



Aquatic Resource Mitigation Fund



**Lori Sommer- Mitigation Program Coordinator
Land Resource Management Program
NH Department of Environmental Services**

PRESENTATION OVERVIEW

- Brief overview on mitigation in New Hampshire
- Aquatic Resource Mitigation Fund
- Mitigation Priority Lists
- Successful land preservation, wetland and stream restoration projects
- 2019 ARM Fund grant round



Floodplain forest protection, Chesterfield

NEW HAMPSHIRE THRESHOLDS FOR WETLAND IMPACTS

- NHDES Wetlands Bureau
 - Regulatory program that issues permits for unavoidable wetland impacts

Permitee must meet avoidance and minimization then...

- **Mitigation** is required
 - Wetland impacts > 10,000 square feet
 - Any tidal impact
 - Stream impacts > 200 linear LF
 - Temporary and secondary impacts (ACOE) to buffers of streams and vernal pools



Sweet gale-meadowsweet-tussock sedge fen, Jaffrey

MITIGATION SEQUENCE

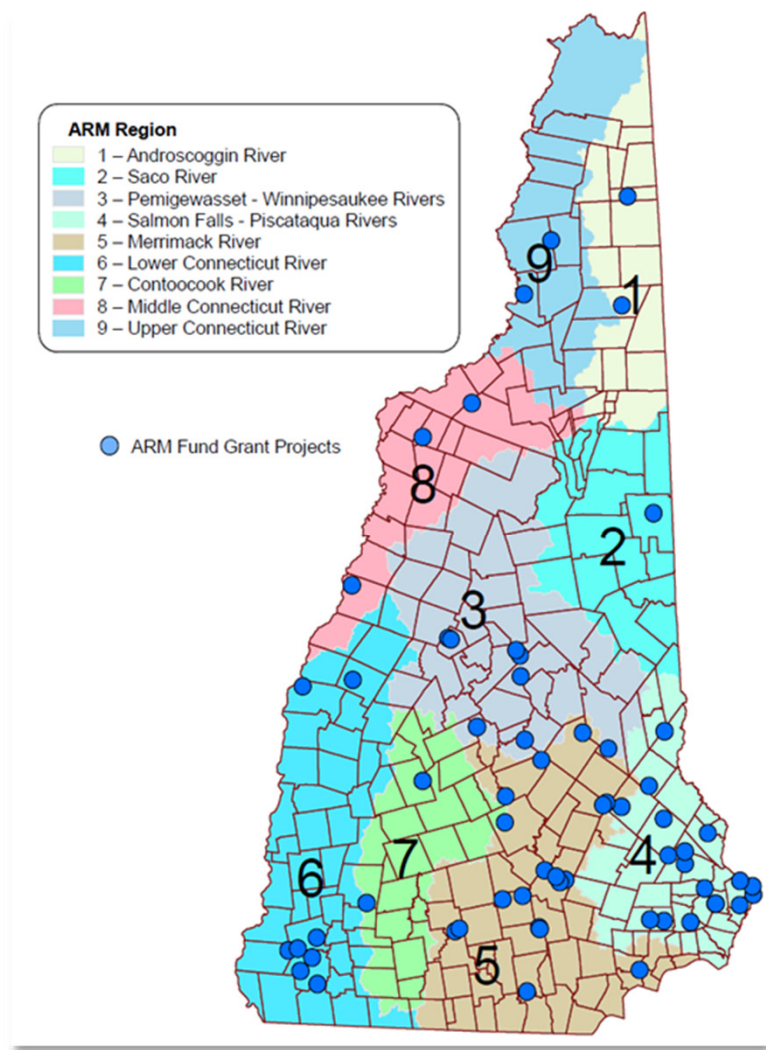
- Permit applicant ***must first consider*** a project prioritized by the town as ***permitee-responsible mitigation***
- Town Conservation Commission is responsible for creating a “Mitigation Priority List”
- If no suitable, local mitigation projects then payment into the **Aquatic Resource Mitigation ("ARM") Fund**



Protection of a 30-acre wetland complex in the Great Bay watershed that is Blanding's Turtle habitat

THE AQUATIC RESOURCE MITIGATION FUND

- NH ILF Program (RSA 482-A:28 – 33)
 - Option for projects that have difficulty finding good local mitigation
 - Payments are made for wetland and stream impacts
 - Funds are pooled by watershed
 - Money is disbursed as competitive grants
- **NHDES Wetlands Bureau** is the ILF program sponsor
 - NHDES assumes mitigation responsibility
 - Administers the program and distributes funds as grants
 - Money is spent in the same watershed

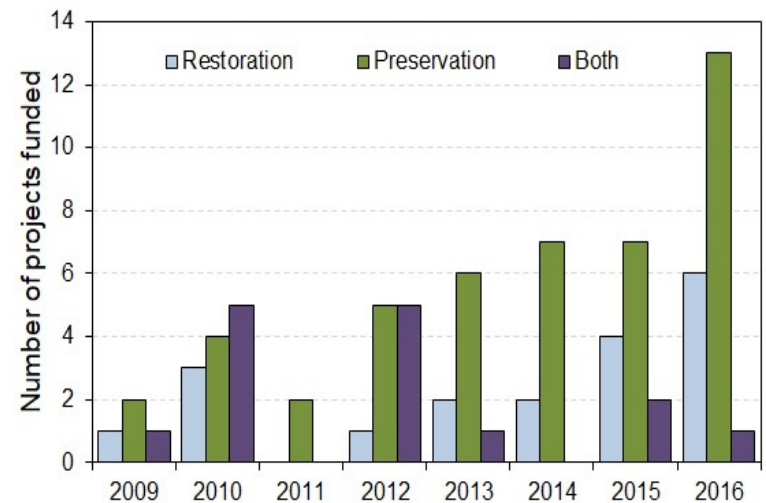


PROJECTS FUNDED BY THE AQUATIC RESOURCE MITIGATION FUND

- **Preservation of high-quality wetlands and streams and their buffers**
 - Acquisition of land, conservation easements, transaction fees, and costs for protection in perpetuity
- **Wetland and stream restoration**
 - Design, construction costs, plantings, and monitoring
- **Tidal improvements**
 - living shoreline and coastal stability

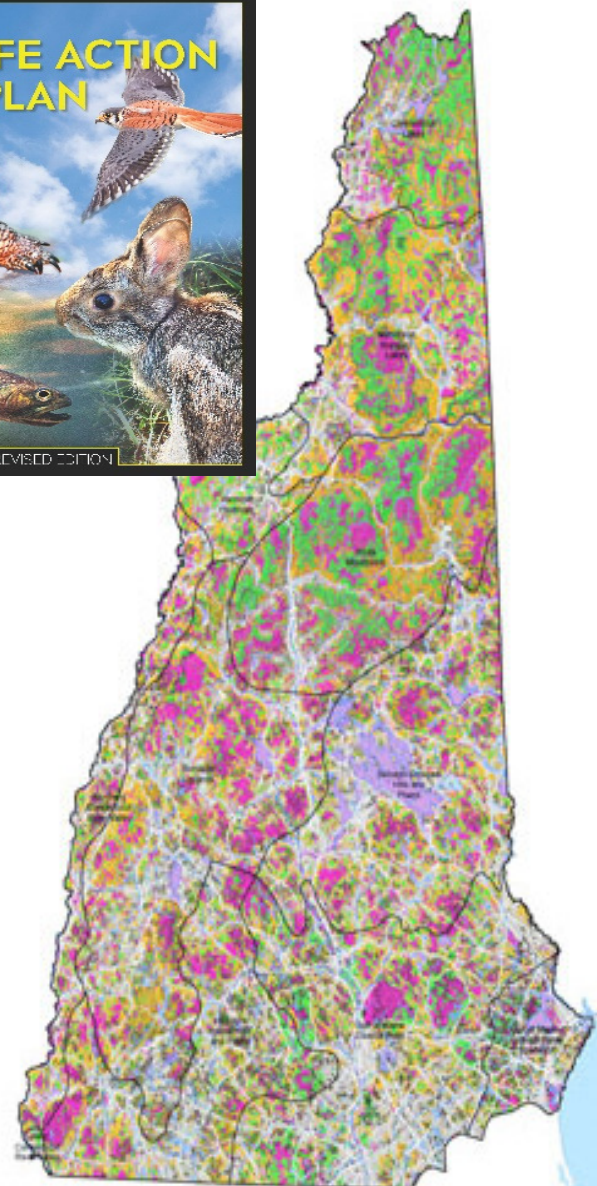
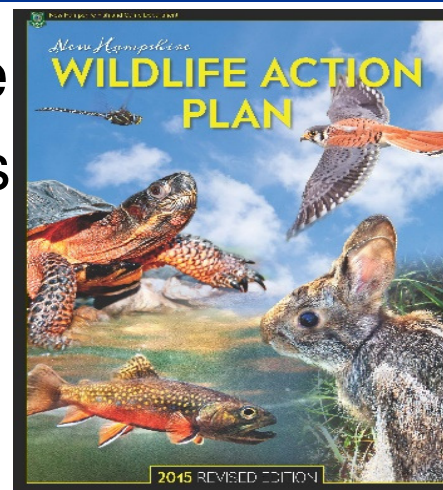
Restore aquatic connectivity

- Dam removals
- Perched culverts that are barrier
- Instream habitat modifications



KEYS TO A COMPETITIVE ARM FUND GRANT

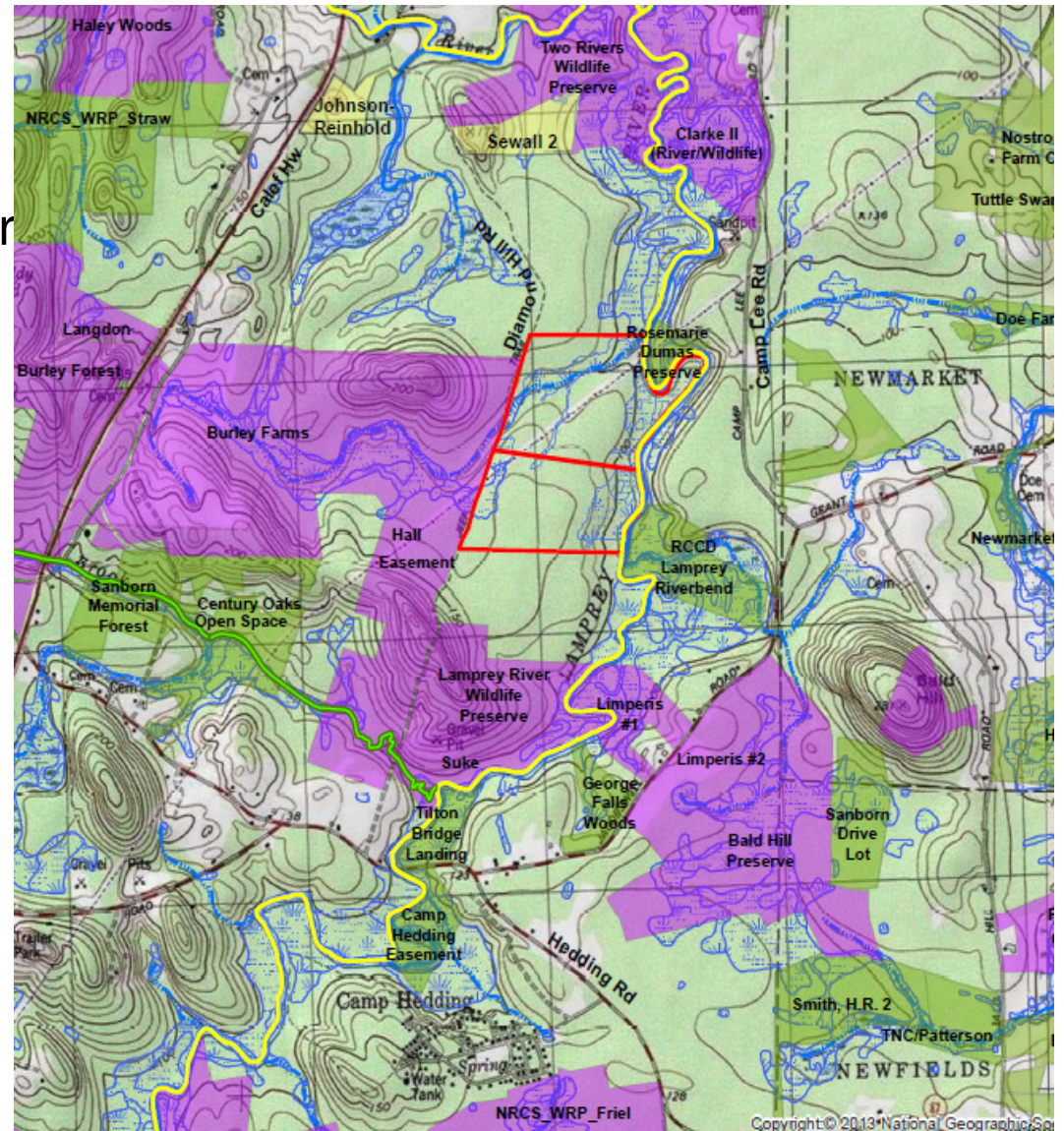
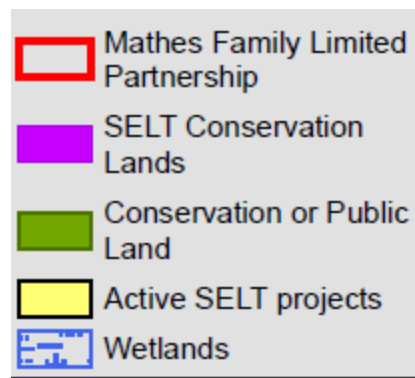
- Prioritize locations that meet multiple criteria and will protect key functions and values
 - Wildlife habitat
 - Water Quality
 - Flood Storage
- Identify aquatic resources & restoration opportunities
 - Prime wetlands, vernal pools, designated rivers
- Focus on wildlife habitat & connections
 - Areas ranked as Tier 1 or Tier 2 by the WAP
 - Locations with threatened and endangered species, and exemplary communities



FINDING GOOD LOCAL MITIGATION *LAND PRESERVATION*

Connecting the landscape

- Review conservation lands layer
- Overlay WAP map
- Consider land uses in the area and threat of development
- Review aquatic resources
- Search for vernal pools
- Survey for rare species



FINDING GOOD LOCAL MITIGATION LAND PRESERVATION

Inventory of NH's Conservation Plans

Compiled 12/5/2017 by Pete Steckler, The Nature Conservancy NH

Statewide:

Wildlife Action Plan (NHFG 2015, Aquatics update 2017)

Resilient and Connected Landscapes (TNC 2016)

Natures Network (UMASS Amherst for NALLC, 2017)

Matrix Forest Blocks (TNC, from ecoregional plans (Northern Appalachian/Acadian, Lower New England Piedmont, North Atlantic Coast), dates vary)

Northern NH

Staying Connected in the Northern Appalachians, Northeast Kingdom to Northern New Hampshire Linkage: Implementation Plan to Maintain and Enhance Landscape Connectivity for Wildlife (TNC 2013)

CT River

Floodplain Forest Conservation and Restoration Priorities (TNC CT River Program 2010)

Silvio O. Conte Conservation Focus Areas (USFWS 2015)

A Land Conservation Plan for the Ashuelot River Watershed (TNC, MC, SPNHF, SWRPC, 2004)

Central

Merrimack River Conservation Plan

Southwest

Quabbin to Cardigan Partnership, to be updated 2018

Mount Washington Valley

Pine River CAP (Parcel based land protection priorities, 2010)

Lakes Region

Lakes Region Conservation Plan (2012, currently being updated to include resilient and connected lands—OSI funded, to be complete by end of 2017).

Land Conservation Resource Assessment of the Ossipee Mountains (Ossipee Mnt Conservation Collaborative (2011)

Seacoast

Land Conservation Plan for NH's Coastal Watersheds (TNC, SRPC, NHEP, SPNHF, RPC, NHCP, 2006)

Land Conservation Priorities for the Protection of Coastal Water Resources: A Supplement to The Land Conservation Plan for New Hampshire's Coastal Watersheds (TNC 2016)

Coming Soon... Connect The Coast: Linking wildlife across New Hampshire's seacoast and beyond (TNC 2018)

Sea Level Affecting Marshes Model Conservation Priorities (NHFG 2014ish)

Resilient Coastal Sites for Conservation in the Northeast and Mid-Atlantic (TNC 2017)

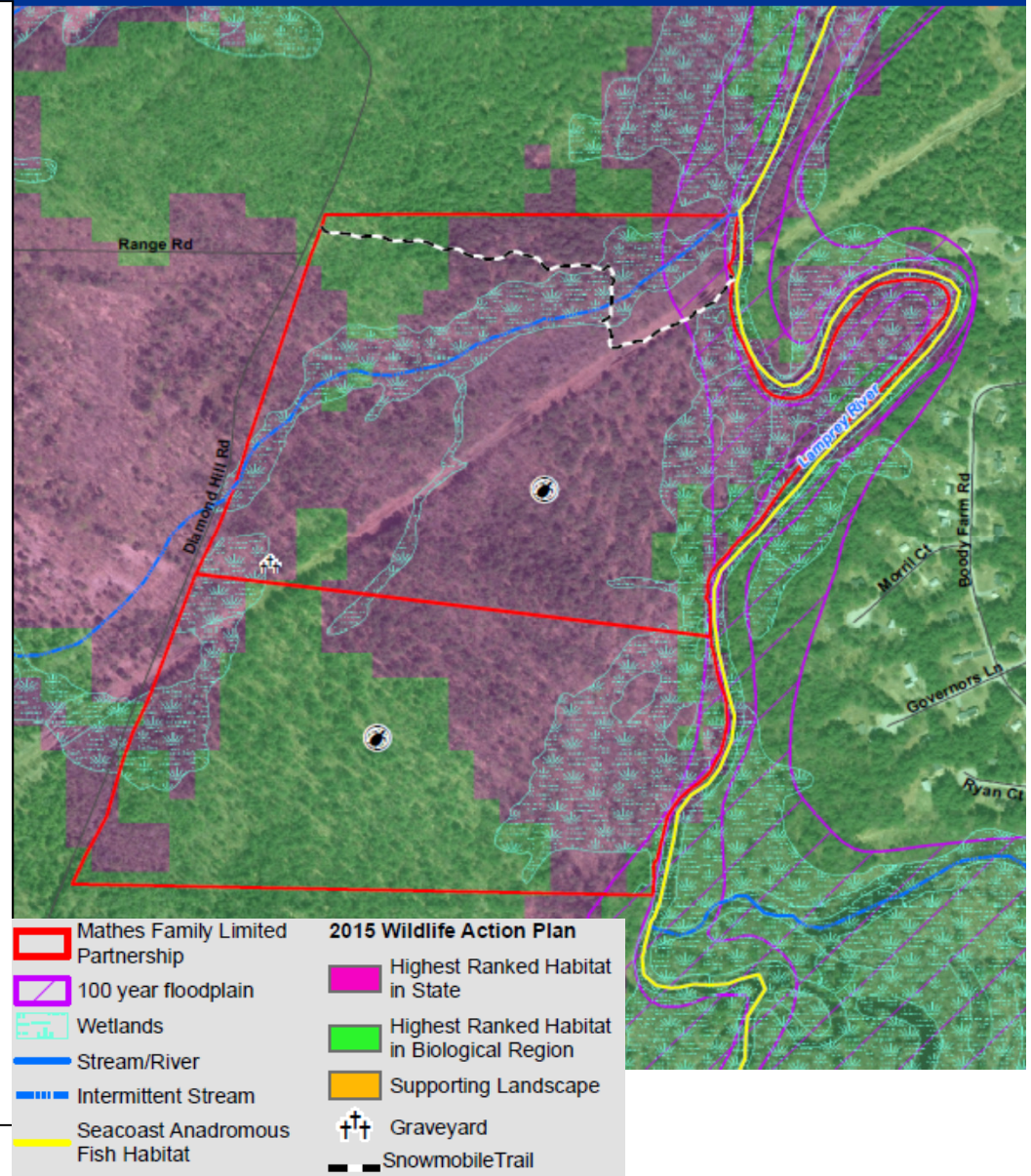
Species Plans

Blandings Turtle Focus Areas (NALCC(?))

Wood Turtle Focus Areas (coming in 2018 from UMASS)

Eastern Brook Trout Joint Venture Priority Watersheds

New England Cottontail Focus Areas



SUCCESSFUL APPROACH TO LAND CONSERVATION

Canterbury Oxbow Property Society for the Protection of NH Forests

- Conservation easement on 294 acres
- ~ 26 acres of wetland with rare floodplain forest
- ~ 2 miles of shoreline along the Merrimack River
- Globally ranked exemplary plant communities
- Highest ranked habitat in NH

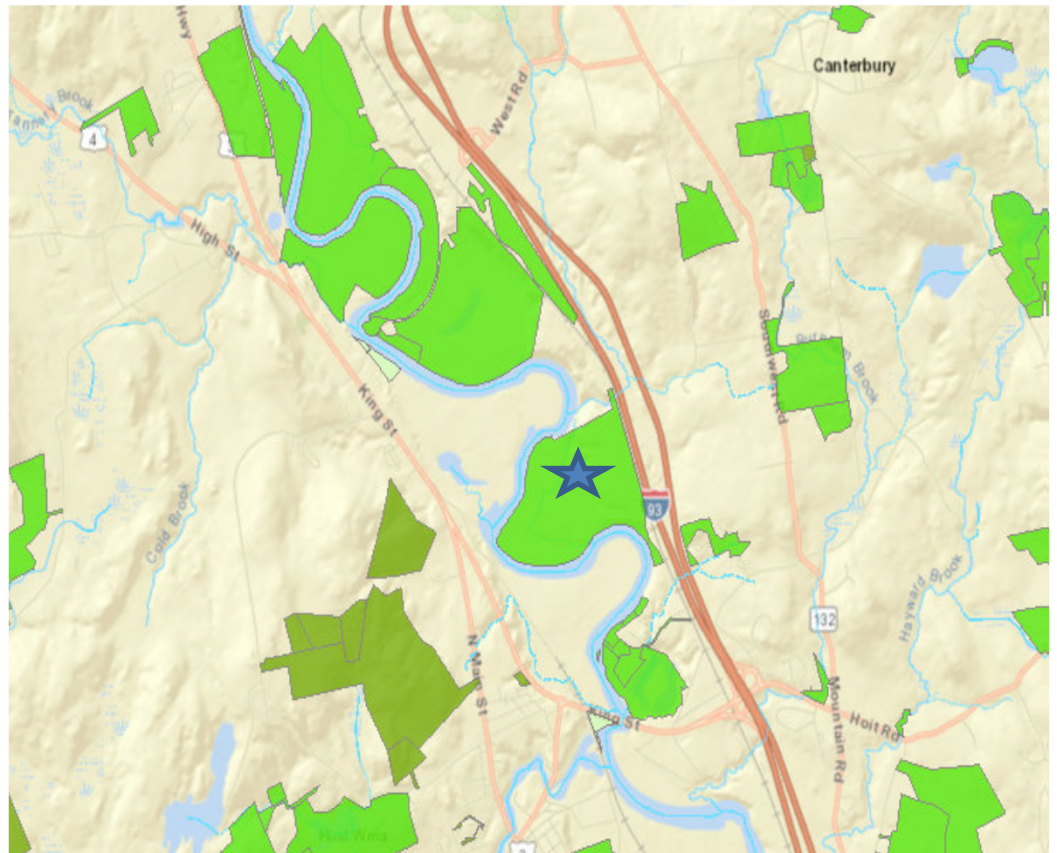


LEVERAGING FUNDS AND PARTNERSHIPS

Partners are the key to success

DES ARM Funds	\$300,000
NOAA Funds	\$100,000
Open Space Institute	\$150,000
LCHIP	\$200,000
<u>Local contribution</u>	<u>\$60,000</u>
TOTAL BUDGET	\$810,000

★ *Oxbow Property, Muchyedo Banks,
Concord*



*SHINING STAR * PROJECT

Conservation easement 29 acres
of land along 1,500 liner feet
of designated Ashuelot River

Enhancement of three field areas
(13 acres) of lower floodplain
with 2,500 trees and shrubs

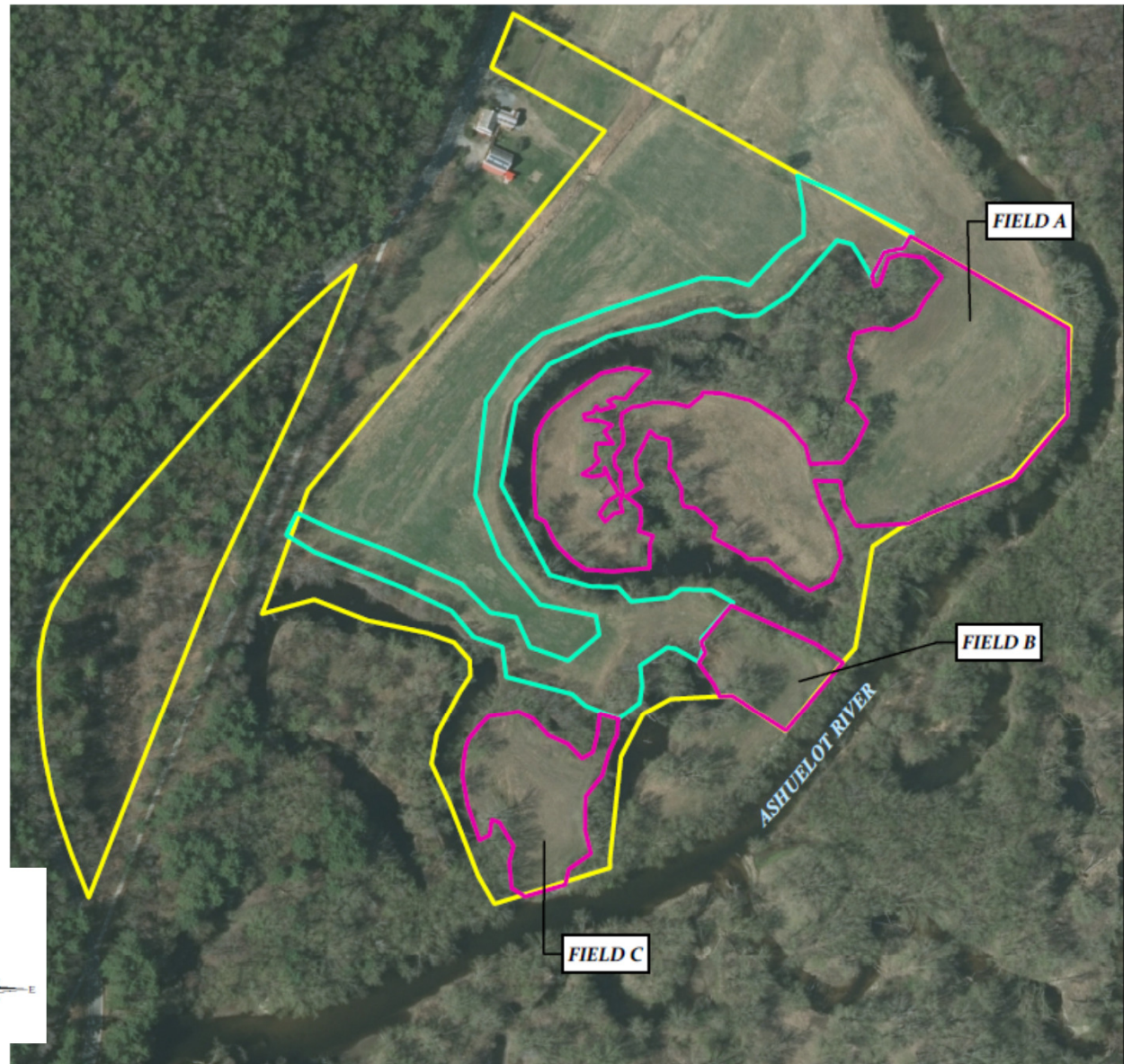
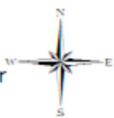
Treatment of invasives in high
Floodplain buffer

* Project Partners *

Monadnock Conservancy
The Nature Conservancy
Town of Swanzey

Legend

- Ballou Tract
- Low Floodplain and Fields
- 50' Wide High Floodplain Buffer



PARTNERSHIPS ARE KEY TO SUCCESS

Statewide Coverage Land Trusts

- Archaeological Conservancy
- Audubon Society of NH
- The Nature Conservancy
- New England Forestry Foundation
- New England Wildflower Society
- NH Preservation Alliance
- Northeast Wilderness Trust
- Society for the Protection of NH Forests
- The Trust for Public Land
- Wildlife Land Trust

Local Land Trusts

- | | | | |
|----|--|----|---------------------------------------|
| 1 | Amherst Land Trust | 18 | Monadnock Conservancy |
| 2 | Ammonoosuc Conservation Trust | 19 | Moose Mountain Regional Greenways |
| 3 | The Appalachian Trail Conservancy | 20 | Nashua River Watershed Association |
| 4 | Ausbon Sargent Land Preservation Trust | 21 | Nichols-Smith Conservation Land Trust |
| 5 | Bear-Paw Regional Greenways | 22 | Nissitissit River Land Trust |
| 6 | Bedford Land Trust | 23 | Pemi-Baker Land Trust |
| 7 | Bow Open Spaces | 24 | Piscataquog Land Conservancy |
| 8 | Chocorua Lake Conservation Foundation | 25 | Silver Lake Land Trust |
| 9 | Dan Hole Pond Watershed Trust | 26 | Souhegan Valley Land Trust |
| 10 | Five Rivers Conservation Trust | 27 | Southeast Land Trust of NH |
| 11 | Franchestown Land Trust | 28 | Squam Lakes Association |
| 12 | Gilmanton Land Trust | 29 | Squam Lakes Conservation Society |
| 13 | Green Mountain Conservation Group | 30 | Turkey River Basin Trust |
| 14 | Harris Center for Conservation Education | 31 | Upper Saco Valley Land Trust |
| 33 | Hanover Conservancy | 32 | Upper Valley Land Trust |
| 15 | Howfima Trust | 33 | Lake Wentworth Foundation |
| 16 | Lakes Region Conservation Trust | | |
| 17 | Mahoosuc Land Trust | | |

LAND CONSERVATION ORGANIZATIONS

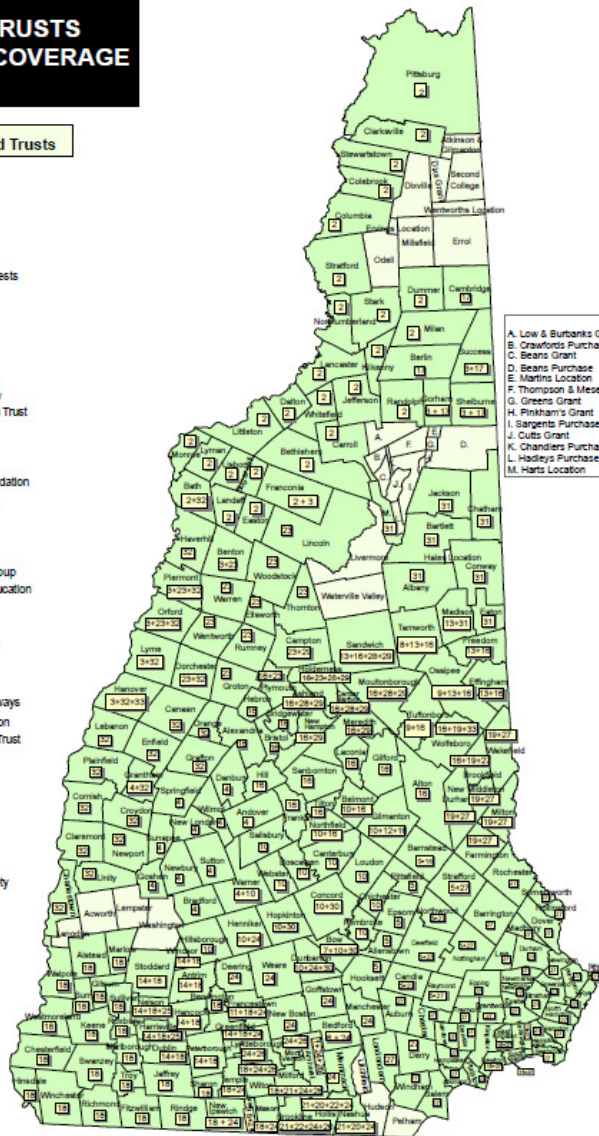
NH LAND TRUSTS GEOGRAPHIC COVERAGE

Statewide Coverage Land Trusts

Archaeological Conservancy
Audubon Society of NH
The Nature Conservancy
New England Forestry Foundation
New England Wildflower Society
NH Preservation Alliance
Northeast Wilderness Trust
Society for the Protection of NH Forests
The Trust for Public Land
Wildlife Land Trust

Local Land Trusts

- 1 Amherst Land Trust
- 2 Ammonoosuc Conservation Trust
- 3 The Appalachian Trail Conservancy
- 4 Audubon Sargent Land Preservation Trust
- 5 Bear-Paw Regional Greenways
- 6 Bedford Land Trust
- 7 Bow Open Spaces
- 8 Chocoma Lake Conservation Foundation
- 9 Dan Hole Pond Watershed Trust
- 10 Five Rivers Conservation Trust
- 11 Franconia Land Trust
- 12 Gilmanton Land Trust
- 13 Green Mountain Conservation Group
- 14 Harris Center for Conservation Education
- 15 Hanover Conservancy
- 16 Howfima Trust
- 17 Lakes Region Conservation Trust
- 18 Mahosuc Land Trust
- 19 Monadnock Conservancy
- 20 Moose Mountain Regional Greenways
- 21 Nashua River Watershed Association
- 22 Nichols-Smith Conservation Land Trust
- 23 Nisississet River Land Trust
- 24 Pemi-Baker Land Trust
- 25 Piscataquog Land Conservancy
- 26 Silver Lake Land Trust
- 27 Souhegan Valley Land Trust
- 28 Southeast Land Trust of NH
- 29 Squam Lakes Association
- 30 Squam Lakes Conservation Society
- 31 Turkey River Basin Trust
- 32 Upper Saco Valley Land Trust
- 33 Upper Valley Land Trust
- 34 Lake Wentworth Foundation



NEW HAMPSHIRE
LAND TRUST
COALITION

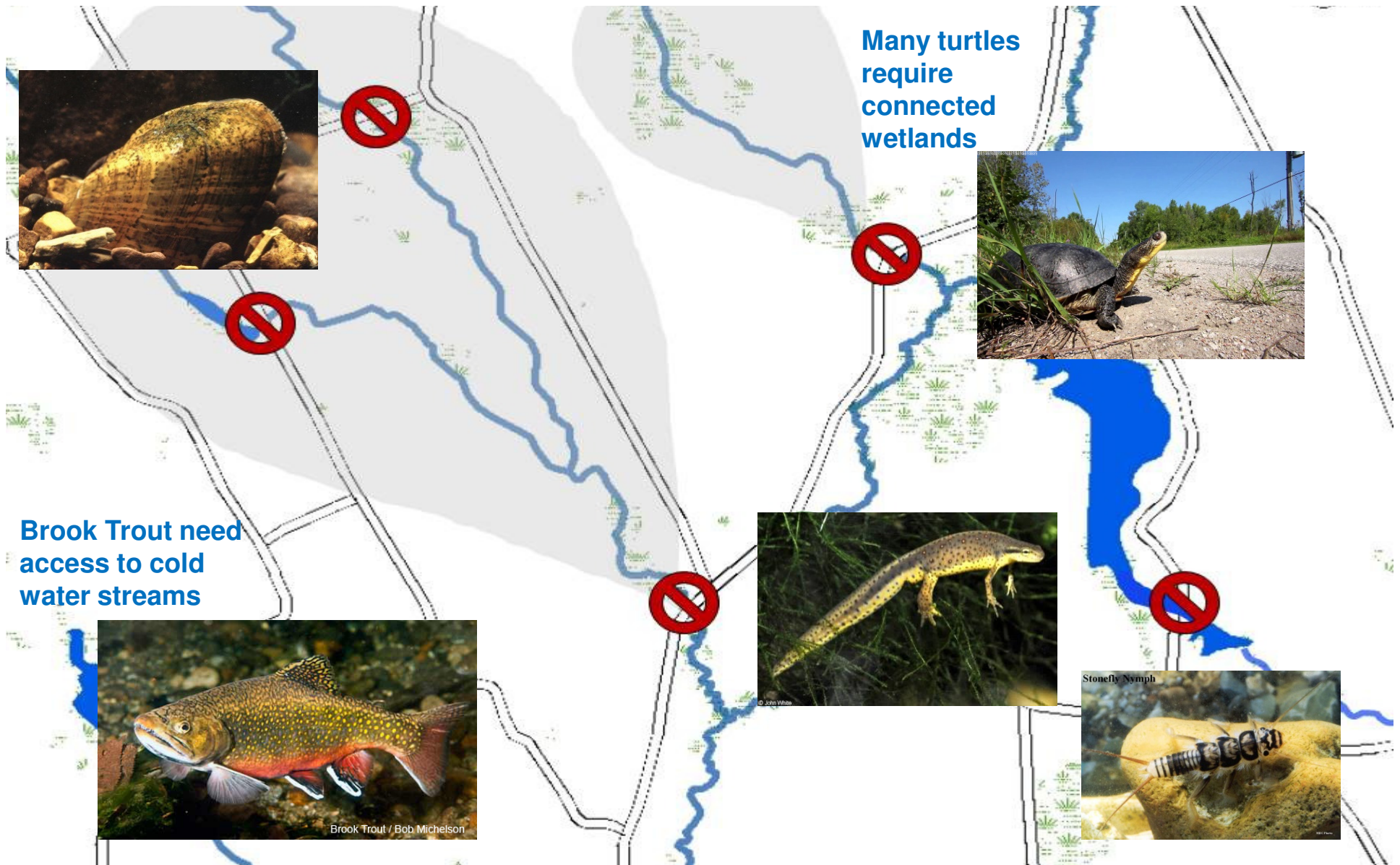
<https://nhltc.org/find-land-trust>

STREAM BARRIER REMOVAL AS COMPENSATORY MITIGATION

- 2010 NHDES adopted rules for stream impacts
 - ARM payment assessed at \$200 LF
 - Funds can be used to offset stream impacts within the same watershed
- Opportunity to use these funds for stream restoration projects
 - Target improvements to stream crossings that are barriers or lack habitat



PROJECTS TO REMOVE STREAM BARRIERS CAN BE USED AS MITIGATION



STREAM RESTORATION PROJECTS AS MITIGATION

Projects that will restore aquatic connectivity, improve habitat, & increase flood resiliency

- Removing aquatic barriers
- Daylighting buried streams
- Habitat enhancements for fish and wildlife such as wood additions and grade controls
- Floodplain reconnection
- Bank stabilization with bioengineering
- Removing hard bank armoring

Coir logs, wood, and buffer plantings can be used to stabilize stream banks rather than hard rock



Wood additions create pool habitat for Brook Trout in Nash Stream



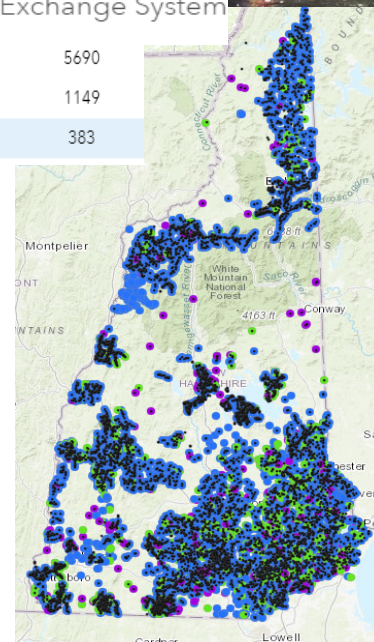
NEW HAMPSHIRE STREAM CROSSING INITIATIVE

- Inventory stream crossings throughout the state to inform decisions on culvert replacement and stream restoration

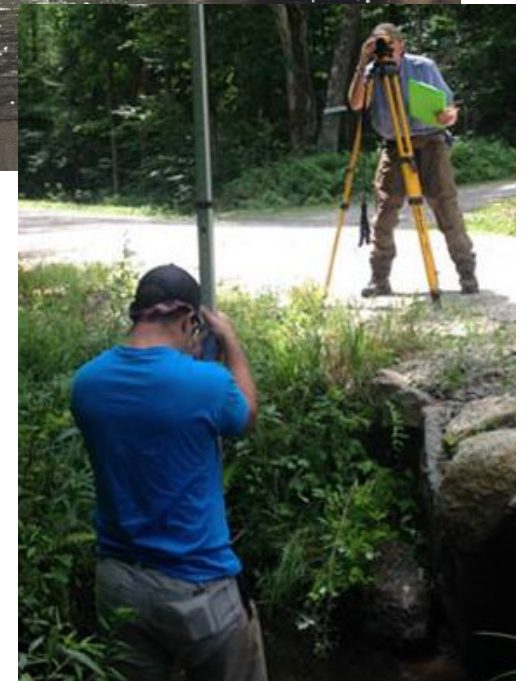


NH Statewide Asset Data Exchange System

• Stream	5690
• Wetland	1149
• Surface	383

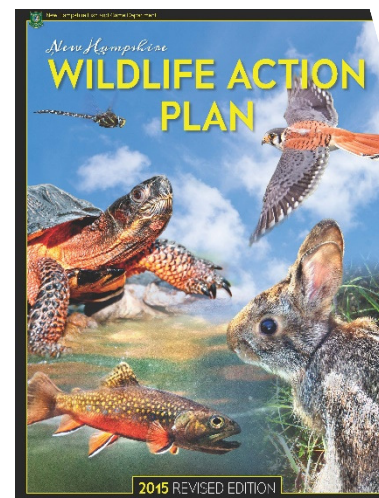
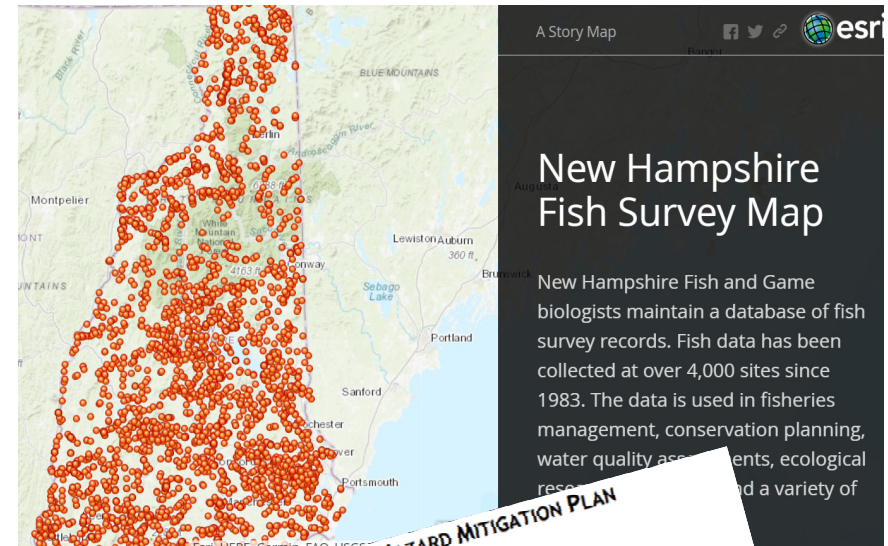


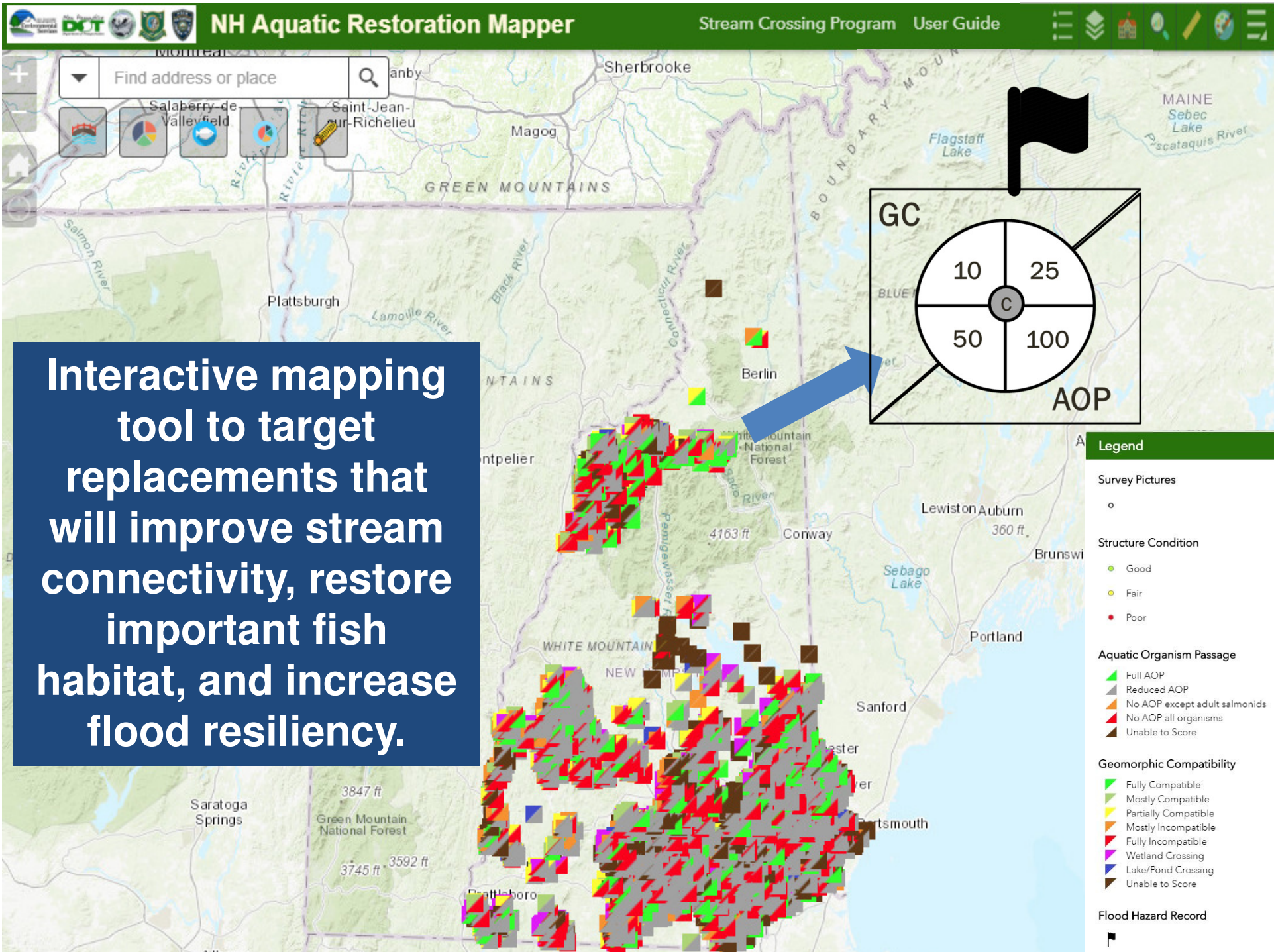
New Hampshire
Technology Transfer Center



FINDING GOOD LOCAL MITIGATION *STREAM RESTORATION*

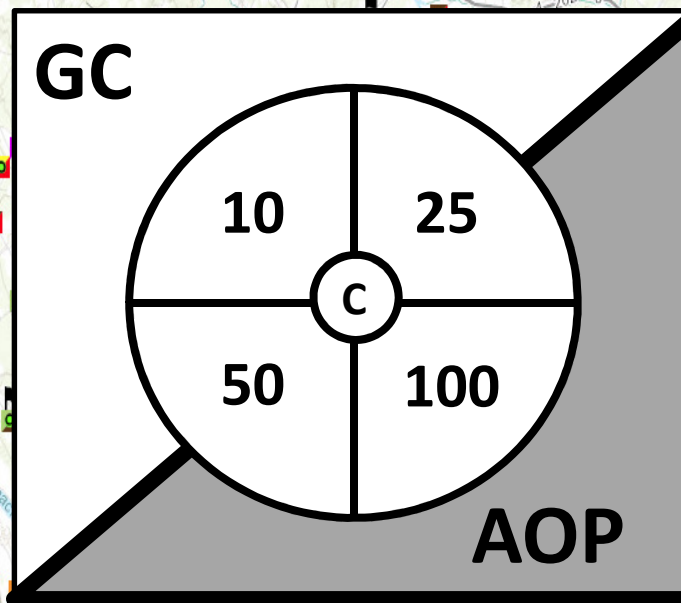
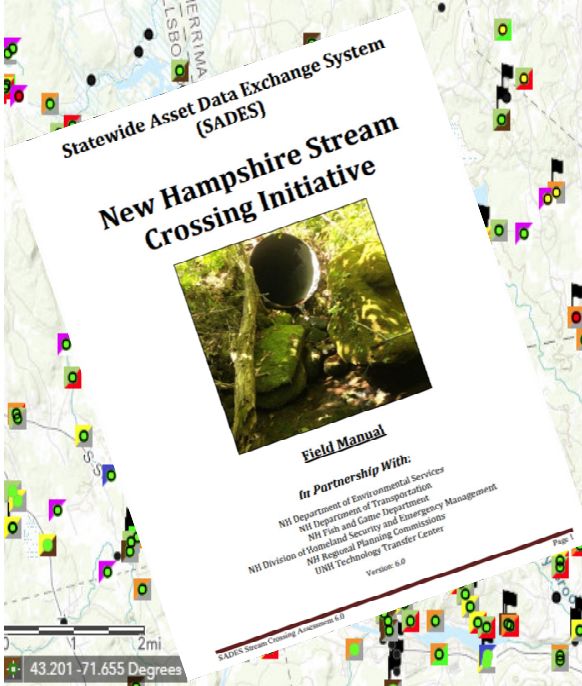
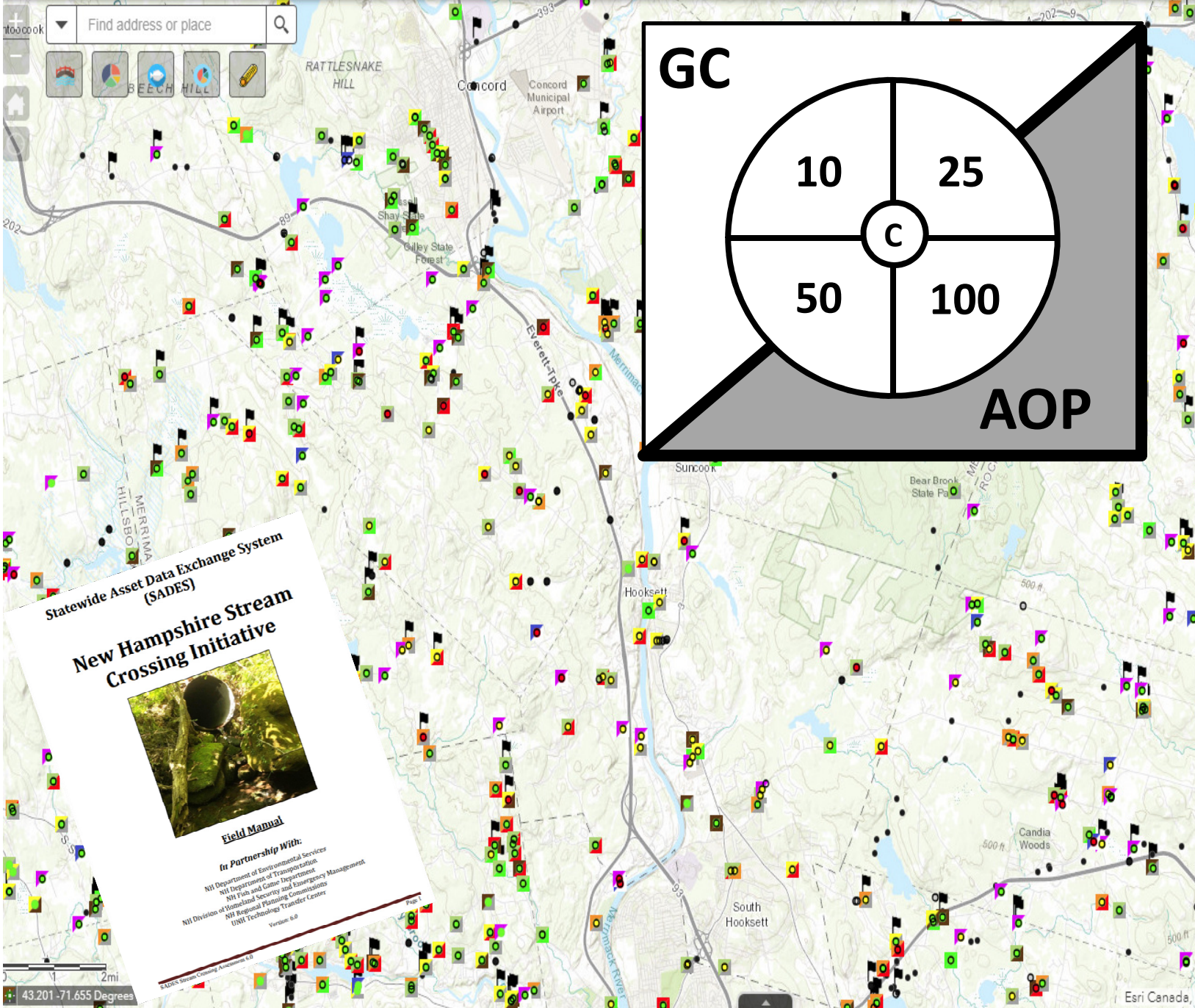
- Focus on:
 - NHFG WAP Tier 1 and Tier 2
 - Benefits to threatened and endangered species
- Use NHFG Aquatic WAP- Fish Survey Data
- Maximize stream miles gained/enhanced for fish and wildlife passage
- Use local flood data
- Land protection is encouraged but **not required**







Find address or place



Legend

Survey Photos



Stormwater Drainage Surveys



Structure Condition

Good

Fair

Poor

Geomorphic Compatibility Score

Fully Compatible

Mostly Compatible

Partially Compatible

Mostly Incompatible

Fully Incompatible

Wetland Crossing

Lake/pond Crossing

Unable to Score

Aquatic Organism Passage Score

Full AOP

Reduced AOP

No AOP except adult salmonids

No AOP including adult salmonids

Unable to Score

Incomplete Surveys



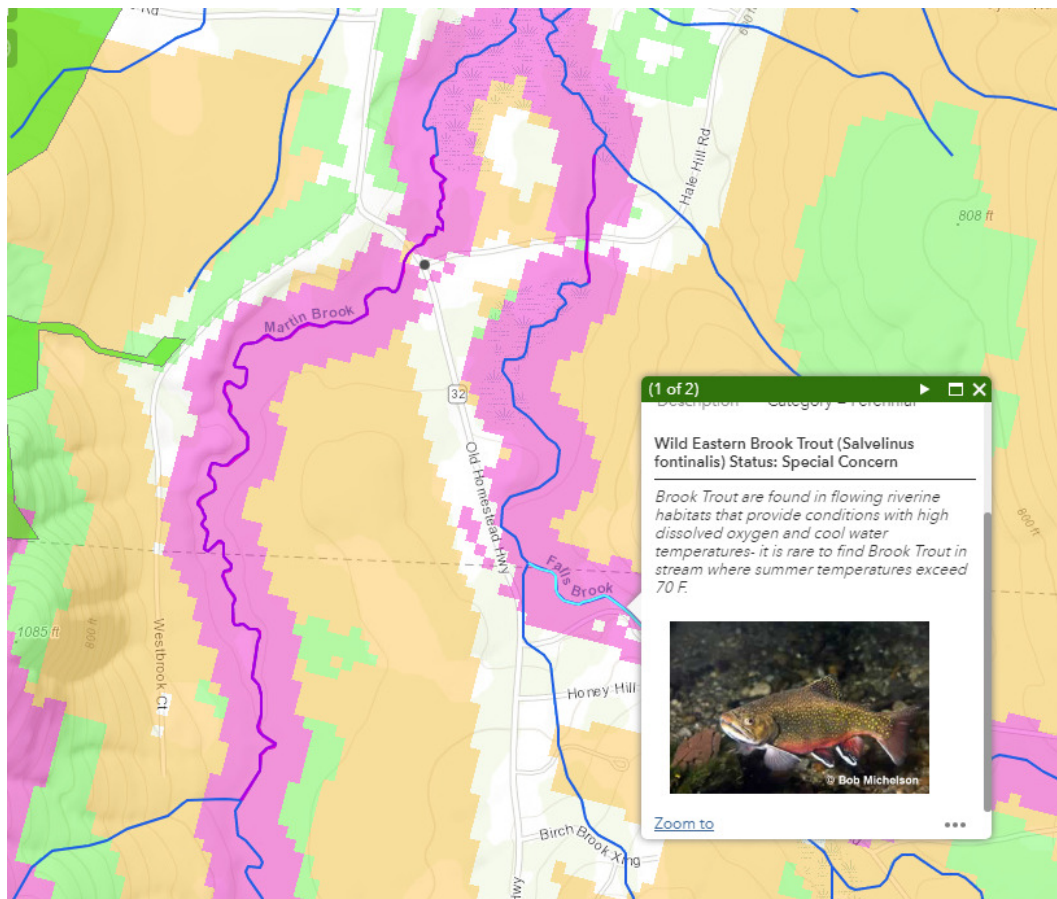
Flood Hazard Record



SUCCESSFUL CULVERT REPLACEMENTS

FALL BROOK CULVERT SWANZEY, NH

- Undersized, 50-foot long metal pipe causing bank and bed erosion
- A barrier to local eastern brook trout



SUCCESSFUL CULVERT REPLACEMENTS

FALL BROOK CULVERT SWANZEY, NH

- Installed 23-foot span open-bottom arch
- Connected ten miles of upstream habitat
- Regained access to coldwater spawning habitat on headwater tributaries



ARM Funding: \$165,000

Total Project Cost:
\$250,572

Project Objectives:

- Restore instream aquatic habitat
- Reconnect coldwater stream for brook trout
- Support high ranked wildlife habitat
- Increase resiliency

Project Partners:

Trout Unlimited, Cheshire County Conservation District, Town of Swanzey, NRCS, Fish & Game, Harris Center

SUCCESSFUL DAM REMOVAL

GREAT DAM EXETER, NH

- Remove first barrier for migrating diadromous fish
- Open more than 13 river miles of freshwater spawning and nursery habitat for River Herring.

Project Partners:

Town of Exeter, VHB,
NOAA, USF&WS, NHFG
NH Coastal Program



SUCCESSFUL DAM REMOVAL

GREAT DAM EXETER, NH

- Remove first barrier for migrating diadromous fish
- Open more than 13 river miles of freshwater spawning and nursery habitat for River Herring.



ARM Funding: \$100,000

Total Project Cost:
\$1,968,854

Project Partners:

Town of Exeter, VHB,
NOAA, USF&WS, NHFG
NH Coastal Program

Great Dam Removal and Exeter River Restoration



Owner: Town of Exeter
Design Engineer: VHB
Contractor: SumCo Eco-Contracting



This project has been completed with the assistance
from the following funding partners:

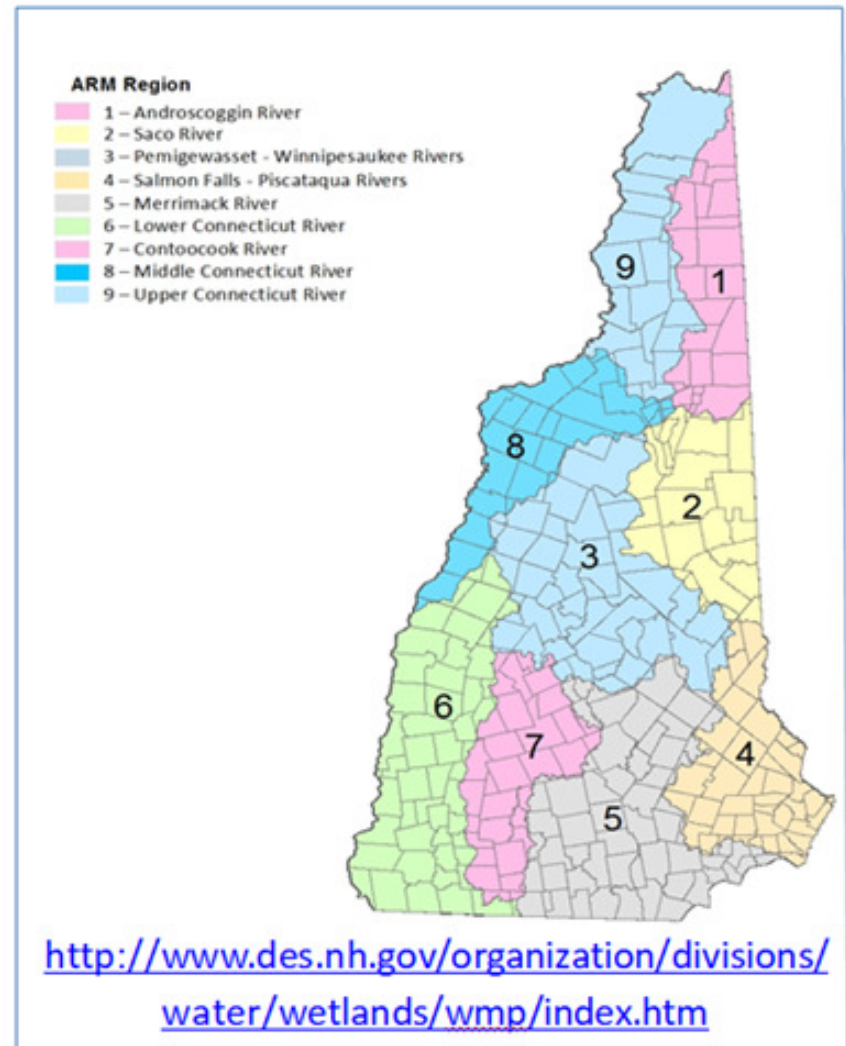
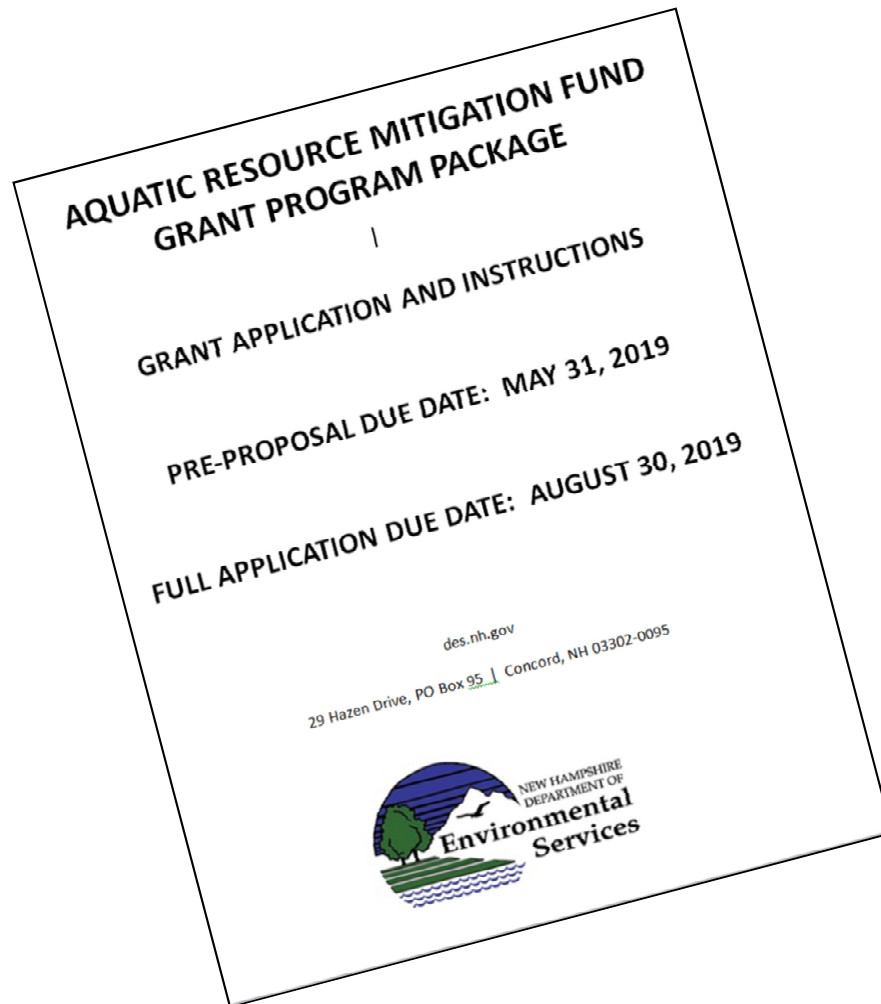
NHDES, Coastal Program
NHDES, Aquatic Resource Mitigation Fund
NH State Conservation Committee, Conservation Grant Program
NOAA, Coastal Ecosystem Resiliency Grant



©2016 Harry McCoy

ARM FUND APPLICATION MATERIALS

\$1,680,000 available in Area 5 –
Merrimack River Service Area



2019 MERRIMACK RIVER WATERSHED IMPACT LEDGER

2009 DISBURSAL OF \$567,400 TO 4 PROJECTS

2010-2012 DISBURSAL OF \$2,156,628.75 TO 7 PROJECTS

2013 DISBURSAL OF \$65,400 TO 1 PROJECT

2014 DISBURSAL OF \$422,70 TO 3 PROJECTS

2012 Award returned \$4061.25

2015 DISBURSAL OF \$915,270 TO 4 PROJECTS

2016 DISBURSAL OF \$1,315,240 TO 7 PROJECTS (Oyster River withdrawn)

2018 DISBURSAL OF \$1,359,000 TO 7 PROJECTS

2019 MERRIMACK RIVER WATERSHED PAYMENTS

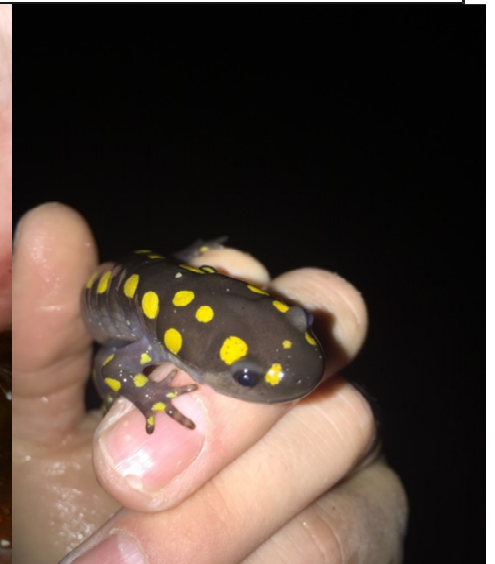
PERMIT #	LOCATION	PROJECT TYPE	COWARDIN CLASS	PRIMARY F/V's	OTHER ISSUES	WETLAND LOSS SQFT	TEMPORARY IMPACTS SQ FT	STREAM LOSS LIN FEET	PAYMENT AMOUNT	ADMIN FEE	DEPOSIT DATE
2018 Carry over funds									\$1,281,661.00		
2017-1809	Bedford	NHDOT rehabilitation of arch culvert within NH Route 114.	R3UB1	Fish and wildlife habitat.				65	\$15,927.60	\$2,654.60	1/18/2018
2017-1156	Londonderry	Commercial development for poultry distribution facility, access, parking and loading areas.	PFO1E	Groundwater discharge, flood storage.		34077			\$168,189.91	\$28,031.65	8/16/2018
2018-882	Northfield	NHDOT replace twin culverts with embedded box culvert under NH Route 132.	R2UB12, PFO1E	Shoreline anchoring				49	\$12,136.32	\$2,022.72	8/16/2018
2018-498	Loudon	NHDOT widening of Rt 106, guardrail and drainage improvements	R4SB3J, R2UB1H,	Fish and wildlife habitat		7966	15,060	433	\$106,102.32	\$17,683.72	8/27/2018

2019 MERRIMACK RIVER WATERSHED IMPACT LEDGER

2016-1953	Londonderry	Manchester Airport clearing trees to runway approach.	PFO1E, PSS1E, PEM1E, R4SB	Nutrient removal, floodflow alteration, wildlife habitat	Near New England Cottontail habitat; temp clearing along 5,230 linear feet of intermittent stream.		311625		\$82,724.17	Paid on 12/13/2017.	11/13/2018
2018-253	Derry	Construction of health service building.	PEM	Flood storage, stormwater detention		11015			\$55,532.50	\$9,255.43	12/14/2018
2017-3475	Salem	Construction of senior housing condominium complex and roadway.	PSS	Wildlife habitat	Prime wetland impacts with 14,900 sq.ft. of prime wetland buffer impacts.	1975			\$9,990.98	\$1,665.16	12/20/2018
2018-1604	Concord	NHDOT replace culverts in 2 locations with work at outlets and banks.	R2UB1, bank	Shoreline anchoring	Bank area			108	\$26,749.44	\$4,458.24	12/27/2018
TOTALS						55,033.00	326,685.00	655	\$1,759,014.24	\$65,771.52	
GRANT TOTALS						55,033.00	326,685.00	655	\$1,693,242.72		

2019 GRANT ROUND SCHEDULE

APPLICATION STEPS	DEADLINE
Request for Pre-Proposals released	February 2019
Pre-Proposal submission deadline	May 31, 2019
Notify applicants for Full Application submittal	Week of June 17, 2019
Full Application submission deadline	August 30, 2019
ACE public notice and New Hampshire Division of Historic Resources review	Week of September 9, 2019
SSC and members of the IRT conduct site visits	September 24, 26 and October 1
SSC evaluation and scoring meeting	October 10, 2019
IRT and Wetland Council review/approval	November 2019
Announcement of awards	December 1, 2019



RESOURCES AVAILABLE FOR MITIGATION PRIORITY LIST

Resources available to assist
in putting together a
comprehensive mitigation
priority list

[NHDES Aquatic Restoration Mapper](#)

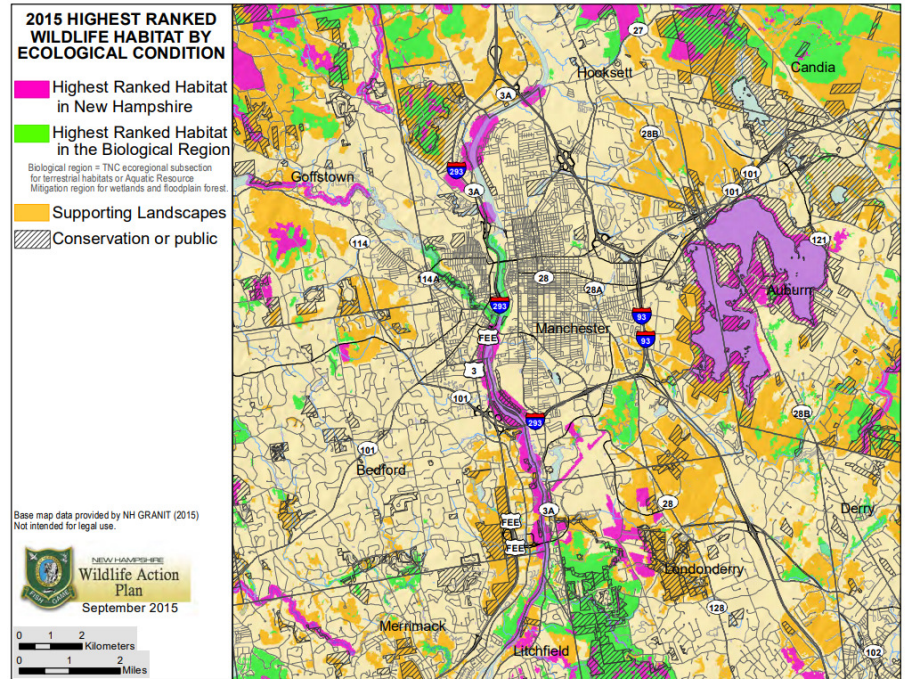
[NHDES One Stop Mapper](#)

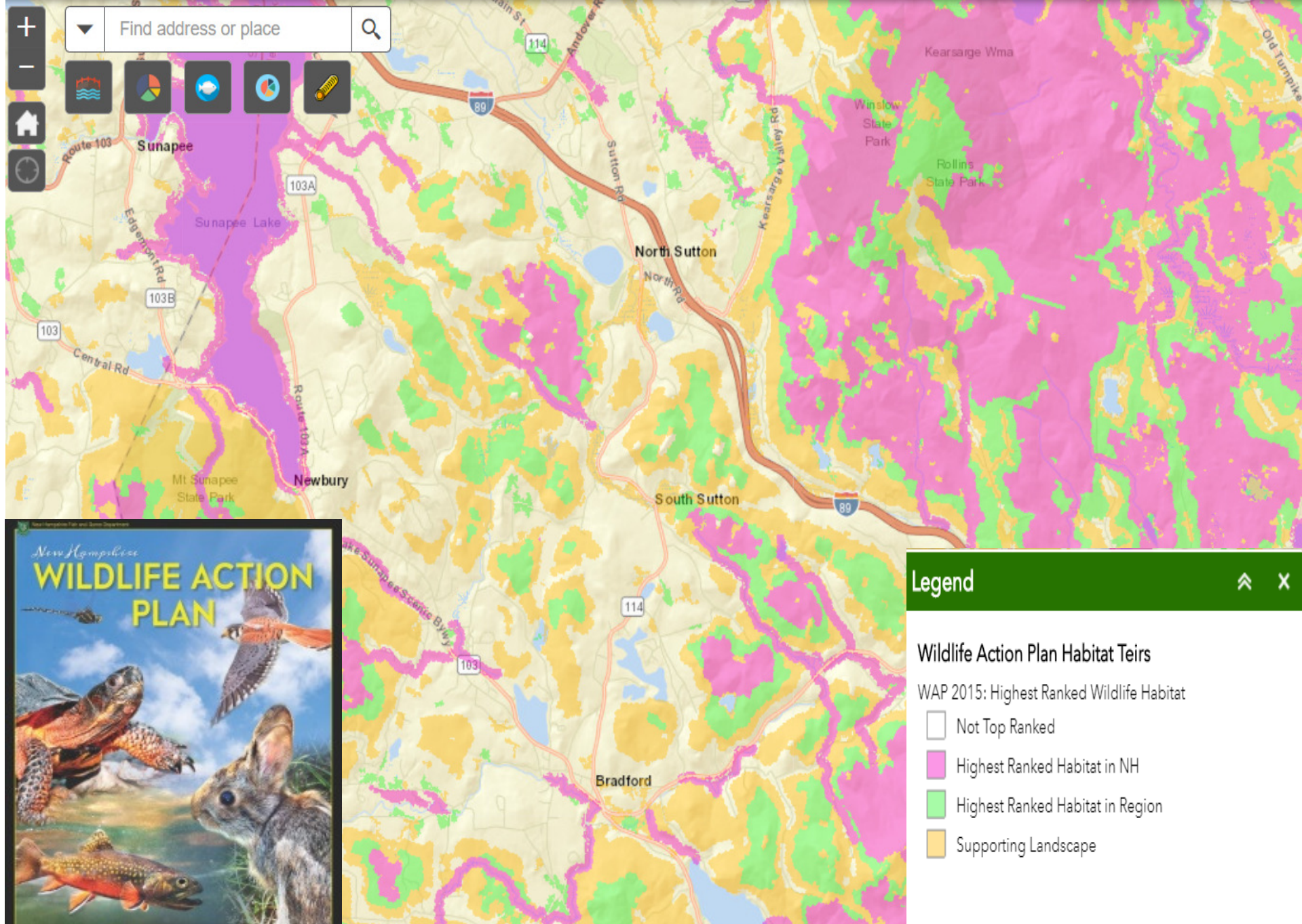
[NHFG Wildlife Action Plan Town Maps](#)

[NH GRANIT](#)

[NH Wetlands Mapper](#)

[NH Land Trust Coalition](#)

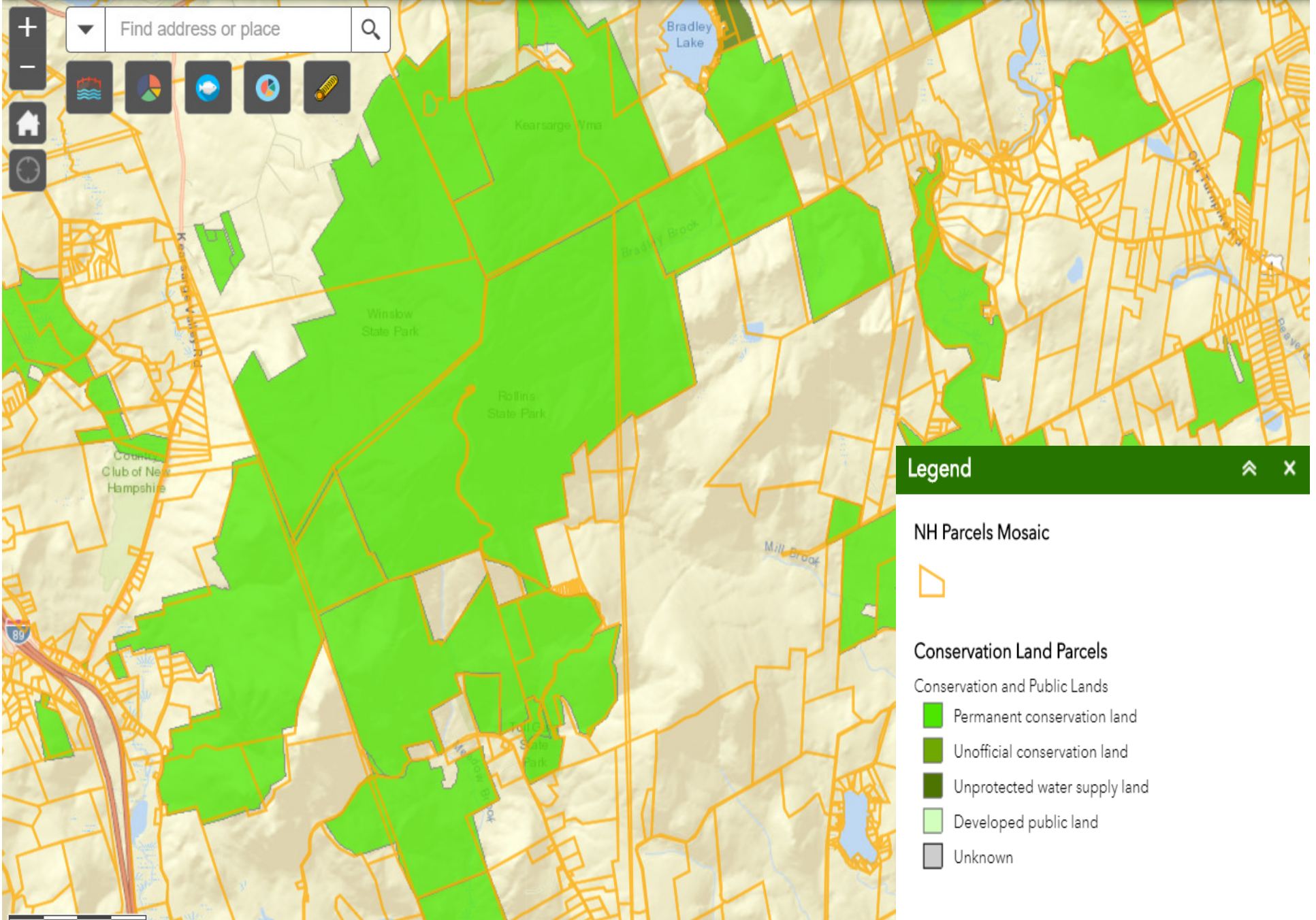


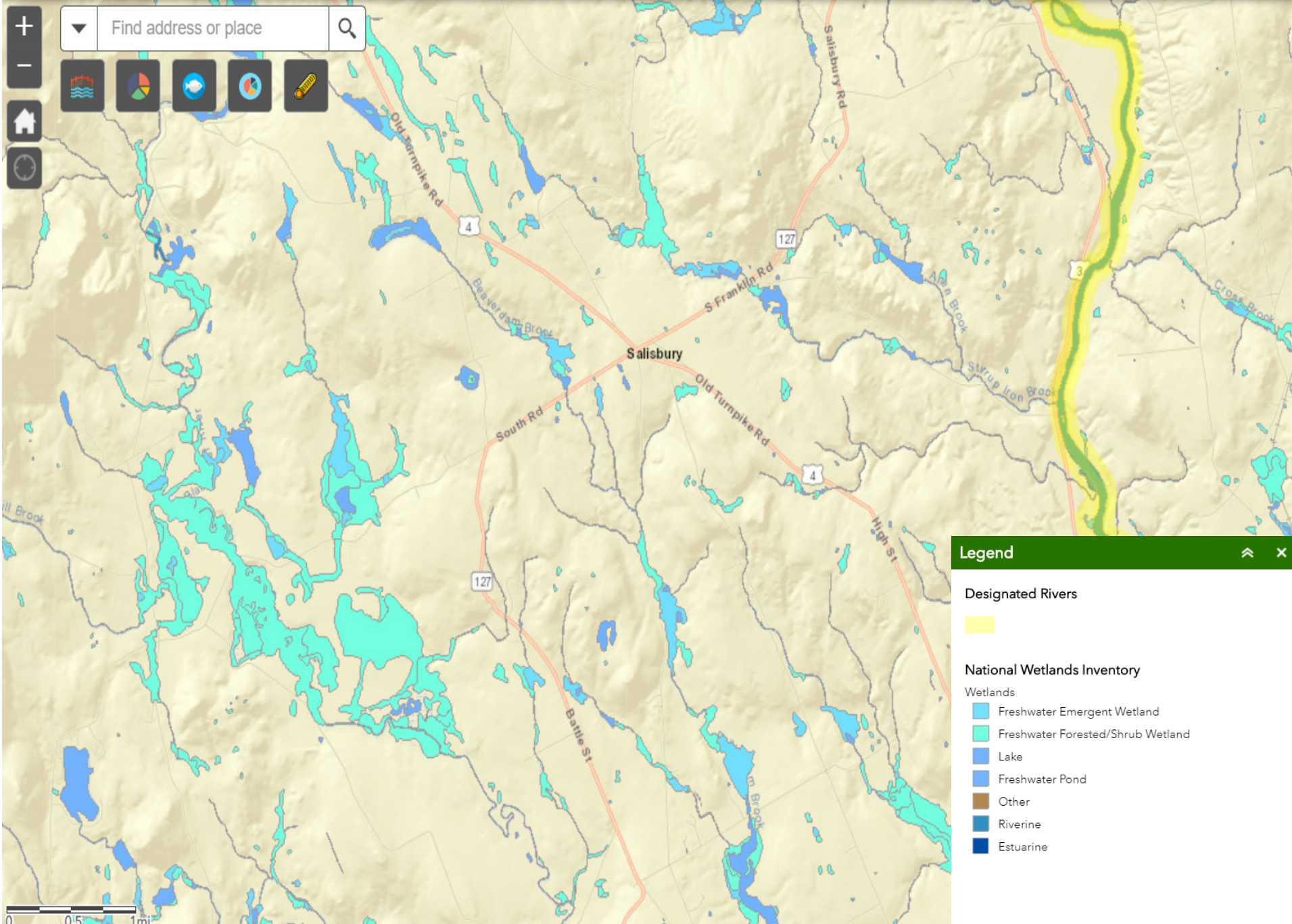




NH Aquatic Restoration Mapper

Stream Crossing Program User Guide







NH Aquatic Restoration Mapper

Stream Crossing Program User Guide

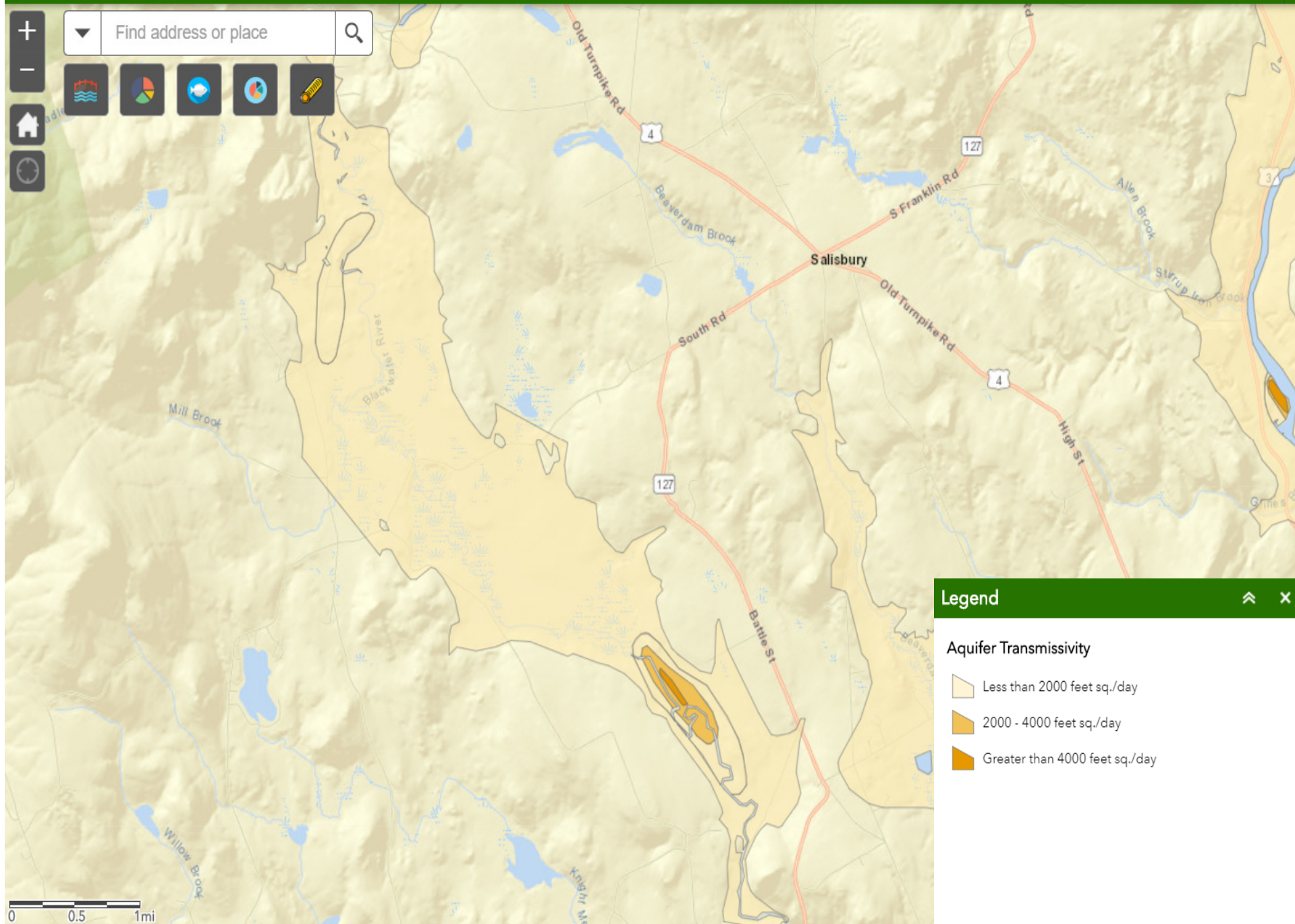


+

-

Find address or place

Q



Legend



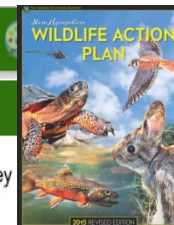
Aquifer Transmissivity

- Less than 2000 feet sq./day
- 2000 - 4000 feet sq./day
- Greater than 4000 feet sq./day



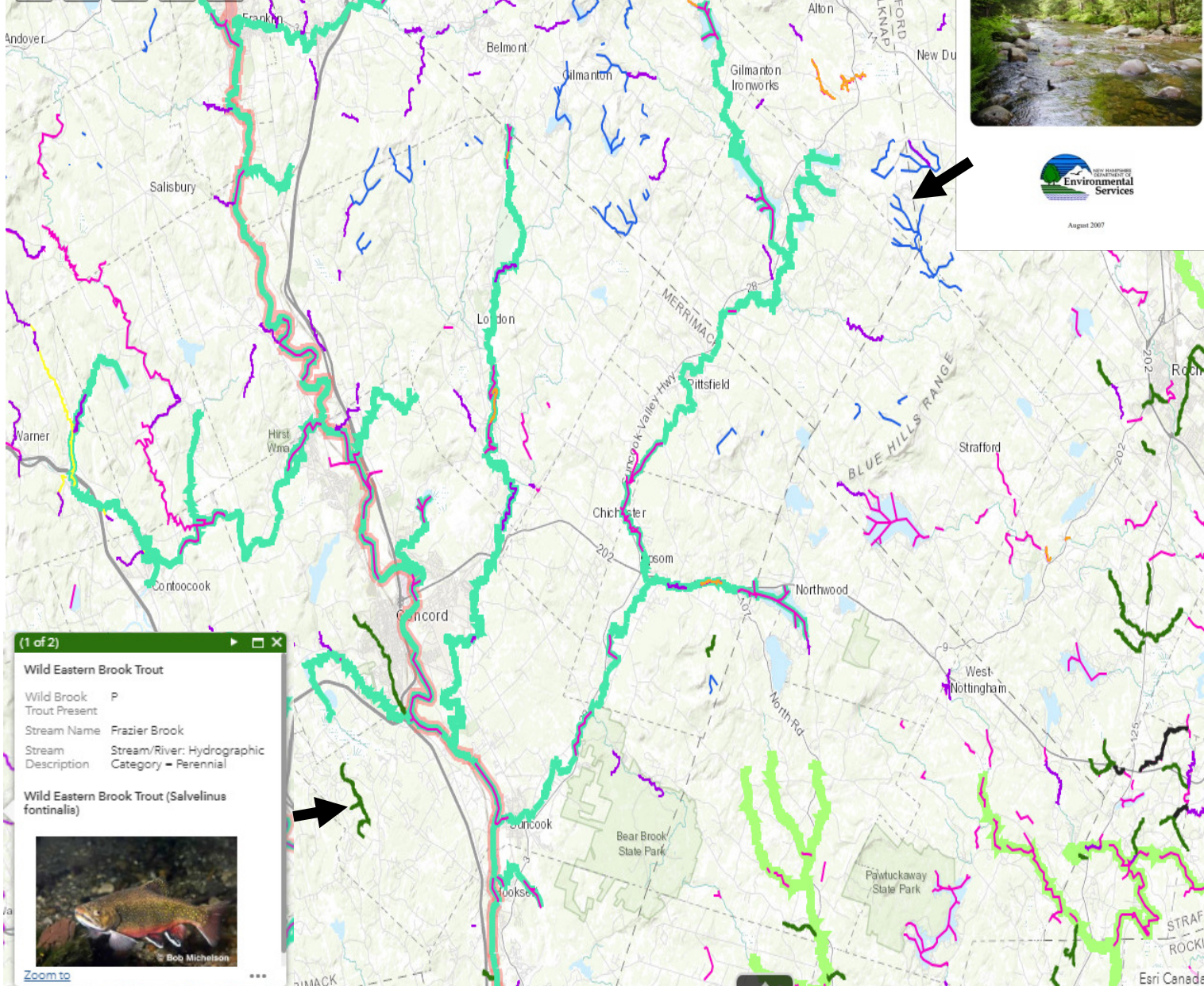
NH Aquatic Restoration Mapper

Stream Crossing Program User Guide



Find address or place

Icons: Map, Layers, Home, Search, Print, Full Screen



Predicated Coldwater Fish Indicator Species Presence in New Hampshire Wadeable Streams

New Hampshire Environmental Services

August 2007

- ### Legend
- American Brook Lamprey
—
 - Bridle Shiner Habitat
—
 - Springfed Wild Brook Trout
— Y
 - Wild Eastern Brook Trout
— P
 - Species of Concern
— P
 - NH Fish and Game Fishery Restoration Interest
—
 - Predicted Coldwater Fishery
— Coldwater
 - Herring Stock Location or Migratory Path
— M
— Y
 - Seacoast Anadromous Fish Habitat
—
 - American Shad Spawning Habitat
— Y

(1 of 2)

Wild Eastern Brook Trout

Wild Brook Trout Present

Stream Name: Frazier Brook

Stream Description: Stream/River: Hydrographic Category: Perennial

Wild Eastern Brook Trout (Salvelinus fontinalis)

Zoom to



www.des.nh.gov/wetlands
Lori.Sommer@des.nh.gov
(603) 271-4059