Wetland Program Development in Rhode Island
Mapping, Monitoring, Assessment, & Restoration Planning

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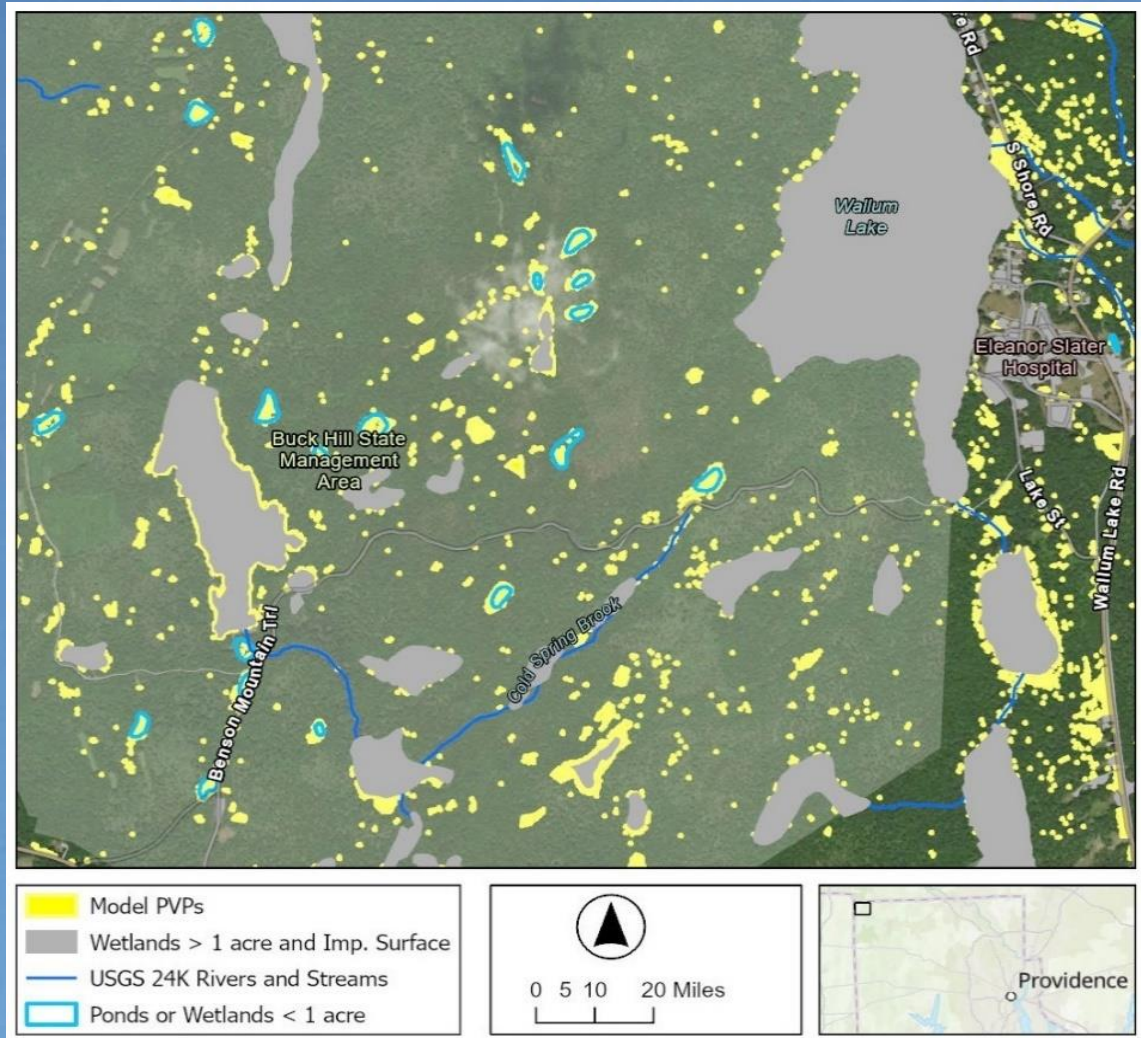**Narragansett Bay National Estuarine Research Reserve**

November 14, 2024

Vernal Pool Mapping Pilot 2: Hybrid Approach 2024

- **With URI EDC developed LiDAR model to liberally identify aquatic depressions**
  - LiDAR and reflectance from aerial imagery
- **Model outputs were photointerpreted to rule out obvious commission errors**

- **Mapping targeted small isolated potential vernal pools (PVPs)**
  - Mapped wetlands > 1 acre were masked
  - Depressions intersecting mapped perennial streams were not included
- **Field verification of PVPs**
- **Goals to optimize mapping**
  - Accuracy
  - Efficiency

THE UNIVERSITY OF RHODE ISLAND

Legend:
- Model PVPs
- Wetlands > 1 acre and Imp. Surface
- USGS 24K Rivers and Streams
- Ponds or Wetlands < 1 acre

0 5 10   20 Miles

Providence

Hybrid Mapping Outcomes 2024 (vs Pilot 1 in 2022)

Errors of Commission: In 2024 based on field surveys of 140 Mapped PVPs
Errors of Omission: In 2024 based on field search of 420 upland acres

Feature	Errors of Commission				Errors of Omission		
	2022		2024		2022		2024
	2D PI	LiDAR	Hybrid		2D PI	LiDAR	Hybrid
Aquatic Depression	41%	70%	17%		29%	33%	26%
Vernal Pool (Bio +)	64%	NA	42%		33%	NA	25%

Feature Type	n	% of Error	% of Features
Upland depression within evergreen trees	9	38%	6%
Wetland depression lacking surface water	6	25%	4%
Stream or riparian wetland	4	17%	3%
Manmade drainage basin, not naturalized	2	8%	1%

Expansion of Salt Marsh Long-term Monitoring

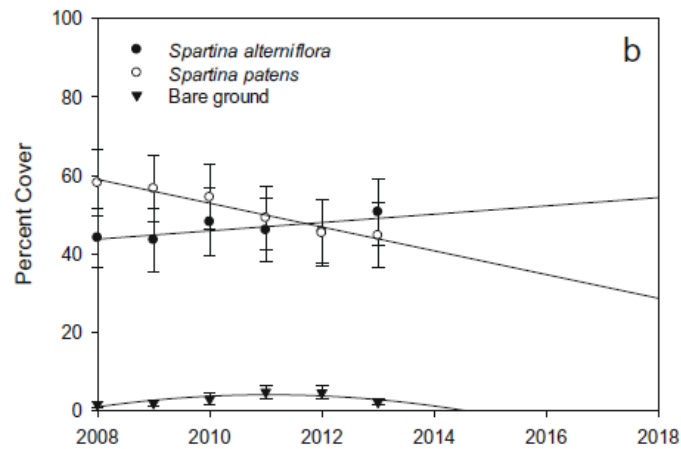From Raposa et al. 2017

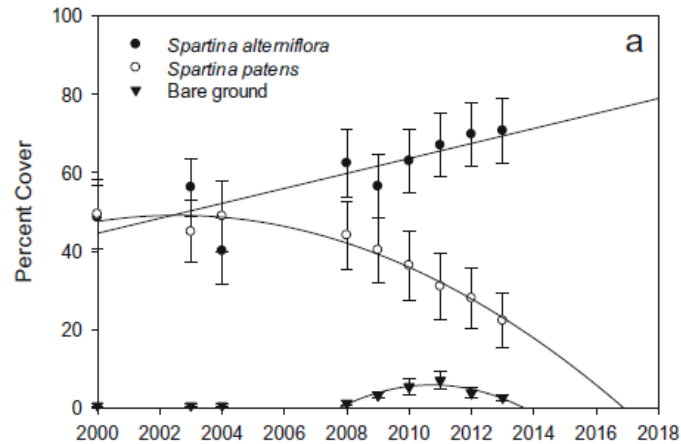Added four Long-term Marshes

Fig. 2 Changes in the cover of *S. alterniflora*, *S. patens*, and bare ground over time in Coggeshall (**a**) and Nag (**b**) marshes. *Error bars* are 1 SE and *curves* were fit with linear and polynomial regressions (the regression for bare ground in Coggeshall was fit using data from 2008 to 2013 only)

Expansion of Salt Marsh Long-term Monitoring

Legend
- Benchmarks
- Tier_3_SETs
- T3 GW Wells
- T3_EdgeEco_Sta
- T3_Nekton_Sta
- T3_Veg_Plots
- MarshRAM_Trans

Ribbed Mussels
Crab Burrows
Bird Points
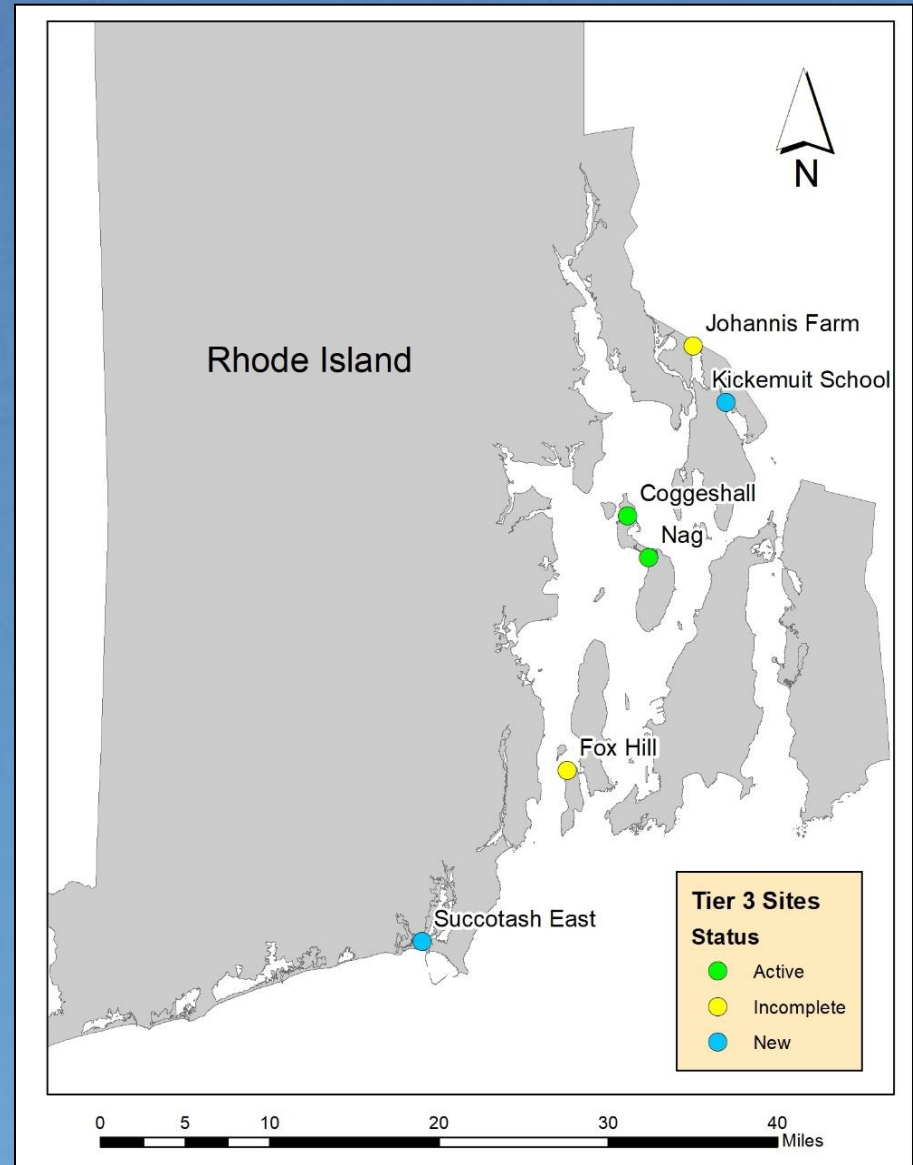
Established Stations

Collected Baseline Data

Retrospective Change Analysis 1972-2020
Across 51 Marshes

Johannis Farm

Legend
- 2020 Vegetated Area
- 1972 Vegetated Area

URI EDC, RIGIS
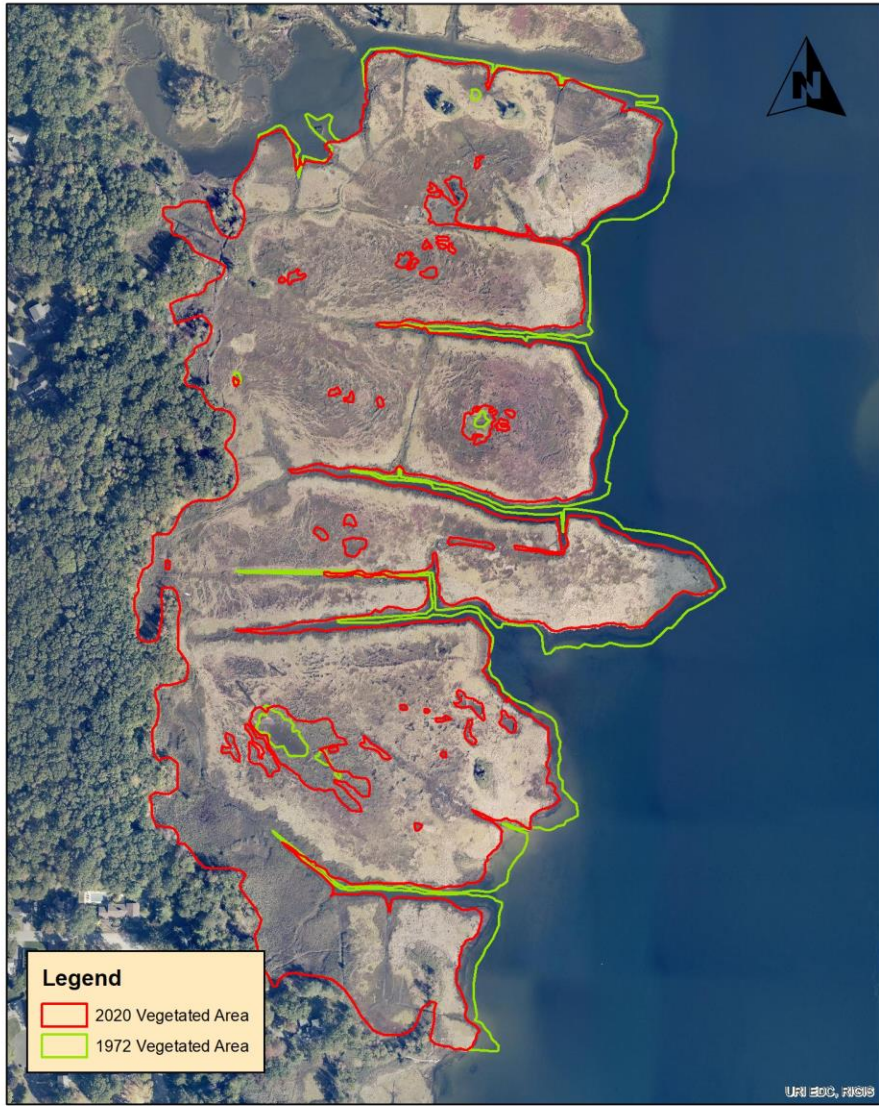
Hundred Acre Cove Islands

Legend
- 2020 Vegetated Area
- 1972 Vegetated Area

URI EDC, RIGIS

Retrospective Change Analysis Results

Net loss   **11.8%**

Minimum   **-0.67%**

Maximum   **33.7%**

Total Acres   **146**

Loss Categories

Seaward Edge   **38%**

Platform Die-off   **29%**

Creek Expansion   **16%**

Ditch Expansion   **16%**

Overwash   **0.8%**

Excavation   **0.5%**

Percent Loss per Marsh by Type
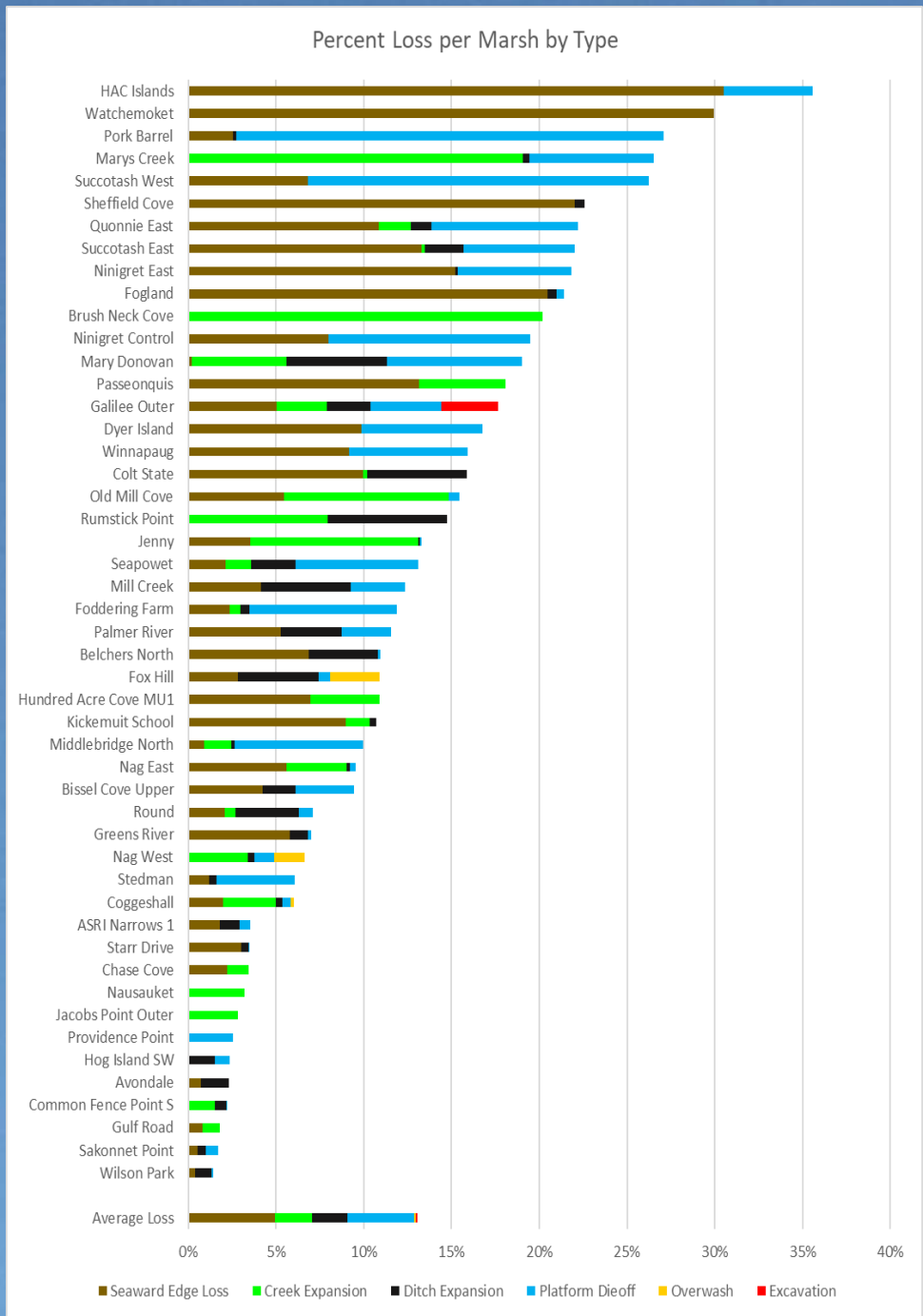
Salt Marsh Restoration Prioritization

Site	Migration	Other Restoration	IMI Bin	Functions and Services	Migration Area (ha)	Replacement Ratio	Buffer	Impoundment	Ditching	Nutrients	Fill	Erosion	Crabs	Die-off	Mowing	Phragmites
Starr Drive	5	4	MD	AA	5.4	60%		XX	XX	XX	X	XX	X	XX	X	X
Quonnie East	5	4	MD	AA	5.3	19%			XXX	XX	XX	XXX	XX	XX		X
Seapowet	5	4	MD	AA	12.6	14%	XX	X	XX	X		XXX	XXX	XX	X	XX
Middlebridge North	5	3	ID	AA	3.8	74%			XX	X		X	X	XX		X
Andys Way	5	3	ID	AA	4.4	35%			X	X				X		X
Palmer River	5	3	ID	AA	5.2	27%			XX	XX		XXX	XXX	XX		X
Succotash East	5	3	MD	A	6.5	16%	XX	X	X	XX	XX	XXX	XXX	X		X
ASRI Narrows NW	5	2	LD	AA	1.7	73%			X	XX	X	XX	X	X		X
Succotash West	4	5	MD	AA	3.0	33%	XX		X	X	X			XX		X
Wilson Park	4	4	ID	AA	2.6	55%	X		XX	X	X	XX	X	XX		XX
Belchers North	4	4	MD	A	4.0	35%			XX	X	XX	XXX	XXX	XX		XX
Rocky Hill	4	4	ID	AA	5.0	29%	XX	XX	X	X	X	XX	X	XX		XX
Nag West	4	4	ID	AA	2.9	22%			XX		X	XXX	XXX	XX		X
Hundred-acre Cove NE	4	4	ID	AA	1.3	20%			X	XXX		XXX	XXX	X		X
Stedman	4	4	ID	AA	3.3	20%			XX	X		X		XX		X
Barrington Beach	4	4	ID	AA	1.1	18%	X		XX	XXX	XX		X	XX		XX
Nag East	4	4	ID	AA	3.9	18%	X		XX	X		XXX	XXX	X		XX
Watchemoket	4	2	MD	B	0.8	136%	XX	X		XXX	XX	XX	XX			XXX
Bissel Upper	4	2	MD	B	2.4	128%	X	XX	XX	XX	X	X	X	X		XX
Brush Neck Cove	4	2	ID	A	3.2	114%				XXX		XX		X		XX
Old Mill Cove	4	2	MD	B	2.0	73%	X		X	XX	XX	XXX	XXX	X		XX
Ninigret East	4	2	ID	A	4.4	63%			X	XX		XX		X		XX
Coggeshall	4	2	ID	A	7.7	38%			XX	X		XXX	XXX	X		X
Round Marsh	4	2	ID	A	11.7	37%			X	XX	X	XX		X		XX
Mary Donovan	4	2	ID	A	5.4	15%	X		X	XXX	XX	XX	XXX	X		X
Colt State Park	4	2	ID	A	8.2	39%	X		XXX	XX	X	XXX	XXX	X		X
Dyer Island	4	1	LD	A	2.5	111%								XX		
Hog Island	4	1	LD	A	3.1	93%			XX	XX				X	X	X
Sheffield Cove	4	1	LD	A	1.5	92%	X		XX		XX	XXX				X
Chase Cove	4	1	LD	A	4.1	80%		X	XX	X	X	XX	XX	X		X
Quicksand Pond	4	1	LD	A	3.6	78%				XX						XX
Passeonquis	4	1	LD	A	2.3	75%	X		X	XXX				X	X	X
Pork Barrel	2	5	MD	A	0.8	18%	X		XX	XX	X	XX	XX	XX		X
Winnapaug	2	5	MD	A	0.0	0%	X		XX	X	X	XX	XX	XX		X
HAC Islands	2	5	MD	A	0.0	0%			X	XXX	XXX	XXX		XX		XX
Ninigret Control	2	5	MD	A	0.0	0%			XX	XXX		XXX		XX		XX
Mary's Creek	1	4	MD	B	0.0	0%	XXX		XX	XX	XXX	XXX	XX	XX		X
Avondale	3	3	ID	A	3.1	67%	XX	X	XX	XXX	XX	X		X		XX
Jenny	3	3	ID	A	3.8	30%	X		XXX		X	XXX	XXX		X	X
Island Road North	3	3	MD	B	0.4	29%	XXX			XXX	XX	XX		X		XX
Foddering Farm	3	3	ID	A	0.5	28%	X			X		XX	XXX	XX		X
Fox Hill	3	3	ID	A	3.9	25%	X		X		X	X	X	X		X
Greens River	3	3	ID	A	0.4	18%			XX	X		XX	XX	XX		X
Rumstick Point	3	3	ID	A	1.4	11%	X		XXX	XX	XXX	XXX	XXX	X		X
Kickemuit School	3	2	LD	A	2.6	63%			XX	X	X	XX	XX	XX		X
Common Fence Point S.	3	2	LD	A	2.2	37%			XX	X		X	X	X		XX
Gulf Road	3	2	LD	A	0.5	37%			X	XXX	X	XX	X	X		XX
Charlestown Beach	3	1	ID	B	1.9	136%	X			XX				X		XX
Providence Point	3	1	LD	B	2.5	53%			XX			X	X	X		X
Galilee Outer	2	2	ID	B	1.4	13%	XX		X		XXX	XXX				XX
Sakonnet Point	2	1	LD	B	1.7	60%	XX		XX	XX	XX					XX
Fogland Beach	2	1	LD	B	1.3	32%	XX			XX		X	X			XX
Mill Creek	2	1	LD	B	1.4	29%			XX	X		XXX	XX			X
Nausauket	1	3	ID	B	1.0	13%	X		XX		X	X	X	X		XX
Jacob's Point Outer	1	3	LD	A	0.5	6%	X	XX	X	XX	XX	XXX	XX	X		XX

5 = Highest Priority   4 = Higher Priority   3 = Moderate Priority   2 = Lower Priority   1 = Lowest Priority

Saltmarsh Restoration Priorities for the Saltmarsh Sparrow

Rhode Island

Last Updated May 10, 2024
Saltmarsh Sparrow: Kay Hennessy

Atlantic Coast Joint Venture (FWS) 2024

Saltmarsh Restoration Priorities | Rhode Island

Succotash Marsh Management Area - 99 acres (40 ha)

Marsh RAM Assessment Data
- Elevation: Low (0.30 NAVD88)
- Disturbance: High
- Index of Marsh Integrity: Most Degraded (5.3)
- Migration Potential: Highest Priority
- High quality high marsh – estimated at 6.2% currently (6 acres)
- Estimated marsh loss = 23.6% (High) between 1972 and 2020

Existing Sparrow Data
Saltmarsh Sparrow detected at this site, breeding has not been confirmed. The vast majority of sparrows occur on the west side (Potter Pond). RIDEM conducted marsh wide EPA walking transects here in 2022. Contact Sam Miller from RIDEM for more information.

For more information visit:

http://www.dem.ri.gov/programs/water/wetlands/monitoring.php

https://www.nbep.org/salt-marsh-ramp

Or contact me:

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