



Saltmarsh Restoration
Priorities for the
Saltmarsh Sparrow

Maryland

Last Updated February 10, 2024

Saltmarsh Sparrow. Ray Hennessy



Saltmarsh Sparrow singing. Mike Kilpatrick

Goal Statement

The Saltmarsh Sparrow (*Ammospiza caudacuta*) is considered an at-risk species by the U.S. Fish and Wildlife Service (USFWS) and a Species of Greatest Conservation Need by the state of Maryland. This document is intended to provide those interested in salt marsh and Saltmarsh Sparrow conservation with information to aid 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. Maryland's breeding Saltmarsh Sparrow population is estimated to be 25.2% of the regional population as of 2011/2012 (Wiest et al. 2019). Its population goal was therefore calculated as 25.2% 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*	State's %	Population Goal (Indiv)*	2030 high marsh goal (ac)**	Total marsh needed to meet 2030 goal (ac)***	Long-term High Marsh Goal (ac)** by 2069	Total marsh needed to meet 2069 goal (ac)***
Maryland	15,100 (+/- 13,300)	25.2%	6,302	5,938	16,494	24,783	68,842
Regional	60,000		25,000	22,943	63,731	79,605	221,119

*Updated population estimates exist for each marsh patch within the range of the Saltmarsh Sparrow, however they are currently under peer review. When they are published, these figures will be updated to reflect the detections in the maps contained within this document.

**High marsh goals represent acres of "high quality habitat," defined as having conditions that support a stable or growing population of breeding Saltmarsh Sparrows.

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

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 that provide a window of at least 24 days with limited flooding.
- Extensive and dense *Spartina patens* vegetation with a deep, well-developed thatch layer; short-form *S. alterniflora*, *Distichlis spicata*, and *Juncus gerardii* also comprise high marsh areas and can support Saltmarsh Sparrow nesting.
- The highest quality 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.



Salt marsh in Maryland's coastal bays. Jonathan McKight

Marsh Identification and Prioritization Process

Marsh parcels were first identified and characterized by an initial round of prioritization in 2021/2022. This process began with identifying the highest-ranked marsh patches identified by the (now outdated) ACJV Saltmarsh Sparrow Habitat Prioritization Tool (top 10%; ACJV 2020). They were then reviewed and refined by representatives from the USFWS, National Park Service (NPS), Maryland Division of Natural Resources (MD DNR), The Nature Conservancy (TNC), MD Coastal Bays Program, and Audubon Mid-Atlantic. A full partner list for the 2021/2022 document development is included in the Acknowledgments section.

In 2023, the information was honed by representatives of our partner organizations (listed above) from its initial version to include recent updates on land ownership, existing and pending marsh restoration projects in each marsh, and recommended next steps to management action. The group also explicitly discussed the potential for marsh restoration techniques (listed and defined below) at each site. The resulting suggestions were not meant to be prescriptive for marsh parcels, but only to indicate that there is potential for these restoration types in the areas indicated. A full partner list for the 2023 document update is included in the Acknowledgments section.

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 always 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 of berms or embankments affecting hydrology of marsh platform.

Land acquisition / protection

Purchase or easement of land to protect, including 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 including deer, horses, crabs, geese, etc.

Additional ecological assessment needed

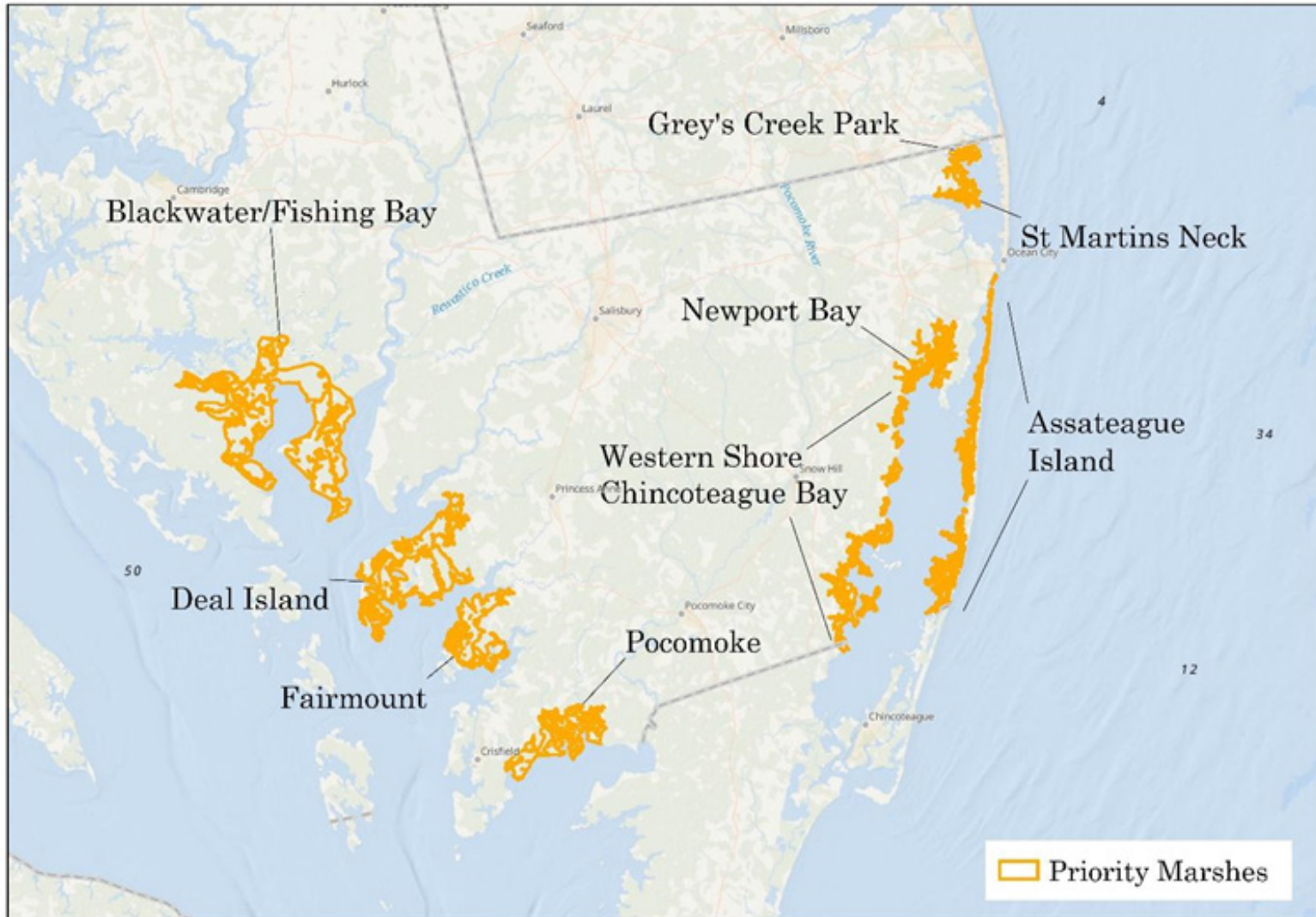
Additional monitoring and site assessment is necessary to determine specific next steps or assess existing restoration efforts at this site.

Ditch remediation is one of several salt marsh restoration strategies used in Maryland marshes. Bri Benvenuti

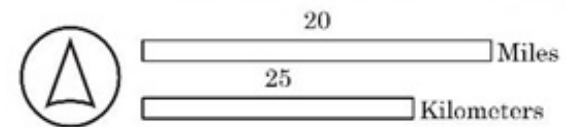


Priority Marshes

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



Maryland Priority Saltmarsh Sparrow Marshes



Greys Creek Park – 505 acres (204 ha)

Existing Conditions

Ownership is mostly Worcester County property; some privately owned marsh islands. This marsh is heavily ditched with a high amount of internal ponding, but not as extensive as in other parts of the coastal bays. Exotic *Phragmites australis* (hereafter *Phragmites*) is present but limited to upland interface. There is limited room for marsh migration due to steeper elevation gradient and forested cover. The marsh edge is also eroding due to wave action and boat traffic. Some large-scale marsh grass die-off is occurring in the southern section of the parcel, but the cause unknown.

Existing Projects

No existing projects are underway at this site.

Existing Sparrow Data

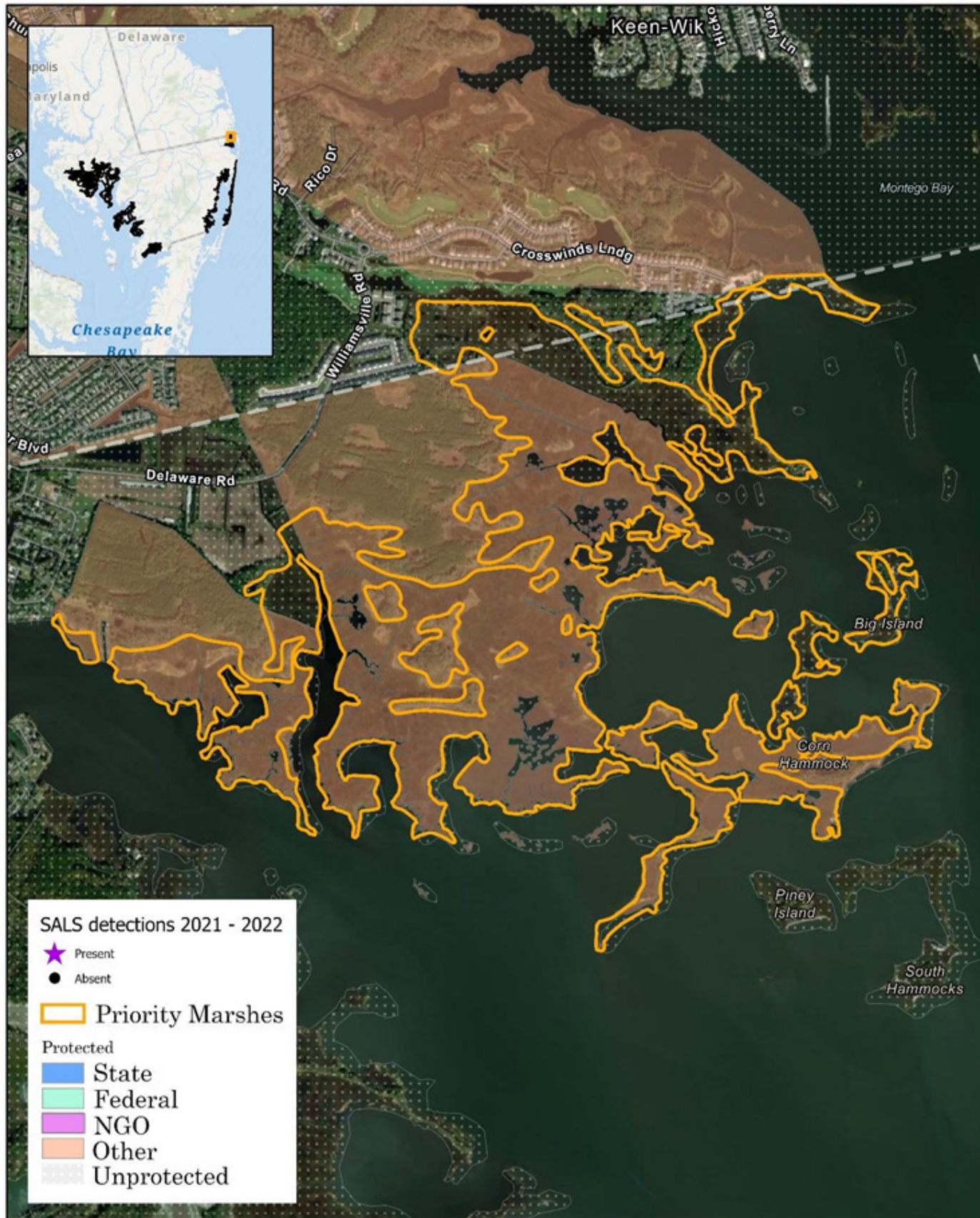
This marsh has no SHARP survey sites. There is low predicted occupancy and density for saltmarsh sparrows. There are two eBird detections at this site (July 2019, July 2021). Breeding has not been confirmed at this site.

Recommended Management / Next Steps To Management Action

- A marsh hydrological assessment is needed to determine specific next steps.
- Runnelling could be applied here to address internal ponding – this may be the best next step given the funding restrictions and prioritizing needed elsewhere in the state.
- This marsh is generally a lower priority for the state compared to other sites.
- There is potential for sediment placement in the southern section of this site.
- Land acquisition for migration space is possible on the northeastern boundary of the parcel.
- Living shoreline may be difficult to prioritize here because of the extensive coastline of this marsh parcel.

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
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Greys Creek Park



0.4 Miles

0.5 Kilometers

St. Martin's Neck – 1,059 acres (429 ha)

Existing Conditions

Ownership is majority local government, with some easements and state Wildlife Management Area (WMA), majority in private ownership. St. Martin's Neck Road bisects peninsula and restricts tidal flow to some extent.

This marsh is heavily ditched, with a large amount of internal ponding. *Phragmites* is present but limited to the upland interface. Erosion of banks has been slowed through living shoreline efforts but is still occurring to a small extent. There is room for marsh migration (bordered by agricultural lands). Ditch plugs were throughout added by Maryland DNR in late 2000s. Isle of Wight WMA was plugged 2008 and monitored for 5 years. Some ditches healed, but large unvegetated areas were also noted in the developing pools. The site was last monitored in 2014. A management plan exists for Assawoman Bay (Center for Watershed Protection, 2021).

Existing Projects

No existing projects are underway at this site.

Existing Sparrow Data

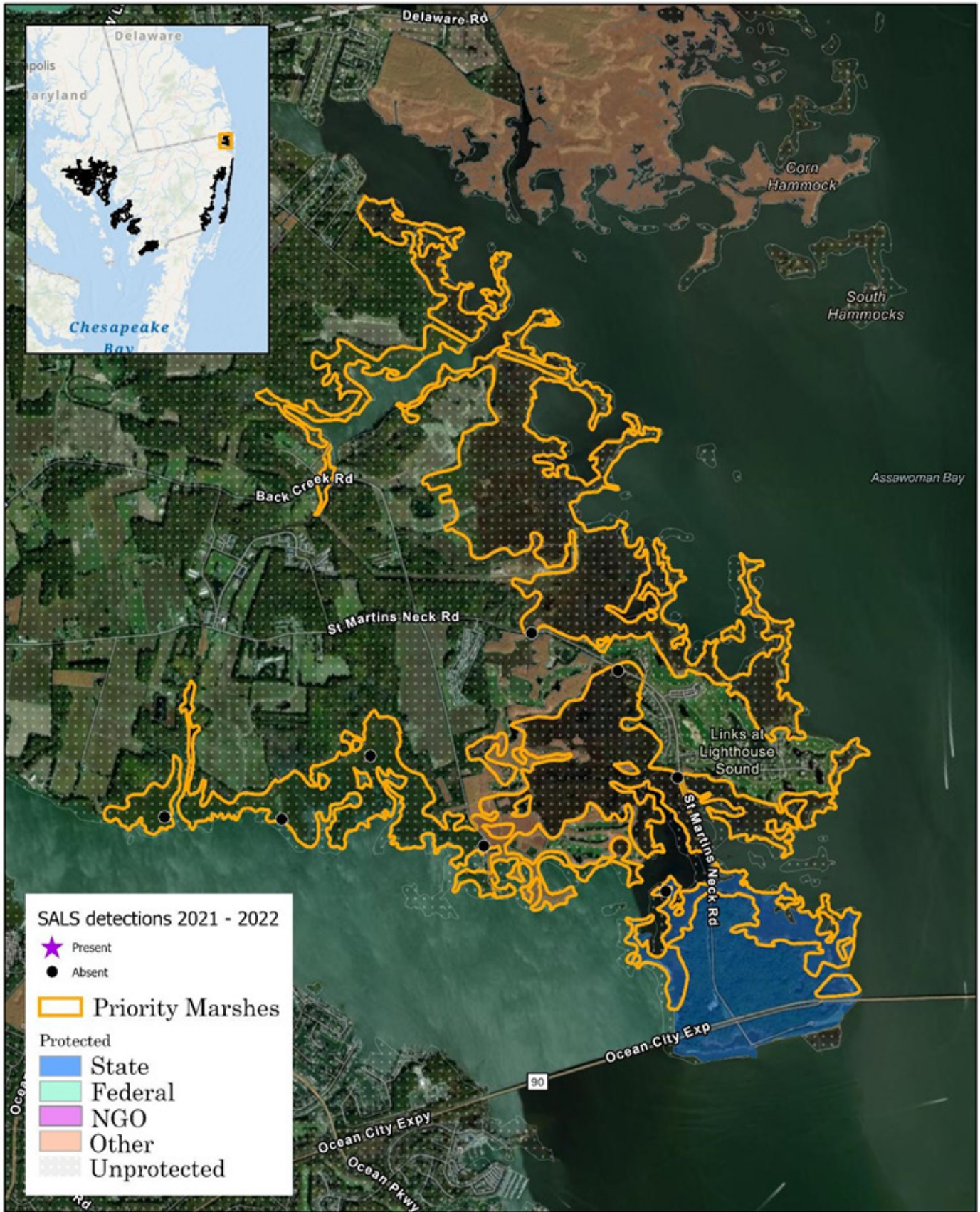
Saltmarsh Sparrow present in historical but not current SHARP surveys (2021/2022; SHARP 2023); breeding has not been confirmed at this site.

Recommended Management / Next Steps To Management Action

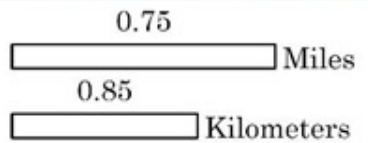
- Reduction of internal ponding through runnelling.
- Land acquisition/protection to facilitate marsh migration.
- Removal of ditch plugs if possible.
- Assessment of St. Martin's Neck Road for tidal restriction extent of upriver marshes.

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
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



St. Martin's Neck



Newport Bay (west of South Point Peninsula) – 2,731 acres (1,105 ha)

Existing Conditions

This marsh is entirely privately owned several different owners. Some of the parcels are in permanent conservation easements. This marsh is a top restoration priority within the coastal bays of Maryland and contains some of the largest patches of marsh in the state.

The marsh platform is heavily ditched with a large amount of internal ponding. One parcel, that is owned by Worcester County, is not ditched and is a good a reference for the rest of the site. Sparrows exist in high densities here. *Phragmites* is present but limited to upland interface. The marsh vegetation has been overgrazed recently by Snow Geese.



Saltmarsh Sparrow in Worcester Co., Maryland. ©John Corcoran

Existing Projects

USFWS: The Service funded and recently completed designs for three restoration projects. (Croppers Island, Stark Langmaid Rd., Stark Bliss Happens Lane. Permits are submitted (estimated date of receiving permits spring 2024.). Two of the sites will receive sediment to nourish the marsh elevation and fill ditches. The third restoration site involves hydrology restoration to drain ponded areas in the marsh. Some material will be harvested by nearby agricultural field (privately owned). Funding was recently secured through the Interior Keystone Initiative (\$800,000) and National Fish and Wildlife Foundation (NFWF) National Coastal Resilience Fund (NCRF) funding. (~\$2.42 million). A third grant was applied for in December 2023 to the Maryland DNR Trust Fund for \$800K. Contact: Rich Mason (rich_mason@fws.gov), Leslie Pitt (leslie_pitt@fws.gov)

USFWS: The NCRF grant will allow full restoration design and permitting on three other large marshes in Newport Bay that total 887 acres. Design work will begin in the summer of 2024. These salt marsh projects include Bay Creek LLC (475 acres), Horner Farm (225 acres), and Worcester County Langmaid Rd (187 acres). These marshes are heavily ditched which has led to widespread ponding. In addition, Snow Geese invaded these marshes in the 1990's and 2000's and caused significant damage and marsh loss. Best contact: Rich Mason (rich_mason@fws.gov), Leslie Pitt (leslie_pitt@fws.gov)

MD Coastal Bays Program: Assessment of entire marsh system necessary and underway through marsh health assessment monitoring (funded through EPA); this will help identify areas that will support revegetation. No funding is needed at this time. Best contact: Kevin Smith (ksmith@mdcoastalbays.org)

Existing Sparrow Data

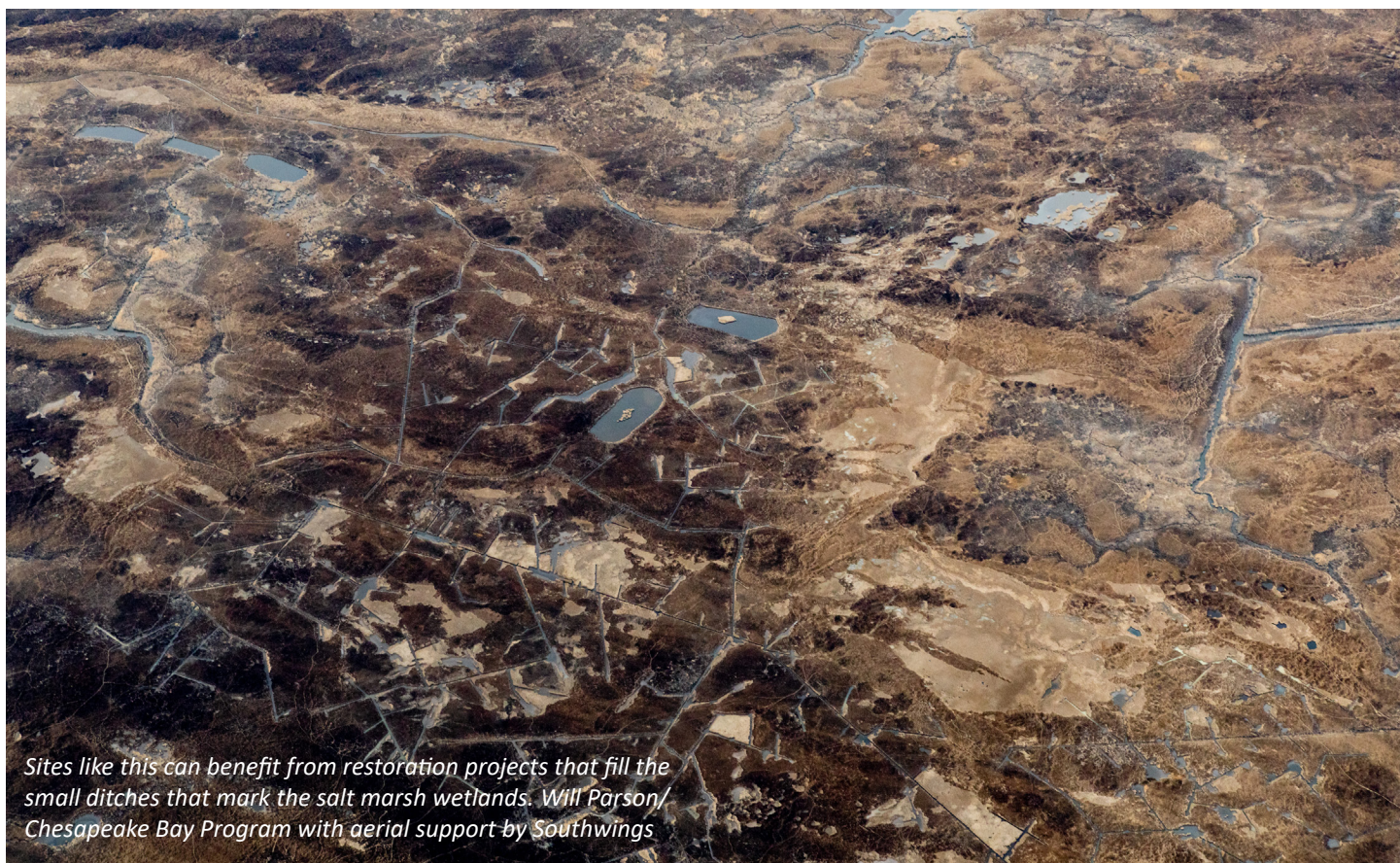
Saltmarsh Sparrow present (2021/2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

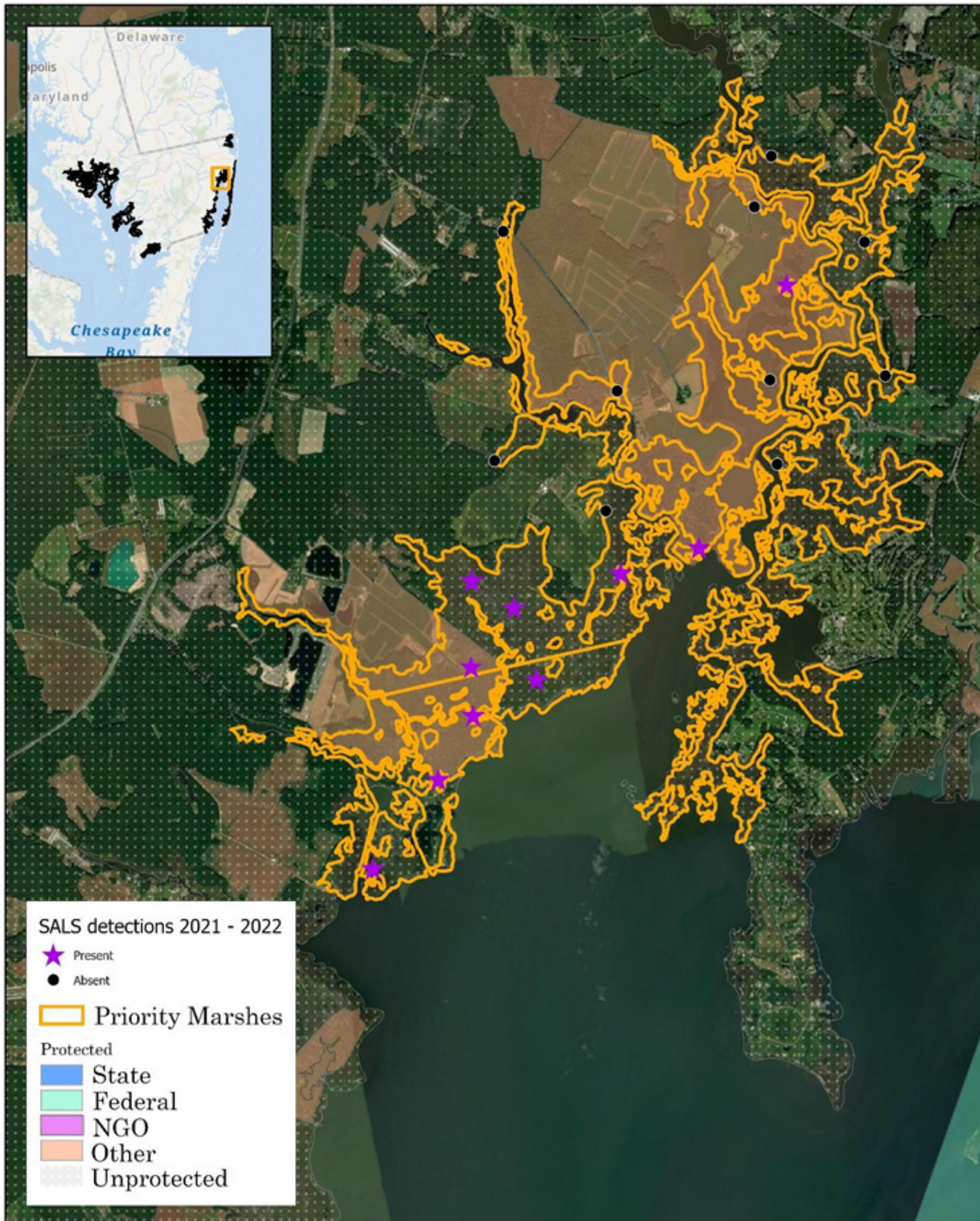
- Elevation assessment to identify specific sites for runnelling
- Explore the potential for sediment placement through use of dredged sediments.
- Protect adjacent agricultural and forest areas for marsh migration.
- Address snow goose herbivory on private lands.
- Landowner outreach for marsh restoration and protection for marsh migration.
- Explore potential for breakwaters to mitigate big wave action.

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
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	N
Living shoreline development	Y
Wildlife herbivory mitigation	Y
Additional ecological assessment needed	Y



Sites like this can benefit from restoration projects that fill the small ditches that mark the salt marsh wetlands. Will Parson/ Chesapeake Bay Program with aerial support by Southwings



Newport Bay



1 Miles

1 Kilometers

Assateague Island – 3944 acres (1596 ha)

Existing Conditions

This parcel is owned by the National Park Service (NPS) and the state of Maryland. Wild horses are present which eat/reduce thatch layer, and there is secondary wildlife impact on the thatch layer from sika and white-tailed deer. The marsh platform has been ditched but is not pervasive.

Overblown sand provides some sediment supply to these marshes, but the marsh is still sinking in this area.



Ponies in the marsh at Assateague Island. Natalie Maynor, CC

Existing Projects

USFWS: Organizing a management group to consider what can be done for marshes on Assateague Island. Best contact: Bart Wilson (bartholomew_wilson@fws.gov)

NPS: This project filled ditches with sands and is complete. Best contact: Bill Hollander (BillHollander@nps.gov)

Existing Sparrow Data

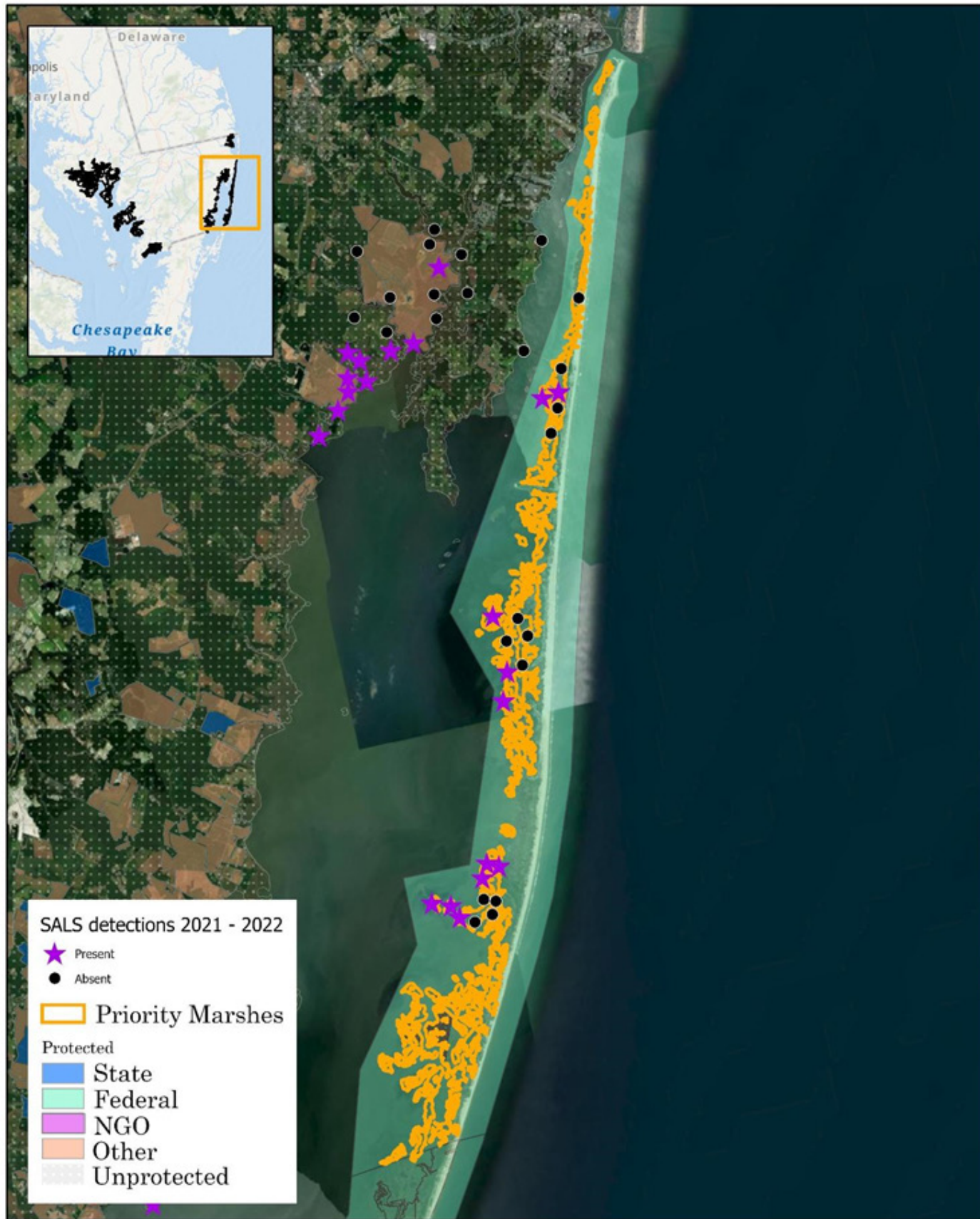
Saltmarsh Sparrows detected (2021/2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

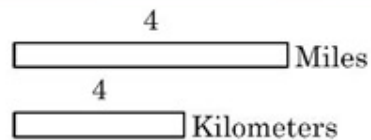
- Explore elevation enhancement at this site; dredging of nearby channels may create source supply.
- Further monitor / analyze results of ditch-filling on NPS lands.

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	N
Land acquisition / protection for marsh migration	N
Facilitated marsh migration	N
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	N
Living shoreline development	N
Wildlife herbivory mitigation	Y
Additional ecological assessment needed	Y



Assateague Island



Western shore of Chincoteague Bay (Islands, North, and South) – 447 acres (181 ha)

Existing Conditions

This marsh is state-owned. It is heavily ditched with a large amount of internal ponding. The marsh edge heavily eroded. Ditch plugs were added in the mid-2000s on EA Vaughn WMA.

Existing Projects

USFWS: Collaborative project with Maryland Department of Natural Resources (DNR) and MD Coastal Bays Program to remove ditch plugs at EA Vaughn in 2022; monitoring underway to measure response. We have funding through the NCRF grant to fund restoration design and permitting on the Smithson Farm marsh (87 acres). Best contacts

for EA Vaughn: Leslie Pitt (leslie_pitt@fws.gov), Kevin Smith (ksmith@mdcoastalbays.org).

Contacts for Smithson Farm: Rich Mason (rich_mason@fws.gov)



An example of a volunteer planting native grasses for a living shoreline project in Chesapeake Bay. Chesapeake Bay Program

MD Coastal Bays Program: Living shoreline work underway to address island loss on Tizzard Island (privately owned) supported through National Coastal Wetlands Grant. Kevin Smith. Matching \$\$ from MD DNR.

USFWS: Cost estimate exists from Sovereign Consulting for design for hydrological repair on interior of Tizzard island (\$50k for survey and design). Funding still needed for design, permitting, implementation, and monitoring. Best contact: Rich Mason (rich_mason@fws.gov).

Maryland Park Service: This project is exploring the acquisition of Tizzard Island from private ownership. No funding needed at this time. Best contact: Kevin Smith (ksmith@mdcoastalbays.org).

Existing Sparrow Data

Saltmarsh Sparrow detected (9/2021/2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

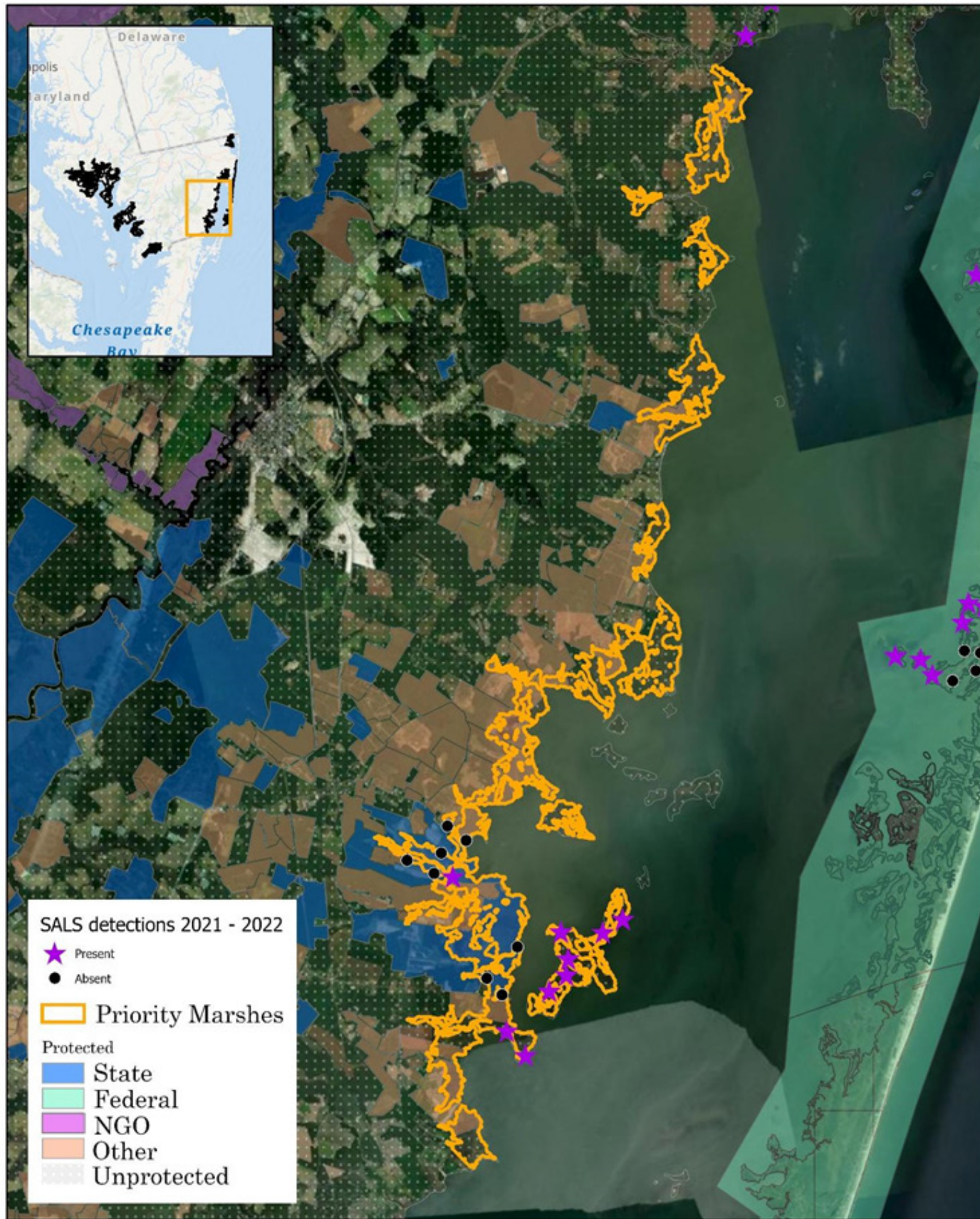
- Elevation enhancement through use of dredged sediments
- Long-term preservation of adjacent uplands to facilitate marsh migration.
- North parcel: should be a priority within the Western Shore area.
- Islands: elevation enhancement is necessary for long-term persistence of these islands. They are also good candidates for living shoreline.

Attributes

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

Chincoteague Island. James Cullen, CC





Western shore of Chincoteague Bay

Pocomoke Sound - 6552 acres (2652 ha)

Existing Conditions

This parcel has multiple owners (see map below); the Irish Grove Sanctuary is owned by Maryland Ornithological Society. This marsh parcel has a significant amount of high-quality high marsh (mix of *S. patens*, *D. spicata* and short *S. alterniflora*) particularly around East Creek and Rumbly Point Road. *Juncus roemerianus* (hereafter black needlerush) dominates the western part of site, and *Phragmites* dominates the transition zone. There is minimal ditching. In the Marumsco Creek area, upslope marsh migration is being compromised by ground surface collapse and subsequent ponding. As trees die the root balls shrink, resulting in ground collapse and basin formation. This site has also historically support eastern Black Rails (as late as 2010).



Eastern Black Rail have historically been found at the Marumsco Creek area. Shutterstock

Existing Projects

There are no known projects at this site.

Existing Sparrow Data

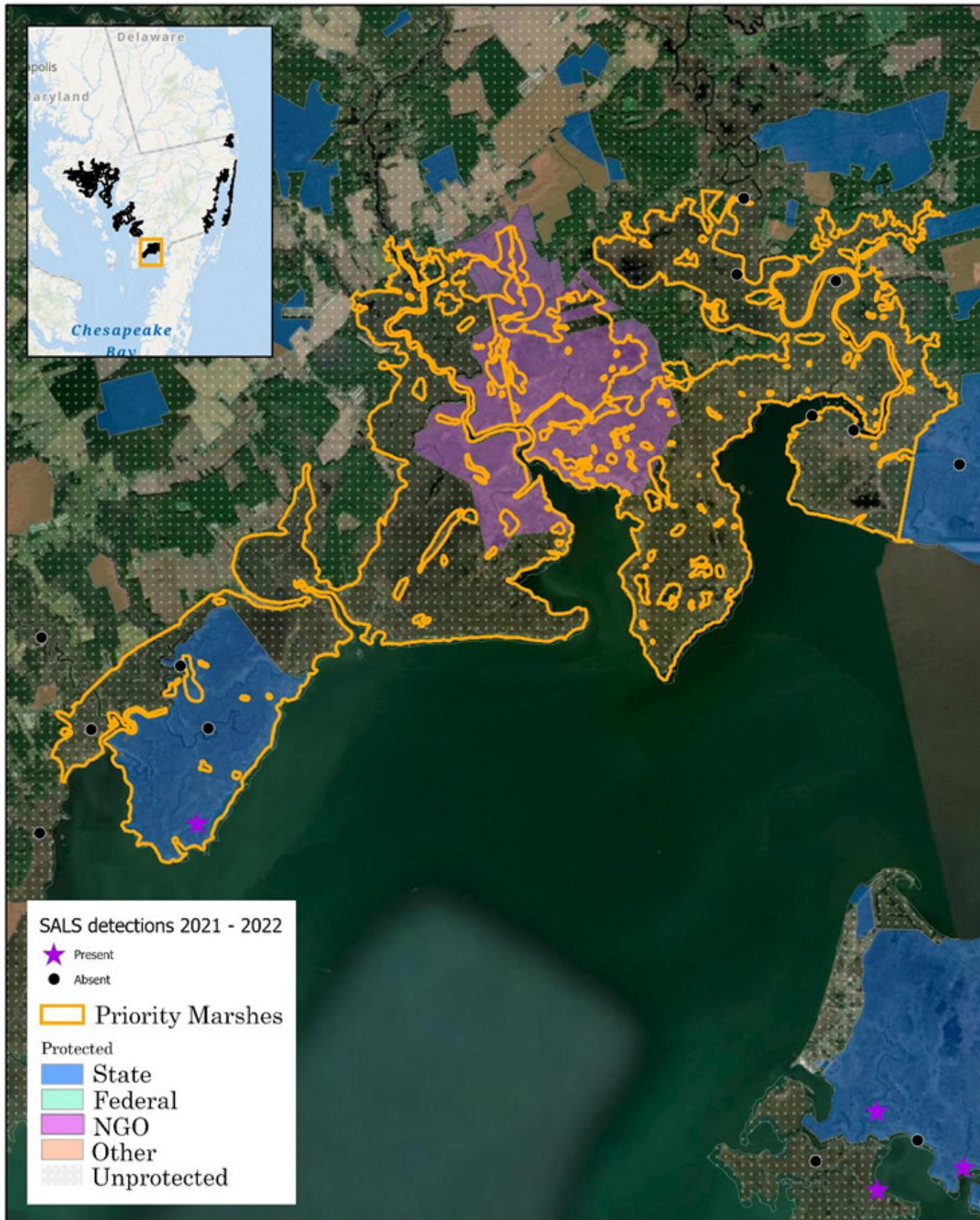
Saltmarsh Sparrow detected (2021/2022); confirmed in high densities and breeding around East Creek and Rumbly Point Road.

Recommended Management / Next Steps To Management Action

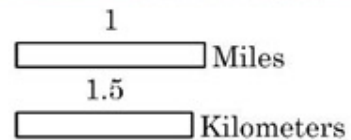
- Monitoring of East Creek-Rumbly Point Road marshes to maintain existing Saltmarsh Sparrow densities and understand why this marsh remains in such good condition.
- Enhance surface drainage of ponded marsh in Marumsco Creek marshes through tidal creek extension and runnelling.
- Explore potential for sediment placement?

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
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Pocomoke Sound



Fairmount – 5812 acres (2352 ha)

Existing Conditions

This marsh parcel is partially owned by the state (Fairmount WMA), although there are also privately owned sections. Some internal ponding is occurring, dominated by black needlerush but many areas of *S. patens* still exist. This is a historically farmed area; from rough examination of aerial imagery it appears to have several berms/embankments affecting the area, but this observation would need to be ground truthed.



A Great Blue Heron rests in a misty marsh at Fairmount Wildlife Management Area. Maryland Department of Natural Resources

Existing Projects

There are no known projects at this site.

Existing Sparrow Data

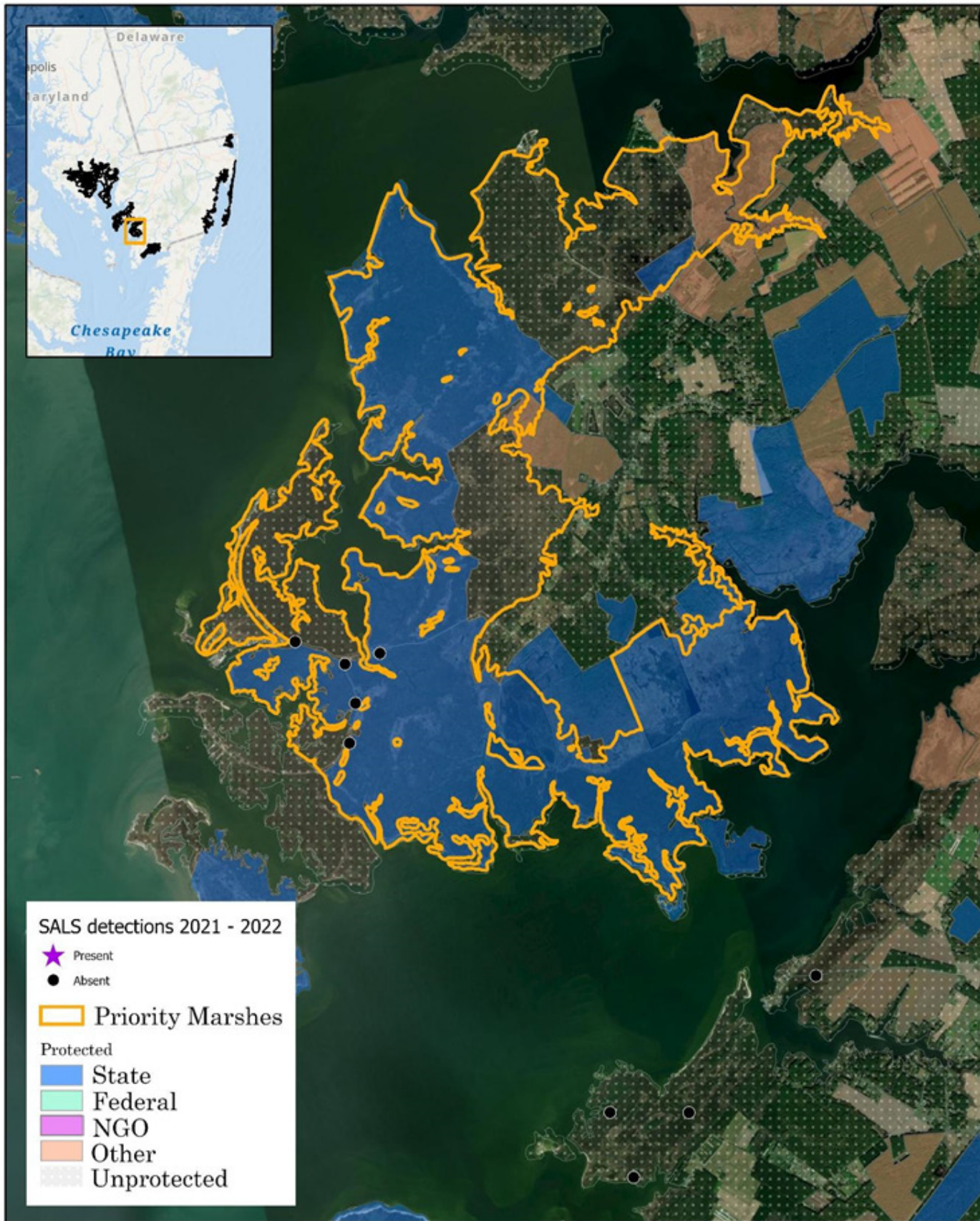
Saltmarsh Sparrows have not been recently detected at this site (eBird, SHARP surveys in 2021/2022; SHARP 2023)

Recommended Management / Next Steps To Management Action

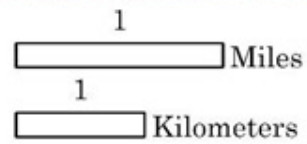
- Ecological assessment including birds, historical agricultural practices, and hydrology
- Potential for single channel hydrology.
- Explore the potential for sediment placement.

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
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	Y
Living shoreline development	Y
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Fairmount



Deal Island - 13,850 acres (5,605 ha)

Existing Conditions

This marsh has deteriorated in recent years and is now mostly waterlogged (poor drainage resulting in internal ponding). High marsh of *S. patens* and *D. spicata* is largely confined to the southeastern section of the WMA. The marsh is unditched, and the vast majority of marsh is black needlerush with *Phragmites* on the upland border. Near the forest boundary there is evidence of extensive waterlogging in the marsh platform.

A large (2,800 acre) brackish impoundment is managed for waterfowl in winter. This is the biggest impoundment in Maryland. Sediment supply is historically low during the winter months.



Deal Island. Matt Tillett, CC

Existing Projects

US Army Corps of Engineers (USACE): This project is in planning stages to restore 76 acres of deteriorating black needlerush marsh along the southern edge of the impounded area using placement of dredge material from the Wicomico River. There is a planned initiation date of October 2023. Partners include Audubon Mid-Atlantic, Maryland Department of Natural Resources, USFWS, NOAA National Centers for Coastal Ocean Science, The Conservation Fund, Wicomico County, and Somerset County. Project goals include the creation of Saltmarsh Sparrow habitat at a sustainable elevation. Ideally this project will be a pilot to later facilitate a series of similar projects using Wicomico River dredged material. Funding is still needed for short- and long-term monitoring at this site. Best contact: Dave Curson (david.curson@audubon.org)

Existing Sparrow Data

Saltmarsh sparrows detected (2021/2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

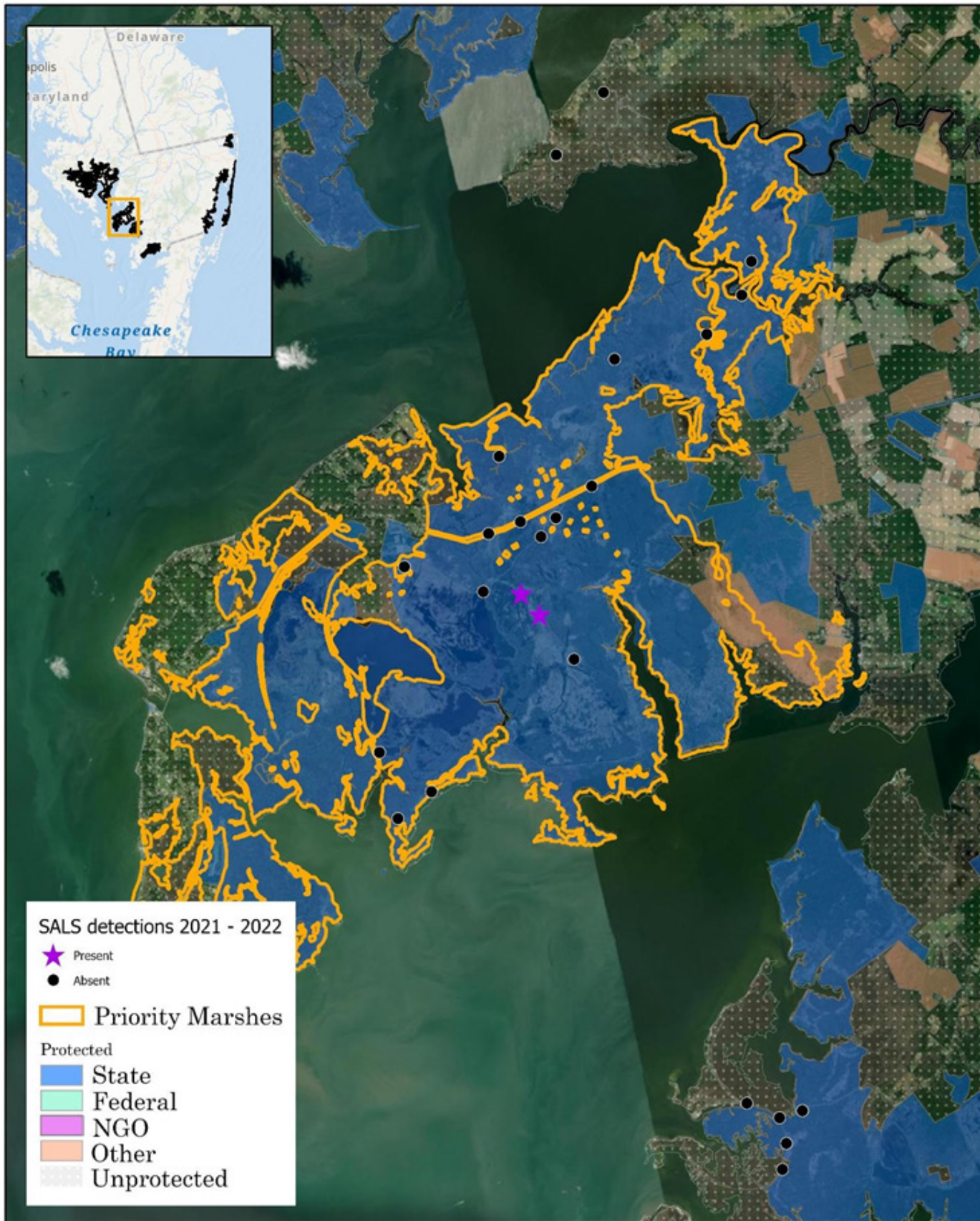
- Support implementation and monitoring for Deal Island project to create high quality high marsh habitat.
- Include Deal Island Partnership (local community group) in restoration planning if possible. Best contact: Brian Needelman (bneed@umd.edu)

Attributes

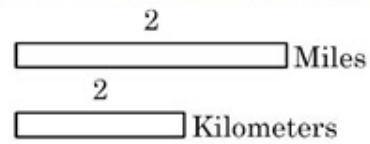
Sediment placement	Y
Repair hydrology - runnelling / channel creation	Y
Repair hydrology - tidal restriction mitigation	Y
Repair hydrology - address ditch plugs	N
Repair hydrology - ditch remediation	Y
Repair hydrology - berm, embankment, or levee modification	Y
Land acquisition / protection for marsh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



Virginia Rail in the marsh. Chesapeake Bay Program



Deal Island



Blackwater National Wildlife Refuge (NWR) / Fishing Bay – 28,015 acres (11,337 ha)

Existing Conditions

This is the largest marsh complex in Maryland. This marsh complex has been closely studied, its dynamics are well-understood; it is a good example of marsh loss due to both nutria herbivory and sea level rise. Subsidence and internal ponding throughout much of the marsh interior is due to these factors, as well as a lack of sediment supply. The internal ponding impacts both the open marsh and the transition zone where ground surface collapse is compromising upslope marsh migration. The best quality marshes within this parcel are around the rim of Fishing Bay, particularly along Fishing Bay's northern edge. These marshes include extensive higher elevation *S. patens* marsh, which probably persists because of sediment supply to this area from Fishing Bay. *Phragmites* is dominant along the upland border and within some of the interior of the marsh.



Salt marsh at Blackwater National Wildlife Refuge. Dan Murphy

The northern half of this complex is burned regularly under a management schedule implemented by MD Department of Natural Resources and Blackwater National Wildlife Refuge (NWR). The southern half is not subject to burn management. Vegetation patterns appear to reflect burn history (northern burned areas dominated by *Spartina spp.*: southern unburned areas dominated by black needlerush). However, *Schoenoplectus americanus* and open water are becoming more extensive as the entire system becomes more waterlogged.

Existing Projects

USFWS: Tree cutting project (Beaver Dam Creek). This project was a collaboration with The Conservation Fund and Audubon Mid-Atlantic. Recognizing the importance of marsh transgression as a tool for creating new tidal marsh habitats through sea level rise, this project removed trees and treated *Phragmites* in approximately 13 acres of forest along a transition zone being impacted by sea level rise. Tree removal was conducted in 2014 and herbicide treatments have succeeded in preventing invasion by *Phragmites*. While wetland species such as least bittern and Virginia Rail were noted in the project area, we failed to detect Saltmarsh Sparrow or other salt marsh obligate species.

USFWS: Partnered with Audubon Mid-Atlantic and The Conservation Fund for a sediment placement project which was completed at Shorter's Wharf in 2016. Best contact: Matt Whitbeck (matt_whitbeck@fws.gov)

USFWS: Partnering with Audubon Mid-Atlantic and The Conservation Fund have funding in hand from USFWS for sediment placement project; conceptual designs are in place. Ask Matt about funding status: Best contact: Matt Whitbeck (matt_whitbeck@fws.gov), Erik Meyers (emeyers@conservationfund.org)

USFWS: This project involves a 2,000 acre NAWCA grant to protect marsh migration space adjacent to Blackwater NWR and Fishing Bay WMA. Funding still needed for long-term monitoring. Best contact: Dan Murphy (dan_murphy@fws.gov)

Existing Sparrow Data

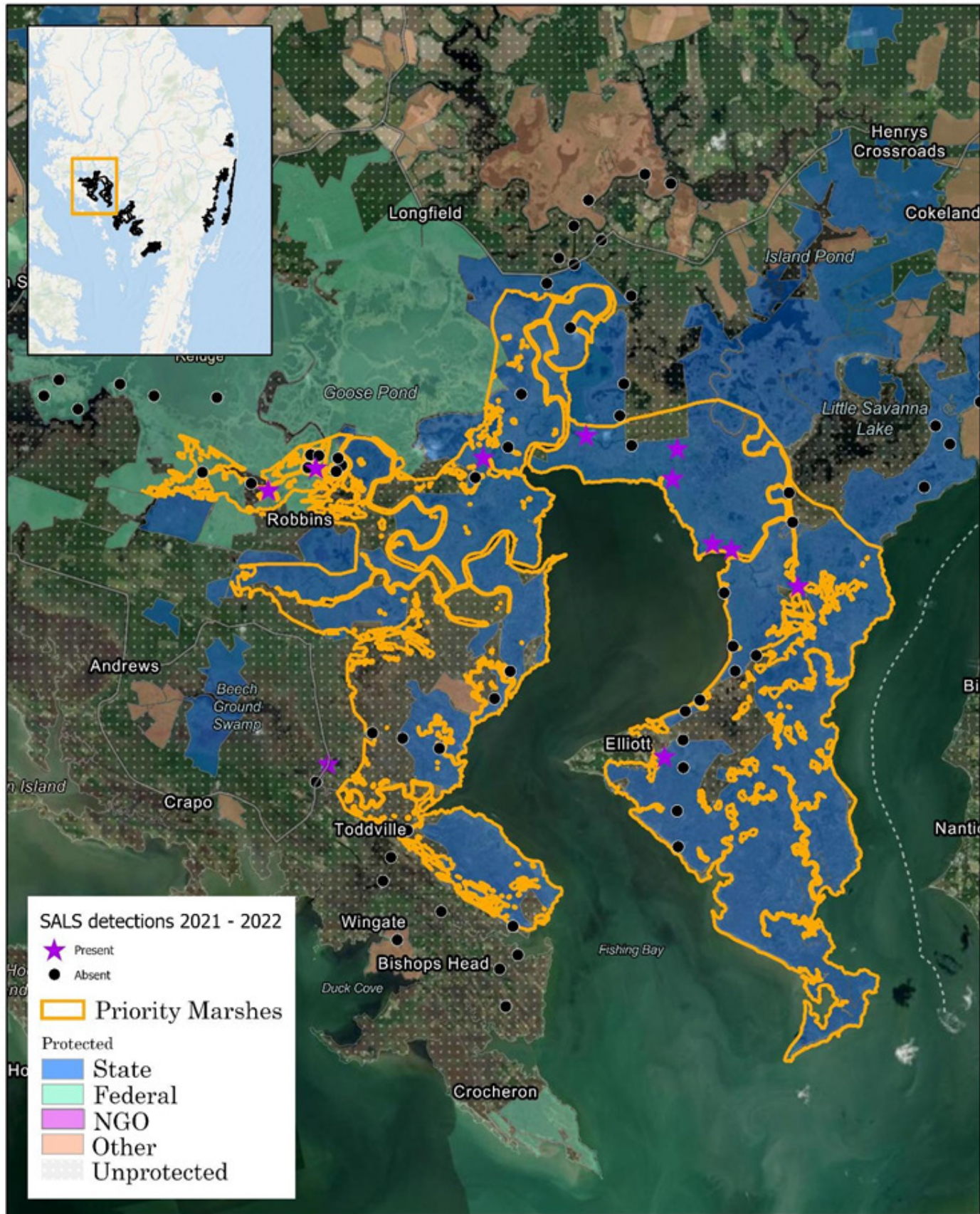
Saltmarsh Sparrow detected (2021/2022; SHARP 2023); breeding has not been confirmed.

Recommended Management / Next Steps To Management Action

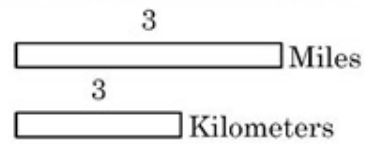
- Address subsidence and waterlogged marsh to maintain the higher-elevation marsh around Fishing Bay and along the riverbanks of the Blackwater and Transquaking Rivers.
- Explore potential for elevation enhancement. Local dredge sources need to be identified; explore use of the deteriorated areas of the marsh complex, Blackwater and Transquaking Rivers, and nearby agricultural fields as potential sediment sources.
- Address ground surface collapse in the marsh migration transition zone to facilitate marsh migration into the surrounding landscape (agricultural fields and forests). More experimental research is needed to facilitate effective transition of uplands to high marsh.
- Explore fire and tree harvest for controlling *Phragmites* invasion during marsh migration.

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	N
Repair hydrology - berm, embankment, or levee modification	N
Land acquisition / protection for marsh migration	Y
Facilitated marsh migration	Y
Invasive plant species mitigation (<i>Phragmites australis</i> , etc.)	Y
Living shoreline development	N
Wildlife herbivory mitigation	N
Additional ecological assessment needed	Y



Blackwater National Wildlife Refuge / Fishing Bay



Best Practices in Marsh Management

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

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 Maryland 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.

Acknowledgements

Thank you to Gwen Brewer (MD DNR), Hen Bellman (Audubon Mid-Atlantic), Alice Besterman (Towson University), Dave Brinker, Dave Curson (Audubon Mid-Atlantic), Julie Devers (Natural Resource Conservation Service; NRCS), Sarah Hilderbrand (MD DNR), Archer Larned (MD Coastal Bays) Rich Mason (USFWS), Jonathan McKnight (MD DNR), Dan Murphy (USFWS), Leslie Pitt (USFWS), Kevin Smith (MD Coastal Bays), Jackie Specht (The Nature Conservancy), Steve Strano (NRCS), and Bhaskar Subramanian (NOAA) for input during the development of this document. Thank you to the Saltmarsh Habitat and Avian Research Program (SHARP) for providing detection data for Saltmarsh Sparrows which informed our sparrow data sections for each marsh.



Tidal creek, Maryland Coastal Bays. Dan Murphy

Cedar Island salt marsh. Dan Murphy



Contact & Citation Information

For more information or to update information contained in the document please contact:

Mo Correll, Atlantic Coast Joint Venture:
maureen_correll@fws.gov

Suggested citation: Atlantic Coast Joint Venture. 2024. Report. Saltmarsh Restoration Priorities for the Saltmarsh Sparrow: Maryland, Version 2.0. Available at: https://acjv.org/documents/MD_SALS_comp_guidance_doc.pdf.

References

Center for Watershed Protection. 2021. Assawoman Bay, Isle of Wight Bay, and St. Martin River Watershed action plan. Final report to the Maryland Bays Coastal Program.

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

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.