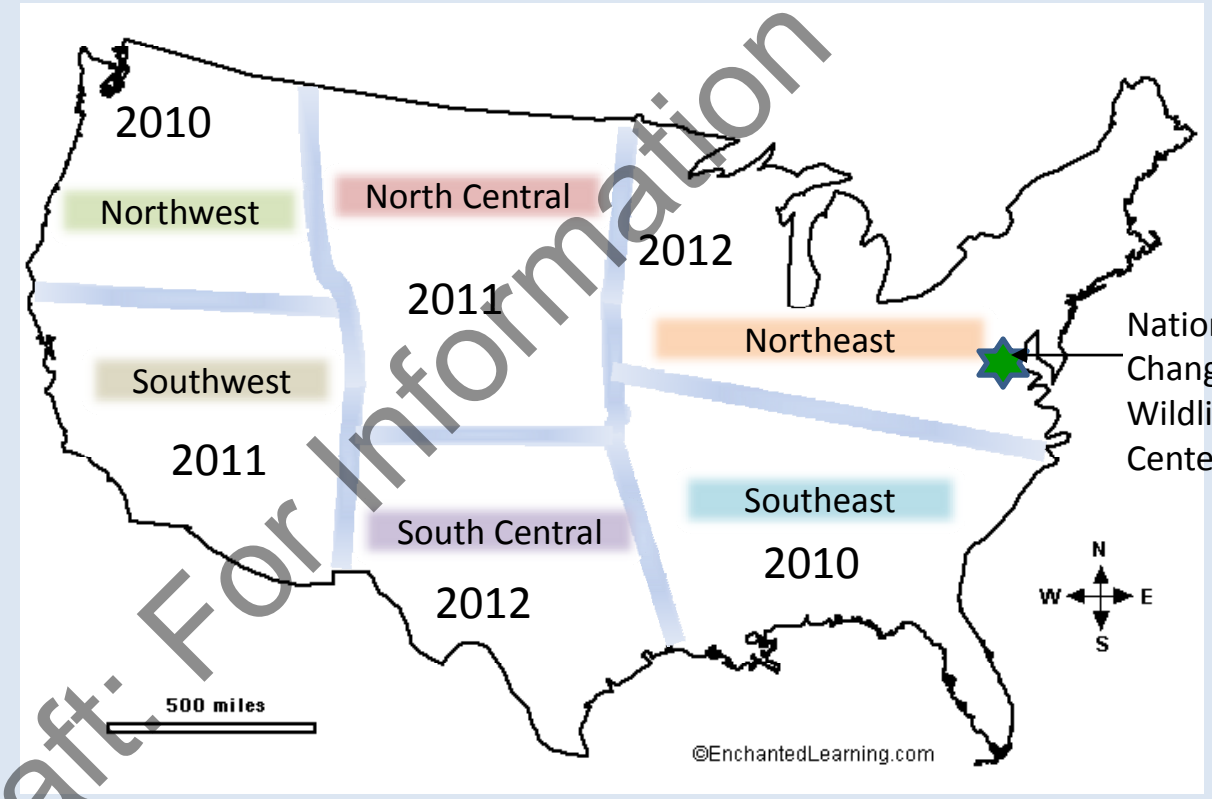
- Partnerships with **natural resource managers** to address their highest priority science needs
- Partnerships with the **scientific community** to develop needed information and tools
- Delivery of robust tools and information at applicable scales directly to resource managers
- Focus on climate change **adaptation** and on **climate change** in context of other actions and stresses.

NORTHEAST CLIMATE SCIENCE CENTER (NE-CSC)

- Management will engender
  - Innovative, practical and stakeholder identified research
  - Strong leadership from the primary research campus
  - Sustainable partnerships between each member of the Consortium
  - Engaged stakeholders (Federal, State, Tribal, NGOs, …..)



Climate Science Centers—Regions – All in Place

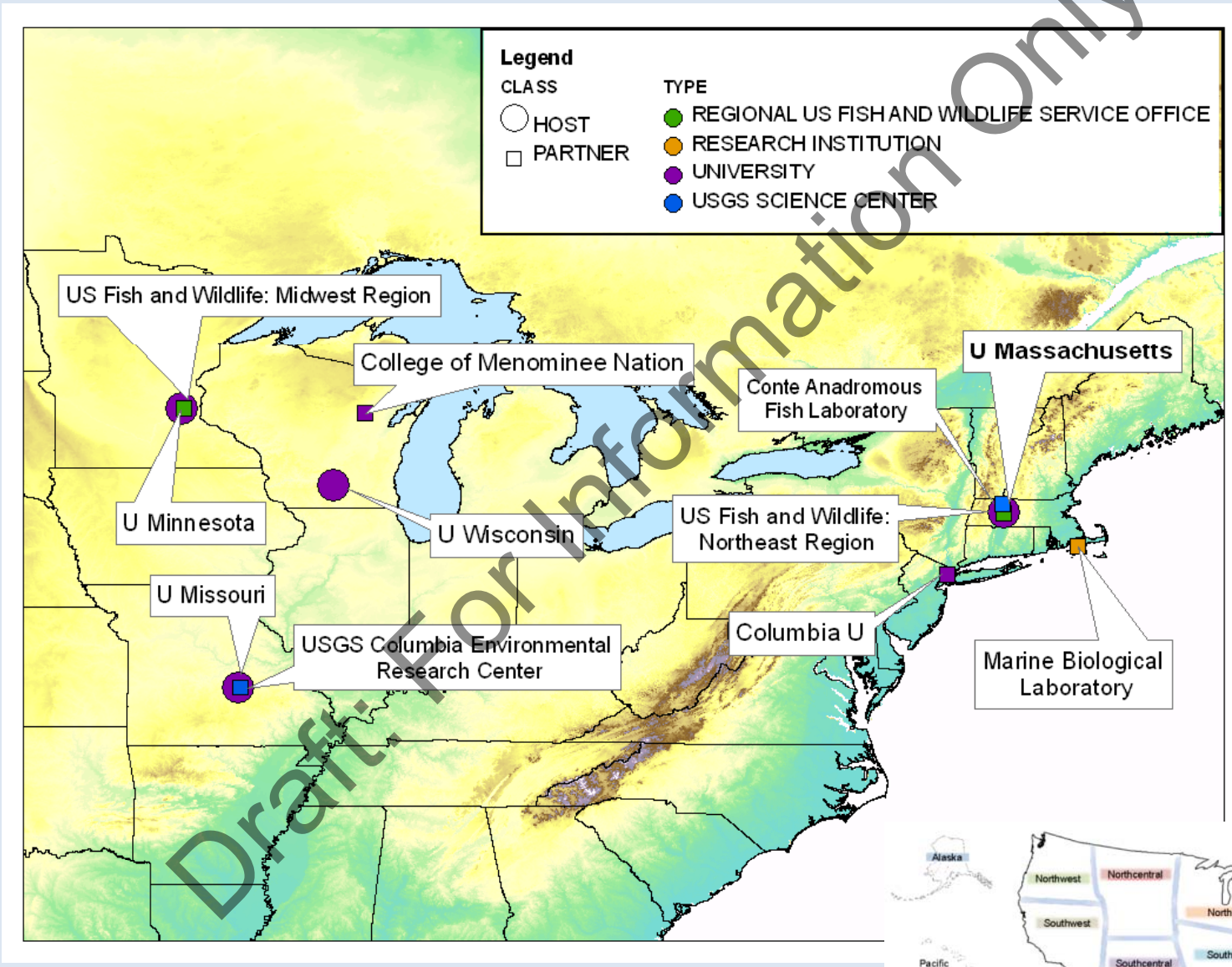


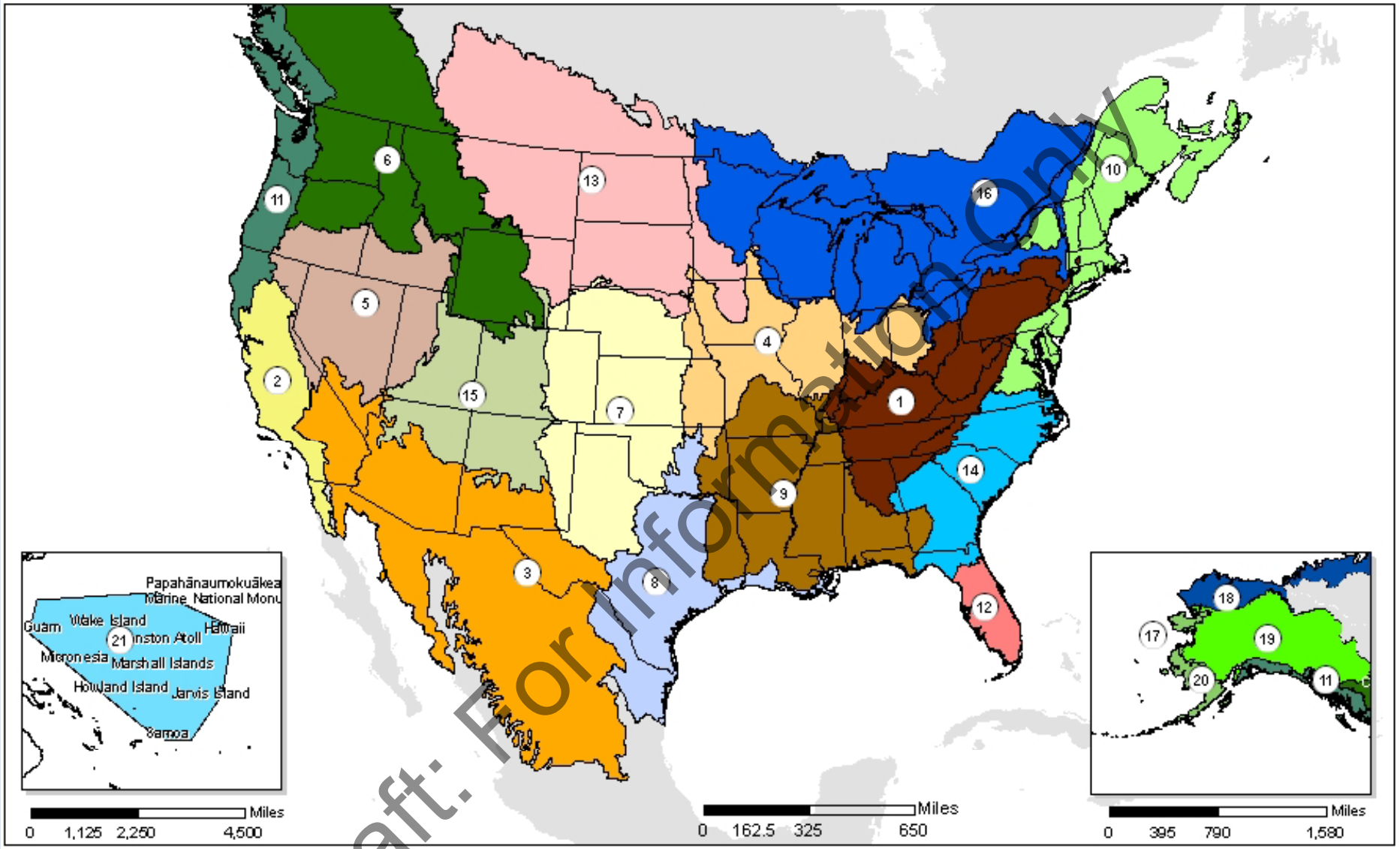
National Climate Change and Wildlife Science Center

"Fuzzy Boundaries"

USGS science for a changing world

Geographic Extent of the DOI Northeast Climate Science Center

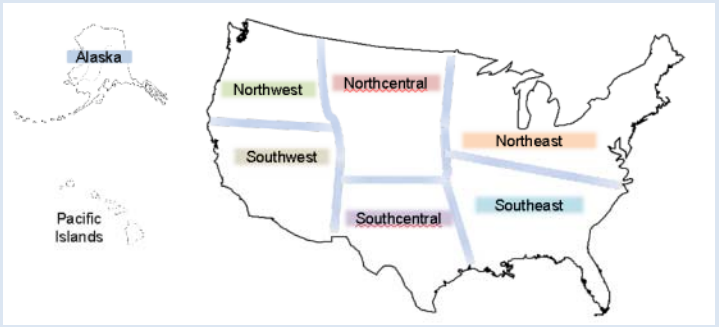




1. Appalachian
2. California
3. Desert
4. Eastern Tallgrass Prairie and Big Rivers
5. Great Basin
6. Great Northern
7. Great Plains
8. Gulf Coast Prairie
9. Gulf Coastal Plains and Ozarks
10. North Atlantic
11. North Pacific
12. Peninsular Florida
13. Plains and Prairie Potholes
14. South Atlantic
15. Southern Rockies
16. Upper Midwest and Great Lakes
17. Aleutian and Bering Sea Islands
18. Arctic
19. Northwestern Interior Forest
20. Western Alaska
21. Pacific Islands
Unclassified

Northeast Region

- 22 states, 10 of the 21 LCC regions, over 130 million people and multi-ecoregions
  - Extreme gradients in environments and threats
  - Limited federal lands, pattern of ownership and management dominated by relatively small and privately owned parcels
  - Complex history of species extirpations, invasions, range extensions, and restorations
  - Complex climate predictions of regional impacts
  - Wide array of stakeholders



Key CSC Characteristics

- University/federal cooperative – access capabilities feds don't have
- Training of grad students – pipeline
- Small federal staff
  - Filling regional gaps
  - Synthesis / assessment / aggregation
- $3-4 m/year, majority in flexible federal funds
- Will build significant cyber infrastructure network
    - At each CSC: university federal node
    - Eight nodes plus NCCWSC
    - Feeding LCCs and other application-oriented efforts (e.g. designed for more than researchers)

University of Massachusetts Amherst

Richard Palmer (Lead PI)

College of Menominee Nation

Melissa Cook (Lead PI)

Columbia University

Radley Horton (Lead PI)

Marine Biological Laboratory

Linda Deegan (Lead PI)

University of Minnesota

Anthony W. D'Amato (Lead

University of Missouri Columbia

Frank R Thompson III (Lead PI)

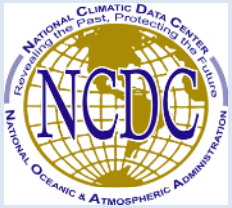
University of Wisconsin-Madison

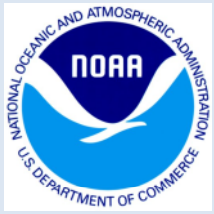
Lewis Gilbert (Lead PI)

Principal Partners and Customers

- Landscape Conservation Cooperators (6)
- DOI Natural Resource Agencies
- State Fish and Wildlife Agencies
- Multi-agency partnerships (Fish Habitat Partners)

Supporting Agencies/Organizations





American Bird Conservancy
Jane A. Fitzgerald, Ph.D. – *Central Hardwoods Joint Venture*

Consortium for Climate Risk in the Urban Northeast (CCRUN)
Cynthia Rosenzweig, Ph.D. – *Columbia University*

NOAA
Ellen L. Mecray – Regional Sciences Service Director, *Eastern Region*

The Nature Conservancy
Brian Richter - *Global Freshwater Program*
Sarene Marshall - *Global Climate Change Program*

U.S. Fish and Wildlife Service
James G. Geiger, Ph.D. – *Northeast Region*
Todd Jones-Farrand, Ph.D. - *Central Hardwoods Joint Venture*
Tom Will – *Midwest Region*
William B. Uihlein, III Ph.D. – *Southeast Region*

U.S. Forest Service
Logan Lee - *Eastern Region*
Michael J. Dockry - *Liaison to College of Menominee Nation*

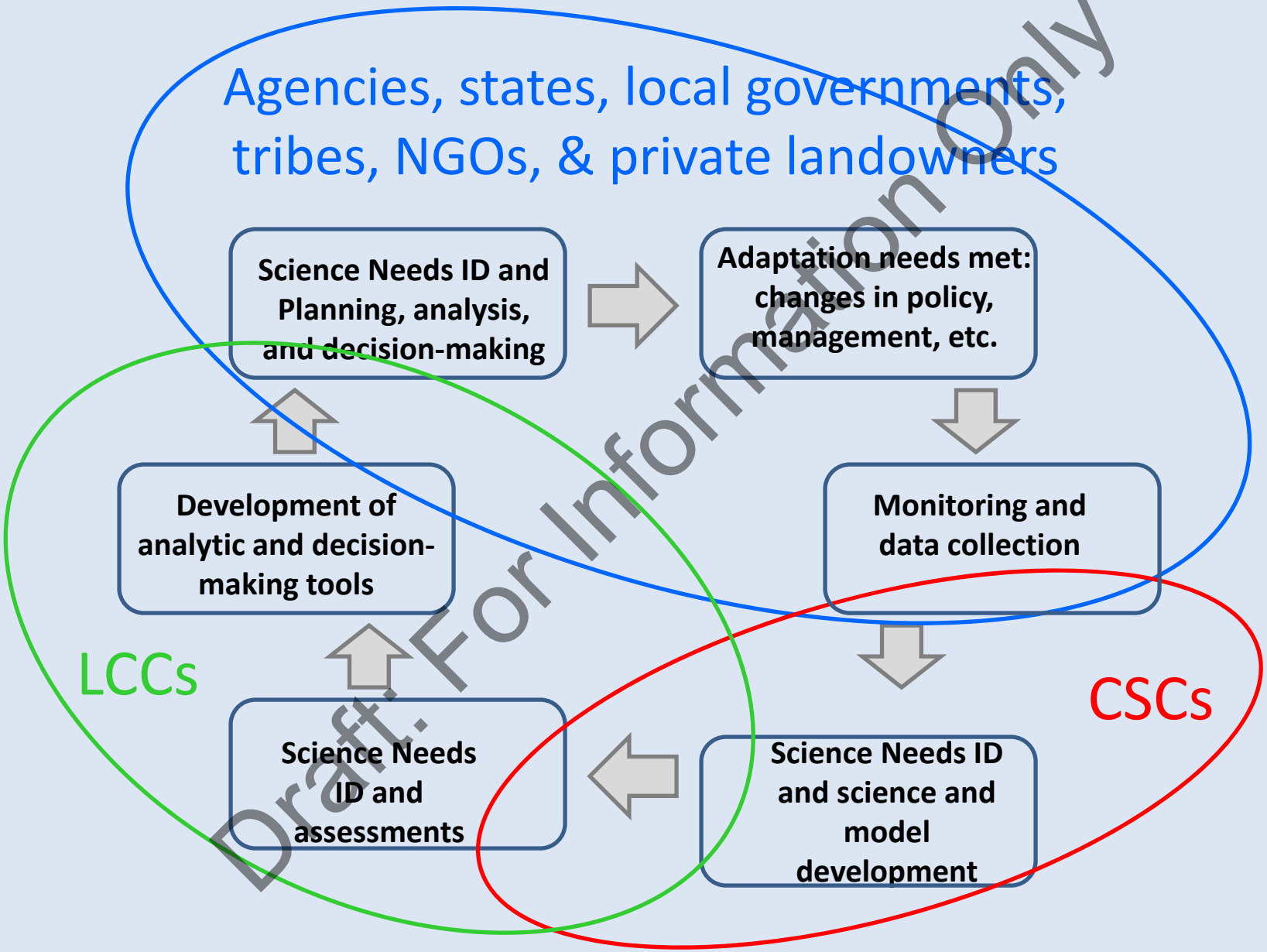
Existing Linkages with DOI

- USGS – Close Relationships
  - UMass - *Silvio O. Conte Anadromous Fish Research Laboratory*, USGS Science Centers
  - All four land grant universities host Water Science Centers and USGS Coops
  - University of Missouri – USGS sponsored Columbia *Environmental Research Center*
  - University of Minnesota and University of Wisconsin – *Upper Midwest Environmental Sciences Center*, focus on ecological modeling
  - Columbia University - *National Biological Information Infrastructure*

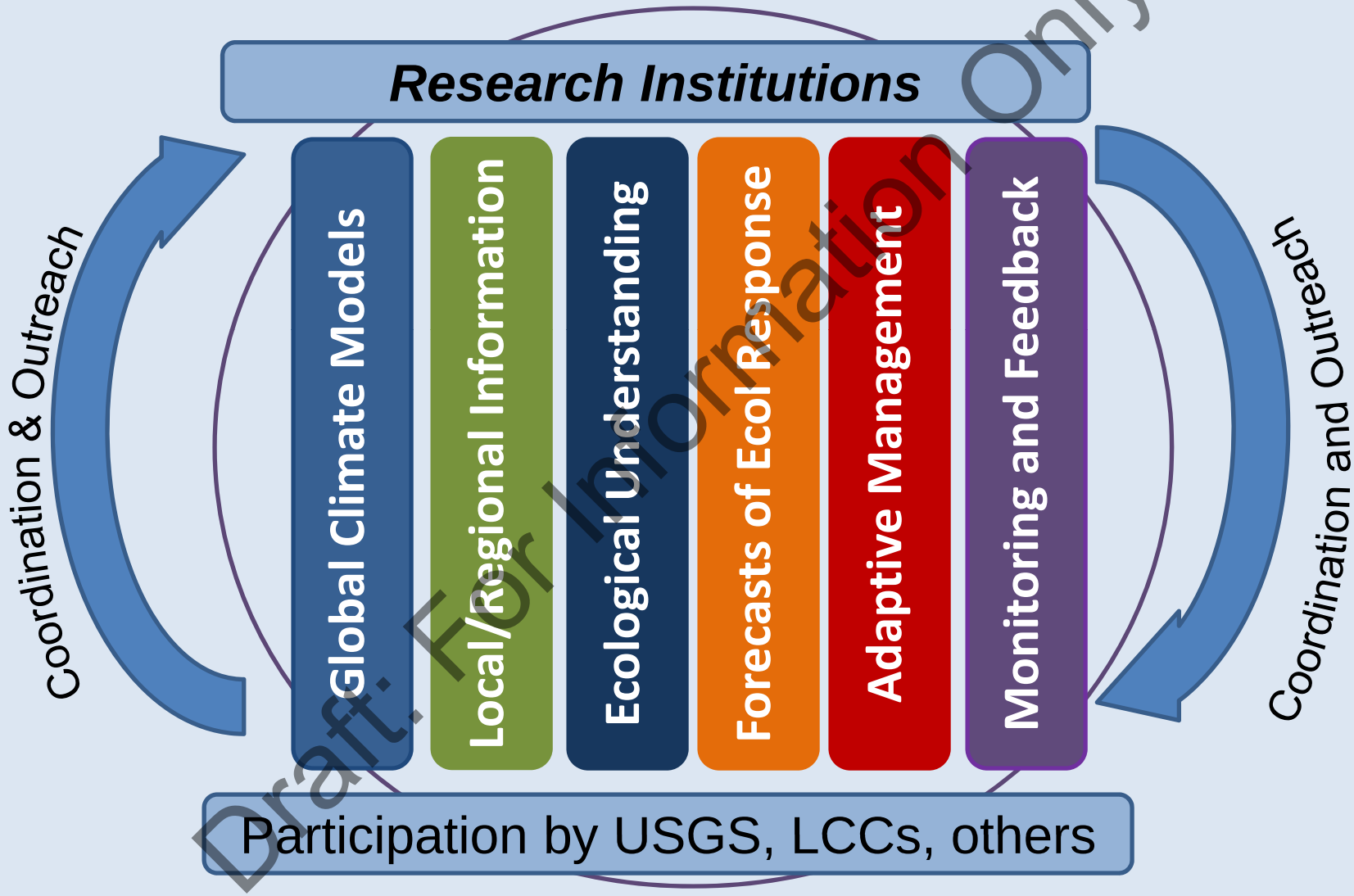
Existing Linkages with Potential Partners

- NOAA and NASA
  - CCRUN – *Consortium for Climate Risk in the Urban Northeast*
    - Columbia University Lead with UMass primary partner
    - Developing downscaled climate data and climate forecasts for "Northeast" that could be expanded to the "Northeast"
    - Project provides access to wide range of existing stakeholder
    - Emphasis on water resources, coastal processes, and health
  - *NOAA Sectoral Application Research Program (SARP)*
    - Use of climate informed forecasts for reservoir management

Climate Change Adaptation Conceptual Model



Broad Research Areas of NE-CSC



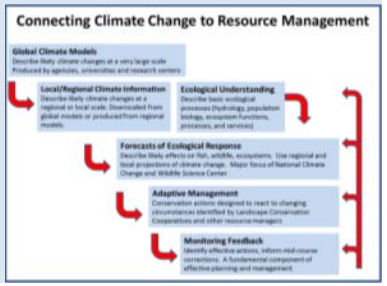
Initial Tasks

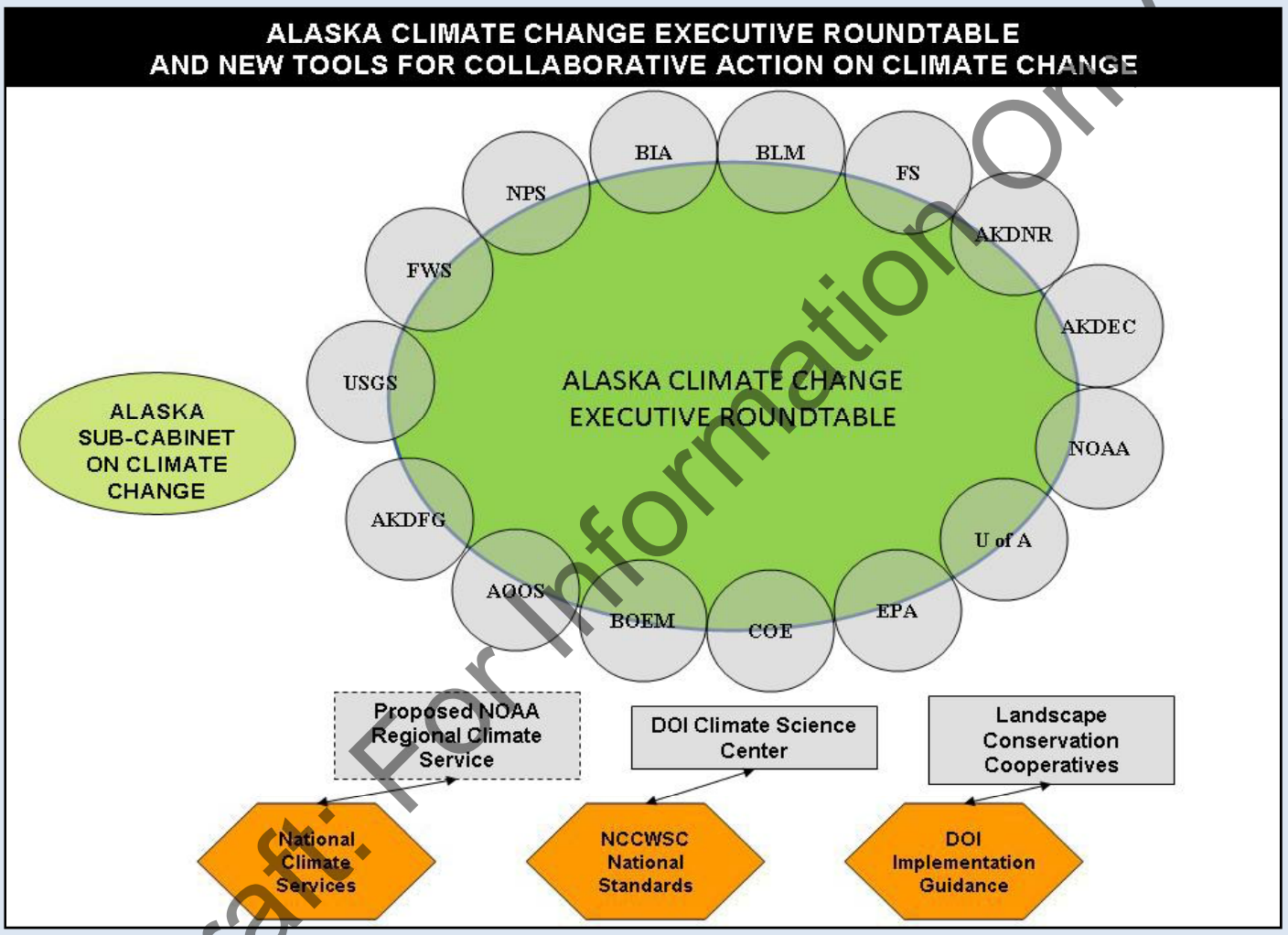
- Establish Start Up Team – "Kitchen Cabinet"
- Begin Process for Identifying and Creating Steering Committee and Advisory Board
- Outreach to Partners to Determine Science Needs from Partners (such as LCCs)
- Use this information to establish Science Plan
- Establish small team of permanent USGS Management and Science Staff
- Time Frame – 9 months

"Right Sizing" Management

Careful consideration was given to the appropriate size of this consortium

- Coordination of research is essential
- Provide adequate resources to ensure sustainable relationships (Buy-in)
- Based on history of success with stakeholders
- Modeled after other successful large scale research efforts (existing CSC and NOAA RISAs)
- Adaptively manage Consortium size and composition





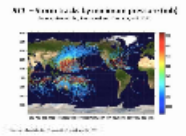
CSC Stakeholder Advisory Committees

Pay to Play – **NO**

Leveraging, Coordinating, Identifying Key Priorities – **YES**

Climate Change Impacts on the New England Environment

Videos:



Gary Yohe, Wesleyan University

"On the Economics of Framing Climate Policy: Pricing carbon and the (minimal) value added of updating economic damage estimates and other random thoughts"

more videos

Upcoming events:

There are no known events

UNDER REVIEW

Material on these pages is in reference to a proposal under review (Program Announcement No. G11AS20014) given to the Department of the Interior to establish a Northeast US Climate Science Center (NE-CSC)

A Proposal to the Department of the Interior to Establish the Northeast Climate Science Center

This site accompanies a proposal to the Department of the Interior to establish a Northeast US Climate Science Center (NE-CSC), hosted at the University of Massachusetts Amherst. The proposal initiates a consortium of seven institutions across the Northeast Region (as defined by the USGS), each contributing significant and unique expertise to the Northeast Region's climate challenge.

The links to the left will navigate through the majority of the proposal text and graphics, including an interactive bibliography. It is intended to enhance the proposal by providing direct links and ease of navigation.

Please don't hesitate to contact us with questions or feedback.

Points of Contact

Points of Contact for DOI – NE –CSC:

Rachel Muir – Interim Director

rmuir@usgs.gov

703-648-5114

Richard Palmer, Principal Investigator

University of Massachusetts

Palmer@ecs.umass.edu

413-545-2808

- On the web -- http://www.cns.umass.edu/neclimate/doi-csc/section-4-1

Northeast Aquatic Connectivity

ERIK MARTIN
THE NATURE CONSERVANCY

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207-619-3745

Overview

BACKGROUND: TEAM, PURPOSE & GOALS

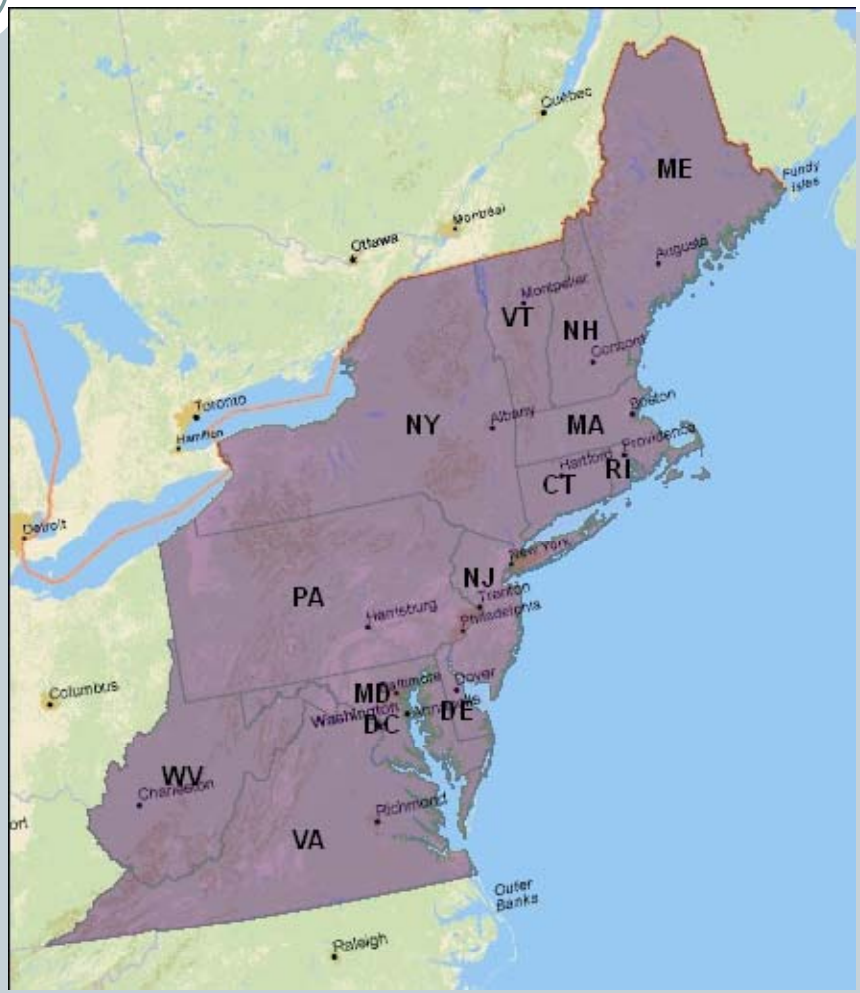
METHODS

RESULTS AND PRODUCTS

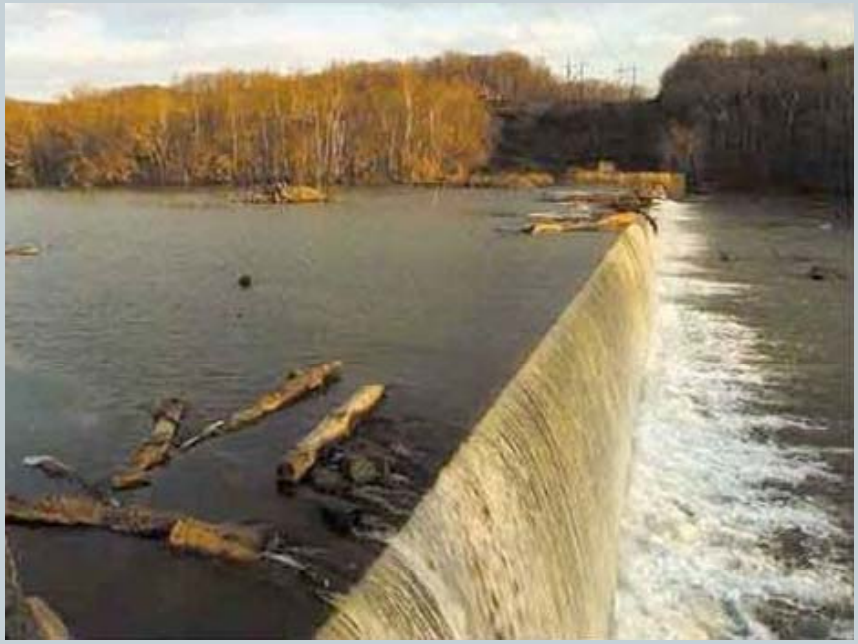
NEXT STEPS & IMPROVEMENTS

Project Team & Study Area

- Northeast Aquatic Connectivity Project.
  - Funded through NE Association of Fish and Wildlife Agencies
  - 13 state study area
- Northeast Aquatic Connectivity Workgroup:
  - State fish and wildlife agency staff (freshwater and/or marine)
  - Canadian provincial agency
  - NGO, academic, & federal reps
  - 40+ particpants
- Led by staff from The Nature Conservancy's Eastern U.S. Division



Purpose & Goals



- Help states to move from *opportunistic to* "***ecological-benefits***" approach to dam removal / fish passage improvement
- Produce a ***tiered list*** of dams in the Northeast U.S. based on their potential ecological benefit if removed / improved passage
- Develop a ***tool*** that allows managers to re-rank dams at multiple scales (state, HUC, etc) or using attribute filters (river size class, dam type, etc)

Uses

- Potential uses of results – From workgroup participants
  - Project evaluation
  - Communicating with owners/funders
  - Grant writing
  - 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

Methods

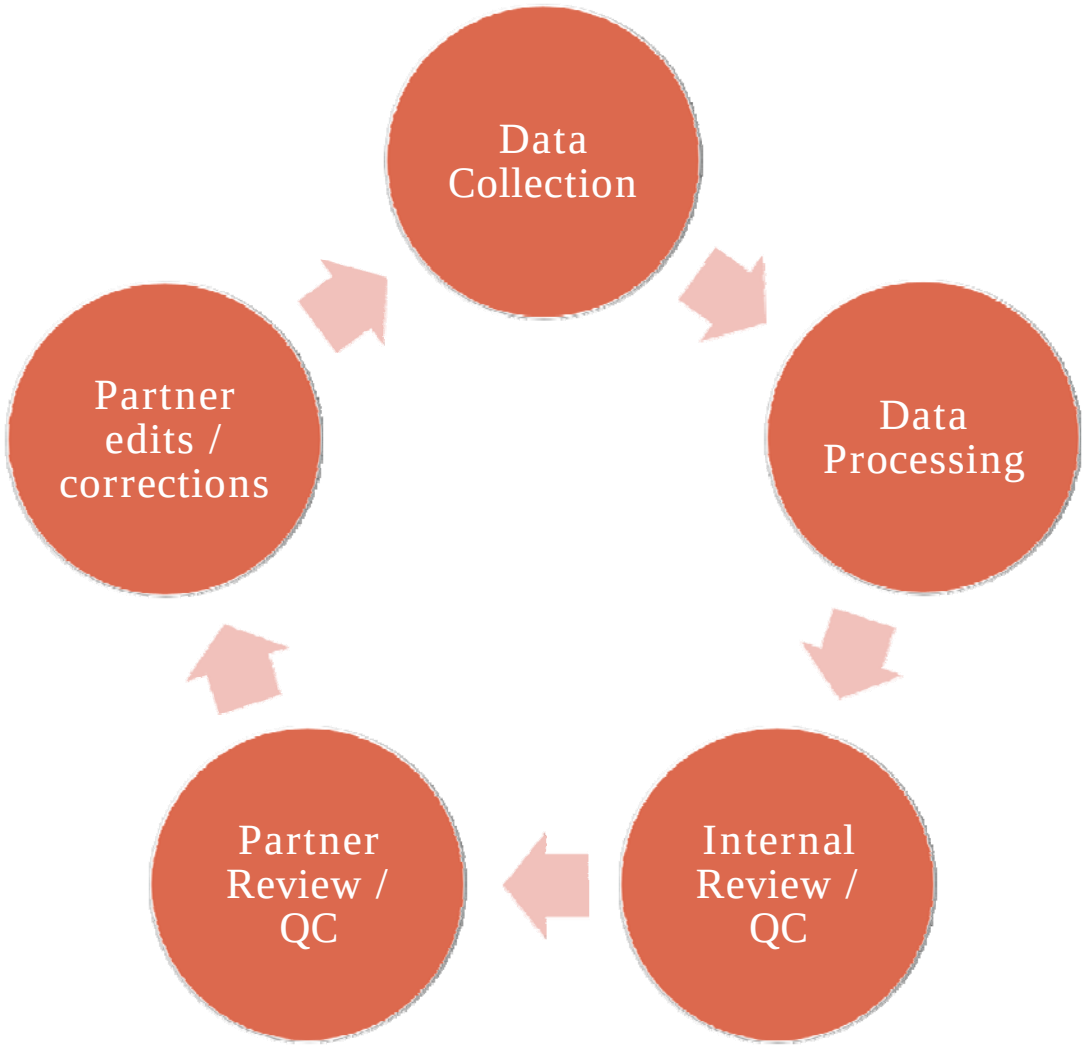
DATA PREPARATION

METRIC CALCULATION

RANKING

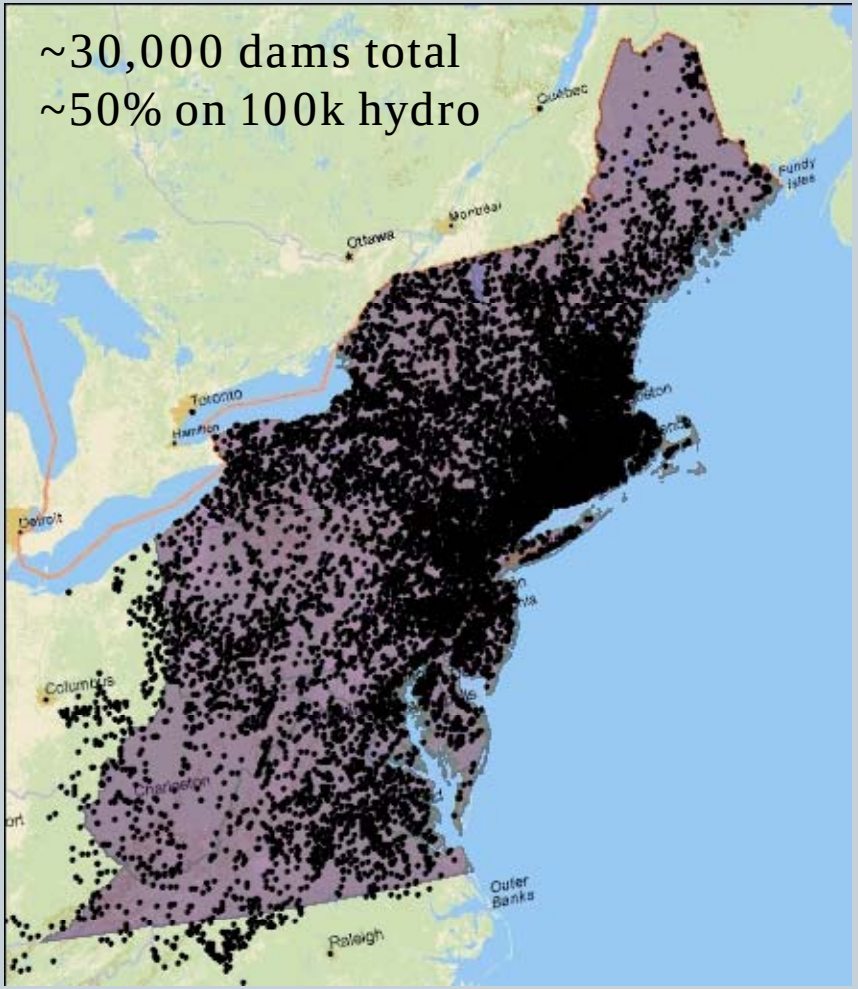
Data Preparation - GIS

- Dams
- Natural Waterfalls
- Anadromous Fish Habitat



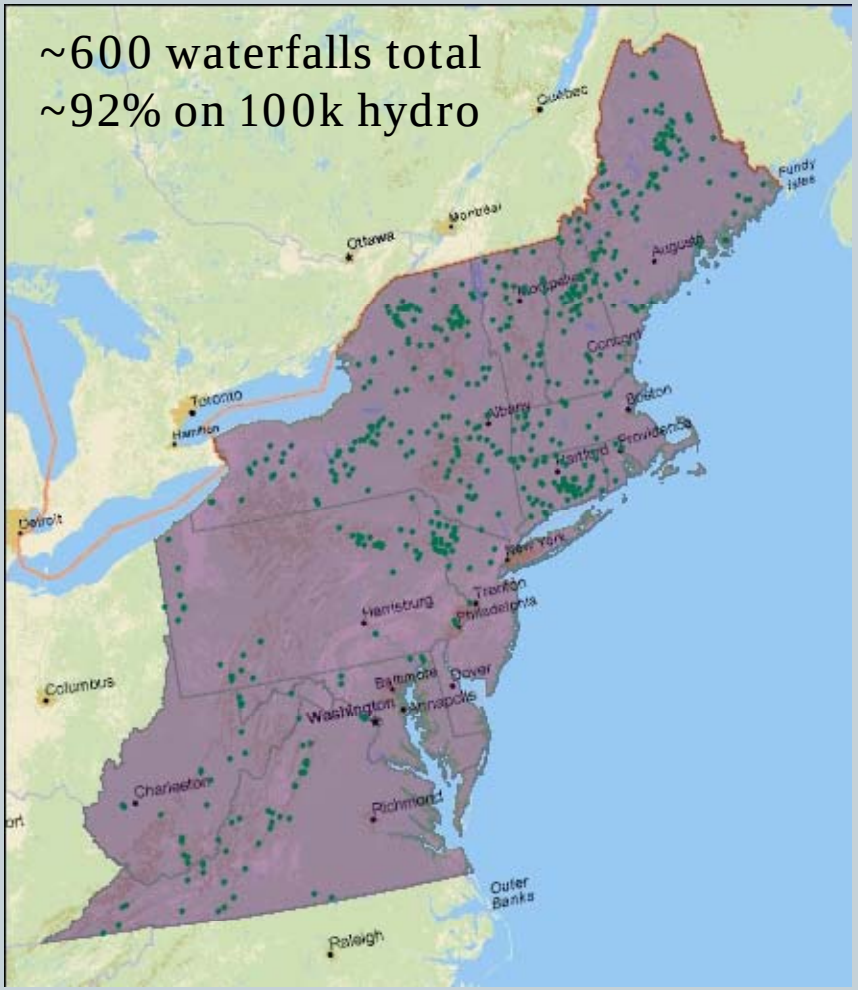
Dams – Primary Unit of Analysis

- Sources:
  - State databases
  - NID
  - GNIS
- Snapped to 1:100k NHD Plus – enables network analysis
  - Has the potential to introduce error: farm pond next to a mainstem river
- Automated error-checking flags to prioritize manual review
  - River name in dam database = river name in NHDPlus
  - Large dam snapped to a small stream
- TNC manually reviewed flagged dams
- Sent to state contacts for additional review / where TNC unable to make a determination



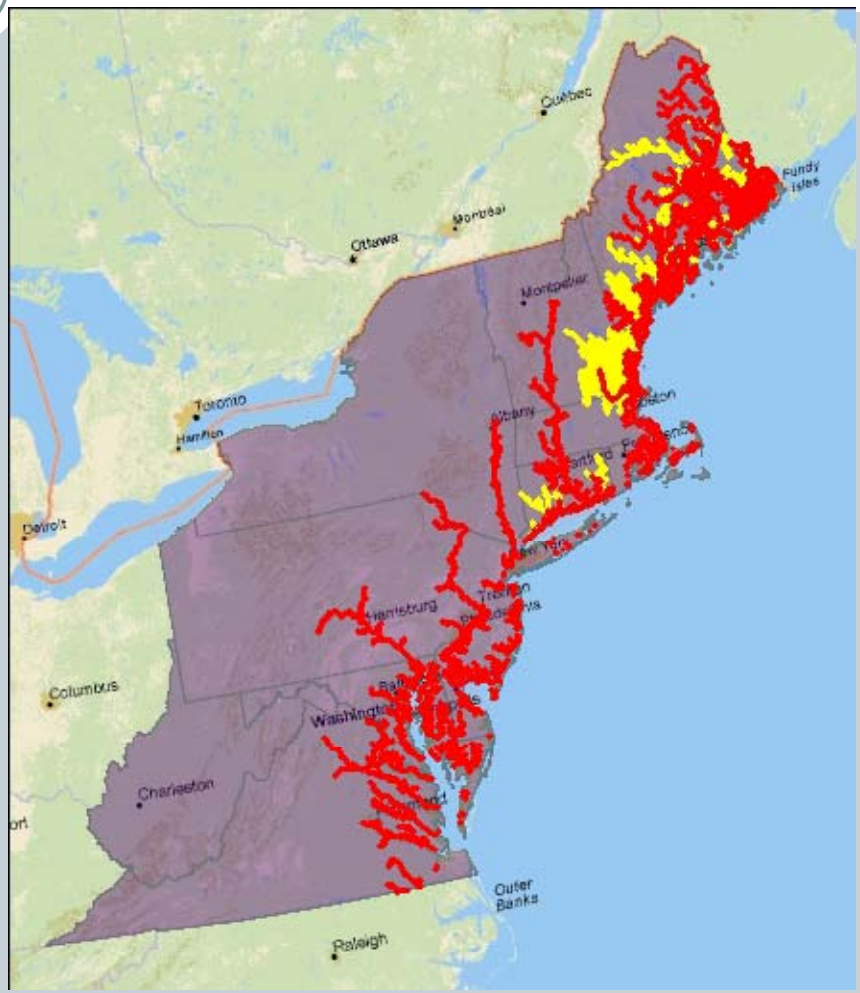
Waterfalls

- Sources
  - GNIS database
  - State biologists
- Snapped to 100k NHDPlus
- More limited review
  - Fewer attributes available (e.g. no RiverName to compare)
  - Less comprehensive data



Anadromous Fish

- Sources
  - ASMFC 2006
  - Houston et al. 2007 (Maine)
  - State biologists
- All data transferred to 1:100k NHDPlus
- 7 Anadromous Species
  - Alewife
  - blueback herring
  - American shad
  - hickory shad
  - Atlantic salmon
  - striped bass
  - Atlantic sturgeon
- Current & Historical presence



Additional Data

- NLCD 2001
  - Natural
  - Agricultural
  - Impervious
- TNC Conserved lands database
- Northeast Aquatic Habitat Classification (TNC)
  - Size class
  - Cold / cool water habitats
- Eastern Brook Trout Joint Venture data
- NatureServe
  - Fish species richness
  - Rare fish, mussels, crayfish
- Roads & Railroads (Esri)

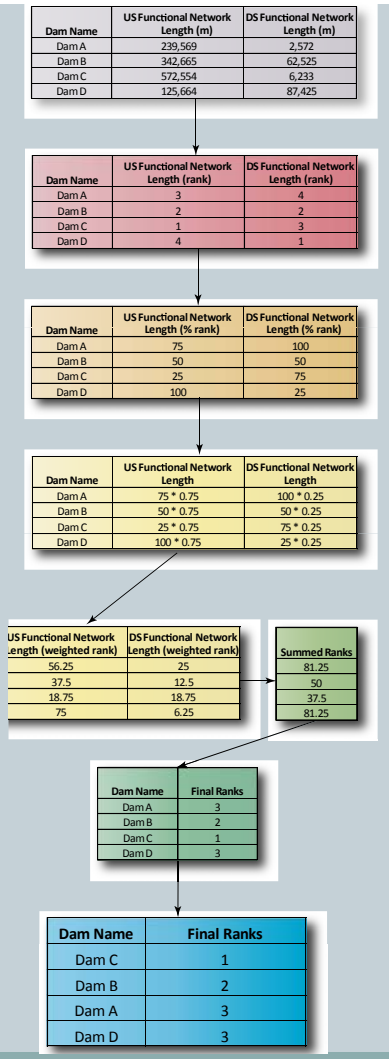
Metric Calculation

- Descriptive attributes in 5 categories calculated for all dams in GIS
  - Connectivity Status
  - Connectivity Improvement
  - Watershed & Local Condition
  - Ecological
  - Size Class
- Relative weights for metrics developed by NEAFWA workgroup
- Different weights for anadromous and resident fish scenarios

Attribute	ANADROMOUS	RESIDENT
Downstream Dam Count	0	0
Downstream Impassable Dam Count	15	
Upstream Dam Density	3	1
Downstream Dam Density	0	1
Distance to River Mouth from Dam	7	0
Upstream River Length	3	0
Density of Small (1:24k) Dams in Upstream Functional Network Local Watershed	5	3
Density of Small (1:24k) Dams in Downstream Functional Network Local Watershed	0	3
Density of Road & Railroad / Small Stream Crossings in Upstream Functional Network Local W	3	5
Density of Road & Railroad / Small Stream Crossings in Downstream Functional Network Loca	0	5
Number of Hydro Dams on Downstream Flowpath	5	0
Connectivity Status Subtotal	**41**	**18**
Upstream Functional Network Size	15	0
The total length of upstream and downstream functional network	0	20
Absolute Gain	2	10
Connectivity Improvement Subtotal	**17**	**30**
% Impervious Surface in Contributing Watershed	3	5
% Natural LC in Contributing Watershed	0	5
% Impervious Surface in ARA of Upstream Functional Network	2	2
% Impervious Surface in ARA of Downstream Functional Network	0	2
% Natural LC in ARA of Upstream Functional Network	5	2
% Natural LC in ARA of Downstream Functional Network	0	2
% Conserved Land within 100m Buffer of Upstream Functional Network	0	2
% Conserved Land within 100m Buffer of Downstream Functional Network	0	2
Watershed and Local Condition Metric Subtotal	**10**	**22**
Number of anadromous species present downstream	5	0
Presence of anadromous species (binary, yes/no)	20	0
Current # of rare (G1-G3) fish species in HUC8 (Max #)	0	3
Current # of rare (G1-G3) mussel species in HUC8 (Max #)	0	3
Current # of rare (G1-G3) crayfish species in HUC8 (Max #)	0	1
Current "Healthy" Eastern Brook Trout in upstream functional network (EBTJV dataset)	0	8
Current Native fish species richness - HUC 8 (Max #)	0	3
Ecological Metric Subtotal	**25**	**18**
River Size Class	5	0
Number of upstream size classes >0.5 miles gained by removal	2	0
Miles Gained of Cold Water Habitat (any stream size)	0	7
Total Reconnected # stream sizes >0.5 mile (upstream + downstream)	0	5
Size Metric Subtotal	**7**	**12**
Sum of Weights (MUST =100)	**100**	**100**

Ranking

- This example ranks 4 hypothetical dams based on 2 metrics
- Simple, transparent



Dam Name	US Functional Network Length (m)	DS Functional Network Length (m)
Dam A	239,569	2,572
Dam B	342,665	62,525
Dam C	572,554	6,233
Dam D	125,664	87,425

Dam Name	US Functional Network Length (rank)	DS Functional Network Length (rank)
Dam A	3	4
Dam B	2	2
Dam C	1	3
Dam D	4	1

Dam Name	US Functional Network Length (% rank)	DS Functional Network Length (% rank)
Dam A	75	100
Dam B	50	50
Dam C	25	75
Dam D	100	25

Dam Name	US Functional Network Length	DS Functional Network Length
Dam A	75 * 0.75	100 * 0.25
Dam B	50 * 0.75	50 * 0.25
Dam C	25 * 0.75	75 * 0.25
Dam D	100 * 0.75	25 * 0.25

US Functional Network Length (weighted rank)	DS Functional Network Length (weighted rank)
56.25	25
37.5	12.5
18.75	18.75
75	6.25

Summed Ranks
81.25
50
37.5
81.25

Dam Name	Final Ranks
Dam A	3
Dam B	2
Dam C	1
Dam D	3

Dam Name	Final Ranks
Dam C	1
Dam B	2
Dam A	3
Dam D	3

Ranking

All dams are sequentially ranked for all attributes.

Dam Name	US Functional Network Length (m)	DS Functional Network Length (m)
Dam A	239,569	2,572
Dam B	342,665	62,525
Dam C	572,554	6,233
Dam D	125,664	87,425

Dam Name	US Functional Network Length (rank)	DS Functional Network Length (rank)
Dam A	3	4
Dam B	2	2
Dam C	1	3
Dam D	4	1

Ranking

Ranks are converted to a % scale. This is necessary for "apples-to-apples" comparisons when metric values are not continuous variables

Dam Name	US Functional Network Length (rank)	DS Functional Network Length (rank)
Dam A	3	4
Dam B	2	2
Dam C	1	3
Dam D	4	1

Dam Name	US Functional Network Length (% rank)	DS Functional Network Length (% rank)
Dam A	75	100
Dam B	50	50
Dam C	25	75
Dam D	100	25

Ranking

Multiply % ran by attribute weight. In this example:

US Functional Network Length = 75

DS Functional Network Length = 25

Dam Name	US Functional Network Length (% rank)	DS Functional Network Length (% rank)
Dam A	75	100
Dam B	50	50
Dam C	25	75
Dam D	100	25

Dam Name	US Functional Network Length	DS Functional Network Length
Dam A	75 * 0.75	100 * 0.25
Dam B	50 * 0.75	50 * 0.25
Dam C	25 * 0.75	75 * 0.25
Dam D	100 * 0.75	25 * 0.25

Ranking

Sum weighted ranks. All metrics which are included (weight >0) are summed to result in a summed rank.

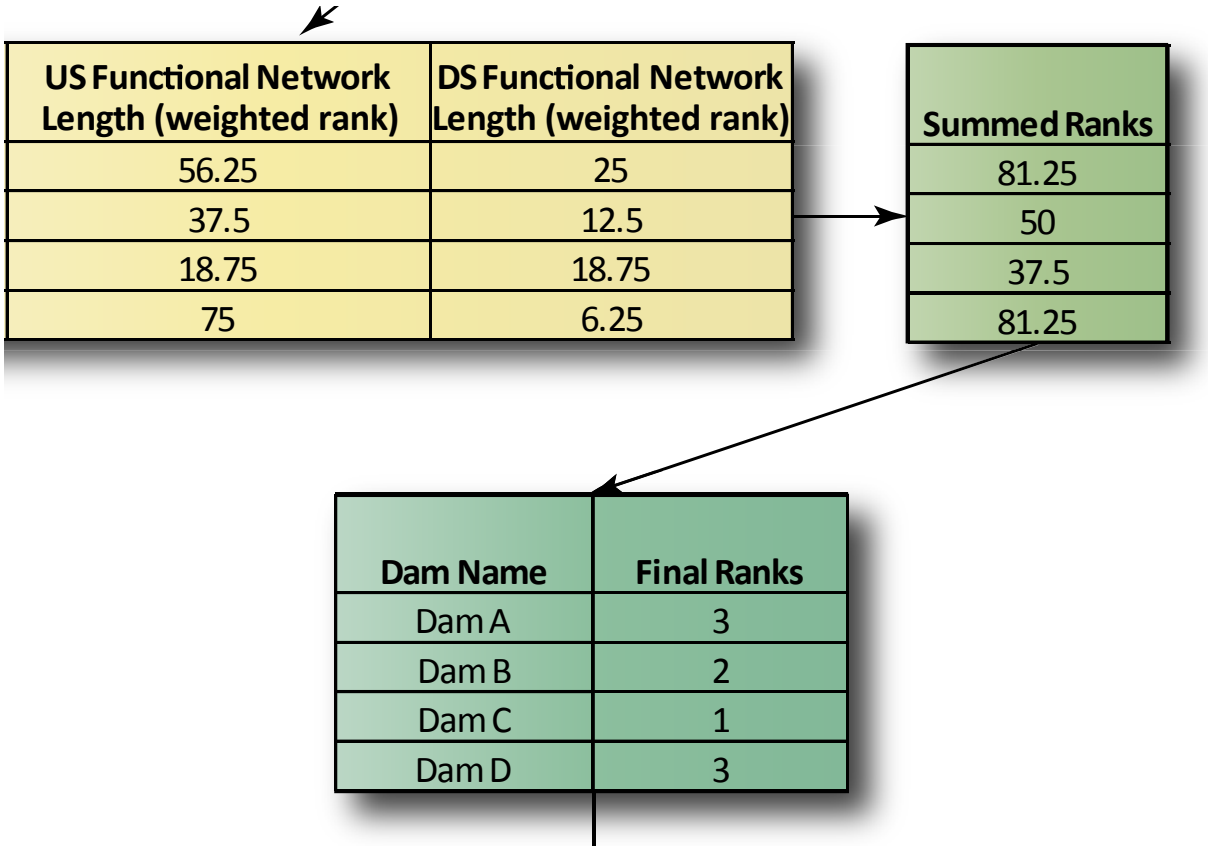
Dam Name	US Functional Network Length	DS Functional Network Length
Dam A	75 * 0.75	100 * 0.25
Dam B	50 * 0.75	50 * 0.25
Dam C	25 * 0.75	75 * 0.25
Dam D	100 * 0.75	25 * 0.25

US Functional Network Length (weighted rank)	DS Functional Network Length (weighted rank)
56.25	25
37.5	12.5
18.75	18.75
75	6.25

Summed Ranks
81.25
50
37.5
81.25

Ranking

Re-rank summed ranks. The summed ranks are in turn ranked



US Functional Network Length (weighted rank)	DS Functional Network Length (weighted rank)
56.25	25
37.5	12.5
18.75	18.75
75	6.25

Summed Ranks
81.25
50
37.5
81.25

Dam Name	Final Ranks
Dam A	3
Dam B	2
Dam C	1
Dam D	3

Ranking

The final ranks are sorted for presentation.

Dam Name	Final Ranks
Dam A	3
Dam B	2
Dam C	1
Dam D	3

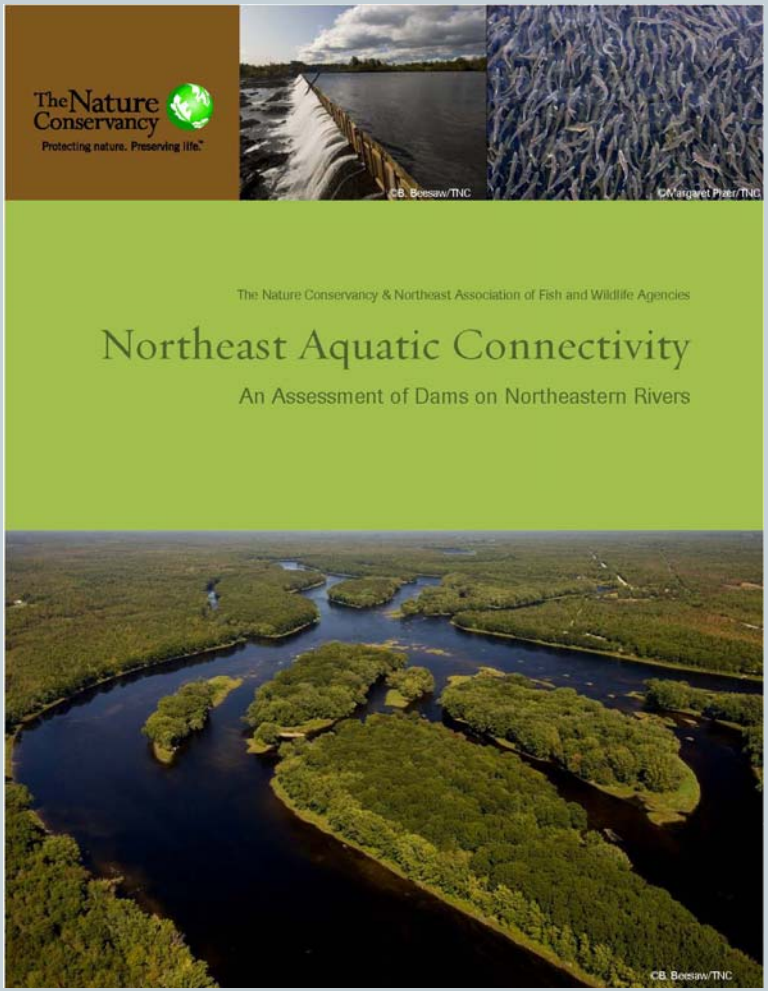
Dam Name	Final Ranks
Dam C	1
Dam B	2
Dam A	3
Dam D	3

Results and Products

DRAFT

JUNE, 2011

NAC Report



1. Executive Summary
2. Background, Approach & Outcomes
3. Data Collection, Data Preprocessing & Data Gaps
4. Methods and Software Developed
5. Assessment Results
6. Northeast Aquatic Connectivity Strategy
7. Conclusion
8. References
9. Appendices

Results

"Default" results calculated using workgroup defined metric weights

Northeast Aquatic Connectivity

Anadromous Fish Benefits Scenario Results

Please refer to the NE Aquatic Connectivity report for a detailed description of these results, analysis methods, and other important information regarding the interpretation of these results.

Note: These results are sorted alphabetically within each result tier by default but can be sorted in any way chosen by the user. For example, to sort dams within a state: **1)** Highlight the entire first row of data by clicking on the "10" at the beginning of Row 10. **2)** On the "Data" tab click the large "Sort" button. **3)** Choose "Expand the Selection" **4)** If the header row (Row 9) gets highlighted, check the "My data has headers" box **5)** Under the "Sort by" dropdown select "State" **6)** Click "Add a Level" and choose either "Tiered results" or "Overall Results Rank" . If you want to sort alphabetically by dam name within a tier within a state, add a 3rd sort level and choose "Dam Name" from the dropdown. **7)** You can then filter out unwanted states using the filter dropdown in the State column (cell C9).

						Result Ranks								
								Categorical Metric Ranks						
	State	Dam Name	Stream Name (NHD)	Town (ZIP overlay)	HUC12 Name	Tiered Results (5% Bins)	Overall Results Ran	Connectivity Status	Connectivity Improveme	Watershed & Local Condition	Ecological	Size Rank	Size Class
10	ME	Abenaquis Dam	Kennebec River	Madison	Getchell Brook-Kennebec River	1	564	8706	3435	3653	7	11	3b - Med. Mainster
11	VA	ACCOTINK DAM	Accotink Creek	Springfield	Accotink Creek	1	431	3885	740	12357	2	24	1b - Creek
12	PA	ADAM T. BOWER MEMORIAL	Susquehanna River		Hallowing Run-Susquehanna River	1	600	12778	1	9166	5	5	5 - Great River
13	RI	ADAMSVILLE POND		Westport	Westport River-Frontal Rhode Island	1	594	2129	3653	7392	6	24	1b - Creek
14	VA	ADKINS DAM	Johnchecohunk Swa	Waverly	Johnchecohunk Swamp-Cypress S	1	439	1741	5559	945	4	25	1a - Headwater
15	ME	Alamoosook Dam	Narramissic River	Orland	Alamoosook Lake	1	15	983	413	3273	5	7	2 - Small River
16	ME	Alder Brook Dam	Grendell Brook	Mapleton	Alder Brook	1	264	2398	1515	1223	7	24	1b - Creek
17	VA	ALLENS MILL DAM	Heartquake Creek	Mattaponi	Heartquake Creek-Mattaponi River	1	276	482	6227	303	3	25	1a - Headwater
18	NJ	ALLOWAY LAKE DAM	Alloway Creek	Woodstown	Upper Alloway Creek	1	277	3024	1409	6096	2	24	1b - Creek
19	ME	Anson Station Dam	Kennebec River	Anson	Getchell Brook-Kennebec River	1	686	11934	315	4003	7	10	3b - Med. Mainster
20	VA	AQUIA CREEK DAM	Aquia Creek	Stafford	Lower Aquia Creek	1	147	6230	454	5635	2	7	2 - Small River
21	VA	ASHLAND MILL DAM	South Anna River	Ashland	Cedar Creek-South Anna River	1	121	4566	374	4254	3	21	3a - Med. Trib. Rive
22	CT	ASPINOOK POND DAM	Quinebaug River	Jewett City	Cory Brook-Quinebaug River	1	626	10646	447	8293	5	16	3a - Med. Trib. Rive
23	MA	Assawompset Pond Dam	Nemasket River	Lakeville	Nemasket River	1	420	6735	1888	4994	6	7	2 - Small River
24	MD	ATKISSON DAM	Winters Run	Joppa	Lower Winters Run	1	69	1017	389	10340	5	7	2 - Small River
25	NJ	ATSION LAKE DAM	Mullica River	Shamong	Upper Mullica River	1	262	1136	952	6058	6	24	1b - Creek
26	VA	AVERY DAM	Otterdam Swamp	Spring Grove	Otterdam Swamp	1	198	2526	2652	812	4	24	1b - Creek
27	VA	AYLETT MILL DAM	Aylett Creek	Aylett	Aylett Creek-Mattaponi River	1	512	4249	3825	4543	3	24	1b - Creek
28	VA	BAKERS DAM		Disputanta	Second Swamp	1	300	3404	2824	1749	4	24	1b - Creek
29	VA	BALLS MILLPOND DAM	Balls Branch	Lancaster	Lancaster Creek	1	143	889	3433	2478	2	24	1b - Creek
30	ME	Bar Mills Dam	Saco River	Hollis Center	Stony Brook-Salmon Falls	1	379	3907	1001	5933	4	18	3b - Med. Mainster
31	VA	BARLOWS POND DAM	Skimino Creek	Williamsburg	Skimino Creek-York River	1	486	1826	5198	5417	3	24	1b - Creek
32	VA	BARR DAM		Hume	Buck Run-Rappahannock River	1	368	6729	3527	7032	2	7	
33	MD	BARREN CREEK DAM	Barren Creek	Mardela Springs	Barren Creek-Nanticoke River	1	193	823	1362	9045	3	24	1b - Creek
34	VA	BARRICKS DAM	Mill Creek	Wake	Locklies Creek-Rappahannock Rive	1	244	512	4797	2851	2	25	1a - Headwater
35	MA	Barstons Pond Dam	Cotley River	East Taunton	Cotley River-Taunton River	1	572	1431	3287	10514	4	24	1b - Creek
36	NY	BASHAKILL WILDLIFE MANAGE	Basher Kill	Cuddebackville	Basher Kill	1	357	11458	470	4015	4	7	2 - Small River
37	VA	BASKERVILLE MILL DAM	Nottoway River	MC Kenney	Waqua Creek	1	168	5310	219	3996	4	21	3a - Med. Trib. Rive
38	ME	Batson River Dam	Batson River	Kennebunkport	Batson River-Goosefare Bay	1	500	456	3896	4386	7	24	1b - Creek
39	NJ	BATSTO DAM	Batsto River	Egg Harbor City	Batsto River	1	115	5594	322	3076	6	7	2 - Small River
40	VA	BATTERSEA DAM	Appomattox River	Petersburg	Oldtown Creek-Appomattox River	1	356	9794	2068	6878	3	11	3b - Med. Mainster
41	VA	BAYLORS DAM	Baylors Creek	Caret	Elmwood Creek	1	185	1651	2949	3311	2	24	1b - Creek
42	NJ	Beaver Club Dam	Sluice Creek	Cape May Court H	Dennis Creek	1	197	302	2896	3743	6	24	1b - Creek
43	MD	BEAVERDAM CREEK WEIR	Beaverdam Branch	Cordova	Kings Creek	1	367	1301	3221	8598	3	24	1b - Creek
44	VA	BEAZLEY DAM	Parrotts Creek	Jamaica	Parrotts Creek-Rappahannock Rive	1	419	269	8039	1191	2	25	1a - Headwater
45	VA	BELSCHES DAM	Moores Swamp	Carson	Jones Hole Swamp-Moores Swamp	1	230	4747	703	3013	4	24	1b - Creek
46	NY	BERLIN FARM DAM	Shin Creek	Livingston Manor	Middle Beaver Kill	1	590	4995	4014	1358	4	24	1b - Creek
47	VA	BIGLER MILL DAM		Williamsburg	Jones Creek-York River	1	679	176	8860	4073	3	25	1a - Headwater

NAC Anadromous Results | NAC Resident Results | NAC Scenario Weights

Ready 70%

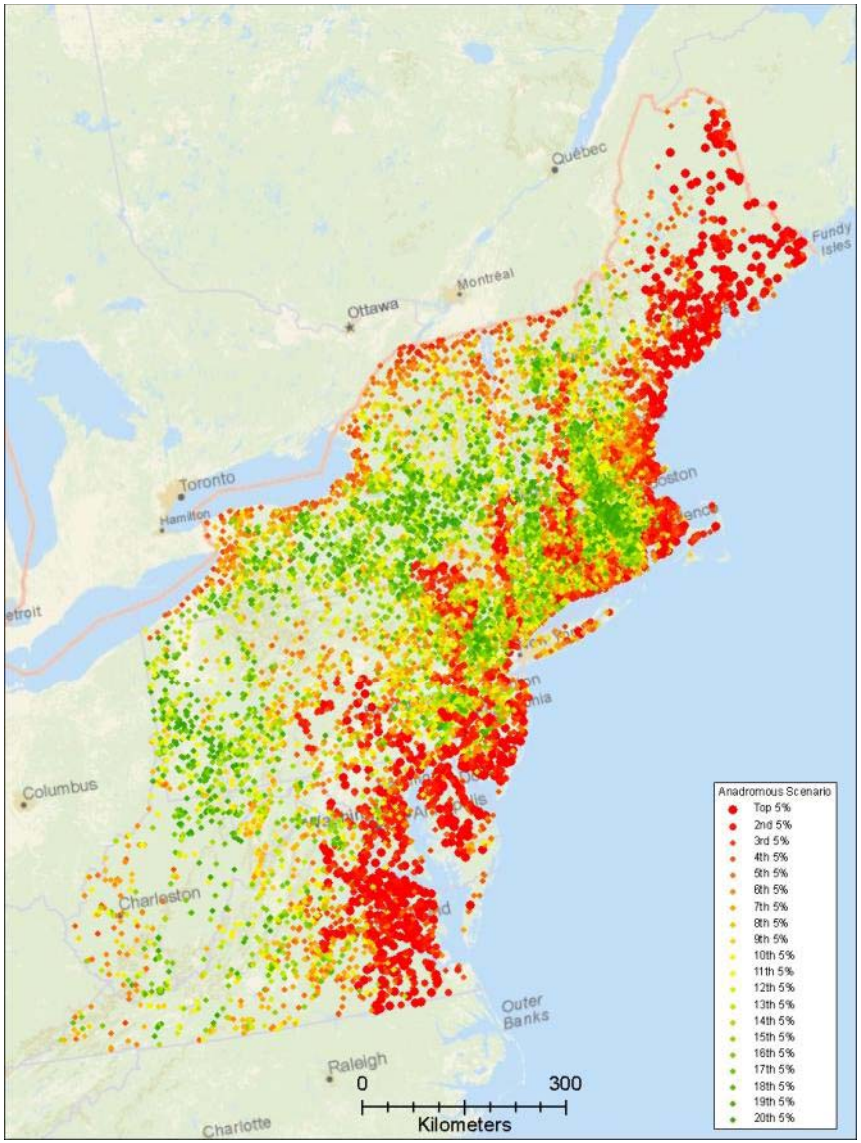
Anadromous fish weighting scenario

Results tiered into 5% bins-- the precise order isn't as meaningful as the broad order

Driven by

Anadromous fish data

Upstream network length

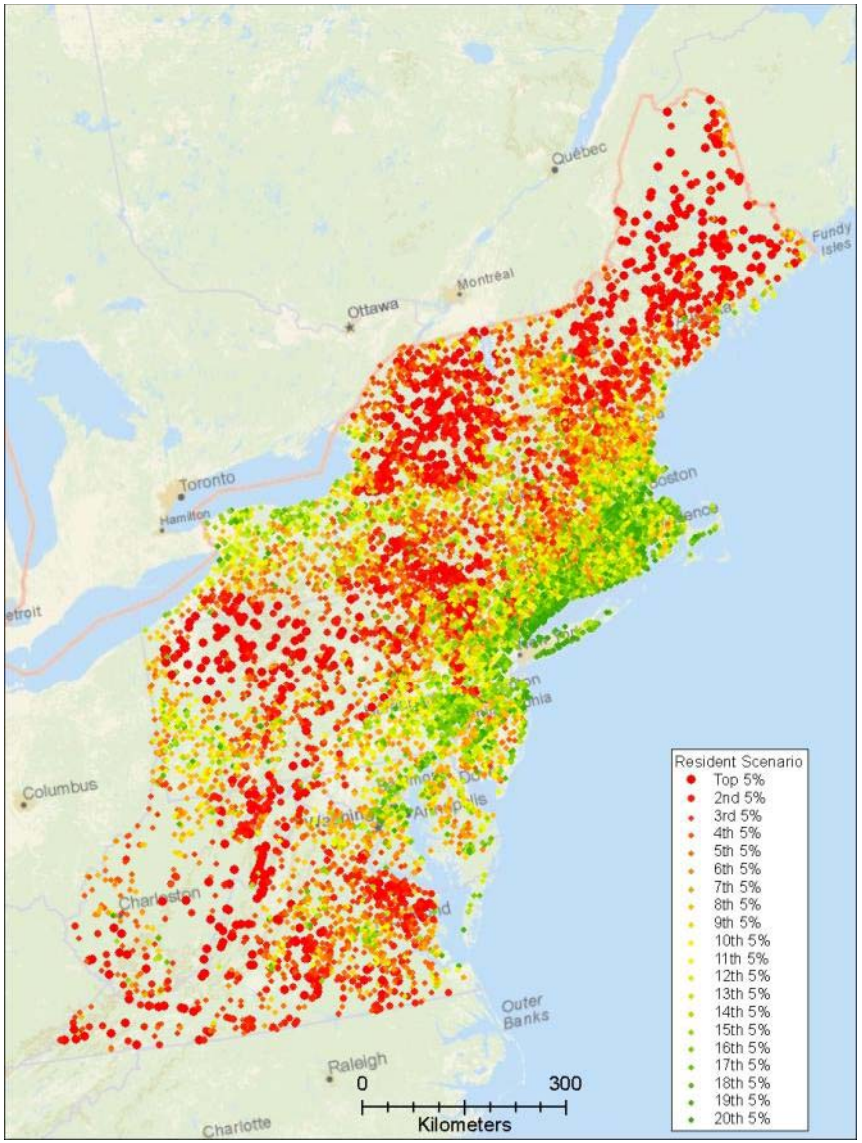


Resident Fish Weighting Scenario

Driven by:

Total length of re-combined connected network

Watershed metrics (e.g. landcover, impervious surface)



NCAT

User Inputs

The Nature Conservancy — Protecting nature. Preserving life.

Northeast Connectivity Assessment Tool

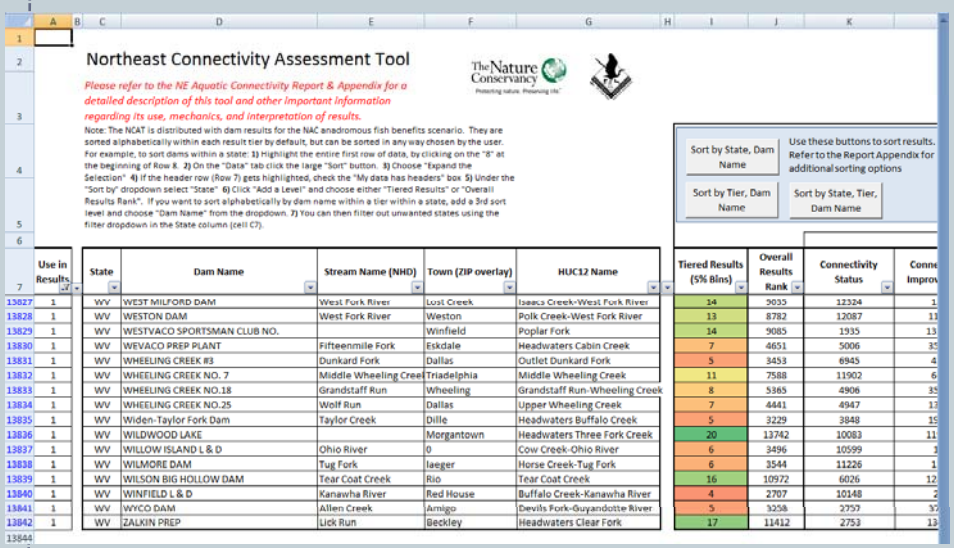
	Attribute	Weight (Sum total MUST =100)
Connectivity Status	Upstream Dam Count †	0
	Downstream Dam Count †	0
	Downstream Impassable Dam Count †	15
	Upstream Dam Density †	3
	Downstream Dam Density †	0
	Distance to River Mouth from Dam †	7
	Upstream River Length ↓	3
	Density of Small (1:24k) Dams in Upstream Functional Network Local Watersh †	5
	Density of Small (1:24k) Dams in Downstream Functional Network Local Wate †	0
	Density of Road & Railroad / Small Stream Crossings in Upstream Functional †	3
	Density of Road & Railroad / Small Stream Crossings in Downstream Functio †	0
	Number of Hydro Dams on Downstream Flowpath †	5
	Total Reconnected Network Miles in Creeks ↓	0
	Total Reconnected Network Miles in Small Rivers ↓	0
	Total Reconnected Network Miles in Medium Tributary Rivers ↓	0
	Total Reconnected Network Miles in Medium Mainstem Rivers ↓	0
	Total Reconnected Network Miles in Large Rivers ↓	0
	Total Reconnected Network Miles in Great Rivers ↓	0
	Size Metric Subtotal	7
	Sum of Weights (MUST =100)	**100**

Scale of Interest	
Enter one of the following: **HUC8 code**, **HUC10 code**, **HUC10 name***, **2-letter state abbreviation**. If the box is left blank, the entire region will be ranked.	MA

*If used, HUC 10 name must match exactly as it is stored in the database(not case sensitive)

Calculate categorical ranks? (slows calculation). Enter "Yes" or leave blank

Outputs



Northeast Connectivity Assessment Tool

Please refer to the NE Aquatic Connectivity Report & Appendix for a detailed description of this tool and other important information regarding its use, mechanics, and interpretation of results.

Note: The NCAT is distributed with dam results for the NAC anadromous fish benefits scenario. They are sorted alphabetically within each result tier by default, but can be sorted in any way chosen by the user. For example, to sort dams within a state: 1) Highlight the entire first row of data, by clicking on the "8" at the beginning of Row 8. 2) On the "Data" tab click the large "Sort" button. 3) Choose "Expand the Selection" 4) If the header row (Row 7) gets highlighted, check the "My data has headers" box 5) Under the "Sort by" dropdown select "State" 6) Click "Add a Level" and choose either "Tiered Results" or "Overall Results Rank". If you want to sort alphabetically by dam name within a tier within a state, add a 3rd sort level and choose "Dam Name" from the dropdown. 7) You can then filter out unwanted states using the filter dropdown in the State column (cell C7).

Sort by State, Dam Name | Sort by Tier, Dam Name | Sort by State, Tier, Dam Name

Use these buttons to sort results. Refer to the Report Appendix for additional sorting options

	Use in Results	State	Dam Name	Stream Name (NHD)	Town (ZIP overlay)	HUC12 Name	Tiered Results (5% Bins)	Overall Results Rank	Connectivity Status	Conne Improv
13827	1	WV	WEST MILFORD DAM	West Fork River	Lost Creek	Isaacs Creek-West Fork River	14	9035	12324	1
13828	1	WV	WESTON DAM	West Fork River	Weston	Polk Creek-West Fork River	13	8782	12087	1
13829	1	WV	WESTVACO SPORTSMAN CLUB NO.		Winfield	Poplar Fork	14	9085	1935	13
13830	1	WV	WEVACO PREP PLANT	Fifteenmile Fork	Eskdale	Headwaters Cabin Creek	7	4651	5006	3
13831	1	WV	WHEELING CREEK #3	Dunkard Fork	Dallas	Outlet Dunkard Fork	5	3453	6945	4
13832	1	WV	WHEELING CREEK NO. 7	Middle Wheeling Creek	Triadelphia	Middle Wheeling Creek	11	7588	11902	6
13833	1	WV	WHEELING CREEK NO.18	Grandstaff Run	Wheeling	Grandstaff Run-Wheeling Creek	8	5365	4906	3
13834	1	WV	WHEELING CREEK NO.25	Wolf Run	Dallas	Upper Wheeling Creek	7	4441	4947	1
13835	1	WV	Widen-Taylor Fork Dam	Taylor Creek	Dille	Headwaters Buffalo Creek	5	3229	3848	1
13836	1	WV	WILDWOOD LAKE		Morgantown	Headwaters Three Fork Creek	20	13742	10083	11
13837	1	WV	WILLOW ISLAND L & D	Ohio River	0	Cow Creek-Ohio River	6	3496	10599	1
13838	1	WV	WILMORE DAM	Tug Fork	Iaeger	Horse Creek-Tug Fork	6	3544	11226	1
13839	1	WV	WILSON BIG HOLLOW DAM	Tear Coat Creek	Rio	Tear Coat Creek	16	10972	6026	12
13840	1	WV	WINFIELD L & D	Kanawha River	Red House	Buffalo Creek-Kanawha River	4	2707	10148	2
13841	1	WV	WYCO DAM	Allen Creek	Amigo	Devils Fork-Guyandotte River	5	3258	2757	3
13842	1	WV	ZALKIN PREP	Lick Run	Beckley	Headwaters Clear Fork	17	11412	2753	13
13844										

BAT

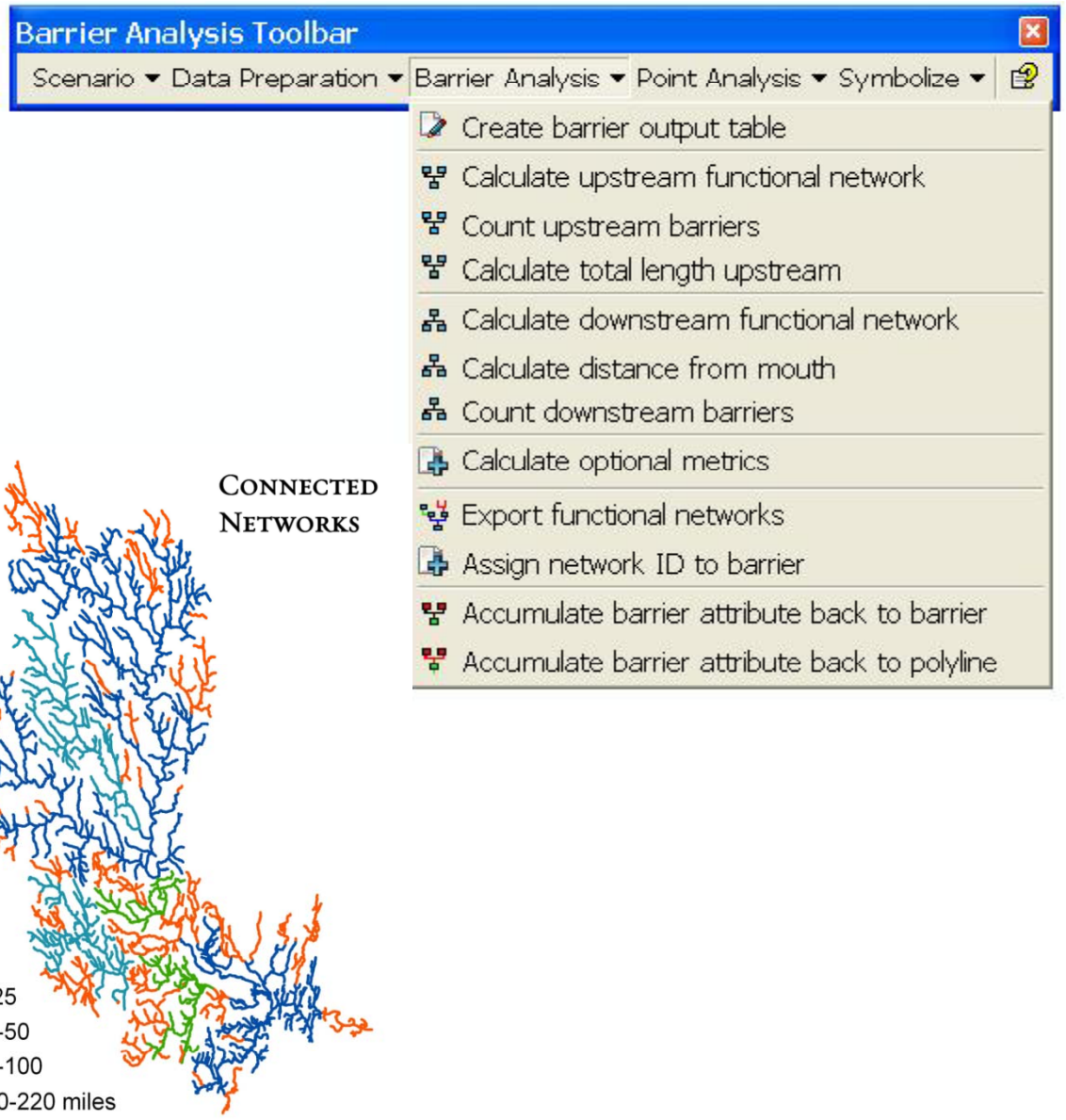
Barrier Analysis Tool

ArcGIS plug-in (9.3)

Greatly facilitates network calculations

Freely available. Contact:

emartin@tnc.org

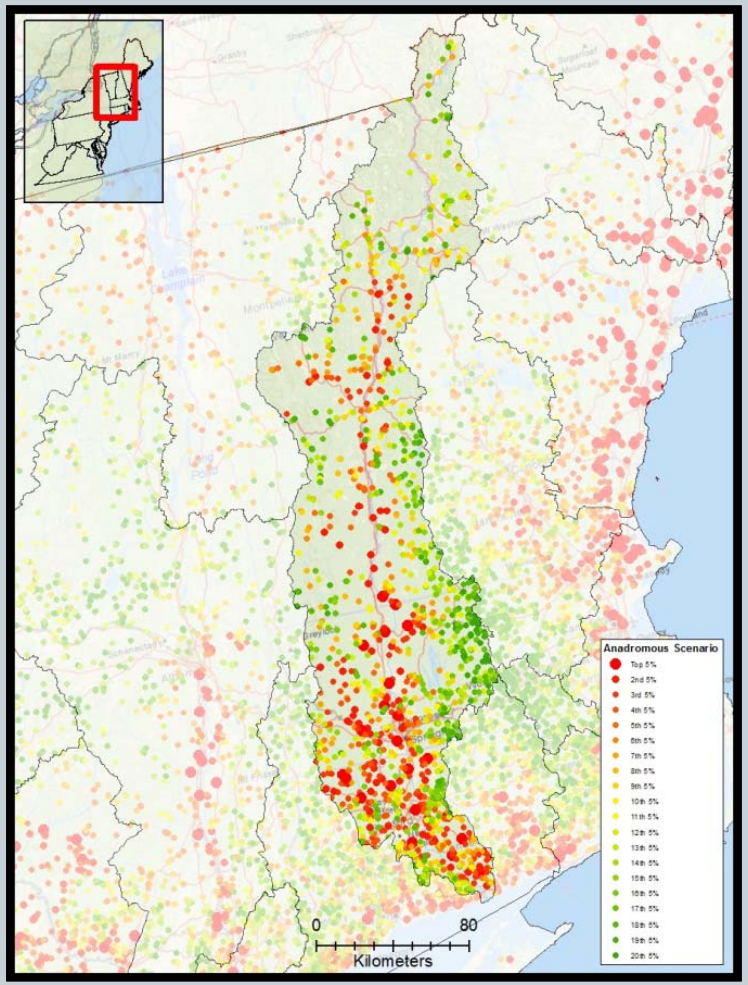


Results

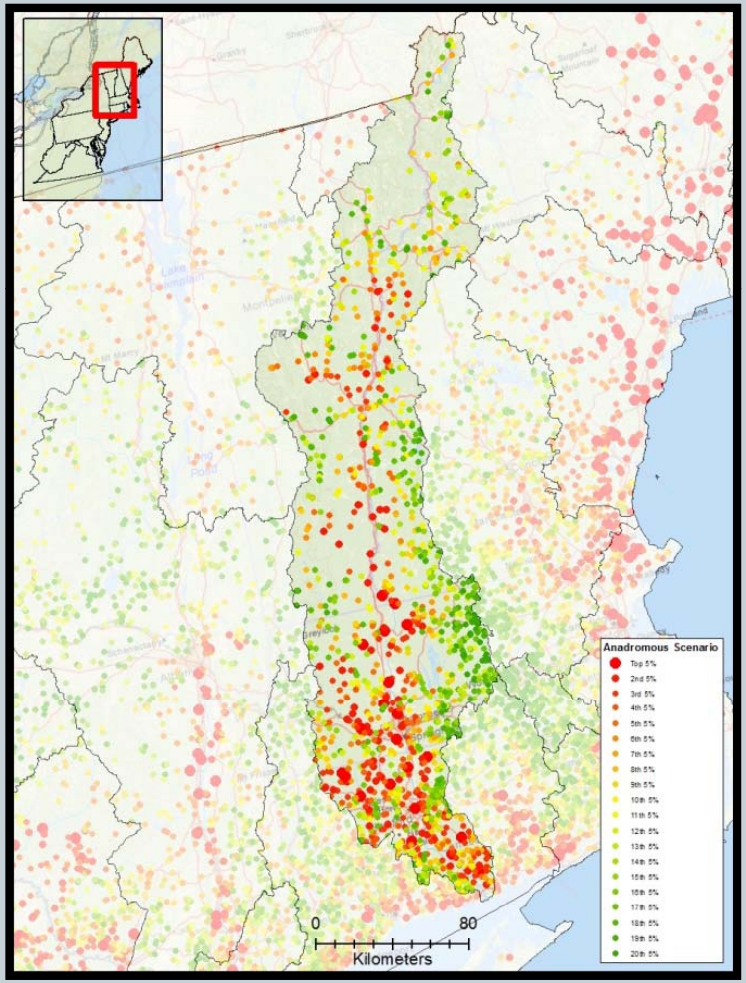
- Coastal Basin Summaries
  - Merrimack River
  - Connecticut River

CT River Basin

- 1422 dams/15,298 km river
- =1 dam / 11 km



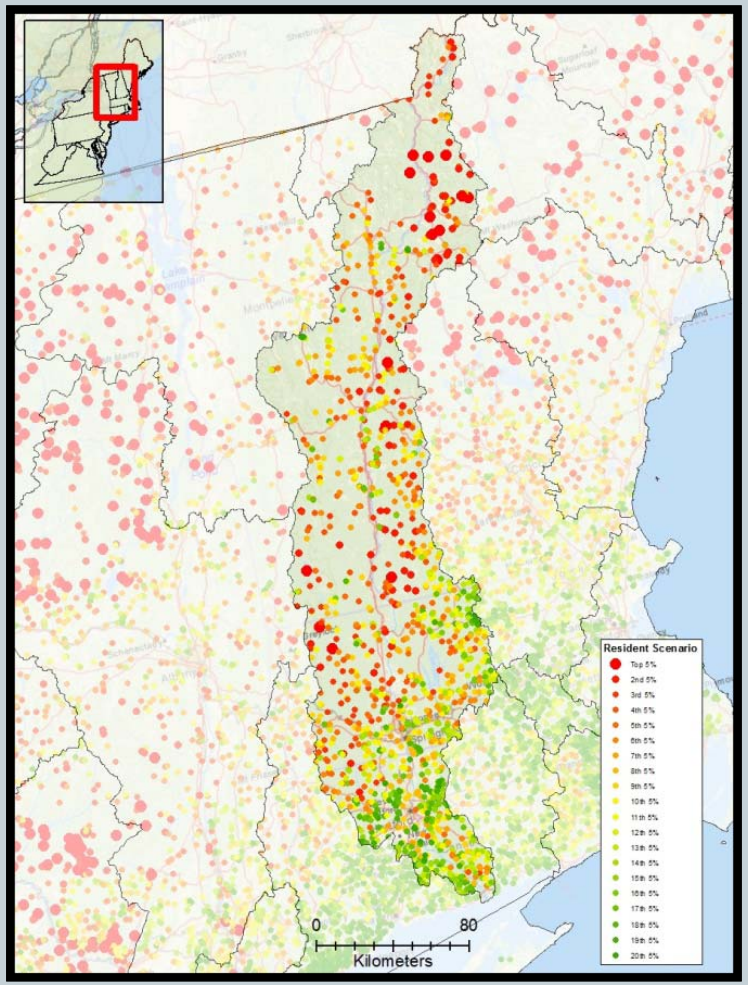
CT River Basin



- Anadromous Benefits Scenario
- 88 dams in top 10% of regional results
- 49 dams have current anadromous fish habitat in downstream network
- 358 dams have historical anadromous fish habitat documented

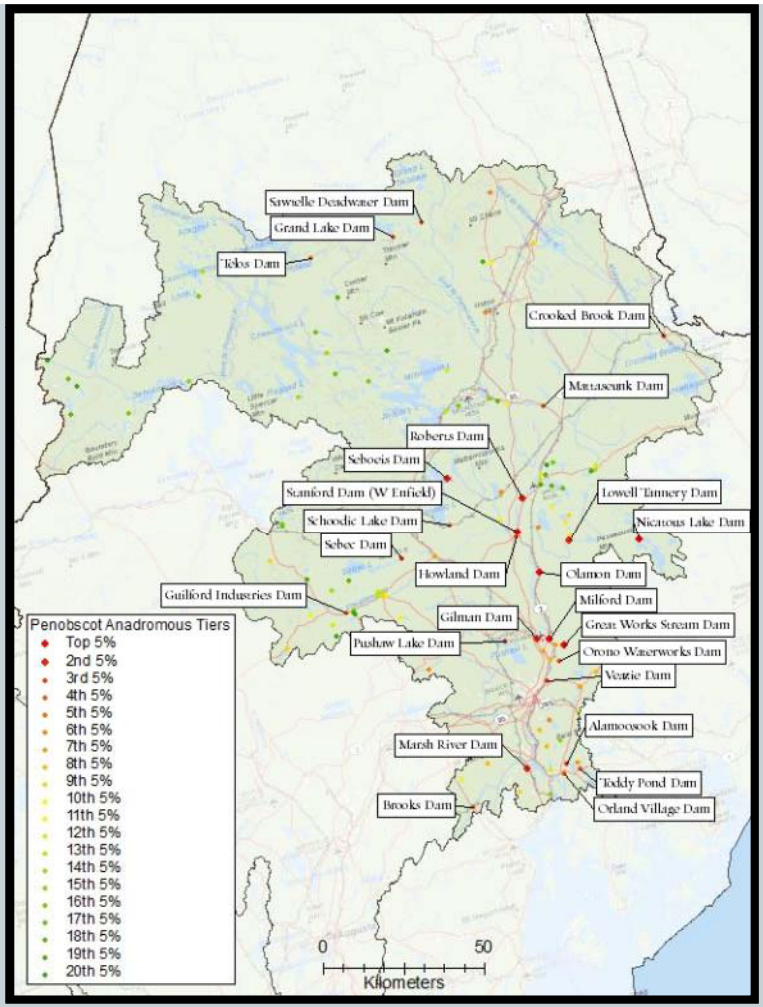
CT River Basin

- Resident Benefits Scenario
- 74 dams in top 10% of regional results
- Longest connected network: 685km
- Median connected network length: 1.8 km



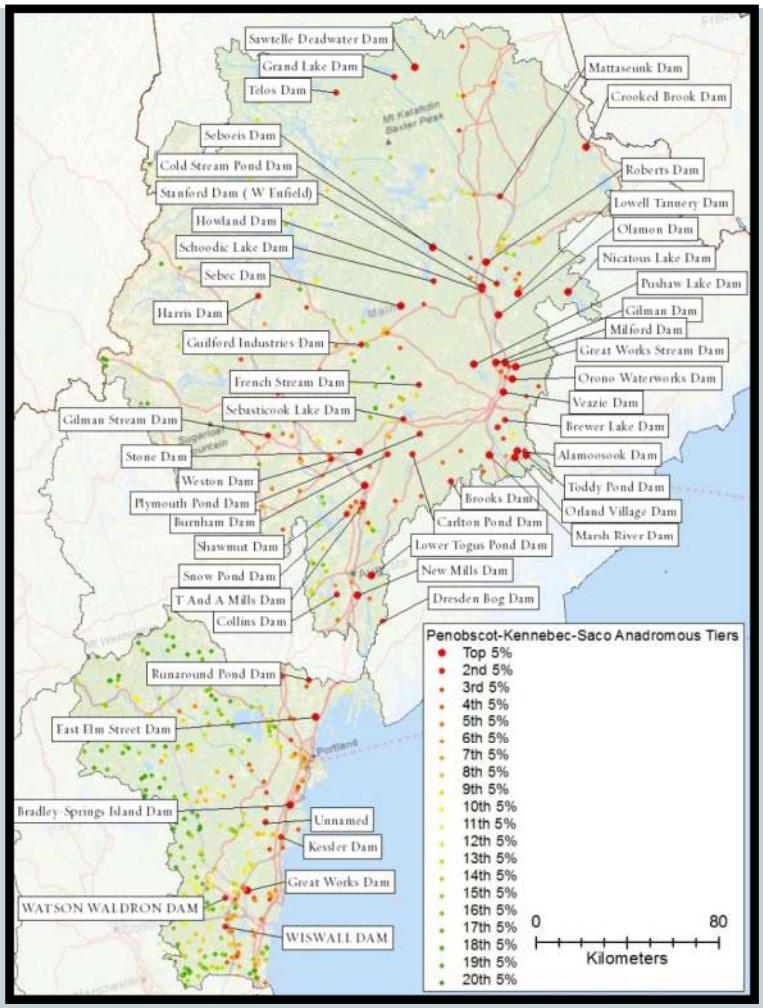
Penobscot River Basin: Basin Assessment

- Dams in the top 5 tiers (1st quartile) are labeled
- Provides additional support/justification to current project
- Highlights other dams which may not have been "on the radar"



Penobscot-Kennebec-Saco/South Coastal

- Top 10% are labeled



Caution: these results…

- Are **not** a hit list of dams
- Are **not** a replacement for site-specific knowledge and field work
- Do **not** incorporate any social or feasibility factors
- Do **not** incorporate every possible aspect of potential ecological benefit

- **Are** a screening-level tool
- Use the **best available** data

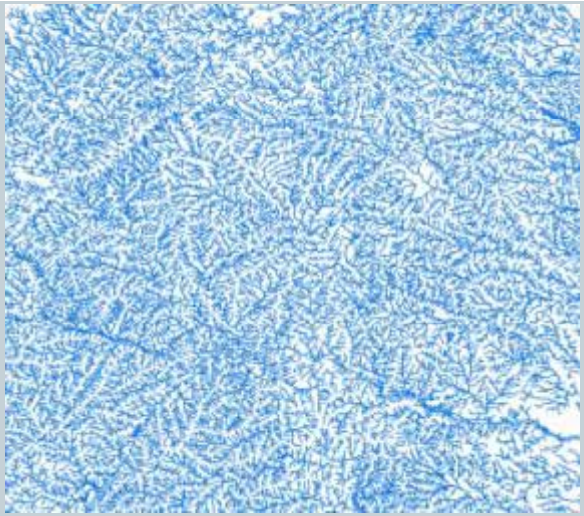
Next Steps and Improvements

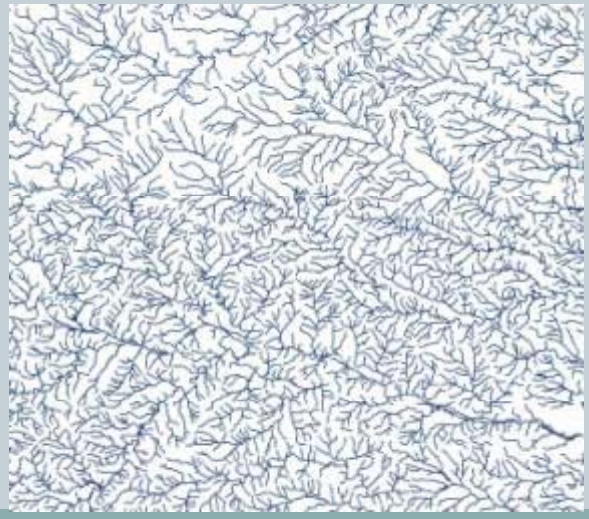
Result Distribution

- Data sharing
- In addition to posting on NEAFWA RCN website…
  - Distribute to Workgroup
  - Notify other organization who are active in dam removals (newsletters, conferences)
  - Wider public / media release (TNC website)

Potential Improvements

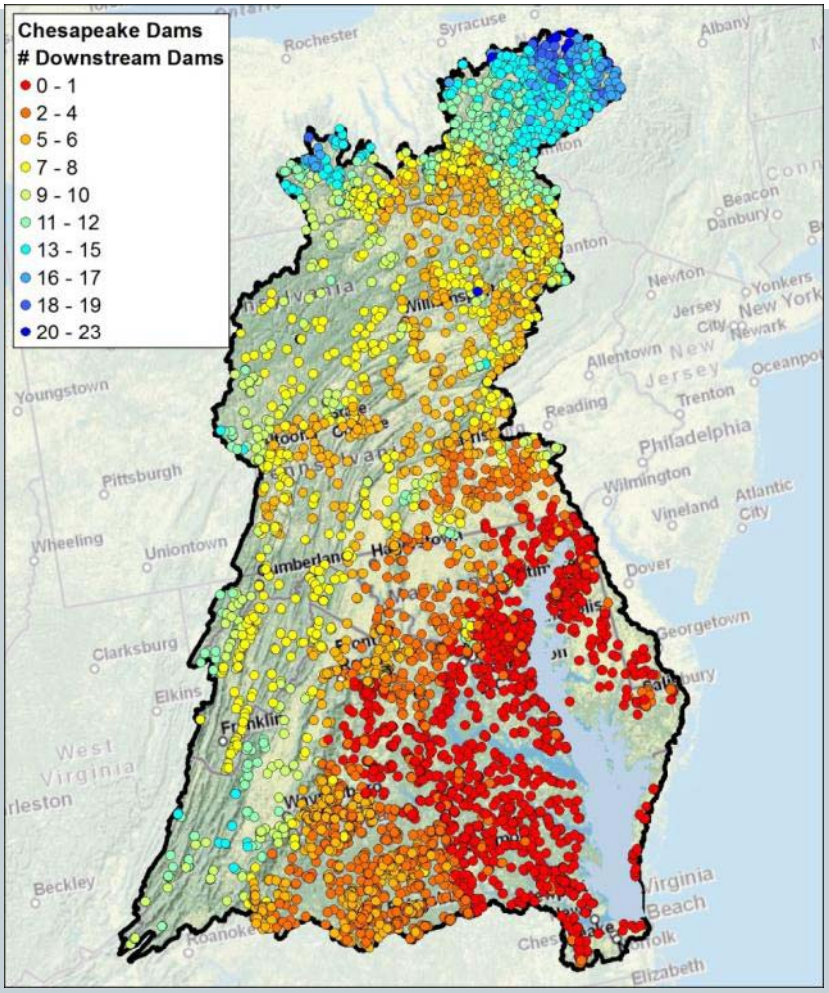
- Input data
  - On-going process
  - Annual updates, funding dependent
- Scale:
  - ~50% of dams fall on 1:100k hydrography
  - ~80% fall on 1:24k hydrography
- More nuanced approach to existing fish passage
  - Passability score
  - Dams in series





Next Steps

- Chesapeake Fish Passage Prioritization
  - Builds off NEAFWA work & MD Ecological Value Criteria
  - Improved…
    - resolution (1:24k)
    - diadromous fish data
    - Web-based Decision Support tool
  - Includes field-sampled ecological condition



Questions?

Fish Passage Restoration in the Mystic Lakes, Medford, MA

Brad Chase -- MA Division of Marine Fisheries

ASMFC Annual Meeting, Boston, November 2011

Mystic Lakes

- Severely altered urban watershed
- Highly ranked restoration project

- Water resources have multiple uses
- Influential outreach effort

- Habitat assessment finds impairment
- Dam reconstruction provides rare opportunity
- Results in unique fish passage improvements


Mystic Lakes
Image © 2011 TerraMetrics
©2010 Google
Imagery Date: 6/18/2010
lat 42.408191° lon -71.097088° elev 7 ft
Eye alt 10.68 mi

1838 -- 1st of many leather processing mills.
1864 -- Mystic Lake Dam built for water supply.
1908 -- Craddock Dam built in Medford Square.
1967 -- Amelia Earhart Dam built at tidal interface.

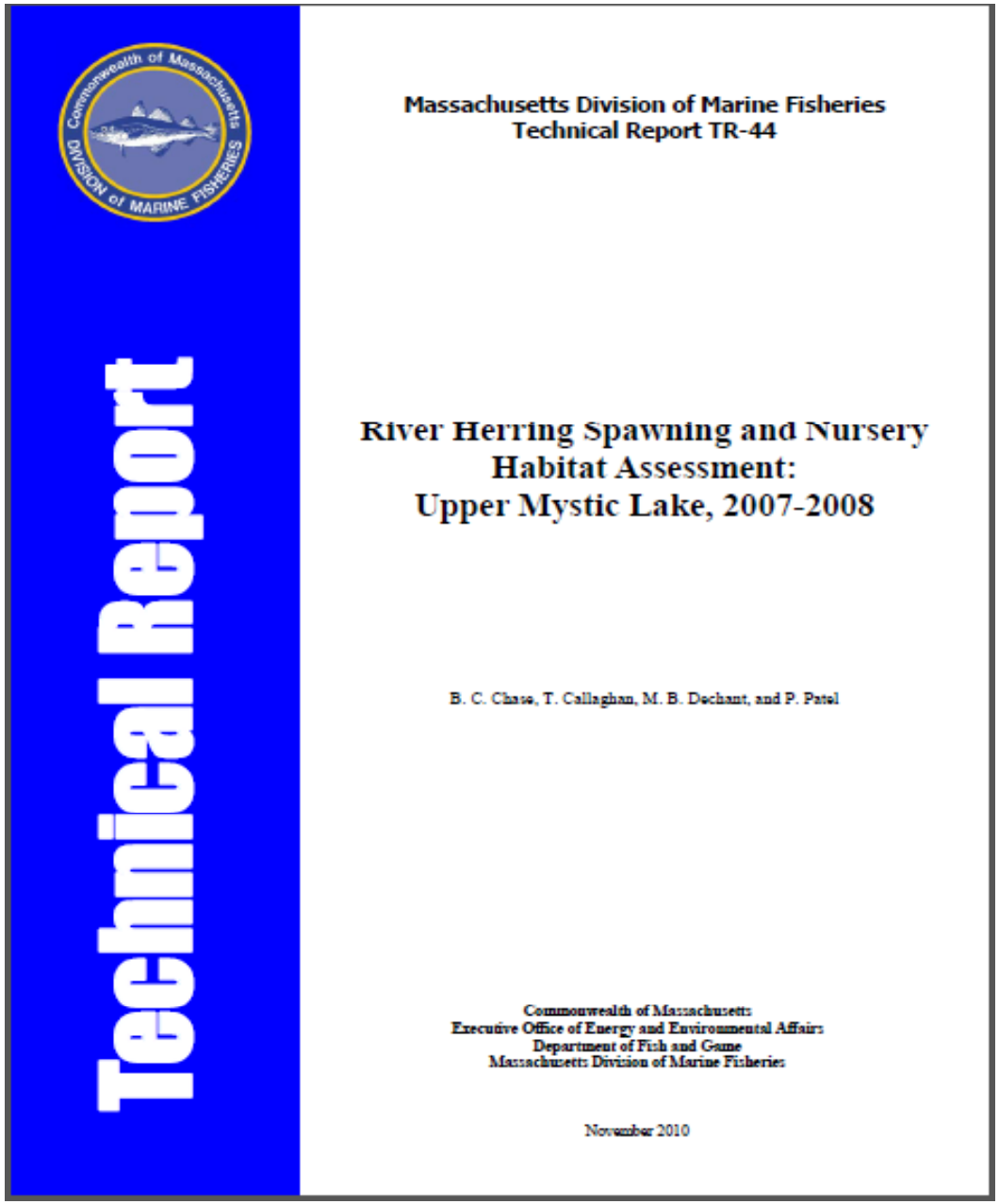
Mystic Lakes Dam

-- Dam owned by Mass. DCR

-- Targeted for decades for reconstruction

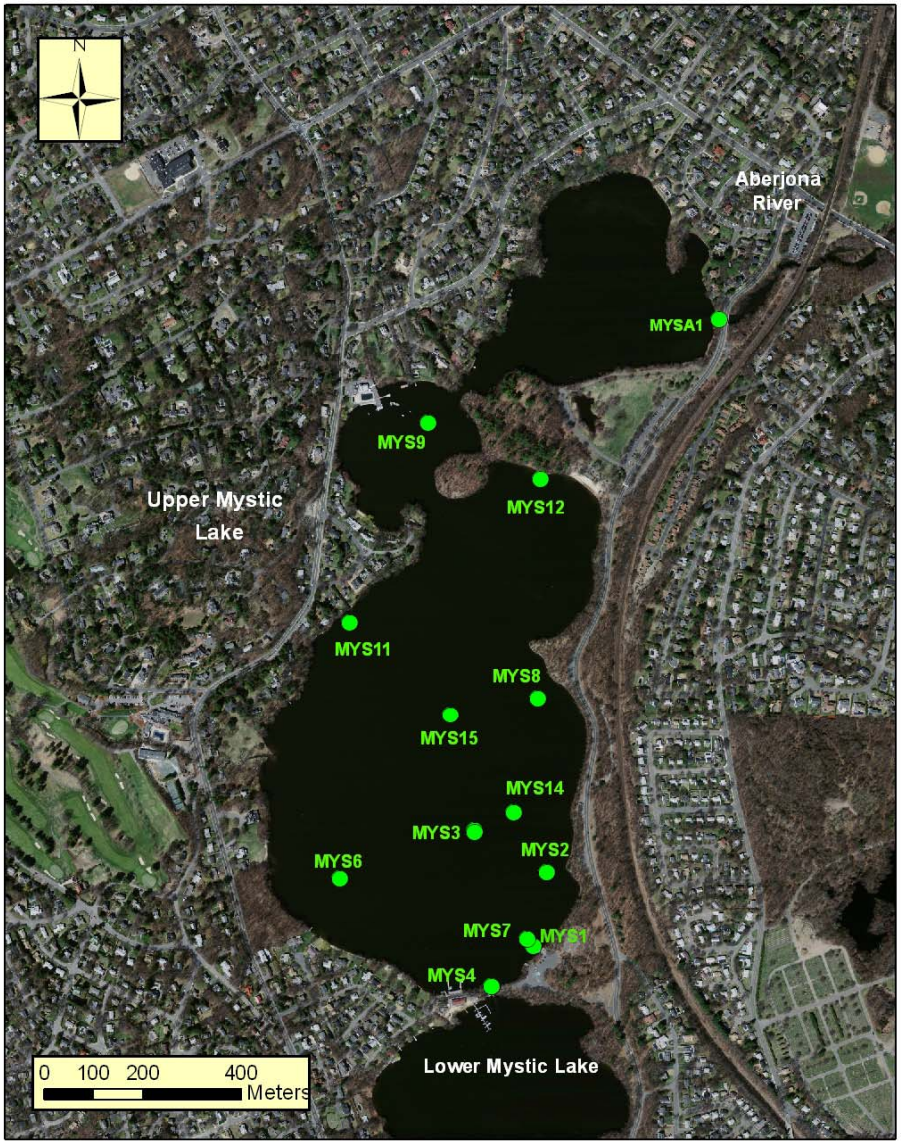
Mystic Lakes Bucket Brigade, 2005-2009

http://www.mass.gov/dfwele/dmf/publications/technical.htm



Massachusetts Department of ENVIRONMENTAL PROTECTION

Figure 1. River herring habitat assessment stations in the Upper Mystic Lake.



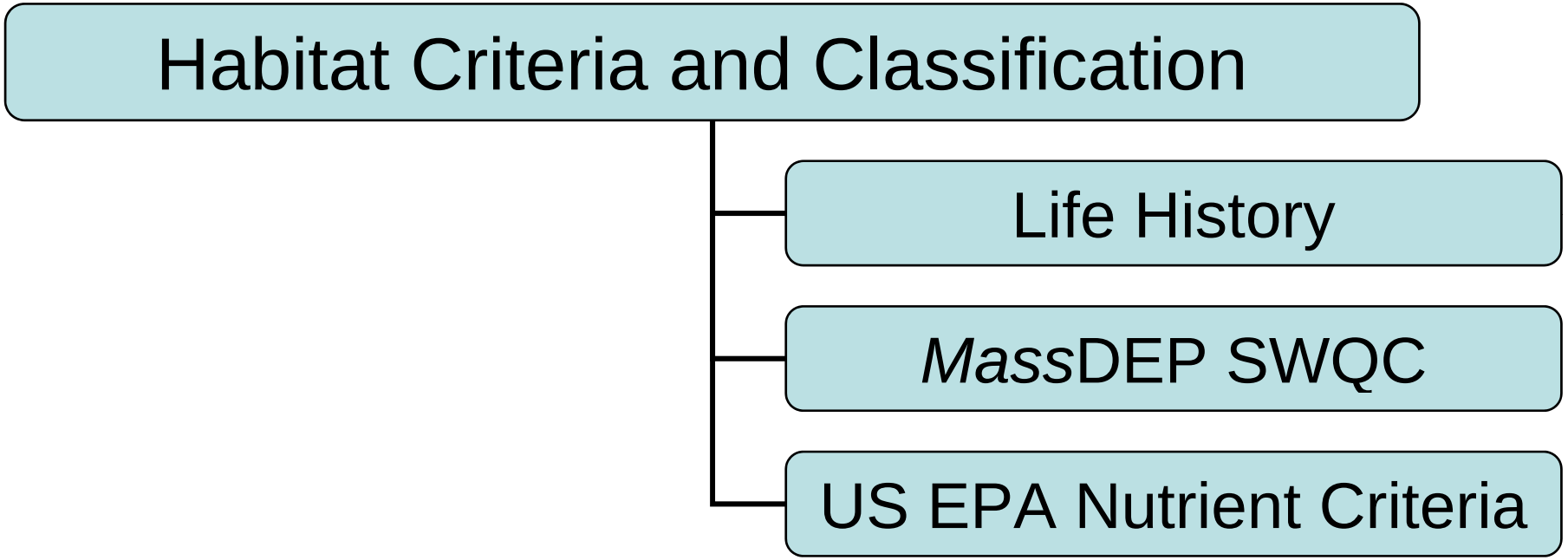
Diadromous Fish QAPP Objectives

1. Provide standardized sampling protocols.

2. Guidance for diadromous fish habitat restoration.

3. Produce data that is acceptable to *Mass*DEP waterbody assessments.

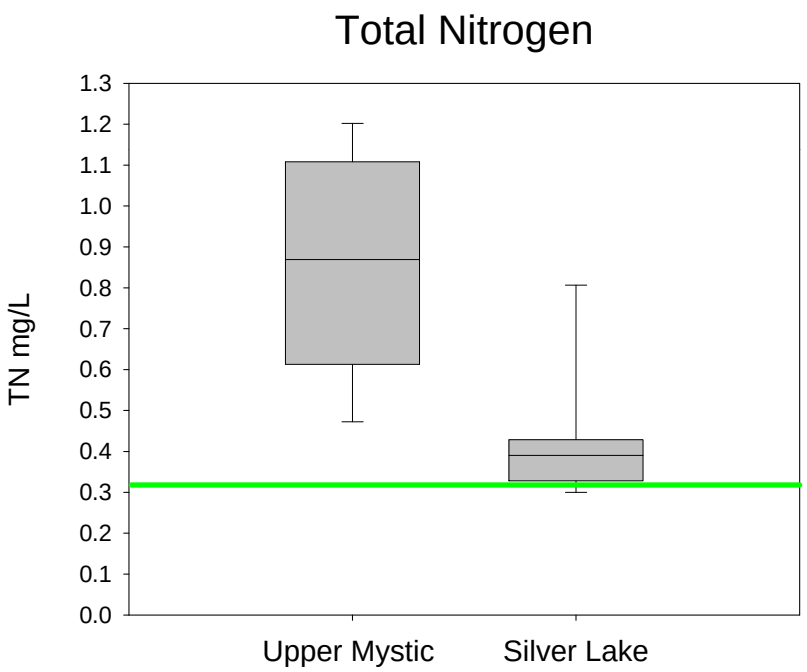
4. Develop criteria for classifying and protecting diadromous fish habitat.


Habitat Criteria and Classification
Life History
*Mass*DEP SWQC
US EPA Nutrient Criteria

Mystic River Watershed Association

Lake Nutrient Measurements

N = 10



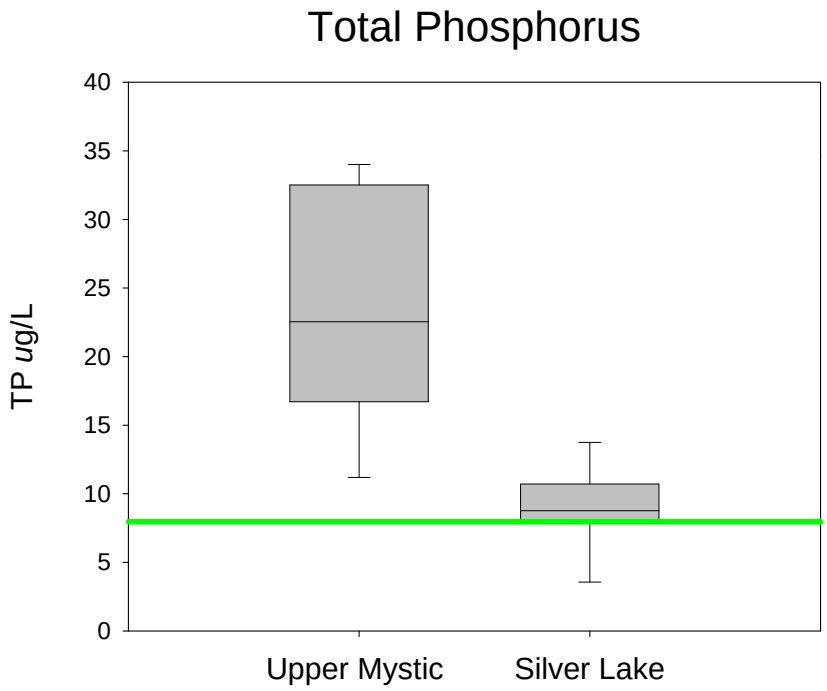
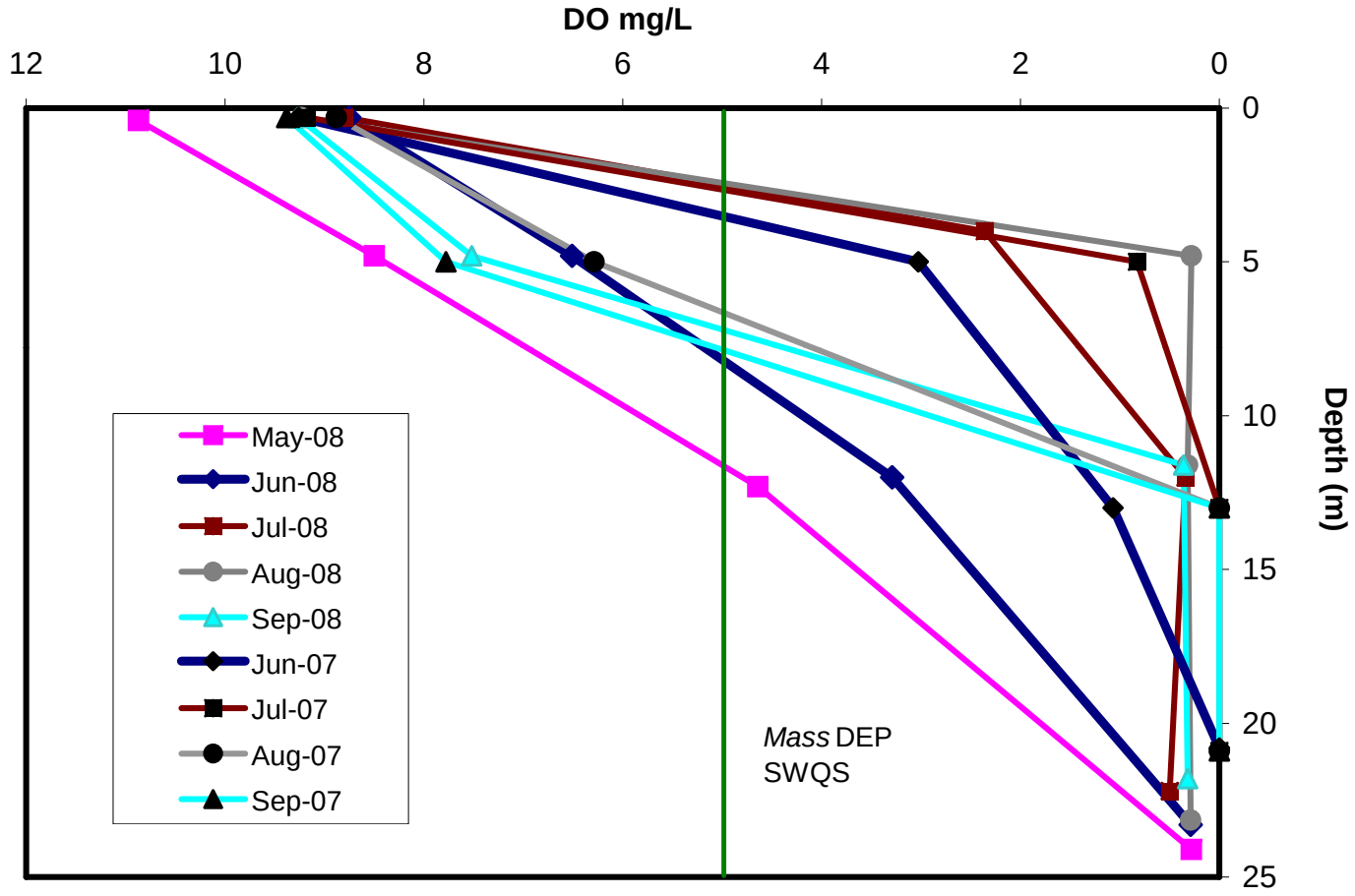


Figure xx. Water column profiles for dissolved oxygen at station MYS3 in the Mystic Upper Lake, 2007-2008. The measurements made in 2007 are marked with black symbols.



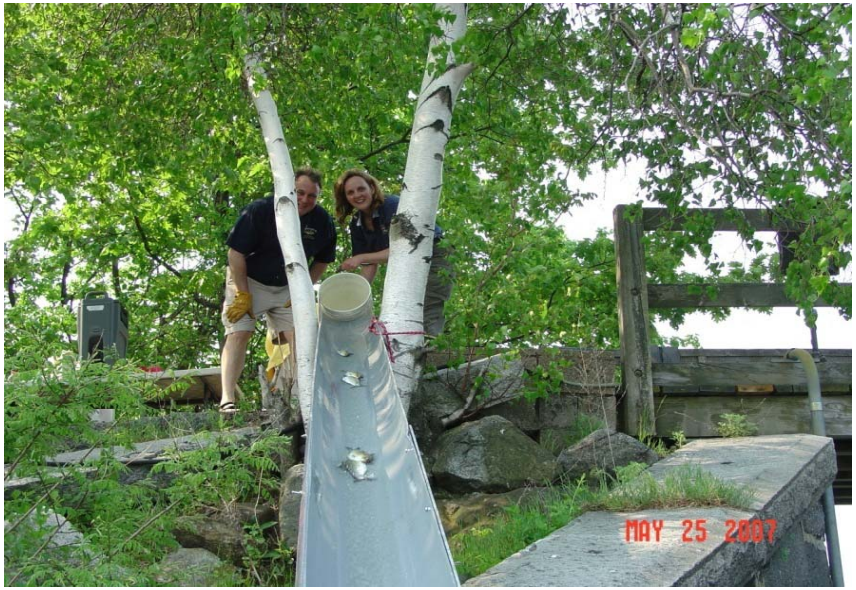
Summary of river herring habitat assessment at the Upper Mystic Lake, 2007-2008.

Parameter	Units	Sample Size (No.)	Acceptable Criteria	Exceedance (%)	Classification
Temp. (nursery)	°C	50	<28.3	0	*Suitable*
Temp. (spawning)	°C	27	<26.0	1	*Suitable*
DO	mg/L	70	>5.0	26	*Impaired*
pH	SU	87	6.5 to <8.3	3	*Suitable*
Secchi	m	26	>2.0	35	*Impaired*
N+N	mg/L	10	<0.32	100	*Impaired*
TP	ug/L	10	<8.0	100	*Impaired*
Fish Passage	NA	9	BPJ	100	*Impaired*
Stream Flow	NA	9	BPJ	100	*Impaired*

Notes:

1. Bottom measurements were excluded from DO classification due to QAPP exemption.
2. *Impaired* classifications result from exceedances >10% at transect stations during two seasons.
3. The US EPA TN criterion was adopted for N+N measurements.

Mystic Lakes Bucket Brigade, 2007



Dam Construction, 2010

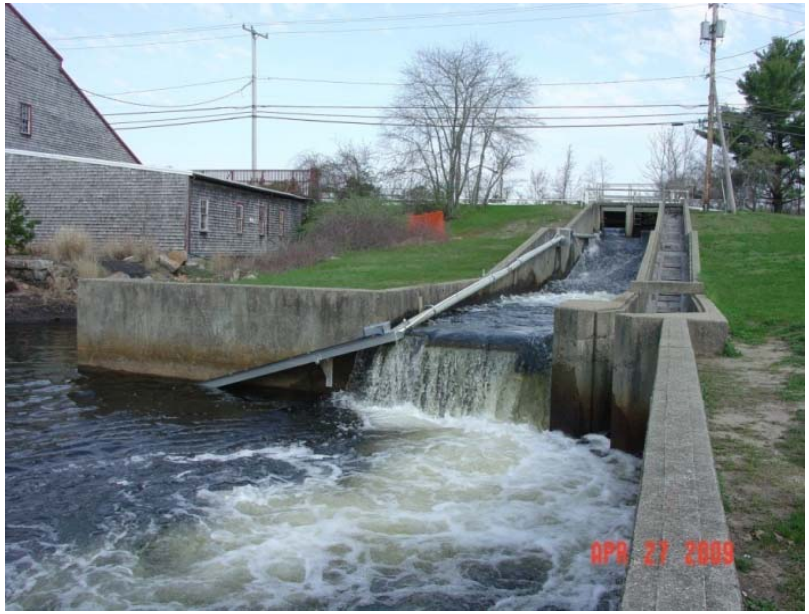
Dam Construction, 2011

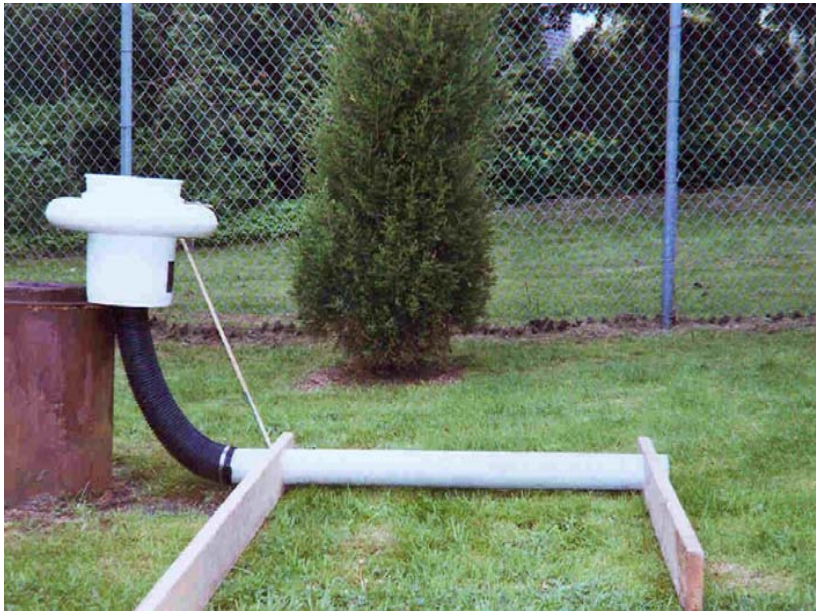
Completion – Spring 2011


dcr
Massachusetts

Eel Passage

Eel Passage, 2007-2010



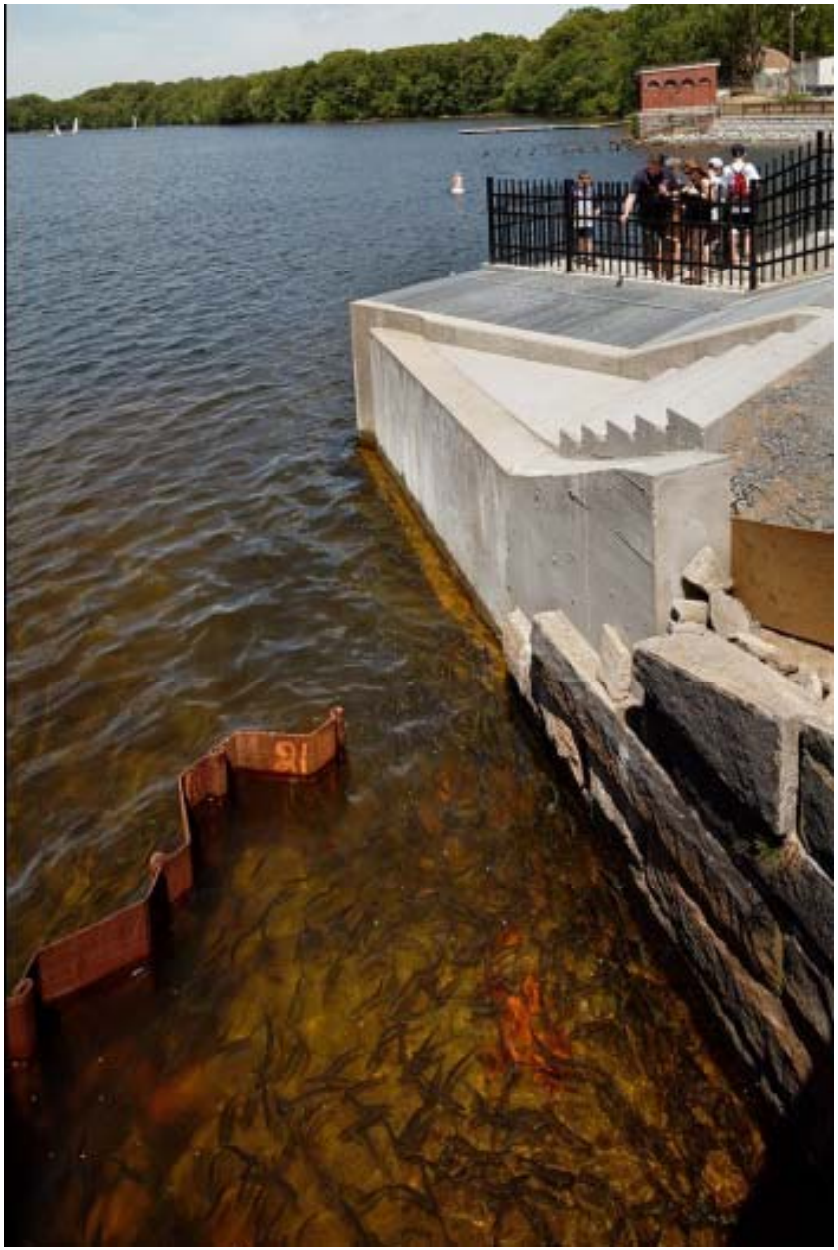


Juvenile Downstream Passage

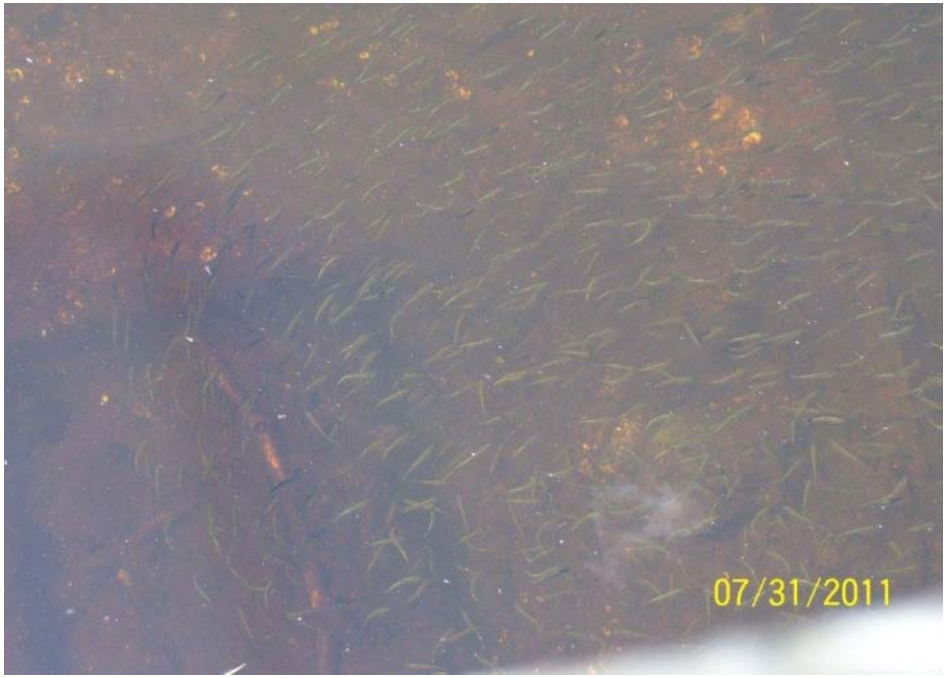
-- experience will contribute to future designs and applications.

Operations and Maintenance

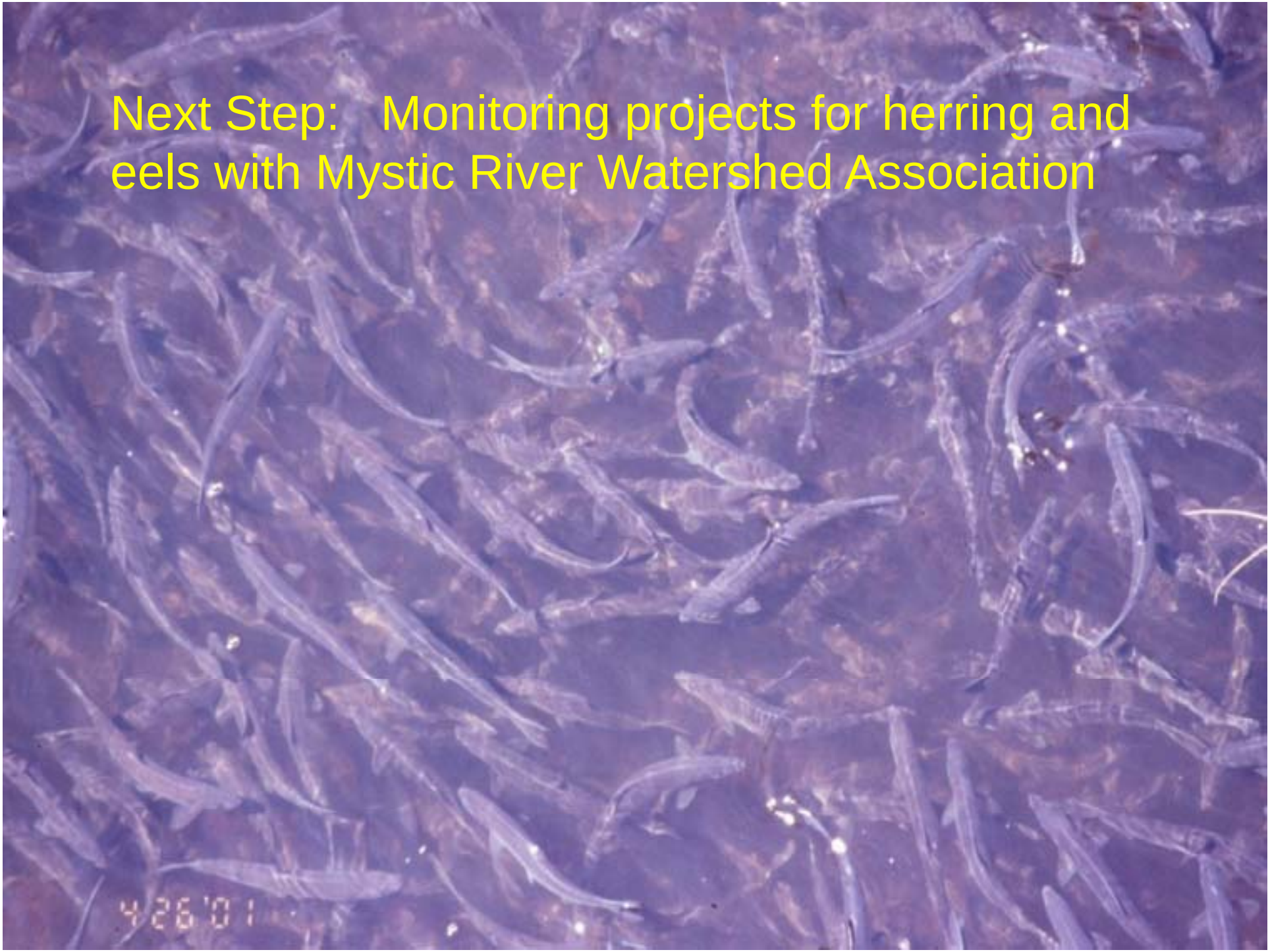
- Passage protocols included in dam O&M
- Draft O&M under review by DCR and DMF
- Adult herring spawning
- Eel passage
- Juvenile herring emigration



Signs of Success



1. Access to 165 acres
2. Integrated eel passage
3. Dedicated juvenile passage facilities and operations


Next Step: Monitoring projects for herring and eels with Mystic River Watershed Association
4 26 '01

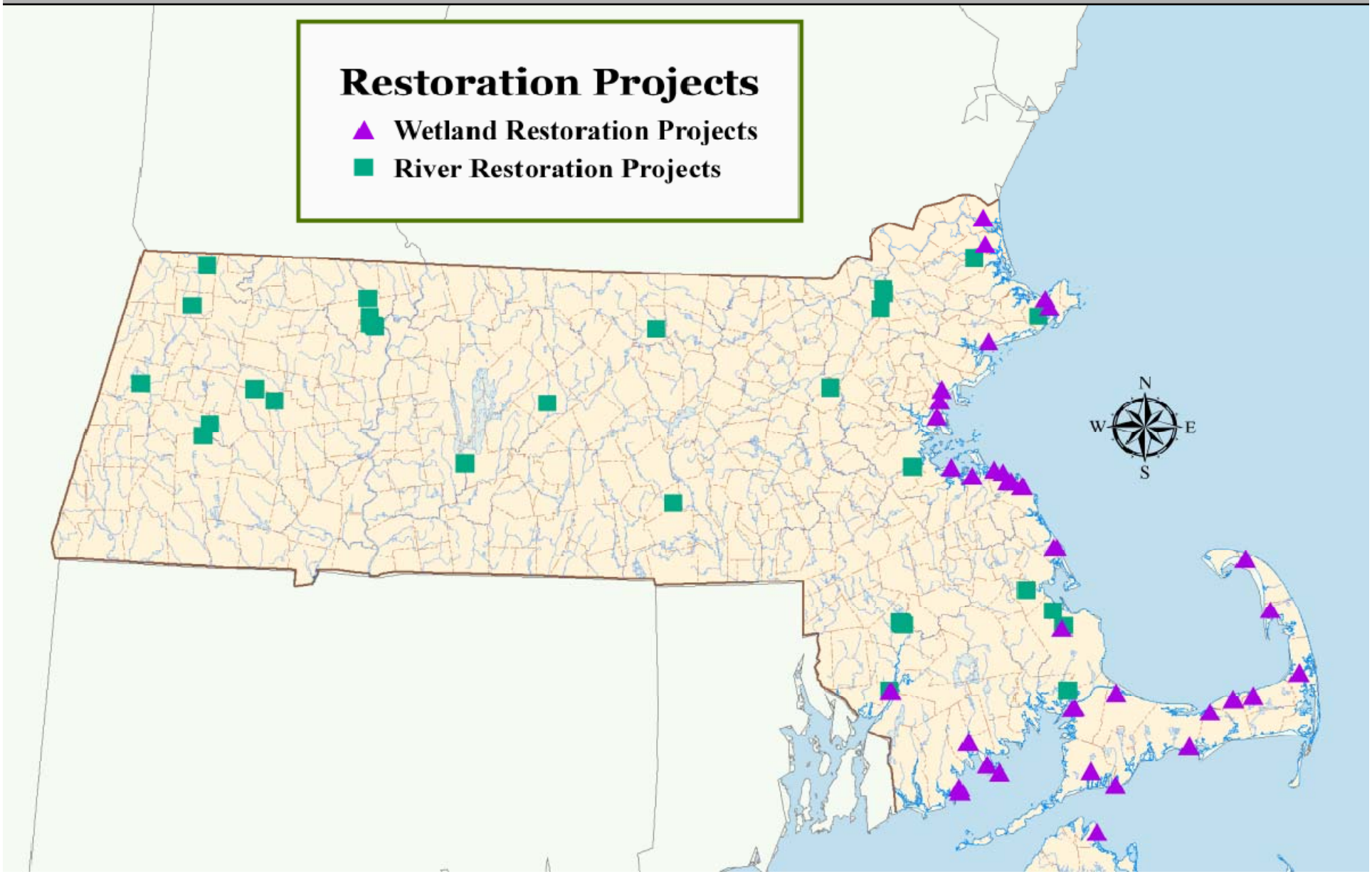
Removing the Wapping Road Dam: Restoring Habitat on the Jones River

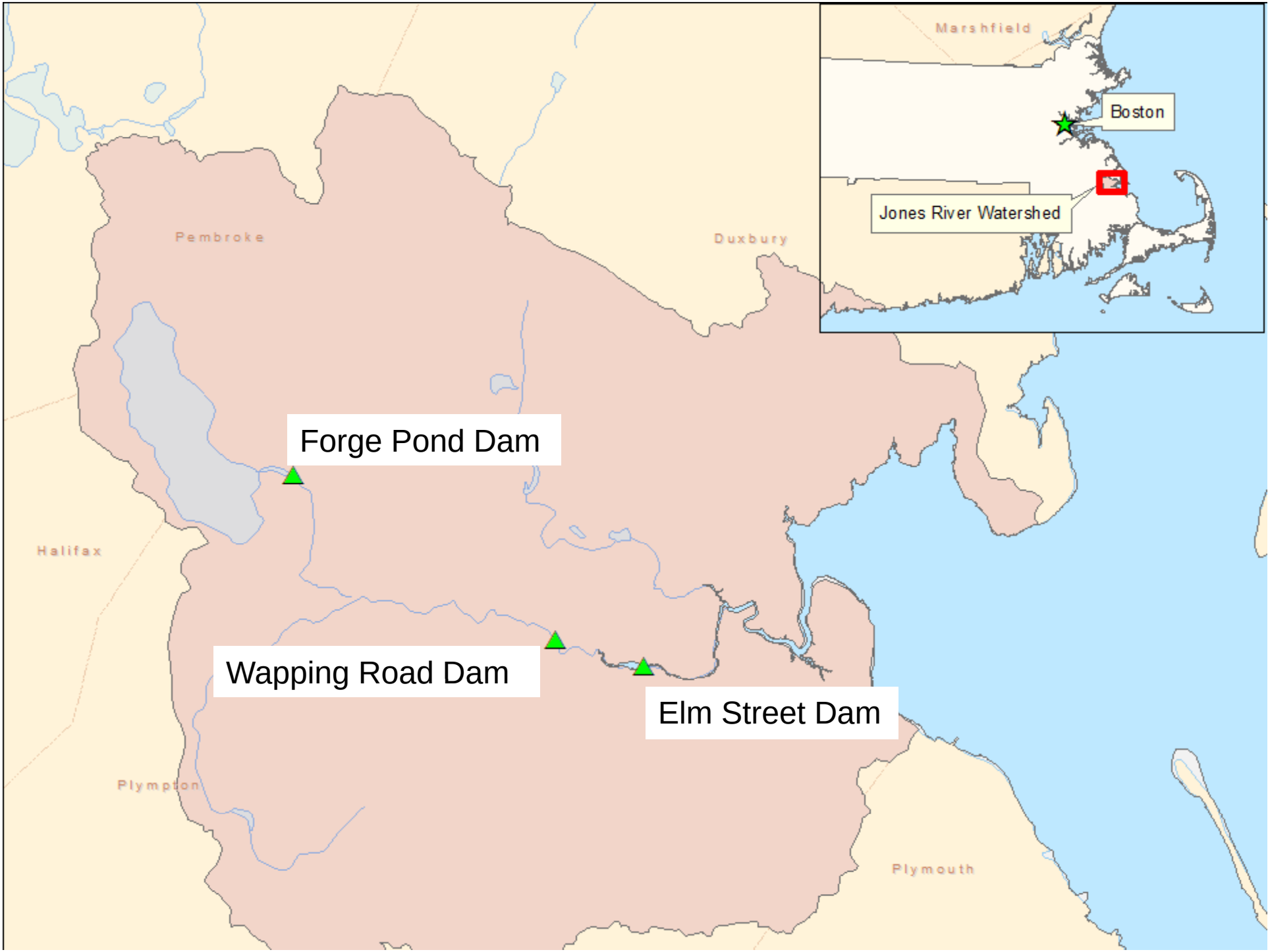
Beth Lambert
Division of Ecological Restoration
November 8, 2011

COMMONWEALTH OF MASSACHUSETTS
Division of Ecological Restoration

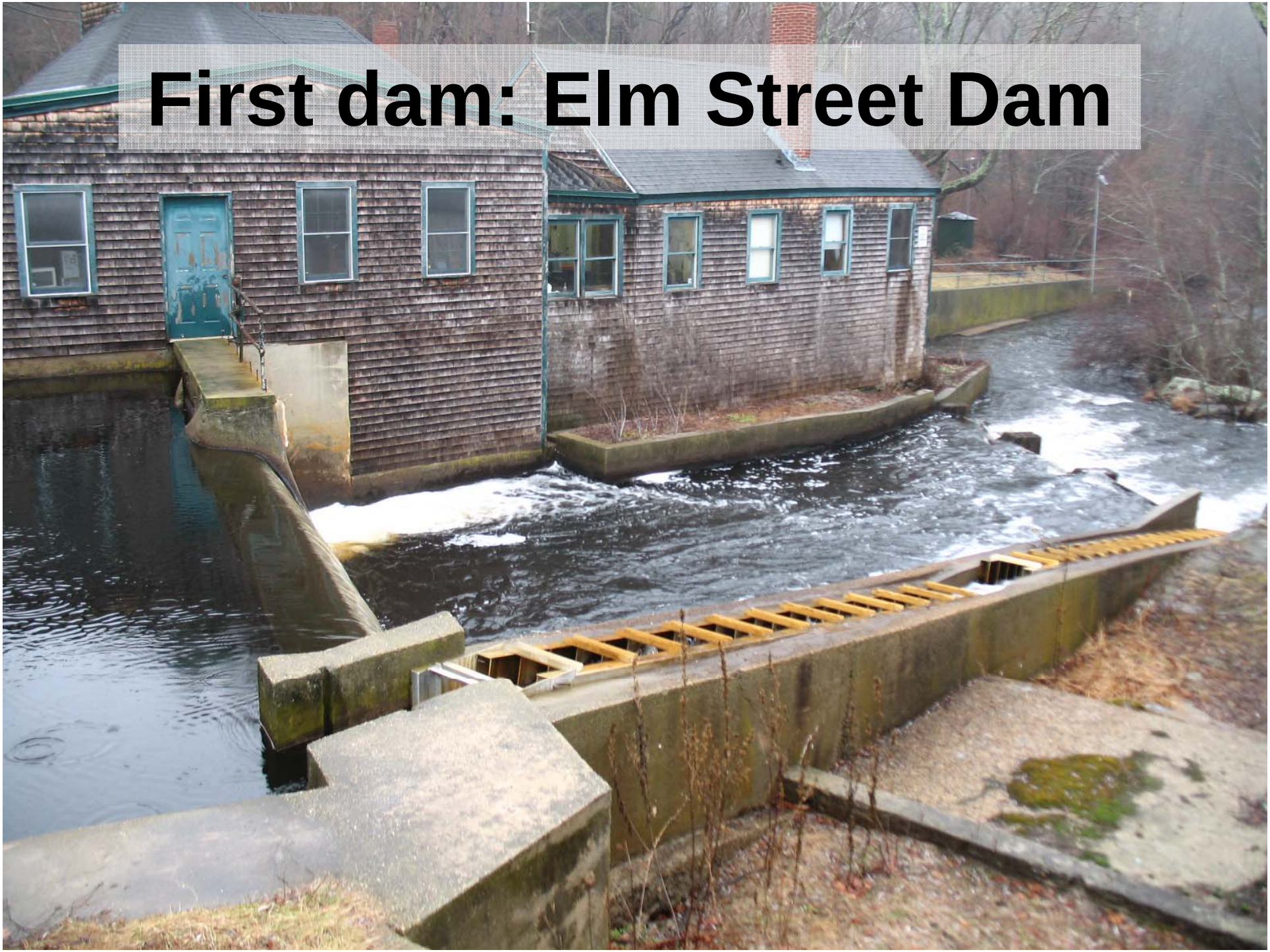
Mission: To restore and protect the health and integrity of the Commonwealth's rivers, wetlands, and watersheds for the benefit of people, fish, and wildlife

Division of Ecological Restoration
Habitat Restoration Projects

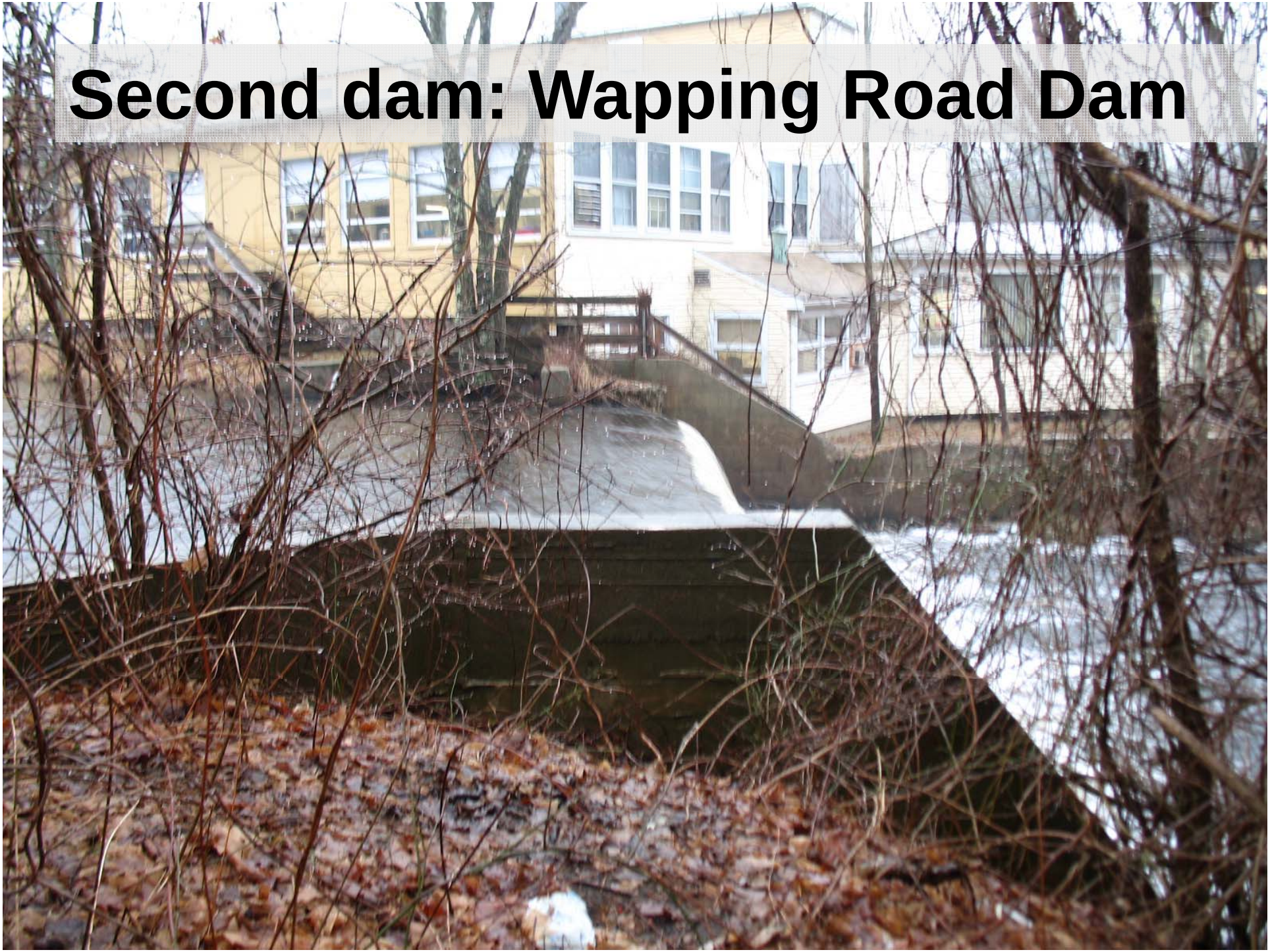



Marshfield
Boston
Jones River Watershed
Pembroke
Duxbury
Forge Pond Dam
Halifax
Wapping Road Dam
Elm Street Dam
Plympton
Plymouth

First dam: Elm Street Dam



Second dam: Wapping Road Dam



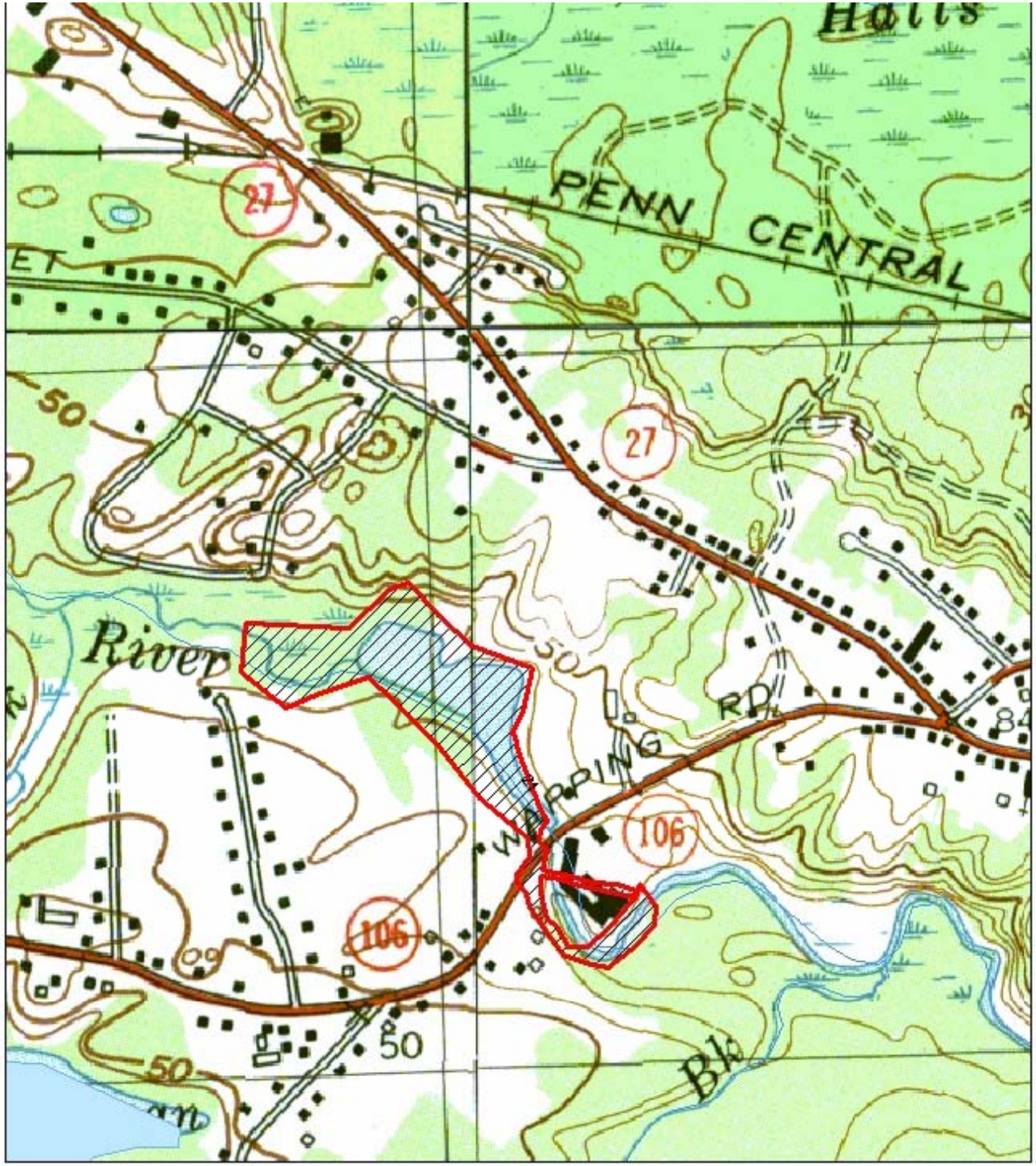
Third dam: Forge Pond Dam

Wapping Road Dam

- Privately owned
- No fish ladder
- Blocked 3.7 miles mainstem + 18.3 miles tribs = 22 miles
- Volunteers count ~200 herring/year at Elm St. Dam

Dam Statistics

- Feasibility study completed March 2009
- Engineering plans completed February 2010
- Permitting completed May 2011
- Construction October 2011
- Construction cost: ~$300,000
- Feasibility, engineering, permitting ~$150,000
- NOAA largest funder
- Jones River Watershed Association project lead
- DER, DMF, Massachusetts Env. Trust, USFWS,


Holts
PENN CENTRAL
27
27
ET
50
River
50
RD
WAPPING
106
106
50
50
Bk


Wapping Road Dam, Jones River,
Kingston, 2008

Wapping Road Dam, Kingston, Jones River, 2011

Removal of Wapping Road Dam, October 2011

Wapping Road Dam Removal – October 2011, halfway through construction


10/21/2011


CAT
312C CAT
PC220USLC


10/21/2011


10/14/2011