

# Saltmarsh Restoration Priorities for the Saltmarsh Sparrow

## *New Hampshire*

*Last updated 14 April 2022*

### Goal Statement

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This document identifies salt marsh areas that are good candidates for restoration, enhancement, management, or other conservation action to provide persistent high-marsh nesting habitat for Saltmarsh Sparrows in the next 10 years as well as long-term salt marsh resilience. This is a first-step document to help partners begin implementation; in most cases collecting additional data on the ground will be required to assess or confirm site characteristics (e.g., water dynamics), and further develop restoration approaches. Partners many considerations that shape implementation efforts, such as funding, organizational capacity, uncertainty, stakeholder support, and regulatory constraints.

### Saltmarsh Sparrow Objectives from the Atlantic Coast Joint Venture (ACJV)

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The ACJV’s Saltmarsh Sparrow Conservation Plan (Hartley and Weldon, 2020) identifies state-by-state population and habitat goals for the Saltmarsh Sparrow based on a goal population of 25,000 birds. New Hampshire’s breeding Saltmarsh Sparrow population is estimated to be 1.8% of the regional population as of 2011/2012 (Wiest et al. 2019), the highest of any state within the breeding range. Its population goal was therefore calculated as 1.8% of the regional population goal of 25,000 birds. Habitat goals listed in the table below are the minimum acres of high-quality habitat (defined below) needed to support the state’s population goal. The short-term habitat goal sets a realistic target for the next 10 years (by 2030); the long-term habitat goal is set to achieve and sustain the state’s Saltmarsh Sparrow population goal.

	2011/2012 Population Estimate	Confidence Interval	State’s %	Population Goal (Indiv)	Short-term Habitat Goal (ac)	Long-term Habitat Goal (ac)	Current High Marsh (Ac)***
New Hampshire	1,100*	(+/- 1,700)	1.8%	459*	<b>556**</b>	<b>2,316**</b>	3,678***
Regional	60,000			25,000*	23,000	79,605	

\*Saltmarsh Sparrow abundance data for New Hampshire have a higher degree of uncertainty than other areas due to the way that Nelson’s Sparrow, Saltmarsh Sparrow, and hybrid individuals were counted. In this hybrid zone, many “unidentified sharp-tailed sparrow” were observed but not included in Saltmarsh Sparrow abundance estimates. This may have resulted in an imprecise estimate of the state’s population.

\*\*Habitat goals represent acres of “high quality habitat,” defined as having conditions that support a stable or growing population.

\*\*\*Current high marsh acres do *not* represent high quality high marsh; most existing high marsh acreage has been altered and needs restoration to be high quality habitat.

## High-quality Habitat for Saltmarsh Sparrows

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High-quality habitat is defined by conditions that allow sufficient reproductive success to support a stable or growing Saltmarsh Sparrow population. Conservation should focus on conserving, restoring, enhancing, and managing for high-quality breeding habitat, which will have the following characteristics:

- High marsh patches with the lowest flooding frequency, which provide a window of at least 24 days with limited flooding.
- Extensive and dense *Spartina patens* vegetation with a deep, well-developed thatch layer at times complemented by intermediate *S. alterniflora*
- High quality high marsh habitat is most often found in the least modified marshes, such as those without ditching, or that are downstream, or free of tidal restrictions like road crossings.

## Marsh Identification and Prioritization Process

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Marsh parcels were identified and characterized by initially examining the highest-ranked marsh patches identified by the ACJV Saltmarsh Sparrow Habitat Prioritization Tool (top 10%; ACJV 2020) along with spatial data developed by the state of New Hampshire (Stevens, unpublished data). A small working group of Saltmarsh Sparrow experts specific to New Hampshire the developed a custom model incorporating known information about habitat relationships between Saltmarsh Sparrows and New Hampshire saltmarshes. The marsh patches presented here collectively sum in area to the ACJV's long-term habitat goals for this species in New Hampshire. We include information about each marsh patch from New Hampshire's downscaled version of the NERRs National Product (Stevens et al. 2021). Restoration action suggestions were also developed and vetted by a state-based working group consisting of non-profit, academic, state, and federal partners. The areas considered are generally the largest existing tidal marsh patches in New Hampshire that have potential for conservation actions that will benefit the Saltmarsh Sparrow.

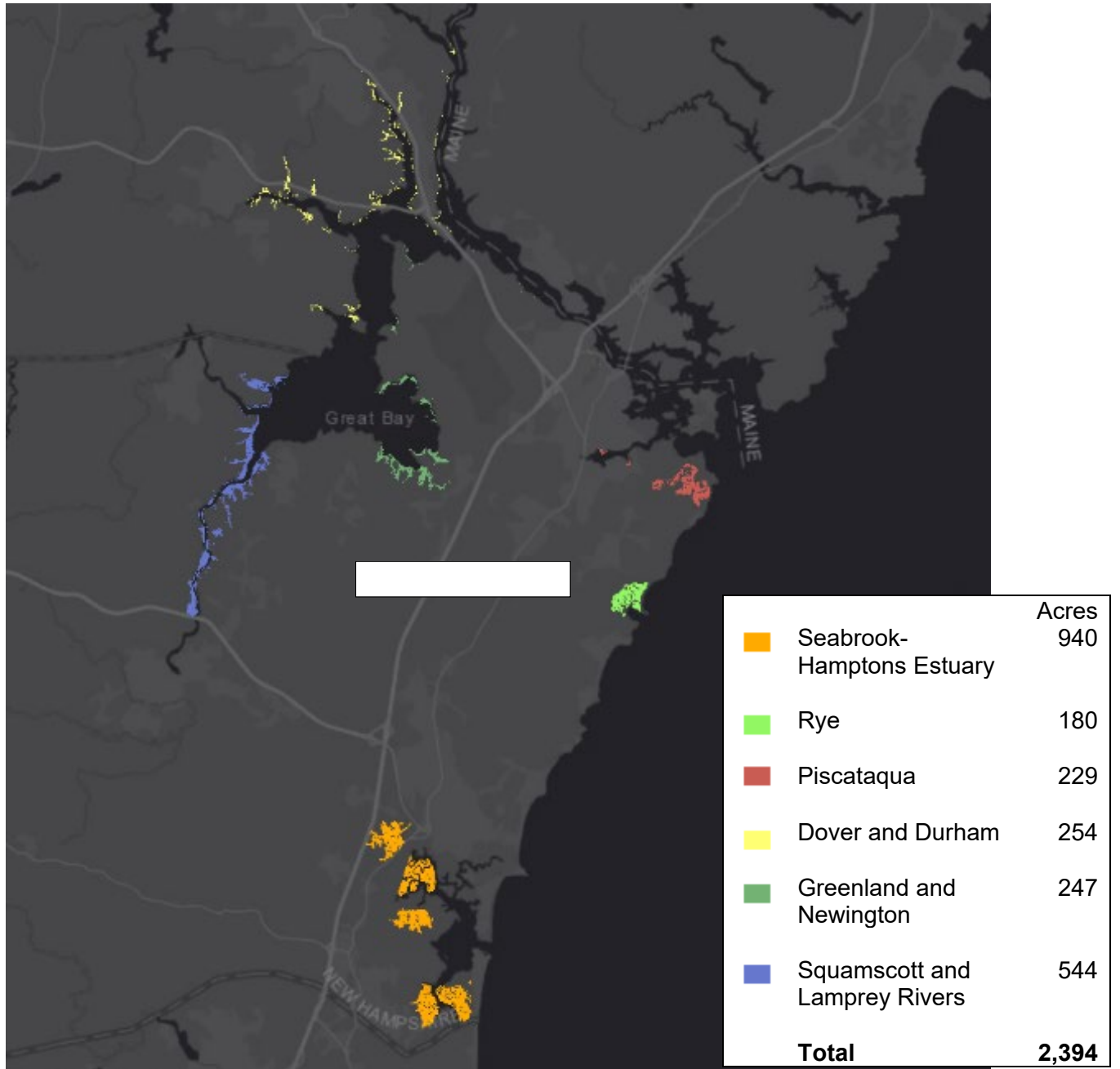
This document will be updated over time to reflect additional expert input, any notable changes in status, and implementation efforts that represent collective progress towards habitat goals.

## Priority Marshes

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The following marshes have been preliminarily prioritized for ongoing restoration planning and action to support the Saltmarsh Sparrow in Maryland.

The marsh parcels below are ordered by geography from south to north. The sites discussed in this document are in the locator map below and described separately on the following pages.



## Seabrook-Hamptons Estuary – 940 acres (380 ha)

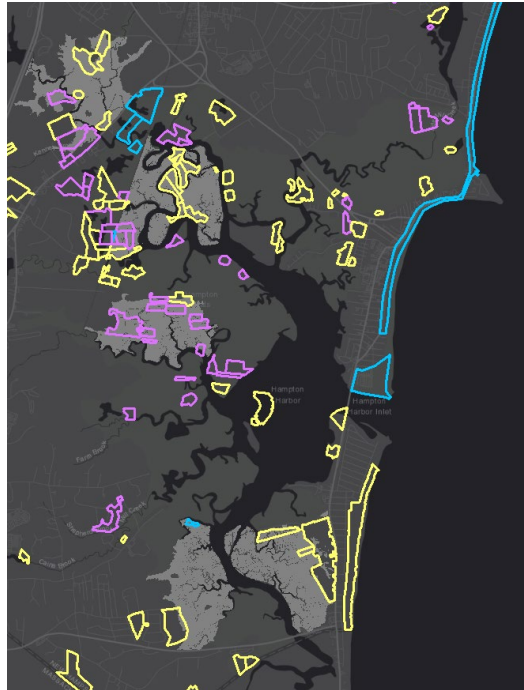
This 940-acre complex is located in Seabrook, Hampton, and Hampton Falls, and is the largest salt marsh complex in the state.

### Area of Interest

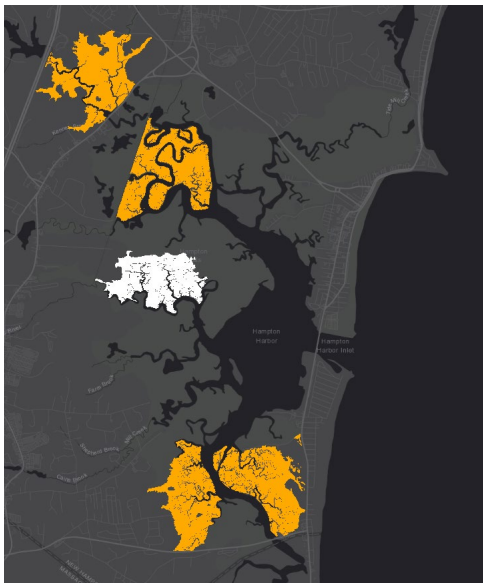


- Municipal
- Federal
- State
- Other Public Land
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- County

### Conservation Lands



### Marsh Resilience



- **NO ACTION** or "light touch" restoration".
- **Improve current condition:** E.g., restore tidal hydrology, drain megapools, invasive species management, removal of berms and fill.
- **Reduce vulnerability:** E.g., ditch remediation, thin layer placement, living shorelines.
- **Facilitate migration:** E.g., barrier removal (seawall, dike etc), make travel corridors more porous, lower topography of adjacent upland, remove shading trees, create new marsh hydrology.
- **Two stage restoration necessary:** Two marsh resiliency categories are deficit so prioritise only when special circumstances exist.
- **Limit investment or trial experimental techniques:** E.g., sediment engine.

**Saltmarsh Sparrow presence**

Compared to other parts of the state, Saltmarsh Sparrows are relatively sparse in this area. Historically the most northeast section of marsh labeled “A” on the aerial photo has supported the highest densities of saltmarsh sparrow in the state. There has also been a consistent population off Drakeside Road in Hampton. More sparrow surveys are necessary to get a better understanding of species presence, population dynamics, and reproductive success in this focus area.

**Marsh resilience**

The majority of marshes in this area are in relatively good current condition but are vulnerable to sea level rise and present-day flooding.

**Short-term restoration recommendations**

- Assess the creation of micro topography to provide nesting opportunities above the marsh plateau.
- Pilot island creation projects to mitigate this area being a potential population sink due to flooding.
- Perennial Pepperweed (*Lepidium latifolium*) and *Phragmites* control.
- Restore hydrology through tidal crossing upgrades.

**Long-term restoration recommendations**

- Ditch remediation to mitigate subsidence and reduce vulnerability of marshes to sea level rise. Focus on upstream areas and expand restoration projects from there.
- There is a very large berm from an abandoned railroad in area “B”. It is currently being considered for conversion to rail trail. This process could involve raising the former rail bed to accommodate sea level rise and/or enhancing permeability by creating, replacing or renovating multiple tidal crossings.
- There are opportunities for *Phragmites* control in the Taylor River area.
- There is potential for research into the influence of marsh plain flooding regime and plant community expression in this area. The presence of a local long-term tide gauge and NOAA high resolution tidal wetland mapping data offer this as a good opportunity.
- Consider removal of the dam upstream of Rt. 95 on the Taylor River. This is the largest potential restoration of tidal flow currently existing in NH.

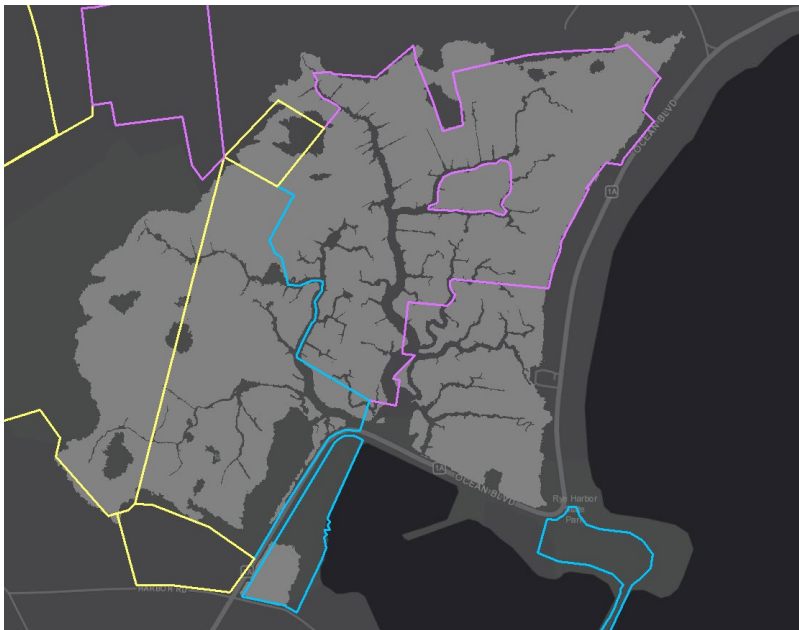
**Rye – 180 acres (73 ha)**

This complex is on the northern portion of New Hampshire's coast, and the smallest area considered in this document.

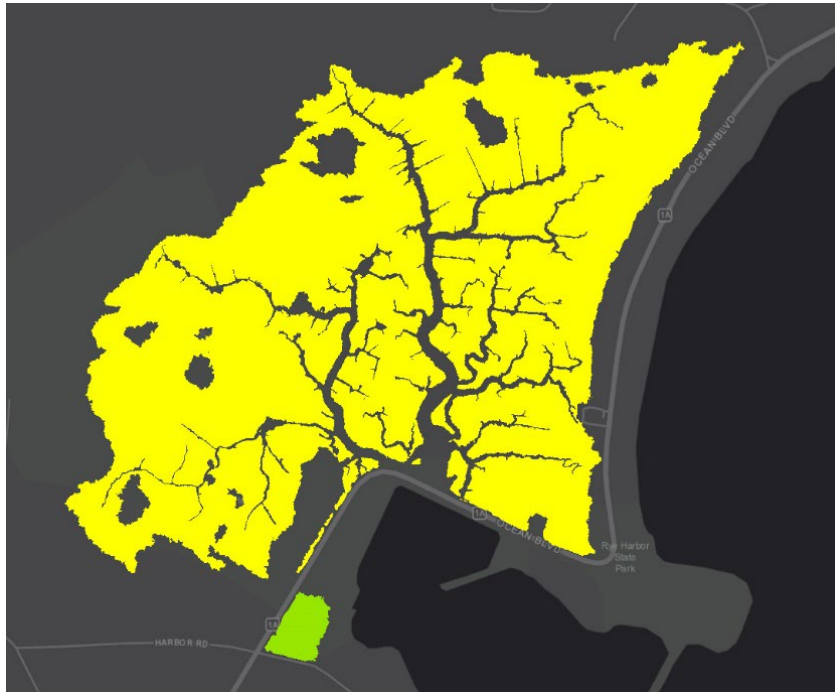
**Area of Interest**



**Conservation Lands**



## Marsh Resilience



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- **Limit investment or trial experimental techniques:** E.g., sediment engine.

### Saltmarsh Sparrow presence

Roadside surveys have revealed few Saltmarsh Sparrows in this area. More sparrow surveys are needed to get a better understanding of species presence, population dynamics, and reproductive success in this focus area.

### Marsh resilience

Due to past restoration activities most of this focus area is highly resilient marsh.

### Short-term

- Repeat NH Coastal Program's three vegetation surveys of this marsh.
- *Phragmites* control.
- Seek opportunities to decrease impervious surfaces surrounding this marsh.
- Pursue fee and easement purchase of private land given the high potential for marsh migration at this site.

### Long-term restoration recommendations

- Survey site for possible collapsing embankments.
- Assess if ditch remediation and runnelling could enhance SALS use of this area.

**Piscataqua – 229 acres (93 acres)**

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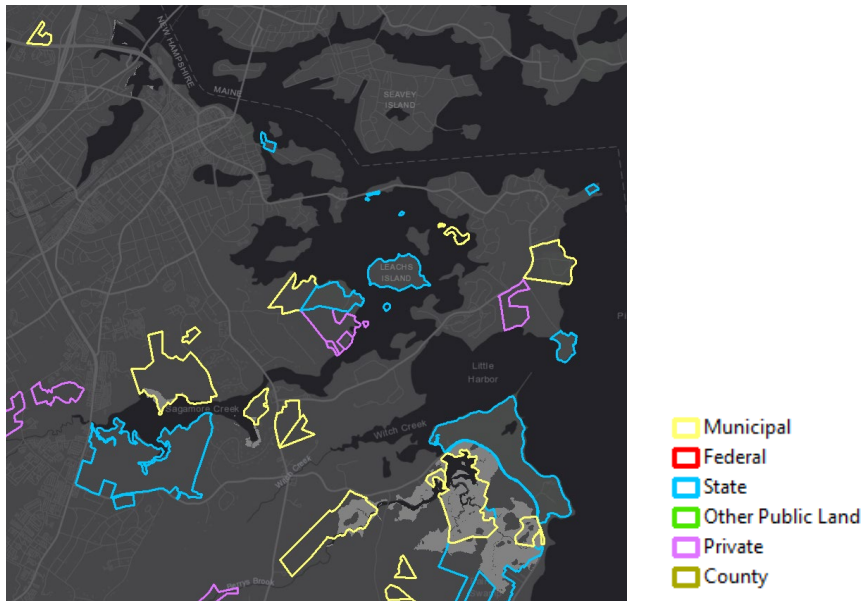
This complex is in Portsmouth, New Castle, and Rye, and is located at the northern edge of New Hampshire's coast.

**Area of Interest**



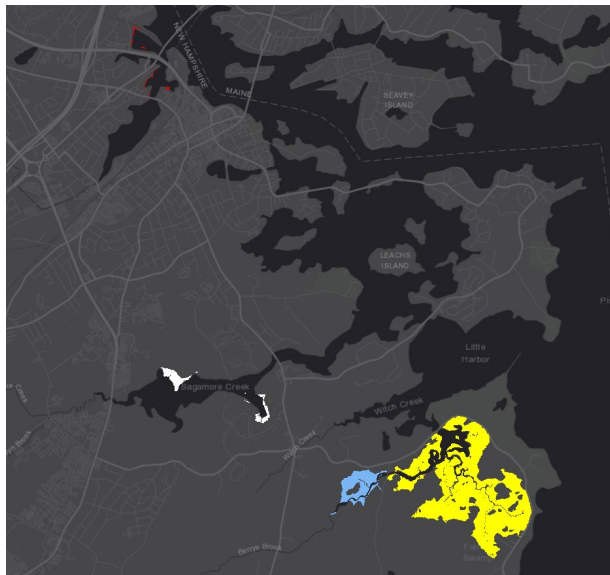


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## Marsh Resilience



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## Saltmarsh Sparrow presence

Fairhill Marsh (shown in yellow, above) historically supported high densities of Saltmarsh Sparrows but recently populations have lessened. Rapid demographic surveys were conducted in this marsh in 2021, however additional sparrow surveys are needed to get a better understanding of species presence, population dynamics and reproductive success in this focus area.

### Marsh resilience

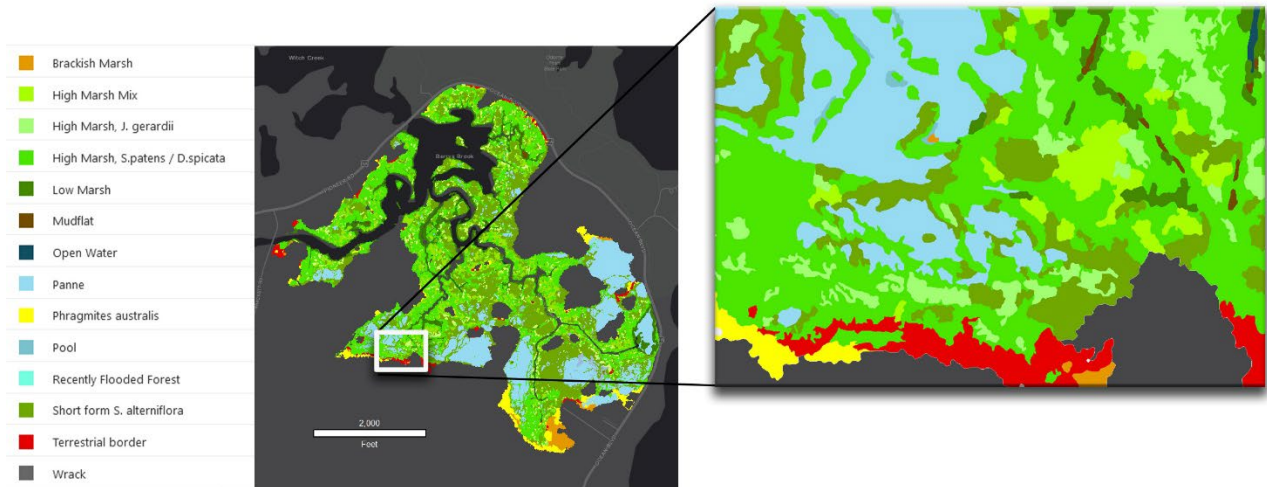
Fairhill Marsh is associated with the largest marsh migration corridor in the state. Most of the remaining marshes in this region show low adaptation potential, primarily due to surrounding built infrastructure.

### Short-term restoration recommendations

- Assess if creating micro topography and islands in Fairhill Marsh will enhance nesting opportunities above the marsh plateau.
- Assess if runnelling large areas of standing water at Fairhill Marsh would be beneficial to sparrow habitat.
- Land conservation in the undeveloped marsh migration corridors.
- Perennial Pepperweed (*Lepidium latifolium*) and *Phragmites* control.

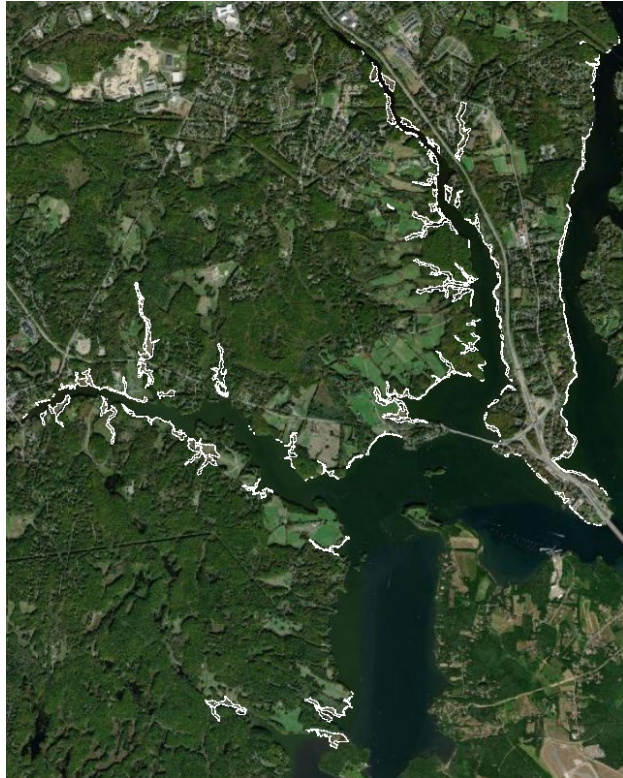
### Long-term restoration recommendations

- Open marsh water management (OMWM) restoration.
- Explore working with DOT on decisions related to road abandonment in this area.

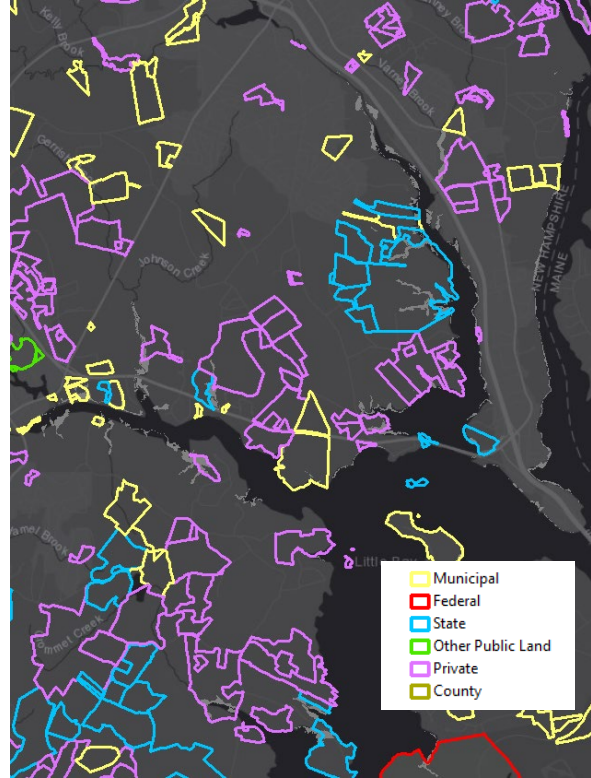


Above: NOAA high resolution tidal wetland map of Fairhill Marsh showing megapools and small stands of *Phragmites* as foci of possible management action. This tidal wetland data, along with marsh resilience metrics such as percent of marsh below mean tide level, was used to create the local saltmarsh sparrow prioritization model for NH. Metrics mirrored several of those used to create the range-wide prioritization.

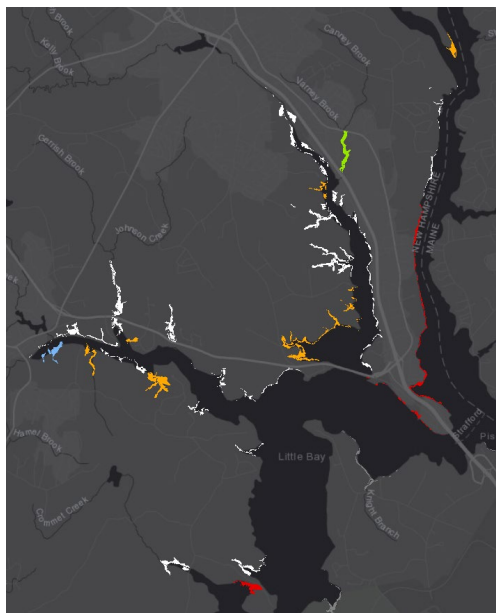
Area of Interest



Conservation Lands



Marsh Resilience



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- Two stage restoration necessary:** Two marsh resiliency categories are deficit so prioritise only when special circumstances exist.
- **Limit investment or trial experimental techniques:** E.g., sediment engine.

**Saltmarsh Sparrow presence**

Saltmarsh sparrows have not been documented in this focus area. Additional sparrow surveys are necessary to get a better understanding of species presence, population dynamics, and reproductive success in this focus area.

**Marsh resilience**

There are a wide range of different marsh resiliency types in this region. The majority would require costly, two-stage, restoration solutions or would last relatively short-term as these fringing marshes are experiencing “coastal squeeze”. There are opportunities to decrease marsh vulnerability to sea level rise in several areas and given the high ecological value of fringing marsh these opportunities should be explored.

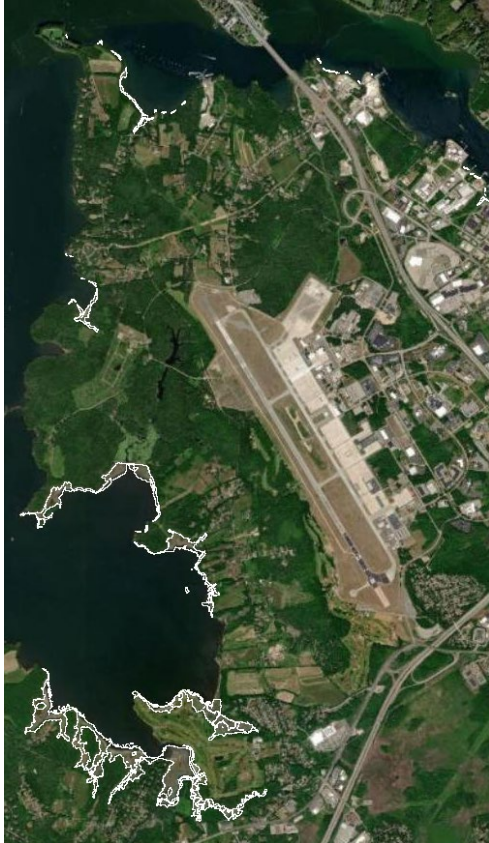
**Long-term restoration recommendations**

- Explore opportunities for ditch remediation.
- Explore opportunities to upgrade tidal crossings in this area.
- Land conservation in the undeveloped marsh migration corridors.

## Greenland and Newington – 247 acres (100 ha)

This is a 247-acre marsh located in Greenland and Newington.

### Area of Interest



### Conservation Lands



- Municipal
- Federal
- State
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- Private
- County

## Marsh Resilience



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- **Reduce vulnerability:** E.g., ditch remediation, thin layer placement, living shorelines.
- **Facilitate migration:** E.g., barrier removal (seawall, dike etc), make travel corridors more porous, lower topography of adjacent upland, remove shading trees, create new marsh hydrology.
- Two stage restoration necessary:** Two marsh resiliency categories are deficient so prioritise only when special circumstances exist.
- **Limit investment or trial experimental techniques:** E.g., sediment engine.

### Saltmarsh Sparrow presence

There are no recent Saltmarsh Sparrow records in Newington; historical records exist for Woodman Point on Great Bay National Wildlife Refuge in July 1997. Greenland marshes support scattered individuals but not in high densities. Additional sparrow surveys are necessary to get a better understanding of species presence, population dynamics, and reproductive success in this focus area.

### Marsh resilience

Most marshes in this area are vulnerable to relative sea-level rise or require a two-stage restoration project design (two resiliency categories are deficient).

### Long-term restoration recommendations

- Ditch remediation.
- Removal of berms and fill.
- Remediate ditch plugs along Pickering, Shaw and Foss Brooks using Parker River NWR protocols.
- Stubbs Pond berm removal.
- OMWM remediation.
- Evaluate restoration opportunities at the mouth of the Winnicut River.

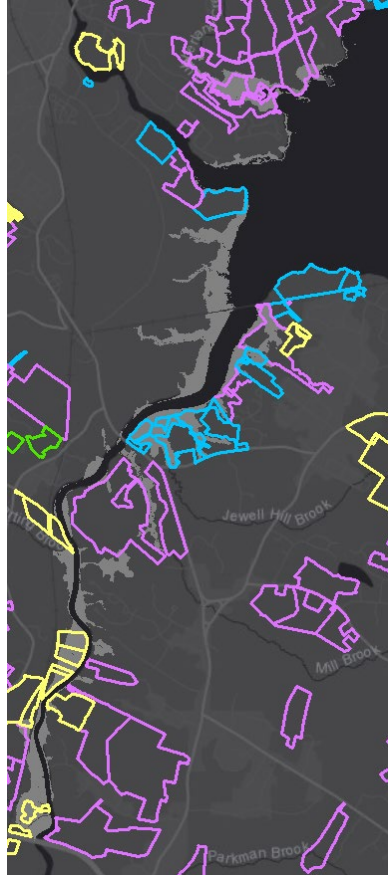
**Squamscott and Lamprey River – 578 acres (234 ha)**

This complex in Exeter, Stratham, and Newmarket is the second-largest salt marsh in the state.

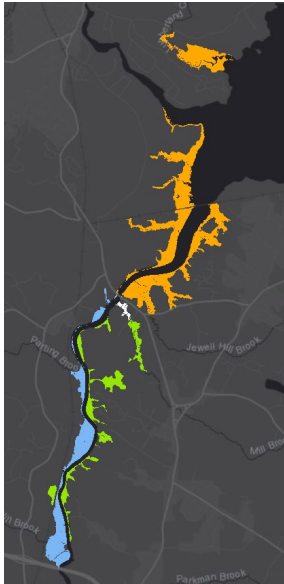
**Area of Interest**



**Conservation Lands**



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- County



- **NO ACTION** or "light touch" restoration.
- **Improve current condition:** E.g., restore tidal hydrology, drain megapools, invasive species management, removal of berms and fill.
- **Reduce vulnerability:** E.g., ditch remediation, thin layer placement, living shorelines.
- **Facilitate migration:** E.g., barrier removal (seawall, dike etc), make travel corridors more porous, lower topography of adjacent upland, remove shading trees, create new marsh hydrology.
- **Two stage restoration necessary:** Two marsh resiliency categories are deficit so prioritise only when special circumstances exist.
- **Limit investment or trial experimental techniques:** E.g., sediment engine.

## Marsh Resilience

### Saltmarsh Sparrow presence

Chapman's Landing and Lubberland Creek are both within this region, which have consistent nesting populations for the species (Field et al. 2018). Additional sparrow surveys are necessary to get a better understanding of species presence, population dynamics, and reproductive success in this focus area.

### Marsh resilience

Marshes in this area provide opportunities to enhance migration and adaptation, to reduce vulnerability to sea level rise and present-day flooding or to improve current condition.

### Short-term restoration recommendations

- Do not alter high marsh plateau or hydrology at either Chapman's Landing or Lubberland Creek. Restoration, other than *Phragmites* control, should be limited or non-existent at these sites. Consider living shoreline projects that protect the waterward edge of these marshes from erosion.
- Restore hydrology with culvert upgrades in this area.
- Land conservation in the undeveloped marsh migration corridors

### Long-term restoration recommendations

- Explore restoration actions on the upland edge to facilitate marsh migration.
- Ditch remediation.
- Removal of berms next to brackish marshes in upstream areas of the Squamscott River.



## **Best practices in marsh management**

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Any management actions should follow best practices to not irreparably harm existing Saltmarsh Sparrow habitat. Necessary precautions include:

- Consulting local land managers and owners before any monitoring or management action is planned.
- Initially limit management impact to a small portion of the high marsh (e.g. <25%).
- Conduct all management action outside the window of active Saltmarsh Sparrow breeding season (avoid May – September annually).

## **Monitoring**

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Ideally any habitat restoration efforts will be monitored both pre-construction and post-construction to measure change and determine whether vegetation goals and elevations as well as bird community metrics have been met.

It is also recommended that the state of New Hampshire collect Saltmarsh Sparrow population and breeding information across marsh areas and also assess their use of different habitat types within delineated tidal marsh. This will enhance knowledge about the presence, density, and reproductive status of this species within the state and will inform our knowledge of habitat use within tidal marshes to further refine restoration goals.

## **Contact Information**

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For more information or to update information contained in the document please contact: Mo Correll, Atlantic Coast Joint Venture: [maureen\\_correll@fws.gov](mailto:maureen_correll@fws.gov)

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## **Acknowledgments**

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providing detection data for Saltmarsh Sparrows which informed our sparrow data sections for each marsh.

## References

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Atlantic Coast Joint Venture. 2020. The Saltmarsh Sparrow Habitat Prioritization Tool. Available at:  
<https://fws.maps.arcgis.com/apps/MapSeries/index.html?appid=1bc5b29be4ac43d8949b2941d2ce5174>

Field, CR, Ruskin, KJ, Benvenuti, B, Borowske, A, Cohen, JB, Garey, L, Hodgman, TP, Kern, R, King, E, Kocek, AR, Kovach, AI, O'Brien, KM, Olsen, BJ, Pau, N, Roberts, SG, Shelly, E, Shriver, WG, Walsh, J, and CS Elphick. 2018. Quantifying the importance of geographic replication and representativeness when estimating demographic rates, using a coastal species as a case study. *Ecography* 41:971-981.

Hartley, MJ and AJ Weldon, eds. 2020. Saltmarsh Sparrow Conservation Plan. Atlantic Coast Joint Venture. Available at: [acjv.org/documents/SALS\\_plan\\_final.pdf](http://acjv.org/documents/SALS_plan_final.pdf)

Stevens, RA, Shull, S, Carter, HJ, Herold, N, and CA Riley. 2021. Marshes in Context: Exploring Marsh Resilience at the Landscape Scale. Final Report on the the NERRS/N OAA Assessment of Tidal Marsh Resilience at the Landscape Scale and Guide for its Use in Marsh Management, Restoration, and Conservation. [www.nerra.org/landscape-scale-marsh-resilience-report](http://www.nerra.org/landscape-scale-marsh-resilience-report)

Wiest, WA, Correll, MD, Marcot, BJ Olsen, BJ, Elphick, CS, Hodgman, TP, Gunterspergen, GR, and WG Shriver. 2019. Estimates of tidal marsh bird densities using Bayesian networks. *Journal of Wildlife Management* 3:109-120.