

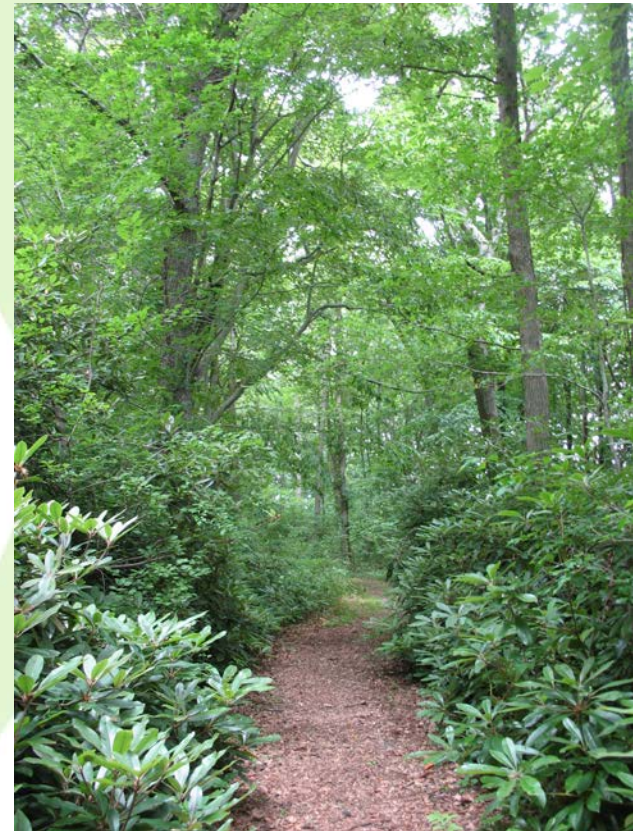
USING LAND PROTECTION TOOLS TO PROTECT WATERSHEDS

BY: Charles B. Allott, Esq.,
Aquidneck Land Trust

Rhode Island Land & Water Summit – March 11, 2017

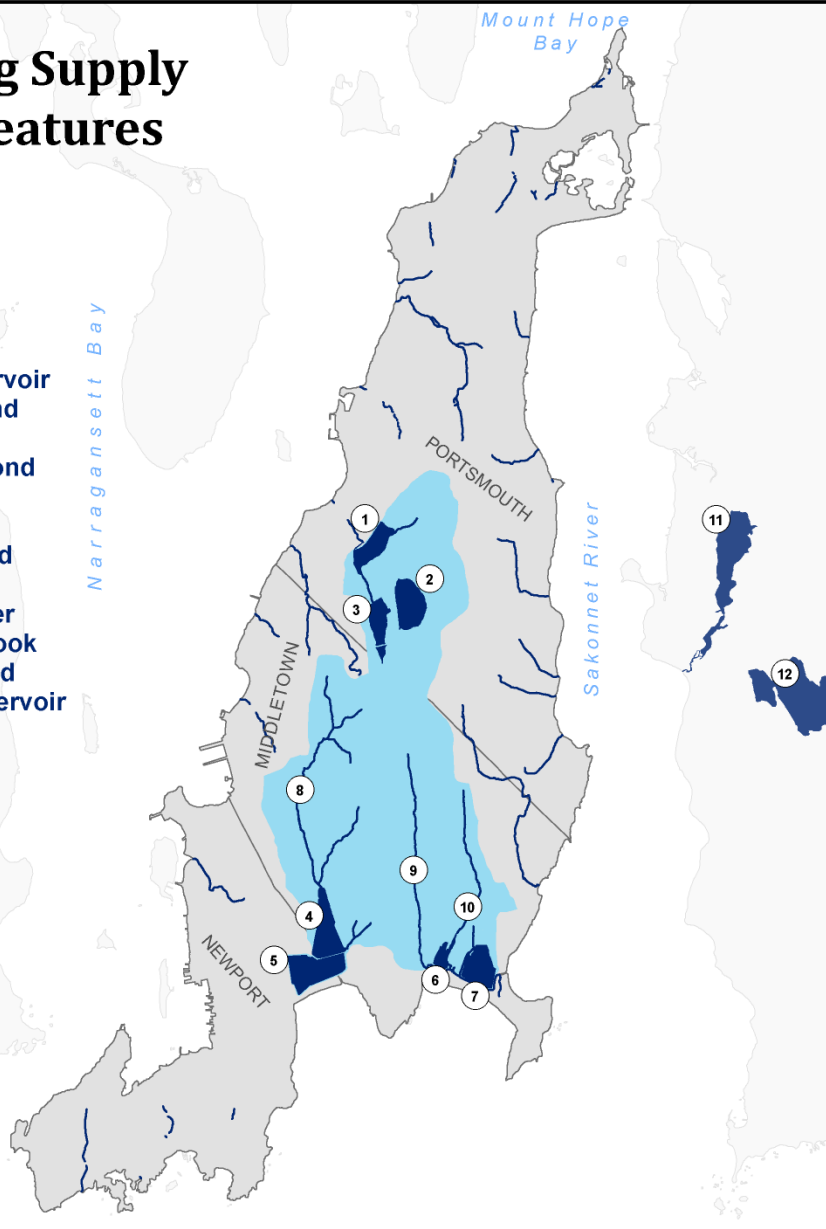
INTRODUCTION TO ALT

- 27 year old organization with a staff of 6 ½, and a board of 21.
- Accredited in 2009 and Reaccredited in 2015
- ALT has conserved over 2550 acres of prime conservation valued land on Aquidneck Island. Others have protected just about the same amount. Together that equals about 21% of the island's land area.
- Farmland, Parkland and Watershed Protection – areas of core strategic concentration.
- Also have over 10 miles of walking trails.

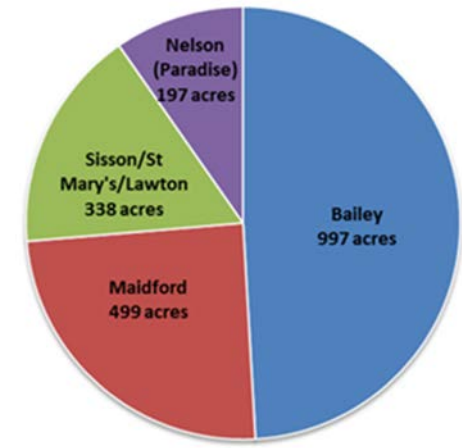


Drinking Supply Water Features

1. Lawton Reservoir
2. St Mary's Pond
3. Sisson Pond
4. Green End Pond
5. Easton Pond
6. Nelson Pond
7. Gardiner Pond
8. Bailey Brook
9. Maidford River
10. Paradise Brook
11. Nonquit Pond
12. Watson Reservoir



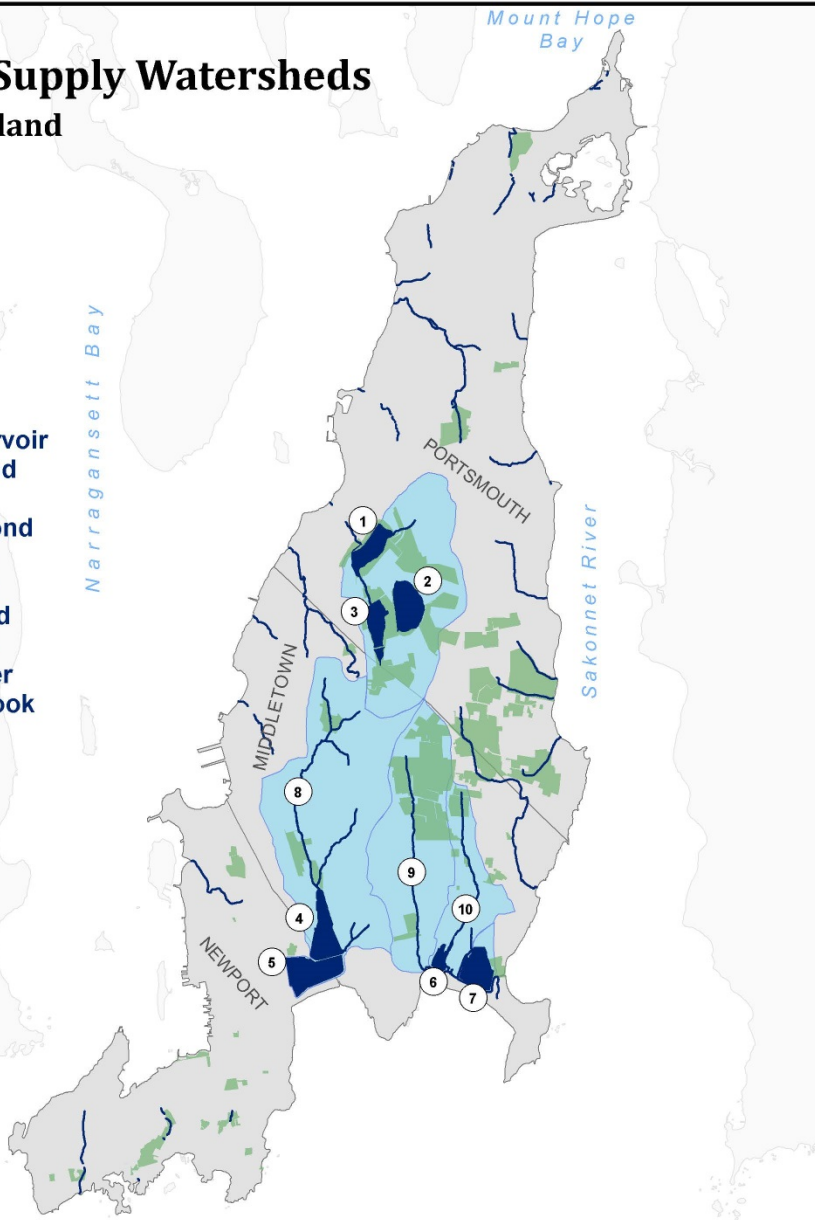
**Remaining Unprotected Open Space
by Watershed**



Drinking Supply Watersheds

Aquidneck Island

1. Lawton Reservoir
2. St Mary's Pond
3. Sisson Pond
4. Green End Pond
5. Easton Pond
6. Nelson Pond
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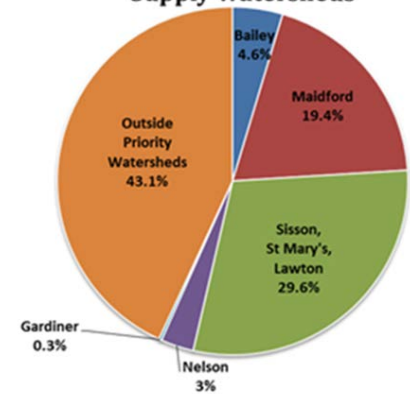


- Streams
- Drinking Reservoirs
- Conserved by ALT
- Watersheds

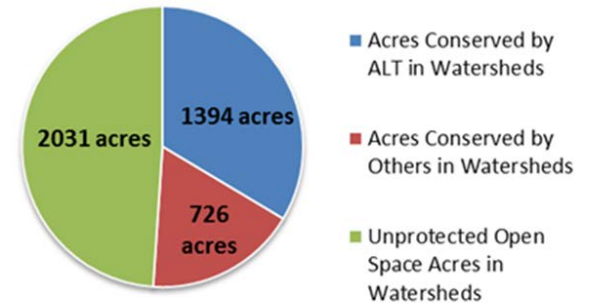
Map Created January 2015

Sources: RIGIS Surface Water Protection Areas, RIGIS 5K Streams

Total ALT Acreage (%) in Drinking Supply Watersheds



Aquidneck Island Drinking Supply Watersheds Conserved Lands



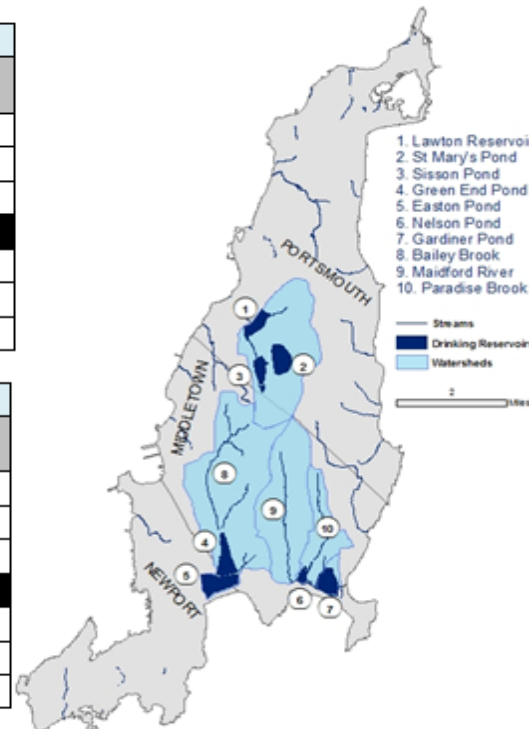
Drinking Supply Watersheds

Drinking Supply Watershed	Area (acres)	Acres Conserved by ALT in Watershed	% of Total ALT Acreage	Number of ALT Projects in Watershed	% of Total ALT projects	Total Open Space in Watershed (acres)	% of Open Space in Watershed protected by ALT	% Total Watershed Area Protected by ALT	Conserved Open Space by All Parties in Watershed	Remaining Unprotected Open Space in Watershed (acres)
Bailey	2590	113	4.6	8	10.8	1204	9.4	4.4	207	997*
Maidford	1463	475	19.4	14	18.9	1000	47.5	32.5	501	499
Sisson/St Mary's/Lawton	1795	724.8	29.6	12	16.2	1357	53.4	40.4	1019	338
Nelson (Paradise)	548	74	3.0	8	10.8	444	16.7	13.5	247	197
Gardiner	146	6.5	0.3	1	1.4	145	4.5	4.5	145	0
All Watersheds	6542	1393.3	56.9	37	50.0	4150	32.4	21.3	2119	2031

*Includes Green End Pond, Easton Pond, and airport

Bailey Brook		
	Acres	Percent of Total Buffer/Watershed
Total Acres of Buffer (300ft)	359	
Total Conserved in Buffer (300ft)	98	27.3
Total Acreage Conserved by ALT in Buffer (300ft)	60.9	16.9
Total Acres in Watershed	2590	
Total Conserved in Watershed	207	8.0
Total Conserved by ALT projects in Watershed	113	4.4

Maidford River		
	Acres	Percent of Total Buffer/Watershed
Total Acres of Buffer (300ft)	225.3	
Total Conserved in Buffer (300ft)	75.4	33.5
Total Acreage Conserved by ALT in Buffer (300ft)	66.4	29.8
Total Acres in Watershed	1463	
Total Conserved in Watershed	501	34.2
Total Conserved by ALT projects in Watershed	475	32.5



Aquidneck Island Water Quality

(RIDEM 2012 Integrated Report)

Bailey's Brook

Not supporting: Fish & Wildlife – “Impaired”

Lawton Brook

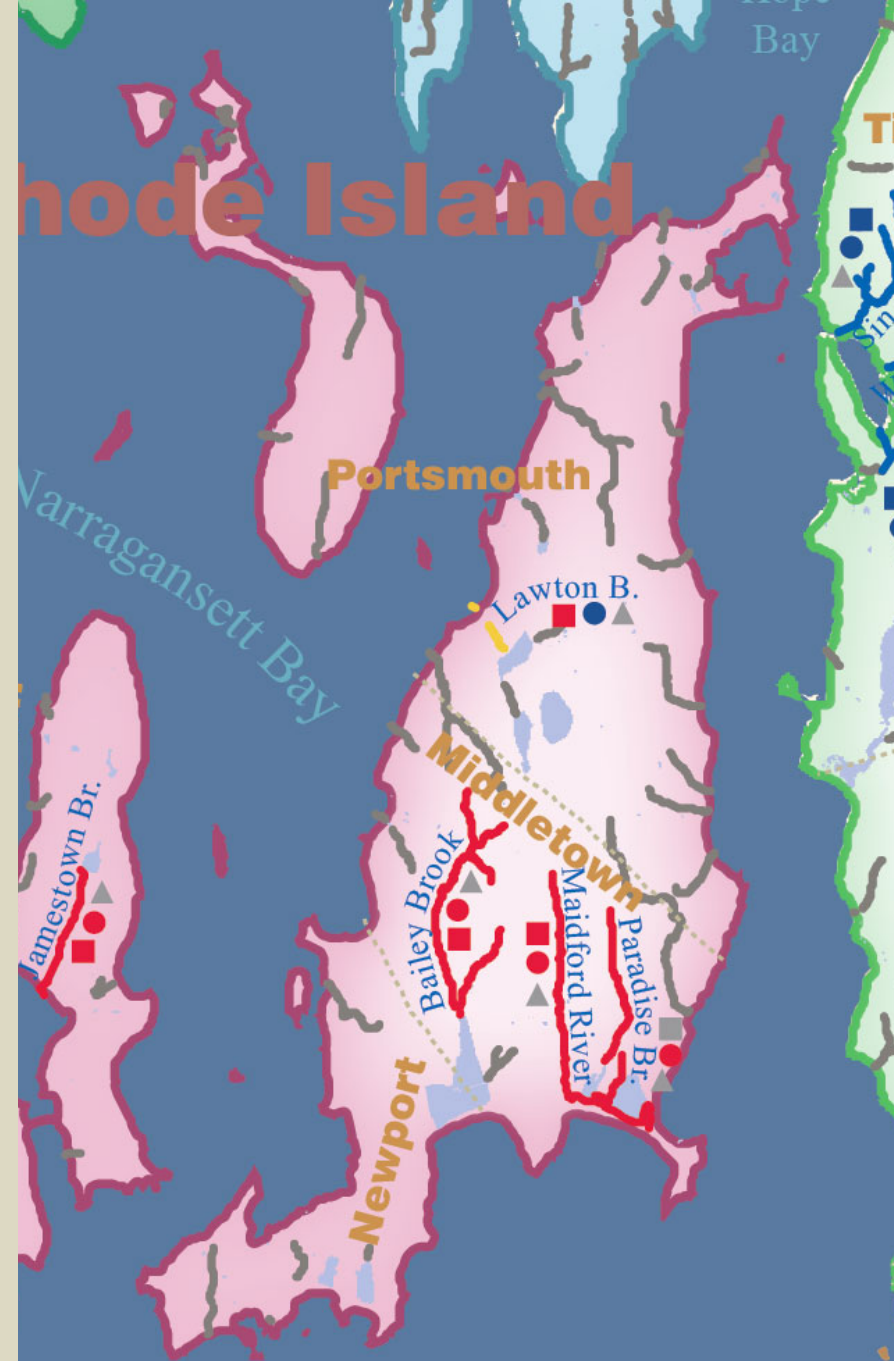
Not supporting: Fish & Wildlife – “Impaired”

Maidford River

Not supporting: Fish & Wildlife – “Impaired”

Paradise Brook

Not supporting: Fish & Wildlife – “Impaired”



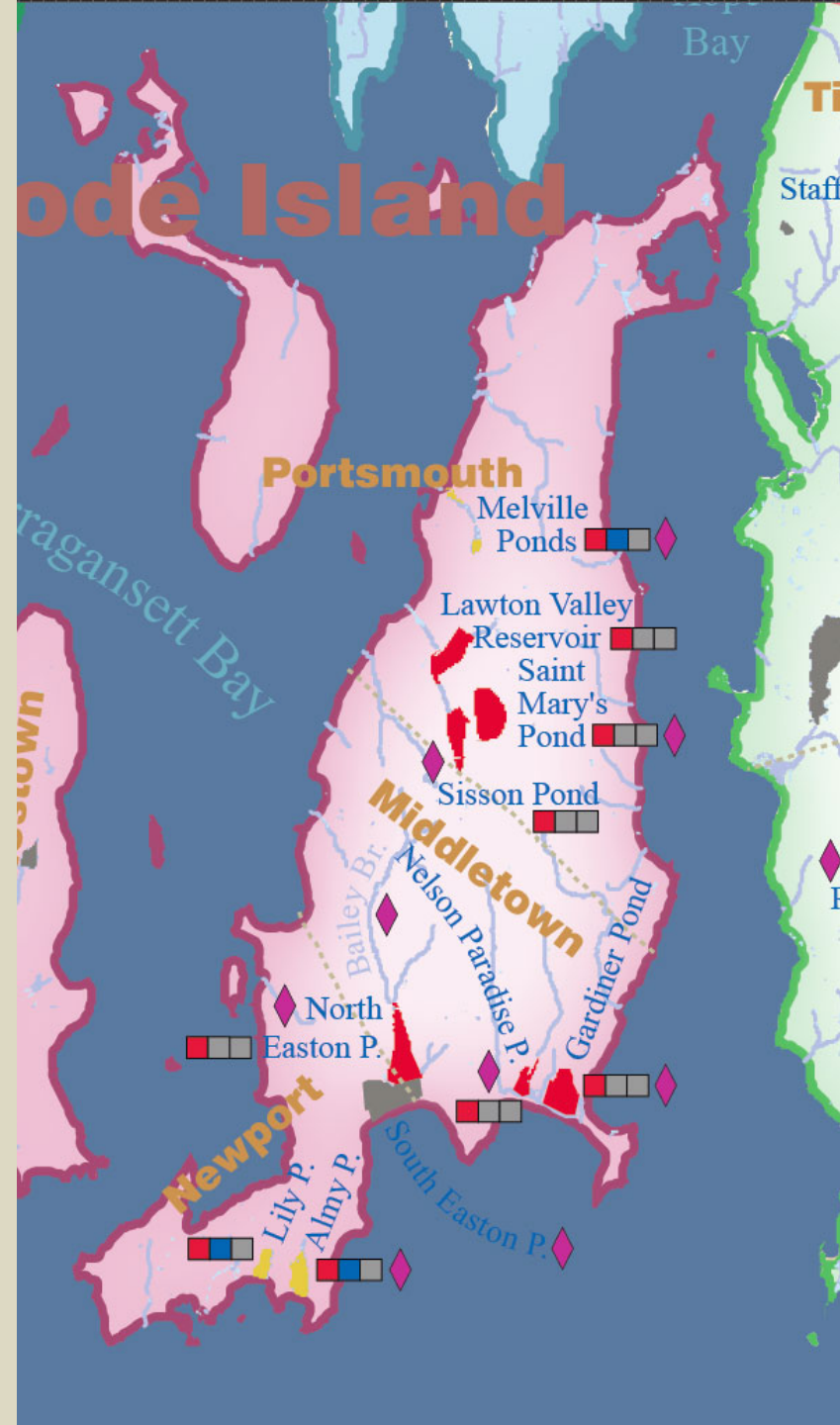
Reservoir Water Quality

Gardiner Pond, Lawton Valley Reservoir, Nelson Paradise Pond, Saint Mary's Pond, Sisson Pond, Easton Pond

Not supporting: fish and wildlife – “Impaired”

Cyanobacteria -- Blue-green algae created by a combination of excess nutrients, sunlight and high temperatures. Blue-green algae blooms may look or smell bad, inhibit recreational activities or negatively affect water quality and other aquatic organisms. Some species of blue-green algae can also produce neurological toxins.

Aquidneck Island water quality is significantly impacted by STORMWATER pollution



MAIDFORD RIVER and PARADISE BROOK WATERSHED CONSERVATION PLAN

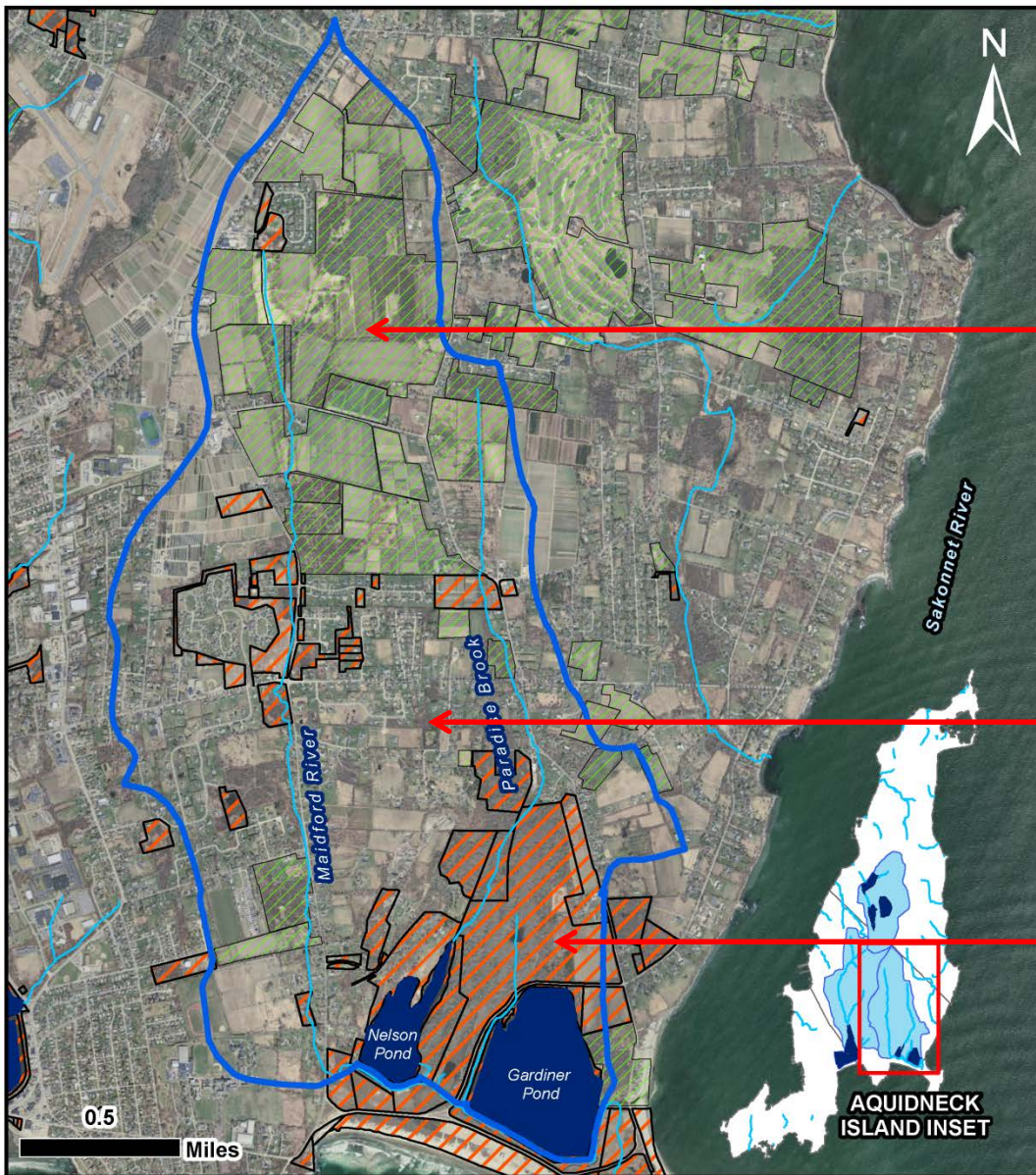
Prepared by



January 07, 2016

For the

Aquadneck
Land Trust



Farm Land

Residential Property

Wildlife Habitat

**Maidford/Paradise/Gardiner
Watershed**

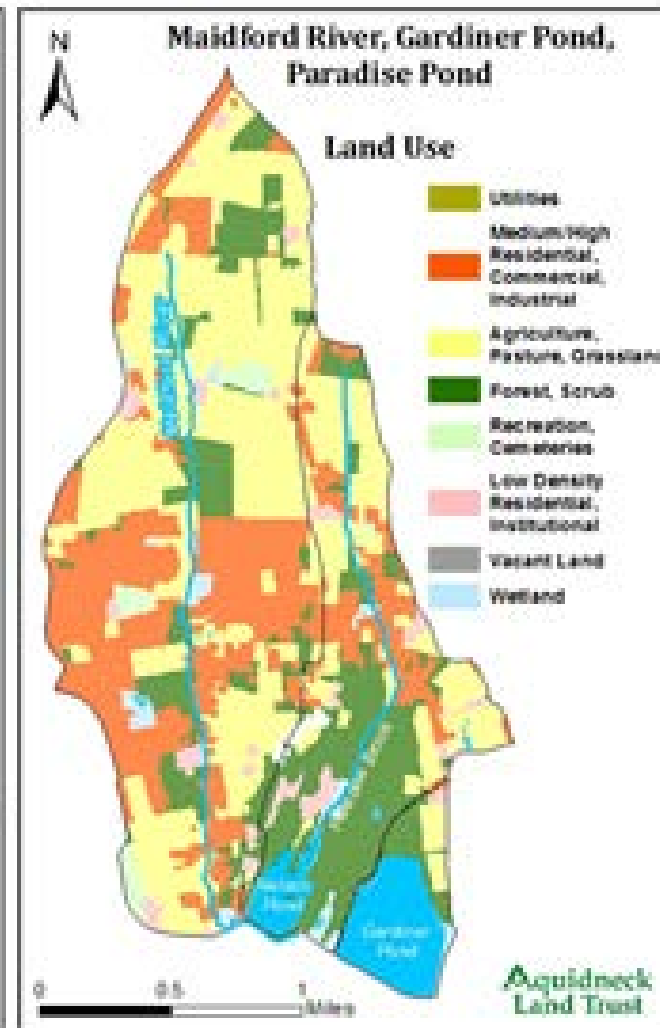
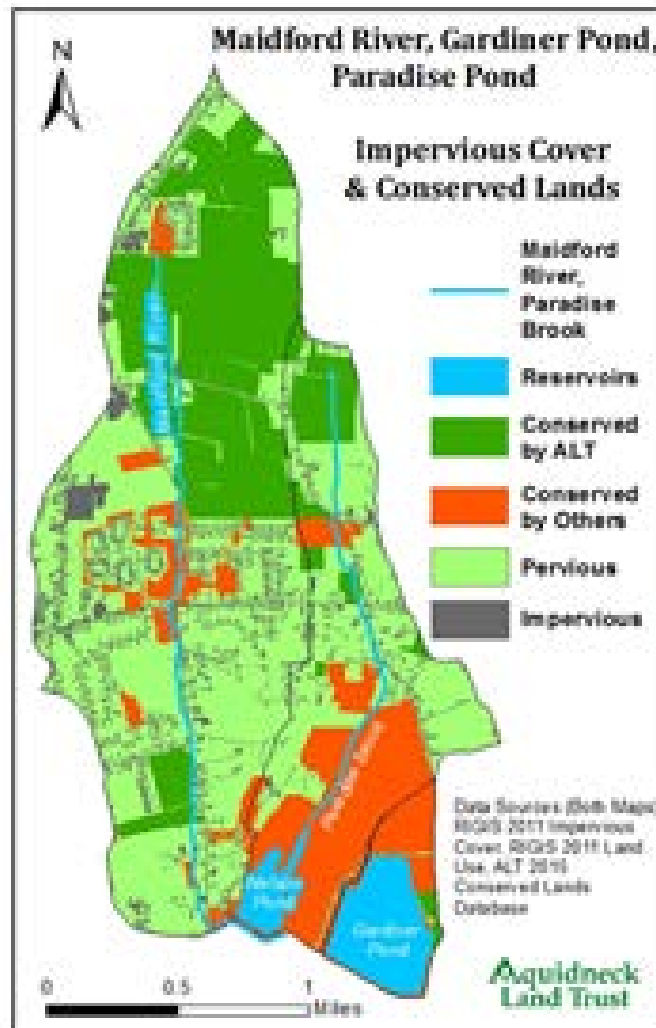


-  Streams
-  Watershed Boundary
-  Conserved by ALT
-  Conserved by Other Parties
-  Drinking Watersheds (Inset)

March 2016

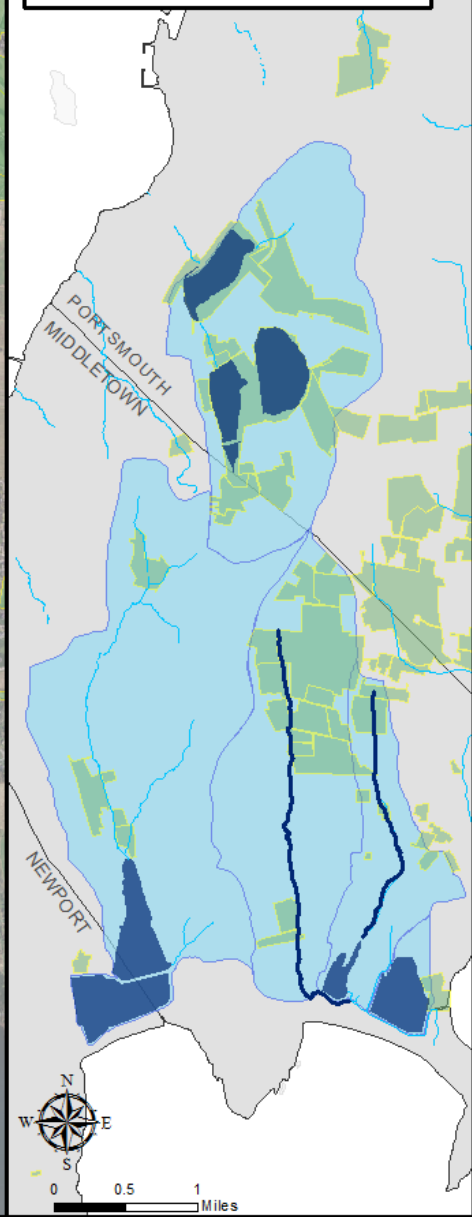
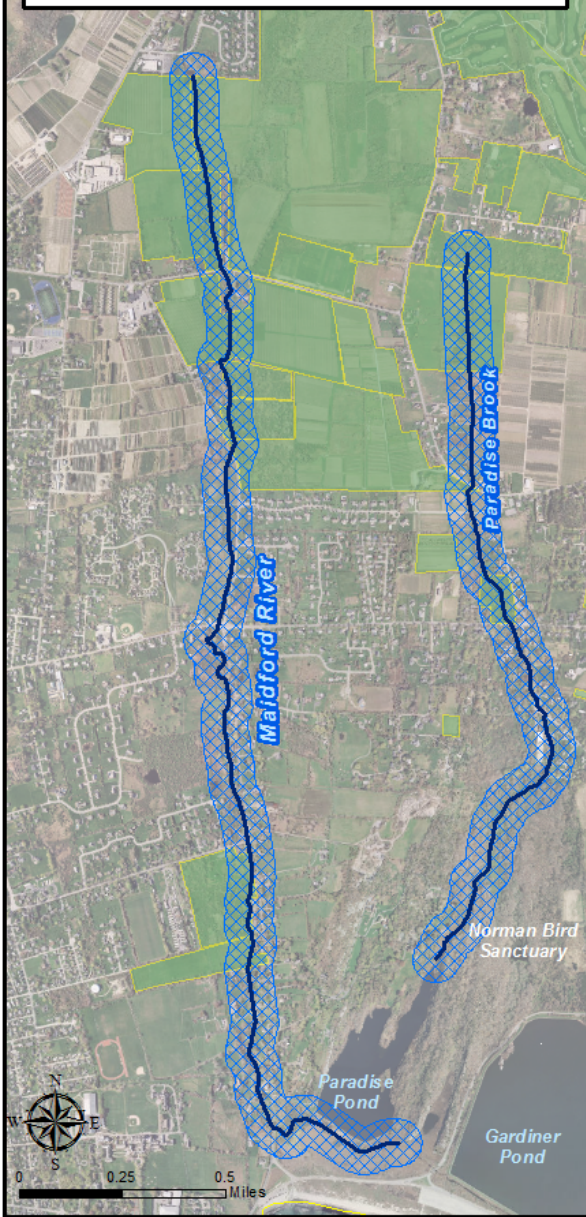
Sources: RIGIS Surface Water
Protection Areas and RIDEM
Watersheds,
RIGIS 5K Streams,
2014 USGS April Aerial Imagery

Watersheds



Maidford/Paradise Buffer Conservation

Drinking Supply Watersheds



Riparian Buffer Conservation

Map Created January 2015

Sources: RIGIS Surface Water Protection Areas, RIGIS 5K Streams, 2011 Aerial Imagery



- Maidford River/Paradise Brook
- Streams
- 300 Ft Buffer Zone
- Conserved by ALT
- Watersheds

Stream Walks

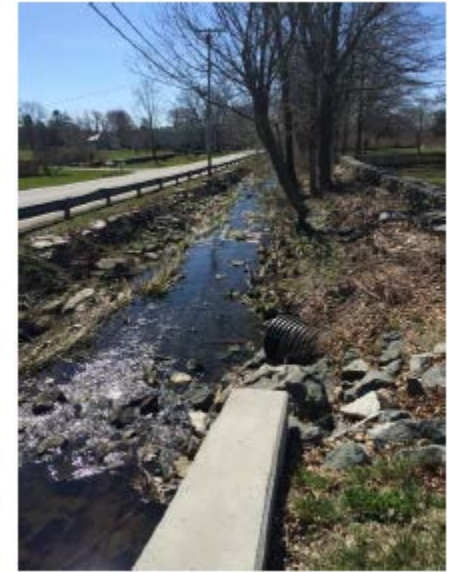
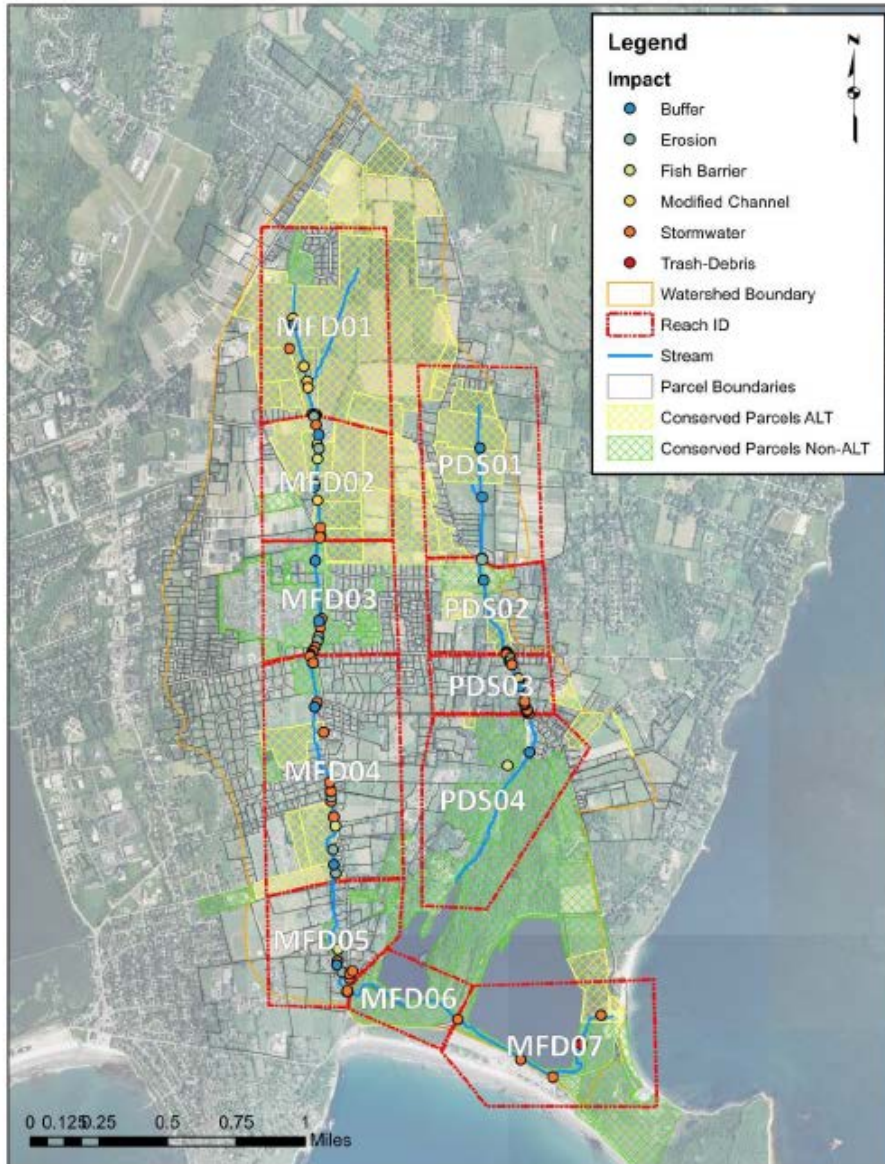
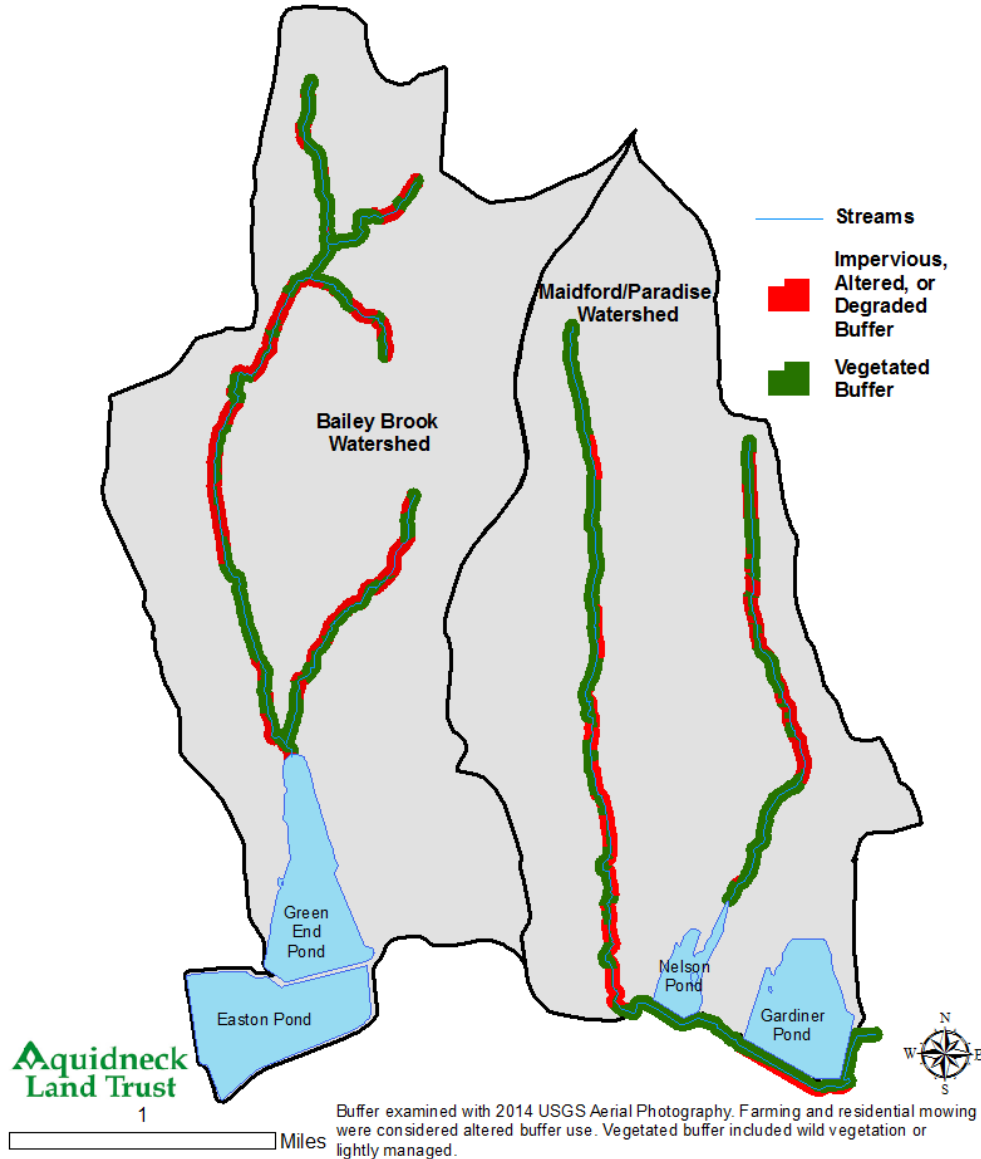
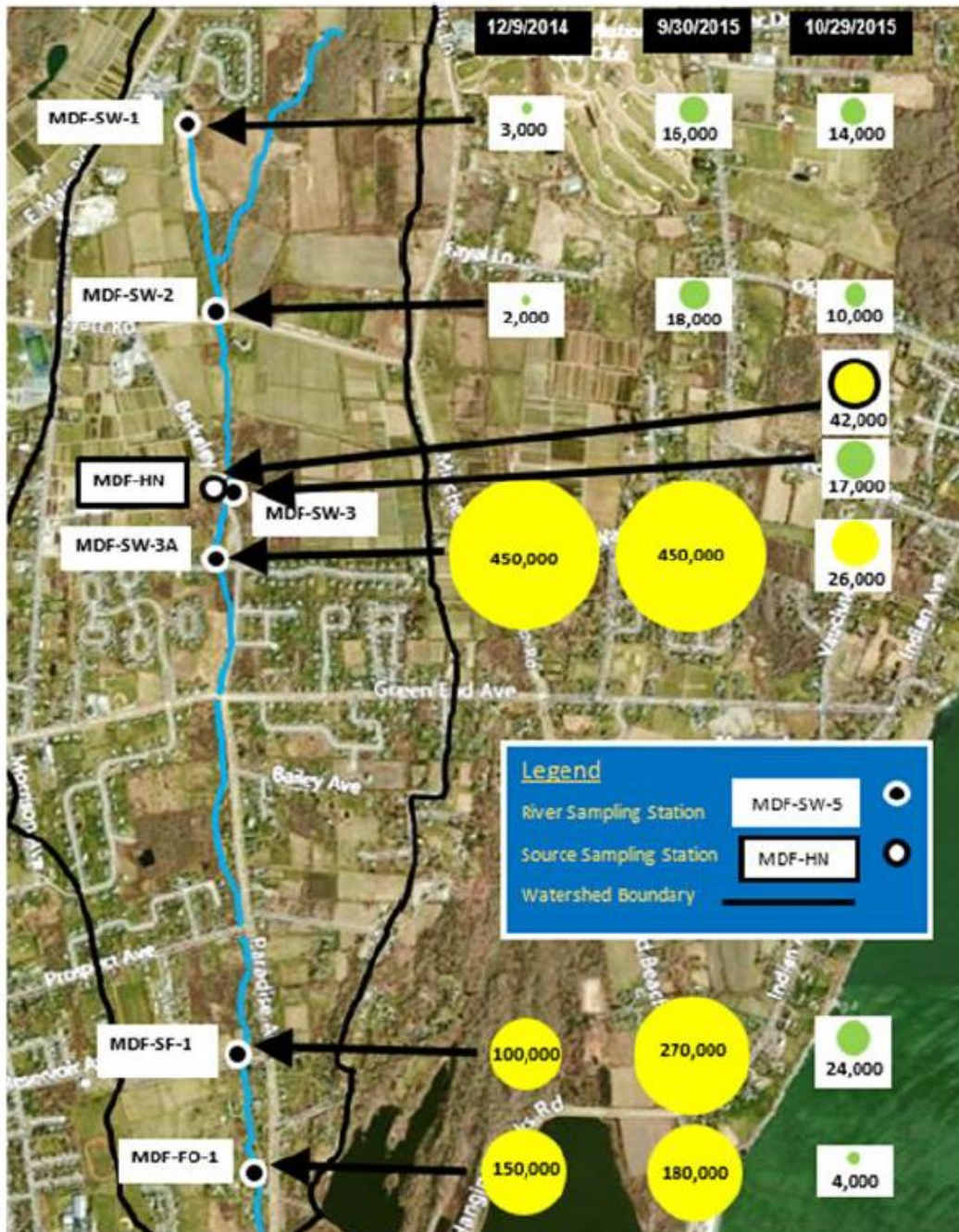


Figure 2-5: Reach delineations with various Reach Impacts observed during stream walks.

Riparian Buffers - Bailey & Maidford Watersheds (150ft buffer on each side)





Bubble Graph

Table 2-4: Water Quality criteria in the Maidford River and Paradise Brook watersheds Adapted from RIDEM, 2016.

Parameter	Criteria - Guideline	Concentration	Source
TP	Criteria and Guideline	25 µg/L (RIDEM Standard) 50 µg/L where a tributary enters a lake/reservoir (EPA Guideline) 100 µg/L for tributary not discharging to a lake/reservoir (EPA Guideline)	RIDEM Water Quality Standards EPA Gold Book Standards
TN	Guideline	610 µg/L (EPA Guideline)	EPA guidance for NE Coastal Zone
TSS	Guideline	25,000 µg/L (EPA Guidance)	EPA Guidance

Bubble Graph:

**Wet Weather
Dry Weather**

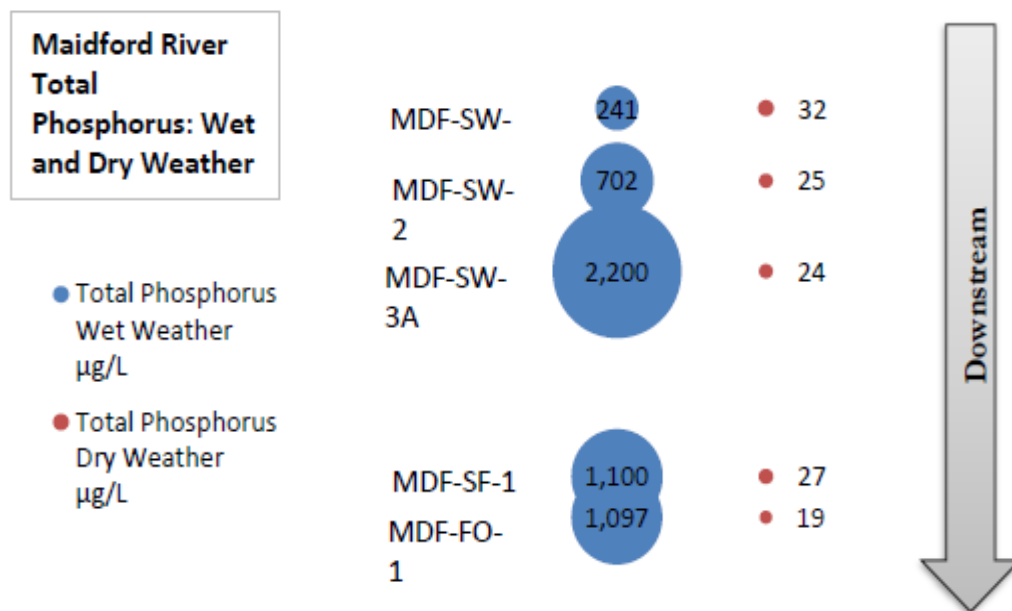


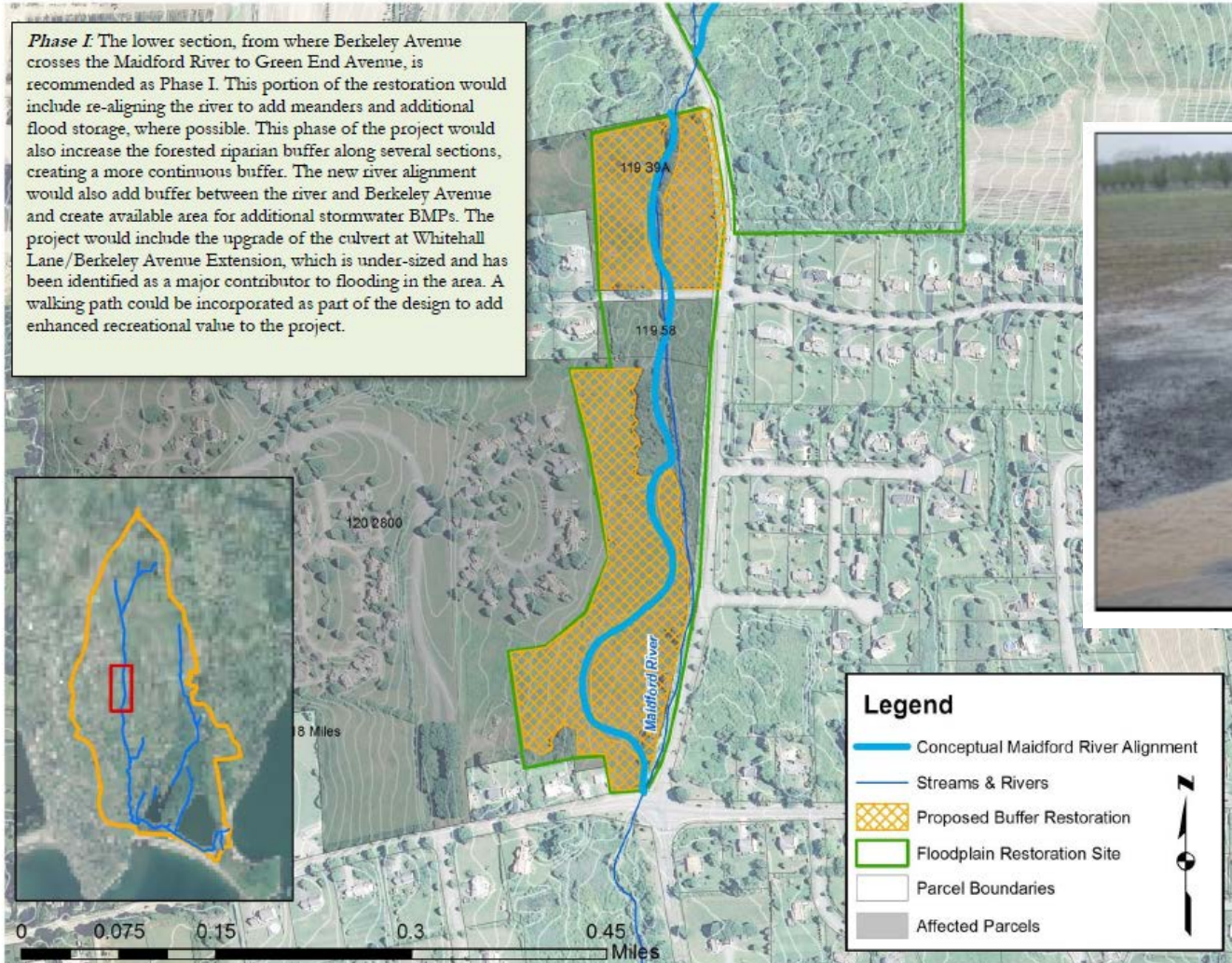
Figure 2-17: Combined wet and dry weather results for total phosphorus levels in the Maidford River (N=3).

BMP Proposal – High Cost

4.1 Site 1: Flood Plain Restoration

4.1.1 Phase I – Berkeley Avenue to Green End Avenue

Phase I: The lower section, from where Berkeley Avenue crosses the Maidford River to Green End Avenue, is recommended as Phase I. This portion of the restoration would include re-aligning the river to add meanders and additional flood storage, where possible. This phase of the project would also increase the forested riparian buffer along several sections, creating a more continuous buffer. The new river alignment would also add buffer between the river and Berkeley Avenue and create available area for additional stormwater BMPs. The project would include the upgrade of the culvert at Whitehall Lane/Berkeley Avenue Extension, which is under-sized and has been identified as a major contributor to flooding in the area. A walking path could be incorporated as part of the design to add enhanced recreational value to the project.



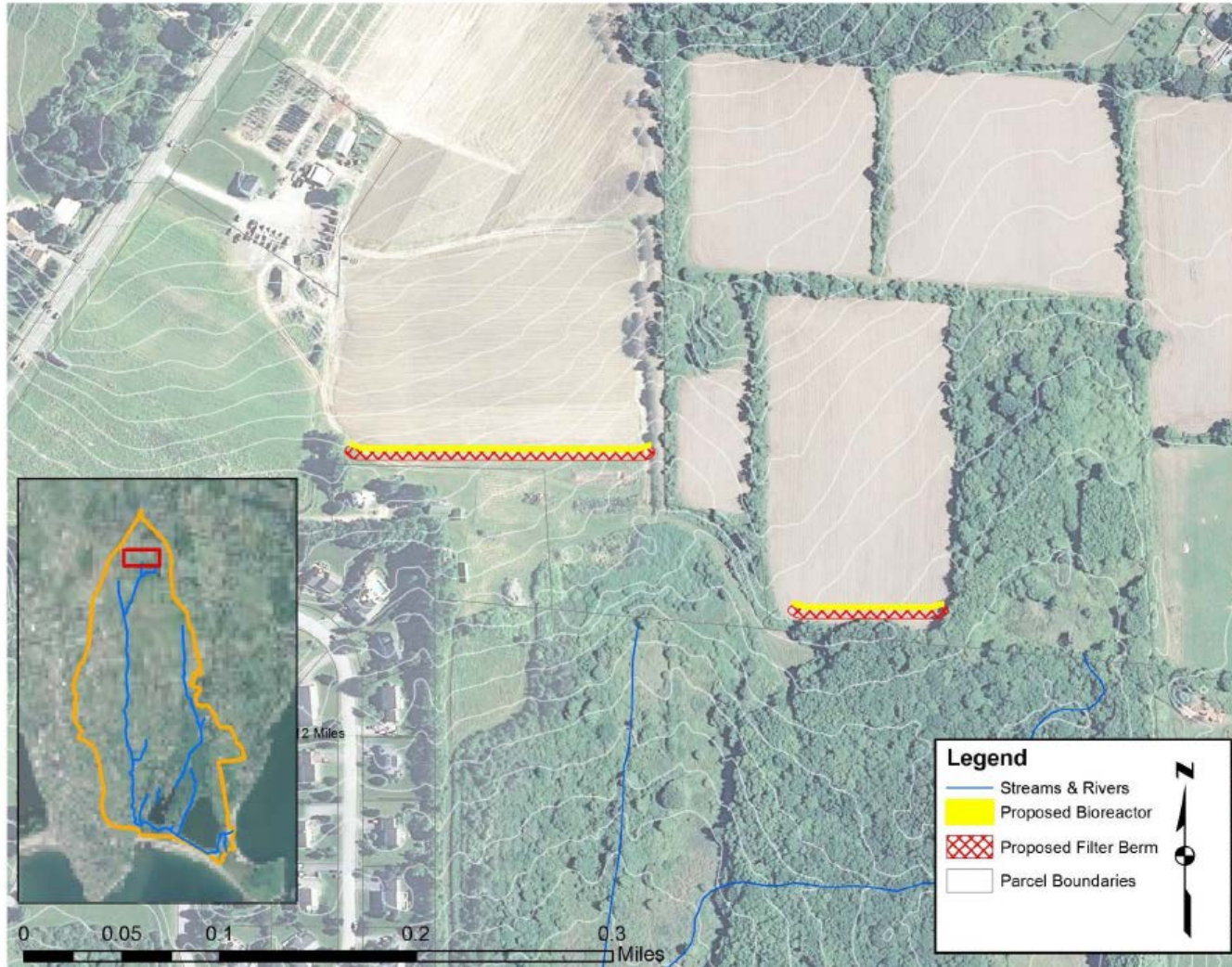
Legend

- Conceptual Maidford River Alignment
- Streams & Rivers
- Proposed Buffer Restoration
- Floodplain Restoration Site
- Parcel Boundaries
- Affected Parcels



BMP Proposal – Lower Cost

4.2 Site 2: Headwaters of the Maidford River



View of Bioreactor installation along field edge. Source: photo Marc Dittrich, Minnesota Dept. of Ag.

Monitoring and Maintaining BMP's and Green Infrastructure on the Land



