Saltmarsh Restoration Priorities for the Saltmarsh Sparrow
Connecticut

Last updated 14 April 2022

Goal Statement

The Saltmarsh Sparrow (*Ammospiza caudacuta*) is a Species of Greatest Conservation Need in Connecticut. This document is intended to provide those interested in salt marsh and Saltmarsh Sparrow conservation with information that will help with conservation implementation. It identifies areas containing salt marsh that are good candidates for restoration, enhancement, and/or conservation to provide persistent high-quality Saltmarsh Sparrow nesting habitat in the next 10 years in addition to long-term salt marsh resilience.

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

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; this goal is lower than published population estimates as of 2011/2012 (Wiest et al. 2019) due to the projected impacts of sea-level rise on nesting success of the species (Field et al. 2017). Connecticut's breeding Saltmarsh Sparrow population is estimated to be 2.7% of the global population; its population goal was therefore calculated as 2.7% 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 %	Population Goal (Indiv)	Short-term Habitat Goal (ac)	Long-term Habitat Goal (ac)	Current High Marsh (Ac)
Connecticut	1,600	(+/- 800)	2.7%	668	**742***	**2,180***	3,422**
Regional	60,000			25,000	23,000	79,605	

* Goals reflect acreage of high-quality habitat defined as habitat capable of supporting population growth
**Current high marsh acres are primarily marsh that has been altered and need restoration.
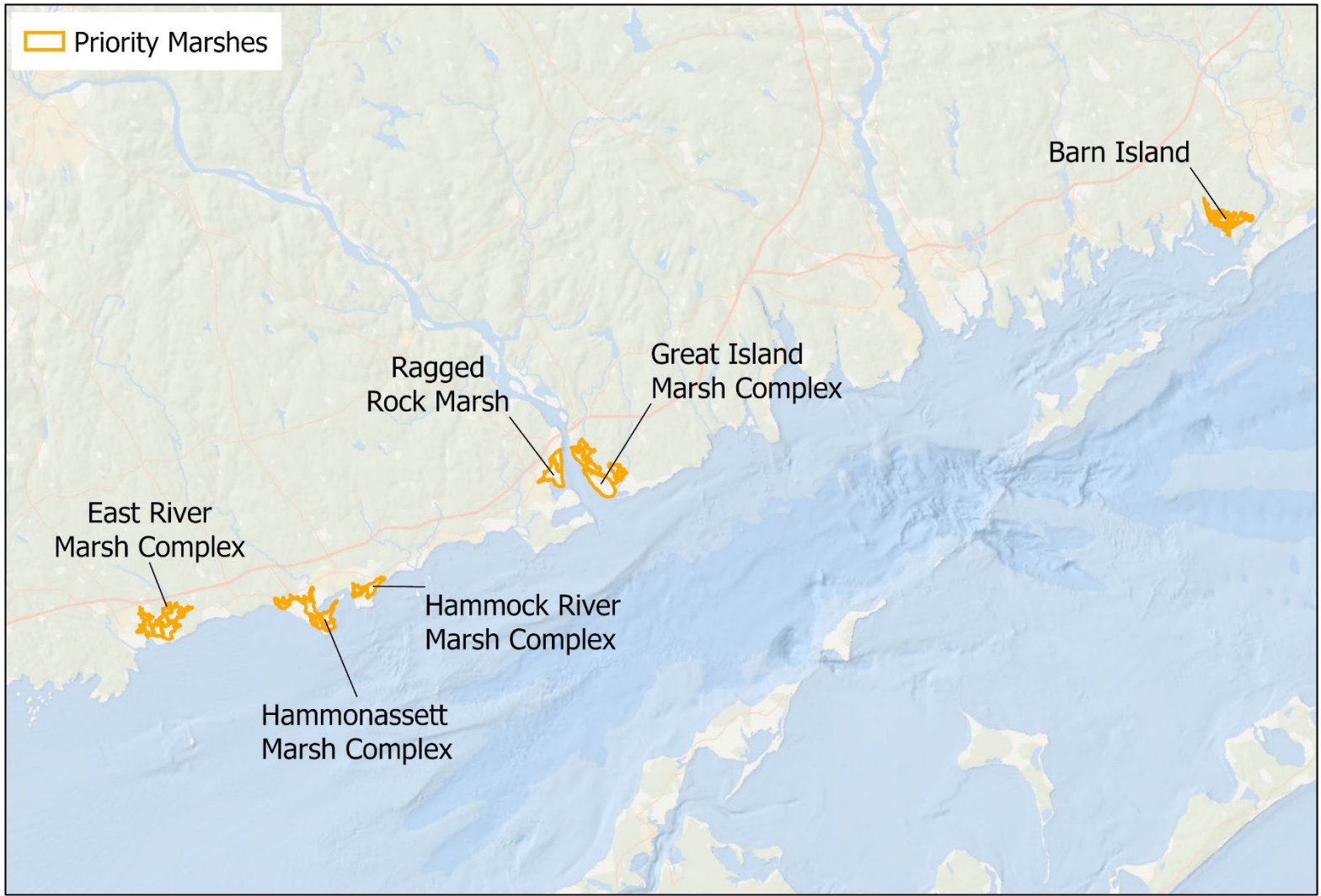
High-quality Habitat for Saltmarsh Sparrows

High-quality habitat is defined as conditions that allow sufficient reproductive success to support a stable or growing Saltmarsh Sparrow population. Conservation should focus on preserving, restoring, or enhancing high-quality breeding habitat which has the following characteristics:
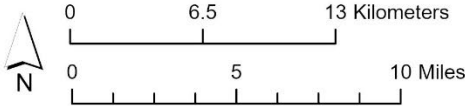
- High marsh patches with the lowest flooding frequency which provide a relatively safe window of at least 24 days with limited flooding. Flooding frequency is directly related to elevation, which can be linked to ditching in Connecticut marshes; on many unditched marshes in this area the marsh platform can be higher than ditched marsh (Warren et al. 1993, LeMay 2007). On ditched marshes the highest ground is often along the creek edge where levees provide cover of *S. patens,* while the marsh platform is a lower-elevation basin predominantly comprised of short form *S. alterniflora*.

- Extensive and dense *S. patens* vegetation with a deep, well-developed thatch layer; the presence of *Juncus gerardii* can also indicate low flooding rates. *J. gerardii* is generally found on the highest ground adjacent to the upland where groundwater discharge creates oligohaline to mesohaline water chemistry. It is generally not found on salt marsh levees but is often the dominant grass on the levees of brackish mesohaline marshes like Great Island.

- The highest 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

Marsh parcels were identified and characterized by the Connecticut Tidal Wetlands Working Group. The group includes biologists, wetland scientists from both Connecticut Department of Energy and Environmental Protection (CT DEEP) and academia, and regulators from Army Corps of Engineers, Environmental Protection Agency, and National Marine Fisheries Service. This group has been in existence for over 20 years and meets annually to discuss and implement beneficial coastal wetland restoration/enhancement projects.

Barn Island

Ragged
Rock Marsh

Great Island
Marsh Complex

East River
Marsh Complex

Hammock River
Marsh Complex

Hammonassett
Marsh Complex

Connecticut Priority Saltmarsh
Sparrow Marshes

| 0 | 6.5 | 13 Kilometers |

N

| 0 | 5 | 10 Miles |

Barn Island – 312 acres (126 ha)

Existing conditions: Barn Island is a highly studied coastal system on the Atlantic coast. The current restoration issues revolve around tidal restrictions into the five impoundments and extensive mosquito ditching throughout the marsh. The ditched portions of the marsh cannot retain and capture the fine sediments that are brought in with tidal exchange, while the unditched marsh is able to capture these sediments and maintain higher elevation than the ditched marsh. The ditched marsh continues to get more saturated over time, while the unditched marsh maintains its levees which constitute the majority of high marsh in the site.

Existing sparrow data: Saltmarsh Sparrows detected, negative growth rate for Saltmarsh Sparrows (Field et al. 2017, 2018)

Recommended management / next steps to management action:
- Experiment with ditch plugging on creek side of ditches to hasten levee formation.
- Improve hydrology through selective runnelling to improve hydrology and promote vegetation growth
- Experiment with ditch infilling in non-primary ditches
- Experiment with enhancing creek-side levees by adding material
- Assess the condition of ditches to assess aggrading and occurrence of *S. patens* on ditch side

Note: CT DEEP is funded through an EPA improvement grant and permitted to remove tidal restrictions in impoundments to benefit overall ecological function of the marsh. Targeted start date November 2021.

Priority Marshes

Barn Island

0   0.4   0.8 Kilometers

0   0.3   0.6 Miles

N
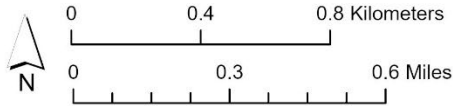
Great Island Marsh Complex (Great Island, Upper Island, Black Hall, Lieutenant River) – 746 acres (302 ha)

Existing conditions: Large, healthy stands of J. gerardii (Great Island), Invasive *Phragmites australis* (hereafter Phragmites) present, ditching
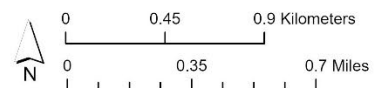
Existing sparrow data: Saltmarsh Sparrows detected, confirmed breeding at site (Elphick et al. 2009)

Recommended management / next steps to management action:
- Manage Phragmites.
- Experiment with enhancement of primary ditches and closure of secondary ditches (e.g. remediation or other methods).
- Measure bank elevations and vegetation communities of plugged ditches.
- Experiment with enhancing creek-side levees by adding material landward to widen levees (i.e. creating micro-topography).
- Assess aggrading and occurrence of *S. patens* on ditches.

Great Island Marsh Complex

Ragged Rock Marsh – 324 acres (131 ha)

Existing conditions: The outer portion of this system is separated from the main marsh by a north to south running creek and is unditched. Phragmites present, site has been ditched
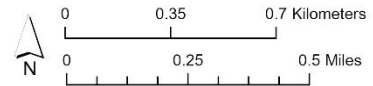
Existing sparrow data: Low density of Saltmarsh Sparrows (observed in early 2000s; C. Elphick, pers. obs)

Recommended management / next steps to management action:
- Manage Phragmites
- Assess elevations between unditched and ditched portions of the marsh

Ragged Rock Marsh

Hammock River Marsh Complex – 309 acres (129 ha)

Existing conditions: Tide gates that run under Beach Park Rd impede full tidal flushing and effectively raise the water table by not allowing all the water in the marsh to exit during outgoing tides
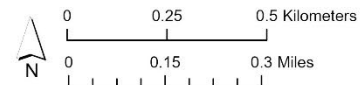
Existing sparrow data: Saltmarsh Sparrow detected, confirmed breeding at site (Elphick et al. 2009)

Recommended management / next steps to management action:

- CT DEEP is in the process of securing funds to install self-regulating tide gates under Beach Park Rd. This will 1) facilitate restoration through a slow drying of the marsh by allowing less water into the system so that the water behind the gates will fully exit on the outgoing tide cycle, and 2) test whether dampening spring tides through the gate will increase nesting success.
- It will be important to evaluate elevations relative to the local tide range to ensure that flooding tides are increased incrementally and do not exacerbate marsh loss.

Hammock River Marsh Complex

Hammonassett Marsh Complex – 679 acres (275 ha)

Existing conditions: Need for Integrated Marsh Management (Rochlin et al. 2012) in some areas of the system.
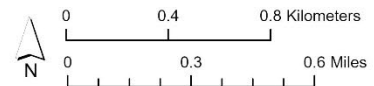
Existing sparrow data: Saltmarsh Sparrow detected, negative growth rate for Saltmarsh Sparrows (Field et al. 2017, 2018).

Recommended management / next steps to identifying management action:

- Experiment with enhancing creek-side levees by adding material (similar to creating microtopography).

Hammonassett Marsh Complex

East River Marsh Complex - 809 acres (327 ha)

Existing conditions: Tidal restrictions in the western section of this marsh complex (Sluice Creek) are resulting in loss of high marsh and conversion to low marsh and low marsh to panne. Grid ditching throughout the marsh complex

Existing sparrow data: Saltmarsh Sparrows detected, negative growth rate for Saltmarsh Sparrows (Field et al. 2017, 2018)

Recommended management / next steps to identifying management action:
- CT DEEP is working to remove the tidal restriction in Sluice Creek. This will restore 127 acres to high marsh
- Experiment with enhancing creek side levees by adding material (similar to creating microtopography)

East River Marsh Complex
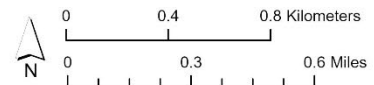
Best practices in marsh management

The lands listed below are large parcels of existing tidal marsh that hold potential for management action to benefit the Saltmarsh Sparrow. Any management actions should follow best practices to not irreparably harm existing saltmarsh sparrow habitat. Necessary precautions include:

- Consult 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).

Policy

Challenges

The permitting of coastal wetland projects is a significant challenge and bottleneck towards progress. This bottleneck is not unique to Connecticut. Further, personnel shortages within CT DEEP are making it difficult to conduct coastal wetland work in-house. This capacity issue adds time to projects and increases overall costs due to outsourcing these efforts that could be done more cheaply by the state.

Potential Solutions

Compiling permitting barriers that are common across states (e.g. Army Corps Of Engineers, Environmental Protection Agency, Fish and Wildlife Service, National Marine Fisheries Service) will be instrumental to also facilitate high-level discussions amongst administrators. It is necessary to determine whether the process can be streamlined for certain activities and for activities proposed by certain agencies.

Monitoring

Any habitat restoration efforts should be monitored both pre-construction and post-construction to measure change and determine whether vegetation goals and elevations have been met.

Acknowledgments

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