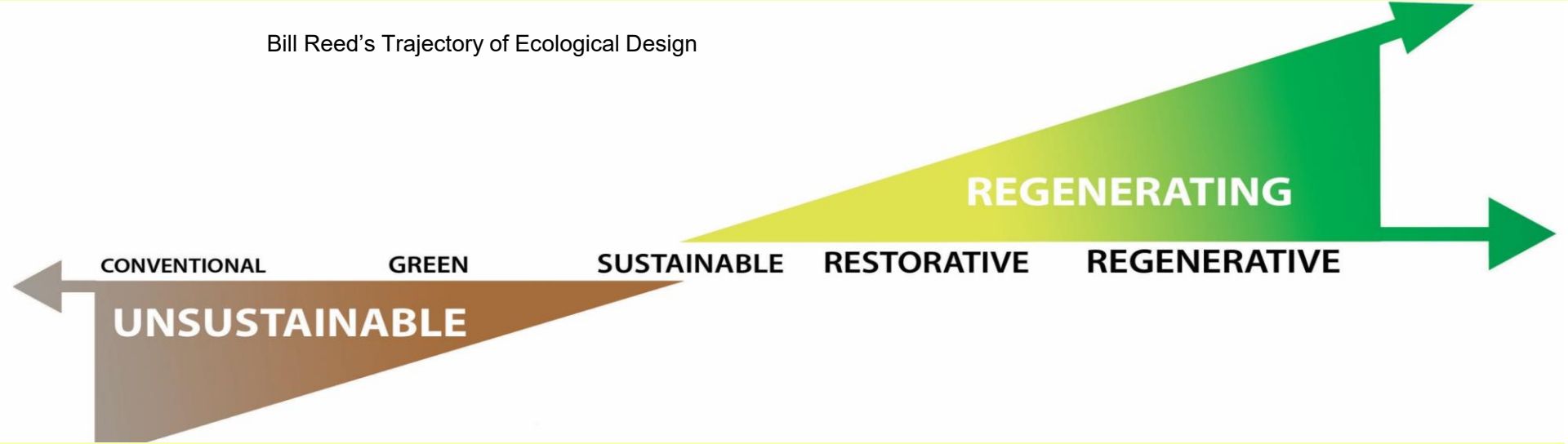
City of Northampton
Resilience & Regeneration Planning and Implementation

- History of Planning & Projects
- Accomplishments/Projects

Northampton's Journey to Carbon Neutrality

Regeneration (mitigation)

Health of people, the economy, and ecosystems, while reducing our contribution to climate change.



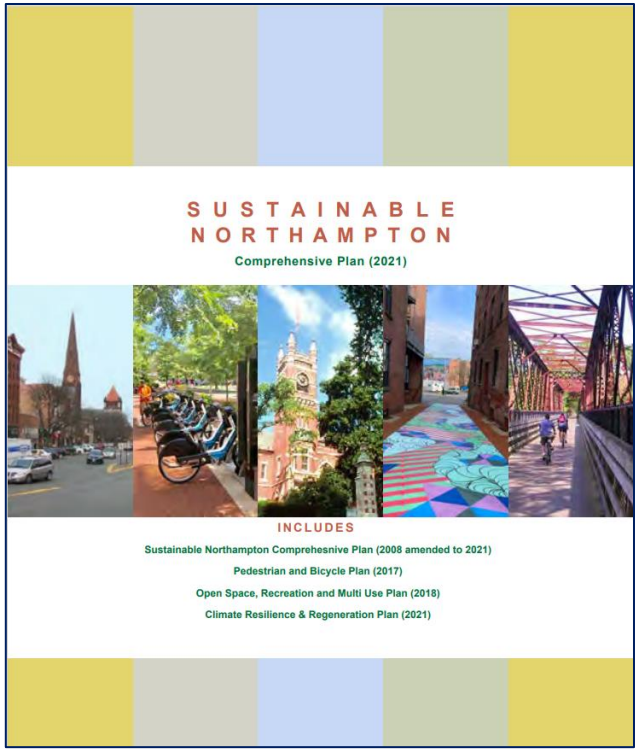
Resiliency (adaptation)

Prepare for climate challenges. Addresses chronic & acute stressors to adapt and thrive despite climate change.

Climate Resilience & Regeneration Plan

- Framework of Equity, Resilience, Regeneration, Economic & Cultural Vitality
- Strategies for Energy, Transportation/Land Use, Equity, Health & Safety, Water, Waste
- 10 Pathways toward Climate Adaptation & Resilience
  - Reduce Energy Demand
  - Transition to renewable electricity
  - EV Deployment
  - Electrification-Resilient Building and Energy Systems
  - Net-0 Buildings
  - CAFÉ standards
  - Land Use Patterns
  - Transportation Mode Shift
  - Carbon Sequestration & offsets- Resilient $ Connected Landscapes
  - City Operations/Carbon Budget

[Comprehensive Plan - Climate Resilience & Regeneration Plan]



Community Climate Resilience Actions

- Equity in Housing- Zoning Code Amendments
- Housing for most vulnerable -27 Crafts
- Hub
    - coordinated access, climate resilience, community/equity
- Equity in Transportation- Bike Share/ Land Use Patterns/ Infrastructure investment (SFRTS, CDBG)
- District Geothermal
- **Designs with Nature**

Resiliency Framework

Northampton Designs with Nature

EXISTING & NEW TREES & NATURAL SYSTEMS

IMPROVE STORMWATER QUALITY

REDUCE FLOOD POTENTIAL

EXISTING UTILITIES

EDUCATE

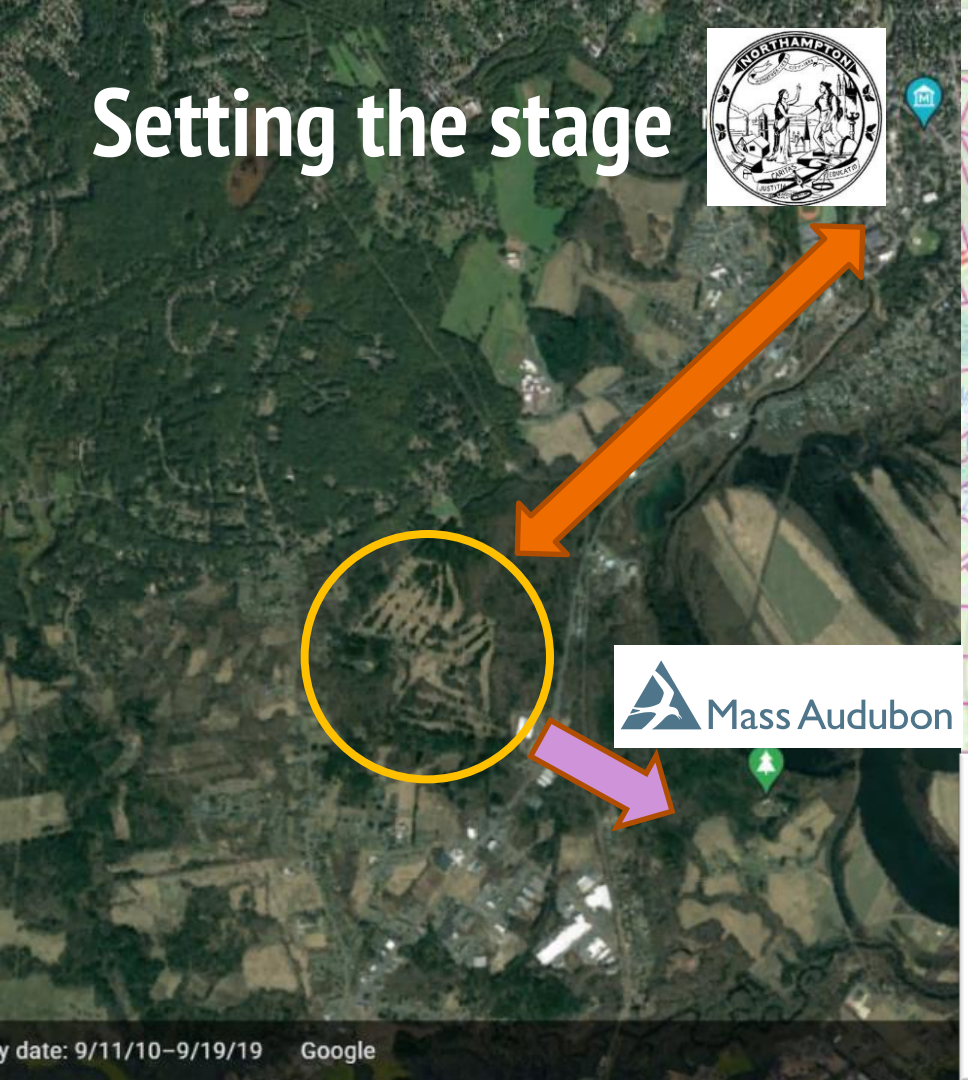
Northampton Designs with Nature

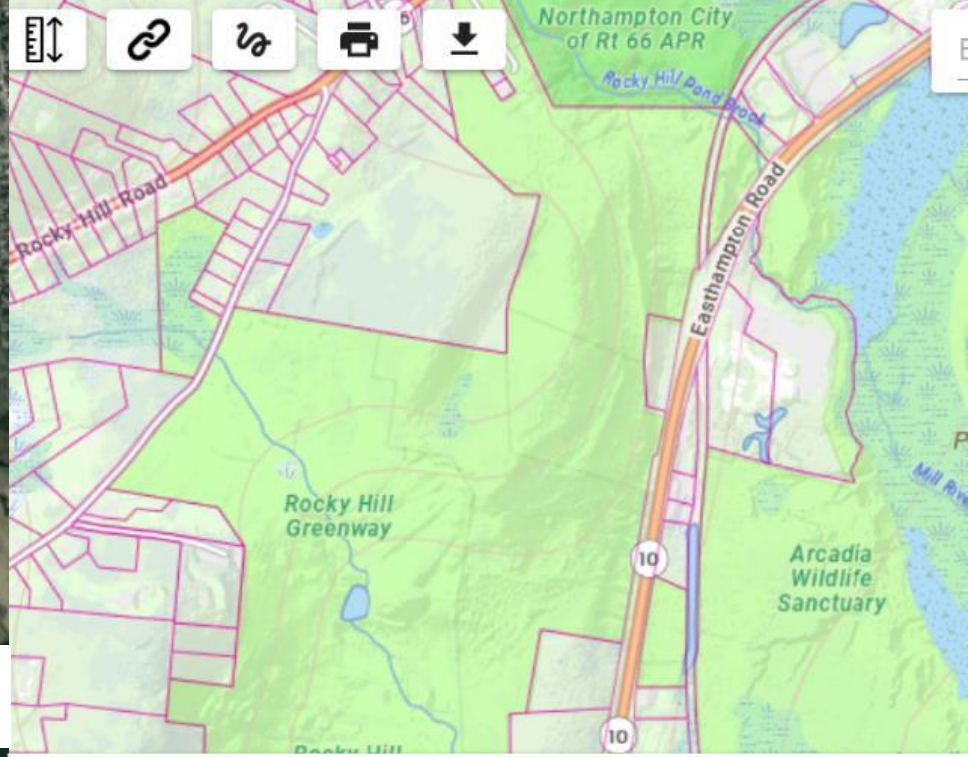
Addressing past engineering that worked *against* nature…

Community Climate Resilience Actions

- Nature-Based Flood Solutions
- Northampton's Flood Control Pumps/Levees
- Acquisition and actively restoring the **Pine Grove Golf Course** for Climate Resiliency
  - Retain water on the site, restore historic hydrology patterns & wetlands, grow forest cover, and lower runoff
  - Carbon capture
  - Reduce heat island effects
  - Restore natural systems
  - Plan for long term full site restoration

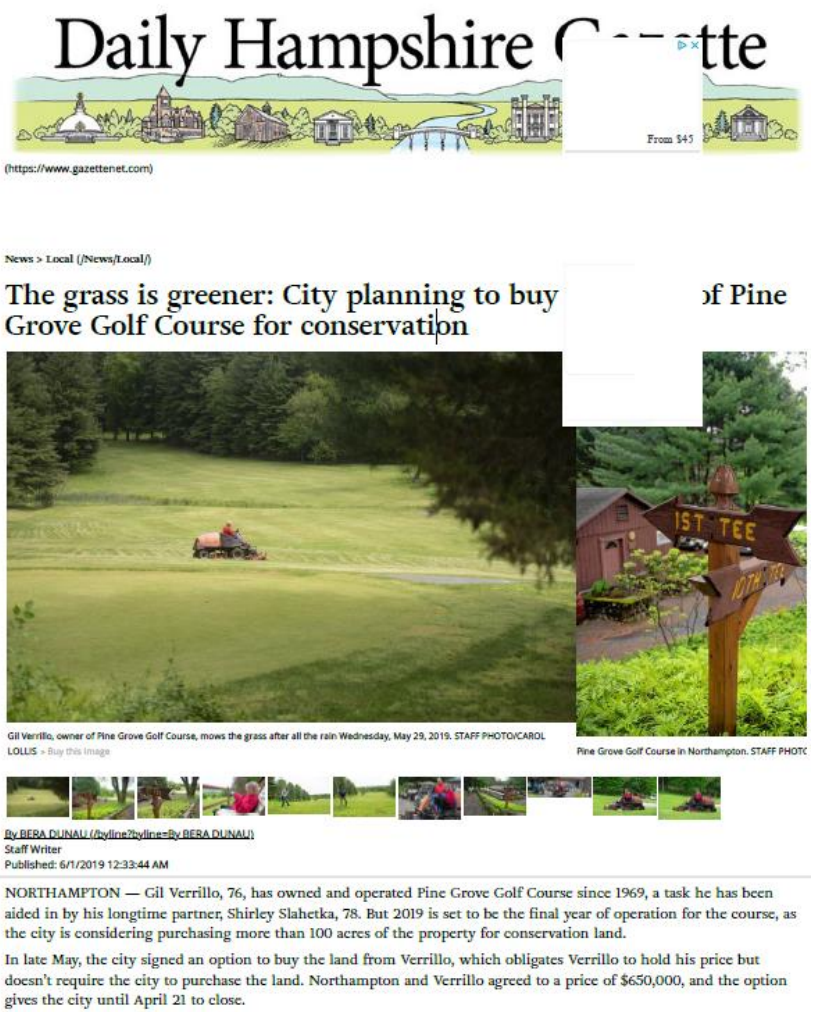
Setting the stage





Land acquisition and first phases

- Golf course owner retiring – looking to sell land
- MA EEA Local Acquisitions for Natural Diversity (LAND) grant to purchase property
- Conservation Restriction held by Mass Audubon
- MVP Grant: master plan, initial restoration work
- Partnership with Division of Ecological Restoration – Priority Projects Prgoram



Daily Hampshire Gazette

From $45

(https://www.gazettenet.com)

News > Local (/News/Local/)

The grass is greener: City planning to buy of Pine Grove Golf Course for conservation

Gil Verrillo, owner of Pine Grove Golf Course, mows the grass after all the rain Wednesday, May 29, 2019. STAFF PHOTO/CAROL LOLLIS » Buy this image

Pine Grove Golf Course in Northampton. STAFF PHOTO

By BERA DUNAU (/byline?byline=By BERA DUNAU)
Staff Writer
Published: 6/1/2019 12:33:44 AM

NORTHAMPTON — Gil Verrillo, 76, has owned and operated Pine Grove Golf Course since 1969, a task he has been aided in by his longtime partner, Shirley Slahetka, 78. But 2019 is set to be the final year of operation for the course, as the city is considering purchasing more than 100 acres of the property for conservation land.

In late May, the city signed an option to buy the land from Verrillo, which obligates Verrillo to hold his price but doesn't require the city to purchase the land. Northampton and Verrillo agreed to a price of $650,000, and the option gives the city until April 21 to close.

Early interventions:
stop mowing & Scarify
to allow vegetation regrowth

January 2020

April 2021

October 2021

July 2022

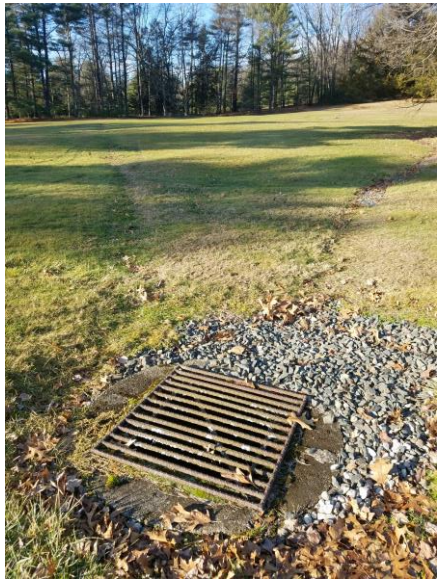
Early interventions:
stop mowing & Scarify
to allow vegetation regrowth

March 2020

October 2020

Early interventions:
remove tile drains to rewet surface

Early interventions:
remove CATCHBASIN STRUCTURES to ALLOW INFILTRATION



Early interventions:
remove EXTRA CROSSINGS AND IRRIGATION

Long Term Goals for the site

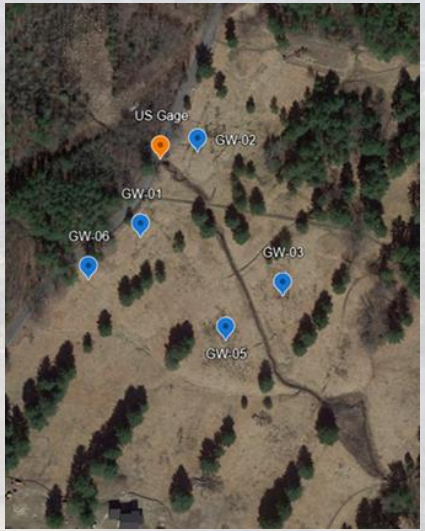
Improve stream and wetland habitat
Reconnect stream with floodplain
Restore stream connectivity
Increase flood storage
Sequester carbon
Provide passive recreation
Connect with existing conservation lands

Where should we actively intervene?

Desired Function	Limiting Factors	Proposed Interventions
Stream connectivity	Dam, culverts, weir	Remove barriers
Floodplain connection	Bank armoring	Remove armoring, regrade channel and floodplain
Flood storage/water retention	Tile drains; mineral fill	Remove tile drains, remove fill, create wetlands
Wetland formation	Mineral fill on top of hydric soils	Remove fill
Thermal buffering	Lack of vegetation	Scarify turf, plant vegetation
Habitat diversity/complexity	Turf grass management	Scarify turf, plant vegetation, add large wood

Data collection to inform design

- Hydrology
- Topographic survey
- Geomorphology
- Soils
- Vegetation



What if we did nothing?

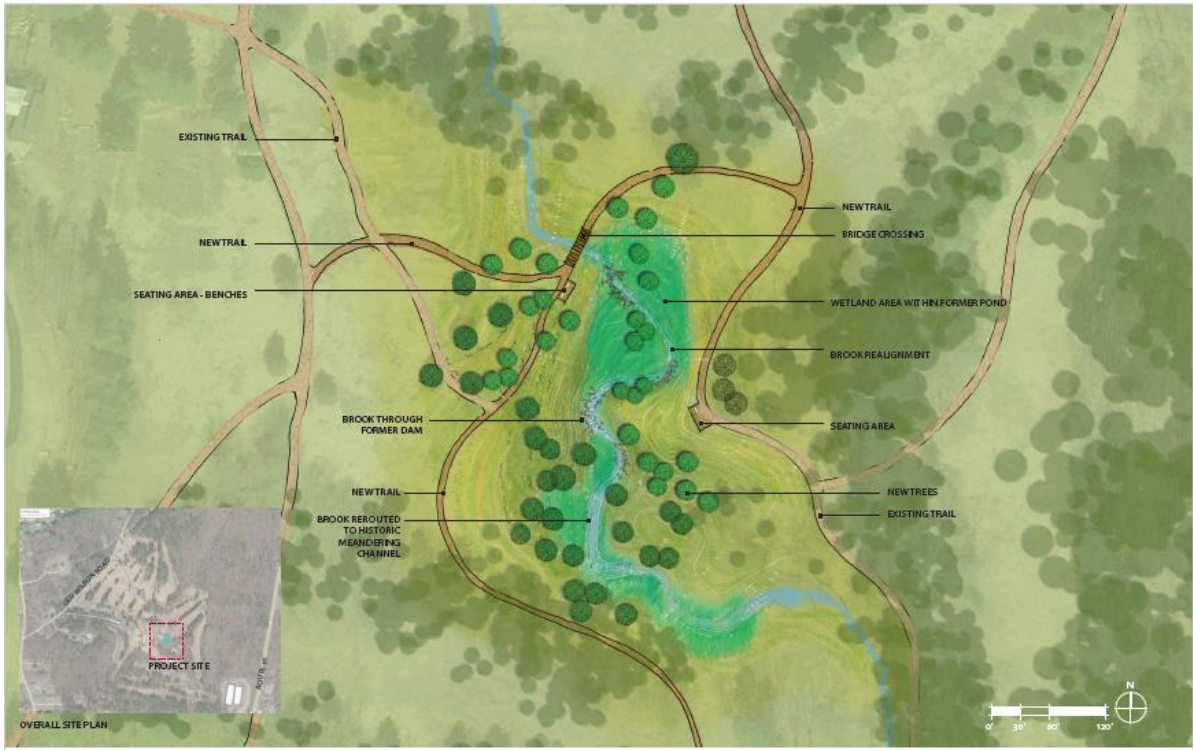
- What would happen on its own?
- What functions need our intervention?
- How long would it take to achieve site goals?

Preliminary designs: dam removal

Nashawannuck Brook Dam Removal
Northampton, MA

EXISTING CONDITION PLAN

HALVORSON Tighe&Bond
06.30.2023



Nashawannuck Brook Dam Removal
Northampton, MA

PROPOSED DAM REMOVAL SITE PLAN

HALVORSON Tighe&Bond
6.30.2023

Nashawannuck Brook Dam Removal
Northampton, MA

RENDERING

HALVORSON Tighe&Bond
6.30.2023

Preliminary design elements

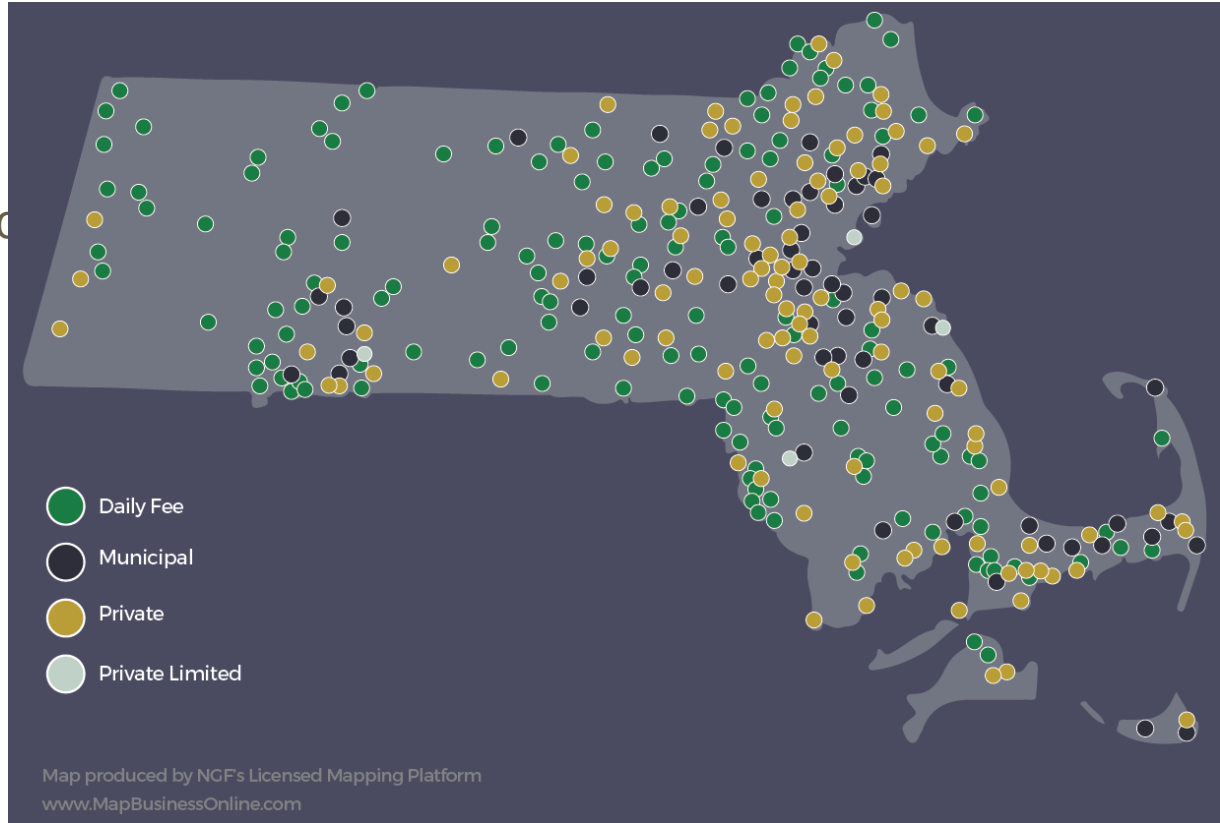
- Dam removal
- Channel restoration
- Forested wetland enhancement
- Riparian corridor tree planting
- Upland tree planting
- Pollinator habitat
- Enhanced trail network, including accessible loop
- Educational signage

Next steps for nashawannuck

- 60% design plans
- Permitting
- Final design plans
- Outreach
- Fundraising
- Construction
- Monitoring

Can these lessons be applied at other golf courses?

- 342 golf facilities in
- 52,000 acres of lanc



Source: The Contributions of Golf to the Commonwealth of Massachusetts: 2022 Impact Report