

Marshes for Tomorrow

The Dorchester County Climate Adaptation Project

Presented by
David Curson, Audubon Maryland-DC



THE CONSERVATION FUND



Marshes for Tomorrow

The Dorchester County Climate Adaptation Project

Principal project elements –

Assessment, Strategy, Communications

Principal partnering agencies -

USFWS Blackwater NWR, Audubon MD-DC, The Conservation Fund

Other partners – Chesapeake Conservancy, MD DNR, USACE, Friends, and more

- Technical Advisory Committee

- Communications Advisory Committee

Marshes for Tomorrow

The Dorchester County Climate Adaptation Project



THE CONSERVATION FUND



Project goal:

Ensure the long term persistence of tidal marsh habitat in Dorchester County, Maryland, together with its full assemblage of associated bird species and other wildlife.

Marshes for Tomorrow

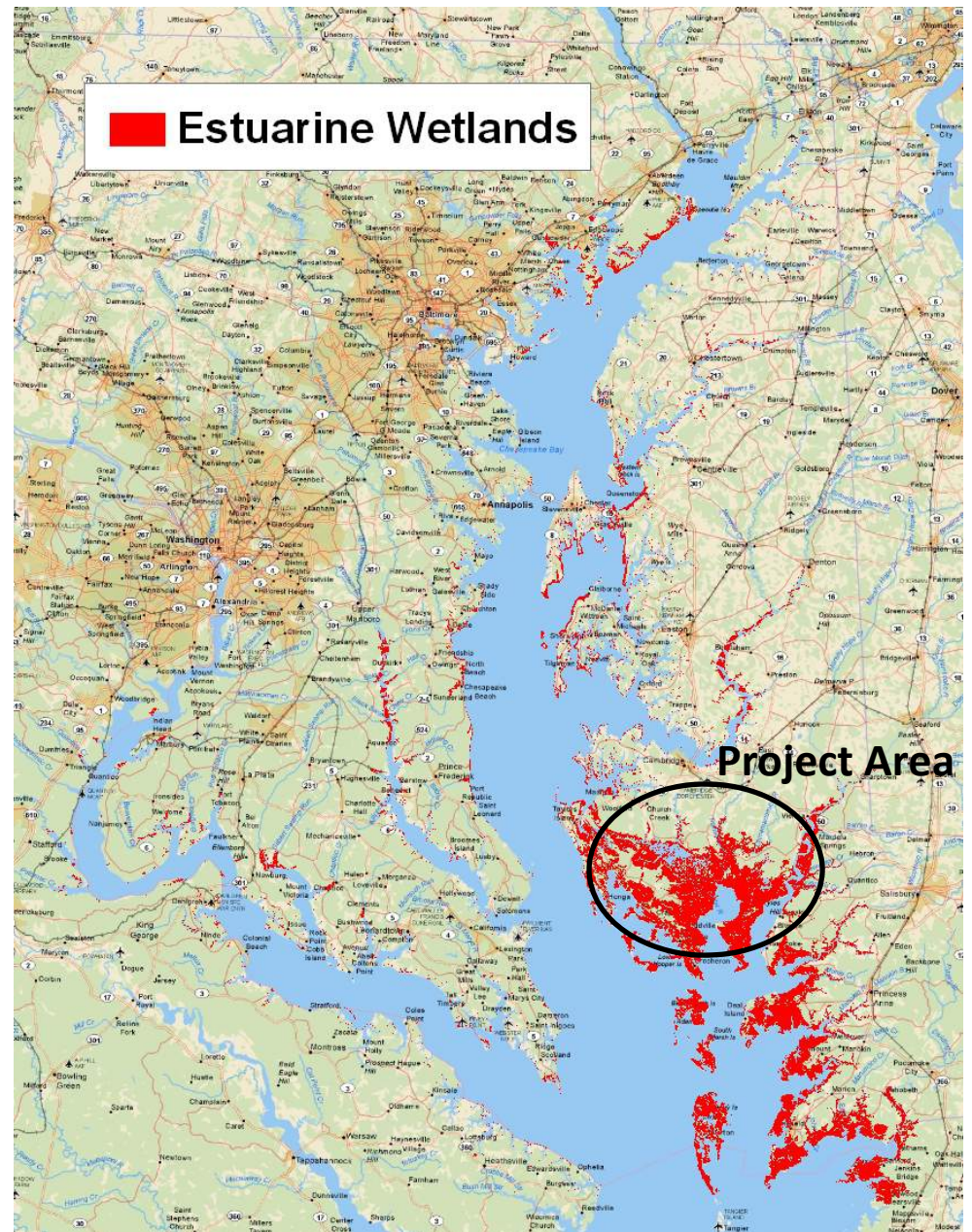
Blackwater Climate Adaptation Project



Introduction

21st Century Conservation.
Planning for a changing climate.

THE CONSERVATION FUND



Southern Dorchester County Important Bird Area

Legend

Marsh Migration Corridors

- 1m SLR vulnerability
- 2m SLR vulnerability
- Maryland-DC IBAs
- Coastal Wetlands (NWI, E2EM)

Southern Dorchester
County IBA

Chesapeake Bay

0 3 6 12 18 24
Km

Global
significance



Black Rail



Saltmarsh Sparrow



Marshes for Tomorrow

Blackwater Climate Adaptation Project



Introduction

21st Century Conservation.
Planning for a changing
climate.

THE CONSERVATION FUND

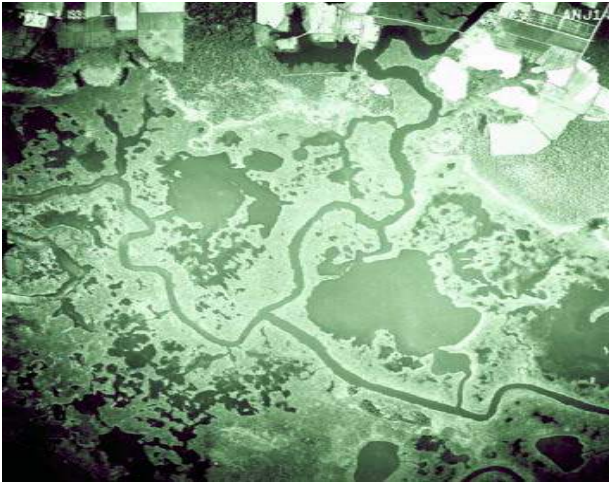


Chesapeake Bay is particularly vulnerable to sea level rise

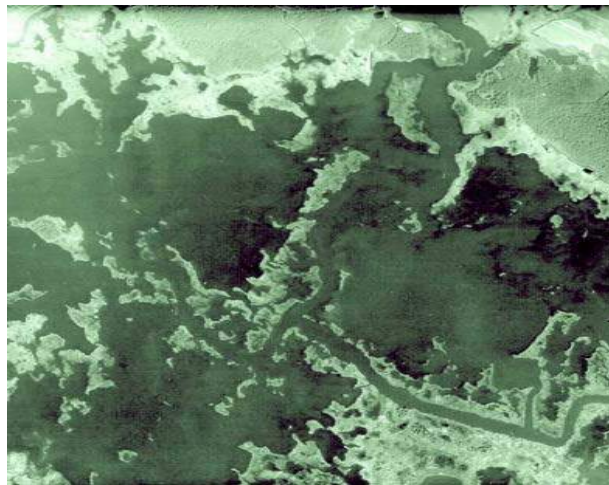
- Relative sea level rise (3.44mm/yr) is twice the global average (1.8mm/yr)
 - Land subsidence from isostatic rebound
 - Shallow zone subsidence
- Narrow tidal range (0.7m) yields flat, low marshes.
- MCCC predicts SLR of 1.03m by 2100.

Marshes for Tomorrow

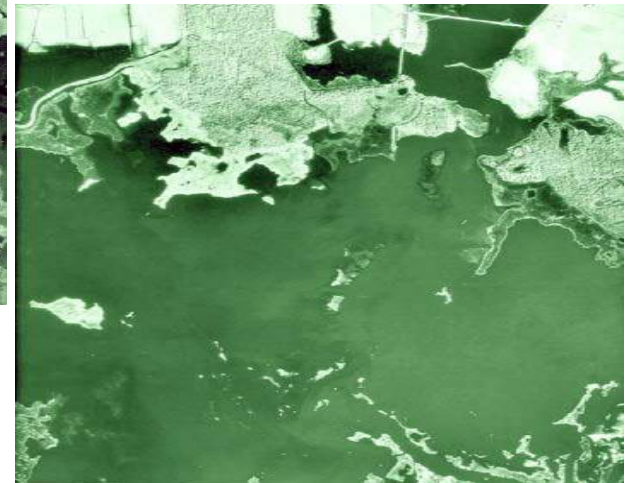
Marsh loss at Blackwater NWR



1938



1974



1989

THE CONSERVATION FUND



Audubon
MARYLAND-DC

Marshes for Tomorrow

Strategic assessment

Blackwater Climate Adaptation Project



Introduction

21st Century Conservation.
Planning for a changing
climate.

Objectives:

- Identify areas of high marsh habitat of highest priority for salt marsh birds.
- Identify and prioritize potential marsh migration corridors.
- Identify potential barriers to marsh migration.

THE CONSERVATION FUND



Marshes for Tomorrow

Focal Salt Marsh Bird Species

Species	Endemic to tidal marshes	Conservation priority		
		National	Regional (BCR 30)	State of Maryland
American Black Duck	Regional population		HH	GCN
Black Rail	Subspecies	WL Red, BCC	HH	E, GCN
Clapper Rail	Subspecies	WL Yellow	H	
Coastal Plain Swamp Sparrow	Subspecies		M	I, GCN
Saltmarsh Sparrow	Species	WL Red, BCC	HH	GCN
Seaside Sparrow	Species	WL Red, BCC	HH	GCN
Willet	Subspecies		H	GCN

THE CONSERVATION FUND



Marshes for Tomorrow

SHARP salt marsh bird survey, 2011-2012

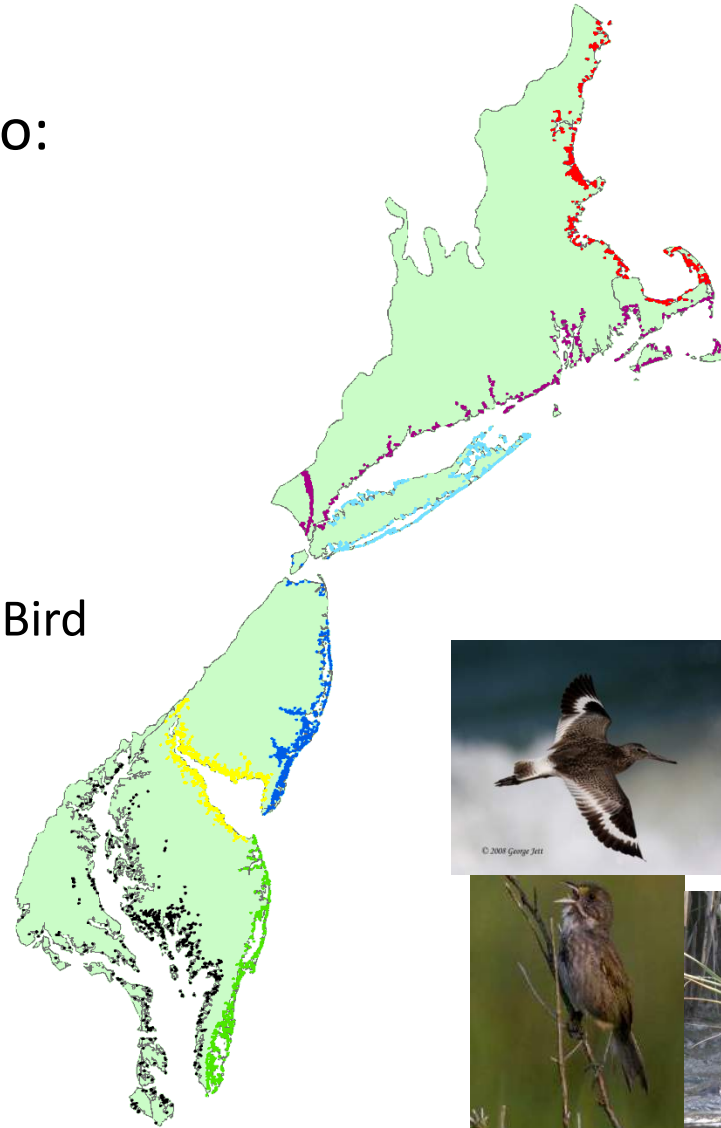
(SHARP - Salt marsh Habitat and Avian Research Program)

National State Wildlife Grant to:

- University of Maine
- University of Connecticut
- University of Delaware
- Maryland DNR & Audubon Maryland-DC

Field Methods

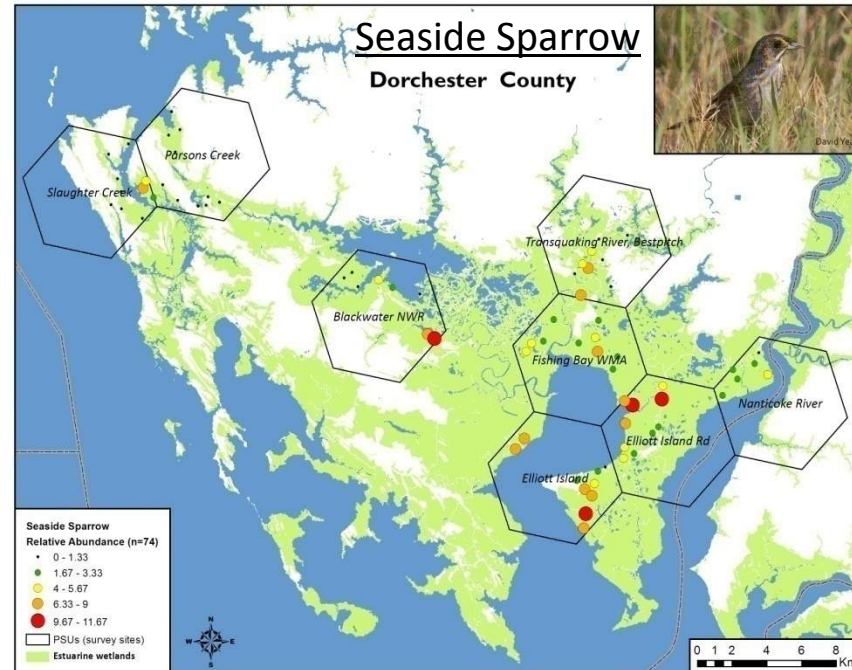
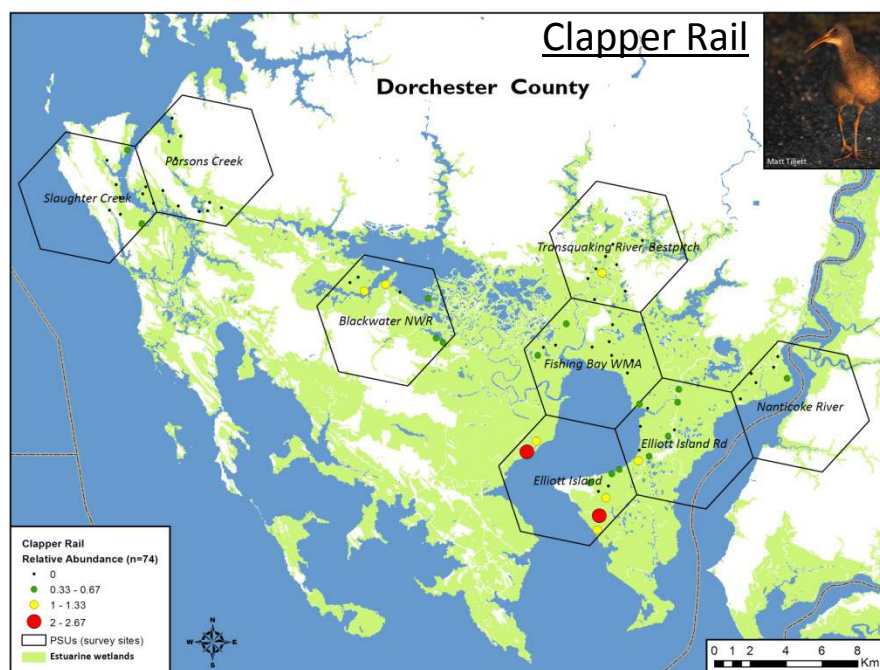
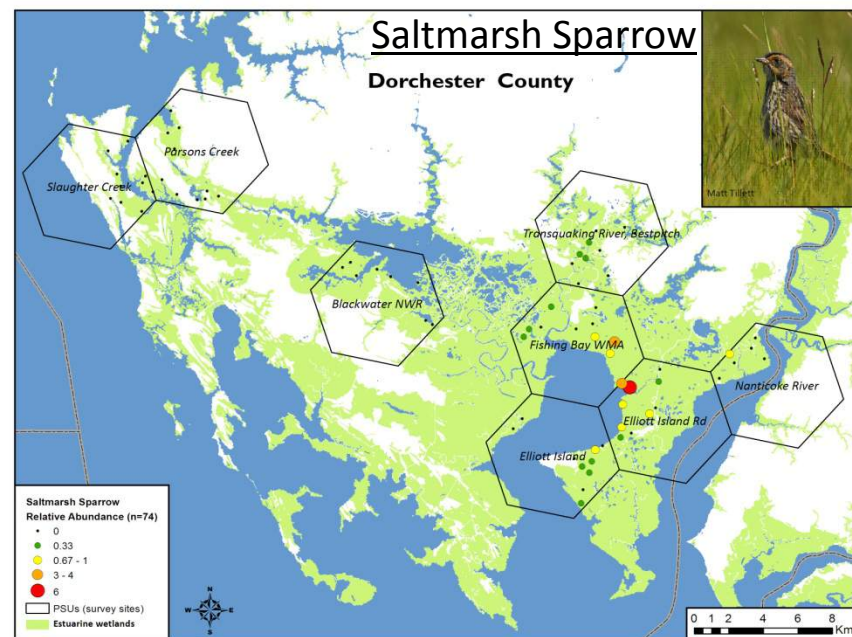
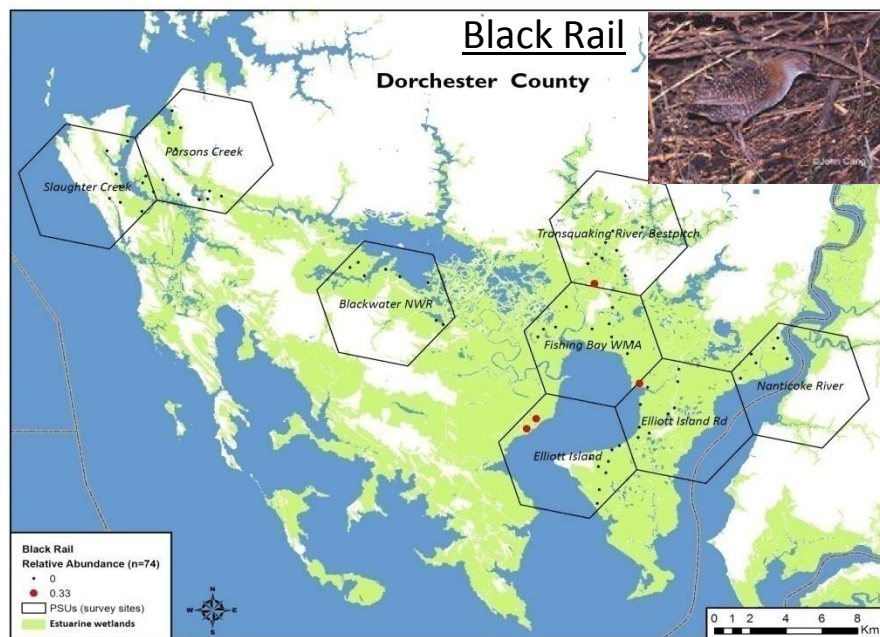
- Standardized N. American Marsh Bird Monitoring Protocol
- Randomly selected points



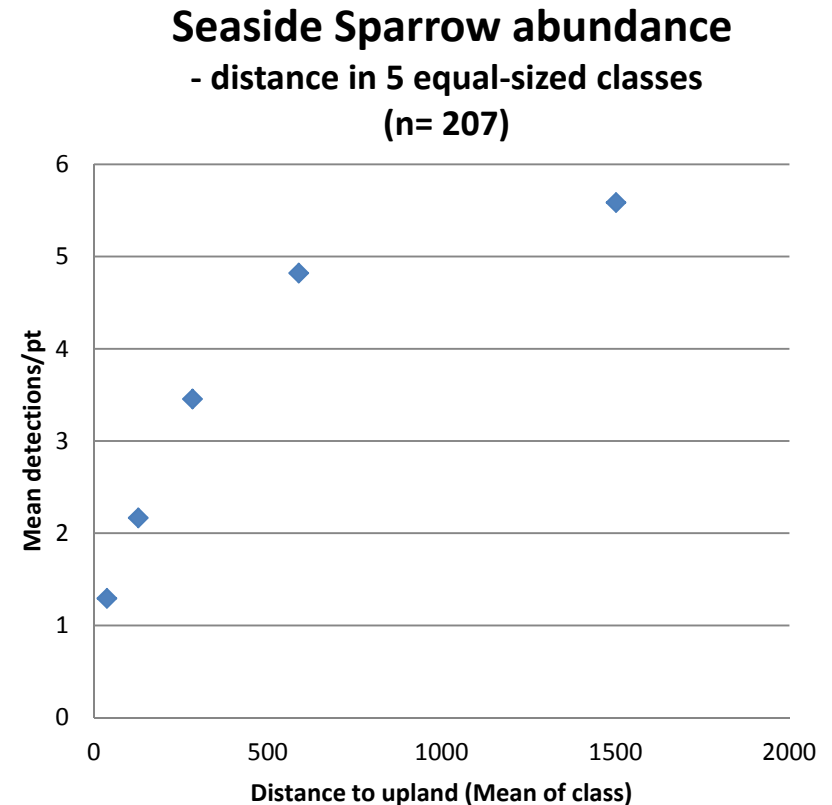
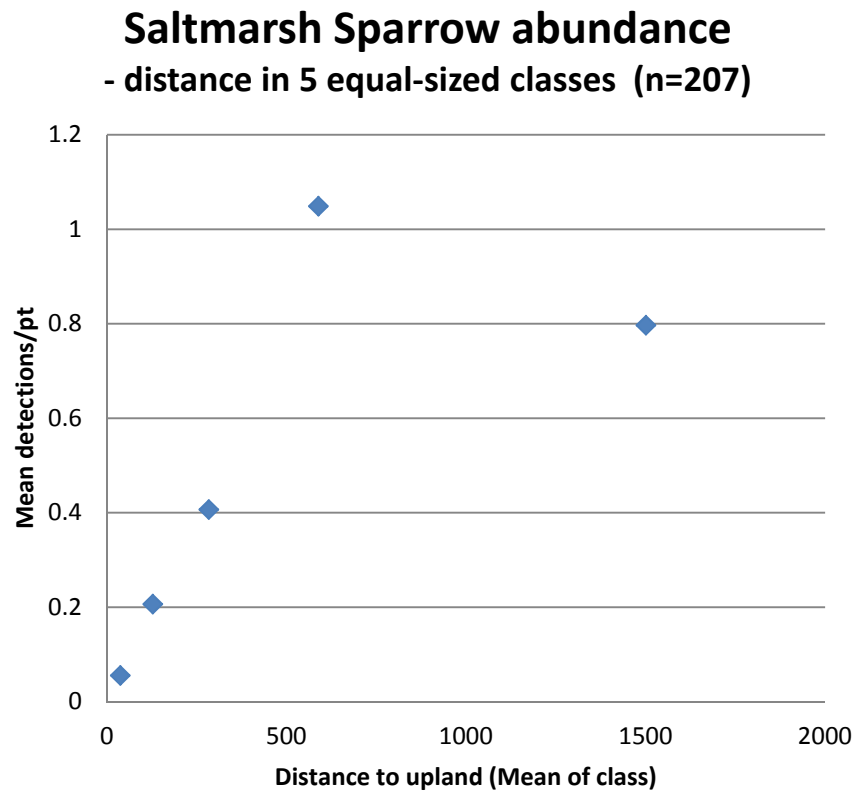
THE CONSERVATION FUND



Focal species distribution – SHARP survey results



Area sensitivity/edge effects in salt marsh obligate birds.



Source: SHARP surveys in Maryland, 2011

Marshes for Tomorrow

Blackwater Climate Adaptation Project



Identifying Salt Marsh Bird Habitat

21st Century Conservation.
Planning for a changing climate.

THE CONSERVATION FUND



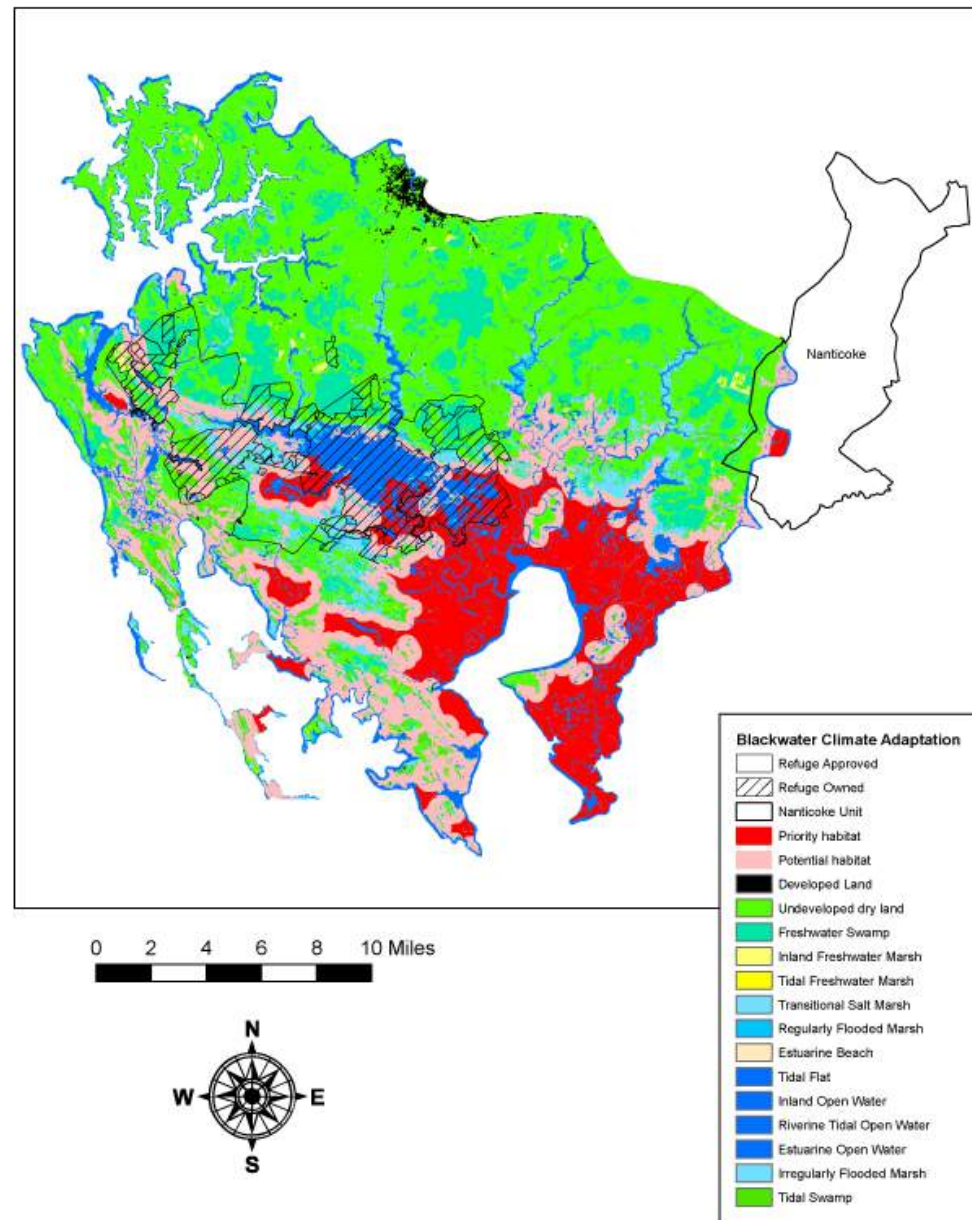
Defining priority salt marsh bird habitat

- Irregularly flooded (high) tidal marsh.
- Meadows of short *Spartina alterniflora*, *S.patens*, saltgrass are highest priority:
 - but have not been mapped in project area, and cannot be distinguished from other high marsh vegetation by predictive SLR models (SLAMM).
- Marsh patch size >65 ha, capable of containing full salt marsh bird assemblage (Watts 1992).
 - DNR SLAMM models used 61 ha patch size threshold (263 ha to include Northern Harrier).
- High priority interior marsh > 500m from upland edge. Lower priority edge marsh contains marsh birds at lower density.

SLAMM – predicted high marsh habitat at 25-year intervals

- Irregularly flooded + transitional marsh
- Minimum patch size = 65 ha
- High priority **interior marsh** >500 m from upland edge
- Lower priority **edge marsh** < 500m from upland edge

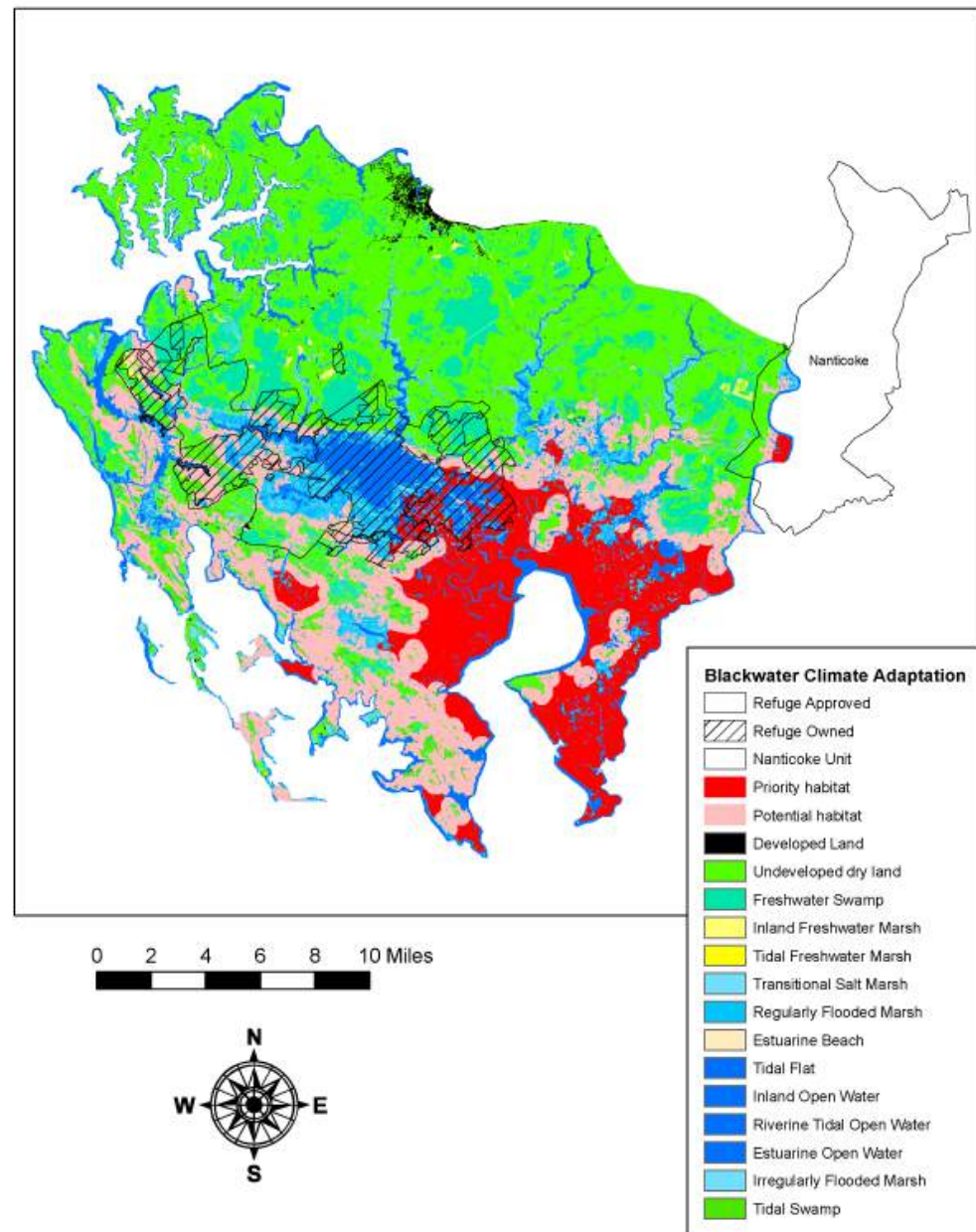
2010 modeled marsh bird habitat (DRAFT)



SLAMM – predicted high marsh habitat at 25-year intervals

- Irregularly flooded + transitional marsh
- Minimum patch size = 65 ha
- High priority **interior marsh** >500 m from upland edge
- Lower priority **edge marsh** < 500m from upland edge

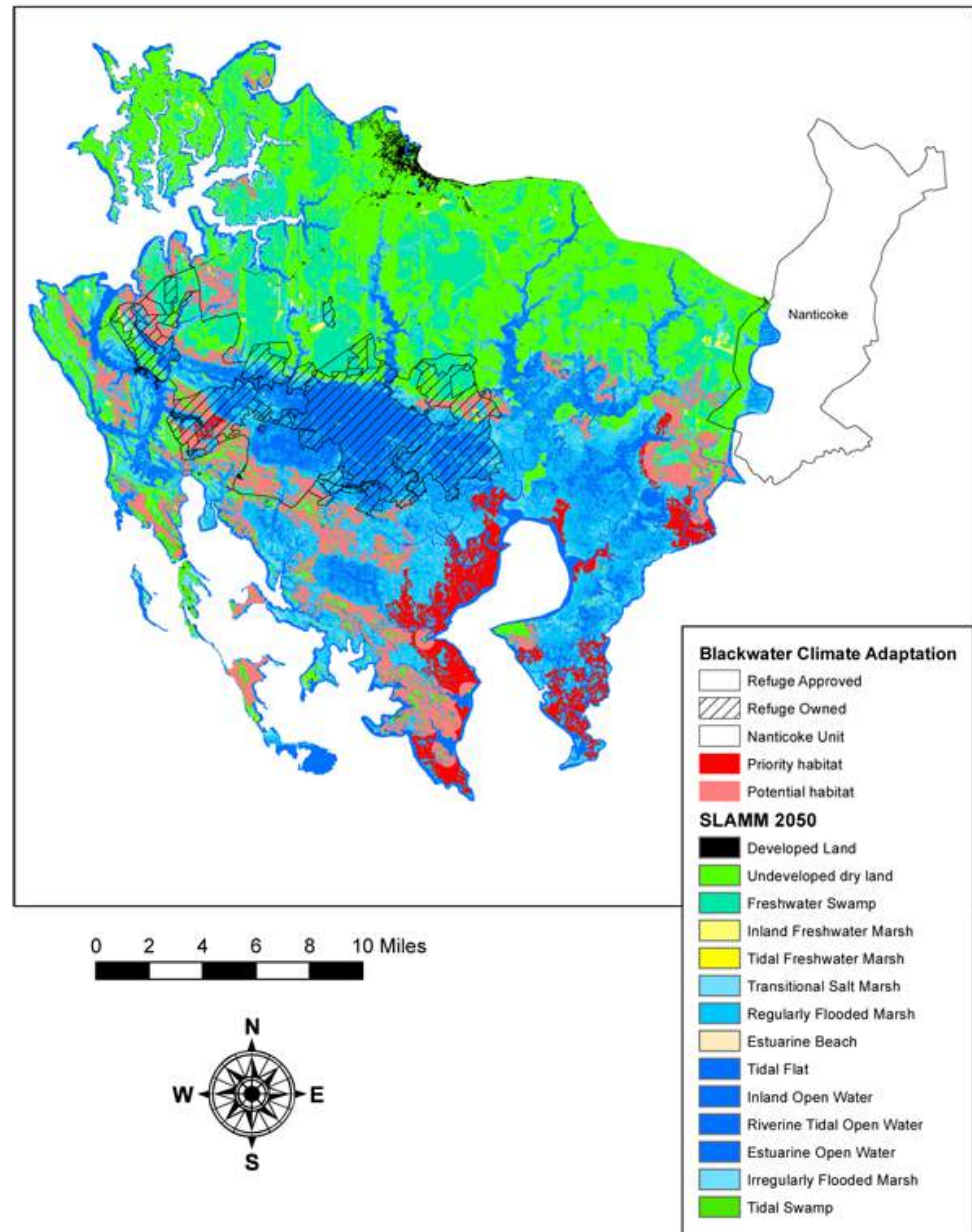
2025 modeled marsh bird habitat (DRAFT)



SLAMM – predicted high marsh habitat at 25-year intervals

- Irregularly flooded + transitional marsh
- Minimum patch size = 65 ha
- High priority **interior marsh** >500 m from upland edge
- Lower priority **edge marsh** < 500m from upland edge

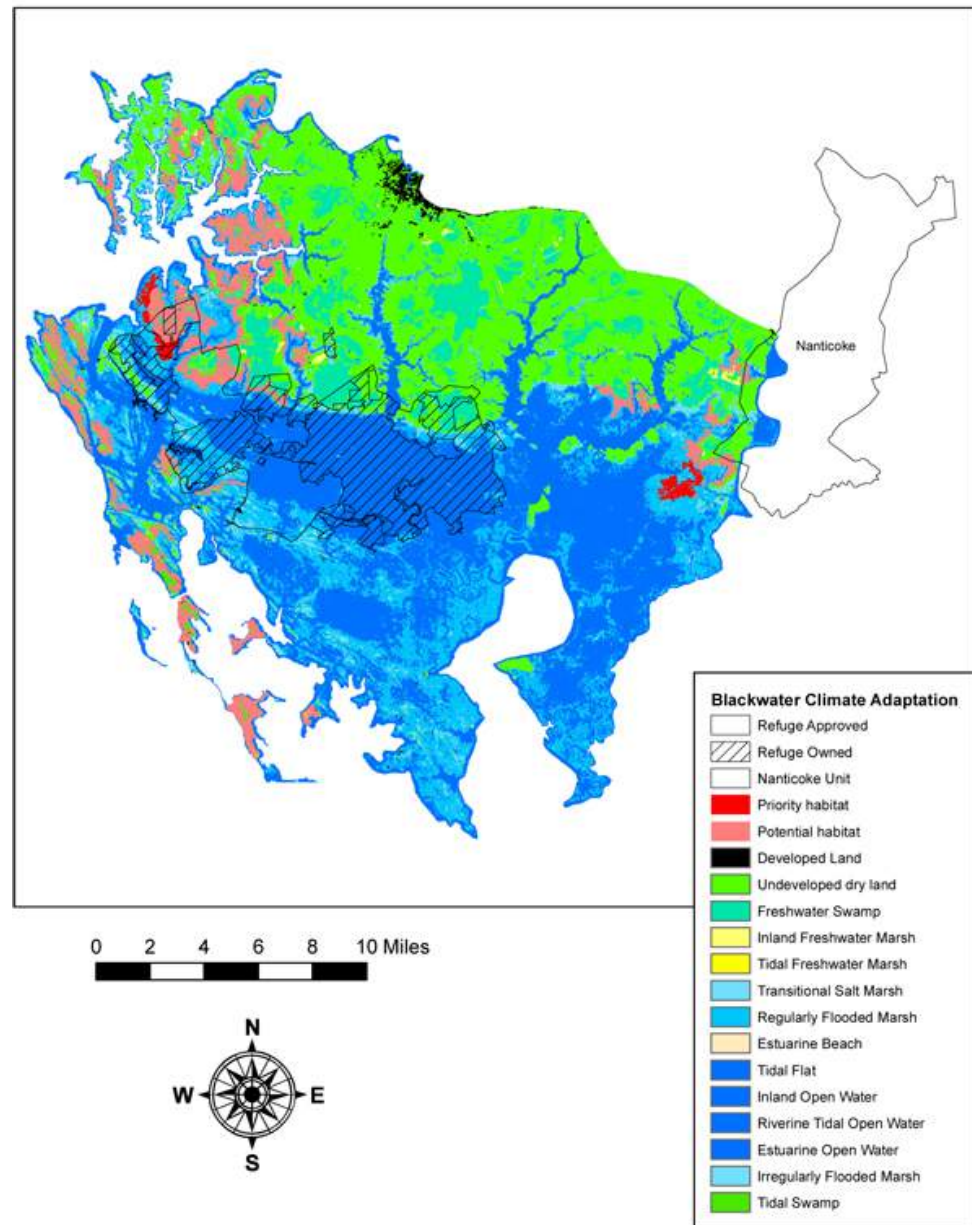
2050 modeled marsh bird habitat (DRAFT)



SLAMM – predicted high marsh habitat at 25-year intervals

- Irregularly flooded + transitional marsh
- Minimum patch size = 65 ha
- High priority **interior marsh** >500 m from upland edge
- Lower priority **edge marsh** < 500m from upland edge

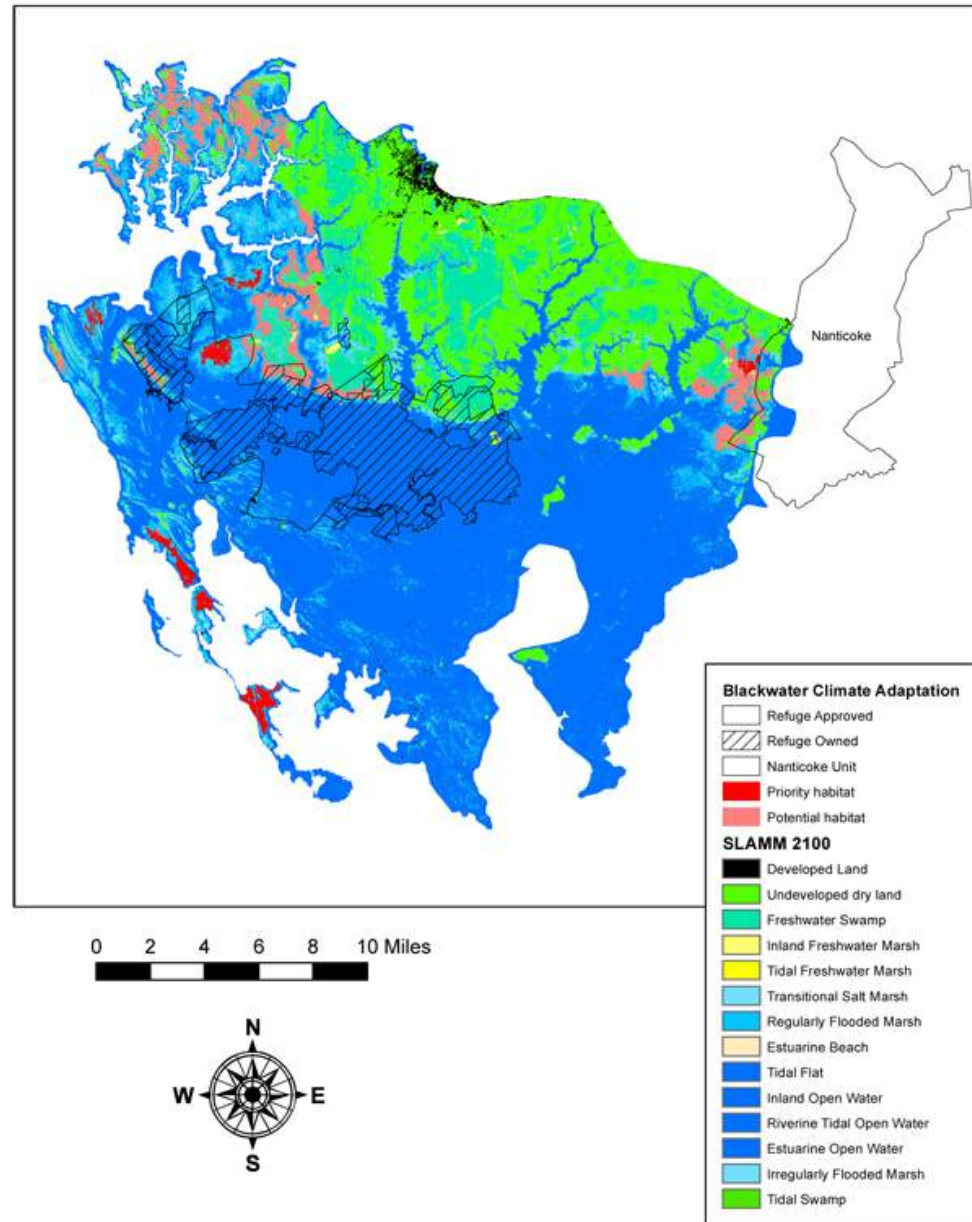
2075 modeled marsh bird habitat (DRAFT)



SLAMM – predicted high marsh habitat at 25-year intervals

- Irregularly flooded + transitional marsh
- Minimum patch size = 65 ha
- High priority **interior marsh** >500 m from upland edge
- Lower priority **edge marsh** < 500m from upland edge

2100 modeled marsh bird habitat (DRAFT)



Marshes for Tomorrow

Blackwater Climate Adaptation Project



Identifying Corridors
for Marsh Migration

21st Century Conservation.
Planning for a changing climate.

Additional Marsh Migration Suitability Factors

- Factors not accounted for in SLAMM:
 - road networks
 - land use/land cover
 - future development/land protection
 - hydrologic factors of inundation risk

THE CONSERVATION FUND

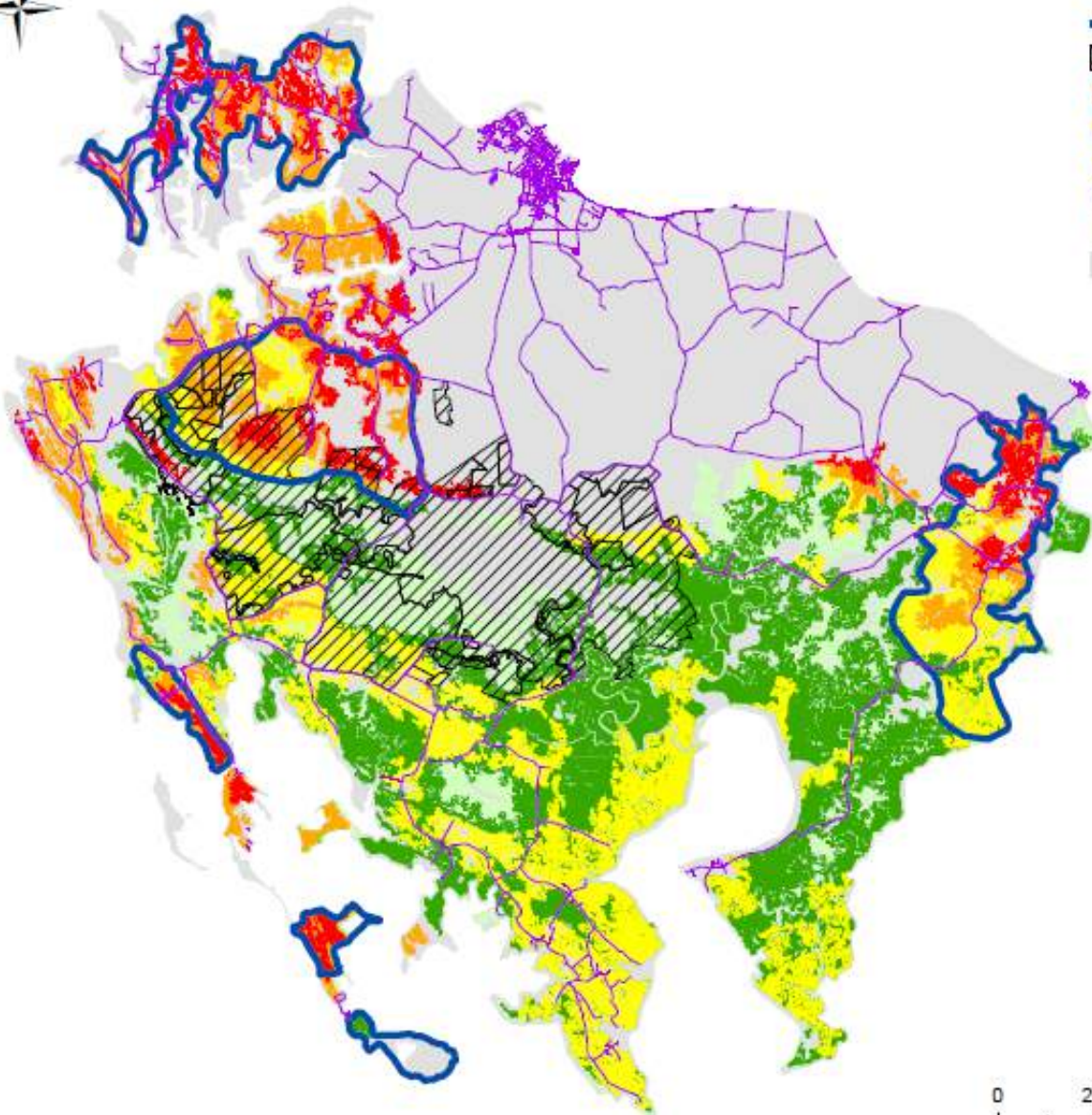


Marsh migration corridors



Blackwater Climate Adaptation Project

- Project Area Roads
- Migration Corridors
- Blackwater NWR
- Marsh Bird Habitat 1 meter SLR (2100)
- Marsh Bird Habitat 72 cm SLR (2075)
- Marsh Bird Habitat 42 cm SLR (2050)
- Marsh Bird Habitat 19 cm SLR (2025)
- Marsh Bird Habitat 2010
- Project Boundary



0 2.5 5 10 Miles

The road forward...

☀ **Adaptation Strategies**

1. Increase resilience/persistence of existing wetlands
 - Thin layer sediment applications
 - Alter drainage regime (ditches), burning regime.
2. Facilitate wetlands migration
 - Pine removal to accelerate transition to marsh
 - Phragmites control at upland ecotone
3. Protect land in priority marsh migration corridors

☀ **Communications Strategy**





Habitat management questions - facilitating marsh migration

Goal – increased area of high priority interior marsh

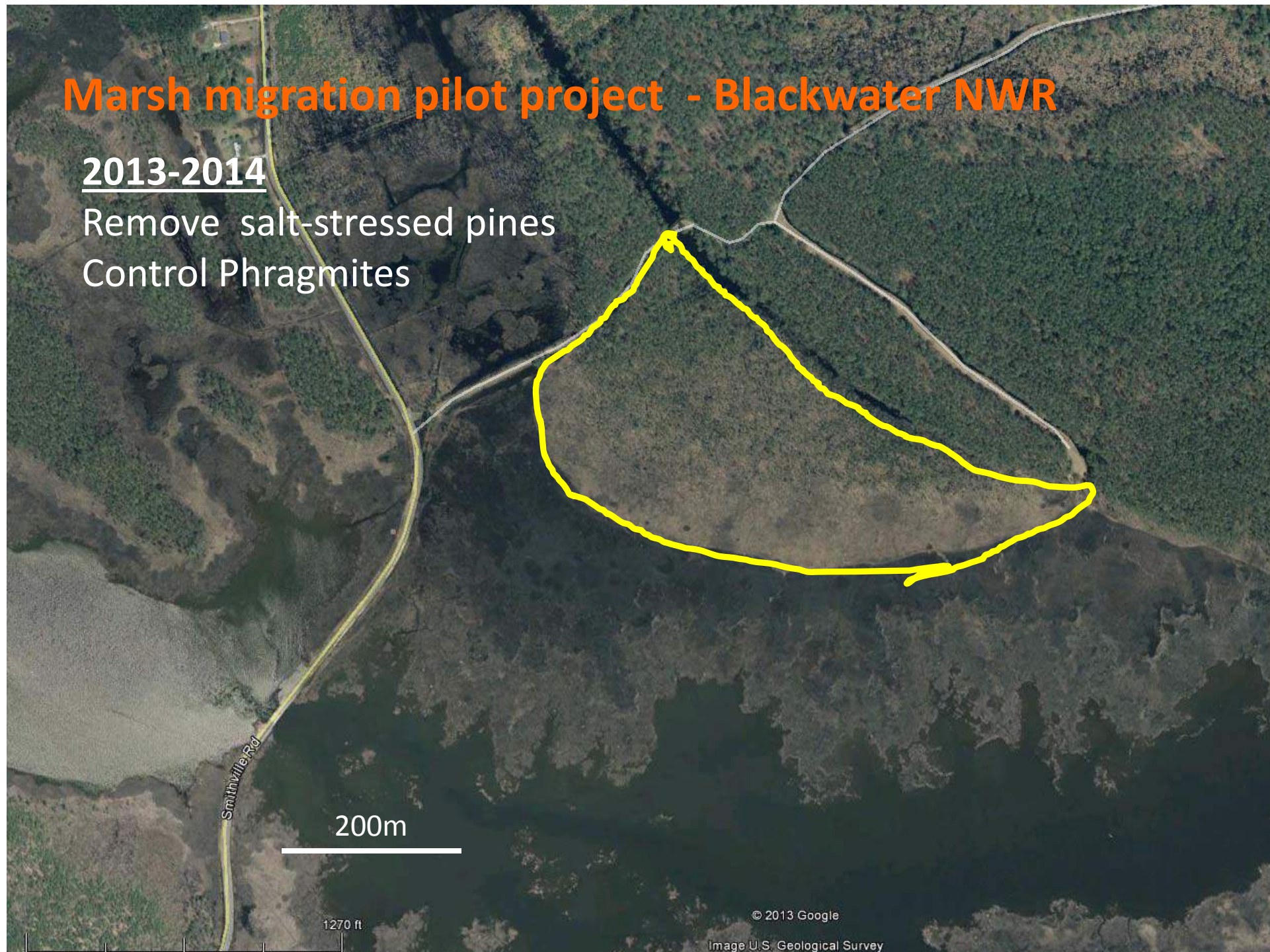
- How can trees be removed without promoting Phragmites?
- Will root zone collapse reduce surface elevation and promote marsh erosion?
- When should pines be removed?
 - While still alive or only when dead?
 - Only after *Spartina patens* is established beneath?
- Pilot tree removal project will begin 2013 on the refuge.
(WCS funded project, TCF/Audubon)

Marsh migration pilot project - Blackwater NWR

2013-2014

Remove salt-stressed pines

Control Phragmites





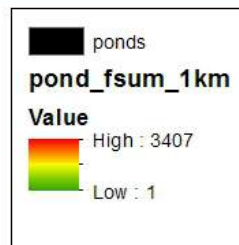
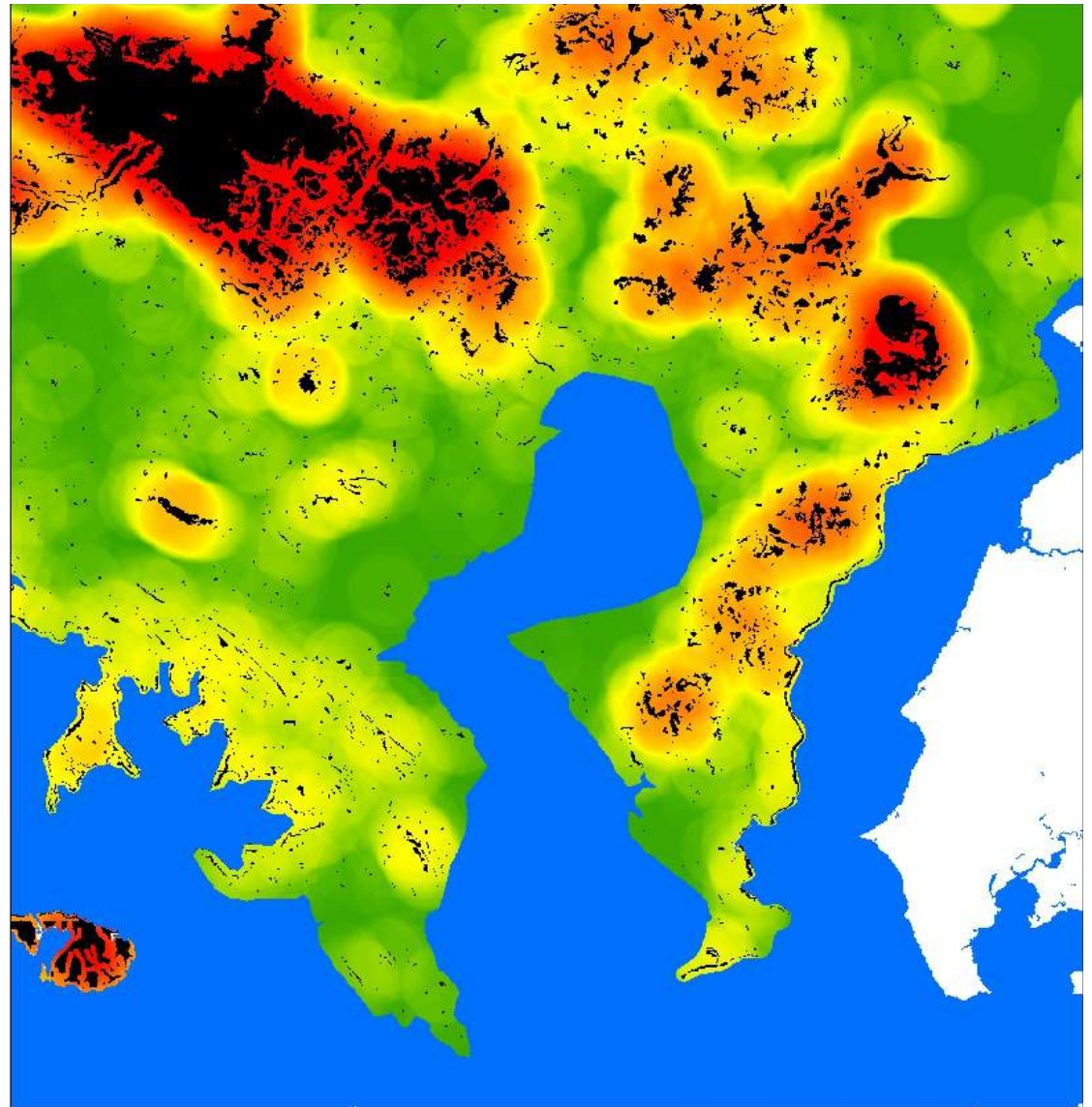
Habitat management questions - increasing resilience of existing marsh

Goals – Increase elevation at a rate equal to SLR?
– Convert needlerush marsh to *Spartina patens* marsh?

- Can sufficient acreage be treated with sediment to make a conservation impact?
- Is onsite sediment suitable or too high in organic content?



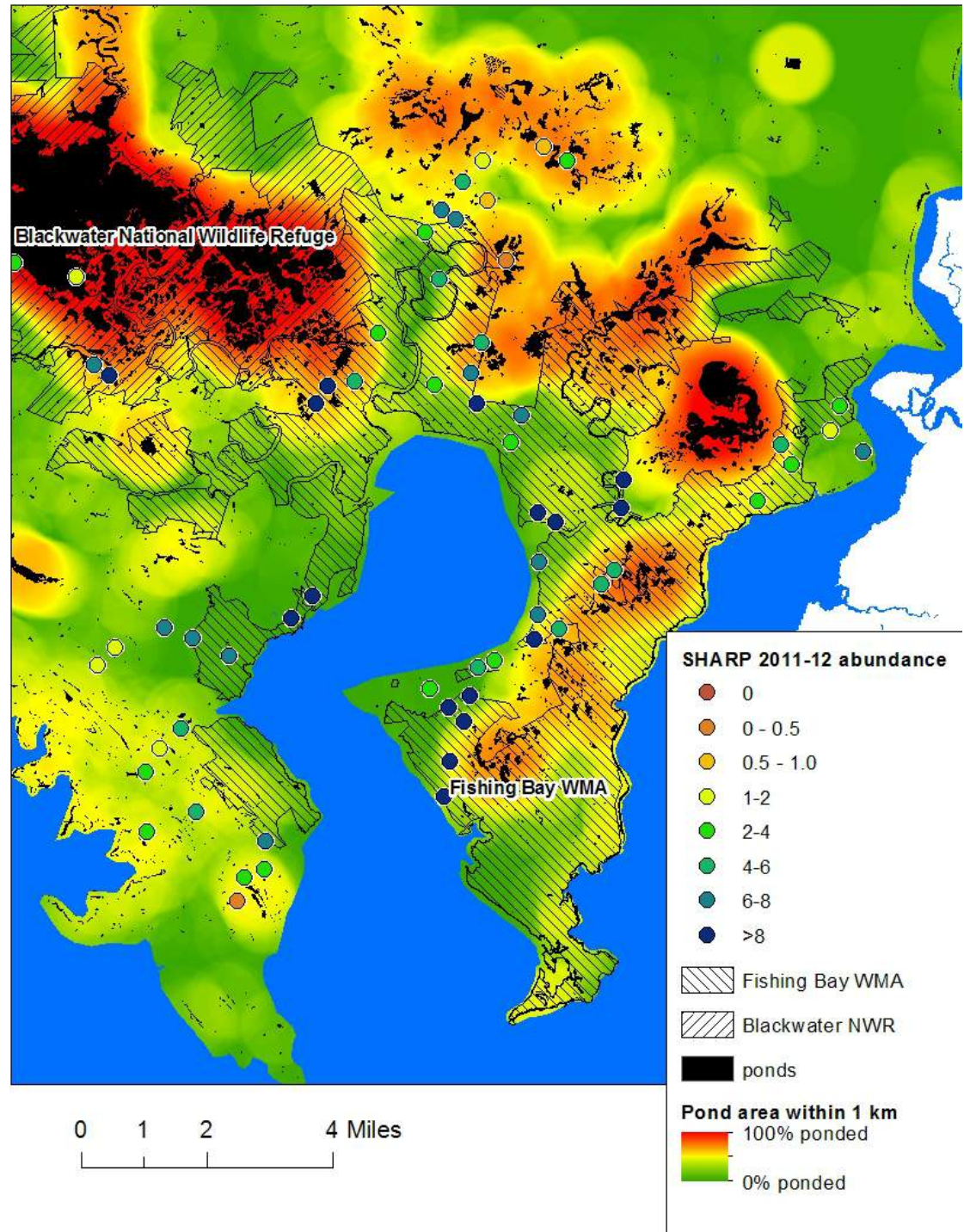
Defining high quality (intact) marsh by pond density



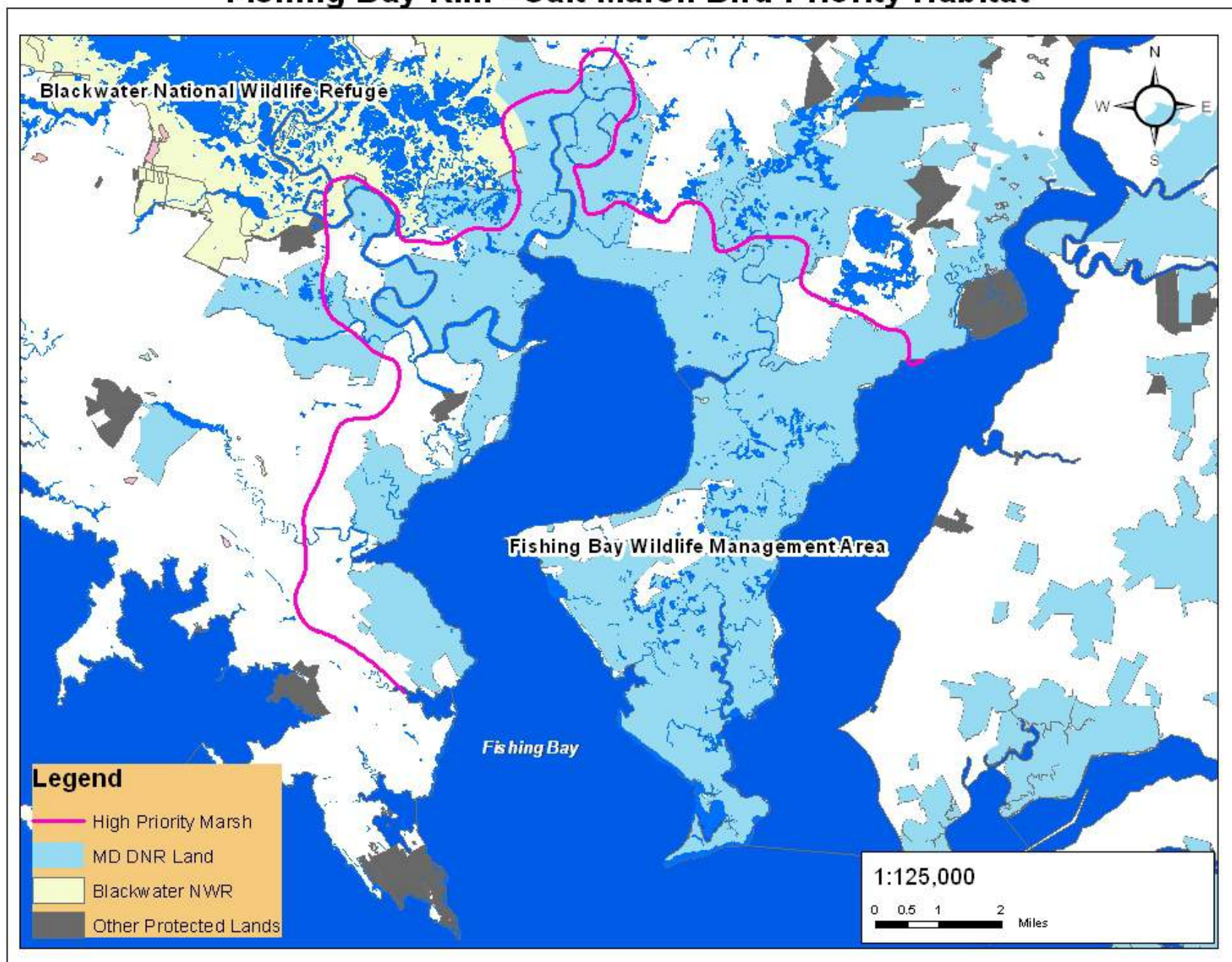
0 1 2 3 4 5 Kilometers

A scale bar with tick marks at 0, 1, 2, 3, 4, and 5 Kilometers.

Defining high quality (intact) marsh by pond density



Fishing Bay Rim - Salt Marsh Bird Priority Habitat

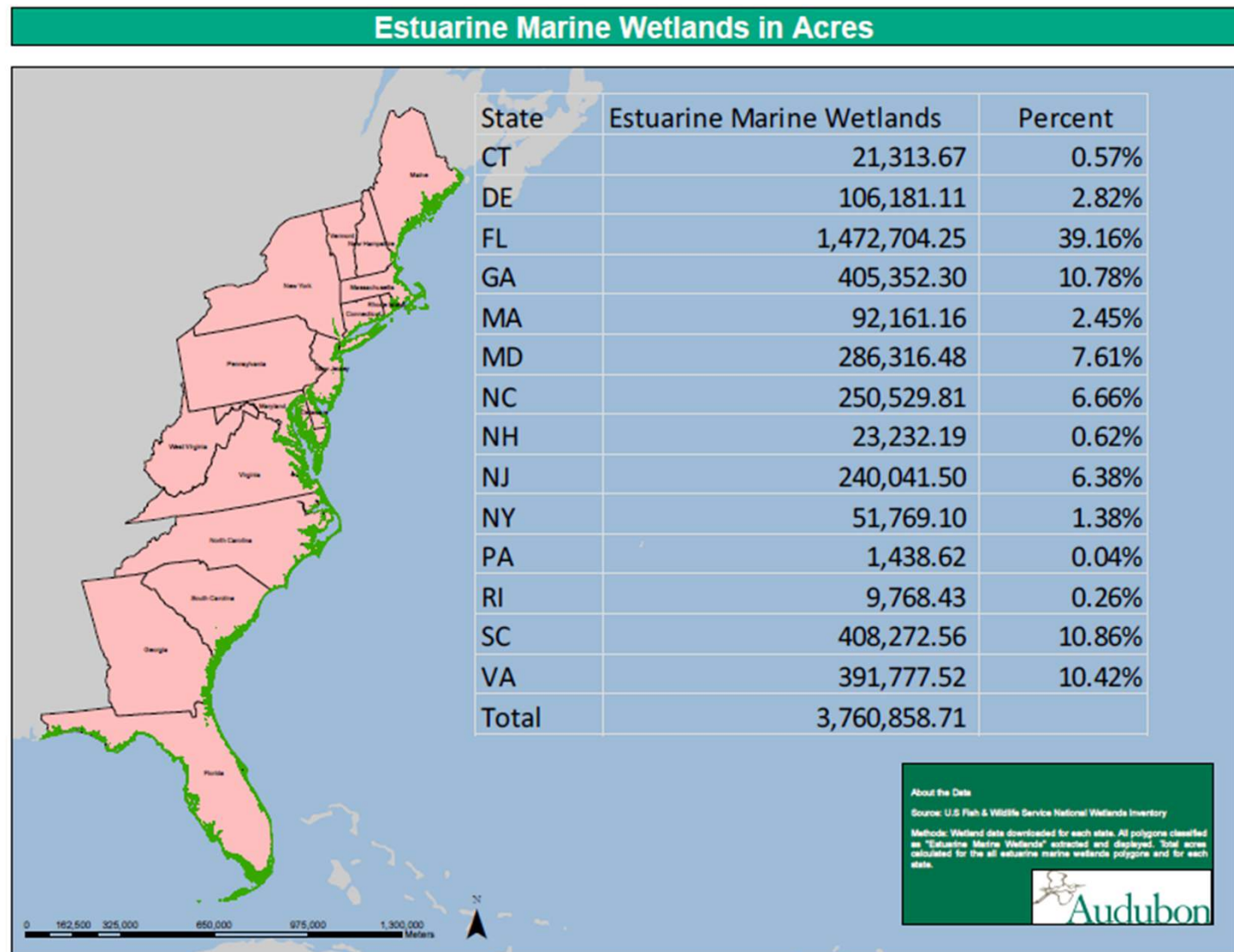


Mapping needs

Key staff have limited GIS skills and time, but do have access to ArcGIS:

- Build geodatabase and map package for Dorchester County/lower Eastern Shore for exploratory spatial analyses.
- Vegetation mapping of marshes. Identify *Spartina* meadows, areas of invasive *Phragmites*.
- Ongoing need for project maps.

Salt Marsh Conservation on the Atlantic Flyway



Acknowledgements

Town Creek Foundation

Maryland DNR

USFWS, via SHARP

USFWS, Chesapeake Bay Field Office

Blackwater NWR

Maryland Ornithological Society

Chesapeake Audubon Society

Audubon Society of Central Maryland

Friends of Blackwater

Toyota Together Green

National Audubon Society