# Integrating Biodiversity & Infrastructure Priorities

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# Taunton River Watershed

- **Important resources facing many threats**
- **Fastest growing region in MA**
- **OLD infrastructure-road crossings, culverts, and drainage built *without* growth or the environment in mind**

# Example Strategies

- **Identifying and protecting vulnerable areas containing critical green infrastructure**
- **Dam removal/River restoration**
- **Road crossing upgrades**
- **Culvert replacement**
- **Stormwater retrofits/Low Impact Development (LID) practices**
- **Assessing areas for road safety, water quality improvement and habitat restoration**

# Geographic Roadway Runoff Inventory Program (GRRIP)


SRPEDD

**Funding for this project was provided under contract with the Mass DOT and with the cooperation of the Federal Highway Administration**

# What is GRRIP?

- **An analysis of roadway drainage systems and structures intersecting environmentally sensitive areas on local and Federal-Aid Eligible Roads in SRPEDD cities and towns.**

# What GRRIP Isn't ...

- **GRRIP *is not* a comprehensive inventory of storm drains, culverts, or bridges.**
- **It *is not* a roadmap to solving all of your stormwater management or stream continuity problems.**

**But *it does* provide simple truths and profound clues about the facilities and areas that may need our attention!**

# Comprehensive Environmental Data

- **A total of twenty-two layers of environmental information from coldwater fisheries to rare birds to globally unique habitats are factored into our GRRIP maps.**

- **Data is compiled from various sources including: Mass GIS, Coastal Zone, DEP, EPA, Management, USDA,  MA Division of Marine Fisheries, NOAA,TNC, EOEEA and others .**

# Purpose of GRRIP

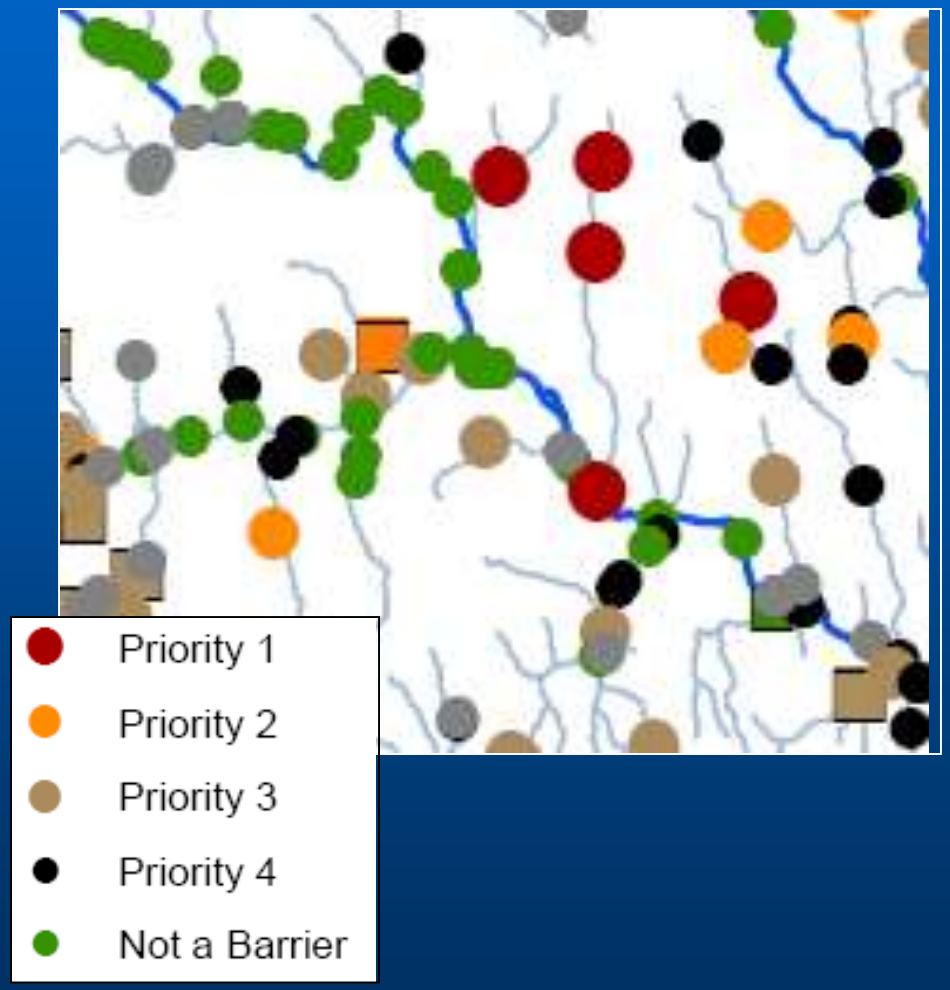
- **Assist local highway departments to prioritize roads prior to construction or rehabilitation projects.**
- **Assist in providing environmental information for individuals dealing with stream continuity and stormwater management.**
- **Assist town planners and conservation officers by providing comprehensive environmental data for planning decisions.**

# End Users and Beneficiaries

- Town Highway, Planning and Conservation Personnel
- Mass DOT Environmental Division & Highway Engineers
- DEP Office of Watershed Management
- EOEEA Departments and Divisions
- DFG Division of Ecological Restoration Program and Fisheries Biologists
- CZM Coastal Nonpoint Source Program
- National Estuary Program Staff
- Regional Planning Agencies
- Watershed Associations
- Environmental Science and Advocacy organizations

# Setting Priorities

- Recommend action where there are barriers to organism passage AND stormwater issues in sensitive areas
- We can add in any other spatial data to inform priority rank



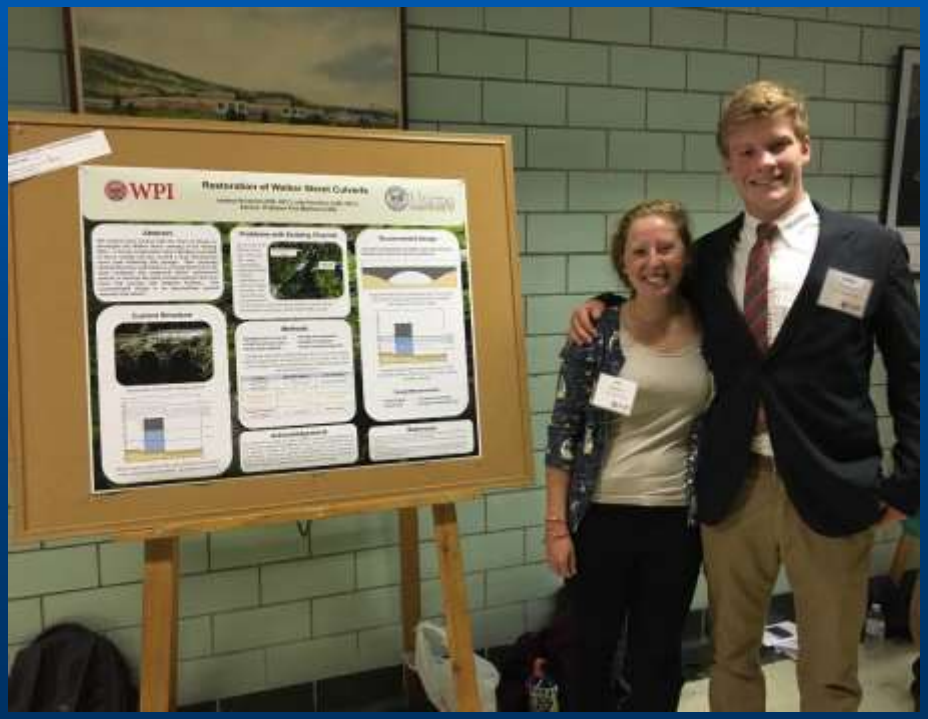
# Town of Norton, Walker Street Culverts

**Goal: to provide a design recommendation to the Town of Norton for a cost-effective stream crossing that a) minimizes flooding of Walker Street, and b) improves bridle shiner habitat and the surrounding wetland area.**

- **The scope of work involved: background research; field reconnaissance; flow data analysis; conceptual design development; design evaluation, and; final structural recommendation.**

# The Project Team

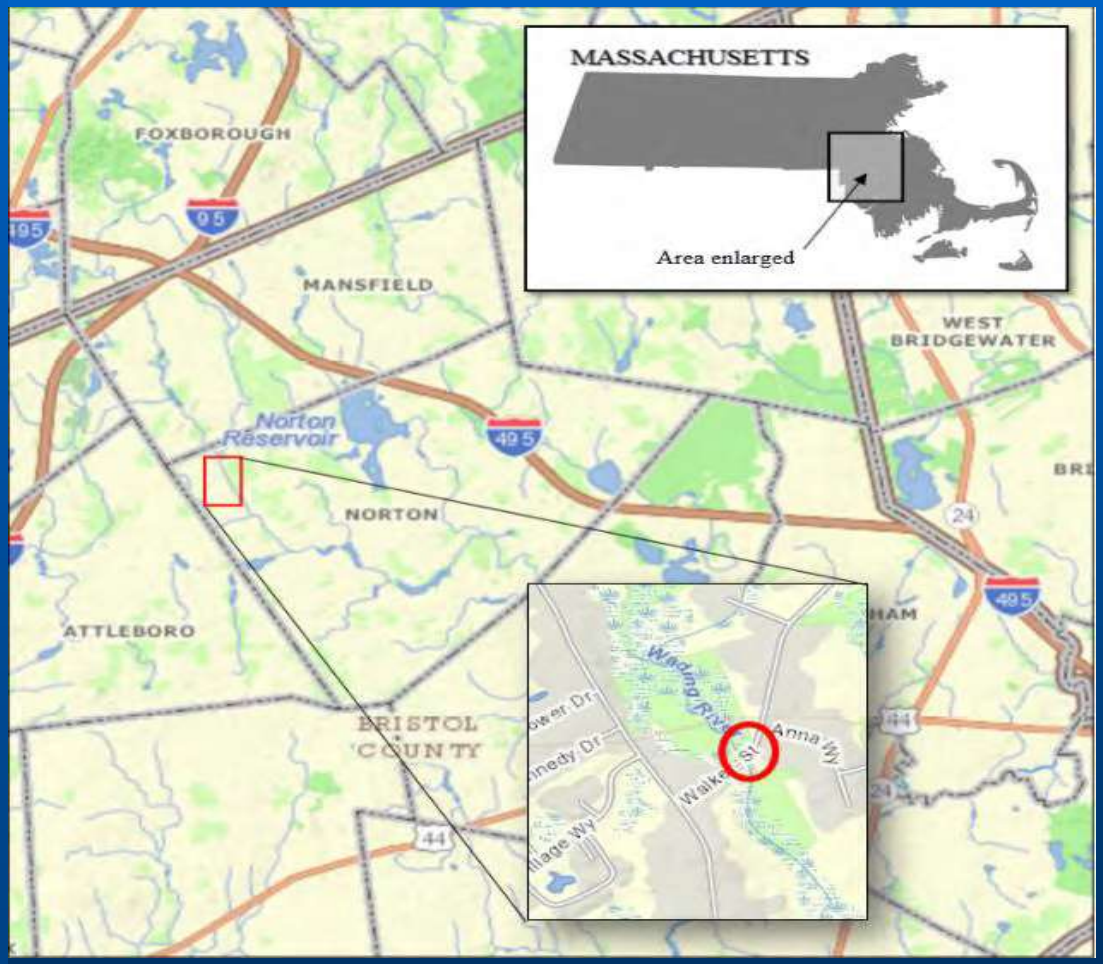
**Jenn Carlino, Norton Conservation Agent; Bill Napolitano, SRPEDD, Paul Mathisen, WPI faculty, Julia Pershken and Jackson Krupnick, WPI Engineering Capstone student interns**



# The Site

- The Wading River runs parallel to Walker St. and turns from the north side of the road at a 90 degree angle under the road
- The river flows through two 72” adjacent culverts
- Below the culverts there is a large scour pool 70’ by 40’ and 6’ to 8’ deep
- The Wading River has a bankfull width of 23’ downstream of the scour pool

# Project Site Location



# Walker St. Culverts North Side

# Walker St. Culverts South Side

- The Stream constriction at the culverts causes flooding during periods of heavy rain
- The large downstream scour pool has created a perched culvert situation that inhibits fish passage

# MA River and Stream Crossing Standards

**MASSACHUSETTS RIVER AND STREAM CROSSING STANDARDS**

Developed by the

**RIVER AND STREAM CONTINUITY PARTNERSHIP**

Including:

University of Massachusetts Amherst

The Nature Conservancy

Massachusetts Division of Ecological Restoration-Riverways Program

American Rivers

March 1, 2006
Revised March 1, 2011

# Important Considerations

- Not intended for coastal streams
- Not intended for irrigation or drainage systems
- Permanent crossings
- Not for channels that don't support fish or wildlife
- May not be sufficient to address drainage or flood control issues
- Not prescriptive
- Importance of "long profiles"
- Adjustment potential

# General Standard #3

**Spans channel width (a minimum of 1.2 times the bankfull width)**

# General Standard #4

**Natural bottom substrate within the structure**

# General Standard #5

**Designed with appropriate bed forms and streambed characteristics so that water depths and velocities are comparable to those found in the natural channel at a variety of flows**

# Recommended Culvert Design

**Open bottom precast concrete arch culvert**

# Funding Priority Projects

- **Municipal Funds**
- **Chapter 90 Funds**
- **MassWorks Infrastructure Program if related to economic development and jobs creation programs**
- **TIP Project listing via DRIVE (new proposed) funds**
- **FEMA/MEMA**
- **DEP Section 604(b) and Section 319 Grant Programs**
- **Stormwater Utility (where available)**
- **Division of Ecological Restoration Grants Program**
- **Public – Private Partnership**
- **MA CZM Coastal Pollution Remediation Grants (CPR)**

# GRRIP Advisors and Partners

- The Nature Conservancy (TNC)
- MA Division of Ecological Restoration (DER),
- USDA
- USF&W
- NOAA
- MA Division of Marine Fisheries (DMF)
- Mass DOT
- Mass Audubon
- Save the Bay
- The Narragansett Bay Project (NBEP)
- The Taunton River Watershed Alliance (TRWA)
- Taunton River Stewardship Council
- Municipal Partners

# In the end, we hope to go from this . . .

# to this, in a whole lot of places!