

Upper Cape Sub Regional Group



Meeting 1

Approach to the 208 Plan Update

Watershed
Based

Stakeholder
Engagement

Maximize Benefits
of Local Planning

No Optimal
Solutions

Goal:

To generate a series of approaches in each watershed that will meet water quality standards

Subgroup Boundaries

208 Water Quality Management Plan Update



Lower Cape

- Herring River
- Pleasant Bay
- Stage Harbor Group
- Nauset and Cape Cod Bay Marsh Group

Mid Cape

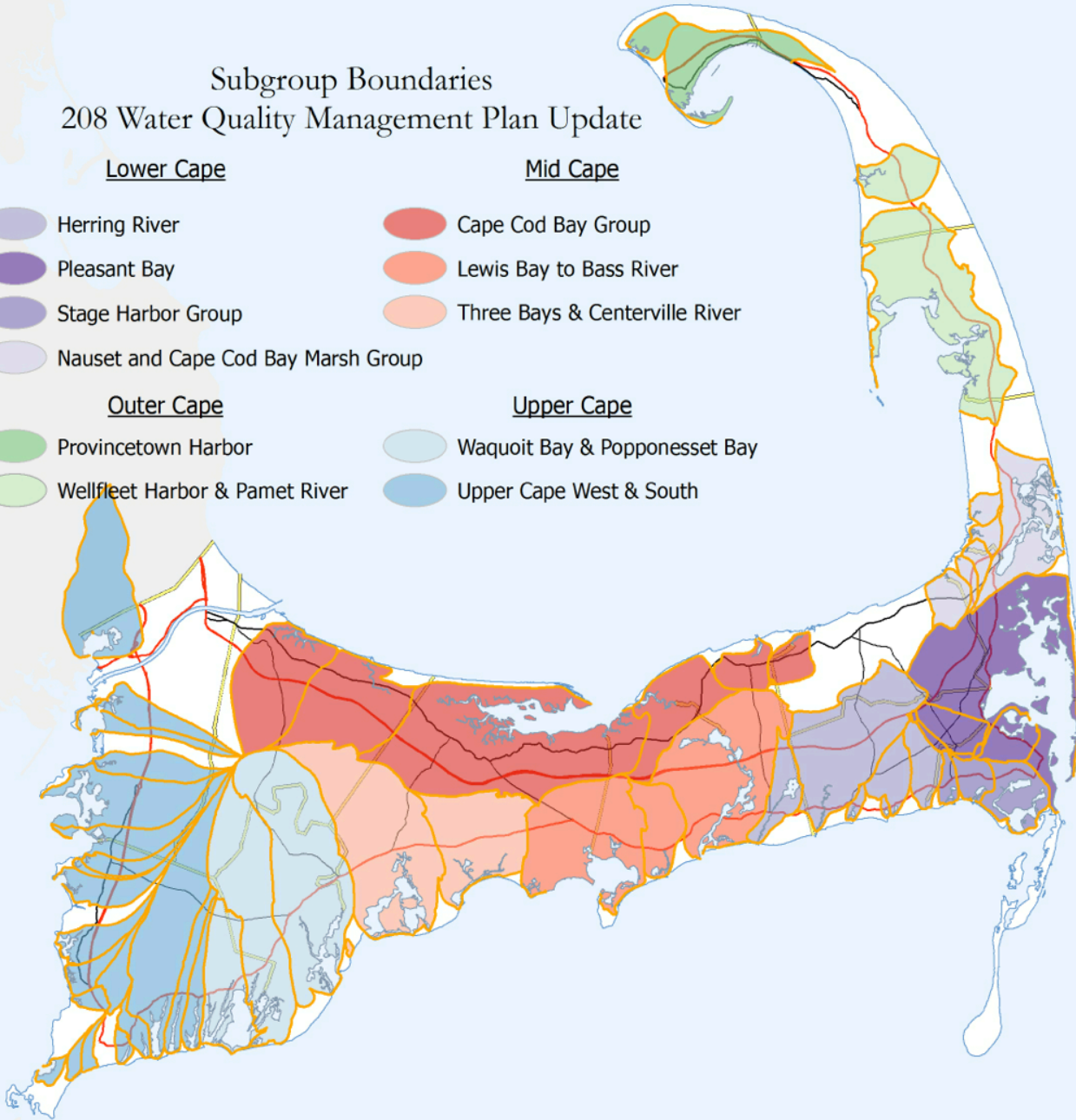
- Cape Cod Bay Group
- Lewis Bay to Bass River
- Three Bays & Centerville River

Outer Cape

- Provincetown Harbor
- Wellfleet Harbor & Pamet River

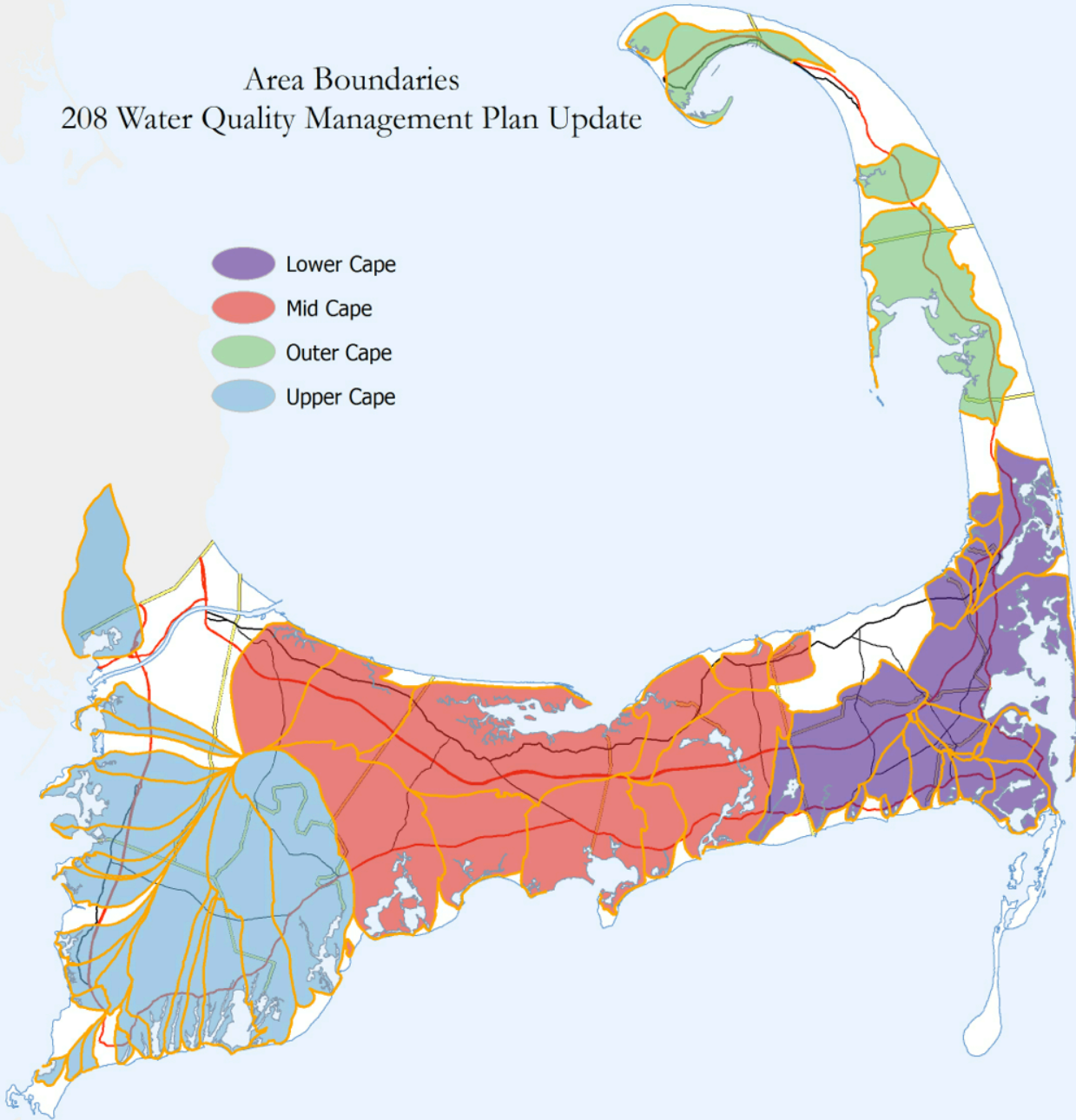
Upper Cape

- Waquoit Bay & Popponesset Bay
- Upper Cape West & South



Area Boundaries 208 Water Quality Management Plan Update

- Lower Cape
- Mid Cape
- Outer Cape
- Upper Cape



Public Meetings

Watershed Working Groups

Goals,
Work Plan
& Roles

Affordability,
Financing

Baseline
Conditions

Technology
Options
Review

Watershed
Scenarios

July

August

September

October

December

Watershed Working Group Process

Standing Sub Regional Meeting Topics

Scenario
Planning

Regulatory,
Legal,
Institutional

Implementation

Mtg. 1

One representative
watershed

Challenges & opportunities
associated with permitting the
watershed scenario

Adaptive management
plans

Mtg. 2

All shared watersheds
& TBL model

Tools to support
intermunicipal cooperation

Monitoring

Mtg. 3

Subregional scenarios
& TBL model

Structures for permitting

Financing &
affordability

Standing Sub Regional Meeting Topics

Scenario
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Regulatory,
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Implementation

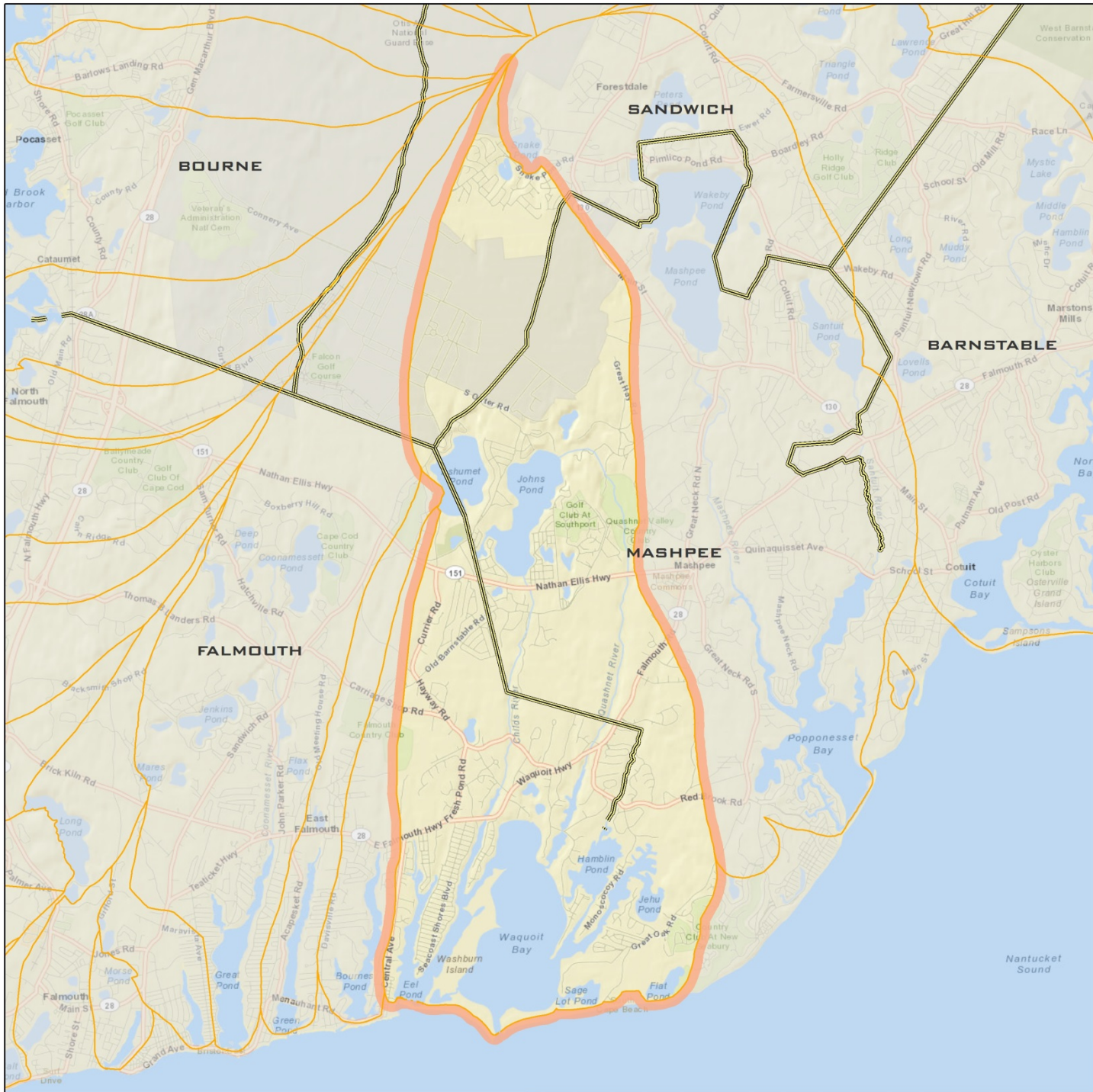
Meeting 1 Goals:

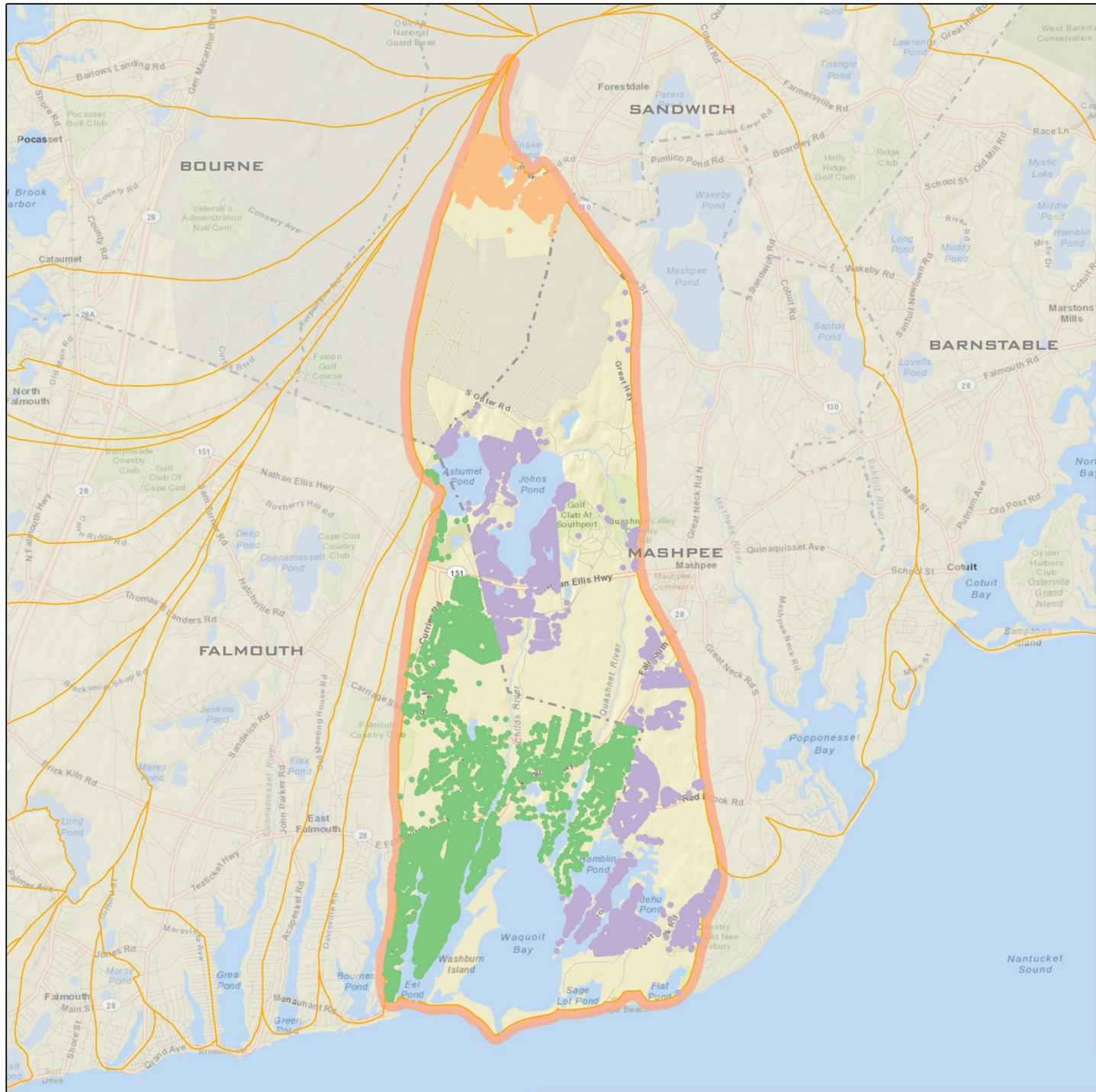
Identify regulatory, legal, and institutional challenges, constraints, and opportunities associated with the 208 Plan approach for water quality

Clarify the definition and components of an adaptive management plan that can be permitted

Scenario Planning

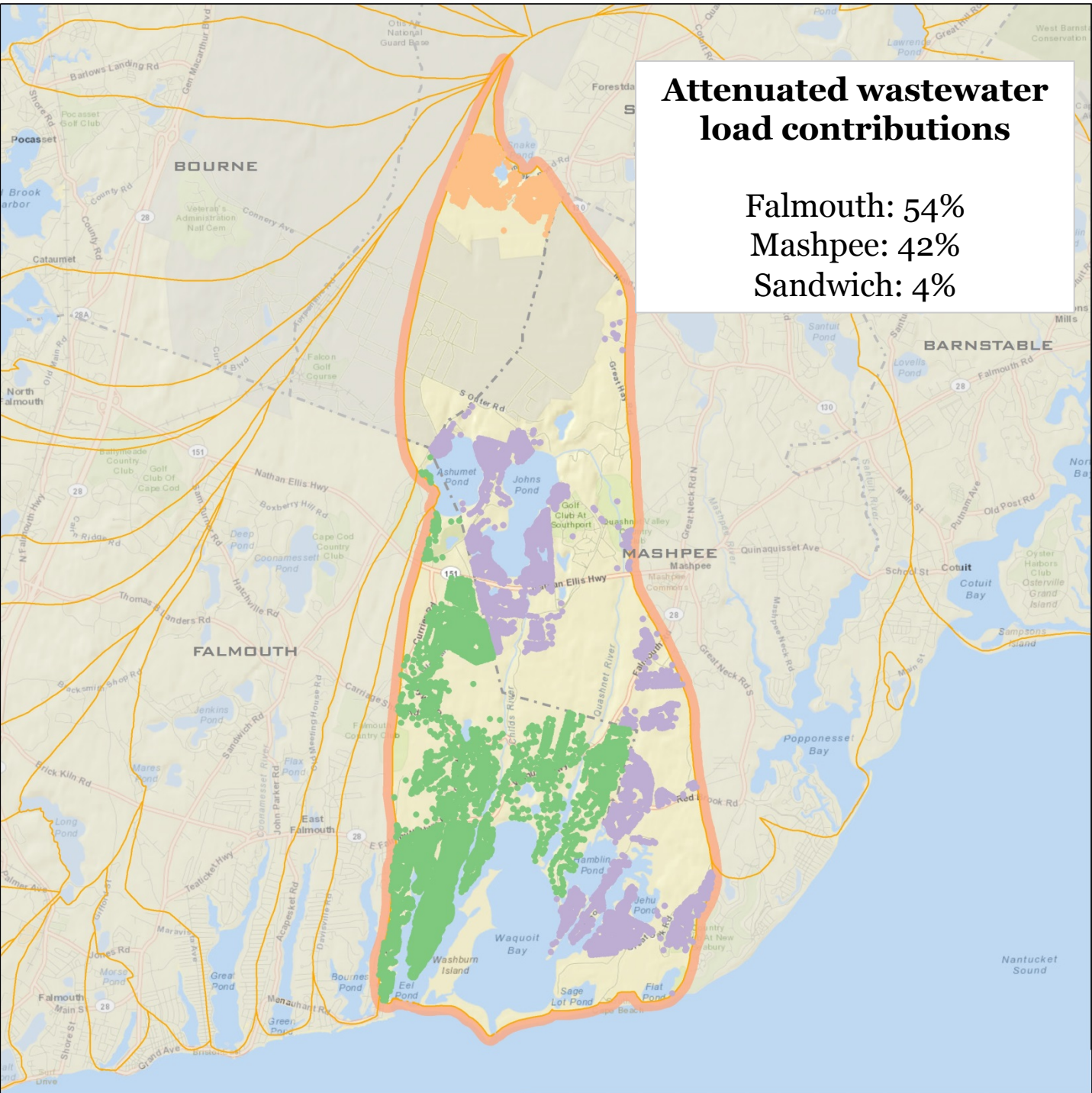
Waquoit Bay



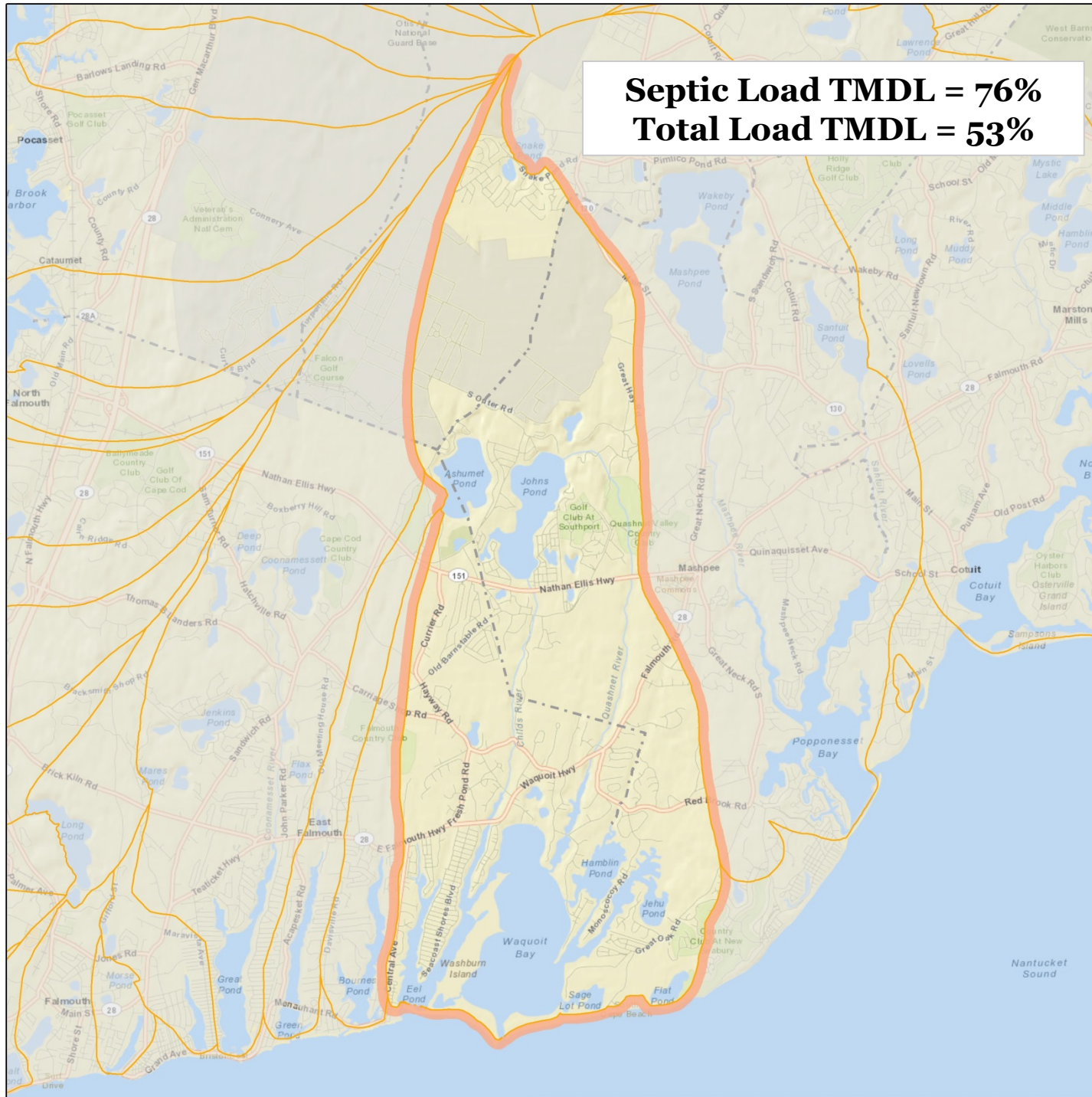


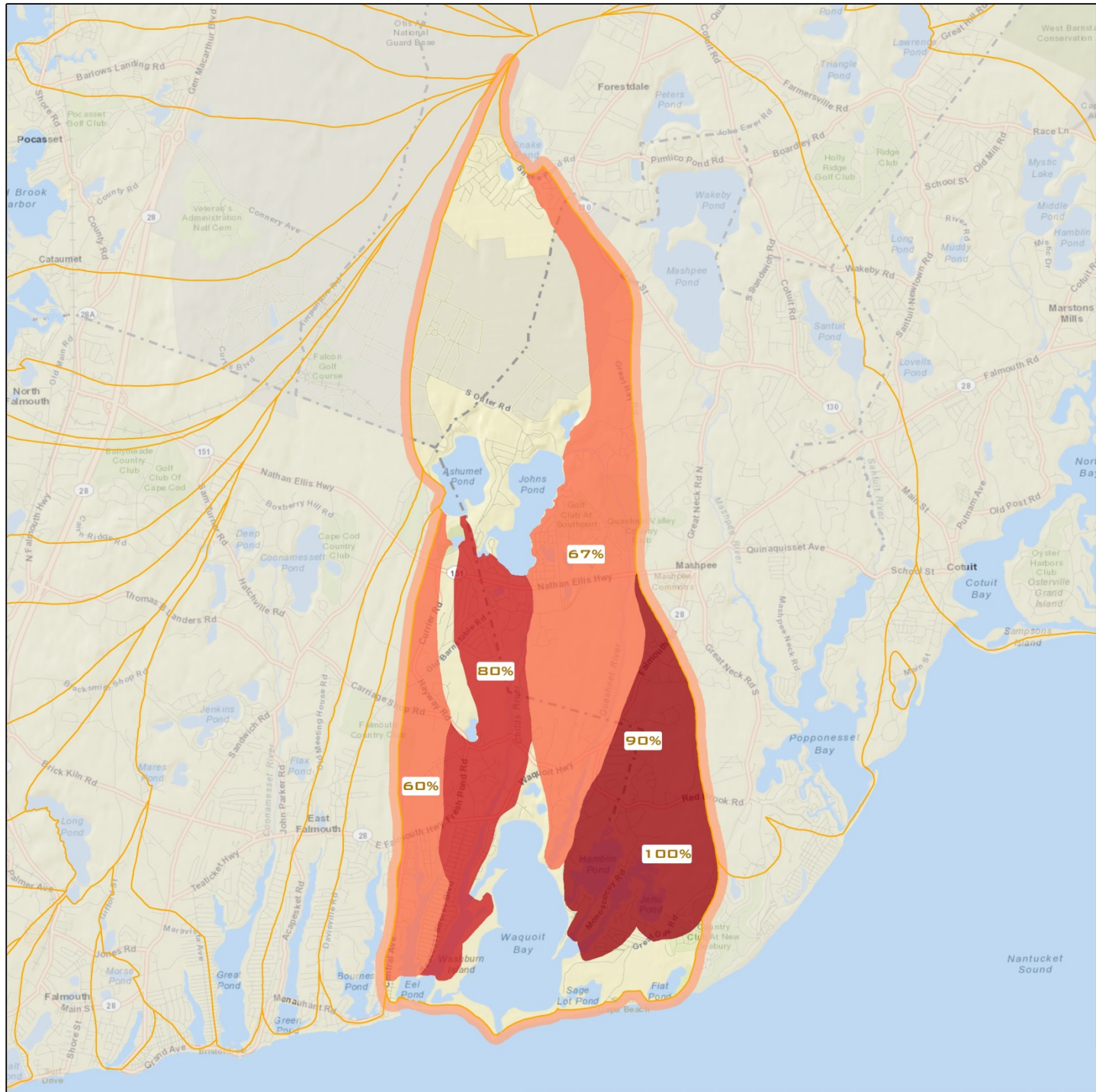
Attenuated wastewater load contributions

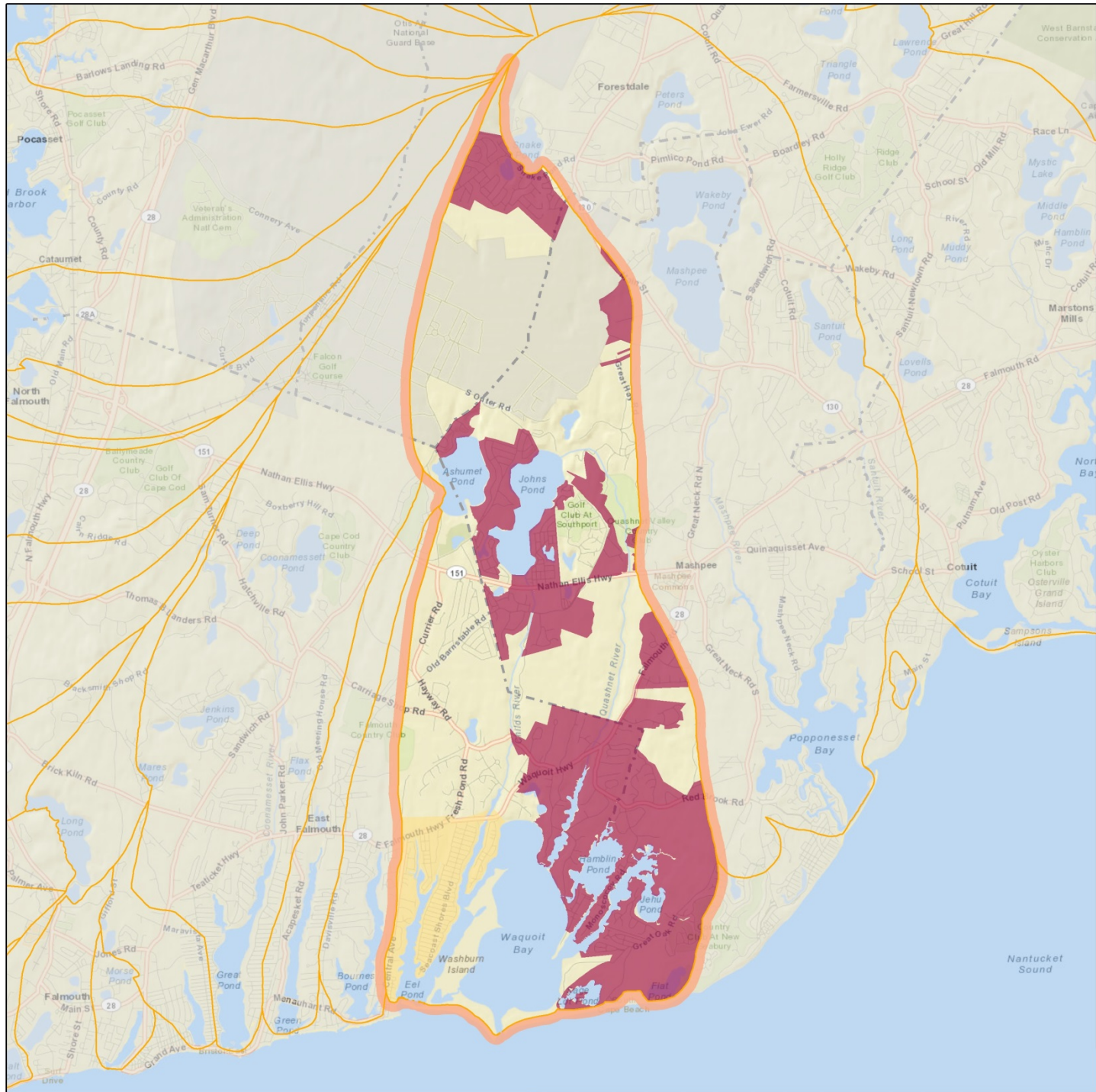
Falmouth: 54%
Mashpee: 42%
Sandwich: 4%

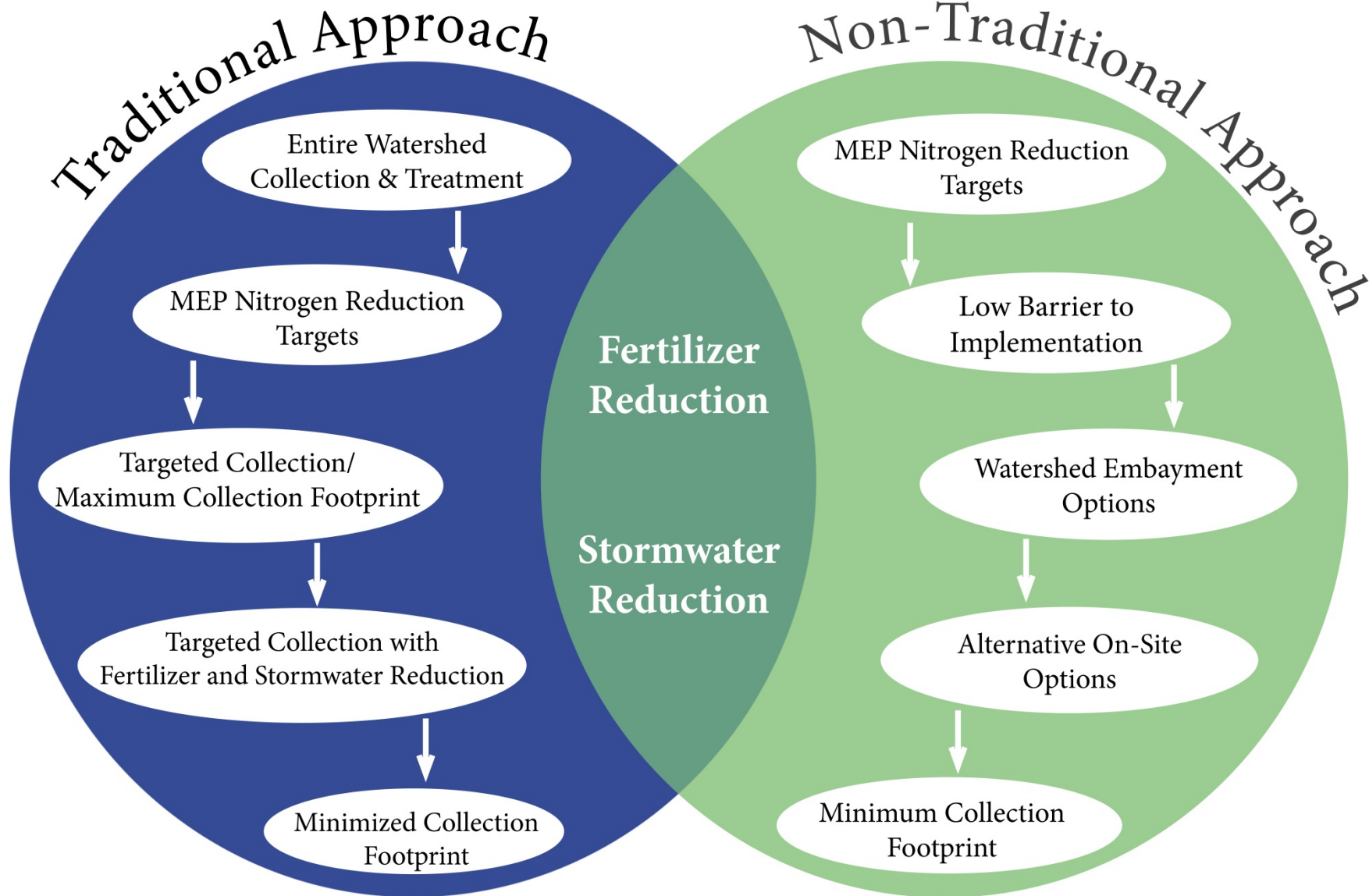


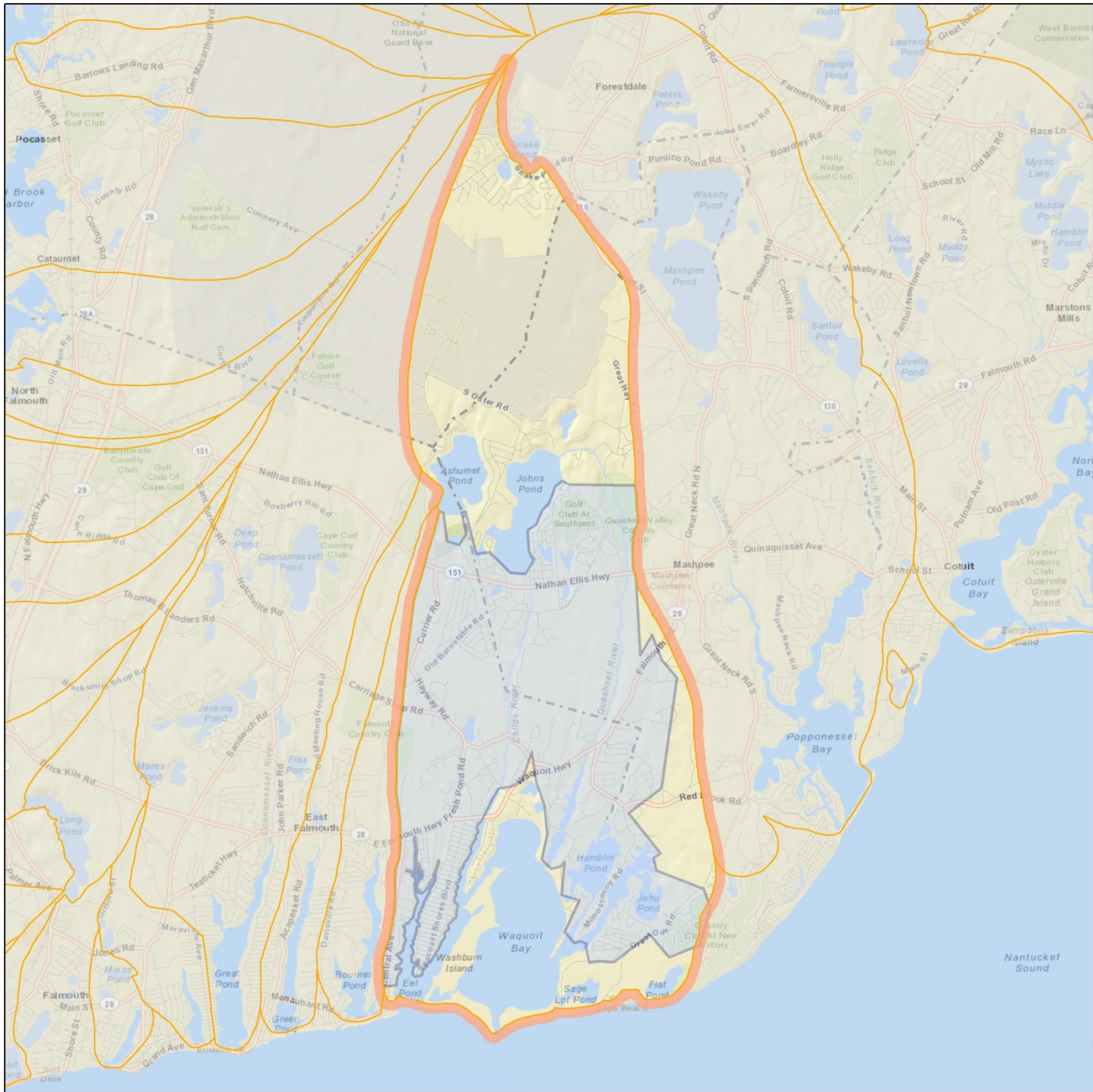
Septic Load TMDL = 76%
Total Load TMDL = 53%

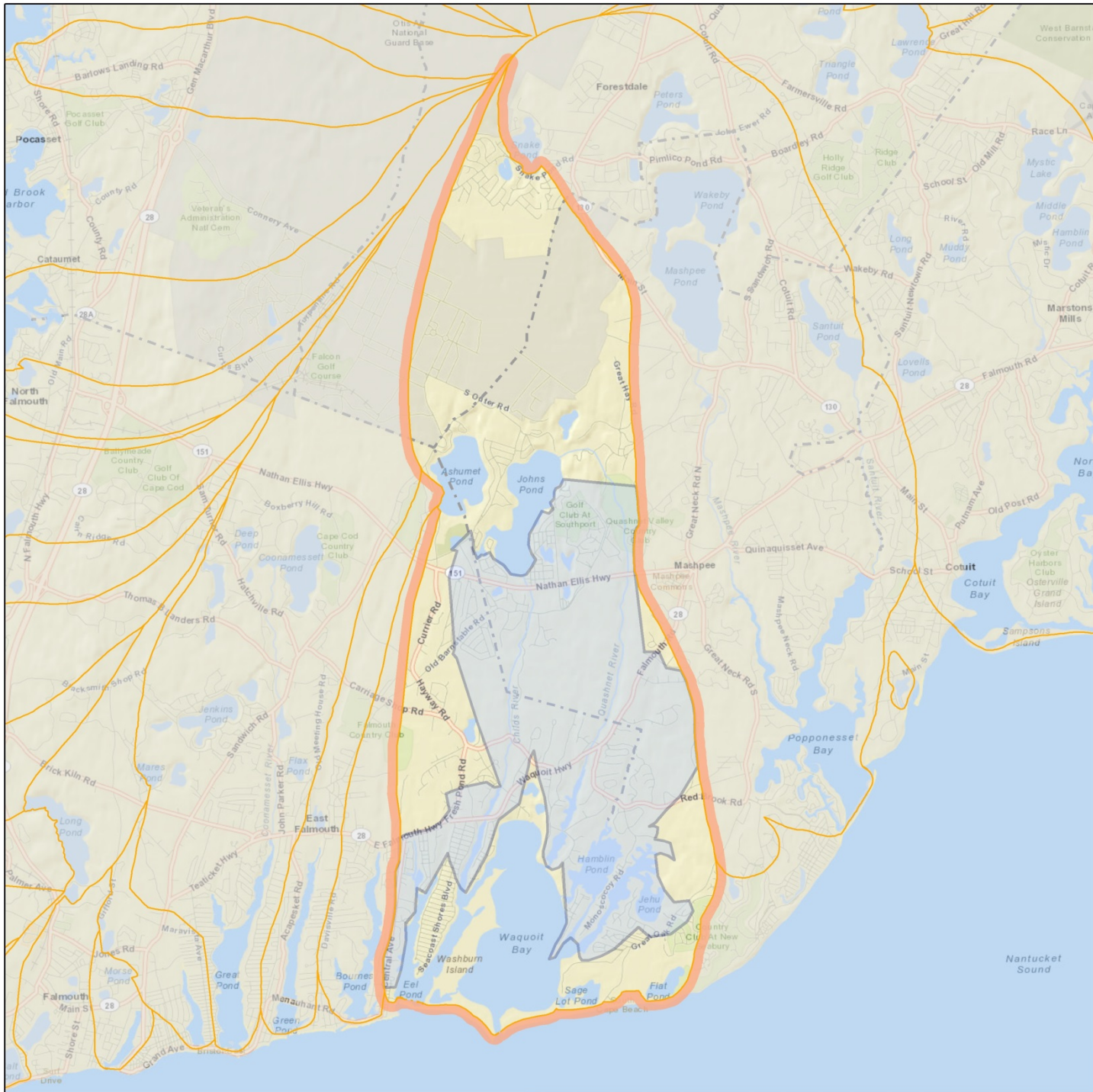












Site Scale

Neighborhood

Watershed

Cape-Wide

Prevention

- Remediation of Existing Development
- Fertilizer Management
- Transfer of Development Rights
- Stormwater BMPs
- Compact Development

Reduction

- Standard Title 5 Systems
- Conventional Treatment
- I/A Title 5 Systems
- Cluster & Satellite Treatment Systems
- Advanced Treatment
- I/A Enhanced Systems
- Wastewater Collection Systems
- Effluent Disposal Systems
- Toilets: Urine Diverting
- Constructed Wetlands: Surface Flow
- Toilets: Composting
- Constructed Wetlands: Subsurface Flow
- Toilets: Packaging
- Stormwater: Bioretention / Soil Media Filters
- Toilets: Incinerating
- Stormwater: Wetlands
- Phytoirrigation
- Eco-Machines & Living Machines

Remediation

- Phytobuffers
- Fertigation Wells
- Permeable Reactive Barrier
- Shellfish and Salt Marsh Habitat Restoration
- Aquaculture/Shellfish Farming
- Inlet / Culvert Widening
- Pond and Estuary Dredging
- Constr. Wetlands - Groundwater, Salt Water, Floating

Problem Solving Approach

Wastewater
 Existing Water Bodies
 Regulatory

1

Identify Current N Removal Needs (Targets/Reduction Goals)

Present Load: X kg/day **Target:** Y kg/day **Reduction Required:** N kg/day

$$X \text{ kg/day} - Y \text{ kg/day} = N \text{ kg/day}$$

2

Additional N Removal Needs

- A. Title 5 Problem Areas
- B. Pond Recharge Areas
- C. Growth Management

3

Low Barrier Technologies

- A. Fertilizer Management
- B. Stormwater Mitigation

4

Watershed Alternative Technologies

- A. Permeable Reactive Barriers
- B. Inlet/Culvert Openings
- C. Constructed Wetlands
- D. Aquaculture

5

On-Site Alternative Technologies

- A. Eco-toilets (UD & Compost)
- B. I/A Technologies
- C. Enhanced I/A Technologies
- D. Shared Systems

6

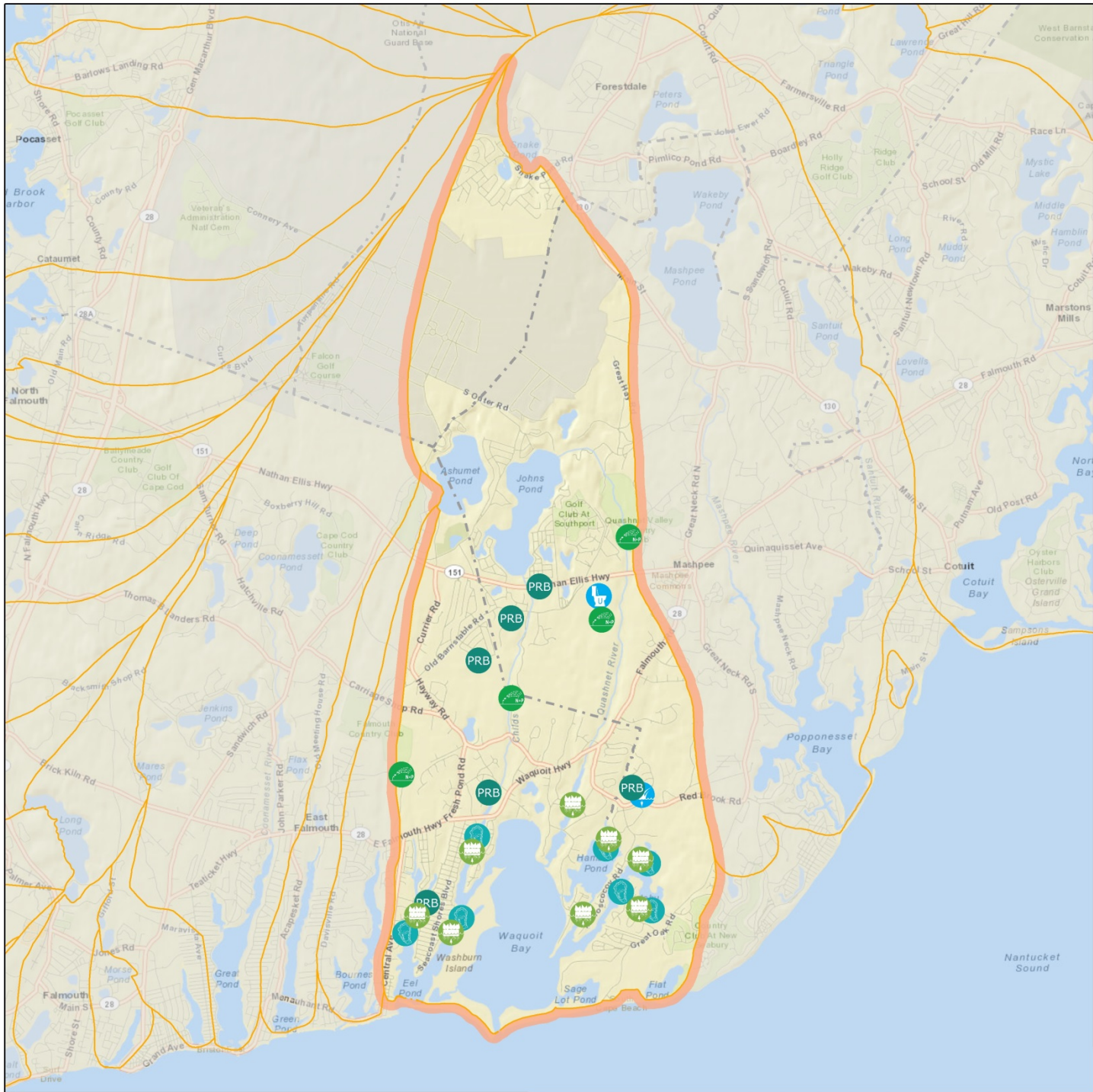
Priority Collection/Sewer Areas

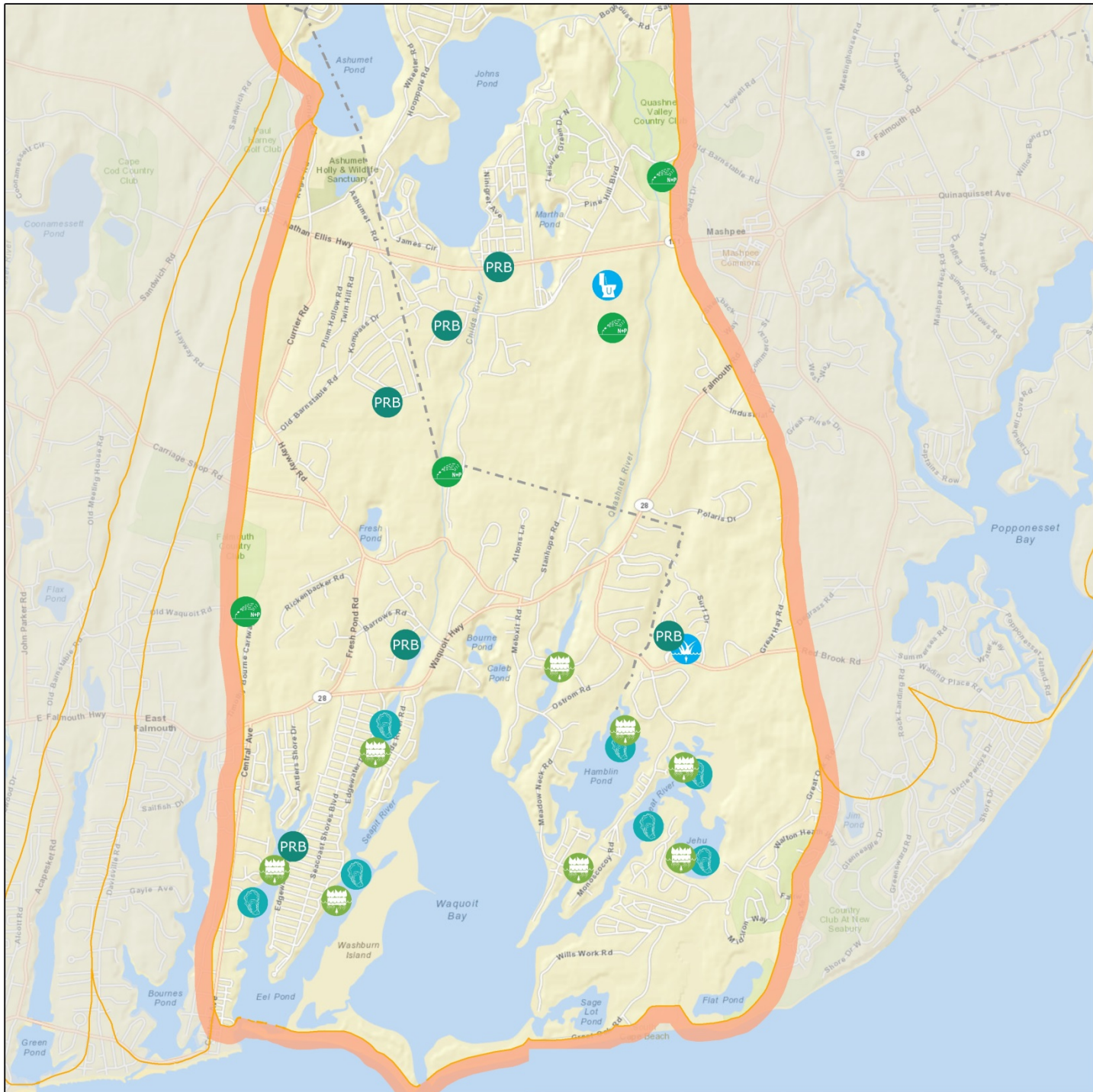
- A. Greater Than 1 Dwelling Unit/acre
- B. Village Centers
- C. Economic Centers
- D. Growth Incentive Zones

7




























Supplemental Collection / Sewer Areas







ACOE**DEP****BOH****ConComm****MEPA***401/404**GWDP**WMA**I&A**Title 5**WPA**Thresholds*

Technology/Approach							
Stormwater Mngmnt							
Fertilizer Mngmnt							
Oyster/Aquaculture							
Ecotoilets							
PRBs							
Constructed Wetlands							
Fertigation Wells							
Phytoremediation							
Habitat Restoration							
Inlet Widening							
Dredging							

Additional permits may apply. Other agencies involved could include:

- MA Natural Heritage and Endangered Species Program
- MA Historical Commission
- US Fish & Wildlife Service/Division of Marine Fisheries
- MassDOT

Regulatory, Legal, and Institutional Interactions

What are some of the hurdles and opportunities associated with permitting the above scenarios?

Implementation

What components of an adaptive management plan are needed to achieve permit-ability and water quality goals?

Adaptive Management

Definition

A structured approach for meeting water quality goals that monitors outcomes, assesses progress over time, and requires recalibration of plans and projects, as necessary, based on review and evaluation of monitoring.

**All materials and resources for the Upper Cape
Sub Regional Group will be available on the Cape
Cod Commission website:**



<http://watersheds.capecodcommission.org/index.php/watersheds/upper-cape>