

Fish Habitat Enhancement Sites, Oyster Restoration Areas, & Oyster Harvest Moratorium in Quonochontaug Pond

**Shellfish Advisory Panel Meeting
February 18, 2016**



Oyster management in Quonnie Pond

- Currently, the entire pond is a designated Shellfish Management Area
- Established in September 2010:
 - Oyster harvest moratorium – collection and harvest of oysters is prohibited across pond
 - Eastern Spawner Sanctuary - protect oyster brood stock & support previous restoration

Oyster Harvest Moratorium

Primary goal:

- Allow stock to rebuild, including in fishable areas, by increasing native populations using disease-resistant broodstock



Status

- Current oyster harvest moratorium set to expire September 2016
- Surveys of pond have determined that oyster population outside of sanctuary is not sufficient to sustain harvest
- Previous restoration efforts are currently being evaluated and show promise
 - Density ~30/m; evidence of recruitment; broad size-class distribution

Fish Habitat Enhancement Project

Project Overview

- Partnership between DEM & TNC to restore degraded fish habitats
- US FWS Sport Fish Restoration Program (SFR) funded project

Primary Goal

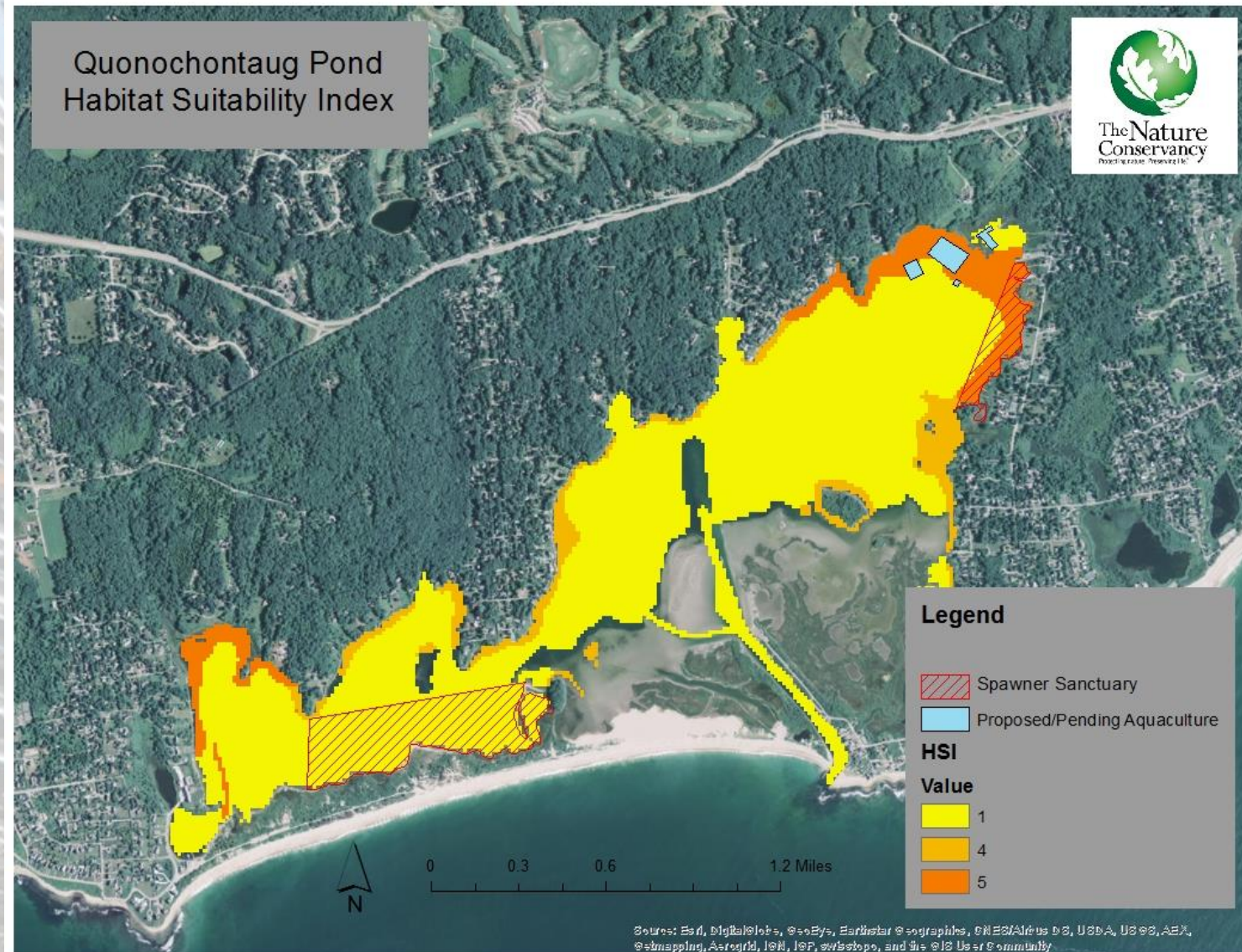
- Determine if construction of oyster reefs is a viable method for improving juvenile populations of important species of sportfish

General Approach

- Construct oyster reef habitat across 4 ponds in the next 4 years
 - Combination of cultch and spat on shell
 - Project design and location advised by Dr. Jon Grabowski of Northeastern University
 - 4 study plots w/ each site having 1 seed on shell, 1 cultch only, 1 control

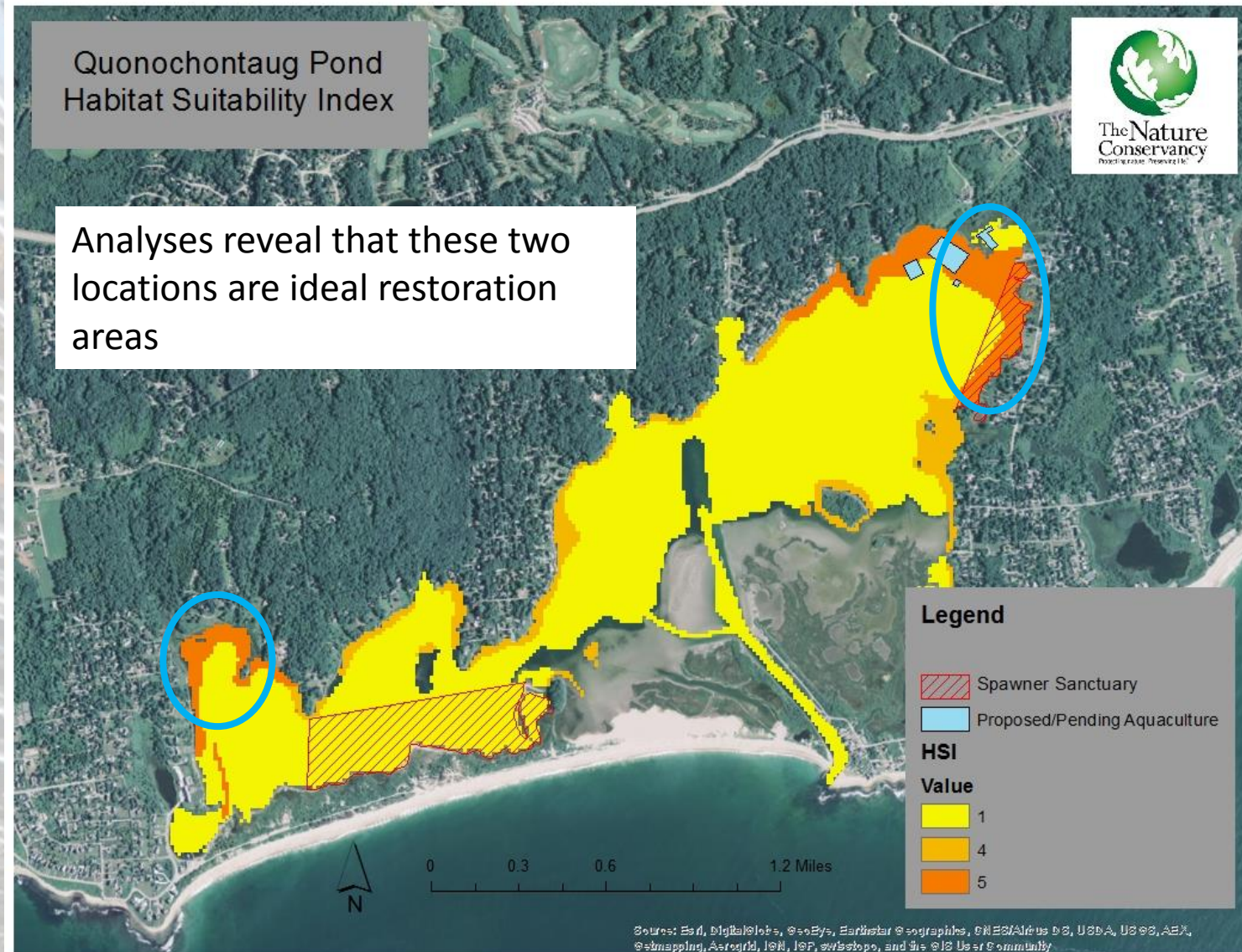
Quonnie Pond proposed study sites

- Site suitability analysis used available geospatial and fisheries data
 - Includes TNC's oyster restoration suitability model, marine sediment data, previous oyster restoration data, fish habitat data, seine survey data, and visual underwater inspections
- Sites were also selected in order to minimize impacts to other known uses in the pond



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Proposed Reef Locations

Quonochontaug Pond - West Sites

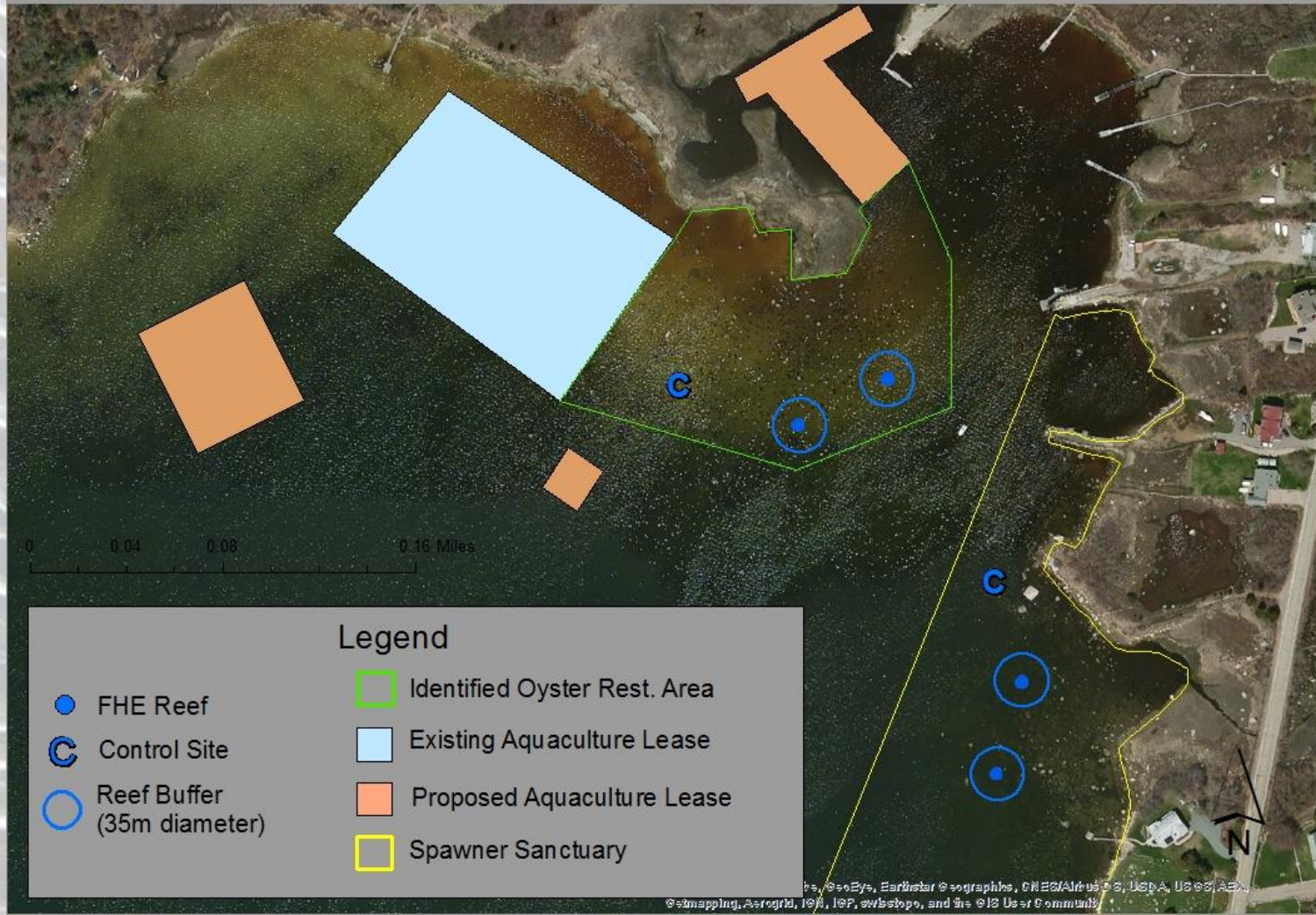


Legend

- FHE Reef
- Reef Buffer (35m diameter)
- Ⓒ Control Site
- Identified Oyster Rest. Area

Proposed Reef Locations

Quonochontaug Pond - East Sites



Quonnie Pond Oyster Management

- DEM needs:
 - Extend oyster harvest moratorium at least 4 years to September 2020
 - 4 year extension will align expiration with Bissel Cove / Fox Island Management Area
 - Alternative: Extend oyster harvest moratorium with no sunset clause while restoration practices are implemented, assessed, and funded
- Establish 3 Oyster Restoration Areas
 - Accommodate fish habitat enhancement and oyster restoration activity in these areas
- SAP Comments?

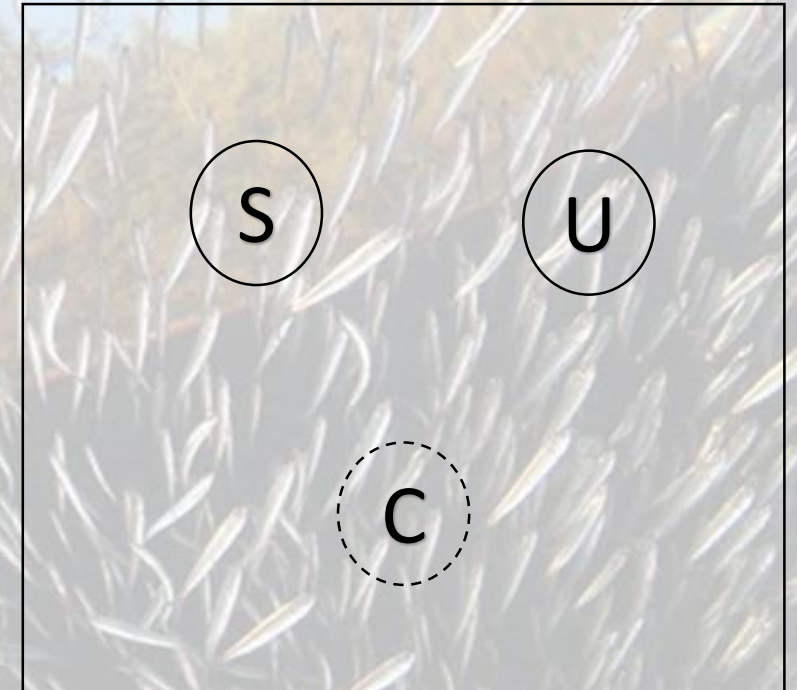
A large school of silver fish, likely salmon, swimming in a river. The fish are densely packed and moving towards the right. The background shows a forested bank under a clear blue sky.

Supplemental Information

Fish Habitat Enhancement Project

- **Methods**
 - 4 study plots are proposed within the pond
 - Each study plot will contain 2 reefs and a control site
 - (8 reefs in pond)
 - Each reef will have a footprint of $\sim 269 \text{ ft}^2$
 - Comprised of about 15 y^3 of surf clam and oyster shell
- **Experimental Design**
 - BACI Design
 - In each study plot, there will be one seeded reef, one unseeded reef, and one control
- **Monitoring**
 - Conduct pre- and post-enhancement evaluation
 - Will continue for 3 years after reef creation
 - Assess effect of oyster reefs on fish diversity/abundance and reef succession

Study Plot



Reefs are separated by at least 35m

Why create oyster reefs to enhance fish habitat?

- In general, oyster reefs have been shown to support greater growth and survival of juvenile stages of fish, and potentially increasing recruitment to the adult stock.
- Harding and Mann (2001) suggested that oyster reefs may provide a higher diversity & availability of food or a greater amount of higher quality food compared to other marine habitats



Habitat Setting

- Grabowski et al. 2005 examined restored oyster reefs in 3 habitats
- Reefs enhanced the abundance of resident invertebrates that comprise >90% of juvenile fish prey biomass
- Abundance of juvenile fish was only augmented in mudflat habitat

