Marsh and Waterbird Monitoring Efforts in the Inland Bays

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DNREC DIVISION OF FISH AND WILDLIFE

Overview

Marsh Birds

Colonial Waterbirds

Questions and Discussion

Documented Declines

- Saltmarsh habitat loss and degradation
  - Sea-level rise and coastal storms
  - Excessive pooling, vegetation die-off
  - Invasive species
  - Past and present human alterations
    - Ditching, tidal restrictions, migration barriers, shoreline hardening
- Marsh bird populations declining from sea-level rise and habitat loss
  - Ex: saltmarsh sparrow: -9%/year
  - Ex: Northern clapper rail: -4.6%/year

Need for Marsh Bird Monitoring

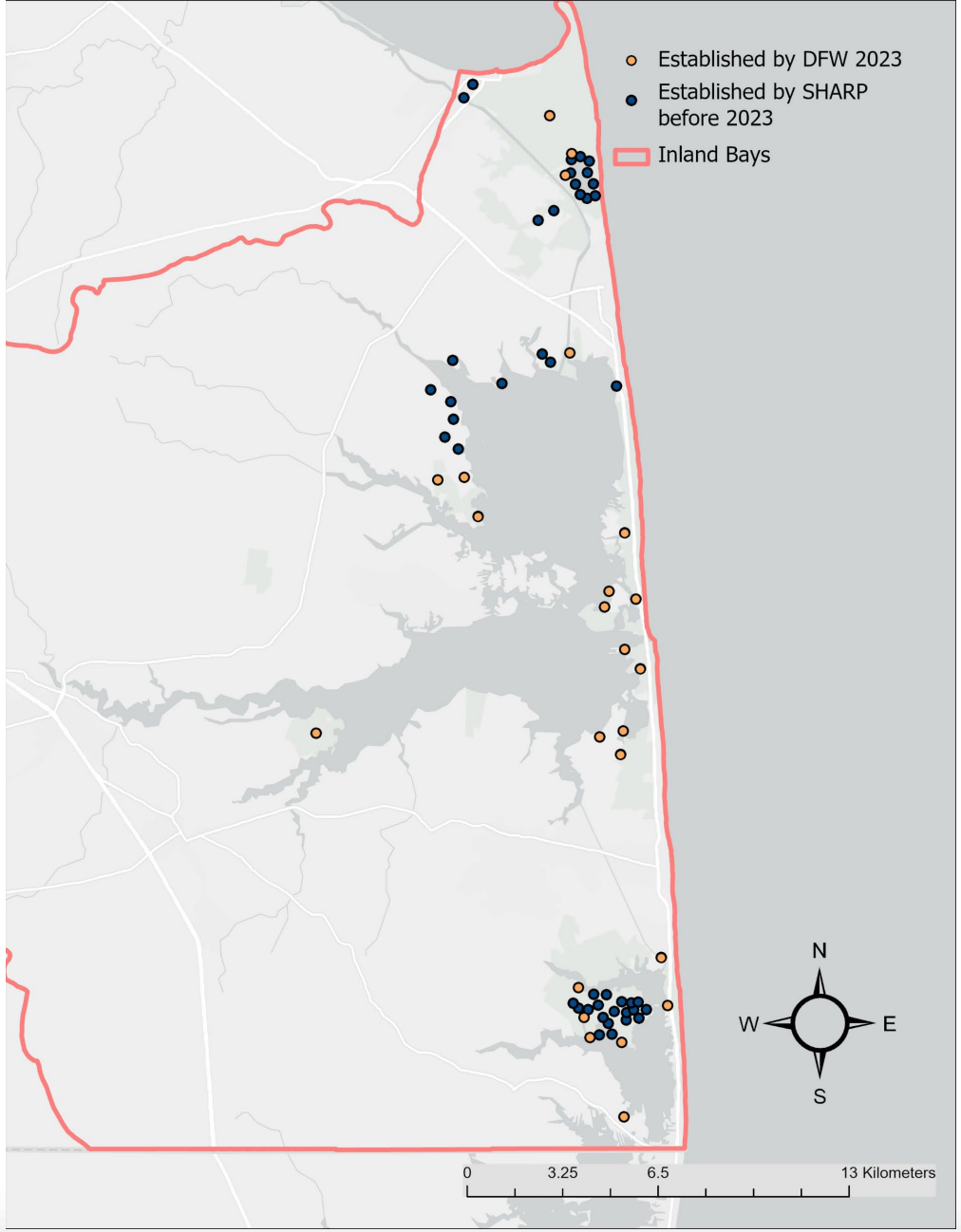
- Understand species occupancy, abundance, and trends
- Contribute to state-level and region-wide management and conservation strategies
- Provide insight for saltmarsh restoration projects
- Enact Saltmarsh Sparrow Conservation Plan (ACJV 2020)
  - Calls for state-level surveys every 2-3 years

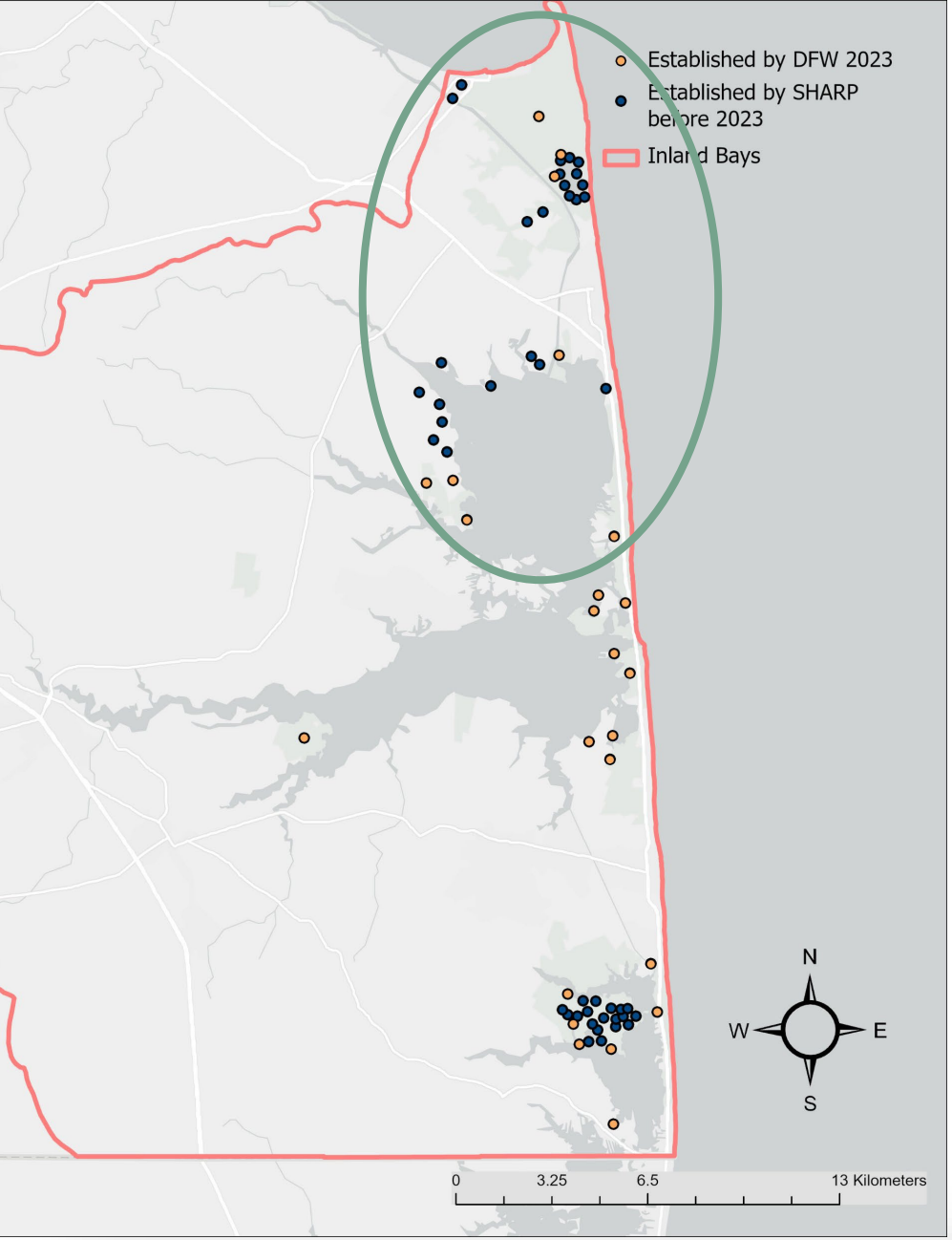
Marsh Bird Point Counts

- Many marsh birds are secretive, difficult to detect and assess using many traditional methods
- North American Marsh Bird Monitoring Protocol (Conway 2011) is specifically designed to address challenges related to marsh birds
  - 2-3 visits per survey point per season
  - May 1 to July 15 during peak breeding season
  - Point counts that include passive period and playback call period
  - Conducted from 30 minutes before sunrise to about 11am
- Point count data can be used for understanding occupancy and estimating abundance
- Survey points randomly selected using a generalized random tessellation stratified (GRTS) sampling design

Marsh Bird Point Counts: Inland Bays

- Some survey points established by Saltmarsh Habitat and Avian Research Program (SHARP) prior to 2023
  - Marsh points: established 2011
  - Impoundment points: established 2018
- Additional marsh survey points established by Delaware Division of Fish and Wildlife (DFW) in 2023 to target spatial gaps
- Sampling has varied across years depending on research goals and land access permissions



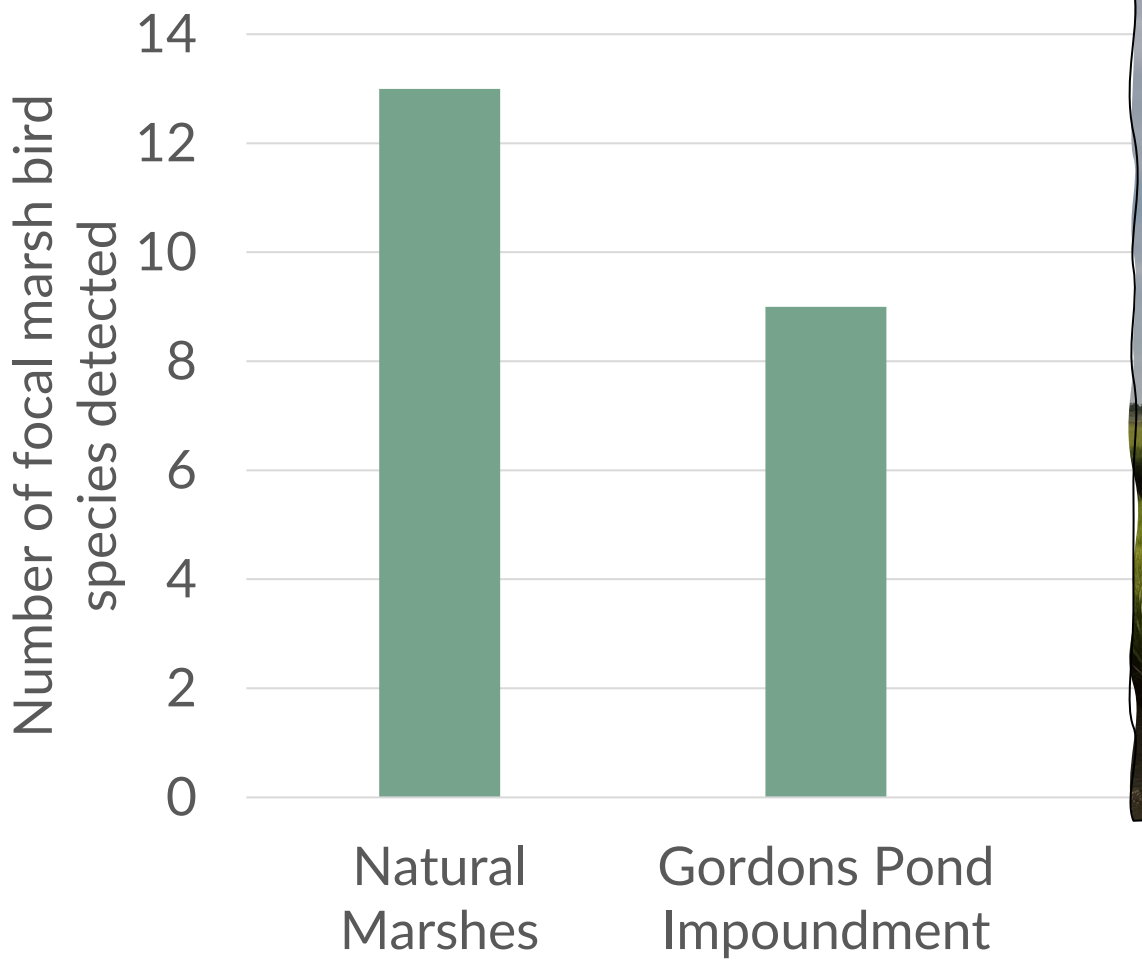


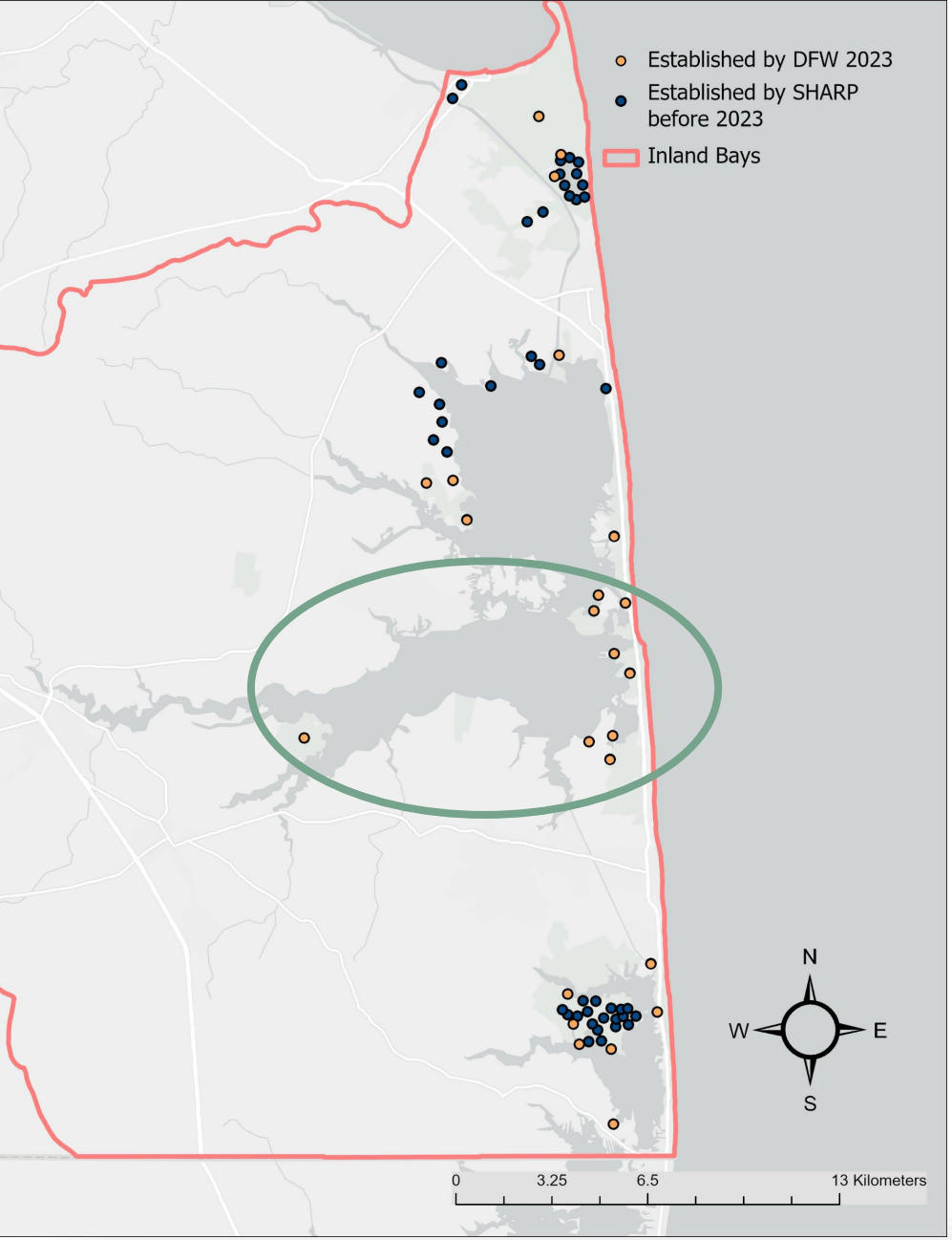
Marsh Bird Breeding Season Occupancy: Rehoboth Bay

Focal species detected during at least one survey:

- American bittern
- Black-necked stilt
- Black skimmer
- Clapper rail
- Coastal Plain swamp sparrow
- Forster's tern
- Least bittern
- King rail
- Marsh wren
- Saltmarsh sparrow
- Seaside sparrow
- Virginia rail
- Willet

Marsh Bird Species Richness: Rehoboth Bay

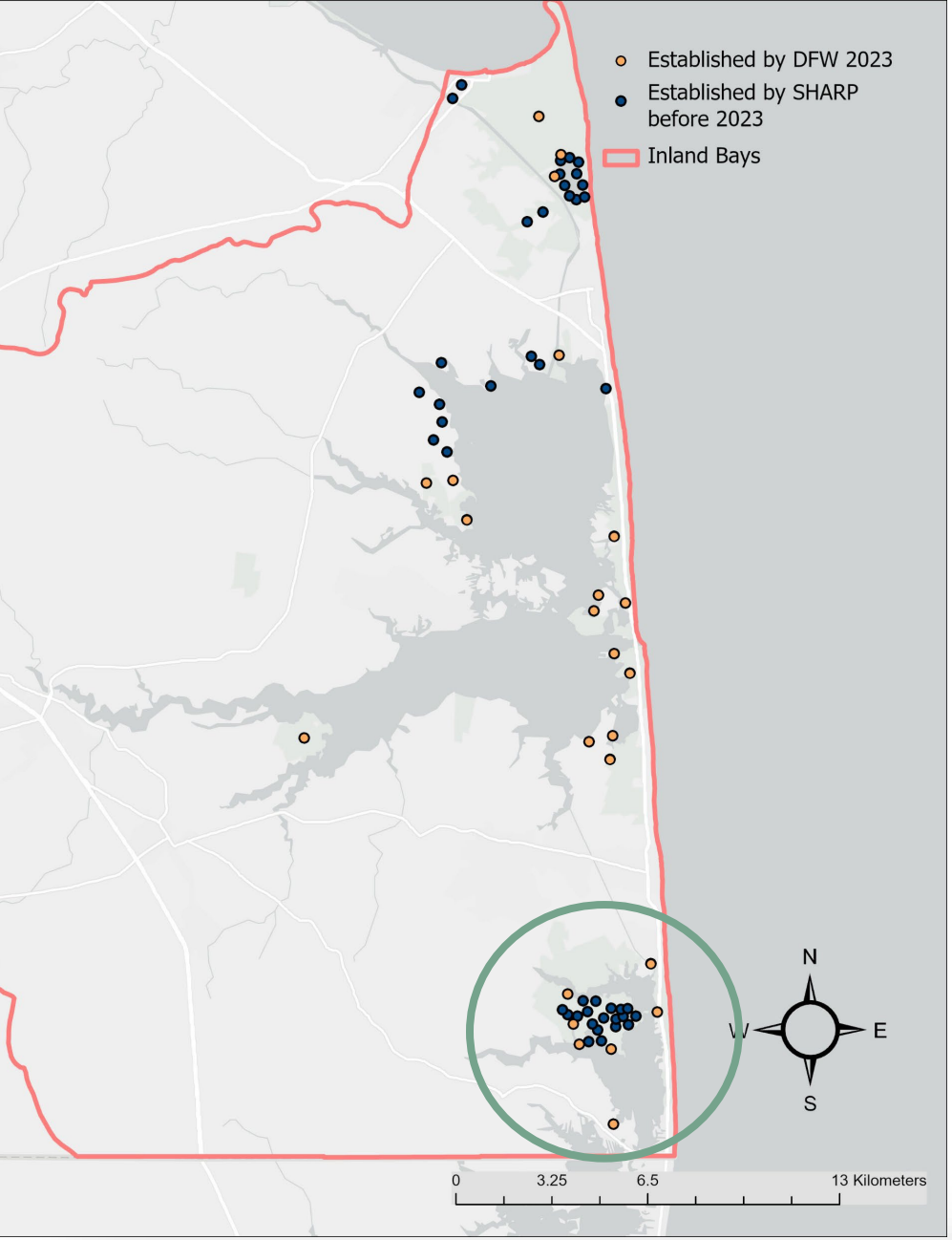




Marsh Bird Breeding Season Occupancy: Indian River Bay

Focal species detected during at least one survey:

- American oystercatcher
- Forster's tern
- Clapper rail
- Seaside sparrow
- Willet

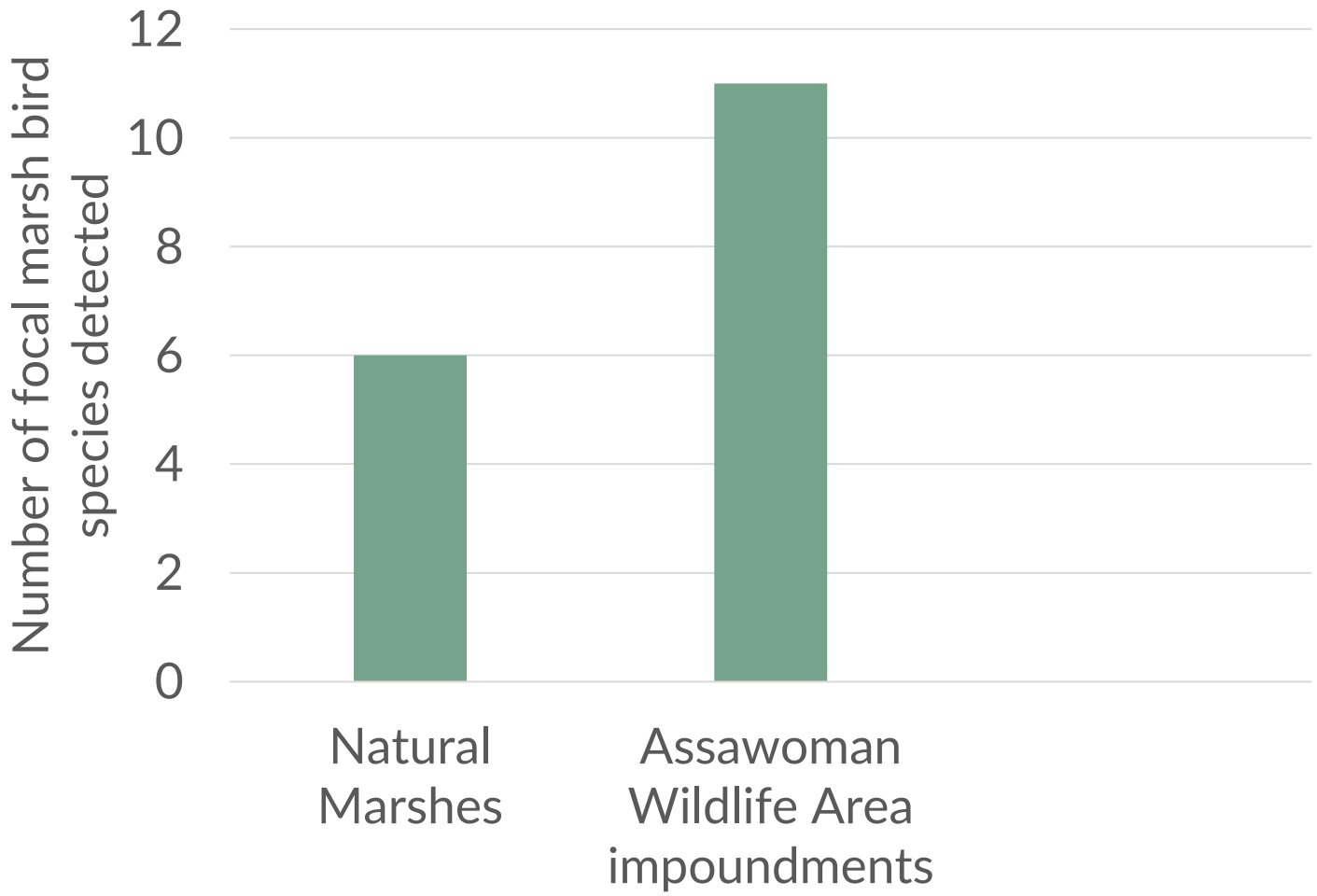


Marsh Bird Breeding Season Occupancy: Little Assawoman Bay

Focal species detected during at least one survey:

- American black duck
- Clapper rail
- Coastal Plain swamp sparrow
- Forster's tern
- King rail
- Least bittern
- Marsh wren
- Saltmarsh sparrow
- Seaside sparrow
- Virginia rail
- Willet

Marsh Bird Species Richness: Little Assawoman Bay



Survey points at James Farm Ecological Preserve

- Point counts began in 2023 with permission from Delaware Center for the Inland Bays
- Very quiet marshes overall
- Very few obligate marsh bird species detected at survey points in 2023

Species Detected at James Farm

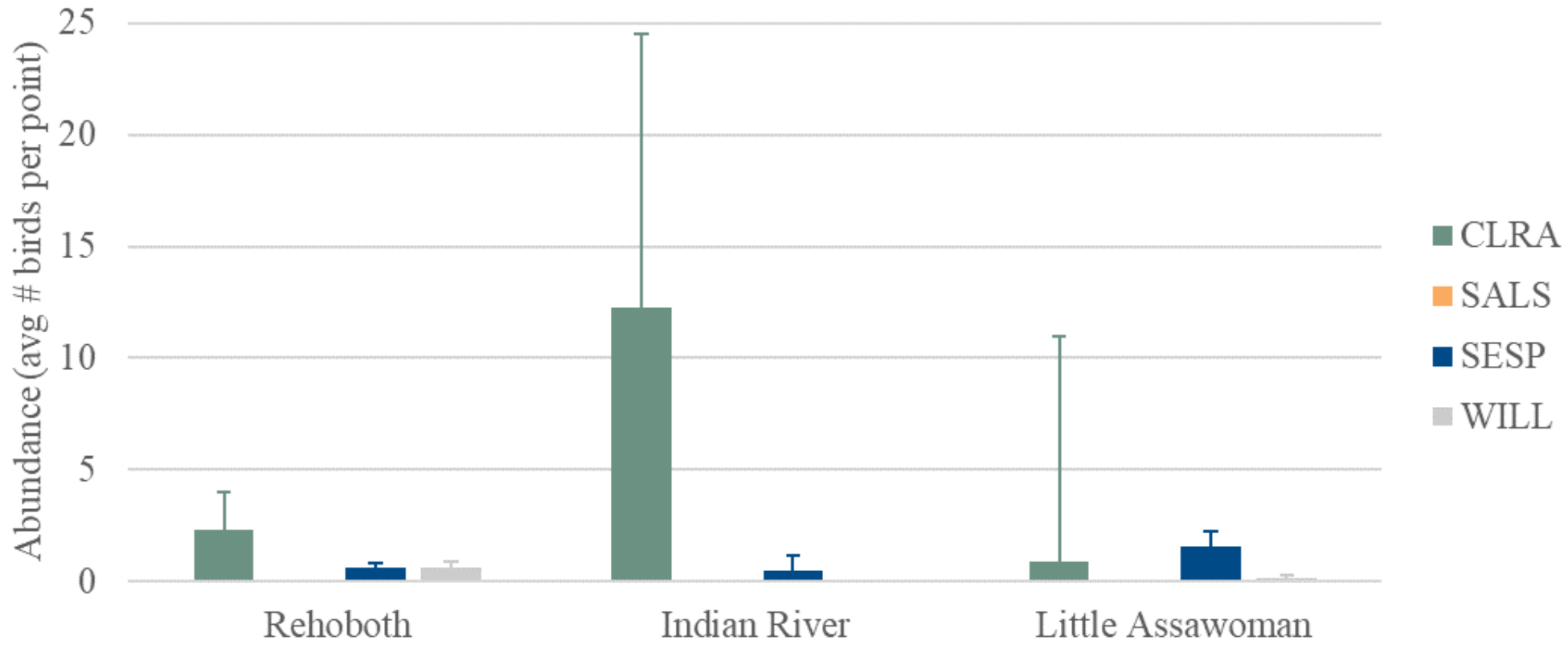
Marsh bird SGCN	Other species (in marsh or along border)
Forster's tern	American crow
Great blue heron	Barn swallow
Laughing gull	Carolina chickadee
	Carolina wren
	Downy woodpecker
	House wren
	Indigo bunting
	Mourning dove
	Northern cardinal
	Osprey
	Pine warbler
	Purple martin
	Red-winged blackbird
	Tufted titmouse

*SGCN=Species of Greatest Conservation Need listed in Delaware's Wildlife Action Plan

Marsh Birds: Estimating Abundance

- Can use point count data to estimate abundance using statistical models
- Estimated abundance by bay using 2023 data for 4 focal marsh bird species:
  - Clapper rail (CLRA)
  - Saltmarsh sparrow (SALS)
  - Seaside sparrow (SESP)
  - Willet (WILL)
- These species are all tidal marsh obligates that can serve as indicators of marsh health

Focal Marsh Bird Estimated Abundance 2023



*Modeled abundance based only on DFW survey points completed in 2023

Marsh Birds: Summary

- Inland Bays are home to many marsh obligate birds and are critical to maintain marsh bird biodiversity in Delaware
  - Natural marshes and impoundments both important
- 2023 data showed that marshes in James Farm Ecological Preserve supported relatively few marsh bird SGCN
  - Future surveys will show if this pattern holds true across years
- Estimated 2023 abundance of four focal marsh birds varied by species and by bay
  - SALS abundance estimated zero with so few detections
  - Delaware Seashore State Park appears to be key habitat for CLRA
  - Future surveys will allow for exploration of trends over time

Future Plans

- Continue to perform point counts statewide every 2-3 years, including in the Inland Bays
- Evaluate status and trends of marsh bird species to inform management and conservation
- Share findings with partners

Colonial Waterbirds

- Herons, egrets, ibis, gulls, terns, American oystercatcher
- In Delaware's Inland Bays, form colonies on islands and coastlines
  - Varied substrate needs by species (sandy, low veg, tall grass)
- Boom-bust dynamics common
- Sensitive to predators, flooding/weather, habitat erosion or suitability, disturbance

Colonial Waterbird Monitoring: Methods

- Intermittent data collection in Indian River and Rehoboth Bays

- Set protocol in 2023
  - Motorboat
  - Monthly surveys
  - Perimeter and point counts
  - Age class and nest counts

  - Survey location expansion

Colonial Waterbird Monitoring: Purpose

Establish baseline

Population sizes? What species breed in the bays? Trends?

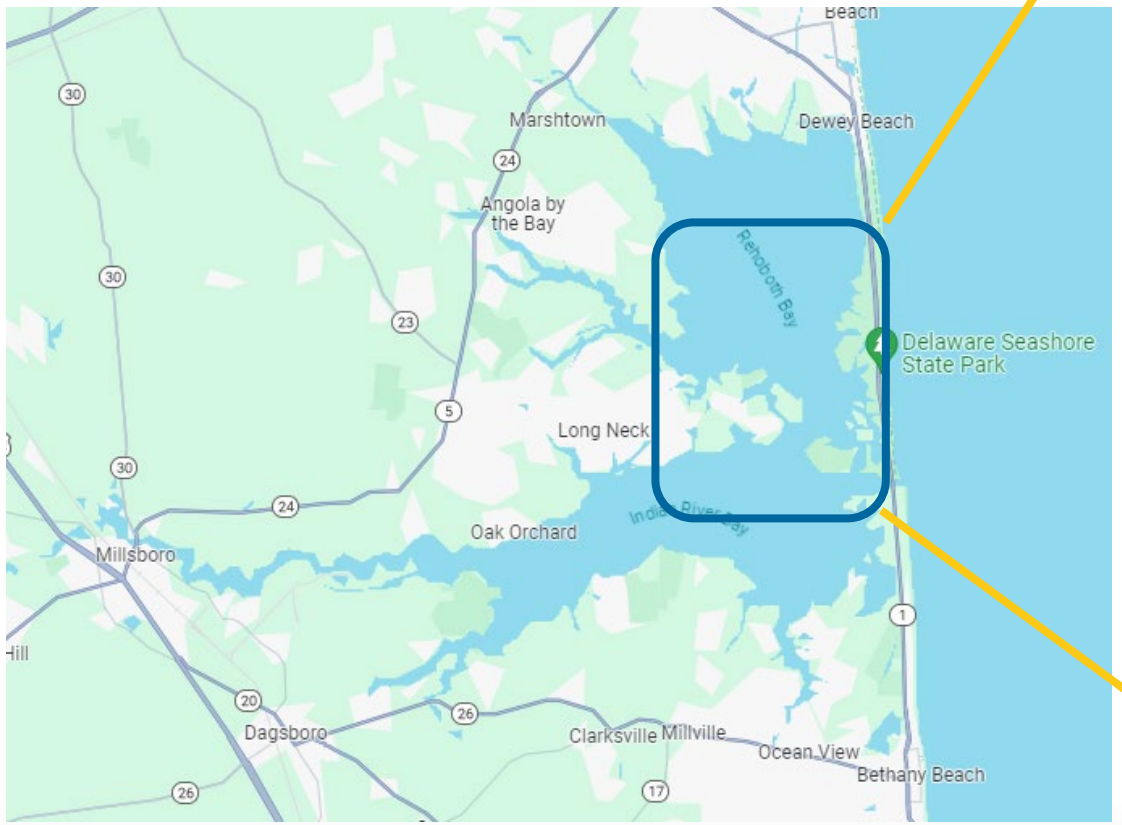
Identify habitat use

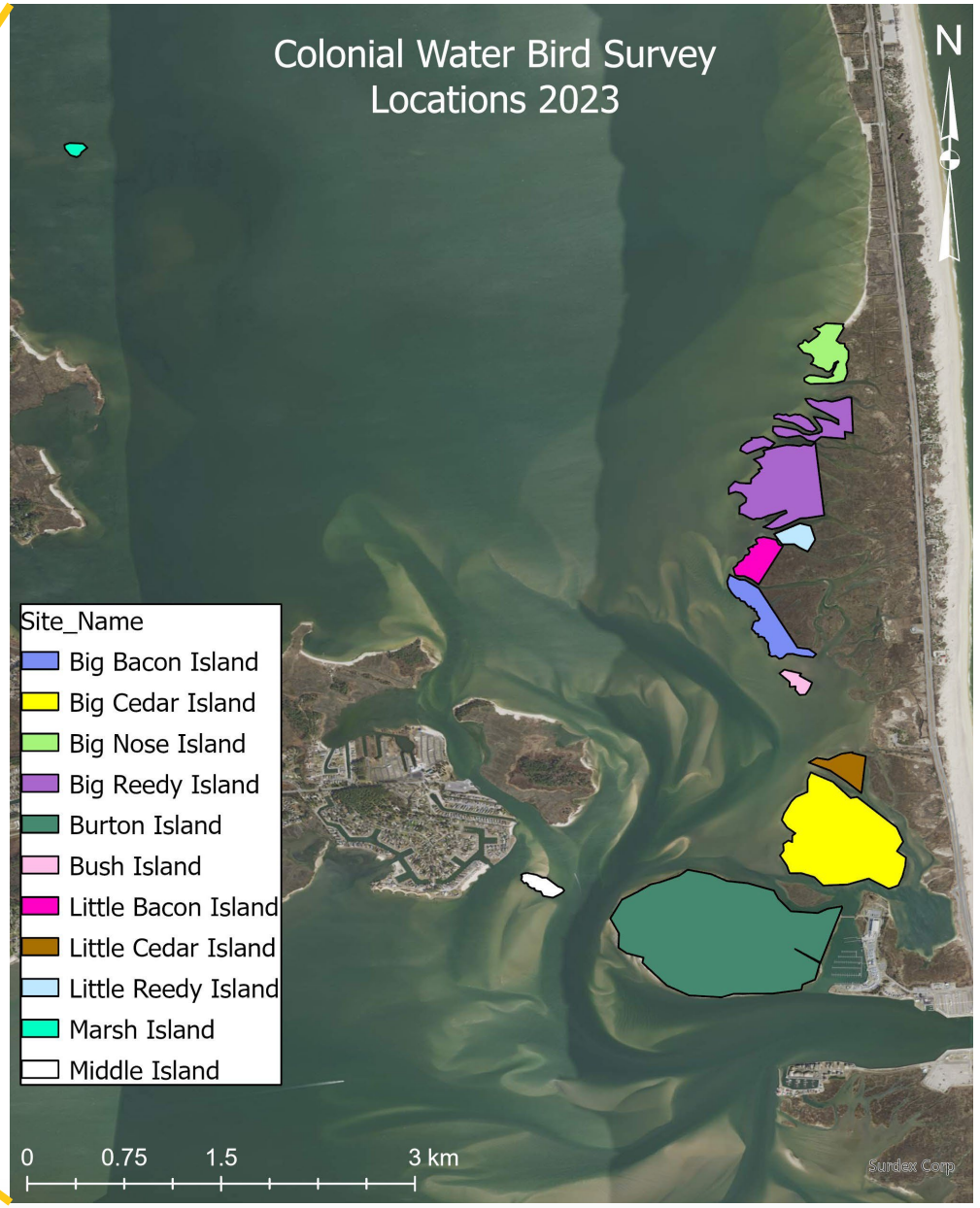
What areas are utilized, and is it consistent? Room for improvement?

Examine productivity

Nest success? Breeding timing and observations?

Colonial Waterbird Monitoring: Sites





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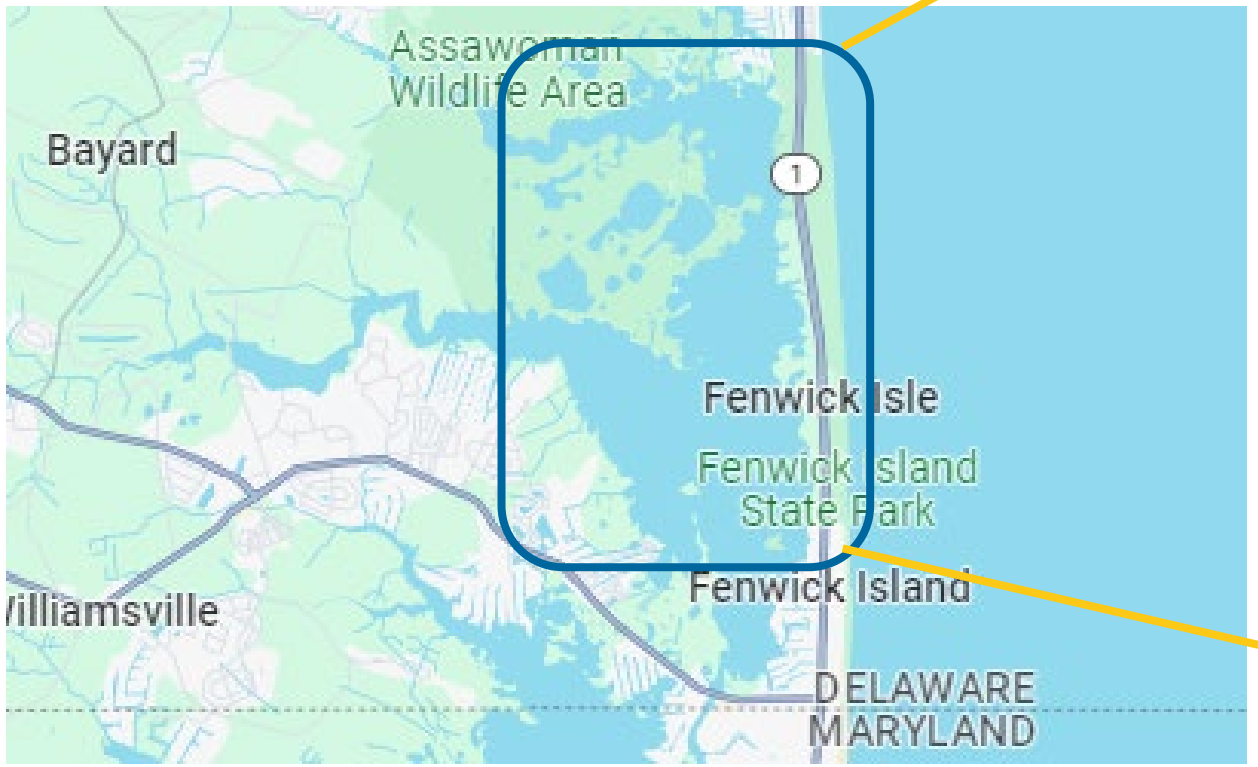

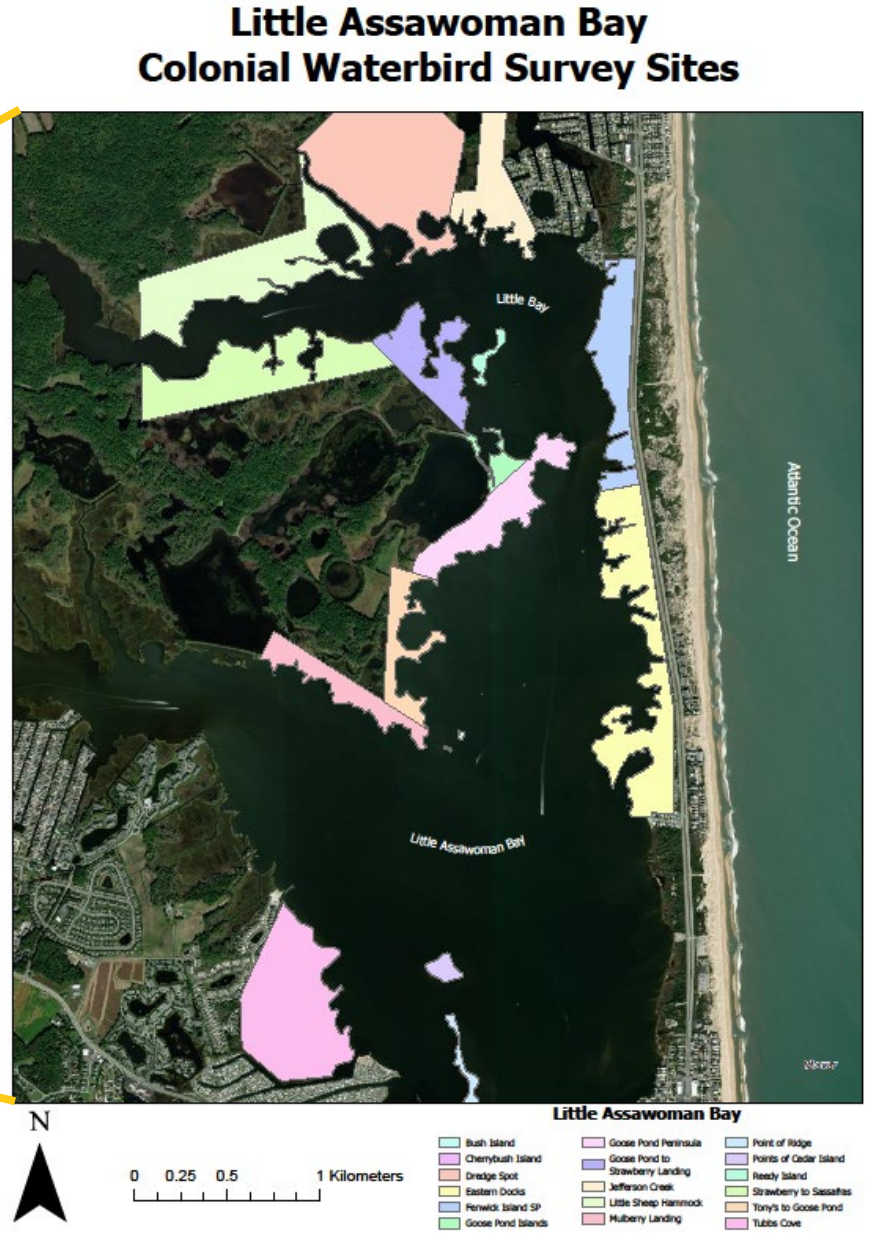

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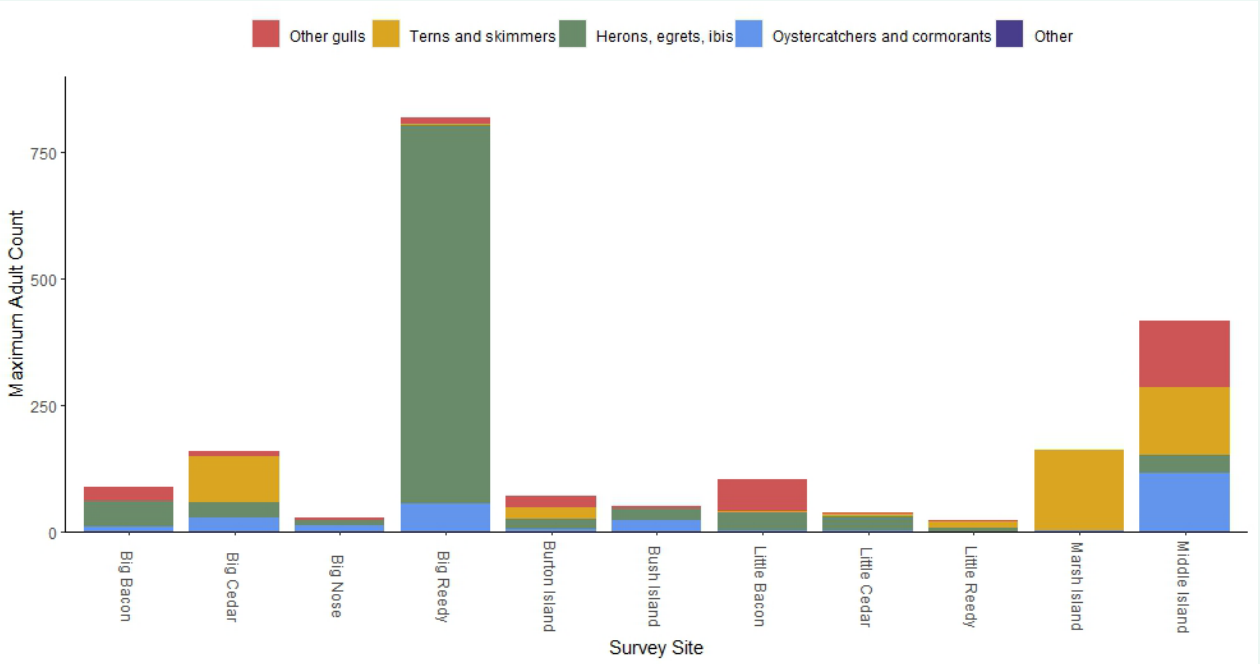
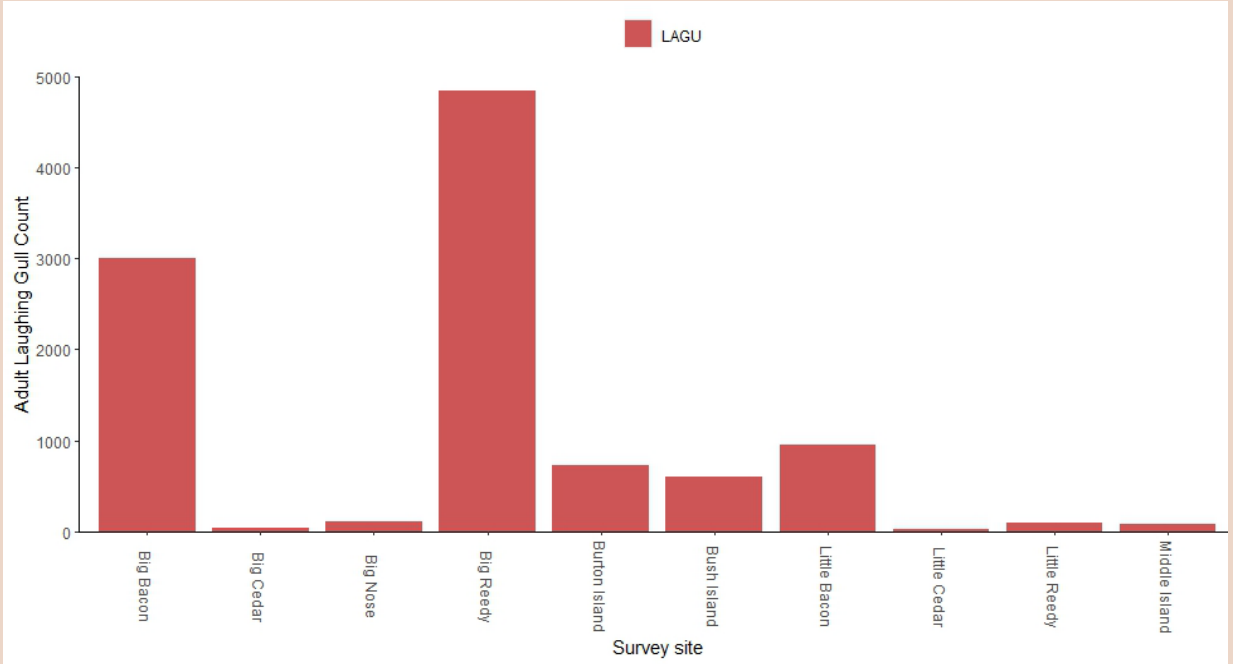
Colonial Waterbird Monitoring: Abundance



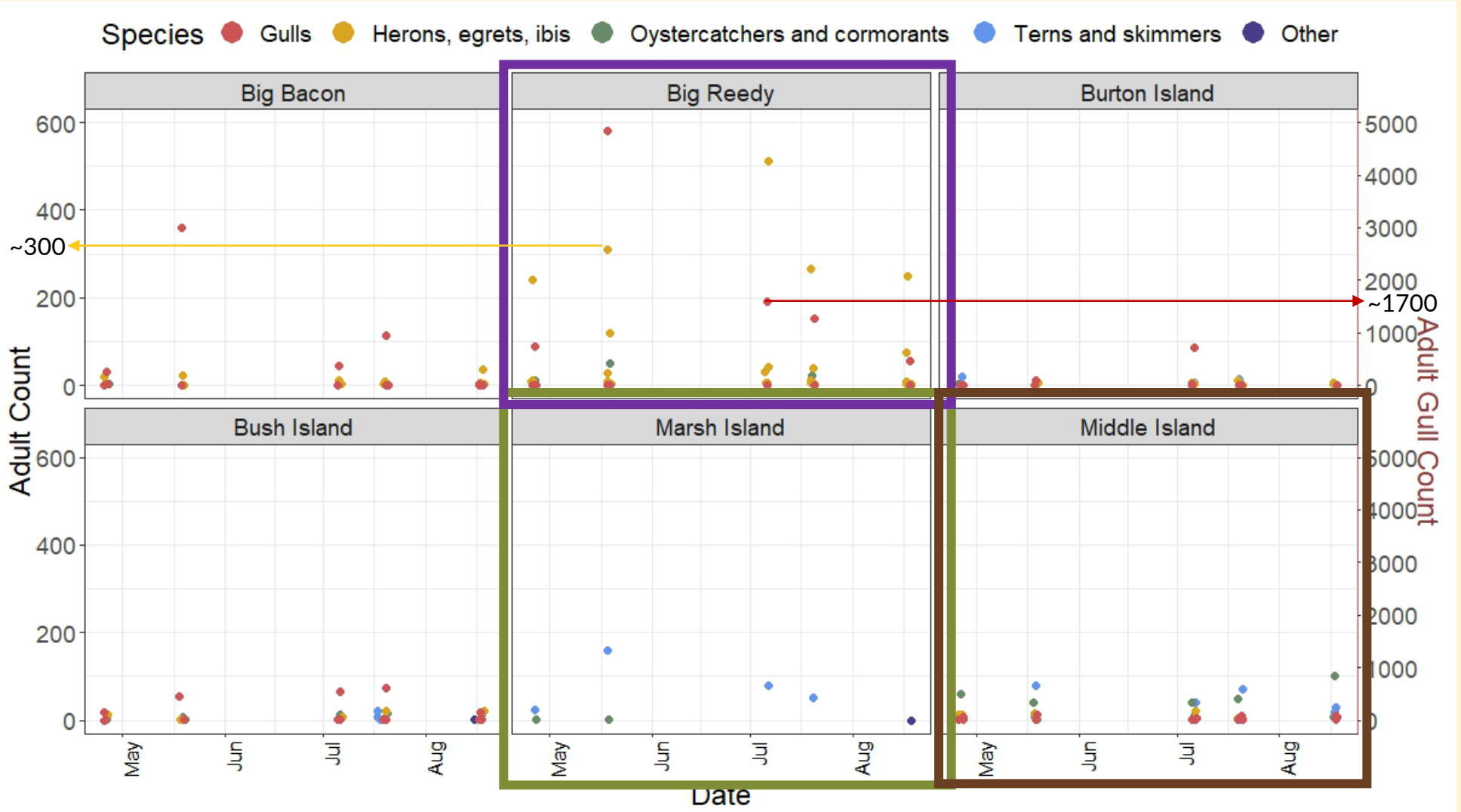



CAEG
SNEG adults
GREG adults
SNEG fledglings

Colonial Waterbird Monitoring: Communities

Guild-wise species counts at each survey in 2023

Gulls plotted on larger axis displayed to the right



Colonial Waterbird Monitoring: Findings

- Heron/egret/ibis breeding colony on Big Reedy
- Tern nest failures at Middle Island, Marsh Island
- Increased overall detection

Colonial Waterbird Monitoring: Future Plans

- Survey expansion and colony identification
- Middle Island tern nest monitoring
- Stay tuned!

Thank you!

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