Ecological Stewardship

Now That It Is Protected How Should It Be Managed?

Bill Giezentanner & Pete Westover
Mass Land Conference
03/13/2026

the COLLABORATIVE

CONSERVATION WORKS

Introduction

- Bill Giezentanner, Senior Associate, the Collaborative
  - 40 years of experience in ecological management
  - Harvard GSD – Lecturer in Landscape Architecture & Planning
  - Mass Audubon – Planning, Ecological Extension Service
  - Wellesley Conservation Land Trust – Board/Stewardship Committee
- Pete Westover, Managing Partner, Conservation Works
  - Board President, Just Roots/Greenfield Community Farm
  - Conservation Law Foundation Mass Board & Board of Trustees committees
  - 10 years teaching Land Use & Ecology at Hampshire College
  - Author, "Managing Conservation Land in Massachusetts"

Need for Ecological Stewardship

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- Preservation/Enhancement of Ecological Assets/Values
  - Biodiversity
  - Sustainable Land Management Practices
  - Wildlife Habitat Enhancements
  - Control of Invasive Species

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  - Biodiversity
  - Sustainable Land Management Practices
  - Wildlife Habitat Enhancements
  - Control of Invasive Species
- Ecosystem Services
- Public Use/Enjoyment
  - Community Engagement
- Climate Change Resilience

Stewardship Plan Elements

- Site's Natural Assets Inventory & Assessment
  - Baseline Survey
  - eBird, iNaturalist, other sources

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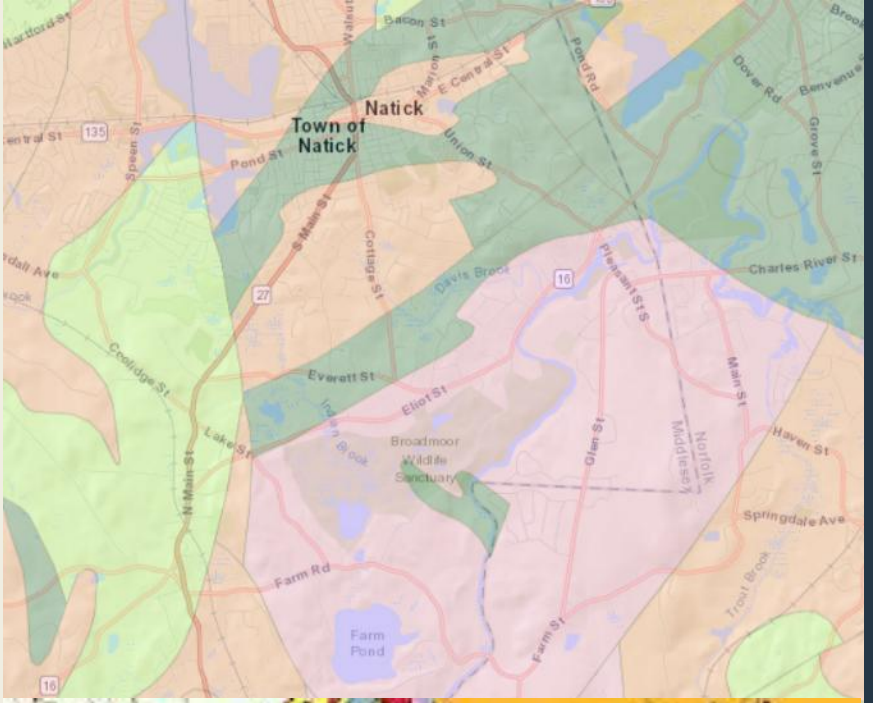
- Site's Natural Assets Inventory & Assessment
  - Baseline Survey
  - eBird, iNaturalist, other sources
- Stewardship Recommendations
  - Goals & objectives
  - Past management
  - Management for each habitat/natural community
  - Public use & trails
  - Management priorities
  - Schedule/cost of management activities

Ecological Assets Inventory & Assessment

- Baseline Survey (if one exists)

Ecological Assets Inventory & Assessment

- Baseline Survey (if one exists)
- Ecological Assets Inventory
  - Geology
  - Topography
  - Soils
  - Natural communities
  - Wildlife
  - Adjacent land uses



Geology, Soils, & Topography

- Geology
- Soils
- Topography
- All relate to the ecological values of the site
- Sources
    - USGS National Geologic Map Database
    - Soil Surveys
    - MassMapper

Natural Communities

- 106 distinct types in 3 categories

Natural Communities

- 106 distinct types in 3 categories
- Terrestrial Communities (48)
  - Cultural grasslands
- Palustrine Areas (Wetlands) (49)
  - Red maple swamp
- Estuarine Environments (9)
  - Salt marsh
- Guide to the Natural Communities of Massachusetts, Natural Community Fact Sheets

Sandplain Grassland – Inland Variant

State Rank: S2 - Imperiled

Sandplain Grassland - Inland Variant dominated by little bluestem, green below is non-native grass. Photo: Marianne Piche, DFW.

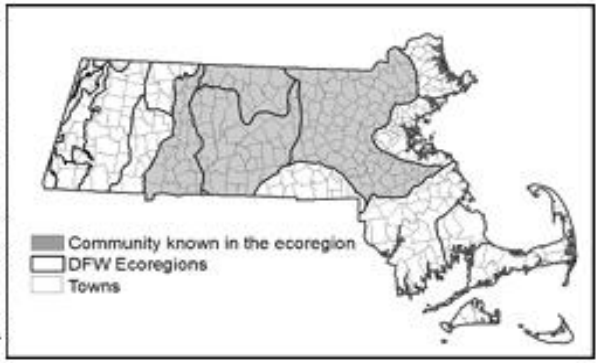
Description: Sandplain Grasslands - Inland Variants are open (essentially treeless), often semi-natural communities visually domsinated by native grasses and herbaceous species with sparse shrubs and patches of bare soil and lichens. They occur inland outside the influence of coastal storms and salt spray, primarily on droughty, low nutrient soils, and usually need management to remain open in the absence of disturbance; otherwise inland grasslands generally succeed to forest. Surroundings often include Pitch Pine - Scrub Oak Communities. Many sites have been severely disturbed in the past which has slowed succession to woody species, but which has also allowed establishment of non-native species. The community occurs at small inland airports, along power line rights of way, and on military lands and wildlife management areas on sandplains – all areas that are managed to exclude tall woody plants.

Sandplain Grassland - Inland Variant is an often semi-natural open community visually dominated by native grasses on sandplains or gravel in interior parts of the state. It usually needs management to remain tree-less.

Characteristic Species: Sandplain Grasslands - Inland Variant are dominated by graminoids, usually little bluestem, Pennsylvania sedge, and poverty grass, usually with many non-native grasses. These communities generally include a mix of herbaceous species such as goldenrods, milkweeds including butterfly weed, and occasionally New England blazing star. There may be fewer shrubs than occur in coastal grasslands, although sweet fern can form large patches, particularly in inland areas, and dewberries may be abundant in either. White pine is often the first tree to invade inland grasslands, with clonal species such as aspen and sumac.

New England Blazing Star. Photo: Jennifer Garrett, NHESP.

Differentiating from Related Communities: Sandplain Grasslands of all types are part of a structural and successional continuum with other communities. When communities are not distinct, the best fit should be named. Sandplain Grasslands - Inland Variant are located inland away from maritime influences and generally lack coastal species including sandplain flax, golden heather, and sandplain blue-eyed grass that grow in coastal Sandplain Grasslands. The regular management needed to maintain inland grasslands usually results in fewer shrubs than are seen in coastal grasslands. Sandplain Heathlands - Inland Variant look shrubbier with a taller shrub layer comprised of scrub oak, black huckleberry, and/or lowbush blueberry, any of which may be dominant. Cultural Grasslands are cultivated or the results of cultivation with non-native, cool season agricultural grasses (pastures and hayfields were the models).



Grassland greening up after recent fire, with adjacent aspen. Photo: Joanne Theriault, NHESP.

Habitat for Associated Fauna: Location in the state and size of the grassland strongly affect the species that inhabit a Sandplain Grassland – Inland Variant. Many grassland birds are typical of midwestern prairies and agricultural fields. Airports currently support Massachusetts' largest populations of Upland Sandpipers, Grasshopper Sparrows, and Savannah Sparrow. Other grassland birds include Killdeer, Northern Meadowlarks, and Horned Larks. Meadow voles, meadow jumping mouse, and the northern short-tailed shrew would be expected in most grasslands. They would be hunted by garter snakes, Kestrels, and wintering Northern Harriers, Snowy Owls, and Short-eared Owls. The suite of grassland Lepidopteran fauna includes many rare species.

Examples with Public Access: Southwick WMA, Southwick; Montague WMA, Montague.

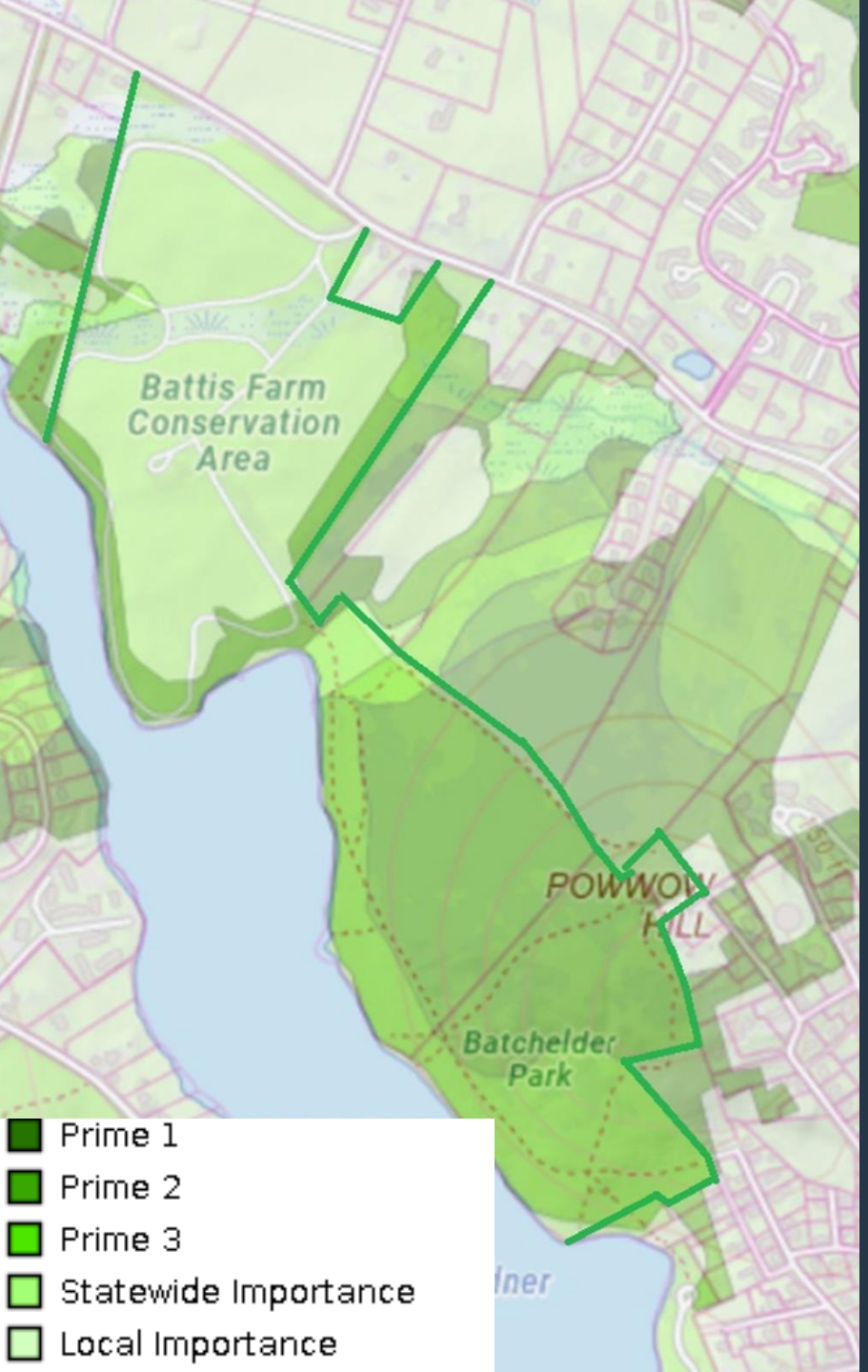
Sandplain Grassland - Inland Variant, airport showing different mowing regimes. Photo: Scott Melvin, NHESP.

From: *Classification of Natural Communities of Massachusetts* http://www.mass.gov/nhesp/
Natural Heritage & Endangered Species Program, Division of Fisheries & Wildlife, 1 Rabbit Hill Rd., Westborough, MA 01581

Updated: 2016
(508) 389-6360

Land Cover/Natural Communities

- MassGIS Land Cover Layer
  - Shows 23 different land cover types
  - Helps determine natural communities
  - Also shows adjacent land uses
- DEP Wetlands Layer
  - Shows 27 categories of wetlands
- Source: MassMapper



Interior & Prime Forests

- Interior Forest areas
  - Areas where forest cover is relatively un-fragmented by human development
- Prime Forest land
  - Classifies potentially forested land into categories based on potential average timber productivity
- Source: MassMapper, UMass

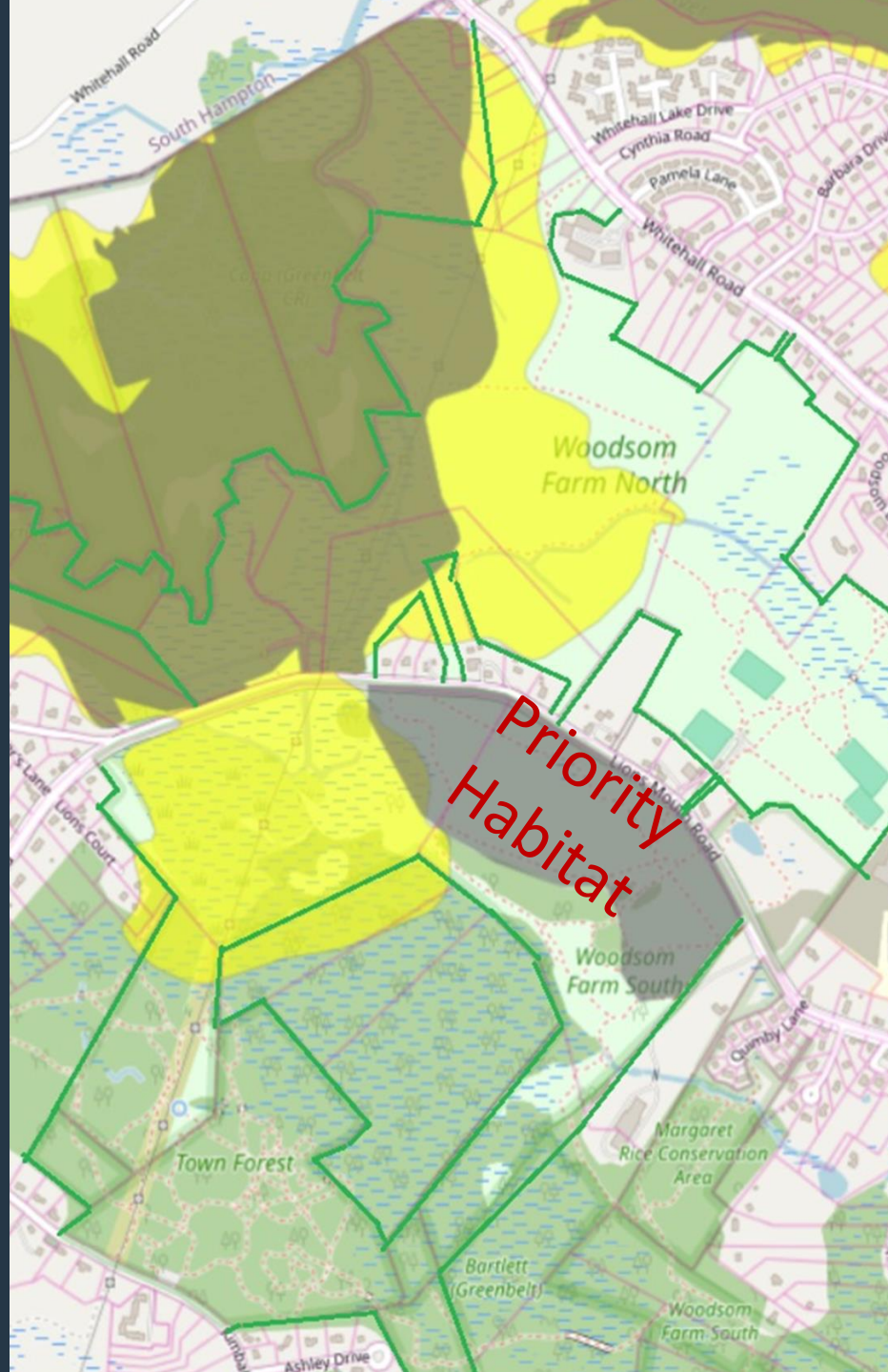
Core Habitat = dark green
Critical Natural Landscape = light green

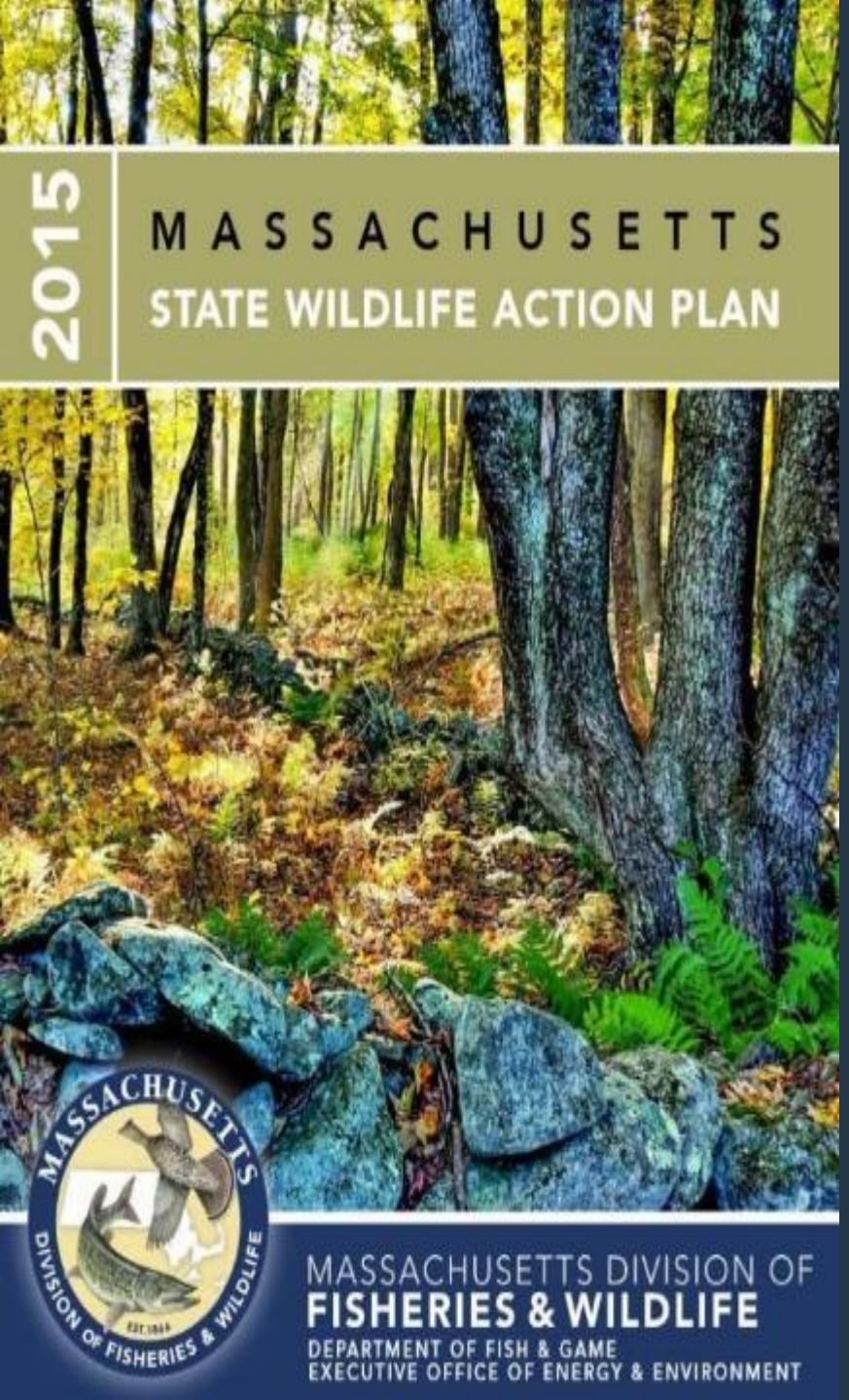
NHESP/TNC BioMap

- Project of The Nature Conservancy & MassWildlife
- Identifies lands most important for maintaining biological diversity
- Several categories
  - Core Habitat
  - Critical Natural Landscape
  - Local Landscapes
- All enhance connectivity & resilience
- Habitat Restoration & Management Center

NHESP Priority & Estimated Habitats

- Protect habitats of state-listed rare species
- Activity within designated areas **require** review by NHESP



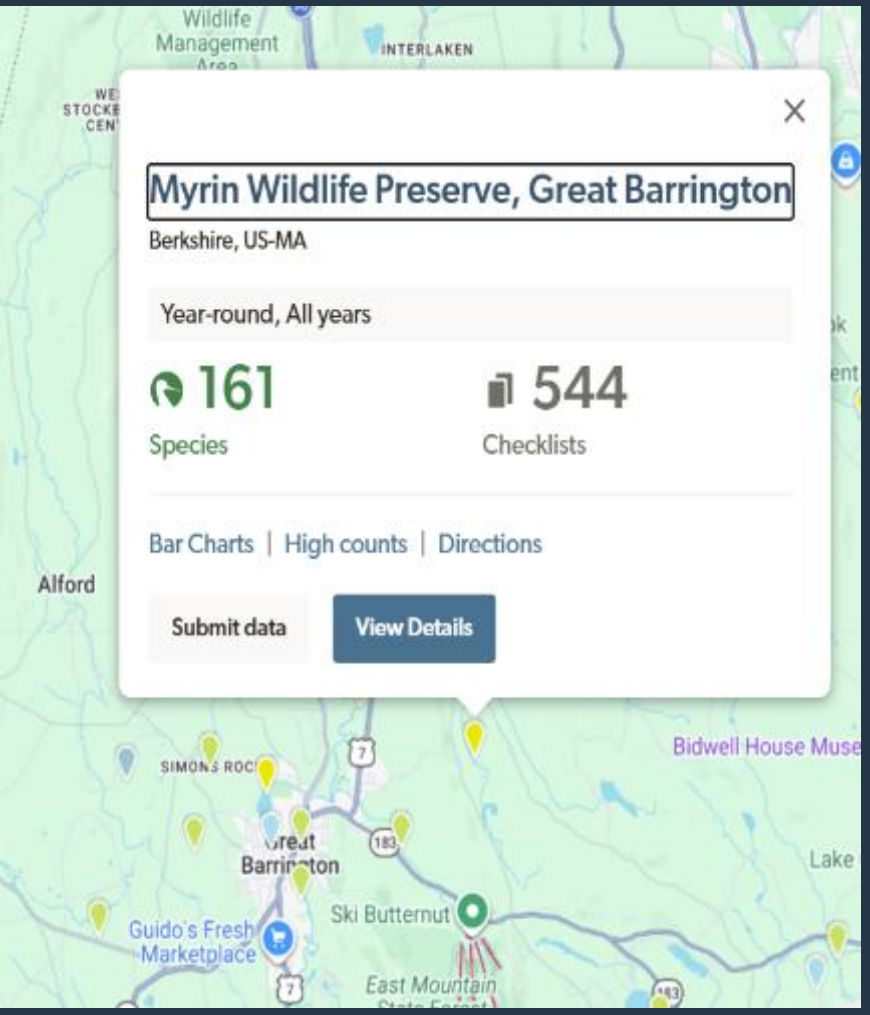


Wildlife

- State Wildlife Action Plan
  - Required by Congress (updated every 10 years)
  - 2025 edition identifies 620 Species of Greatest Conservation Need (SGCNs)
  - 35 natural communities that support these species
  - Important information to guide conservation efforts

eBird Hotspots

- Check for your site or hotspots nearby



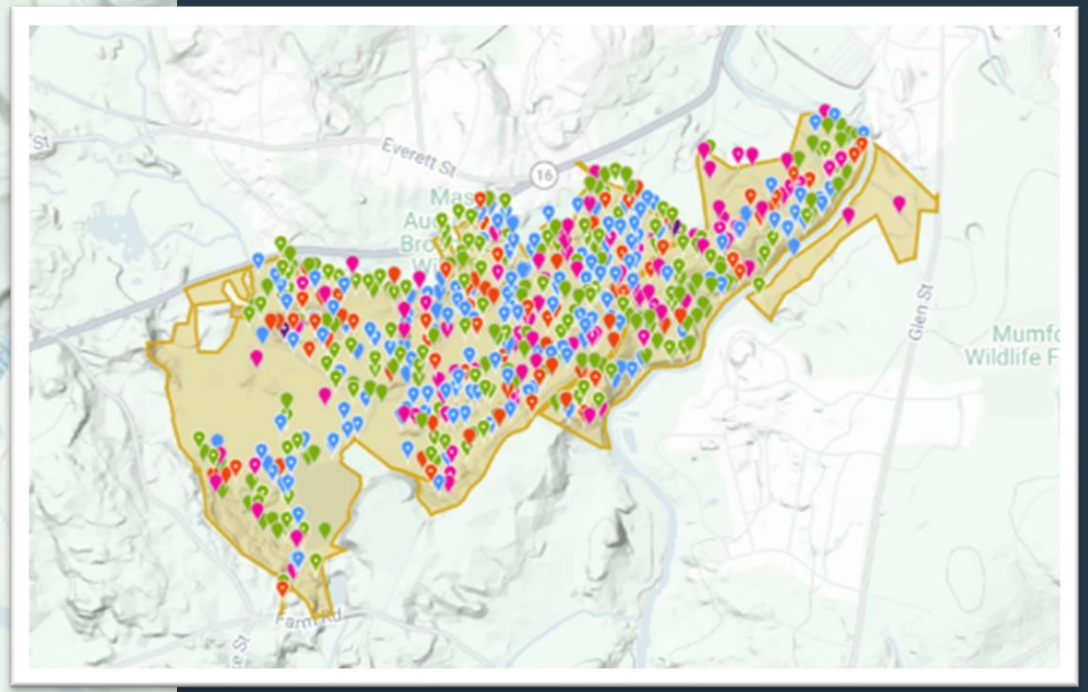
Bird List

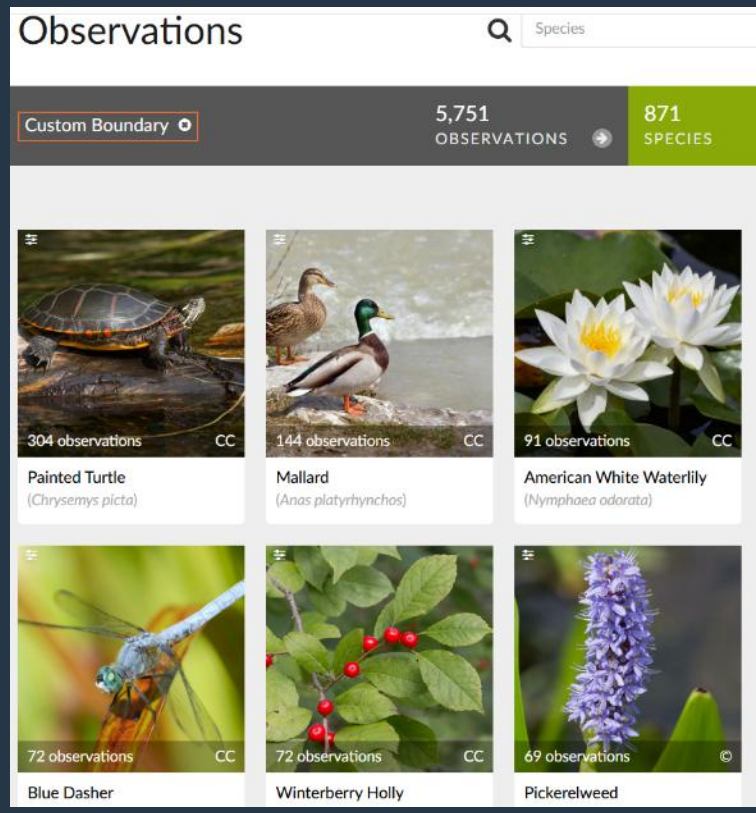
161 All Years	13 This Year 2026	0 This Month Feb 2026

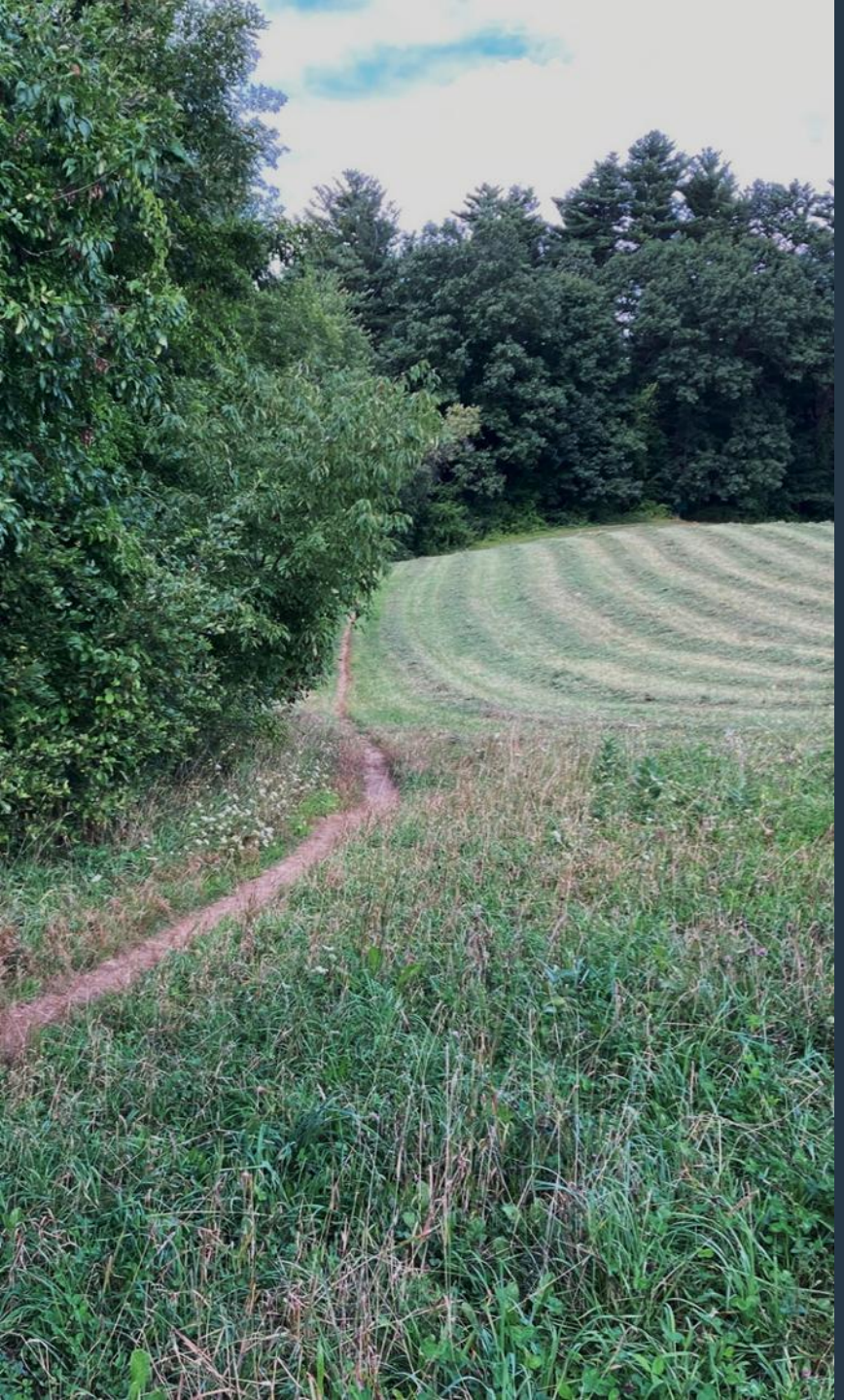
	SPECIES NAME	COUNT
1.	**Mallard** *Anas platyrhynchos*	4
2.	**Downy Woodpecker** *Dryobates pubescens*	1
3.	**Blue Jay** *Cyanocitta cristata*	1
4.	**American Crow** *Corvus brachyrhynchos*	2
5.	**Black-capped Chickadee** *Poecile atricapillus*	6
6.	**Tufted Titmouse** *Baeolophus bicolor*	1
7.	**White-breasted Nuthatch** *Sitta carolinensis*	2
8.	**Red-breasted Nuthatch** *Sitta canadensis*	5
9.	**Eastern Bluebird** *Sialia sialis*	1

iNaturalist

- Draw a rectangle or circle around your location
- Some sites may have a geographic project area defined

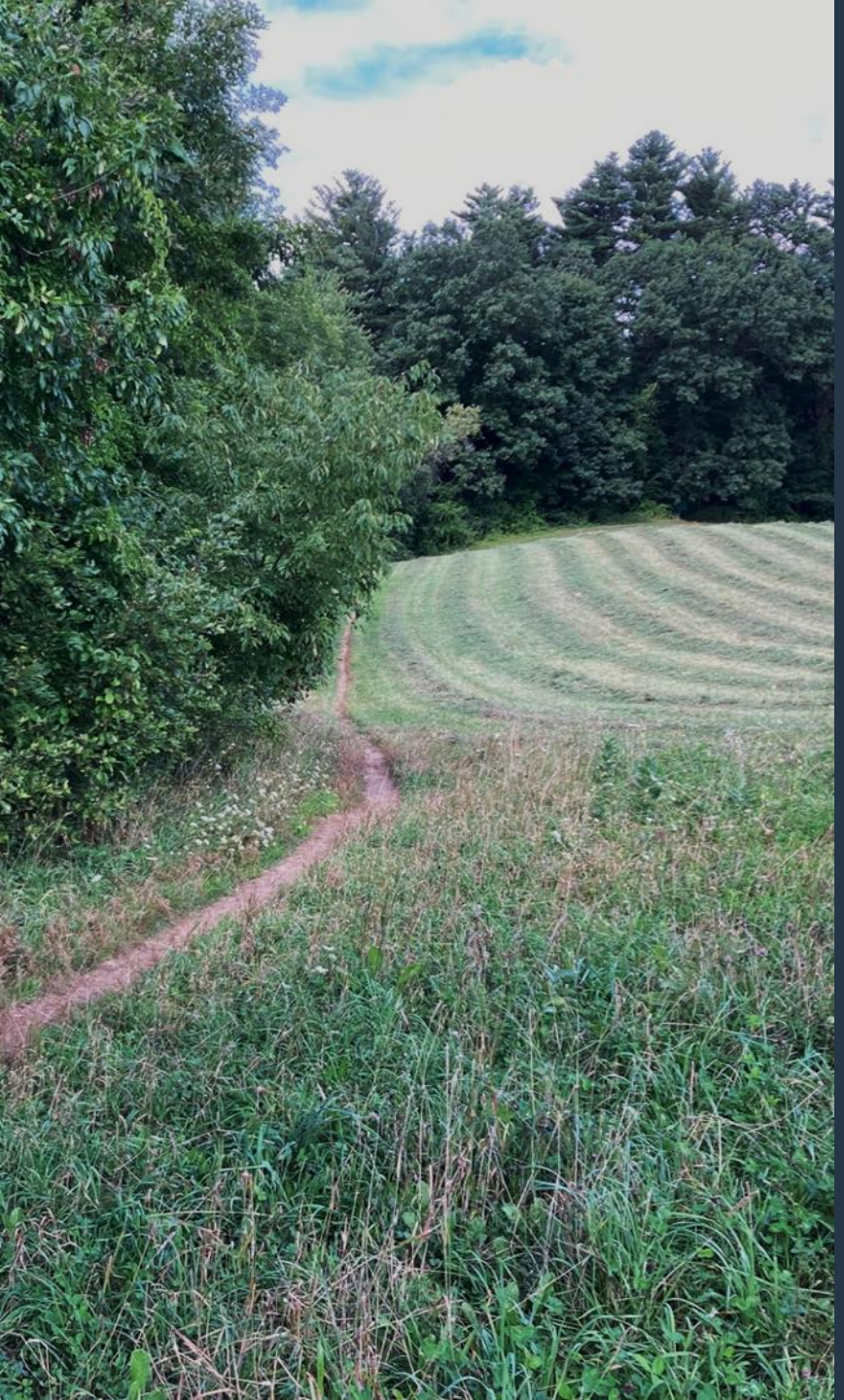






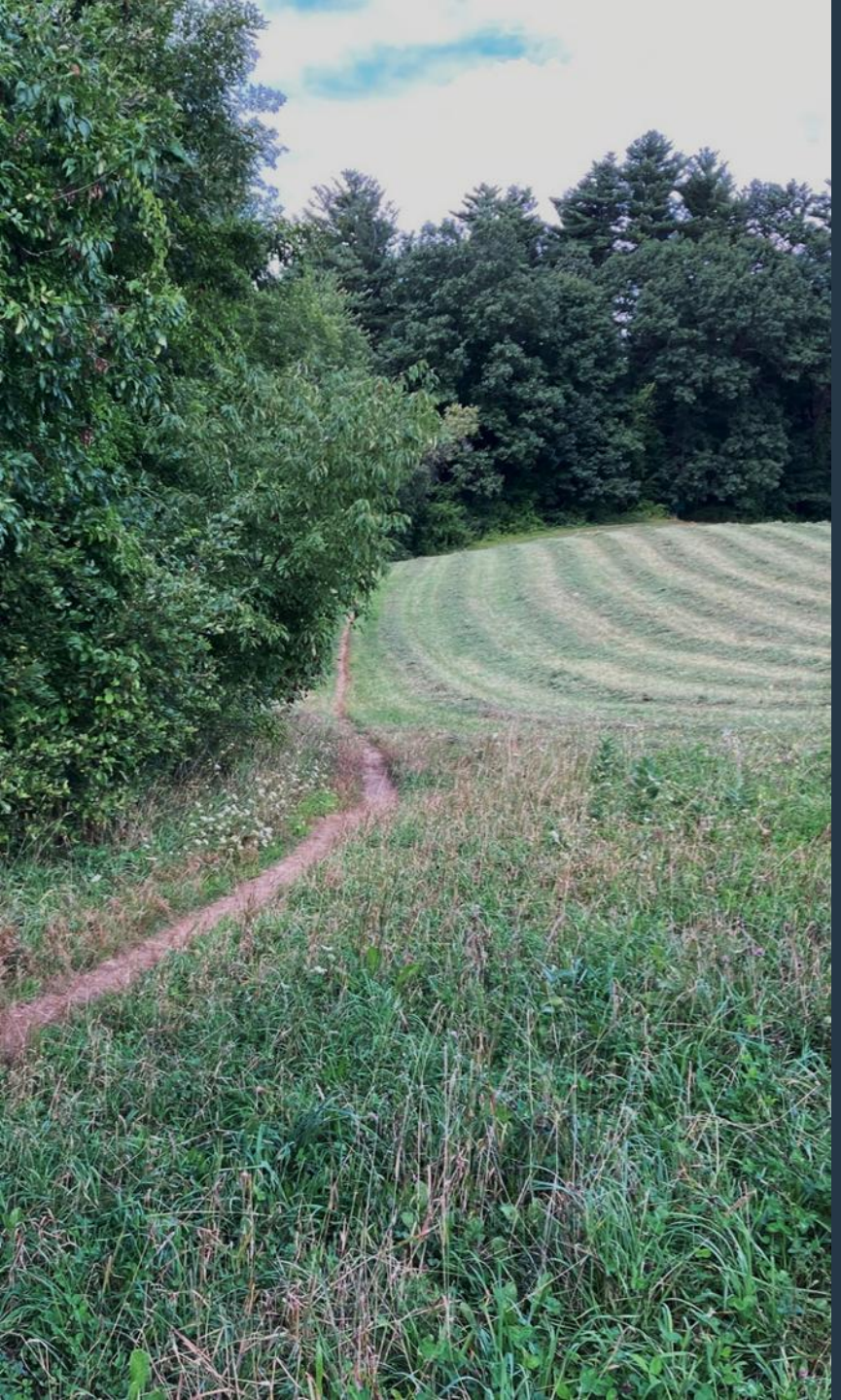
Assessment

- Each natural community
  - Description
  - Typical associated species
  - Species observed/eBird, iNaturalist
  - S rank
  - Species of Greatest Conservation Need



Assessment

- Each natural community
  - Description
  - Typical associated species
  - Species observed/eBird, iNaturalist
  - S rank
  - Species of Greatest Conservation Need
- Issues that may impact stewardship
  - Habitat fragmentation
  - Climate change
  - Trail that impinges on a Priority Habitat
  - Other



Ecological Stewardship Recommendations

- Stewardship goals & objectives
- Rules & regulations
- Safety concerns
- Threats & opportunities
  - Climate change
  - Deer browse
- Past management

Steps to Increase Resilience

- Reduce non-climate stressors
  - Control invasive plants
  - Reduce deer population
- Restore form & function
  - Remove a dam to promote fish spawning
- Increase complexity
  - Increase diversity & micro-climates
- Create linkages
  - Connect to nearby lands & create corridors

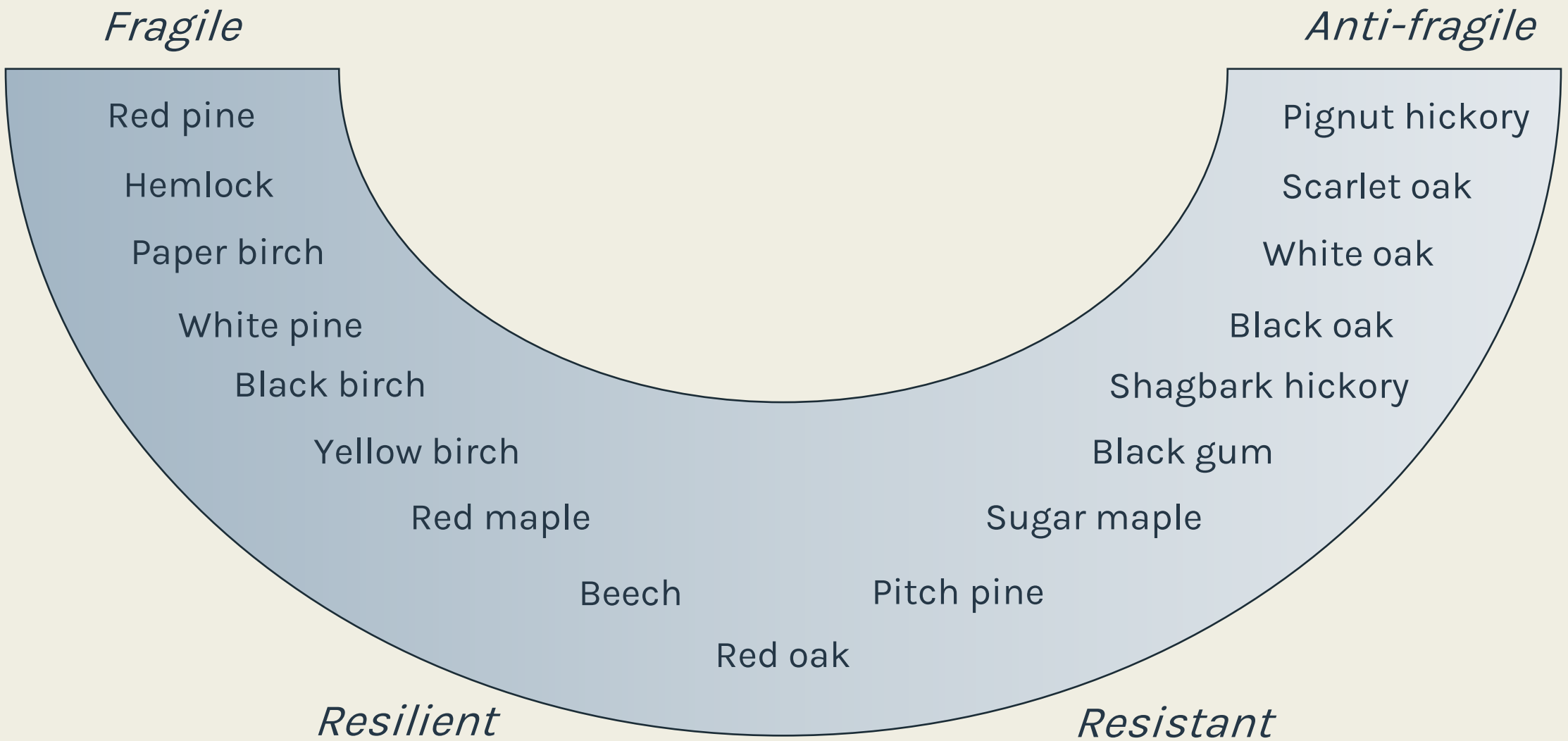
Ecological Stewardship Recommendations

- Stewardship of each natural community
- Management of non-native invasive species
- Wildlife enhancement
- Recreation management
  - Trails

Stewardship of Each Habitat Type

- Grasslands
- Forests
  - Passive management
  - Active management
    - Foresters for the Birds
    - Climate Smart Forestry
- Wetlands
- Un-forested uplands

Climate change vulnerability spectrum



Non-native Invasive Species

- 79 introduced plant species categorized as “invasive” (39), “likely invasive” (37), or “potentially invasive” (3)
- Why are invasive plants a problem?

Non-native Invasive Species

- 72 introduced plant species categorized as “invasive” (39), “likely invasive” (37), or “potentially invasive” (3)
- Why are invasive plants a problem?
  - Can out-compete, displace, & kill native species
  - Use up moisture & nutrients that are then not available for native plants
  - Lack insects or diseases of their place of origin that might keep them in check
  - Generally, do not provide resources for native species

Wildlife Enhancement

- Brush piles
- Snags
- Nest boxes
- Pollinator plantings
- Field management
- Forest management
- Restoration
- Prescribed burn

Stewardship Priorities

- Will vary with each site
- Limited resources
- First priority
- Second priority
- Third priority

Schedule of Stewardship Activities

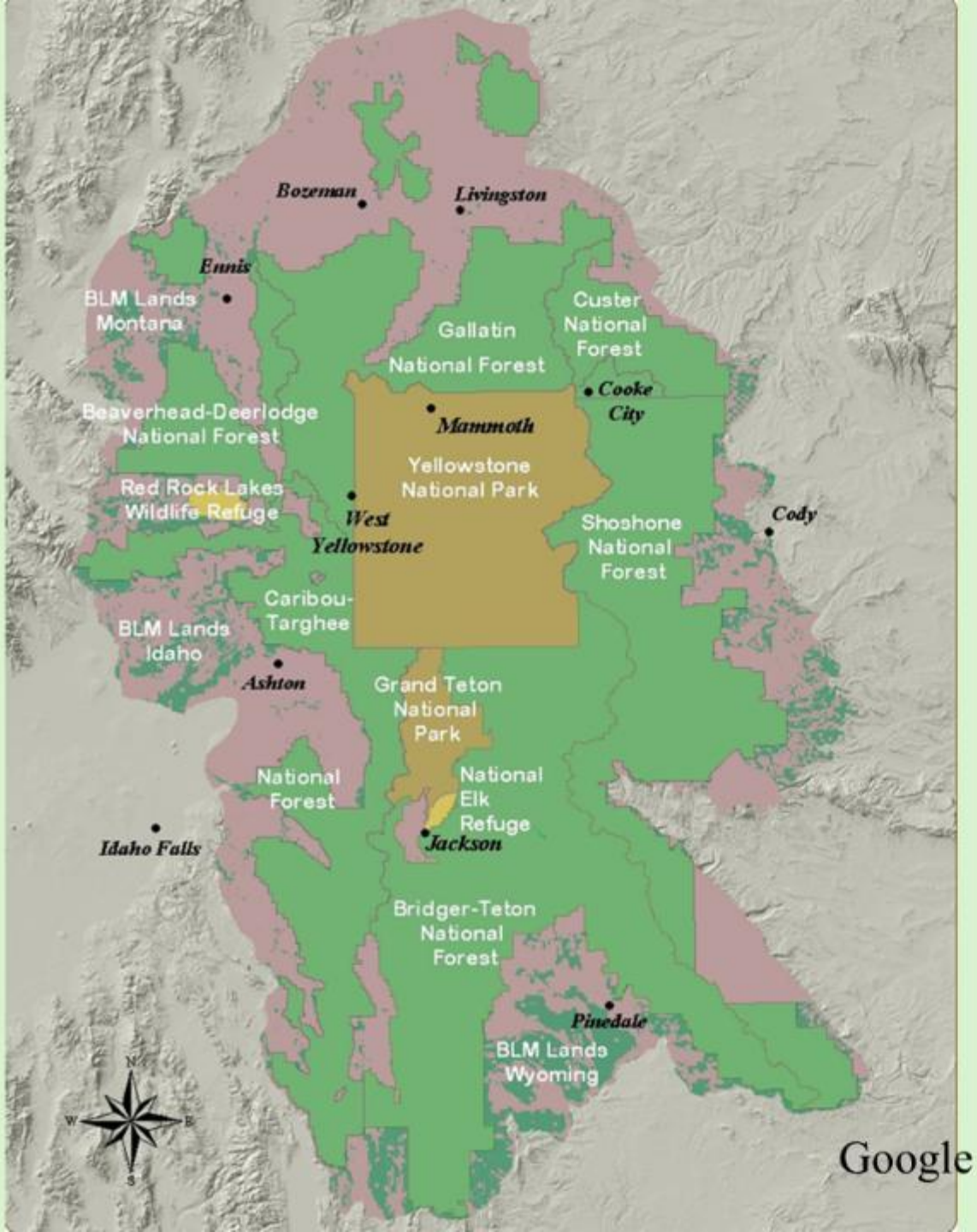
- Will vary with each site
- Yearly on-going actives
- Short-term projects
- Long-term projects
- Use to develop annual budget
- Use to develop fundraising goals
- Funding sources – Mass. Wildlife Habitat Management Grant Program

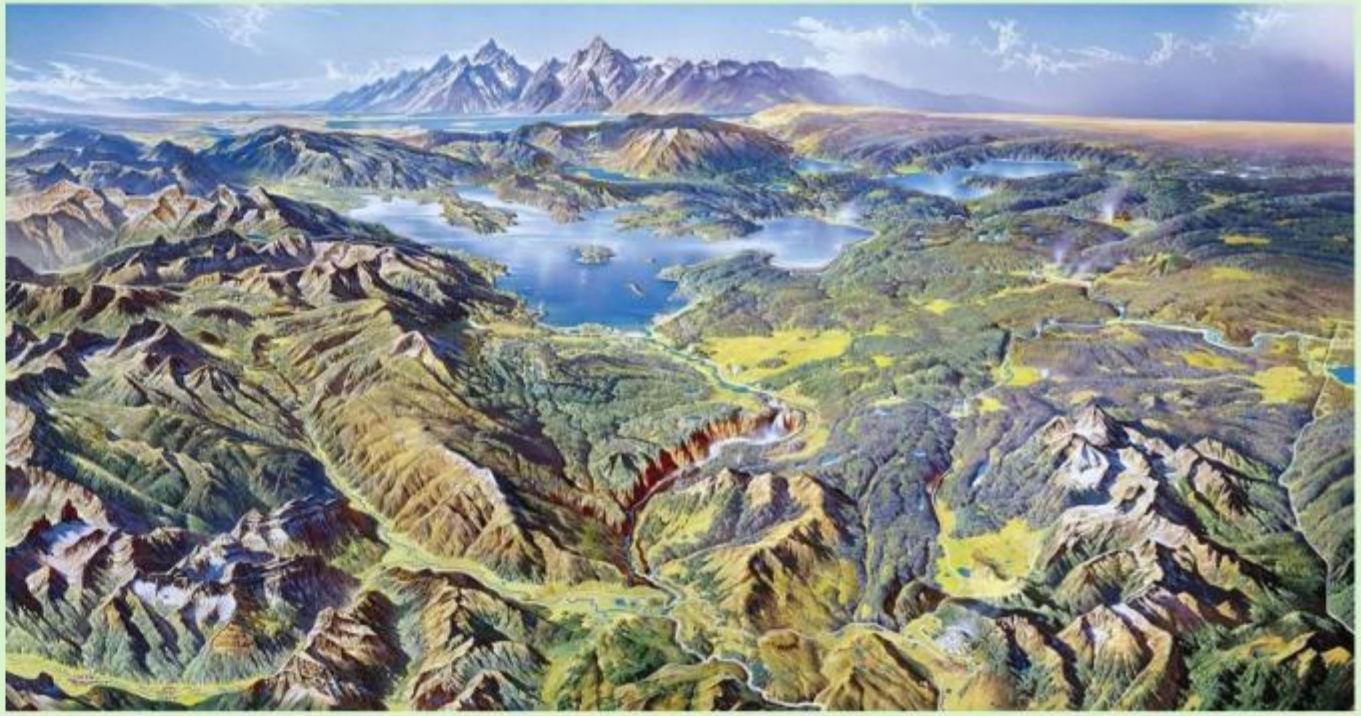
Monitoring & Follow-up

- Stewardship is not a one-and-done proposition
- Have a commitment to make revisions based on results
- On-going

Examples

- Preparing to do stewardship
  - Don’t rush in
- Information gathering – may take a year or two
- Regional implications – corridors & adjacent protected land
- Balance of biodiversity, recreation, agriculture, & scenery
- Plan for continuing maintenance
- Focused observation IS stewardship





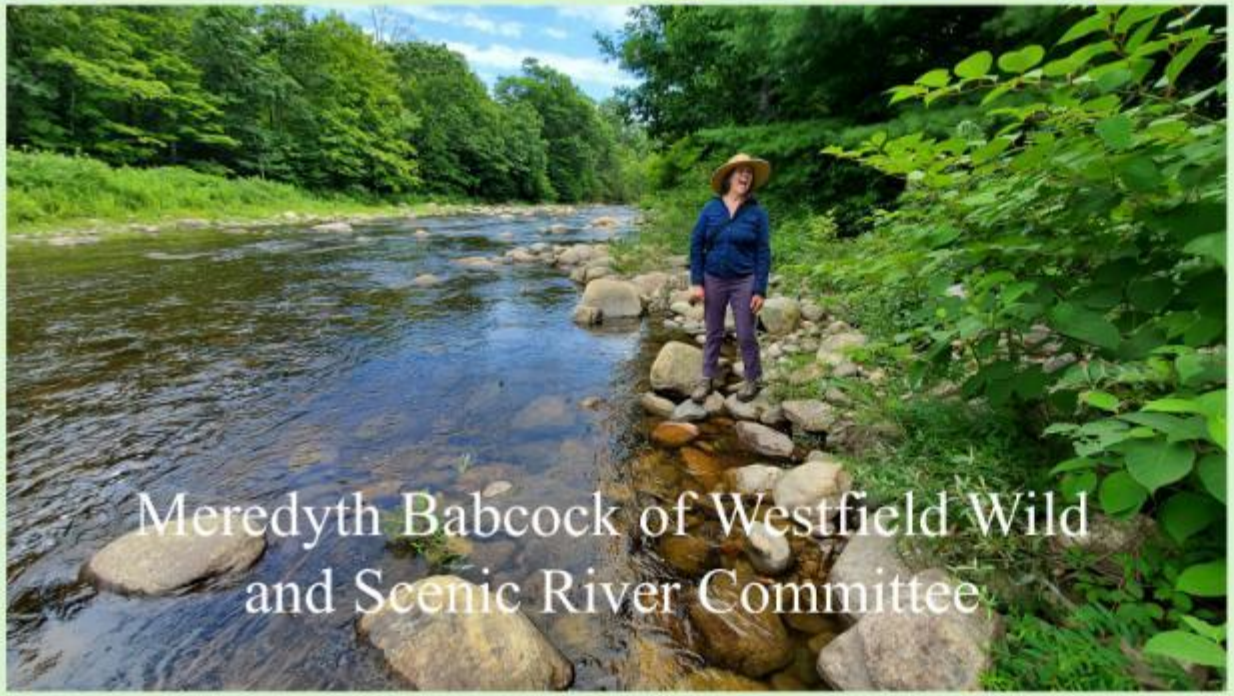
Google Images

Chester Elementary School - 2025

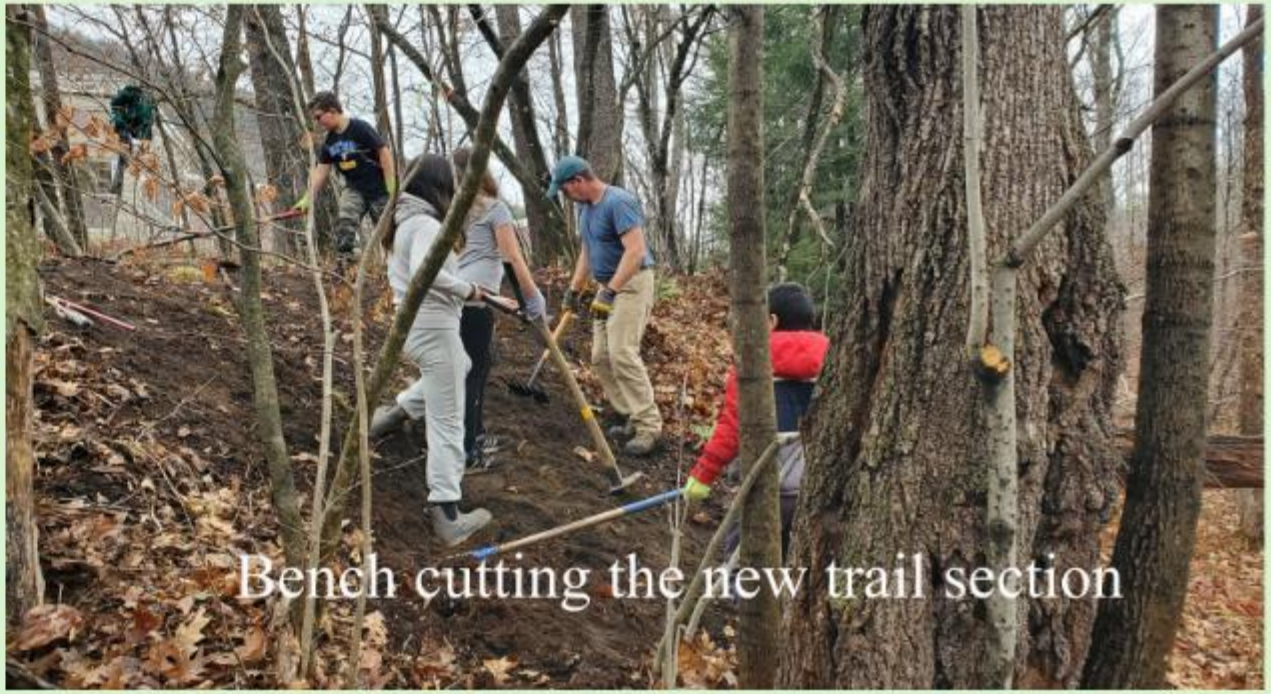
- 5th Grade invasive control & trail rehab
- Meetings w/students, teachers, etc.
- Preparation for workday
- DEP & NHESP permitting
- Result
  - Environmental education
  - Site improvements
  - Plan for on-going invasives control

Japanese barberry near the river

Original fall-line trail section



Meredyth Babcock of Westfield Wild and Scenic River Committee



Bench cutting the new trail section

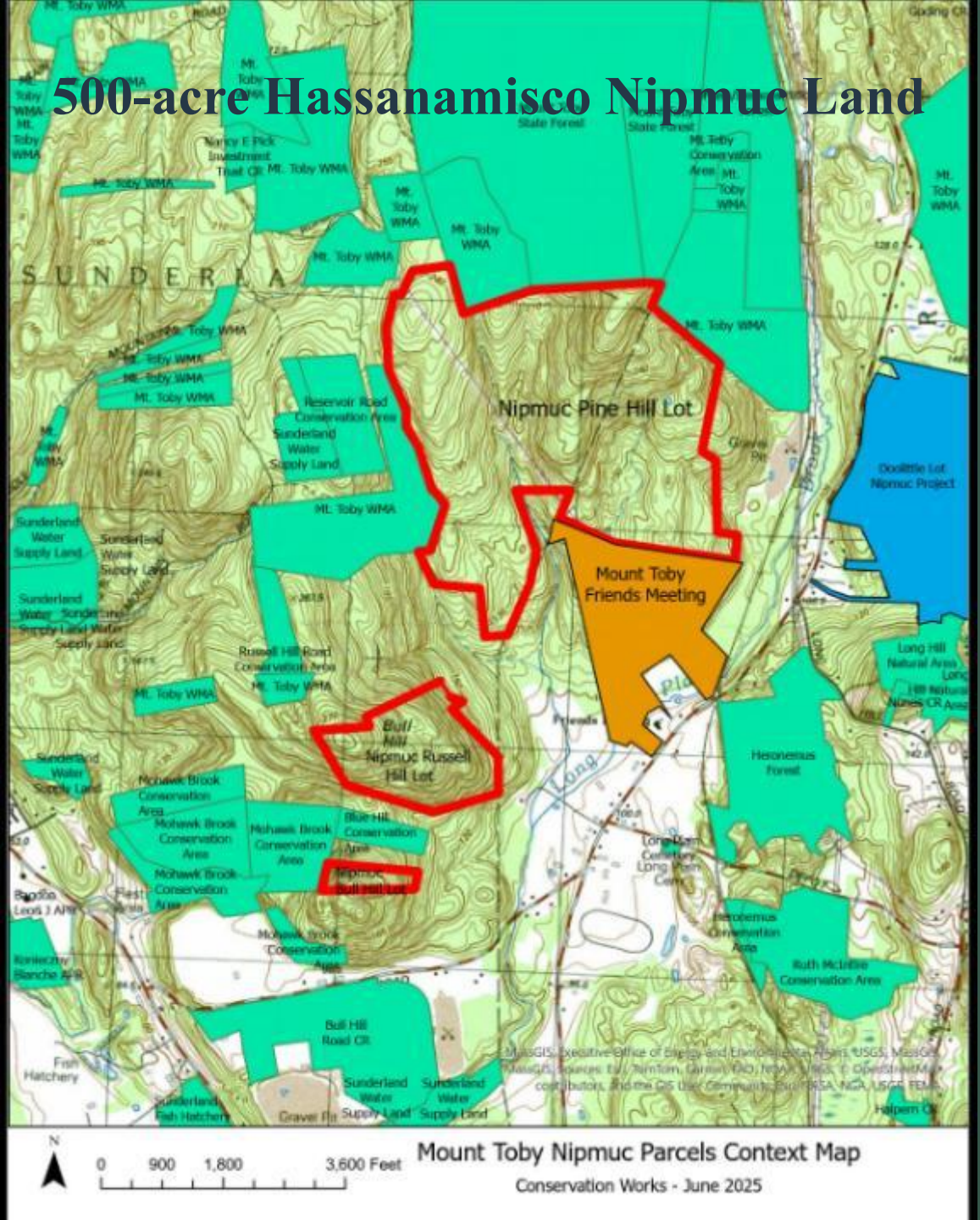
47-mile Robert Frost Trail

- Importance of monitoring & on-going maintenance
- Trail adopters
- Regular reporting & gatherings
- Articulated maintenance goals
- DFW constraints
- DFG land
- Relationship to adjacent 235-mile New England National Scenic Trail (NET)
- Next steps to protect by purchase or easement

Hassanamisco Nipmuc Land – Leverett & Sunderland

- 1,000-acre project
- Cowls Lumber transactions with Nipmuc
- 2025 Ecological assessment
  - Conservation Works
  - Tribal members
  - Outside experts
- Information sources
  - iNaturalist
  - Cowls Forest Management Plan
  - Community historian
  - Mount Toby Friends (adjacent 80-acre parcel

500-acre Hassanamisco Nipmuc Land



Mount Toby Nipmuc Parcels Context Map

Conservation Works - June 2025

488-acres Planned for Rematriation

Open Space from Mass GIS 2025

Doolittle Locus Map

Conservation Works - June 2025

N W E

Hassanamisco Nipmuc Land – Leverett & Sunderland

- Information Gathering
- Remote wildlife cameras
- Drone
- Stream sampling
- Permanent bird census plots
- Invasives
- Other features
- Public use
- How this will lead to future tribal management

DOOLITTLE PARCEL

Recently logged area – 85 acres

Ridgetop heath complex – 20 acres
(classic heath bald)

Nipmuc stewardship crew

2020 Wildfire site – 55 acres


PINE HILL PARCEL

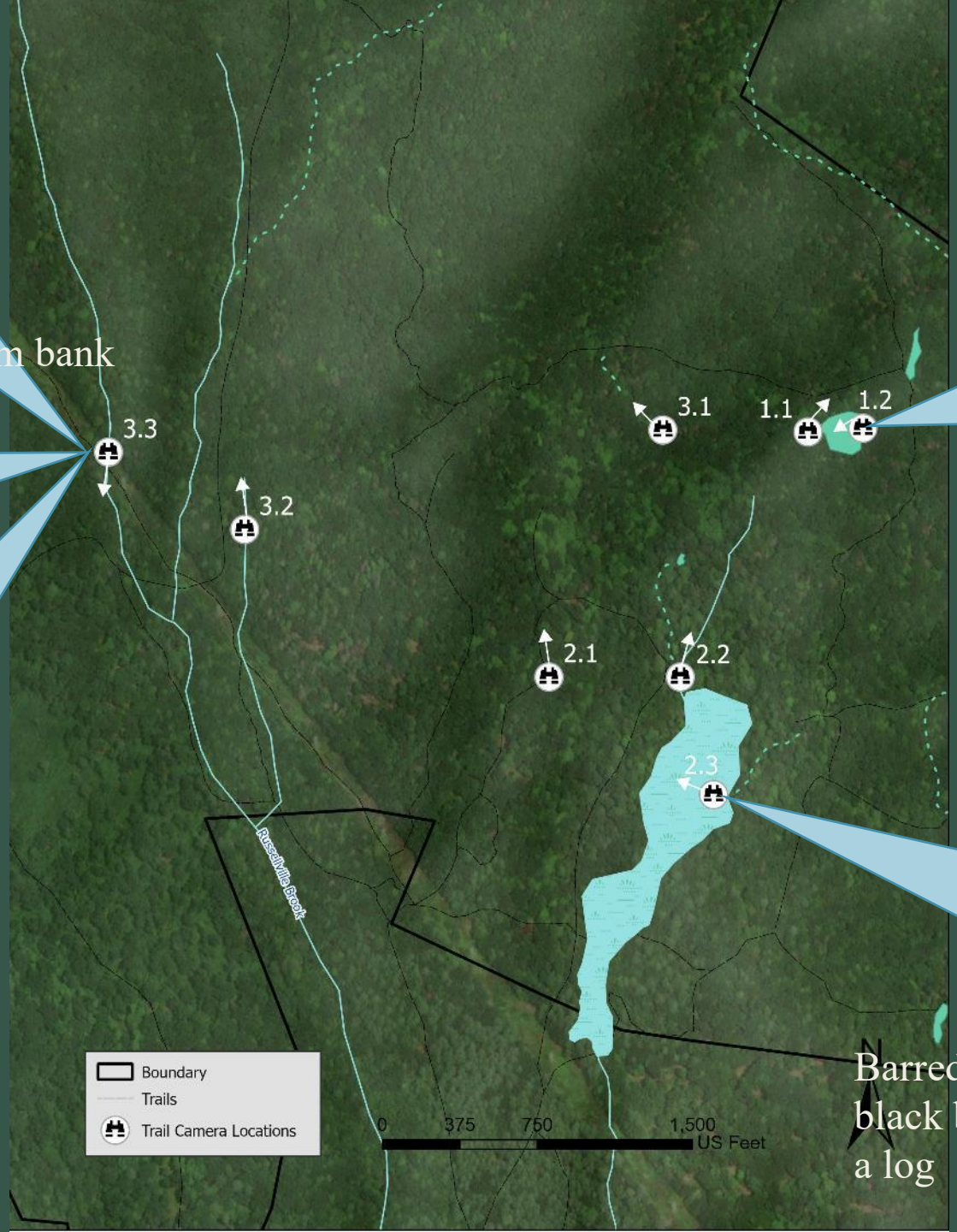

Hassanamisco Nipmuc group
with Conservation Works staff

WILDLIFE CAMERAS

Opossum checking out the stream bank

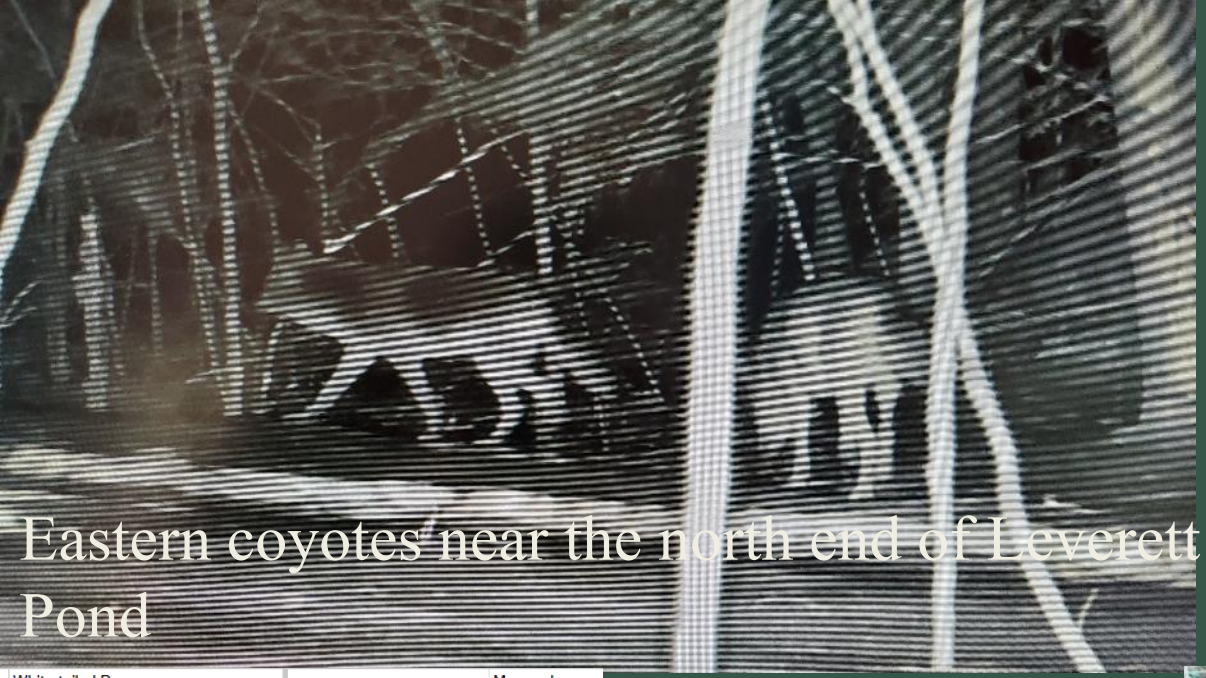
Bobcat crossing stream

Porcupine looking for food



Turkey vulture taking a sun bath

Barred owl and black bear using a log



Eastern coyotes near the north end of Leverett Pond

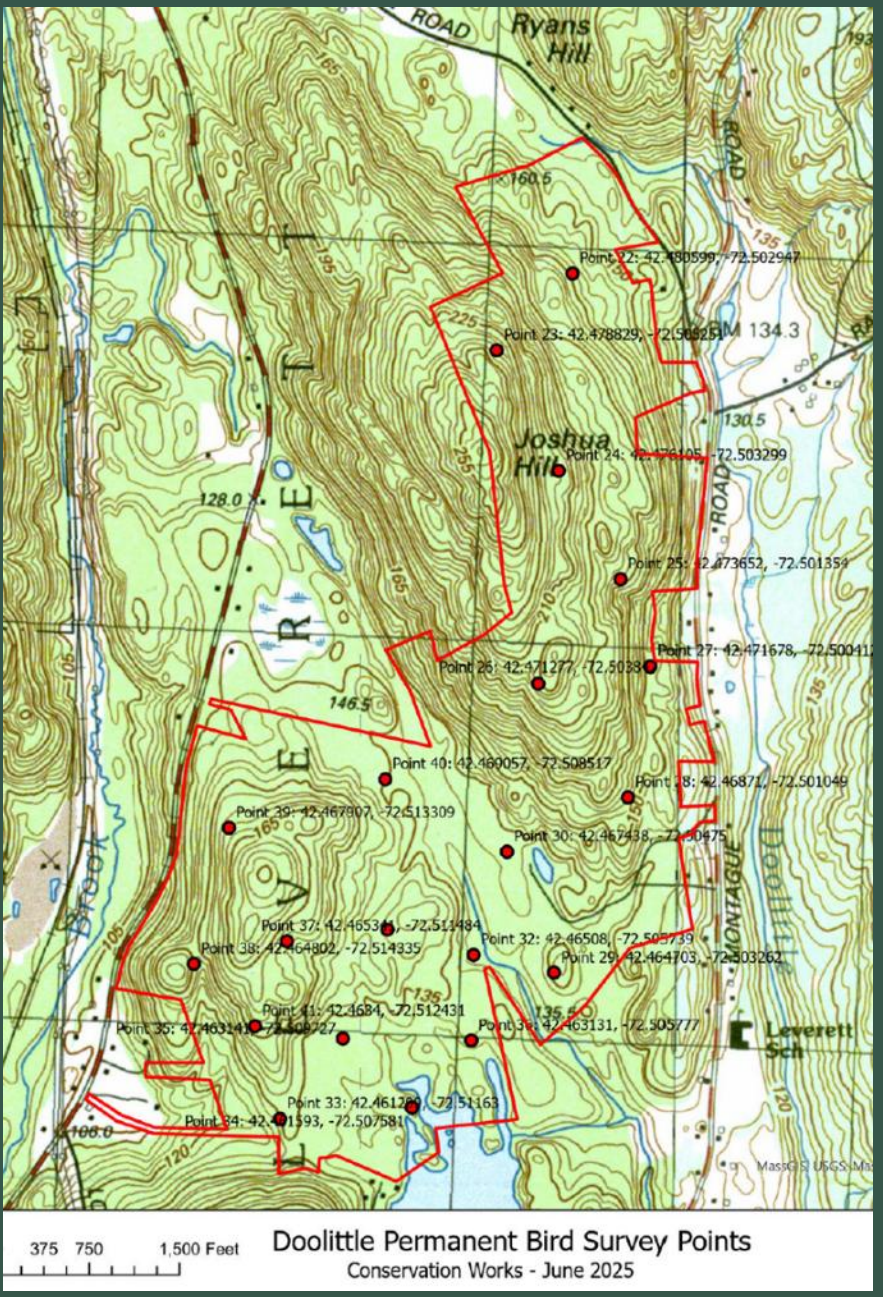
Porcupine droppings on Joshua Hill

White-tailed Deer		Mammal
Eastern Gray Squirrel		Mammal
Eastern Chipmunk		Mammal
Beaver		Mammal
North American Porcupine		Mammal
American Red Squirrel		Mammal
Black Bear		Mammal
Eastern Garter Snake		Reptile
Common Snapping Turtle		Reptile
Eastern Red-backed Salamander		Amphibian
Eastern Newt		Amphibian
Gray Treefrog		Amphibian
Wood Frog		Amphibian
Green Frog		Amphibian
American Toad		Amphibian
Giant Millipede	*Narceus americanus*	Invertebrate
White Slant-line moth	*Tetracis cachexiata*	Invertebrate
Banded Pennant dragonfly	*Celithemis fasciata*	Invertebrate
Virginia Tiger Moth	*Spilosoma virginica*	Invertebrate
Four-barred Gray moth	*Aethalura intertexta*	Invertebrate
Large Empty Oak Apple Wasp	*Amphibolips quercusinanis*	Invertebrate
Underwing moth sp.	*Catocala sp.*	Invertebrate
Mosquito sp.	*Aedes sp.*	Invertebrate
Orchard Orbweaver spider	*Leucauge venusta*	Invertebrate
Morbis Owlet moth	*Chytolita morbidalis*	Invertebrate
Hemlock Woolly Adelgid	*Adelges tsugae*	Invertebrate
Beech Leaf Disease	*Litylenchus crenatae*	Invertebrate
Fern leafroller moth	*Herpetogramma sp.*	Invertebrate
Dog tick	*Dermacentor variabilis*	Invertebrate
Deer tick	*Ixodes scapularis*	Invertebrate
Witch-hazel Cone Gall Aphid	*Hormaphis hamamelidis*	Invertebrate

Doolittle Wildlife

American toad

One of several black bears recently recorded in the brush near the summit of Joshua Hill



Bird Census Sites

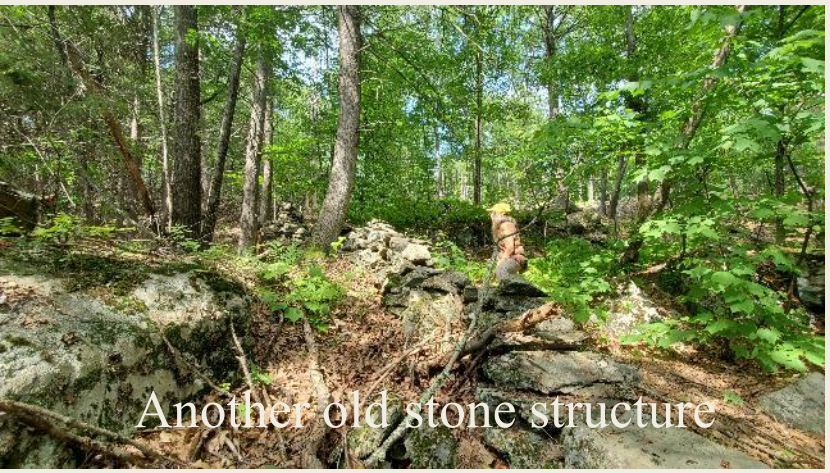
- Flagged & located by GPS for future monitoring
- Birds recorded at each plot for 10 minutes at least 2 times during the June 2025 season

STONE FEATURES


Stone row or wall near the center of the tract


Stone row ending at the main stream


Site on Joshua Hill


Another old stone structure


Part of the serpentine wall on the south ridge of Joshua Hill


George McClure at one of the stone rows


Near the south Montague trailhead


Stone row near the top of Joshua Hill

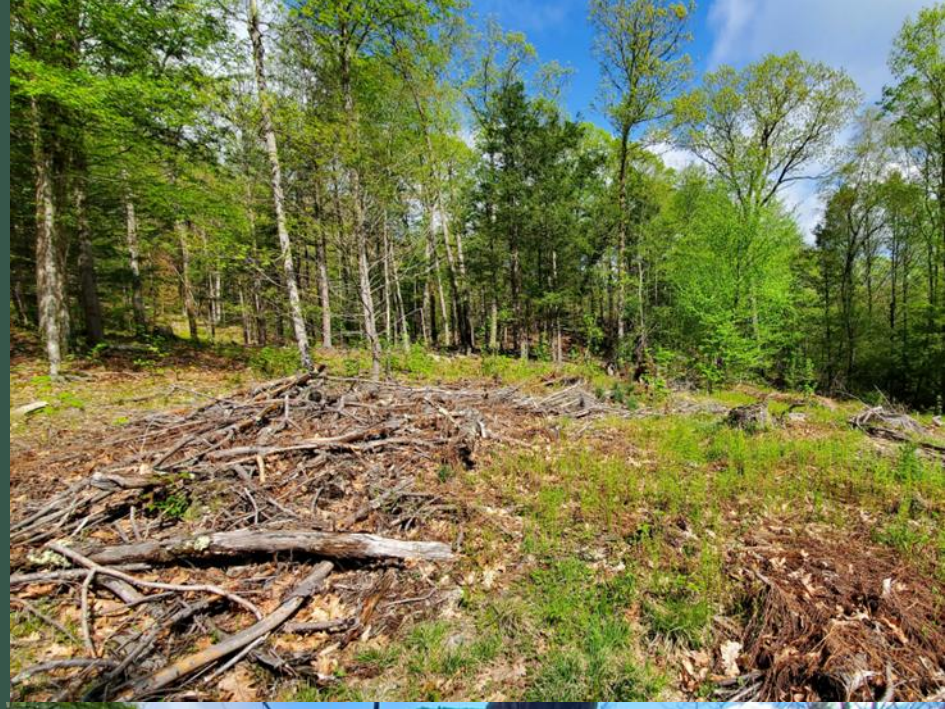

Another part of the serpentine

Other Data Collection

- Vernal pools & small ponds
- Leverett Pond shoreline & adjacent wetlands
- Stream network
- Trails & woods roads
- Deer herd
- Flora/pollinators
- Invasives
- Climate change projections
- Possible small housing sites
- Boundary monuments

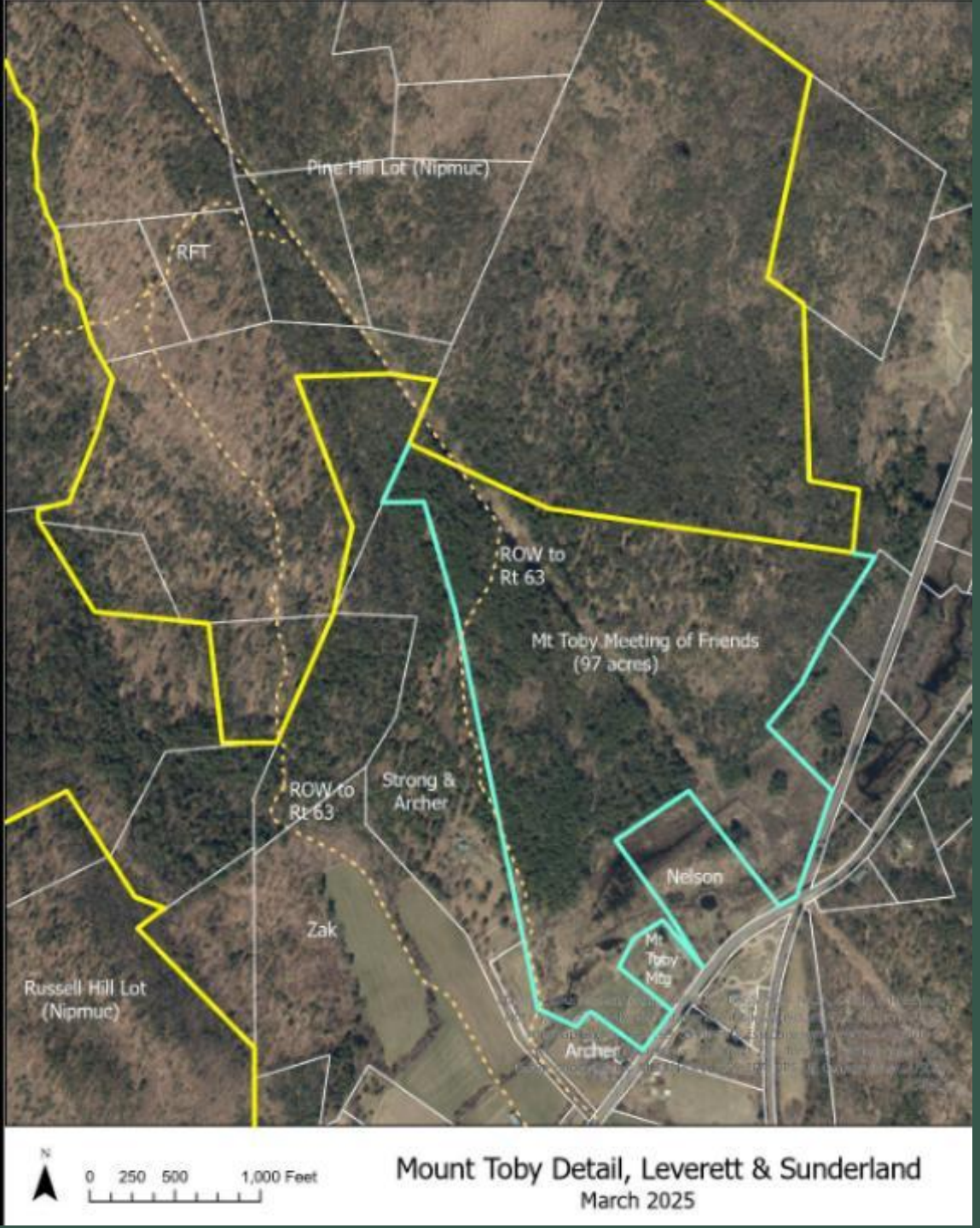
Doolittle Stewardship Possibilities

- Prescribed burn
- Control of non-native invasive plants
- Restoring desirable plant growth
- Restoration forestry
- Establishment of dock & boat launch
- Climate change adaptations

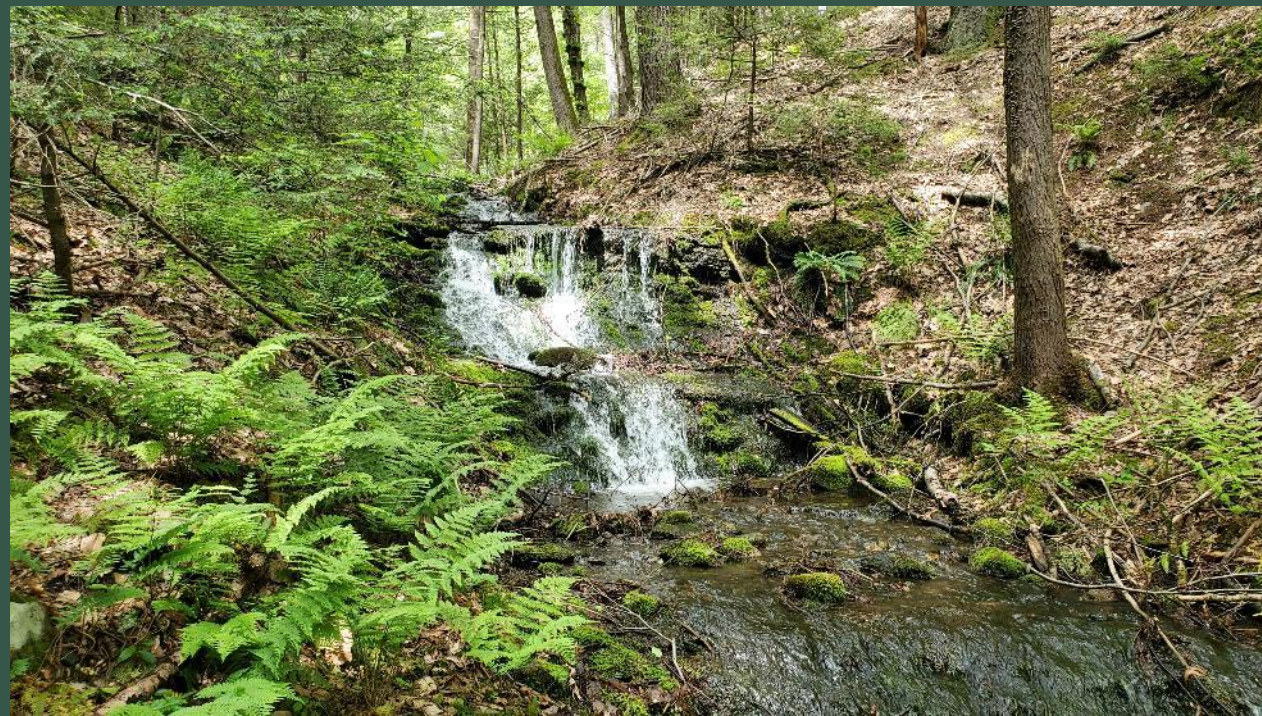


Pine Hill Stewardship Possibilities

- Restoration forestry
  - Prescribed burn
  - Thinning/selective logging
  - Soil restoration
  - Reforestation/planting trees
  - Control of non-native invasive plants
- Access
  - Parking
  - Trail improvements


Pine Hill Lot (Nipmuc)
RFT
ROW to Rt 63
Mt Toby Meeting of Friends (97 acres)
ROW to Rt 63
Strong & Archer
Nelson
Mt Toby Mtg
Zak
Russell Hill Lot (Nipmuc)
Archer
N
0 250 500 1,000 Feet
Mount Toby Detail, Leverett & Sunderland
March 2025


The abutting Friends Meeting property



Ecological Assessment Band

- Jasmine Goodspeed, Hassanamisco Nipmuc
- Goerge McClure, Hassanamisco Nipmuc
- Nick Smaldone, Stewardship Crew Leader
- Matti Weisberg, Stewardship Crew
- Carl Martin, Stewardship Crew
- Corina Ramos, Stewardship Crew
- Eva Gibavic, Leverett Historian
- Dr. Robert Gegear, Umass Dartmouth
- Russ Cohen, wild edibles
- Jess Aplin, Hilltown Land Trust, tracker
- Jill Craig, Conservation Works
- Ben Silverstone, Conservation Works
- Zac Peterson, Conservation Works
- Pete Westover, Conservation Works

Questions & Discussion

Thank you!