River Herring and Roads: Updates and Advice from MassDOT

Massachusetts River Herring Network Sixth Annual Meeting

Thursday October 27, 2016

Tim Dexter, Wetlands & Wildlife Biologist
Annie Bastoni, Stormwater Program Coordinator

River Herring Passage at Roadways

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Opportunities for Improvement

- Culvert Replacements
- Fishways / Ladders
- Dam Removal

Regulations: New Stream Crossings

Regulations: Stream Crossing Replacement

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Meet Stream Crossing Standards to maximum extent practicable, considering potential benefits and constraints

Construction of New Fishways, Ladders & Eel Ramps

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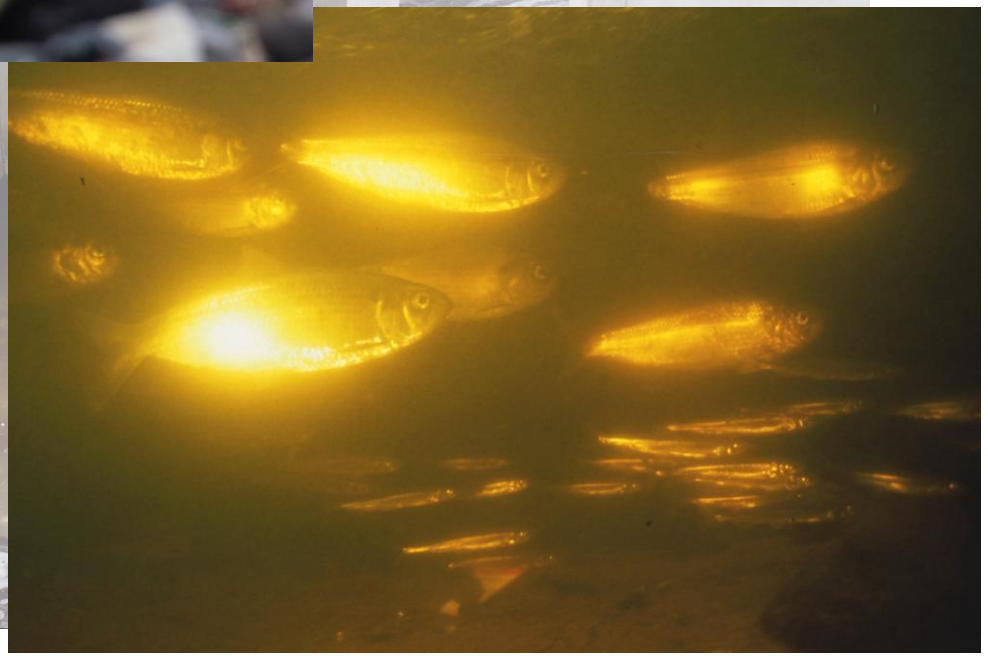
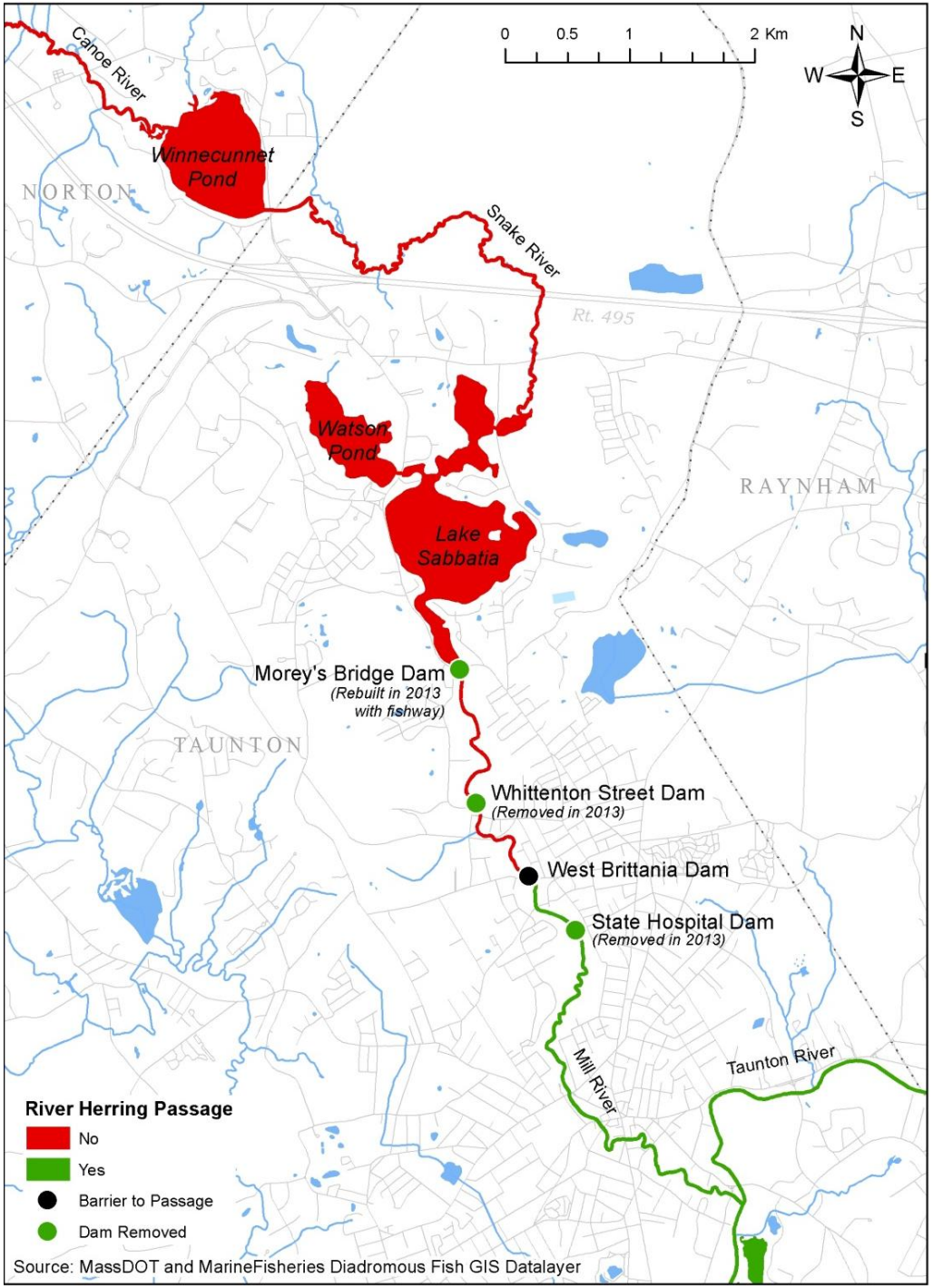


Morey's Dam, Taunton, MA



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Retrofit or Rebuild More Efficient Fish Ladders / Fishways

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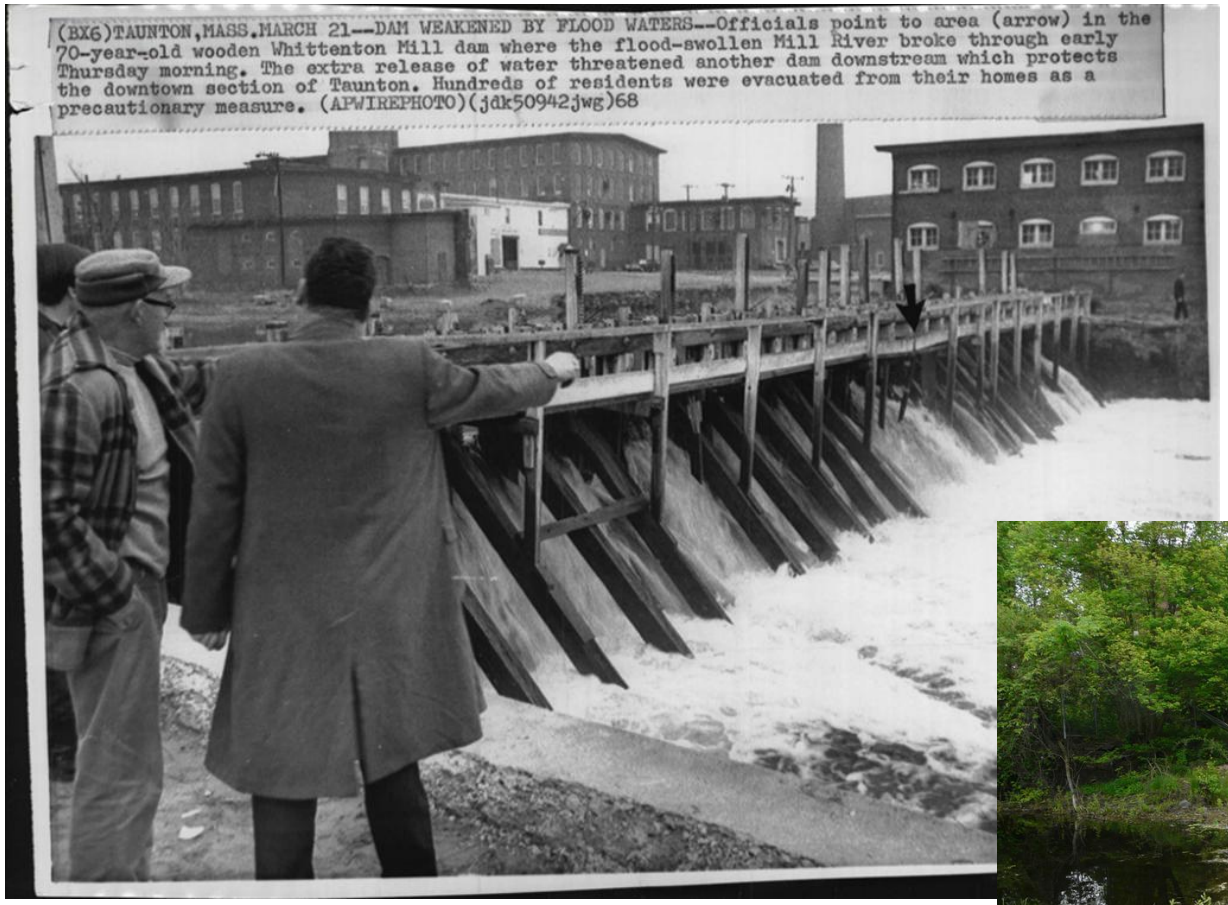
Identify Creative Opportunities for Improvements: Dam Removal



Whittenton Dam, Taunton, MA

Whittenton Dam Removal Pre/Post

Whittenton Dam, Taunton, MA

Dam Removal "Low Hanging Fruit"

Oxbow Brook, Rowley, MA

Identify Priorities & Develop Action Plans: Diadromous Fish Restoration Planning w/ Mass Marine Fisheries

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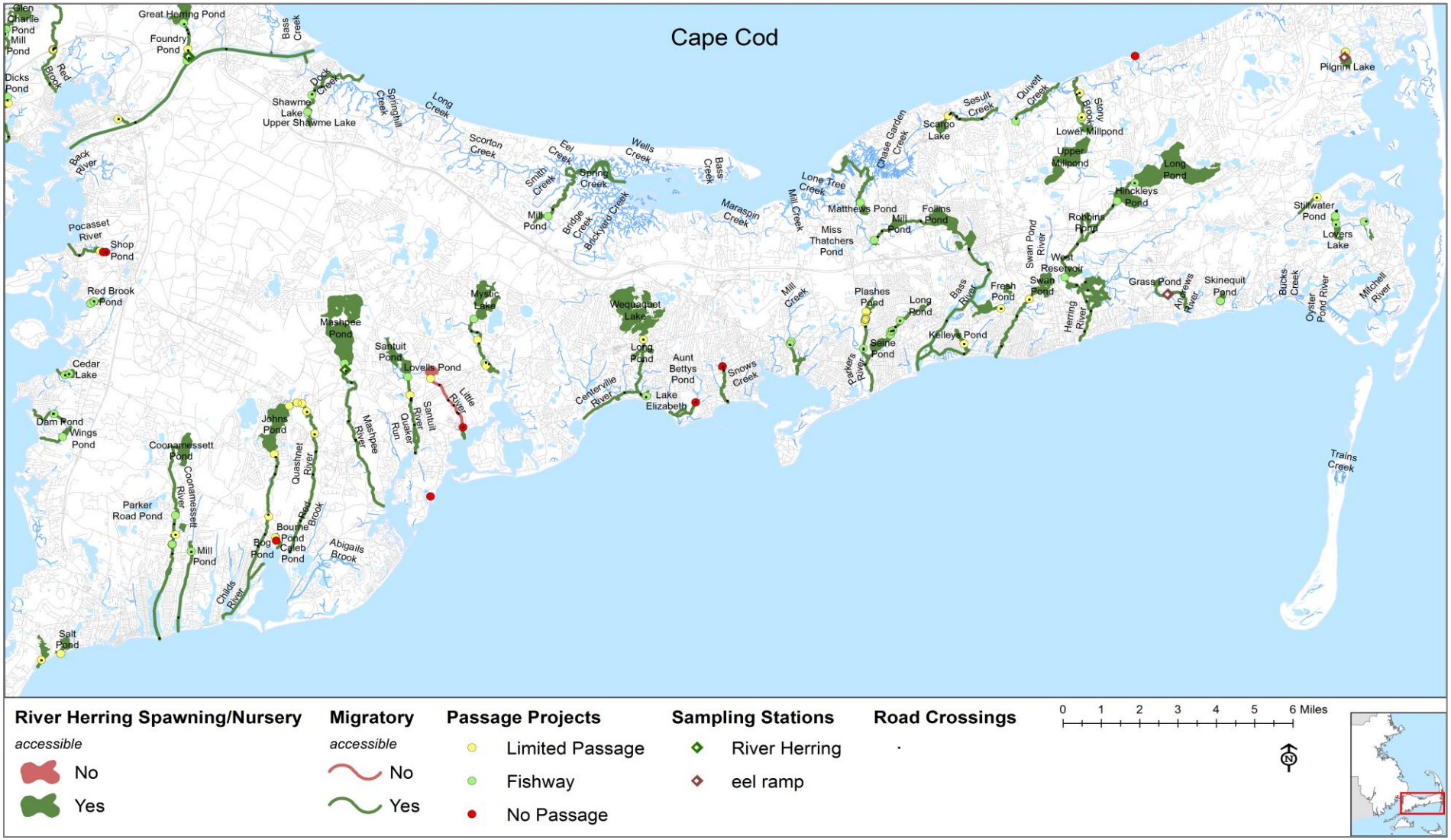
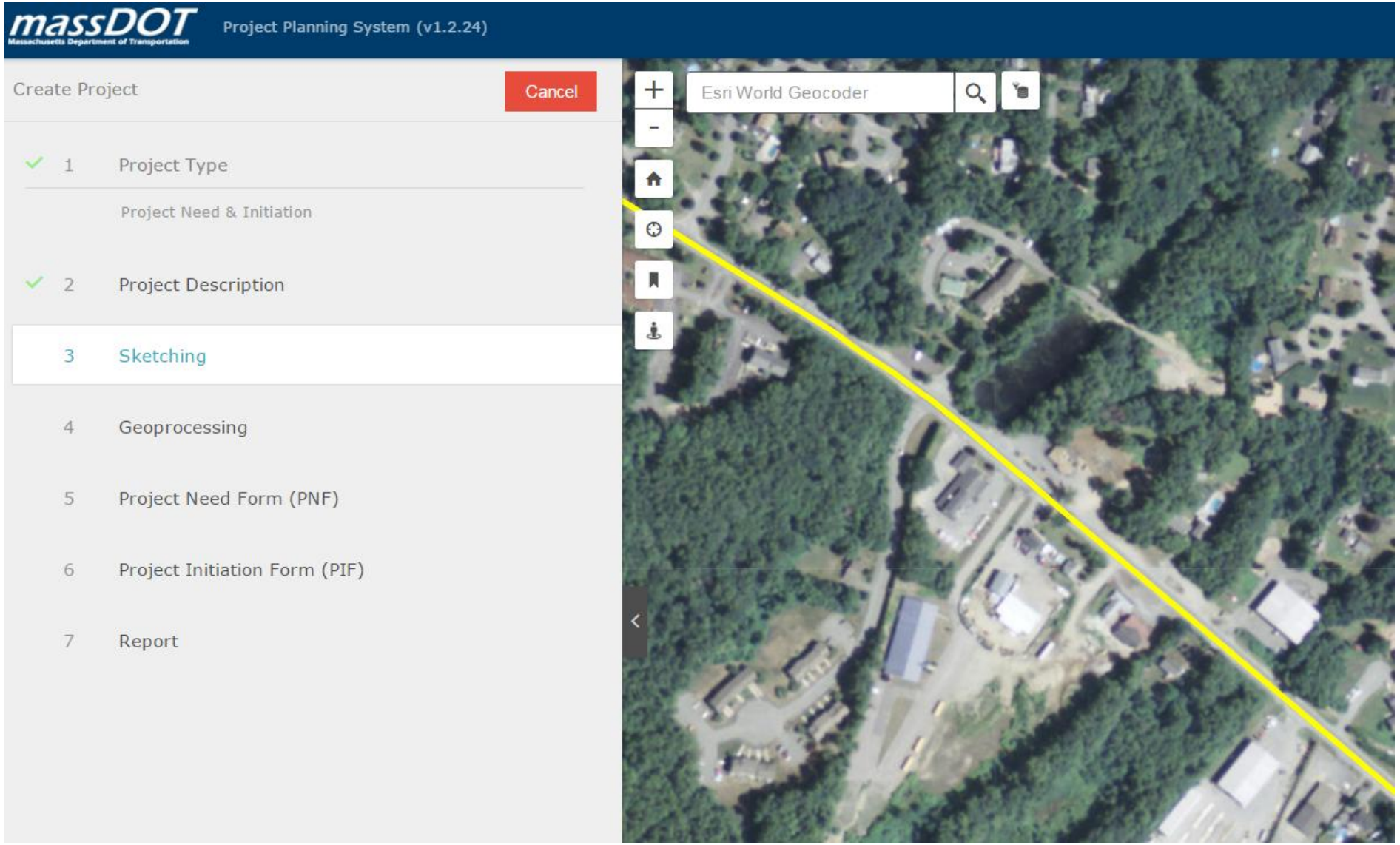


MassDOT Project Planning System



Identify diadromous fish communities by waterbody and waterway segments

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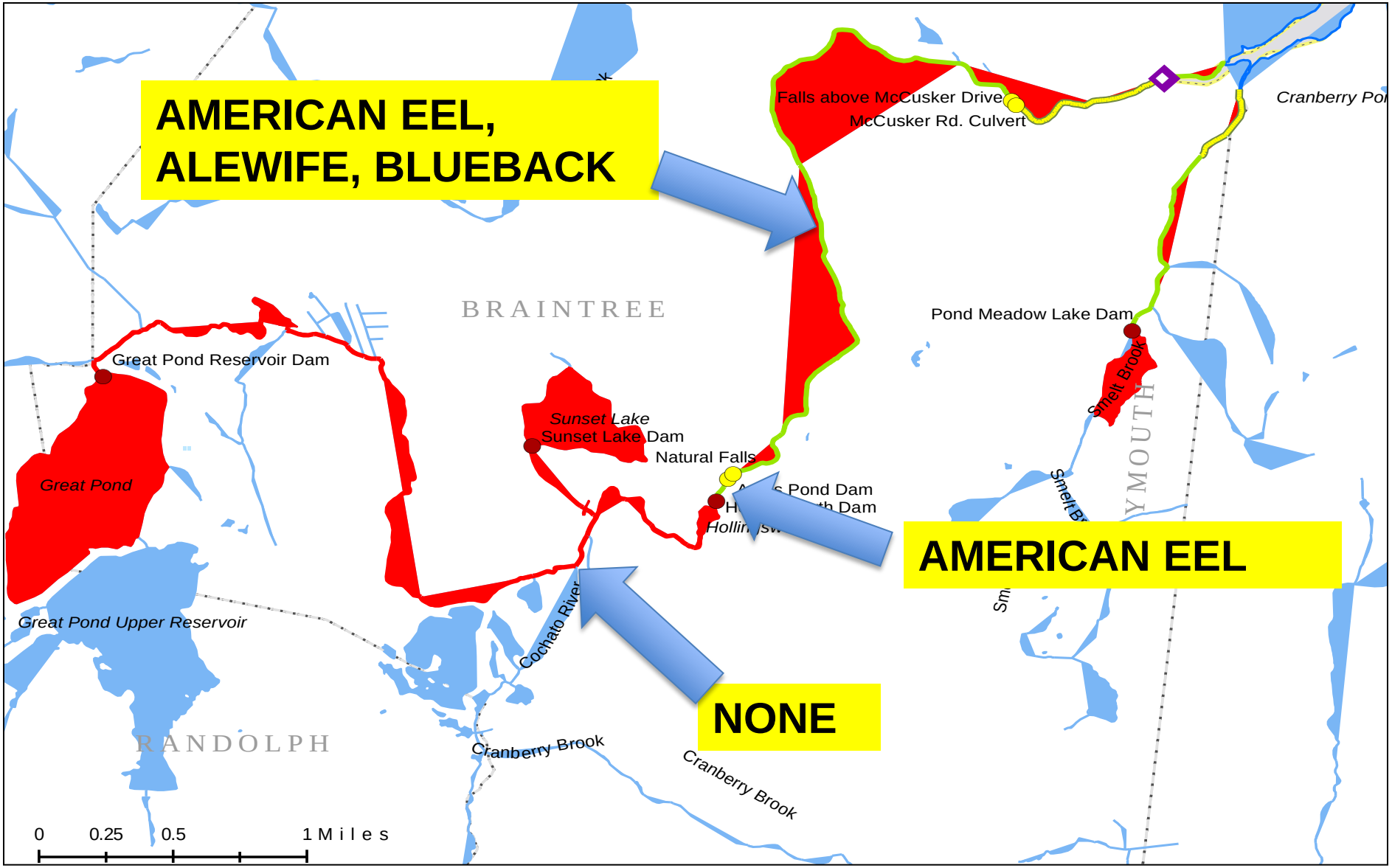
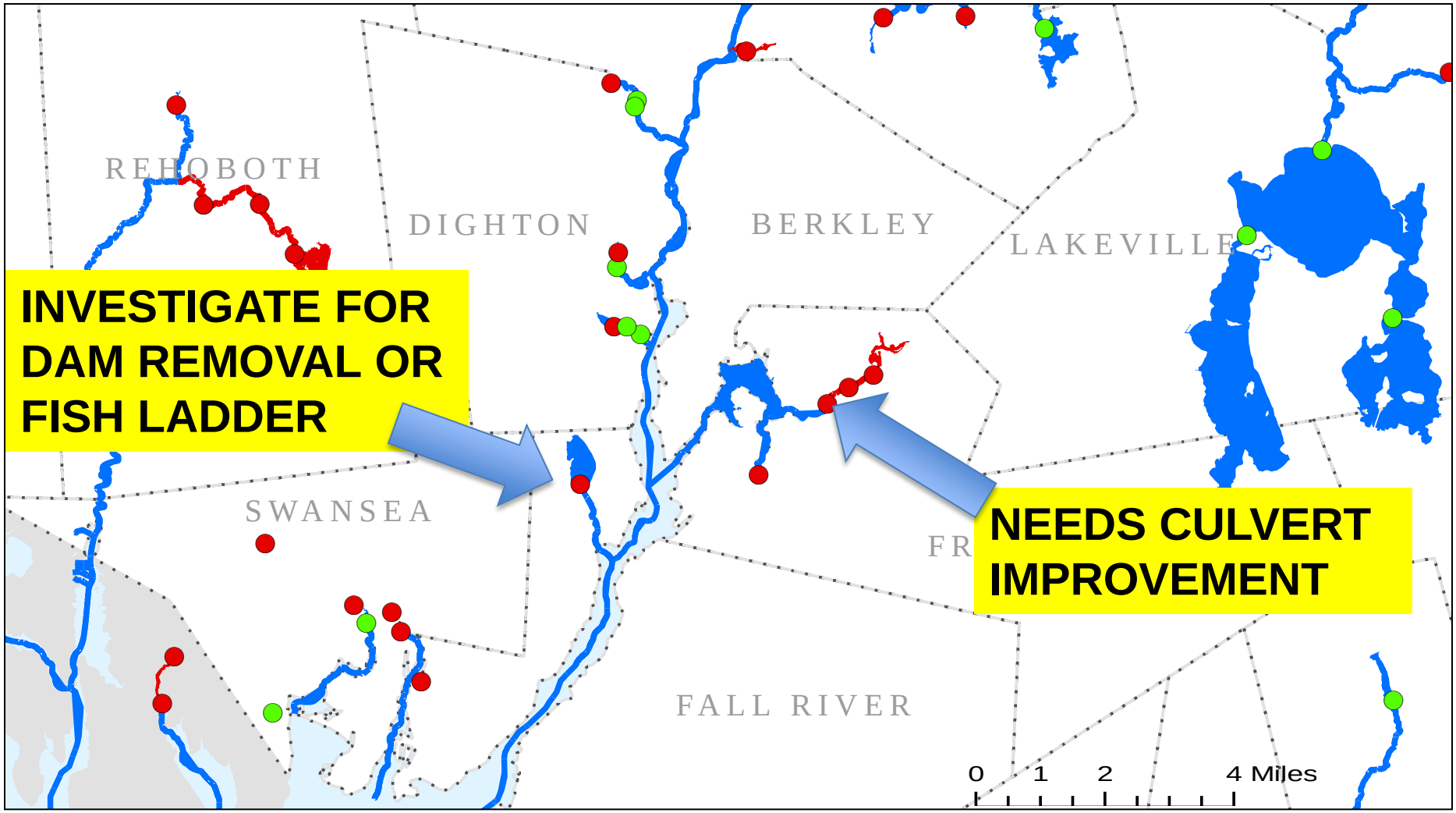


Make recommendations for diadromous fish passage improvements



Identify Priorities & Develop Action Plans: Diadromous Fish Restoration Planning w/ Mass Marine Fisheries

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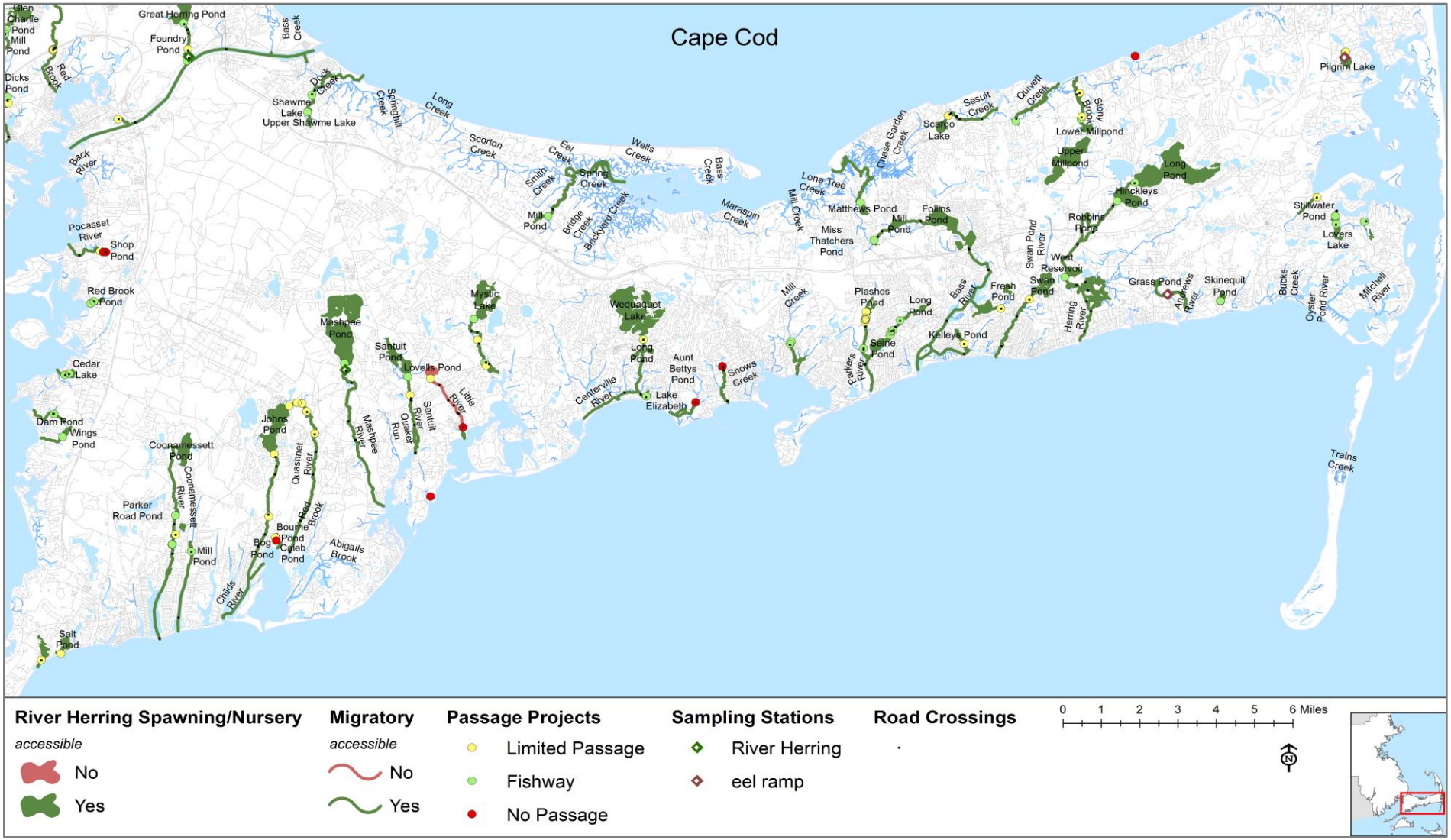
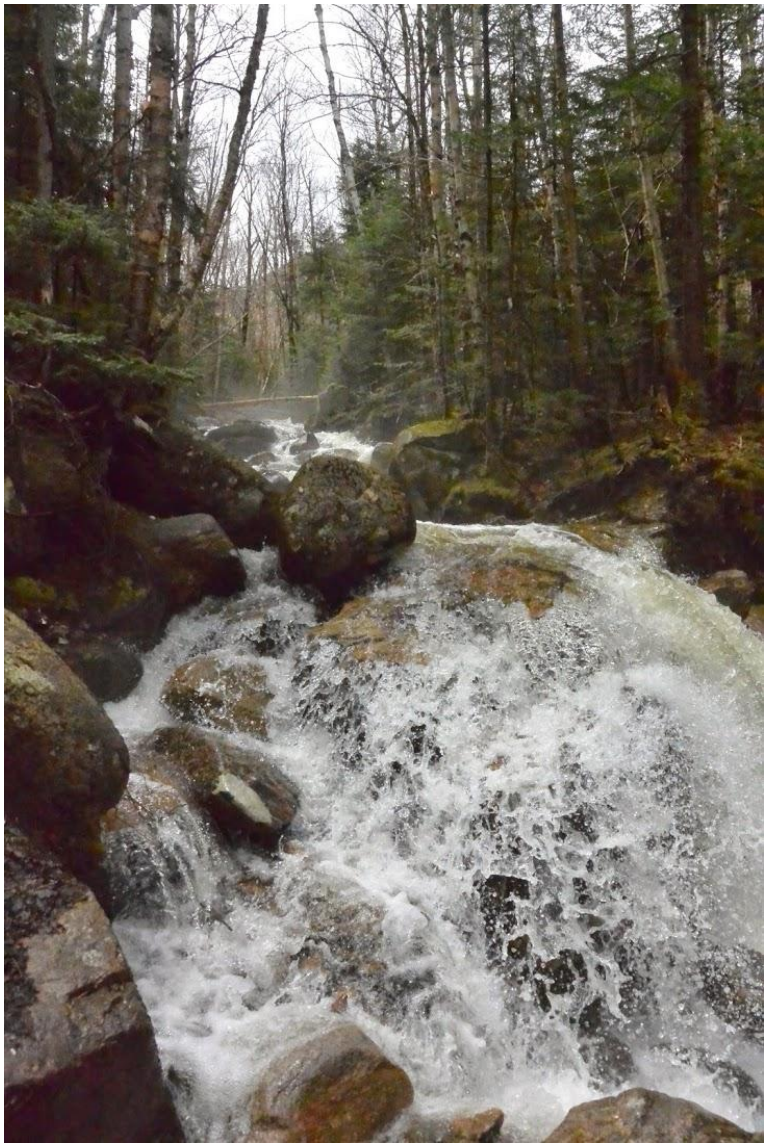


River Herring Passage Coordination

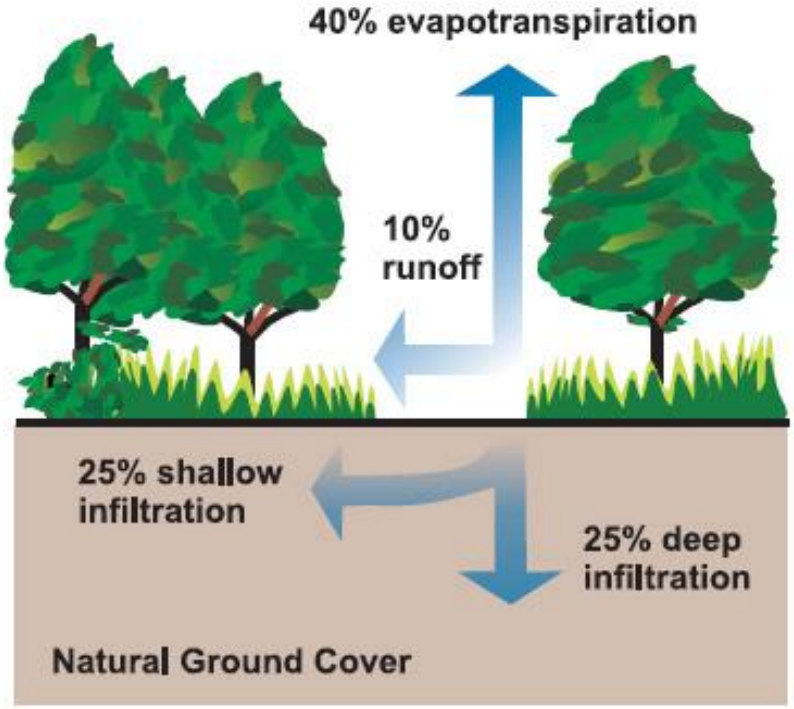
- Dept. Public Works
- Regional Planning Agencies
- Conservation Commissions
- Division Ecological Restoration – Stream Continuity Program
- MarineFisheries (DMF) – Issues on state roads
- MassDOT Stream Crossing Handbook update (2017)

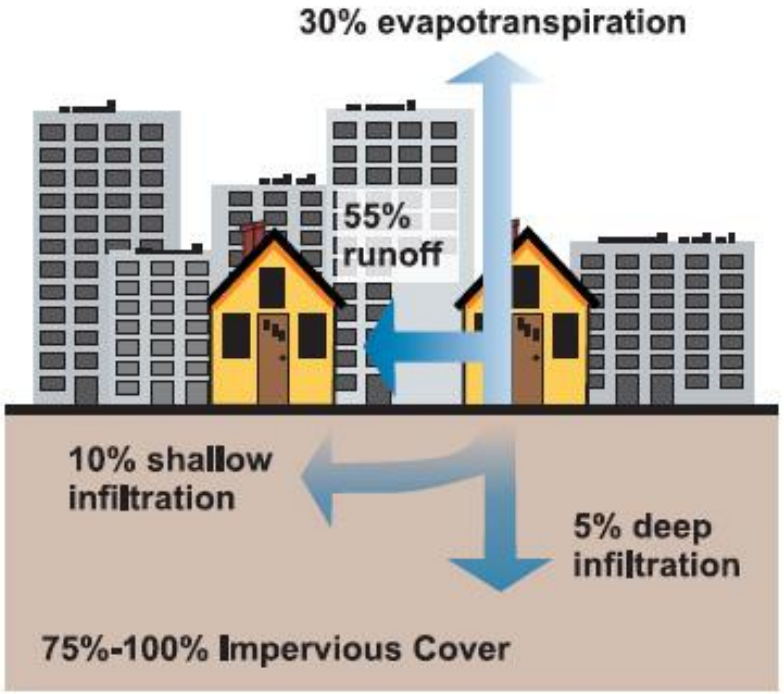
Outline

- Stormwater Impacts
- Mitigation Options
- Case Studies
- MassDOT's Stormwater Program
- Discussion



The Urban Water Cycle





Potential Impacts from Stormwater

- Peak Flow Rates
- Erosion and Sedimentation
- Temperature Changes
- Reduced Base Flows
- Nutrient Loads

DEP Stormwater Standards

- Codified in 2008 to replace SW Policy (1996)
- Detailed In Massachusetts Stormwater Handbook
- 10 Standards deigned to promote Water Quality and offset new development:

1. No New Discharges
2. Control Peak Rate Flow
3. No loss of Recharge
4. Water Quality
5. Land Uses With Higher Potential Pollutant Loads (LUHPPL)
6. Critical Areas
7. Redevelopment
8. Construction Phase Controls
9. Long Term O&M
10. Illicit Discharge Detection and Elimination (IDDE)

Stormwater Management Goals

Maximum Extent Practicable with logic in mind

- Reduce impervious cover
- Reduce runoff volume
- Manage the first flush
- Promote country drainage
- Maintain tree cover
- Use vegetated slopes (riprap & reinforced soil)
- Eliminate exposed soils
- Reduce sedimentation/TSS loading
- Decrease exposed hardscapes

Best Management Practices (BMPs)

- Tools to treat runoff and mimic natural conditions
- Site specific; designed to complement and enhance the surrounding environment
- Designed to control stormwater quality and quantity

Sediment Control

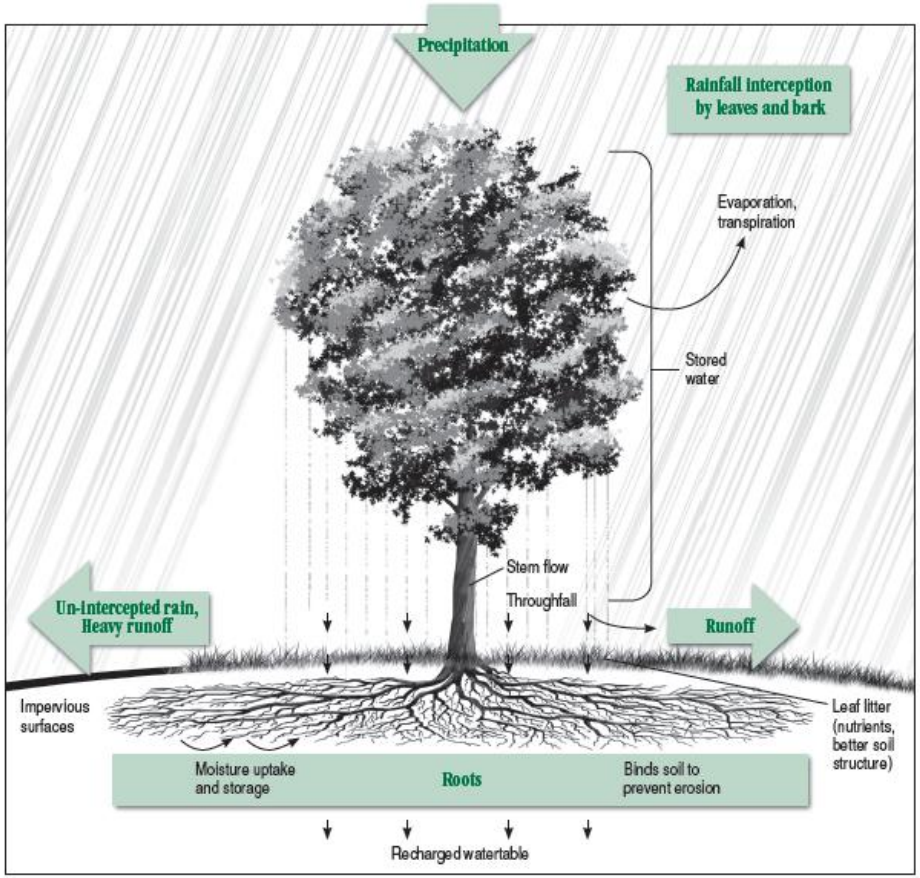
Sediment Control

Porous Pavement

Trees as BMPs

In addition to interception/ evaporation, trees reduce runoff by:

- Uptake and transpiration from the ground
- Enhancing infiltration into the ground
- Roots binding soil, preventing erosion and associated accelerated runoff



Source: Tree City USA Bulletin No. 55
Arbor Day Foundation

Royalston Outlet Sediment Trap

Royalston Vegetated Slope

Non-Structural BMP – Improved Winter Roadway Maintenance

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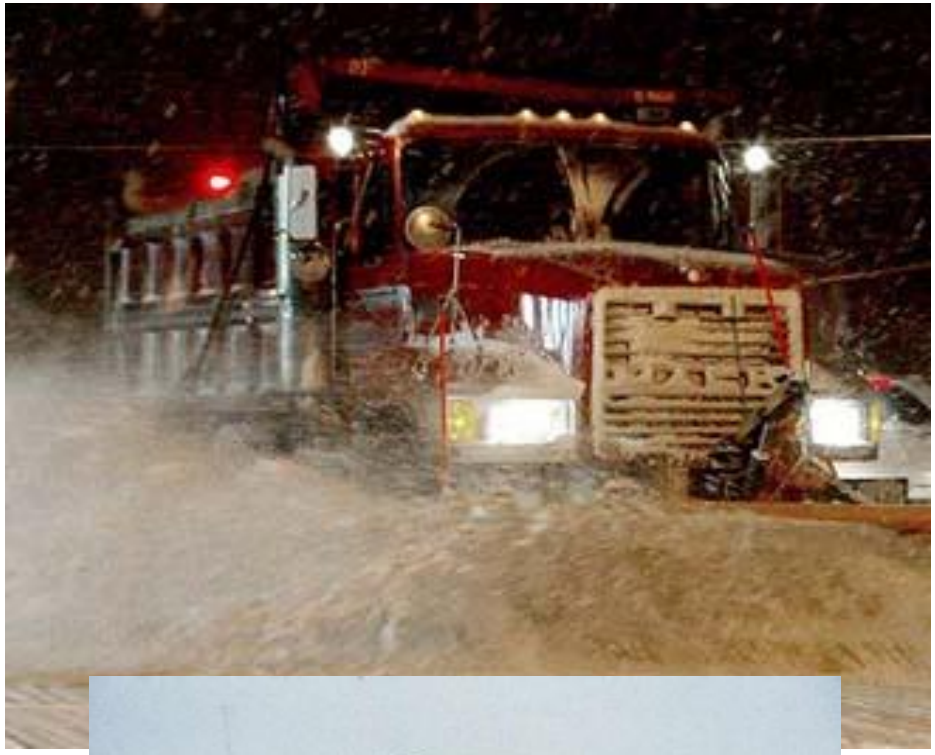
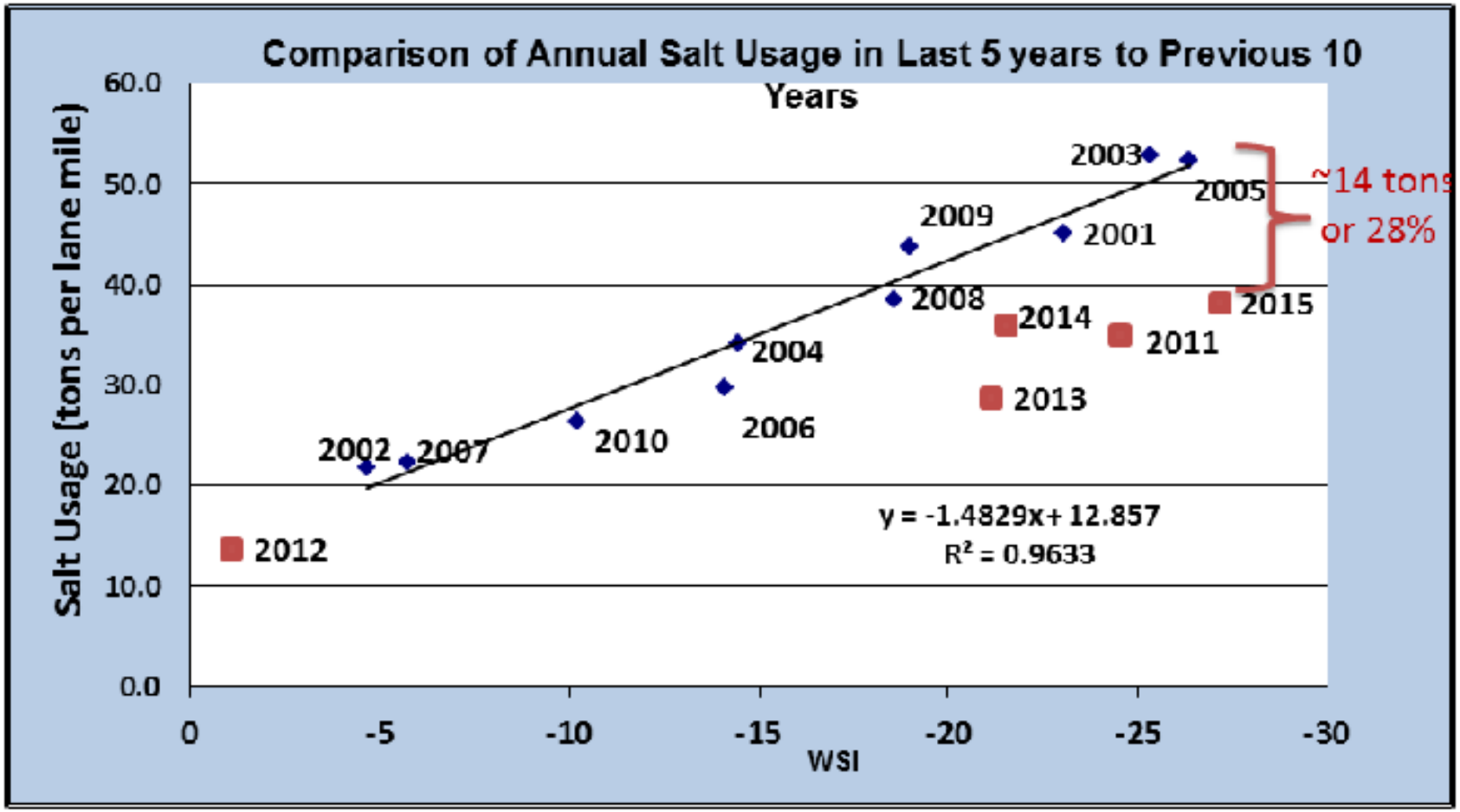
- Winter roadway maintenance is necessary to facilitate transportation and the economy.
- Combination of plowing and deicing operations to maintain appropriate levels of service.
- Salt, sanding and other treatments can create contamination and sedimentation issues due to highway run-off.

Salt Remediation Program

Operational Improvements

- Anti-icing (roadway pretreatment)
- Pre-wetting NaCl prior to spreading
- Appropriate equipment batteries
- More plowing
- Use of new technologies for more efficient application of material
- Better “house keeping” at salt facilities
- De-emphasis on sand use




Comparison of Annual Salt Usage in Last 5 years to Previous 10 Years
Salt Usage (tons per lane mile)
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0
-5
-10
-15
-20
-25
-30
WSI
2003
2005
2009
2001
2008
2014
2015
2004
2011
2013
2002
2007
2010
2006
2012
y = -1.4829x + 12.857
R² = 0.9633
~14 tons
or 28%

Questions?

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