Saltmarsh Restoration Priorities for the Saltmarsh Sparrow

Maine

Last Updated March 1, 2024

Saltmarsh Sparrow. Bri Benvenuti

Saltmarsh Sparrow. Ray Hennessy

Goal Statement

The Saltmarsh Sparrow (*Ammospiza caudacuta*) is considered an Endangered Species under the Maine Endangered Species Act. This document is intended to provide those interested in salt marsh and Saltmarsh Sparrow conservation with information that will help with conservation action implementation. It identifies priority 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. For each of the priority areas, existing conditions and possible management interventions are provided. Many of the areas identified are owned by state and federal agencies, while others are owned by land trusts and private entities. In some instances, there is co-ownership and variation in the management across ownerships. Collaboration and partnership will therefore be an integral part in advancing efforts to benefit the Saltmarsh Sparrow and its habitat.

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). Maine's breeding Saltmarsh Sparrow population is estimated to be 2.7% of the global population, therefore its population goal was 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 6 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*	State's %	Population Goal (Indiv)	2030 high marsh goal (ac)**	Total marsh needed to meet 2030 goal (ac)***	Long-term (2069) High Marsh Goal** (ac)	Total marsh needed to meet 2069 goal (ac)**
Maine	1,600 (+/-1,200)	2.7%	668*	886	2,461	2,511	6,975
Regional	60,000		25,000	22,943	63,731	79,603	221,119

**Saltmarsh Sparrow abundance data for Maine 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 sparrows" were observed but not included in Saltmarsh Sparrow abundance estimates. This may have resulted in an imprecise estimate of the state's population.*

*** Acreage based on the assumption that ~36% of tidal marsh acreage is high marsh (Correll et al. 2019).*

****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

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 window of at least 24 days with limited flooding.
- Extensive and dense high marsh *Spartina patens* vegetation with a deep, well-developed thatch layer at times complemented by intermediate *Spartina alterniflora*.
- High-quality high marsh habitat is most often found in the least modified marshes, such as those with minimal ditching, or that are downstream/free of tidal restrictions like road crossings.

Maine coastal marsh. Kate Ruskin

Marsh Identification and Prioritization Process

In version 1.0 of this document, marsh parcels were identified and characterized by first identifying the highest-ranked marsh patches identified by the ACJV Saltmarsh Sparrow Habitat Prioritization Tool (top 10%; ACJV 2020). They were then reviewed and refined by a group of non-profit, academic, state, and federal partners, with the last review occurring April 2023 (for creation of version 2.0). Marsh summaries were created, informed, and finalized via partner working groups (see Acknowledgements for full partner list). The areas considered were generally the largest existing tidal marsh patches in Maine that have potential for conservation actions that will benefit the Saltmarsh Sparrow before 2030. In multiple cases, the group combined adjacent small habitats into one area to assist in future planning and implementation. The group has sorted these identified marshes into the following subcategories to further refine this prioritization within the state:

Priority Marshes: Marshes prioritized for ongoing restoration planning and action to support the Saltmarsh Sparrow in Maine.

Honorable Mention: The following marshes were identified by the partner group as important to keep in mind for future restoration work.

The information in this document including spatial delineations of priority marshes are available as part of a regional set of marsh restoration priorities for the Saltmarsh Sparrow. This information is available to view on the ACJV Saltmarsh Sparrow mapper.

Restoration Technique Definitions

The following terms are used repeatedly throughout this document to identify opportunity for different techniques at identified marshes, including in the "attributes" section. ***This information is meant to identify opportunity and potential for these restoration techniques at each site but is not meant to be prescriptive***. A formal site assessment and design is aways necessary to identify specific next steps and restoration strategies within each marsh parcel.

Sediment placement
Placement of material (including sediments from dredging efforts) on the marsh platform. Includes thin-layer placement, thick-layer placement, beneficial use of dredged sediments, formation of hummocks/microtopography, etc.

Repair hydrology - runnelling / channel creation
Modification of marsh platform using shallow channel creation to remove or prevent ground water saturation at the marsh surface that results in marsh vegetation death and marsh subsidence. Excavated peat is reused to create structured microtopography.

Repair hydrology - tidal restriction mitigation
Removal or modification of large-scale tidal restrictions such as road crossings, culverts, bridges, etc. to restore tidal flow.

Repair hydrology - address ditch plugs
Adjustment of ditch plugging on marsh platform to improve hydrology.

Repair hydrology - ditch remediation
Adjustment of human-made ditches on the marsh platform to improve hydrology.

Repair hydrology - berm, embankment, or levee modification
Removal or alteration of berms, stonewalls or embankments to restore hydrology of marsh platform and marsh migration corridor.

Land acquisition / protection for marsh migration
Purchase or easement of land to protect for eventual marsh migration.

Facilitated marsh migration
Active assistance of marsh migration through modification of the environment.

Invasive plant species mitigation (*Phragmites australis*, etc.)
Removal or mitigation of invasive plants.

Living shoreline development
Development of nature-based features to promote shoreline stabilization.

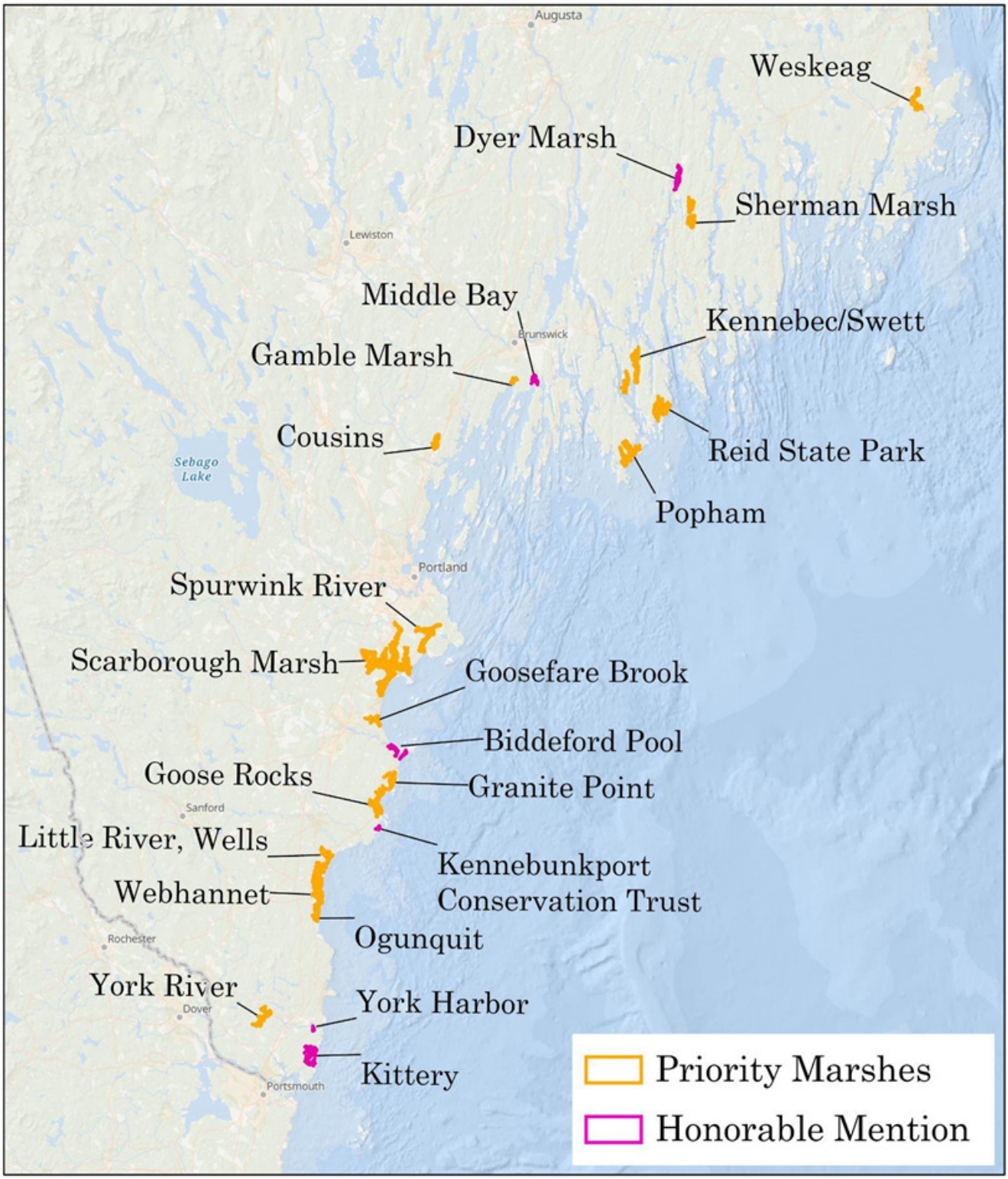
Wildlife herbivory mitigation
Removal or management of wildlife due to overgrazing. Wildlife includes deer, horses, crabs, geese, etc.

Additional ecological assessment needed
Additional monitoring and site assessment is necessary to determine specific next steps or assess existing restoration efforts at this site.

Additional Definitions
Surface Elevation Tables (SETs) - monitor change in marsh elevation over time.

Priority Marshes

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



York River Complex – 254 acres (103 ha)

This complex is partly protected by the York Land Trust. Most or all of it is within the acquisition boundary of Rachel Carson National Wildlife Refuge (NWR), which acquired their first parcel in 2024. The area has been designated a Wild and Scenic River by the National Park Service (NPS) in 2022 and Wells and York River is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. This marsh is also an important site for northern long-eared bats (federally endangered) and rainbow smelt. Additionally, this is a Maine Marsh Monitoring Program Sentinel Site, including long-term SET stations

Saltmarsh habitat at Rachel Carson National Wildlife Refuge. Creative Commons

Existing Conditions

Tidal restrictions, existing historic farming infrastructure (ditches, dikes), and invasive species (*Phragmites*, purple loosestrife) affect this site. Marsh erosion is occurring along the marsh platform edge.

Existing Projects

There are no existing salt marsh restoration projects at this site.

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by the Saltmarsh Habitat and Avian Research Program (SHARP) and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

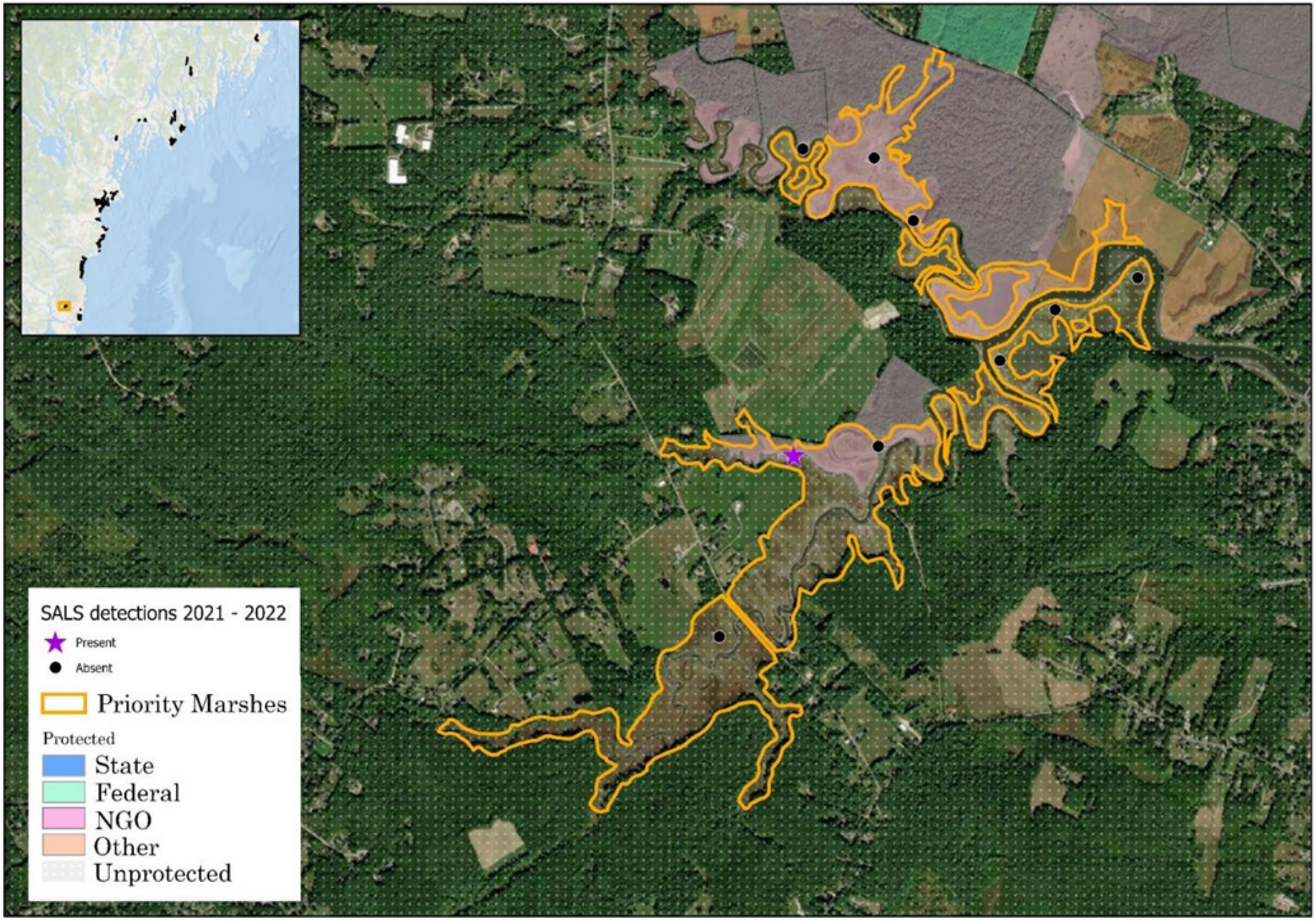
- Assess site hydrology including pooling and ditching severity.
- Assess potential for addressing tidal restrictions which do exist in this system and may be having a long-term negative effect on marsh resiliency, but likewise could be having a positive effect on Saltmarsh Sparrow productivity in the short-term.
- Assessment for potential hummock placement. Large-scale sediment placement is likely not feasible at this site.
- Assess marsh edge erosion for potential restoration actions.
- Assess for facilitated marsh migration (e.g. stone walls, forest, etc).
- Build partnerships with municipal, private, non-profit, and community engagement partners. Opportunities exist to engage private landowners, possibly via Natural Resource Conservation Service (NRCS). Land protection of buffering uplands is a priority here, both for accessing marshes for restoration and monitoring, as well as long-term marsh migration opportunities that exist.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	N
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	Y
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Note: This is a Maine Marsh Monitoring Program Sentinel Site. To avoid disturbance to fragile, long-term research plots, please coordinate with the Maine Coastal Program prior to planning.

State and federal agency leaders visit a marsh at Rachel Carson NWR in southern Maine. USFWS



York River Complex

Ogunquit River Complex – 298 acres (121 ha)

This marsh is almost entirely owned by Rachel Carson NWR. This site is the southern portion of the state's second largest salt marsh area and Wells and Ogunquit Marsh is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. This marsh has SETs installed.

Ogunquit marsh. Reveblue, Creative Commons

Existing Conditions

Tidal restrictions, existing historic farming infrastructure (ditches, dikes), invasive species (*Phragmites*, purple loosestrife) all affect this marsh. Furbish road regularly floods during high tide and storm events and the marsh is surrounded by development. Road debris is pulled into the marsh when tide/flooding recedes. Several state-listed plants are present at this location. Red Knot, Least Tern, and Roseate Tern (all federally listed species) occur at this site as well.

Existing Projects

USFWS: Project at Furbish marsh supported by Maine Natural Resource Conservation Program (MNRCP) grant including runnelling, ditch remediation, and creation of higher elevation mounds to increase high marsh area. Paired with a control site south of Furbish Rd. Design and Implementation are funded, support is still needed for monitoring. Best contact: Susan Adamowicz (susan_adamowicz@fws.gov)

USFWS: Partnering with Ducks Unlimited, Maine Wetland Coalition, on a NAWCA-funded project in Furbish Rd. north for hydrological restoration including runnelling and beneficial use of dredged runnel material. Design and Implementation are supported, support still needed for monitoring. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org)

USFWS: Marsh mat experiment occurred here in the past and is complete.
Best contact: Nicole Sanders (nicole_sanders@fws.gov)

USFWS: South of Bourne Rd. old ditch plug project completed ~2000.
Best contact: Susan Adamowicz (susan_adamowicz@fws.gov), Nicole Sanders (nicole_sanders@fws.gov)

USFWS: North of Bourne Rd. partnering with Ducks Unlimited, on a NAWCA-funded project for hydrological restoration including runneling and beneficial reuse of dredged runnel material. Design and implementation are supported, additional support for monitoring is still needed. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org)

Town of Wells: Federal Lands Access Program grant on hold to address Furbish Road flooding.
Best contact: Karl Stromeyer (karl_stromeyer@fws.gov)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR. This site is unique in having relatively high productivity (in some years) due to a tidal restriction on Furbish Rd that dampens spring tide flooding of nests.

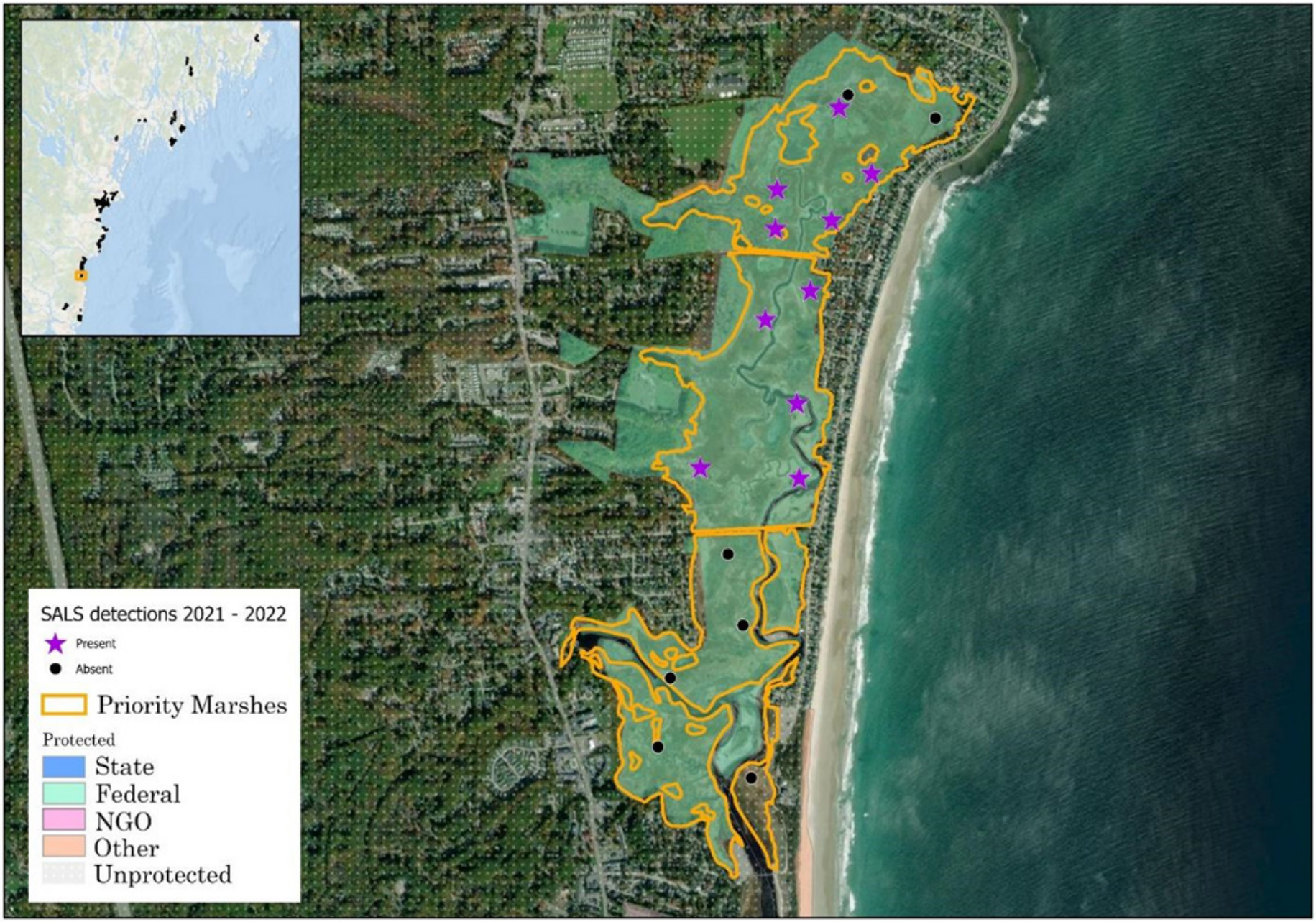
Representative Chellie Pingree of Maine releases a Saltmarsh Sparrow into a marsh at Rachel Carson NWR. Gabrielle Mannino

Recommended Management / Next Steps To Management Action

- Assess site hydrology, including pooling and ditching severity, ditch plugs, and potential for addressing tidal restrictions.
- Assess potential for elevation enhancement and land protection/marsh migration corridors on the west side.
- Removal of tidal restrictions will likely negatively impact development around the marsh.
- Build partnerships with municipal, private, non-profit, and community engagement partners (Town of Wells, Town of Ogunquit).

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Ogunquit River Complex

Webhannet River Complex in Wells – 934 acres (378 ha)

This is the second largest salt marsh in Maine, owned primarily by Rachel Carson NWR. Wells and Ogunquit Marsh is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. The Wells National Estuarine Research Reserve maintains a network of Water Quality instruments at this site including NOAA tidal gauge, 40+ vegetation plots, and crab trapping. This marsh has SETs installed on site.

Existing Conditions

Tidal restrictions, existing historic farming infrastructure (ditches, dikes), and invasive species (*Phragmites*) are present at this site. There is active dredging of Well's Harbor which is a potential source of sediment for projects. Oyster aquaculture is also present in select locations (leased sites).

Existing Projects

Maine Department of Inland Fisheries and Wildlife (MDIFW): Partnering with USFWS and Ducks Unlimited for hydrological restoration of marsh platform through runnelling and beneficial use of runnelling spoils and natural ditch plug removal. This project is supported through a competitive SWG grant. Design and implementation is funded and partially permitted, support is still needed for monitoring. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Danielle D'Auria (danielle.dauria@maine.gov).

USFWS: Partnered with Ducks Unlimited for hydrological restoration of marsh platform through runnelling and beneficial use of runnelling spoils and natural ditch plug removal in Mile Rd. Implementation was completed in fall 2023. Supported through a standard NAWCA grant. Designs are completed, permits are in progress. Support still needed for monitoring and adaptive management of marsh into the future. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org)

USFWS: Partnering with Ducks Unlimited for hydrological restoration of marsh platform through runnelling and beneficial use of runnelling spoils and natural ditch plug removal in Wells Harbor. Work is supported through standard NAWCA grant. Designs are completed, permits in progress. Implementation is fully funded. Support still needed for monitoring and adaptive management of marsh into the future. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org)

Ducks Unlimited: Partnering with USFWS and University of New Hampshire (UNH) on a pilot project for sediment placement and marsh platform hydrological restoration. Material for placement is coming from Wells harbor dredge. Design and storage of dredge material is supported, funding still needed for implementation and monitoring. UNH will likely be studying this project as part of a PhD student's dissertation work. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org), Greg Moore (Gregg.Moore@unh.edu).

Town of Wells: Partnering with USFWS and Wells Reserve on a feasibility study of tidal crossing on Drake's Island Rd. including hydrological modeling. Alternative designs are completed, final plans will be decided upon in 2024. Permitting is underway. Funding is still needed for implementation and monitoring. Best contact: Carol Murray (cmurray@wellstown.org)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

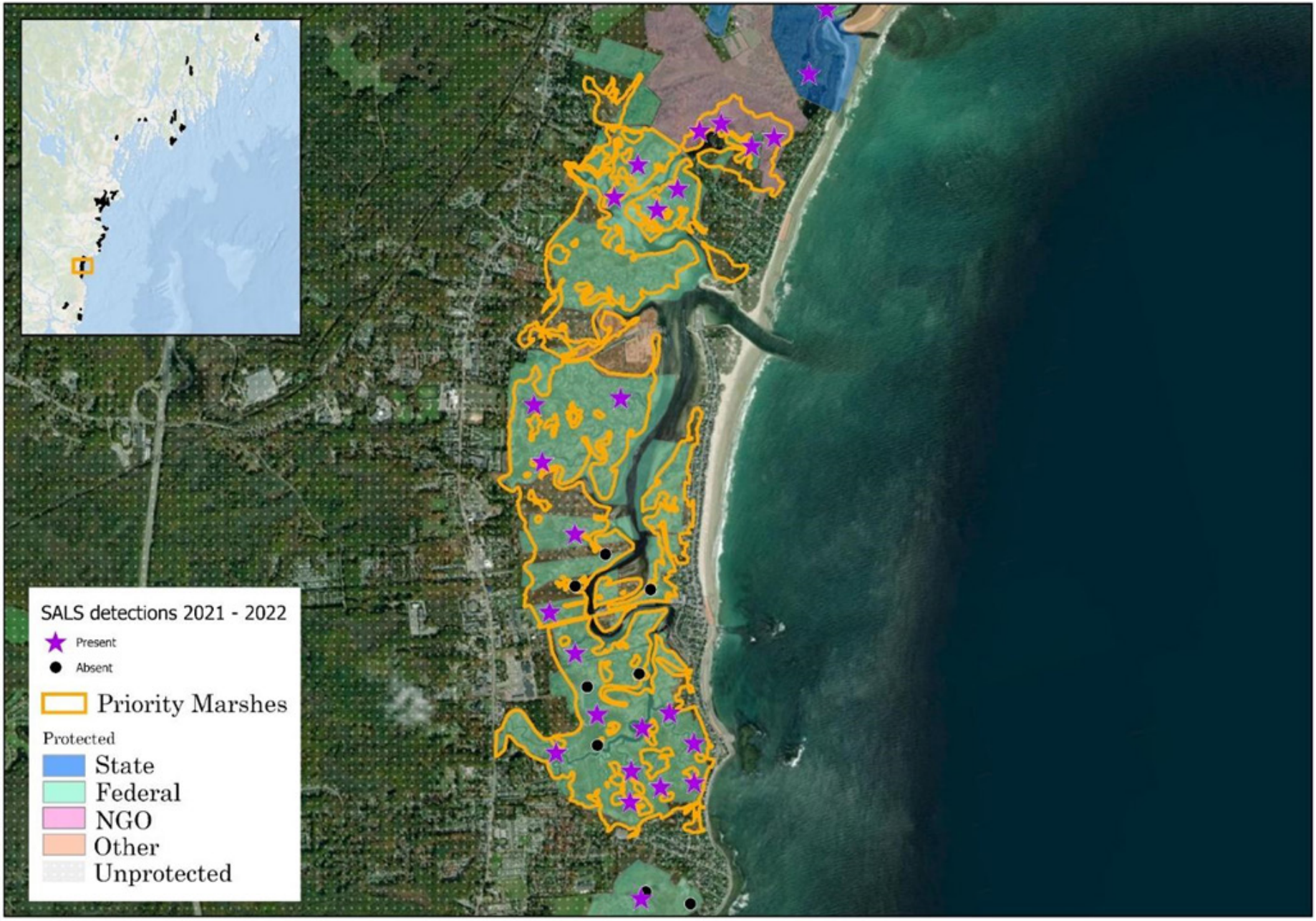
Example of runneling to restore the natual flow of the marsh. Bri Benvenuti

Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity.
- Assess natural ditch plugs.
- Assess potential for addressing tidal restrictions and thin layer deposition.
- Assess function and management of the self-regulating tide gate at Drakes Island Rd. These operations are a potential sediment supply for elevation enhancement or microtopography work.
- Explore options on the northern end of the parcel for marsh migration.
- Explore opportunity for facilitated marsh migration behind Hannafords or underneath Rt. 1 or around Wells Reserve boundary.
- Outreach to the dredging operations for work towards restoring sediment supply to these marshes could result in a local source of sediment.
- Build partnerships with municipal, private, non-profit, and community engagement partners (Town of Wells, Wells Harbor Master, USACE, Shellfish Commission).

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	Y
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Webhannet River Complex

Little River Complex in Wells & Kennebunk – 212 acres (86 ha)

Most of this site (163 acres) is owned by Rachel Carson NWR, though the southern portion of this complex (Wells National Estuarine Research Reserve), with ~21 acres of tidal marsh, is state land. Wells and Ogunquit Marsh is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. It is home to the largest least tern colony in the state of Maine. This site is unique in that the river mouth is not hardened on either side (no jetties, etc). This marsh has SETs installed on site.

Existing Conditions

Ditching, surface pooling, tidal restrictions, existing historic farming infrastructure (ditches, dikes), and invasive species (*Phragmites*, small amount of perennial pepperweed) all affect this site. Ditch plugs exist behind Crescent Surf to the north..

Existing Projects

USFWS: Partnering with Geoff Wilson on hydrological restoration of marsh platform, supported by an MNRCP grant. Best contact: Susan Adamowicz (susan_adamowicz@fws.gov)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity.
- Assess potential for addressing tidal restriction in the northern portion.
- Assess potential for sediment placement, although this site may have lower need for sediment placement in the foreseeable future.
- Land acquisition could lead to opportunities for facilitated marsh migration.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

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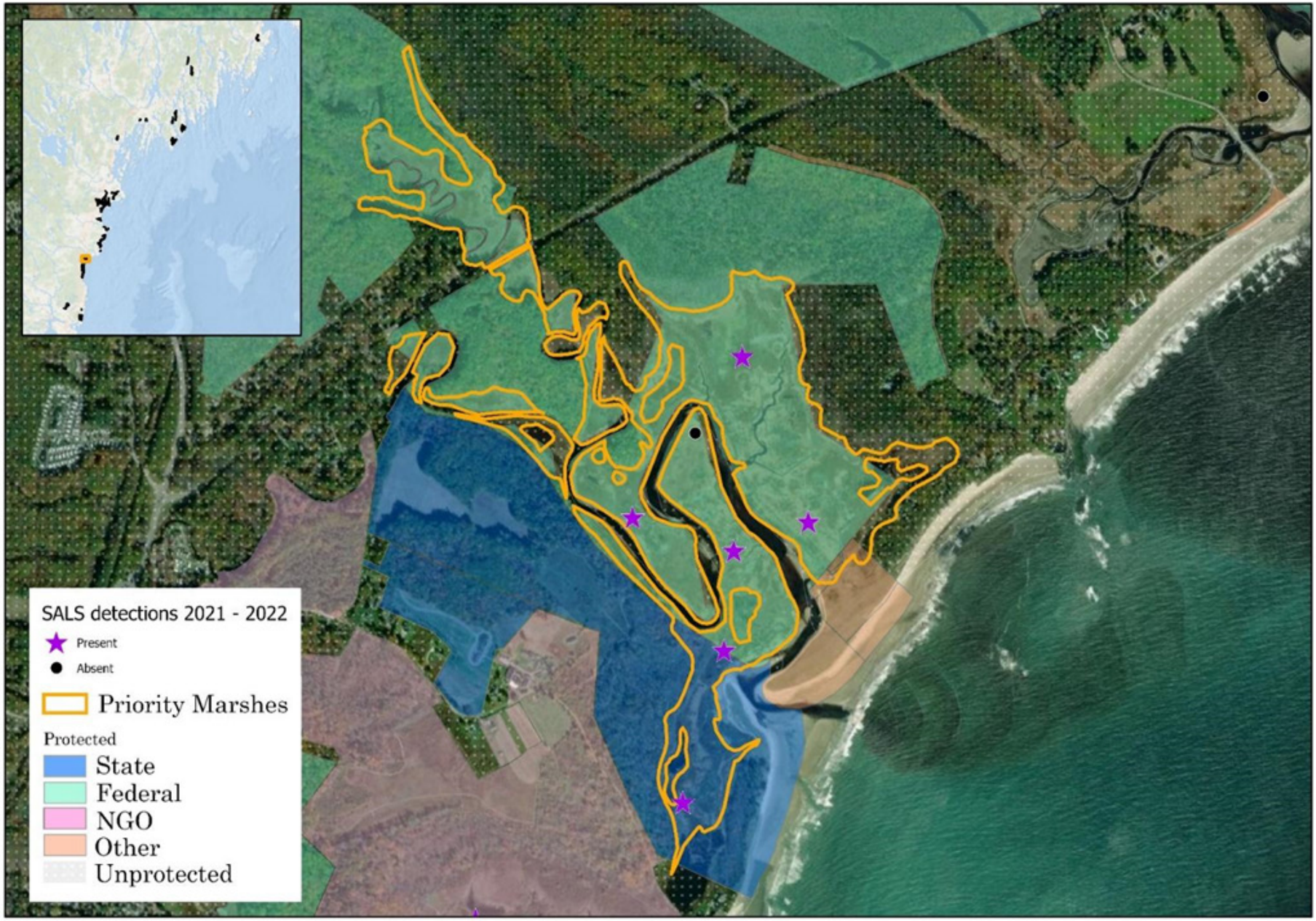
Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Little River Complex

Goose Rocks Complex in Kennebunkport – 439 acres (178 ha)

Most of this complex (267 acres) is owned by Rachel Carson NWR. The Batson River flows behind Goose Rocks beach. Important area for Least Terns, Roseate Terns, Piping Plovers, and Red Knots. This marsh has SETs installed on site.

Goose Rocks Complex is an important site for the Federally Endangered Roseate Tern. USFWS

Existing Conditions

Tidal restrictions, ditch plugs, existing historic farming infrastructure, and invasive species affect this site.

Existing Projects

USFWS: Pilot project for ditch remediation near Goose Rocks. Best contact: Susan Adamowicz (susan_adamowicz@fws.gov)

USFWS: This project removed ditch plugs, completed around the year 2000. Project is located off of Marshall Pt. Rd. Best contact: Karl Stromeyer (karl_stromeyer@fws.gov)

USFWS: Partnering with Ducks Unlimited for hydrological restoration of marsh platform through runnelling and ditch remediation and beneficial use of runnelling spoils and natural ditch plug removal in North of Marshall Pt. Rd. through a standard NAWCA grant. Implementation is fully funded. Support still needed for monitoring and adaptive management of marsh into the future. Best contact: Nicole Sanders (nicole_sanders@fws.gov), Bri Benvenuti (bbenvenuti@ducks.org)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity, removal/modification of ditch plugs.
- Assess potential for addressing tidal restriction in the northern portion..
- Assess for potential for sediment placement, specifically microtopography.
- Several stone walls exist that could be removed to facilitate marsh migration.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Goose rock beach. Jean-François Renaud
Creative Commons

Goose Rocks Complex

Granite Point – 213 acres (86 ha)

This marsh complex is split between Kennebunkport and Biddeford. Nearly half of this complex (95 acres) is owned and managed by Rachel Carson NWR. This area is an important lobster and fish nursery. This marsh has SETs installed on site.

Existing Conditions

Ditch plugs, existing historic farming infrastructure, and invasive species affect this site.

Existing Projects

USFWS: Partnering with ACJV and Geoff Wilson to restore marsh platform hydrology to reduce water pooling and mitigate ditch plugs, and ditch remediation. Designs are nearly complete, permitting planned for 2024, implementation funded, support still needed for monitoring. Best contact: Susan Adamowicz, (susan_adamowicz@fws.gov)

Town of Biddeford: This project replaced a culvert road crossing in 2023. Support is still needed for monitoring at this site. Best contact: Tom Milligan (tom.milligan@biddefordmaine.org)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity.
- Removal/modification of ditch plugs.
- Protection of buffering uplands to enable future marsh migration.
- Land acquisition is needed for more of the marsh complex.
- Remove old driveway to improve hydrology.
- Area where ditch plugs are installed has a lot of standing water – this area could eventually benefit from sediment placement.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Granite Point

Goosefare Brook – 162 acres (65 ha)

This site is important to Federally threatened Piping Plover. Ray Hennessy

Split between Saco and Old Orchard Beach, this 162-acre complex is largely owned and managed by Rachel Carson NWR (116 acres of tidal marsh). Majority of the rest of the acreage is privately owned. The complex has a major tidal restriction affecting the entire system. Acquisition of this area has been attempted but not yet successful. This marsh is an important area for Piping Plover and Least Terns (federally listed species). A section close to Camp Ellis (USACE project) is classified as "Impaired Waters" by EPA, which is a level of designation indicating potentially poor/contaminated water. This contamination could likely influence the salt marsh at this site. Previous dredging at nearby Camp Ellis has dislodged wood chips/detritus that affects ecosystem function. A Self-Regulating Tide Gate exists near Old Orchard beach side of the marsh. An additional restriction exists on the old trolley line running through this marsh parcel. This marsh has SETs installed on site.

Existing Conditions

Tidal restrictions, existing historic farming infrastructure, invasive species.

Existing Projects

Town of Saco: Partnering with USFWS through FLAP project to improve pedestrian trail that goes into adjoining upland. Three tidal restrictions exist along the trail, one of which will be addressed through this project. The proposed work will replace a failed culvert (already partially removed by the Town of Saco) with a bridge. Design and Implementation funded for removal of first tidal restriction. Support still needed for removal of the remaining 2 restrictions and monitoring. Best contact: Karl Stromeyer (karl_stromeyer@fws.gov)

USFWS: *Phragmites* control through tidal restriction removal. Best contact: Susan Adamowicz (susan_adamowicz@fws.gov)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

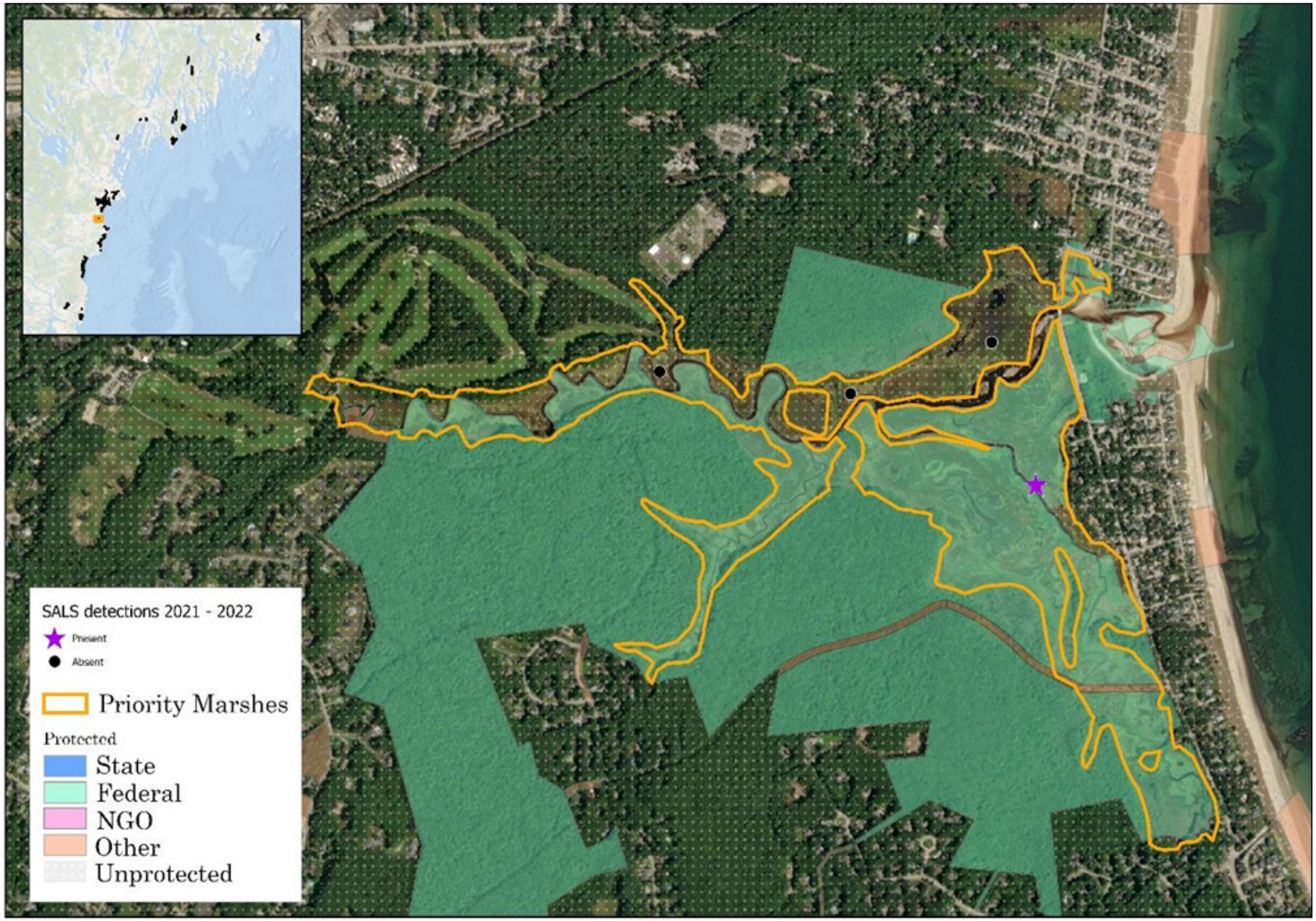
Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity.
- Assess potential for addressing tidal restrictions (Rt. 9 and trail crossing and old trolley lines).
- Assess potential for land protection/marsh migration corridors (Refuge owns portions of land within the migration area).
- Assess need for sediment placement due to long-term lack of sediment from tidal restrictions.
- Sparrow populations are sparser at this site than in other areas; could be a good option for experimental pilot projects.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Saltmarsh Sparrow. Bri Benvenuti



Goosefare Brook

Scarborough Marsh – 2,605 acres (1,054 ha)

Scarborough Marsh is Maine's largest salt marsh complex (<2600 acres). About 80% of it is owned by the state in the Scarborough Wildlife Management Area. Scarborough Marsh is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. Jones Creek area (former Snow Cannery) may be up for sale within the foreseeable future. Nonesuch River is regularly dredged.

Existing Conditions

Ditching, ditch plugs, and tidal restrictions all affect this marsh. A road and culvert modification affect hydrology here, and *Phragmites* exists throughout the marsh, including along terrestrial borders.

Existing Projects

Scarborough Land Trust: Multi-partner proposal was recently submitted to NOAA CZM for design work on a portion of the marsh as well as tidal restriction monitoring/design. Best contact: Andrew Mackie (amackie@scarboroughlandtrust.org), Ryan Robicheau (Ryan.robicheau@maine.gov),

Maine Department of Transportation: Community engagement grant to address infrastructure, notably Rt. 1 and Pine Pt. Rd. Maine Audubon and MDIFW will participate in these community engagement efforts. Best contact: Ryan Robicheau (Ryan.robicheau@maine.gov)

MDIFW: 10-acre acquisition underway for marsh migration (north of Rt. 1).
Best contact: Ryan Robicheau (Ryan.robicheau@maine.gov)

Eastern Trail Alliance: Project addressing former dam underneath old rail crossing under Nonesuch river. Implementation is largely funded, support for monitoring still needed.
Best contact: Chelsey Berlin (chelsey.berlin@easterntrail.org)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). This marsh has also been intensively studied by SHARP including demographic work. Best contact: Kate Ruskin (katharine.ruskin@maine.edu)

Recommended Management / Next Steps To Management Action

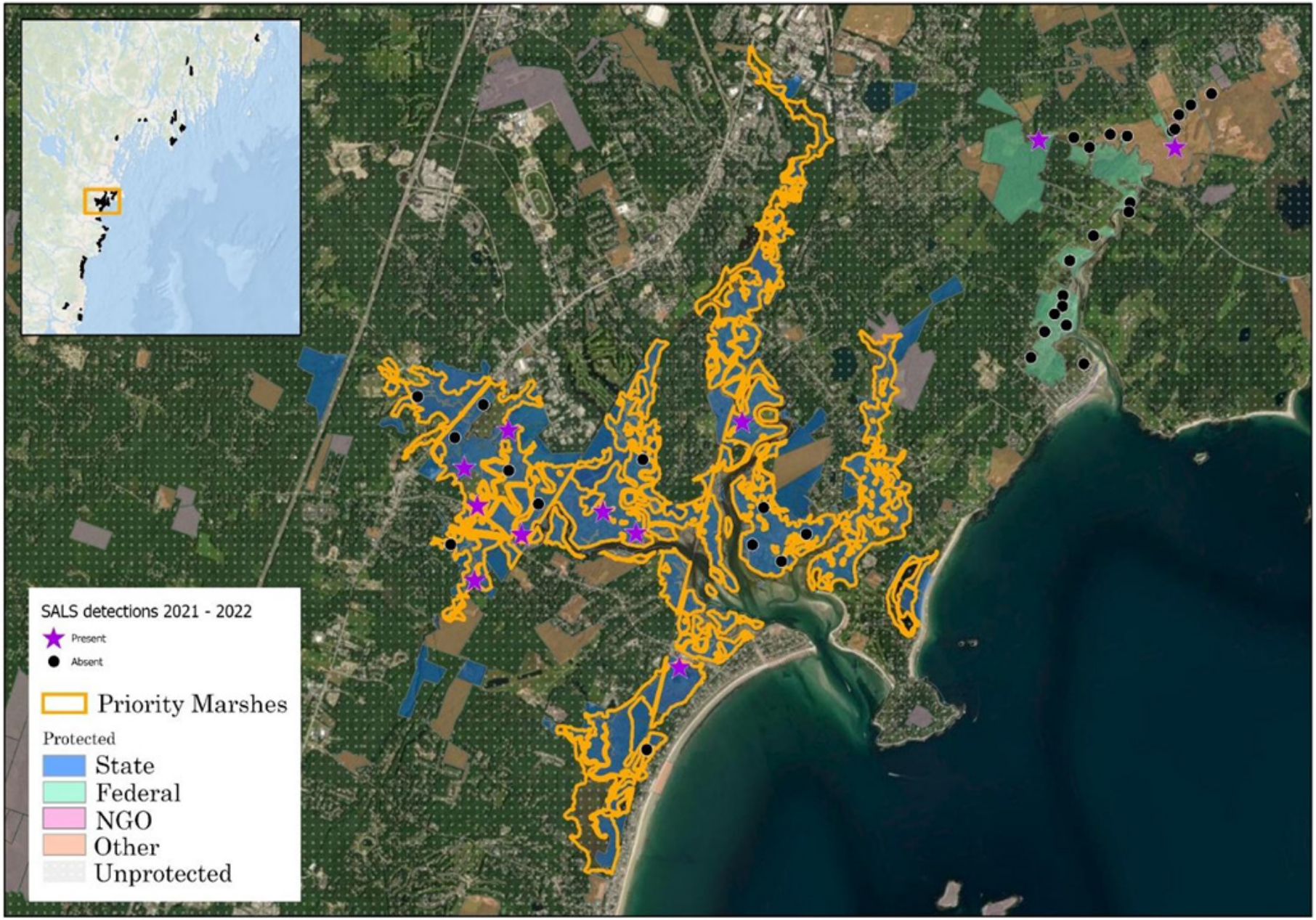
- Conversation with local managers to implement ditch plug removal.
- Land protection around marsh boundary.
- Resurvey Saltmarsh Sparrow population in Jones Creek area.
- Assess hydrology for pooling and ditching severity and potential sediment placement.
- Assess for *Phragmites* control.
- Assessment for facilitated marsh migration.
- Engage with Maine Department of Transportation (DOT) effort to help inform active restoration.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Notes: Jones Creek parcel is a potential source population for Saltmarsh Sparrows. This comes from data from 2012 - 2014; Recommend no restoration occurs before more the area is resurveyed for sparrows. Birders refer to this area as Pel-Reco (named after the former canning plant). Severe tidal restrictions are in place there currently. This is also a Maine Marsh Monitoring Program Sentinel Site. To avoid disturbance to fragile, long-term research plots, please coordinate with the Maine Coastal Program prior to planning.

Scarborough Marsh. Greg Shriver



Scarborough Marsh

Spurwink River Complex – 434 acres (176 ha)

This complex is immediately northeast of Scarborough Marsh (see map above), in Scarborough and Cape Elizabeth. A portion of this marsh system (near Sawyer Road) has a hydrological study completed by the Towns of Cape Elizabeth and Scarborough, the Wells National Estuarine Research Reserve (NERR), and other partners, which assessed the culvert/tidal restriction at Sawyer Road & Rt. 77. Significant areas in this complex are owned by federal (USFWS/Rachel Carson NWR), state, and municipal partners. There is a protected area within the Spurwink River Complex (William Jordan Farm Conservation Easement) which includes 2 acres of tidal marsh on State land along the Spurwink River in Scarborough/Cape Elizabeth. The Town of Cape Elizabeth owns significant marsh acreage as well as adjacent upland areas and freshwater / brackish wetlands. Scarborough Marsh is a Focus Area of Statewide Ecological Significance under the State's Beginning with Habitat program.

Existing Conditions

Tidal restrictions, ditching, existing historical farming infrastructure (ditches, dikes), present day wastewater infrastructure, and invasive species *(Phragmites*) all affect this marsh.

Existing Projects

Town of Cape Elizabeth: Partnering with USFWS, Wells NERR, Town of Scarborough, and Casco Bay Estuary Partnership to implement a Maine Natural Resource Conservation Program funded project to remove Sawyer Rd.across from the marsh and restore adjacent marsh surface hydrology through runnelling and ditch remediation. A separate Town of Cape Elizabeth study is in the planning phase to develop alternatives for raising the Spurwink Road crossing of the marsh. This study will include concepts for restoration of tidal hydrology beneath the road. Current funding applications cover design (all sites) and permitting, implementation, monitoring (Sawyer Rd. only). Additional support needed to permit, implement, and monitor the rest of design for this marsh. Best contact: Maureen O'Meara (maureen.omeara@capeelizabeth.org)

Runneling and ditch remediation can restore the hydrology on a marsh. USFWS

Town of Cape Elizabeth: Replaced culvert on Willow Brook in 2022. Implementation is complete (rip rap was removed winter 2023/2024), monitoring underway. Project is fully funded. Best contact: Maureen O'Meara (maureen.omeara@capeelizabeth.org)

USFWS: Funded by USFWS Invasive Plant program, small project site exploring innovative design to control *Phragmites* without herbicide. Project is fully permitted and partially implemented. Support is still needed for monitoring. Best contact: Susan Adamowicz (susan_adamowicz@fws.gov)

Existing Sparrow Data

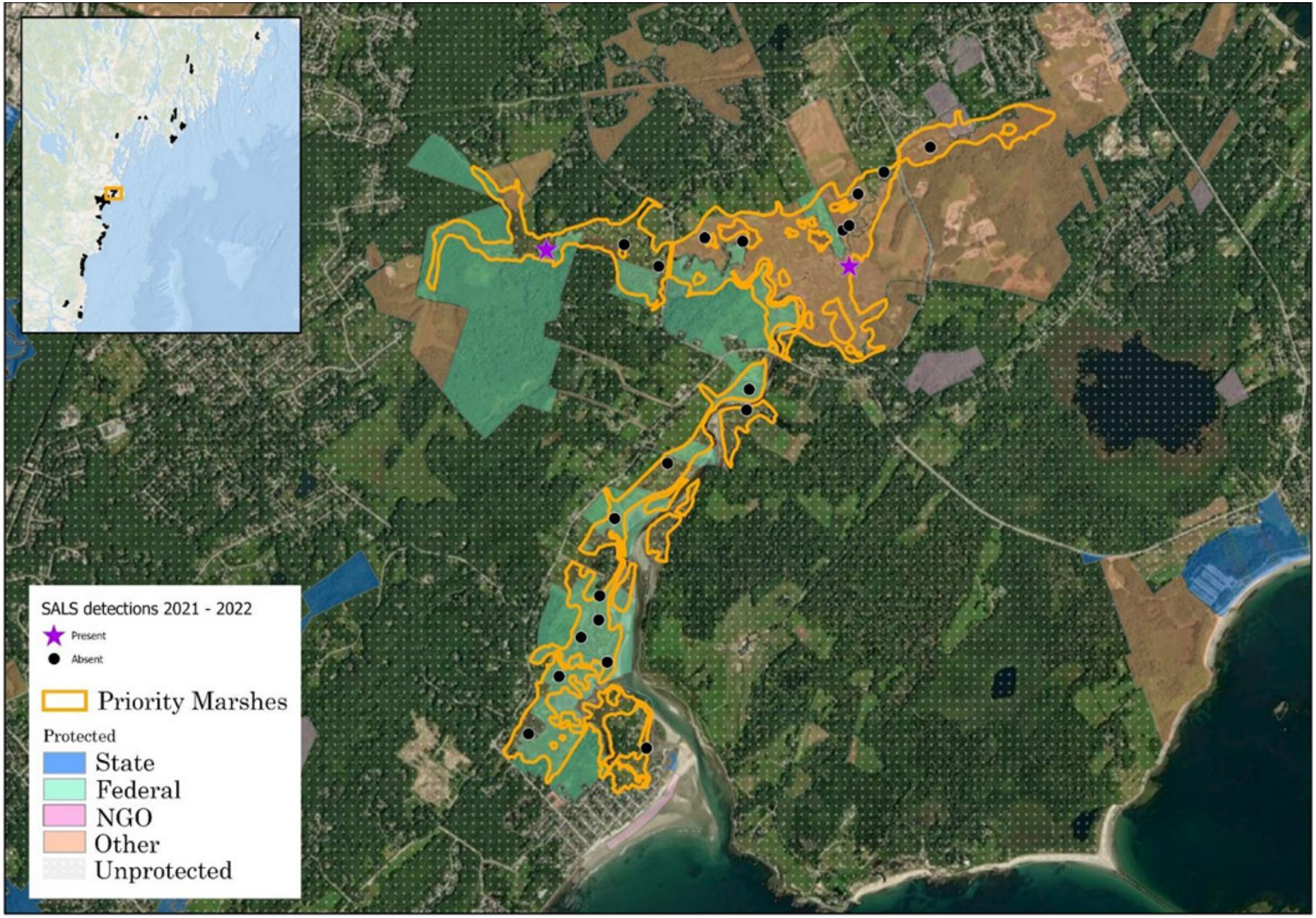
Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). There are 20+ years of point count and demographic monitoring/productivity data for portions of the area collected by SHARP and Rachel Carson NWR. Local Saltmarsh Sparrow population estimates are also available through Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

- Assess site hydrology for restoration of tidal flow.
- Protect buffering uplands adjacent to the site to protect the surrounding water resources (i.e. improved water quality) and enable marsh migration.
- Reanalyze local sparrow data for updated population estimates.
- Build partnerships with municipal, private, non-profit, and community engagement partners in Cape Elizabeth and Scarborough including State DOT, Cape Elizabeth and Scarborough public works and planning departments, Cape Elizabeth Land Trust, Scarborough Land Trust, and Black Point Corporation.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Spurwink River Complex

Cousins River Complex – 128 acres (52 ha)

Part of this complex in Yarmouth and Freeport was conserved as part of a NAWCA grant project. There is low to moderate potential for marsh migration around this complex. This area falls within the Maquoit and Middle Bay Focus Area of Statewide Ecological Significance under the State's Beginning with Habitat program.

Existing Conditions

Ditching, embankments, drainage/hydrology setbacks resulting in saturated marsh with some pooling, potential runoff from adjacent highways. Tidal restriction affects marsh. Maine DOT has designs in place to replace the Route One bridge, the lowermost tidal crossing, with construction planned to begin in 2025 or 2026. The extent of the resulting alteration to tidal hydrology is unknown.

Existing Projects

USFWS: Collaborating with Casco Bay Estuary Partnership, Maine Coastal Heritage Trust, Freeport Conservation Trust, and Royal River Conservation Trust to collectively protect and restore Cousin's River marsh through acquisition of marsh and adjacent uplands and restoration of marshland under protection. Best contact: Matt Craig (matthew.craig@maine.edu), Julia Kemnitz (julia_kemnitz@fws.gov)

Ducks Unlimited: Ducks Unlimited and Maine Coast Heritage Trust have a proposal under consideration for restoration plans in this marsh for 100 acres within this parcel.
Best contact: Bri Benvenuti (bbenvenuti@ducks.org), Jeremy Gabrielson (jgabrielson@mcht.org)

Existing Sparrow Data

No SHARP or eBird data available. Low predicted occupancy for Saltmarsh Sparrows.

Recommended Management / Next Steps To Management Action

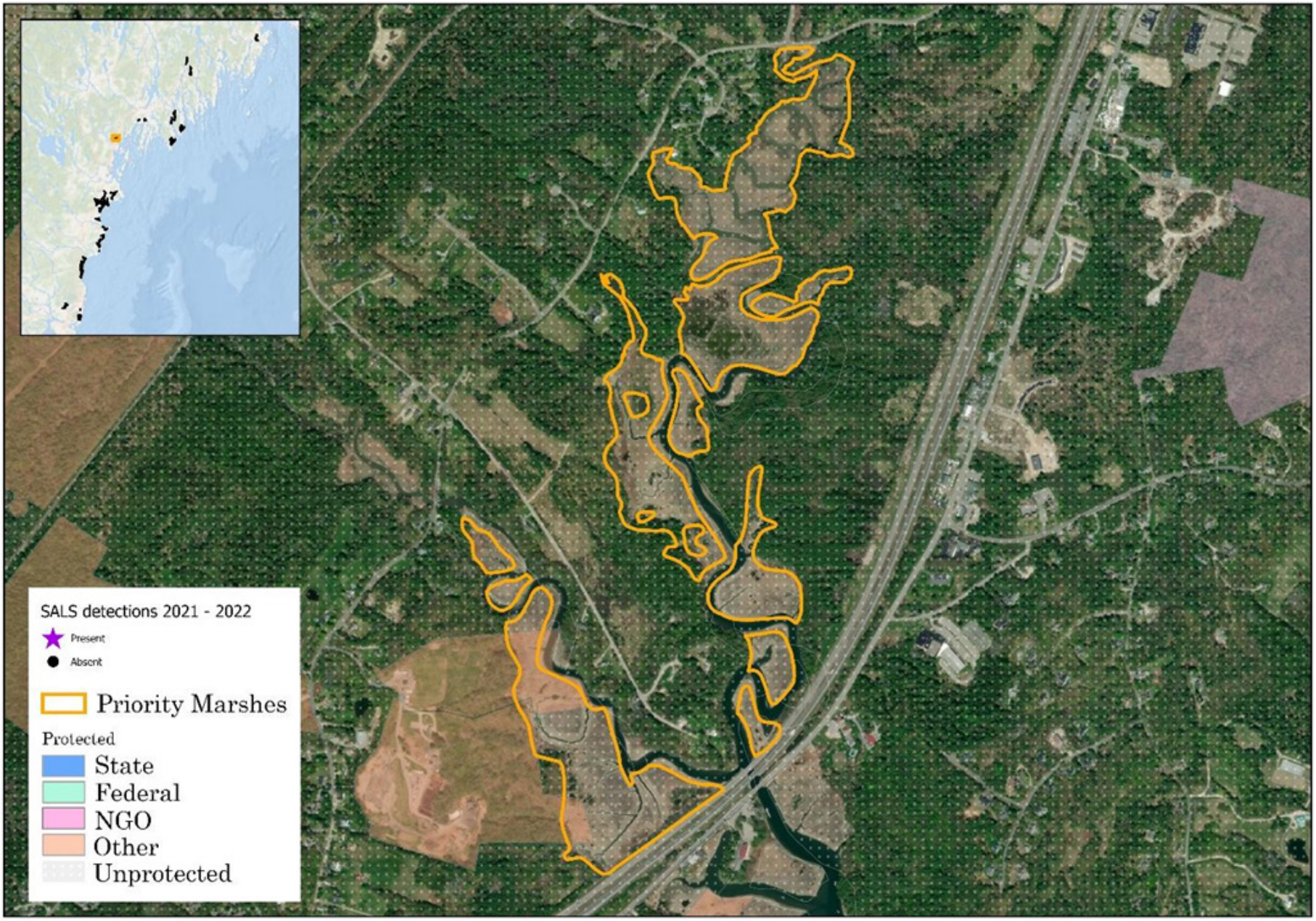
- Conversation with local managers to implement ditch plug removal.
- Land protection of buffering uplands to enable marsh migration.
- Explore the site for potential sediment placement on a small scale through creation of microtopography.
- Build partnerships with municipal, private, non-profit, and community engagement partners.
- Hydrological assessment.
- Build partnerships with municipal, private, non-profit, and community engagement partners. Town of Freeport, Town of Yarmouth.

Salicornia spp., also known as pickleweed, thrive in the tidal marshes in Maine. Mo Correll

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Nelson's (left) and Saltmarsh (right) sparrows coexist and hybridize in Maine tidal marshes.
Bri Benvenuti



Cousins River Complex

Gamble Marsh (Dept. of Inland Fisheries and Wildlife) – 53 acres (21 ha)

Located in Maquoit Bay. Nearly half (21 acres) of this tidal marsh is State-owned. Maquoit and Middle Bay is a Focus Area of Statewide Ecological Significance under the State's Beginning with Habitat program.

Existing Conditions

This marsh has ditching, embankments, drainage/hydrology setbacks resulting in saturated marsh with some pooling. There is potential future threat of nutrient input from an adjacent landowner (farm fields are currently not in production but are mowed infrequently). There are at least three places where tidal exchange in the marsh has been altered by built structures including roads, dams, and remnant fords. The Town of Brunswick is concerned about water quality in Maquoit Bay and is actively partnering with Casco Bay Estuary Partnership and other partners to monitor and protect water quality.

Existing Projects

Ducks Unlimited: Gamble Marsh design/restoration & culvert/tidal restriction design included in a 2024 NOAA Transformational proposal that also includes Cousins Marsh and Drakes Self Regulating Tidegate. Best contact: Bri Benvenuti (bbenvenuti@ducks.org)

Town of Brunswick: Partnering with MDIFW, Maine Geological Survey, and Casco Bay Estuary Partnership on a living shoreline pilot project. Implementation is complete, with periodic adaptive management actions resulting from ongoing project monitoring. Support is needed for maintenance of living shoreline and continued monitoring. Best contacts: Ashley Charleson (acharleson@brunswickme.org), Pete Slovinsky (peter.a.slovinsky@maine.gov)

Existing Sparrow Data

Saltmarsh Sparrows present and confirmed breeding at this site historically (Maxwell et al. 2018), and as recent as 2022. This marsh is the site of past SHARP demographic plot (data from years 2016-2017, 2020, 2022). Best contact: Logan Maxwell (logan.maxwell@unh.edu), Adrienne Kovach (akovach@unh.edu)

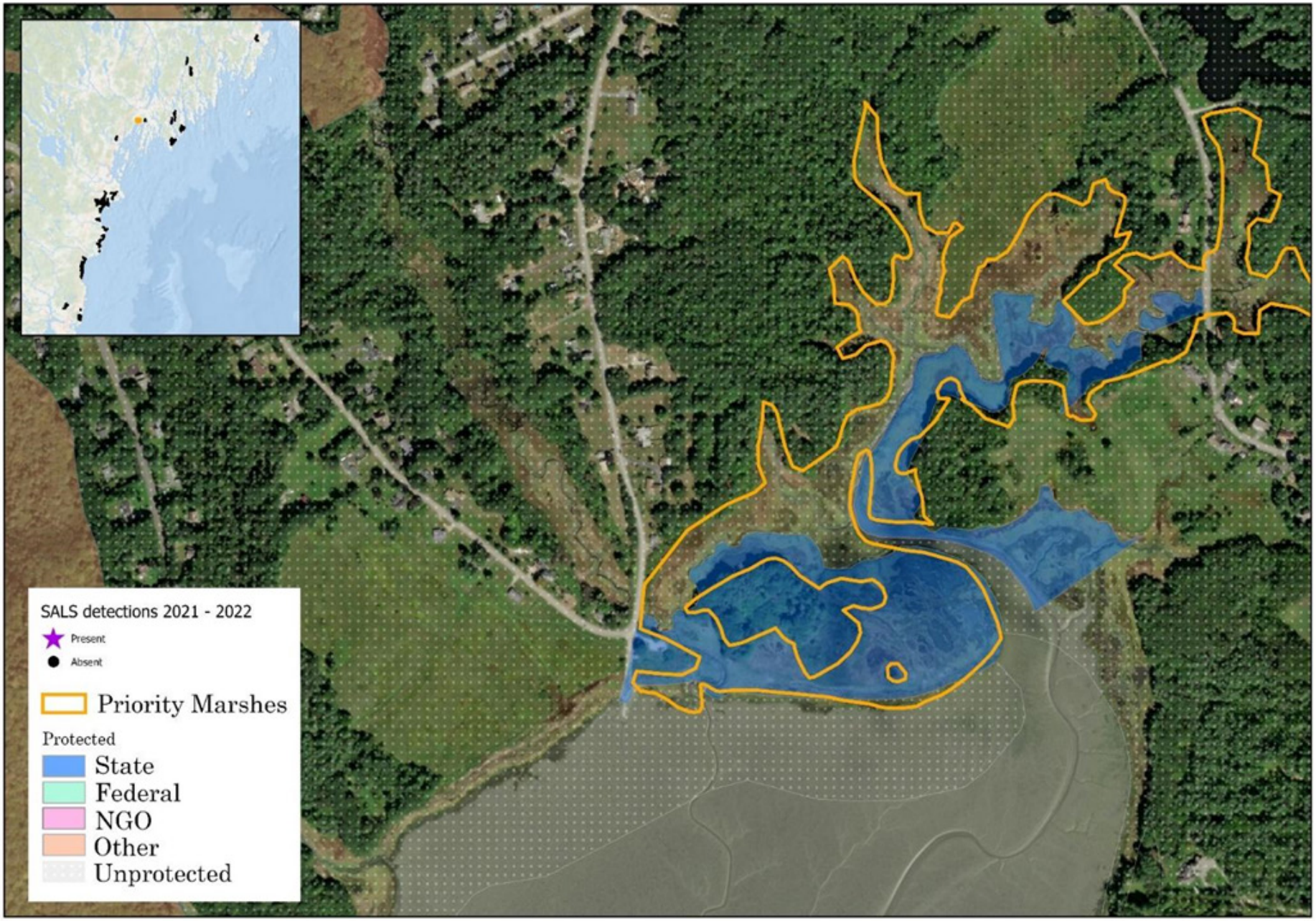
Recommended Management / Next Steps To Management Action

- Assess site hydrology to address drainage blocks.
- Assess nutrient input from adjacent lands.
- Protect buffering uplands to enable marsh migration.
- Hydrological assessment.
- Build partnerships with municipal, private, non-profit, and community engagement partners, including existing Saltmarsh Sparrow researchers who can aid in delineating the relatively small area of marsh where nesting occurs to guide restoration actions.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Gamble Marsh is a confirmed breeding site for Saltmarsh Sparrow. USFWS



Gamble Marsh

Popham Beach – 608 acres (246 ha)

This salt marsh complex is largely protected; 192 acres is in Popham Beach State Park and another 187 acres is within the Morse Mountain Preserve. Kennebec Estuary is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

Existing Conditions

Ditching, embankments, and a canal placed in marsh in the 1950s all affect this site. Some ditches are collapsing due to age, and there is not much standing water. There are large stands of *S. patens* and higher *Ammospiza* sparrow densities for the area. Tidal influence comes from the north.

Existing Projects

Bates College: Partnering with USFWS & SMARTeams to repair marsh platform hydrology in Morse Mountain Preserve (west side of rt. 209). No additional support is needed. Best contact: Bev Johnson (bjohnso3@bates.edu)

Existing Sparrow Data

Saltmarsh Sparrows are present and confirmed breeding at this site (2021/2022; SHARP 2023). SHARP demographic monitoring plot 2016 – 2022. Best contact: Logan Maxwell (logan.maxwell@unh.edu), Adrienne Kovach (akovach@unh.edu)

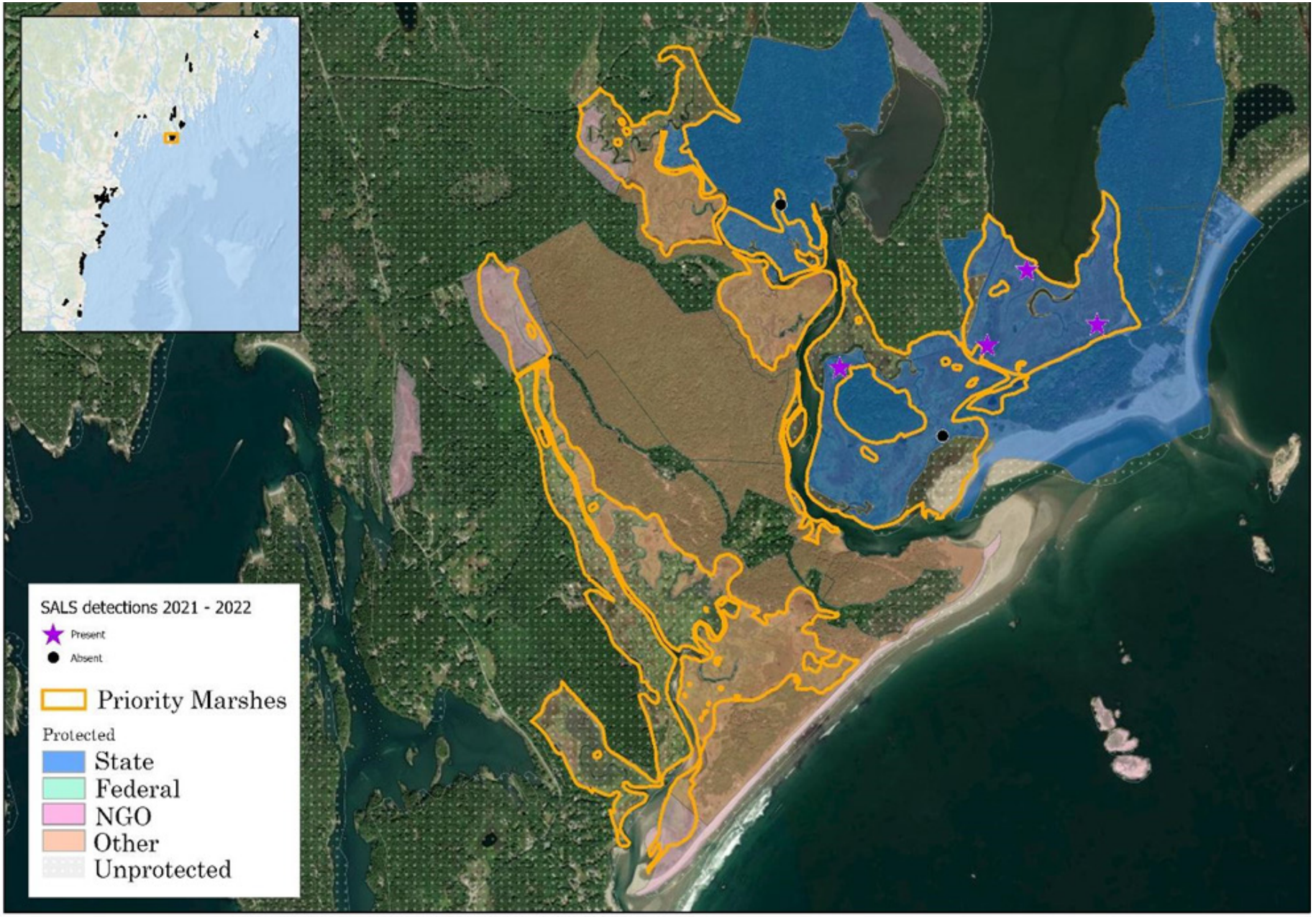
Recommended Management / Next Steps To Management Action

- Assess hydrology for potential ditch remediation.
- Continue to build partnerships with municipal, private, non-profit, and community engagement partners, including existing Saltmarsh Sparrow researchers with active projects to determine any potential restoration site locations.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	N
Repair hydrology - address ditch plugs	N
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	N
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	N
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Note: This is a Maine Marsh Monitoring Program Sentinel Site. To avoid disturbance to fragile, long-term research plots, please coordinate with Maine Coastal Program prior to planning visits.



Popham Beach

Kennebec River Complex –582 acres (236 ha)

This complex includes several disjunct areas, the two most major described below, and in "Honorable Mention". Kennebec Estuary is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

Existing Conditions

Ditching, berms/embankments, pooling, and a tidal restriction all affect this site.

Existing Projects

Kennebec Estuary Land Trust: Partnering with USFWS, DIFW, TNC, USFWS, Town of Georgetown to remove tidal restriction through road crossing (Flying Point Rd.). Funded through MNRCP to repair marsh hydrology. Hydrological modeling and design completed spring 2023, initial implementation of embankment removal planned for winter 2024. Support is still needed for monitoring. Best contact: Ruth Indrick (rindrick@kennebecestuary.org)

Existing Sparrow Data

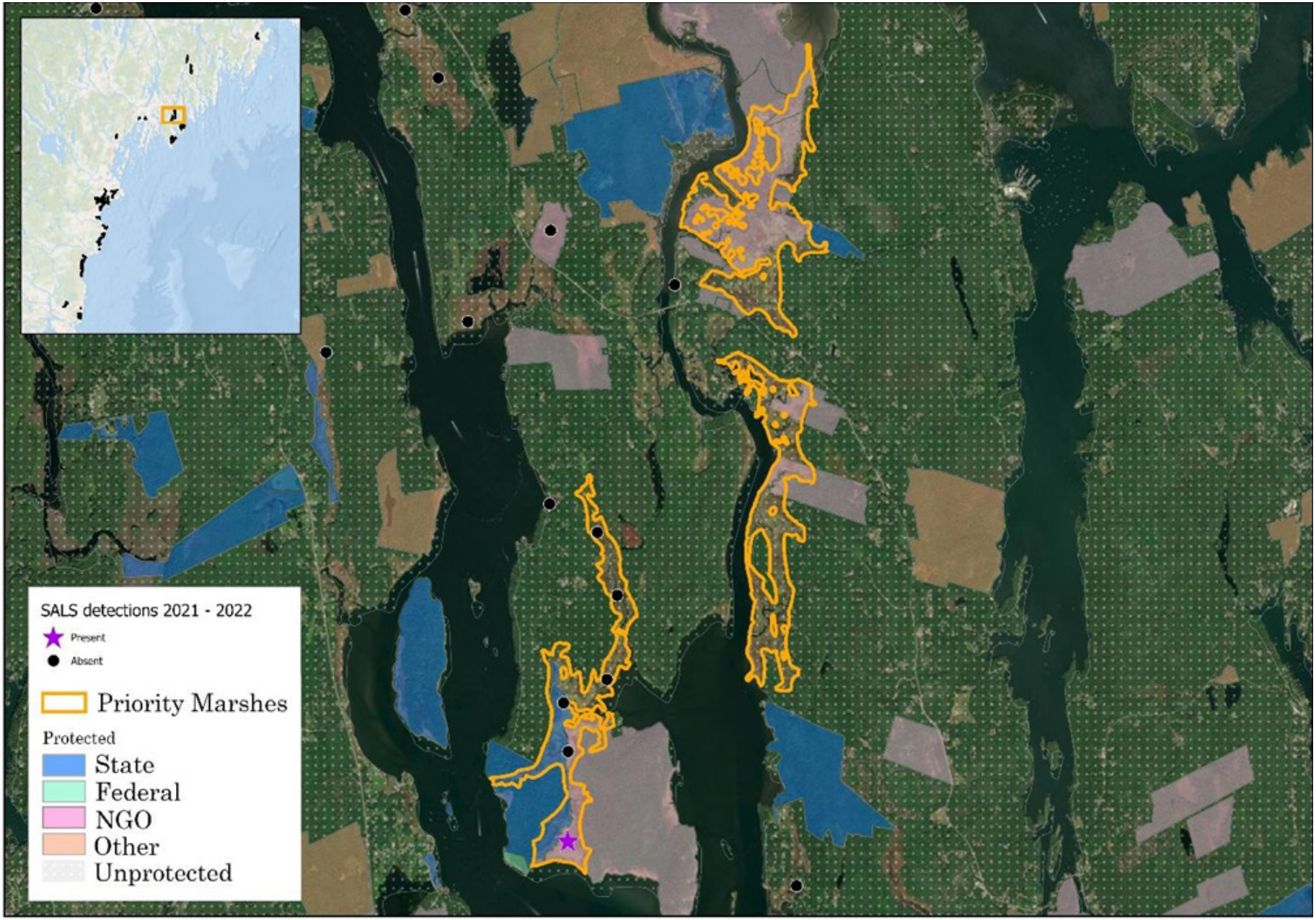
Saltmarsh Sparrows are present at this site (2021-2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

- Assess site hydrology.
- Build partnerships with municipal, private, non-profit, and community engagement partners, including Town of Brunswick.

Attributes

Sediment placement	N
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Kennebec River Complex

Reid State Park – 457 acres (185 ha)

This complex includes several disjunct parcels, and most of it is in conservation ownership. ~221 acres of tidal marsh is on state land, and Kennebec Estuary Land Trust owns ~56 acres. Kennebec Estuary is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

Existing Conditions

A road bisects the park which alters hydrology to the upriver portion of marsh. More information is needed about site-level characteristics for this area.

Existing Projects

Kennebec Estuary Land Trust: Partnering with USFWS and MDIFW to repair surface hydrology. Assessment of the site is underway through SMARTeams. Applied to MNRCP to support design, permitting, implementation, and monitoring. Support is still needed for monitoring. Best contact: Ruth Indrick (rindrick@kennebecestuary.org)

MDIFW: Project to acquire 11 acres of salt marsh on Little River is underway. Closing planned end of summer 2023. Best contact: Ryan Robicheau (ryan.robicheau@maine.gov)

Existing Sparrow Data

Saltmarsh Sparrows are present at this site (2021/2022; SHARP 2023), breeding has not been confirmed.

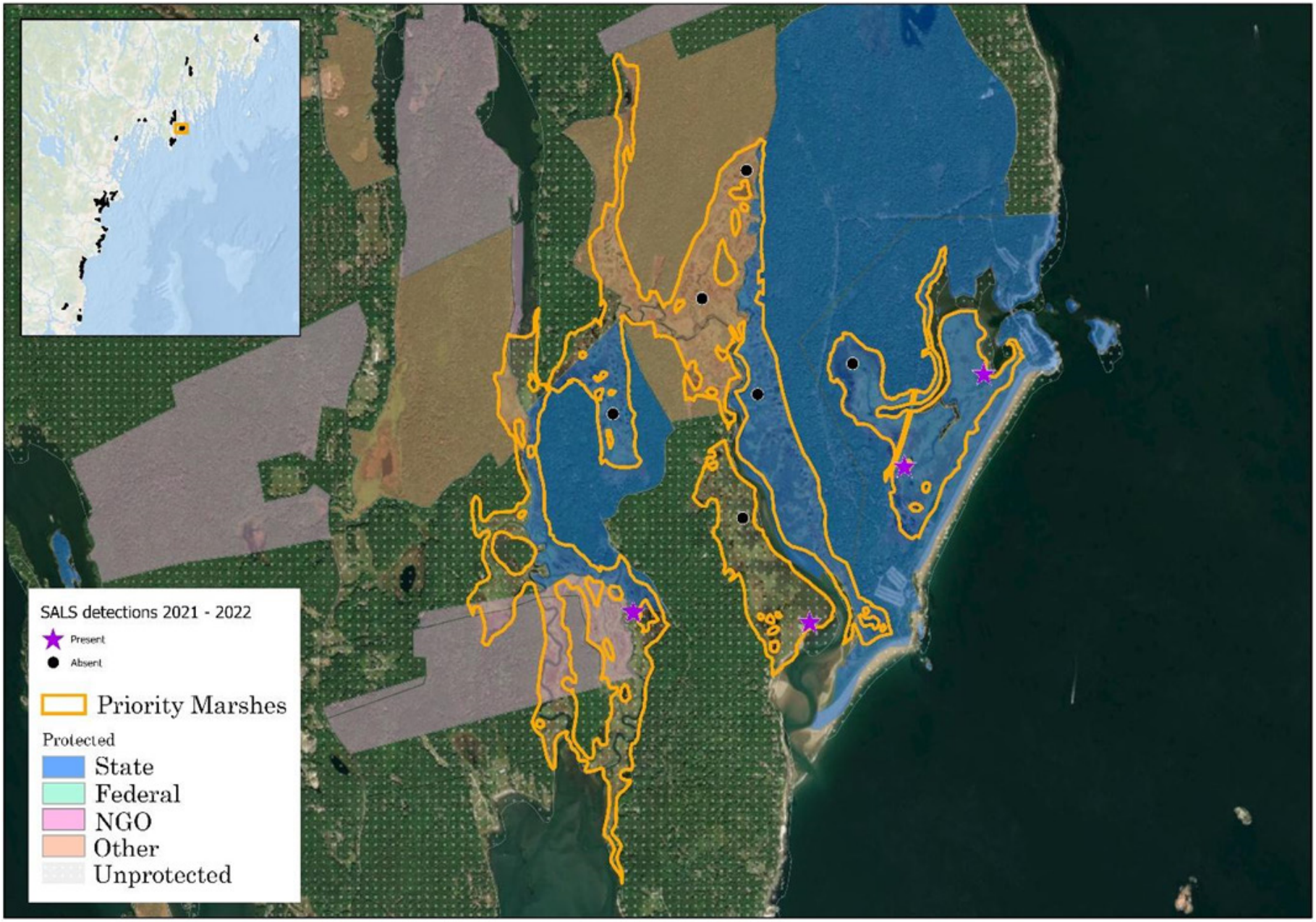
Recommended Management / Next Steps To Management Action

- Assess site hydrology.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Note: This is a Maine Marsh Monitoring Program Sentinel Site. To avoid disturbance to fragile, long-term research plots, please coordinate with Maine Coastal Program prior to planning visits.



Reid State Park

Lower Sheepscot Complex – 364 acres (147 ha)

This ~130 acre complex on tributaries (Deer Meadow Brook and Marsh River) of the Sheepscot River is north of Route 1 in the town of Newcastle, between Wiscasset and Damariscotta. Most of this marsh complex is in conservation ownership, with the 123-acre Guptill Island owned by the Midcoast Conservancy on its Eastern side, and a 650-acre state-held conservation easement on its Western side. Sherman Lake Wildlife Management Area is just to the south of this complex, immediately south of Route 1. Much of the land adjacent to Sherman Marsh is owned by the Coastal Rivers Conservation Trust (formerly Damariscotta River Association) and Maine Dept. of Inland Fisheries and Wildlife. The Lower Sheepscot River is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

Existing Conditions

Low to moderate migration potential. More information is needed about site-level characteristics for this area.

Existing Projects

There are no known salt marsh restoration projects at this site.

Existing Sparrow Data

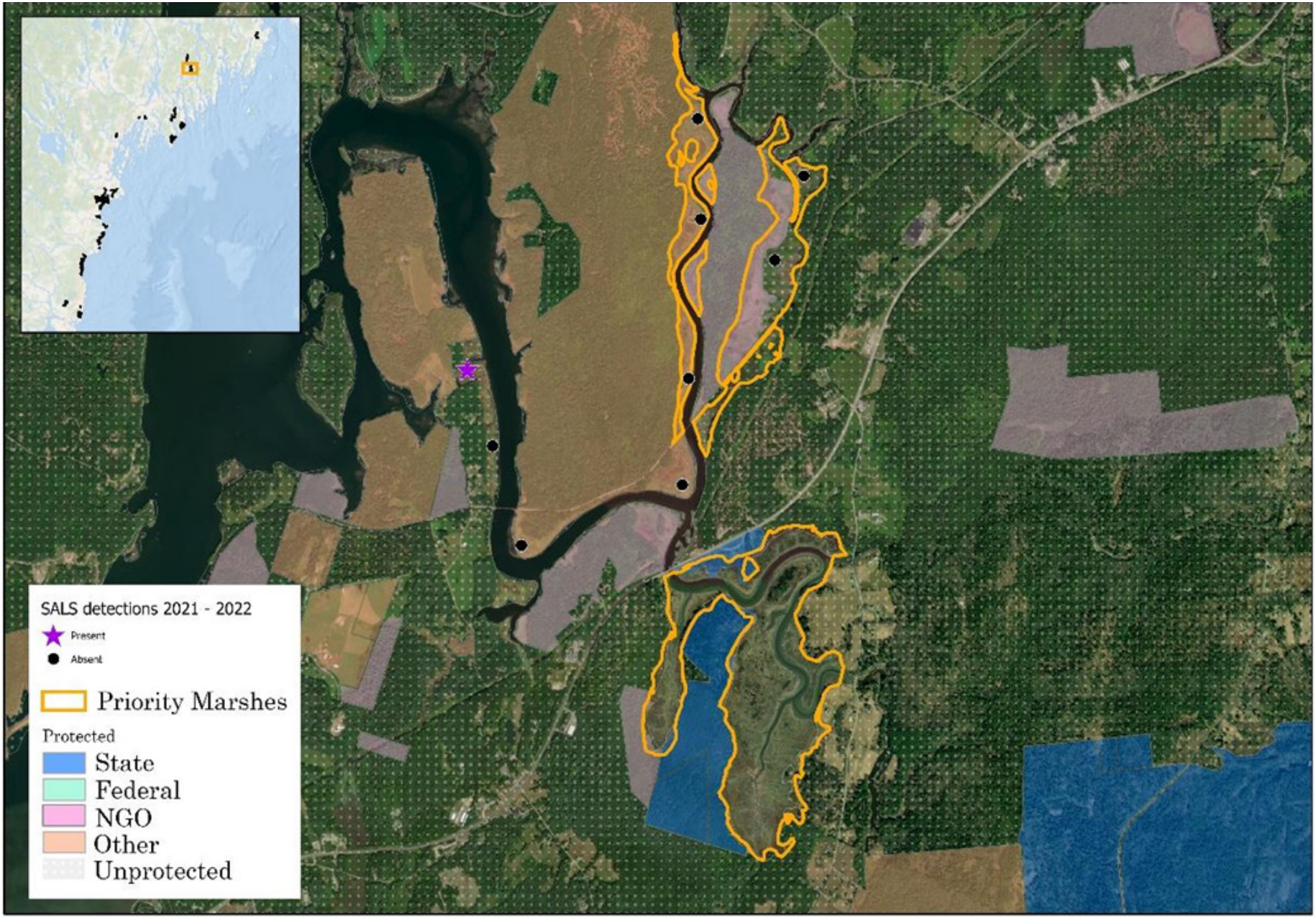
Saltmarsh Sparrow has historically been present at this site (2011/2012) but in the most recent round of regional surveys (2021/2022); breeding has not been confirmed at this site.

Recommended Management / Next Steps To Management Action

- Land protection of buffering uplands adjacent to the site to enable future marsh migration.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Lower Sheepscot Complex

Weskeag Marsh (Waldo Tyler WMA) – 310 acres (125 ha)

This 310-acre salt marsh complex in South Thomaston is largely state owned, with some portions in land trust ownership. The southern/western portion adjoins an open bay and some parts have been ditched, plugged, and otherwise modified. The Weskeag Creek is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

Existing Conditions

Ditching, ditch plugs, and a tidal restriction all affect this site.

Existing Projects

Ducks Unlimited: Partnering with MDIFW to repair marsh hydrology including ditch plug removal/modification. MNRCP funding covers design, permitting, implementation, and monitoring for a portion of the marsh. Additional support needed for restoration for the rest of this parcel. Best contact: Bri Benvenuti (bbenvenuti@ducks.org)

Existing Sparrow Data

Saltmarsh Sparrows have been detected at this site (2021/2022; SHARP 2023); breeding has been confirmed. This site represents the northern end of the Saltmarsh Sparrow breeding range and zone of overlap with Nelson's Sparrow (i.e. the hybrid zone) and is an area of importance in terms of maintaining genetic diversity for both species.

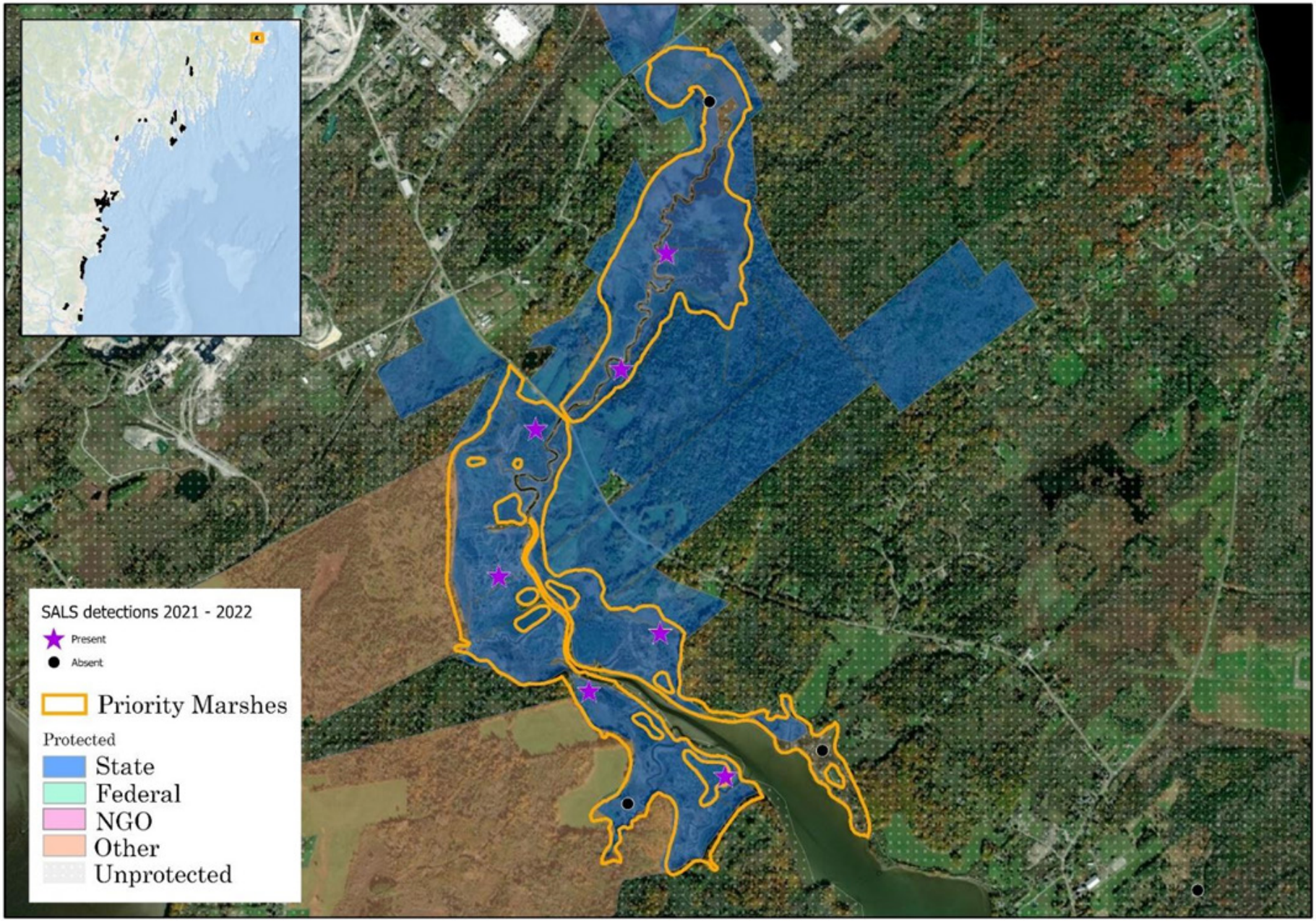
Recommended Management / Next Steps To Management Action

- Assess site hydrology including pooling and ditching severity, removal/modification of ditch plugs.
- Assess opportunities for land acquisition of migration space around this parcel.
- Assess marsh migration opportunities.
- Build partnerships with municipal, private, non-profit, and community engagement partners (George's River Land Trust).

Attributes

Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	Y
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Tidal marsh land acquisition / protection	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (*Phragmites australis*, etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y

Note: This is a Maine Marsh Monitoring Program Sentinel Site. To avoid disturbance to long-term research plots, please coordinate with Maine Coastal Program prior to planning site visits



Weskeag Marsh

Honorable Mention

Weskeag Marsh (Waldo Tyler WMA) – 310 acres (125 ha)

This marsh is in Brunswick, just east of Maquoit Bay. Portions of this complex are owned by the Brunswick-Topsham Land Trust, Harpswell Heritage Land Trust, and Maine Department of Inland Fisheries and Wildlife (through easements). Maquoit and Middle Bay is a Focus Area of Statewide Ecological Significance under the State's Beginning with Habitat program. One or more agricultural parcels in close vicinity to this parcel have agricultural easements.

Existing Conditions

This marsh does not have public access and is difficult to visit. The marsh platform has ditching, embankments, drainage/hydrology setbacks resulting in saturated marsh with internal pooling and standing water. There is a limited future threat of nutrient input from adjacent landowners (farm fields are currently not in production and are mowed infrequently).

Existing Projects

There are no known existing salt marsh restoration projects at this site.

Existing Sparrow Data

No data is available.

Recommended Management / Next Steps To Management Action

- Assess site hydrology to address drainage blocks.
- Assess nutrient input from adjacent lands.
- Protect buffering uplands to enable marsh migration.
- Build partnerships with municipal, private, non-profit, and community engagement partner (Maine Coast Heritage Trust, Harpswell Heritage Land Trust, MDIFW, Casco Bay Estuary Partnership, private landowners)

Kittery (Brave Boat Harbor) Complex – 310 acres (125 ha)

This marsh in Kittery is mostly owned by Rachel Carson NWR, 268 acres of tidal marsh. Despite being a relatively large marsh, this complex currently has relatively few Saltmarsh Sparrows. Brave Boat Harbor is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program. This marsh has SETs installed on site.

Existing Conditions

Ditching, ditch plugs. *Typha* spp. and invasive *Phragmites* stands.

Existing Projects

There are no known existing salt marsh restoration projects at this site.

Existing Sparrow Data

Saltmarsh Sparrows are present (2021/2022; SHARP 2023); breeding has not been confirmed. Local Saltmarsh Sparrow population estimates are available through Rachel Carson NWR.

Recommended Management / Next Steps To Management Action

- Assess site hydrology including the trolly line restriction, pooling, and ditching severity.
- Assess potential for ditch plug removal.
- Build partnerships with municipal, private, non-profit, and community engagement partners.

Biddeford Pool - 135 acres (55 ha)

This is a popular birding spot, most of which (76 acres) is in federal ownership as part of Rachel Carson NWR. This area is particularly important for shorebirds and waterfowl; the narrow strips of marsh do not appear to be favored by Saltmarsh Sparrows. There is a dredging operation nearby, but it is on a long rotation and was dredged in 2020. Some of the marsh (on the northwest edge) has ditch plugs. This marsh has SETs installed on site.

Dyer Marsh – 206 acres (83 ha)

This salt marsh complex is along the Sheepscot River in Newcastle. A small portion is owned by the Midcoast Conservancy. The Lower Sheepscot River is a Focus Area of Statewide Ecological Significance under the state's Beginning with Habitat program.

York Harbor – 24 acres (10 ha)

One parcel on the lower York River (Wheeler Marsh) is in municipal ownership. Of the 24 acres of marsh there, 22 is publicly owned (Maine Minor Civil Division). Approximately 18 acres of this marsh were created in 1961 when dredge spoils were deposited on mud flats. This site was enhanced for improved marsh function (2004) and monitored by the Wells National Estuarine Research Reserve. This site has several challenges, including being bounded by Route 103 and the marina, which can impede bird community assessment at this site.

Kennebunkport – 23 acres (9 ha)

This parcel is owned by the Kennebunkport Conservation Trust. The parcel is ~23 acres, but most of that is high marsh.

Lower Kennebec River Complex (see "Kennebec River Complex" in Priority Marsh section)

There are several areas that merit further examination and consideration, such as Winnegance Creek. See map above that includes Swett Marsh WMA.

Future Considerations

Management Actions

Interventions within marshes should follow best practices to not irreparably harm existing Saltmarsh Sparrow habitat. Necessary precautions include:

- Consulting local land managers, property owners, and state agencies before any monitoring or management action is planned
- Conduct intensive marsh modifications outside the window of active Saltmarsh Sparrow breeding season (June 1 – September 30 annually).
- Initially limit management impact to a phased design in a small portion of the identified marsh (e.g. <25%).

Policy Considerations

The Saltmarsh Sparrow is state-listed as Endangered, and considered an at-risk species by USFWS. Some caution is therefore warranted when considering restoration actions at a site. Some of the restoration and management techniques suggested to benefit Saltmarsh Sparrow are novel and considered somewhat experimental as they are not yet well understood. Others have aspects that are controversial, such as using self-regulated tide gates to dampen spring tides. These gates have potential to cause problems if not managed carefully and continuously over time. We recommend that partners collaborate early and often. Partners and regulators need to encourage practitioners to try some of the management suggested, at least at a small scale initially (e.g., pilot projects) and to manage adaptively, to understand possible solutions. Considering the costs and benefits of no action will be important.

Monitoring

Any habitat restoration efforts should be monitored both pre-construction (2+ years before implementation) and post-construction (up to 10 years after implementation is complete) to measure change and determine whether vegetation goals and elevations have been met. This monitoring will ideally include an array of ecological metrics specific to tidal marshes in Maine and will be integral to build upon the existing knowledge base for salt marsh restoration in this area. The ACJV, SHARP, and Ducks Unlimited recently released recommendations for monitoring Saltmarsh Sparrows at restoration sites which includes a decision tree for deciding timelines, level and type of monitoring, and spatial distribution of data collection locations.

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Saltmarsh Sparrow about to fledge. Bri Benvenuti

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