

A stylized, monochromatic illustration of a plant branch with several large, pointed leaves. The leaves are rendered with fine, parallel lines to indicate texture and shading. The illustration is set against a dark gray background.

Squam Rock Land Trust: Mass Audubon Restoration and Management Plan

December 6, 2023

Why have an ecological plan?

Nature Needs Us

The World Wildlife Fund estimates that mammals, birds, fish, amphibians and reptiles have collapsed by 68% between 1970 and 2016. We are among many in a monumental, urgent movement to restore and sustain the ecological health of our local and global species and ecosystems.

Benefits of a responsibly managed space:

- Biodiversity and species vitality - habitat and sustenance for pollinators and other wildlife
- Safe, enjoyable shareholder access to a ecologically healthy property
- Resilient land in the face of sea level rise and more frequent and intense storms
- Mitigation of property misuse, overuse and poor design or function

Our Purpose Compels Us

The original purpose of the SRLT was to preserve the land for the recreational activities of Annisquam Residents. The Trustees believe that the extraordinary benefits this property provides to this community as a natural space creates a responsibility and opportunity - to manage the land in an ecologically sound manner to ensure its function and desirability for generations to come.



Why Implement a Plan Now?

The State of the SRLT

Like many private and public open spaces, much of SRLT has been infested with invasive species of plants. Our trail system requires renovation, and several of our habitats have been undermined. The longer we wait to remediate these problems, the more difficult that will become. An ongoing management plan will protect our property from further degradation.

The Future is Here

Another important factor to consider is the pressure that climate change places the land.

“Massachusetts is already experiencing the effects of climate change, from hotter summers with more periods of drought, warmer winters with less snow cover but more precipitation, rising sea levels, more frequent severe weather events, and inland flooding in winter and spring.” (Mass Audubon)





We now know that
well-managed land
SUSTAINS us and the
natural world.

It provides:

- The air we breathe, the water we drink
- The food we eat
- Sequestration of carbon
- Climate moderation
- Protection from flooding
- Habitats for a diversity of plants and animal
- Recreation that renews our spirits
- Health benefits from being in nature
- Filtration, decomposition of wastes



The Goals of the Plan

These were crafted from shareholder input, trustee research and the Trust's original *raison d'être*.

Preserve safe
shareholder access and
ample recreation space

Improve the ecological
health and resiliency of the
property for the longterm

Apply conservation best
practice and honor
conservation regulations

Foundational Plan Strategies

There are many implementation recommendations and details in the Audubon plan: all are tied to these foundational strategies.

- Reduce non-climate stressors – e.g. control invasive plants and pests
- Ensure shareholder safety and security are protected
- Sustain sanctuary for pollinators and other wildlife
- Restore form and function – e.g. restore the layers of the maritime forest
- Increase and protect complexity – for example, increase biodiversity and microclimates/natural habitats (We have 7 habitats/natural communities)
- Continuously maintain and prevent damage, rather than allow degradation and face remediation
- Nurture a community with the knowledge and commitment to continually care for the property
- Establish use regulations and policies to ensure restoration investment is protected



Where Are we Starting?

Based on Mass Audubon's assessment of SRLT, they have recommended and prioritized multiple projects. Several will be ongoing as part of longterm management. Not all will be acted upon in the near term.

Three areas have been prioritized for immediate attention. Acting quickly here will help to head off additional damage that would ultimately require more time, energy and resources to remediate.

- **Invasive Plant Control**
- **Trail System Renovation**
- **Mowing Strategy**



Controlling Invasive Species

Audubon's assessment identified significant invasive species problems at SRLT. Mass Audubon calls invasive plants "one of the greatest threats to the nature of Massachusetts." This is why:

Destructive in Multiple Ways

Non-native plants can:

- Out-compete, displace, and kill our native species
- Grow fast and produce a lot of seeds – some can smother an area in a single season
- Spread disease and cause mortality of other species
- Disrupt the beneficial relationships within ecosystems, undermining their function

What Is Particularly Vulnerable

Invasives pose particular threats to:

- Rare plants and species that rely on single or limited native species – e.g. Monarch butterflies that depend on native milkweed
- Our native birds, which have evolved over thousands of years eating the insects that feed on our native plants and their seeds. They do not obtain the same nourishment from non-natives
- Insects that feed on native plants only - the presence of invasive non-natives reduces food for birds that eat insects



Audubon Strategies to Combat Invasives

Early detection and
removal

Prioritization of targeted
management

Flexible management to
accommodate the most
recent, effective techniques
and options

A volunteer force helped the trustees map the invasives in the lower half of the property this fall so we now know what is where and in what quantity. We will prioritize areas to address and start work in the late winter and early spring.

Trail Renovation

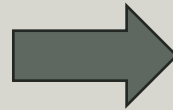
Mass Audubon conducted an extensive trail system assessment for SRLT this year and has prepared a trail strategy and implantation plan. The goal is to create a well-designed, comfortable, and safe trail network that facilitates enjoyment of the area and protects the conservation values of the site.

Assessment Findings

Many of the trails at Squam Rock pasture have problem areas **including erosion, trail widening, and overly steep sections**

Erosion washes away our precious top soil; eroded trails and overly steep trails **undermine trail safety** for shareholders

Some of the existing trails are too close to **regulated wetland areas and their buffer zones**



SRLT Trail Renovation Strategies

Ensure the trail network provides shareholders with a safe means for exploring and enjoying the site

Whenever possible, locate all trails outside of sensitive natural resource areas, such as habitat for sensitive wildlife, steep slopes, or soils that are too wet or prone to erosion

Locate trails to minimize redundancy and enhance the visitor experience

Do not exceed the capacity of the site to accommodate trails

Priority Trail Renovations

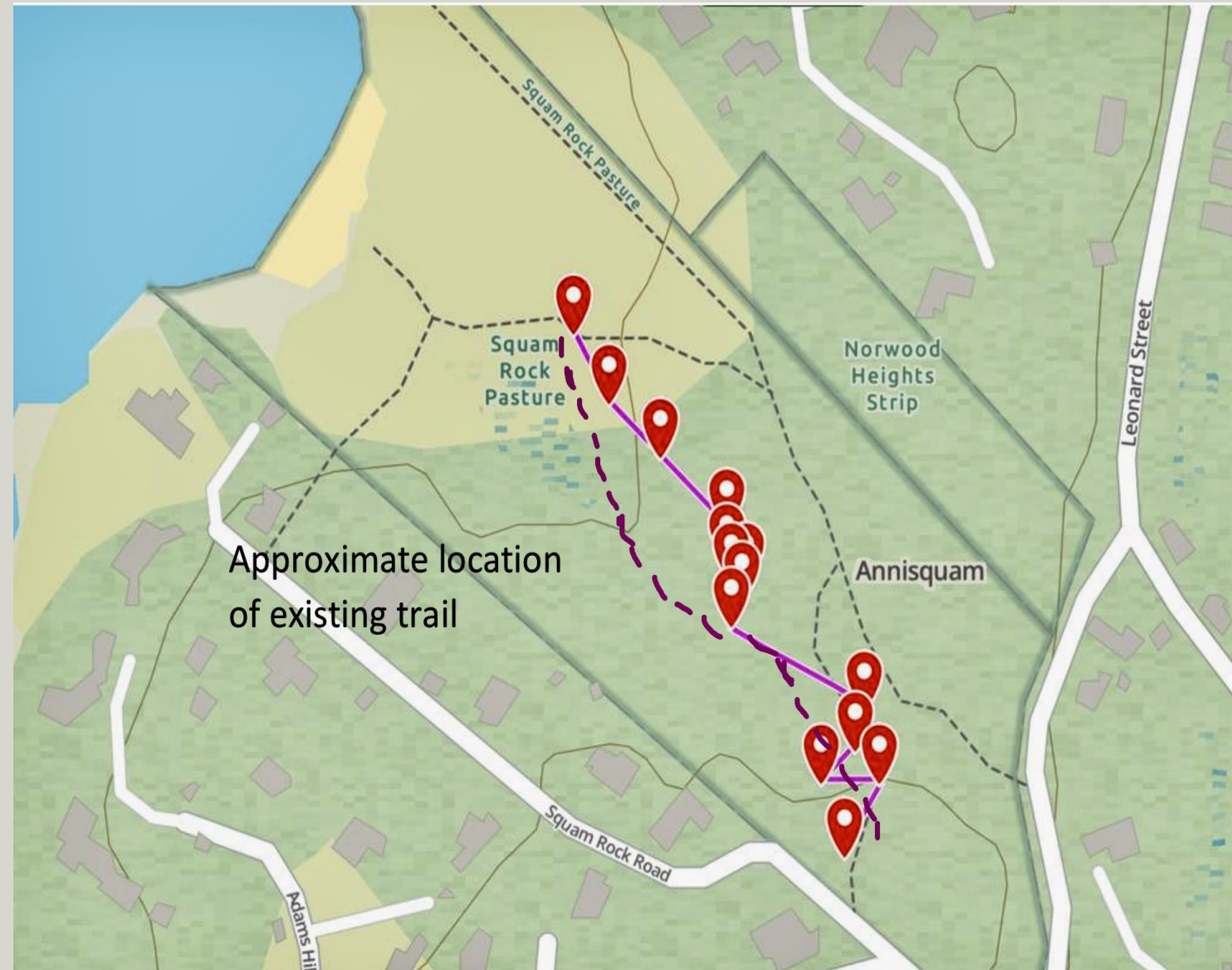
Two trails at Squam Rock Pasture are currently slated for improvements this winter.

All of the proposed work will be done with volunteers using hand tools under the supervision of Mass Audubon.

The Main Trail leads from the entrance on Walnut Street down to the entrance to the beach. Several sections are located on the fall line and have erosion problems. In summer of 2023 one major section in an unregulated area was successfully relocated to avoid steep sections by mowing a new route and blocking off the old trail.

Squam Rock Trail along NE side of Wooded Swamp

Much of this trail is very close to the Wooded Swamp and is in the regulated “buffer zone.” It is recommended that the entire length be relocated away from the swale along the Wooded Swamp.



Questions





Appendix

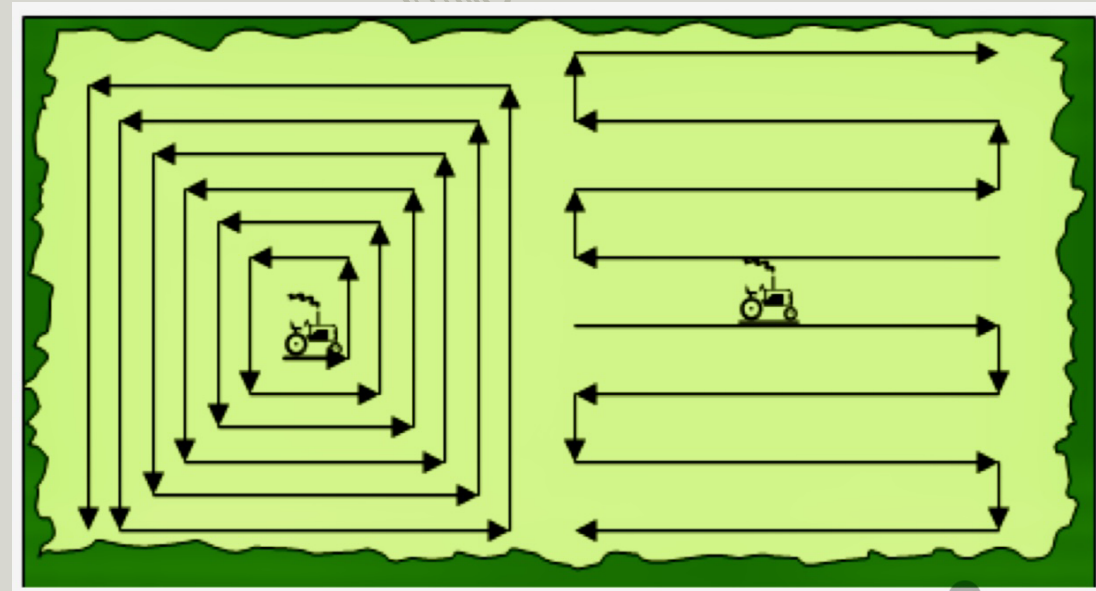
Overview of four natural communities

Cultural Grassland

This open habitat type has become less common in Massachusetts as agricultural land has grown into forest or been developed for housing or commercial use. As a result, remaining grasslands are valuable habitat for a range of plants and animals that are also becoming less common. Squam Rock Pasture's small field (total of 3 acres) provides habitat for both resident and migratory birds.

Audubon's recommendations:

- Manage the area to support plants and invertebrates, both of which provide cover and food for a variety of birds and small mammals
- Rotate areas to be mowed to allow restoration of heavily used areas
- As grazing by animals is not an option for SRLT, use periodic mowing to control invasives
- Remove woody shrubs growing in the field or on the field edge to resist their natural expansion into the field
- How mowing is done influences wildlife. Mowing from the outside toward the center has the potential can trap small mammals, fledgling birds, reptiles, and amphibians in the center. Mowing from the middle and working outward allows wildlife to have a chance to escape (see graphic)



Maritime Shrubland

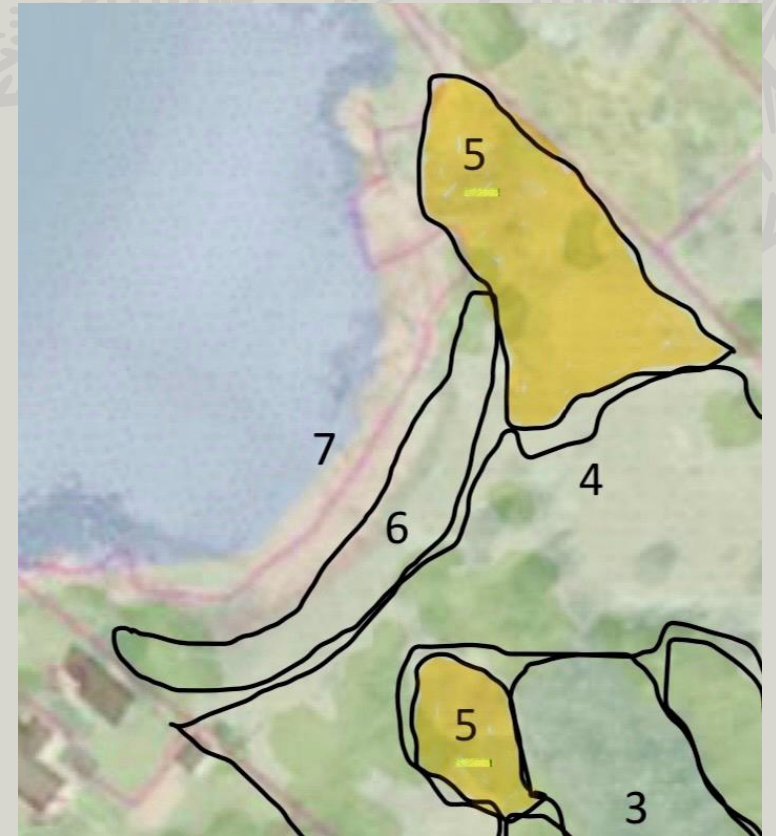
Maritime Shrublands occur along the coast and within the area of direct influence of the ocean and salt spray. Their thickets provide nesting areas for northern harriers, eastern towhees, and song sparrows. Maritime Shrublands are heavily used during fall migrations for cover and forage; their plants have fruit attractive to migrants.

On Audubon's recommendation, mowing was curtailed in 2022 to allow appropriate species to regrow. We are now seeing that regrowth.

In 2023, we planted the native shrubs including Service Berry, Pussy Willow, Black Huckleberry and Chokeberry in our shrubland.

Audubon has also advised that ongoing management should:

- Allow the area to succeed to shrubland with limited mowing
- Allow the growth of appropriate plants that support insects, birds and wildlife
- Control invasives
- Periodically cut trees that grow beyond 1 ½ " in diameter.



SRLT's Maritime Shrubland Areas marked "5"

Maritime Forest and Wooded Swamp

Recommendations

- Pursue ongoing control of several invasive species including Norway maple, honeysuckle, privet, and bittersweet.
 - Plant a dense ground cover red fescue and oak sedge to deter the establishment of invasive woody plants (glossy buckthorn, multiflora rose, etc.)
- Increase species diversity by planting native trees and shrubs
 - Plant low bush blueberry, woodland aster, American cranberry viburnum, sheep laurel, witch-hazel, and hay scented fern for wildlife cover and food
- Increase structural diversity of the forest with a range of different ages and sizes of trees/ shrubs including dead/dying snags
 - Encourage red oak, beech, and hickory in the canopy. Hickory and red oak are good choices for sustainability in the face of climate change.
- Enhance views by selective pruning
- Create Brush piles to enhance wildlife



Coastal Bank

Recommendations



Audubon's assessment indicates that the coastal bank is locked in place by invasives and unable to move as sea level rises. Continued erosion from winter storms is undermining the bank and is likely to lead to its collapse sometime in the future.

They believe the best approach to restoration would be:

- Conduct physical, not herbicidal, removal of the existing invasive plants by using a mini excavator to dig up and remove the plants and their roots. (The invasives are too entrenched for hand removal.)
- Regrade and replant with native species to stabilize the area to allow a more natural build-up as well as enhance its value for wildlife

This restoration of the coastal bank will require permits from the Gloucester Conservation Commission. It would be a large project with funding required for drawings, the preparation of permits, the actual removal of the invasives and the restoration of the area. Contractors would be involved. On-going monitoring is required to ensure that only desirable plants are colonizing.

When the coastal bank restoration is done it would be environmentally beneficial to “daylight” the stream and remove the stone culvert, then plant the edges with native wetland species.

The timing and extent of this project has not yet been determined, but any outside contractor work will be triple bid.