

AVIAN HABITAT PRIORITIZATION FOR THE EASTERN SHORE AT THE PARCEL LEVEL

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Outline

- Importance of analysis
- Summary of existing conservation plans
- Goals and objectives
- Study area
- Methods
- Results
- Discussion

Importance of Analysis

- Eastern Shore of Virginia is a critical migration corridor
- Numerous migratory bird species populations in decline
- Numerous threats facing migratory birds
- Recommendation made to acquire and protect land in a series of conservation corridors

Existing Plans

- Identified focus areas based on broad taxonomic groups
- Coarser scale than my study area
- Focused on planning versus implementation

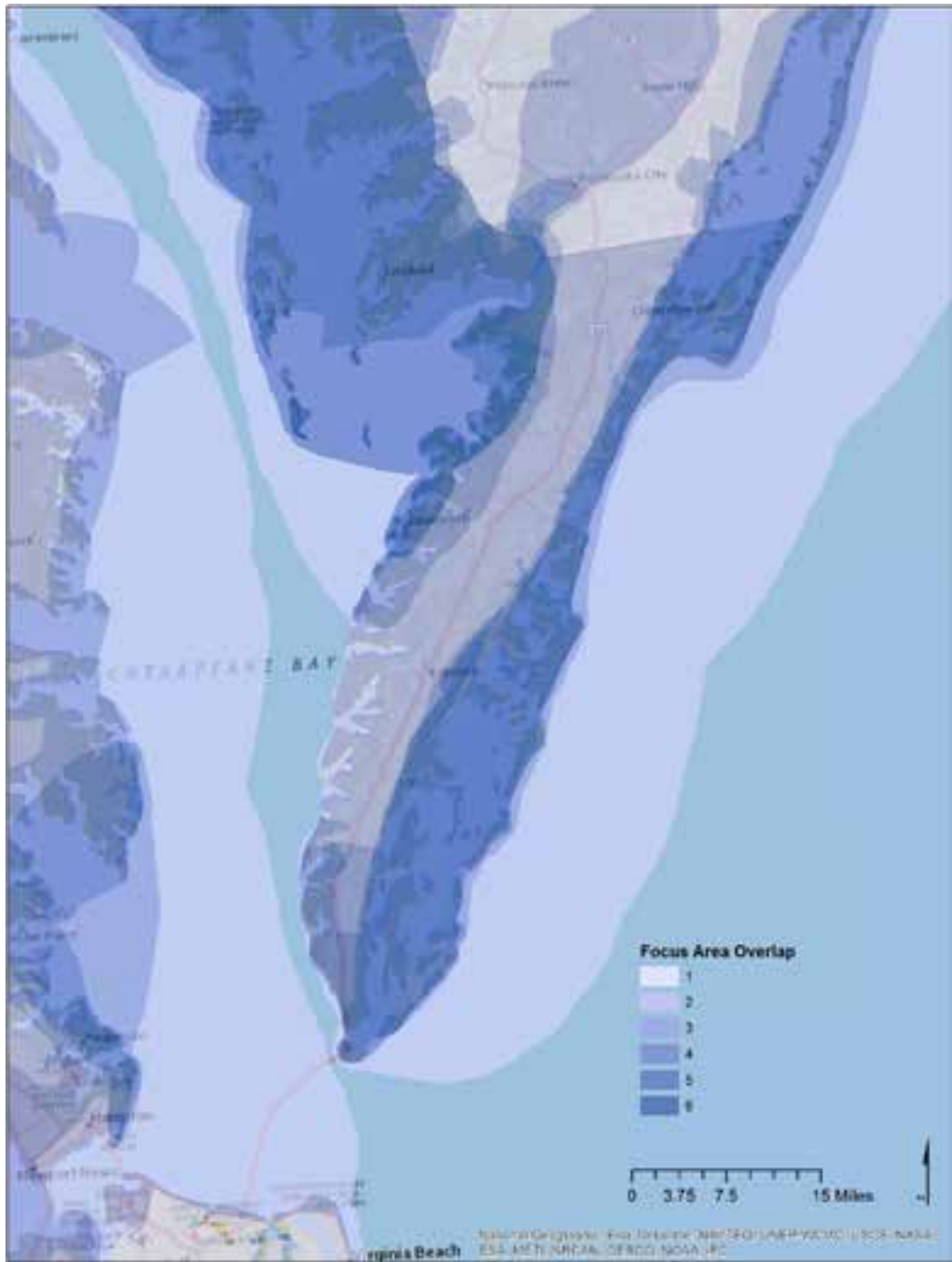


*North American Waterfowl
Management Plan*



Focus Area Overlap





Goals

- Identify and prioritize parcels for habitat protection based on importance to migratory birds
- Develop a web mapping application incorporating the prioritized parcels identified in my analysis



Analysis Objectives

- Develop potential habitat distribution layer for each response guild
- Identify non-protected parcels within the study area
- Identify parcels vulnerable to sea level rise
- Create a habitat protection prioritization strategy for non-protected parcels
- Create an interactive web map which will allow users to:
 - View the prioritized parcels for each guild
 - Perform basic queries
 - Print maps

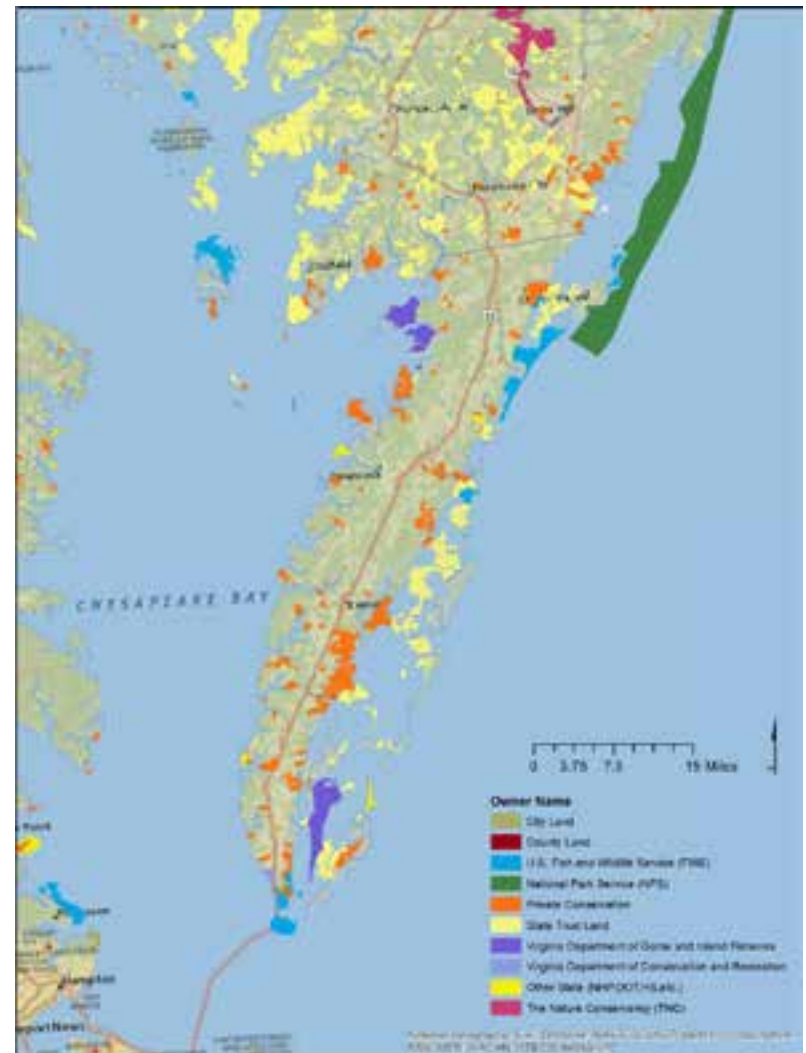
Study Area

- 425,505 acres
- Agricultural and aquacultural community
- Historically hardwood dominated forest with interspersed marshes and wetlands
- International Biosphere Reserve
- Western Hemisphere Shorebird Network Site
- Globally important migration corridor



Ownership of Protected Lands

- Three National Wildlife Refuges
- Seaside barrier islands and seaside farms owned/managed by TNC
- Four Wildlife Management Areas
- One state park
- Two natural areas
- Barrier Island owned by Department of Conservation and Recreation



Land Cover Summary

Modified Land Cover Type	Acres	% of Total
Agriculture	139,169	33
Forest	130,272	31
Salt Marsh	104,826	25
Early Successional	20,782	5
Open Water	13,003	3
Developed	11,125	3

Methods - Guild Development

- Develop a species list for response guilds based on habitat requirements during foraging and breeding
- Use C-CAP land cover types as a base
- Whole guild approach vs. guild indicator species
- Sensitivity to habitat fragmentation
- Based on Eastern Shore habitat, not range-wide

Guilds

- .. Beach
- .. Riparian
- .. Forest Interior
- .. Forest Edge
- .. Scrub/Shrub
- .. Grassland
- .. Freshwater
- .. Wetland/Marsh
- .. Forester Wetland
- .. Saltmarsh
- .. Pine

Methods - Analysis

- Create a layer of all non-protected real estate parcels
- Create a layer of overlapping focus areas
- Identify habitat within non-protected parcels which are adjacent to conservation lands
- Identify habitat within non-protected parcels which intersect habitat corridors

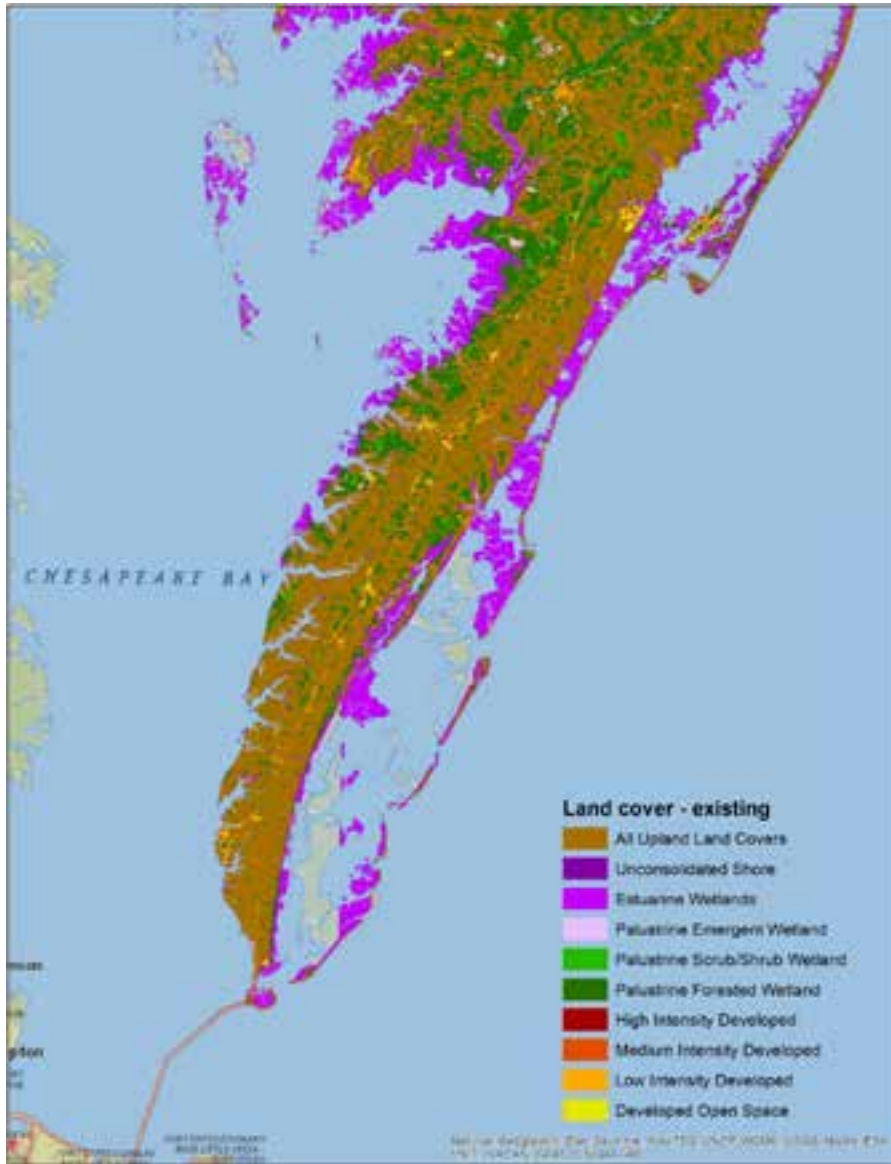
Methods – Minimum Patch Size

- Determine minimum patch size
- Identify concentrated stopover sites

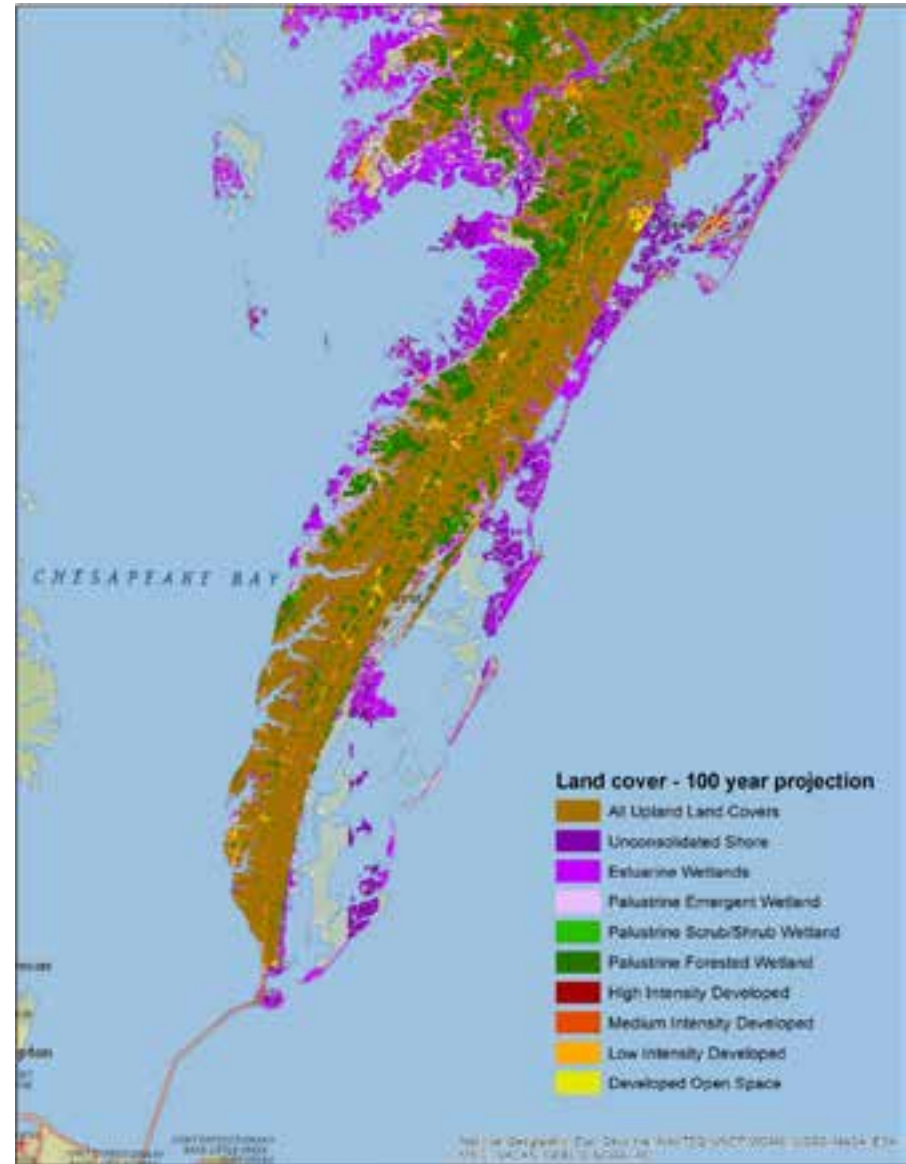


Methods – Sea Level Rise Impacts

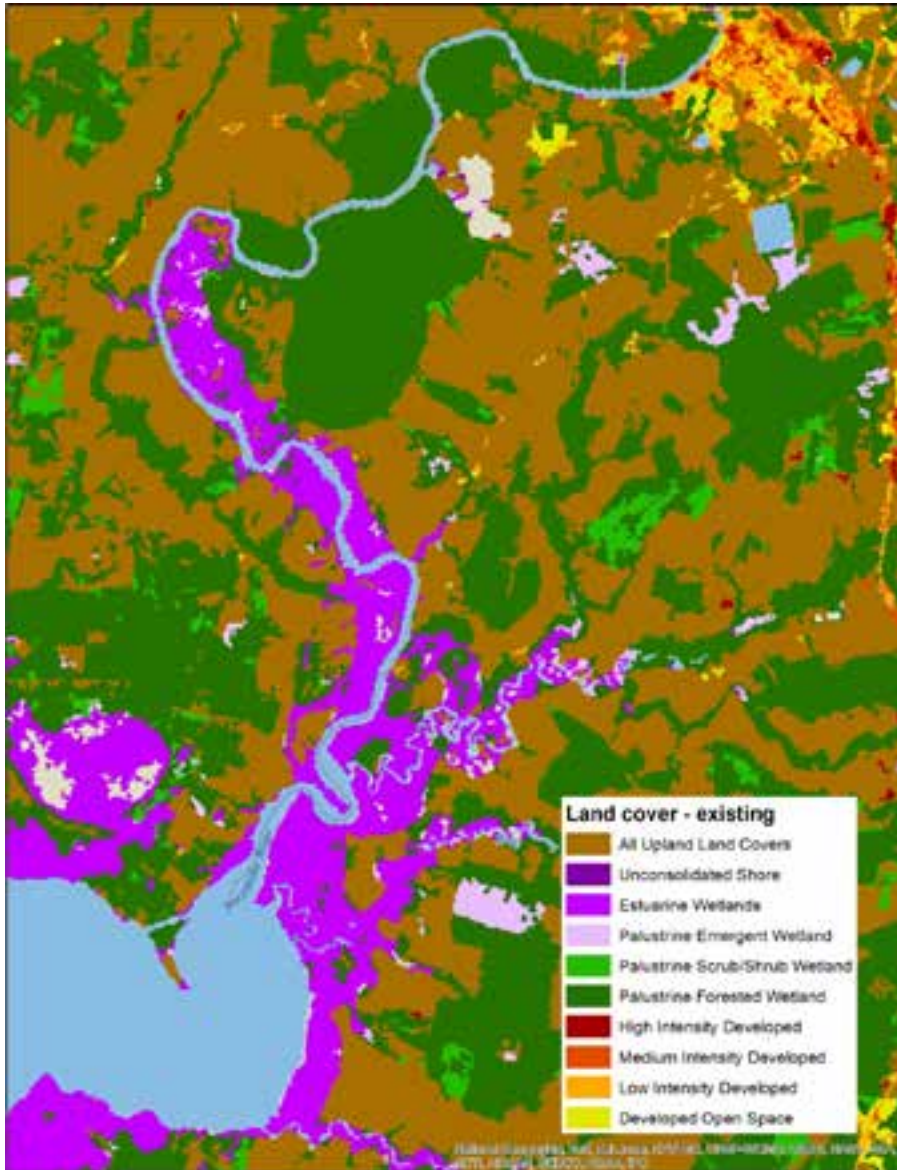
- Global sea level rise is expected to be between 7 - 21 inches by 2100
- Sea level rise along Atlantic Coast is expected to be 3 to 4 times the global average
- As a result, estuarine and beach habitat is expected to decline over 80 percent by 2100
- Identify parcels vulnerable to sea level rise



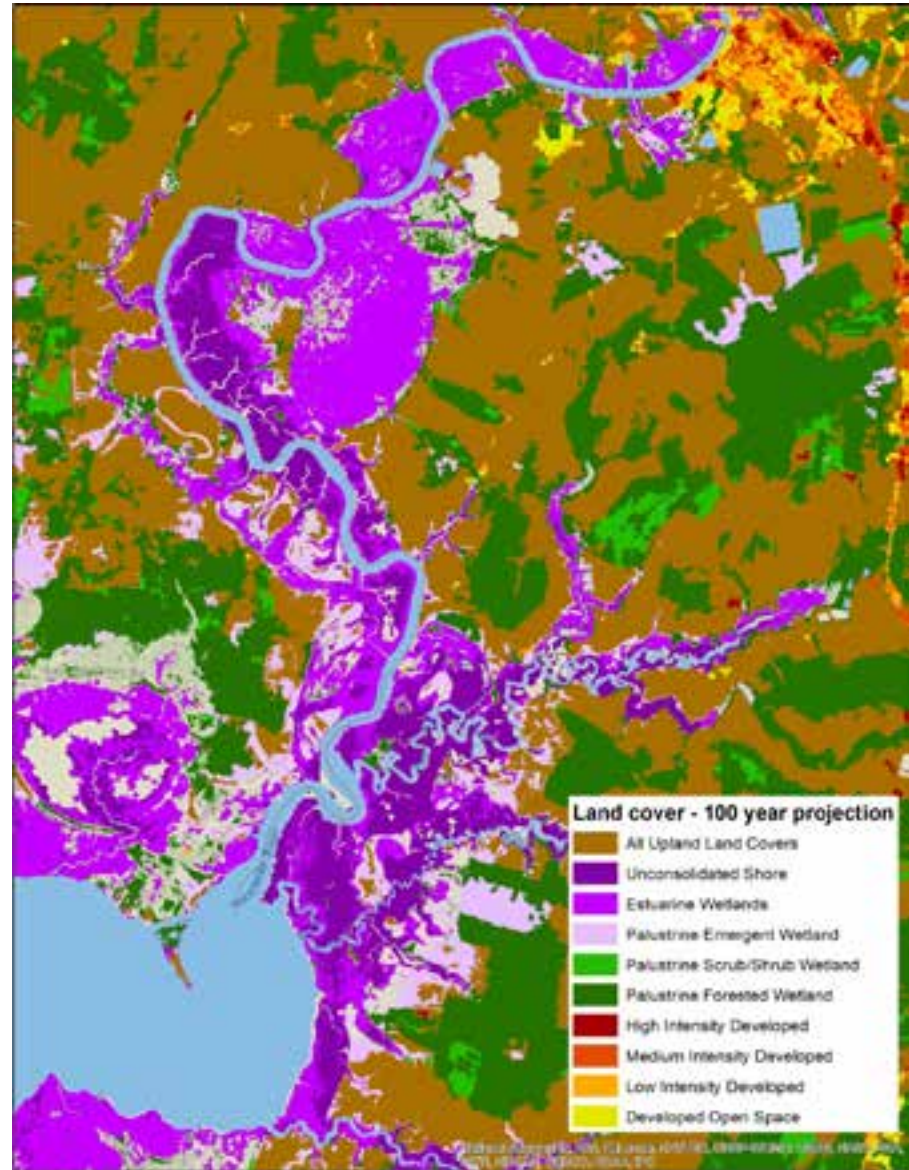
Current C-CAP Land cover



Projected C-CAP Land cover



Current C-CAP Land cover



Projected C-CAP Land cover

Methods- Analysis

- Assign weights to input data layers to prioritize non-protected lands using a weighted overlay analysis
 - Highest
 - High
 - Medium
 - Low
- Use prioritized values of habitat to rank parcels
 - High
 - Medium
 - Low

Methods – Web Mapping Application

- ArcGIS Online
- Each guild data layers was uploaded to ArcGIS Online
- Pop-up information configured
- Customized feature symbology
- Provided information via dashboard tool
- Shared map with the public

Results

Guild	Total Acres	Non-protected Areas	% Non-protected
Beach	11,403	1,707	15%
Riparian	6,571	3,779	58%
Forest interior	38,344	33,447	87%
Forest edge	102,419	82,114	80%
Scrub/shrub	13,362	10,585	79%
Grassland	43,782	37,434	86%
Freshwater wetland/marsh	2,973	1,786	60%
Forested wetland	93,395	76,232	82%
Saltmarsh	115,456	29,194	25%
Pine	23,225	19,116	82%

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Maximum and Average Patch Size

Guild	Maximum Patch Size Acres	Average Patch Size Acres
Beach	1,008	1.4
Riparian	1,038	548.0
Forest interior	3,430	30.6
Forest edge	6,832	9.5
Scrub/shrub	53	0.5
Grassland	349	6.6
Freshwater wetland/marsh	301	0.5
Forested wetland	4,907	2.2
Saltmarsh	8,244	11.1
Pine	210	3.8

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Prioritized Habitat within Non-protected Parcels

Guild	Highest Acres	High Acres	Medium Acres	Low Acres
Coastal/beach	556	529	419	48
Riparian	521	866	2,165	148
Forest interior	7,318	13,507	9,671	1,740
Forest edge	10,703	30,427	35,183	4,989
Scrub/shrub	2,211	1,291	1,610	3,216
Grassland	5,050	4,489	8,382	18,377
Freshwater wetland/marsh	342	239	528	310
Forested wetland	9,736	29,901	24,104	10,020
Saltmarsh	10,888	10,175	4,890	1,270
Pine	2,423	3,108	5,514	7,152

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Total Number of Parcels and Acreage Total

Guild	Total # of Parcels	Total Parcel Acres
Coastal/beach	1,832	39,770
Riparian	718	25,353
Forest interior	4,420	152,827
Forest edge	29,471	273,283
Scrub/shrub	18,631	235,570
Grassland	10,420	185,521
Freshwater wetland/marsh	2,870	102,724
Forested wetland	17,502	251,375
Saltmarsh	20,711	165,179
Pine	10,474	186,510

Total Number of Parcels and Acreage Total

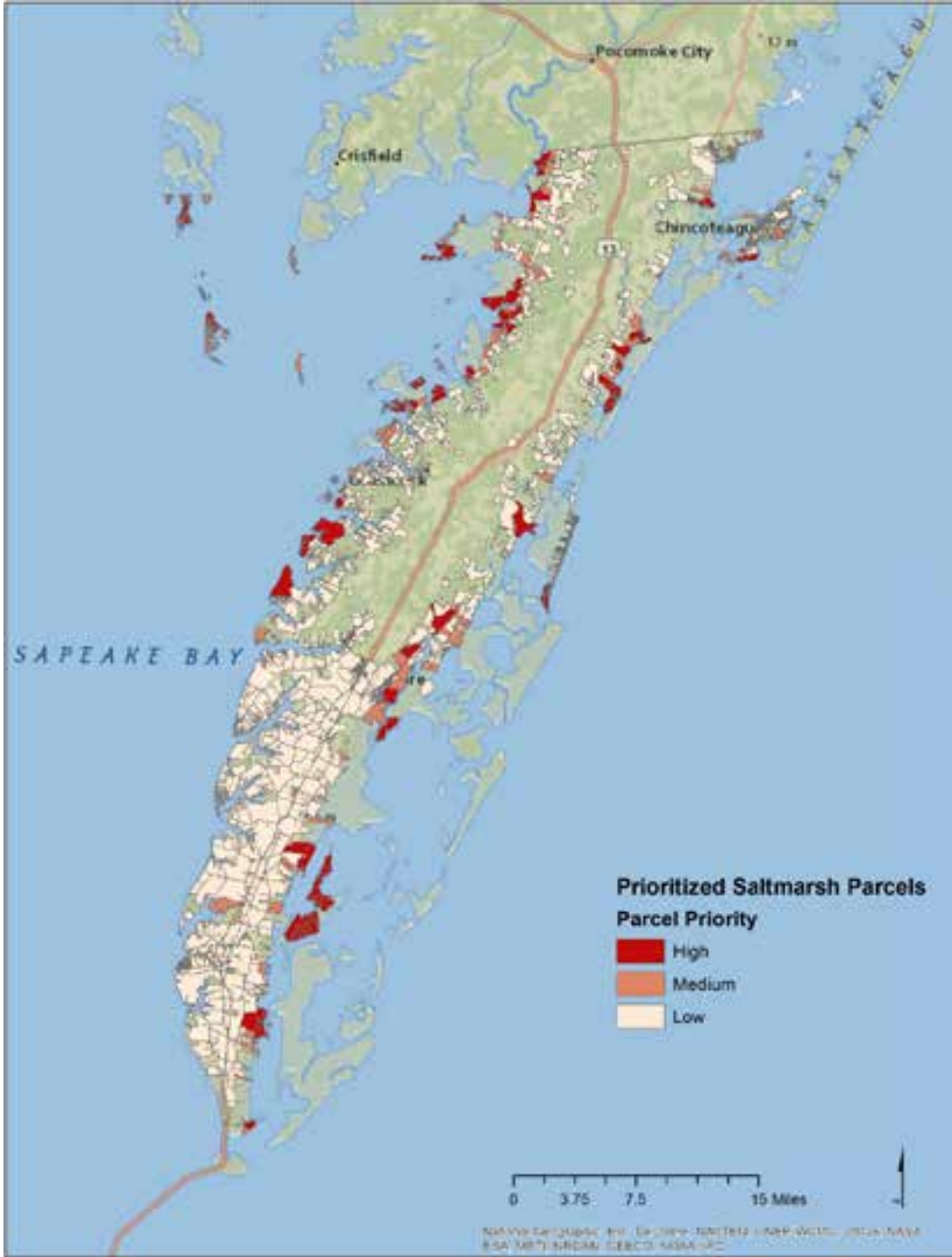
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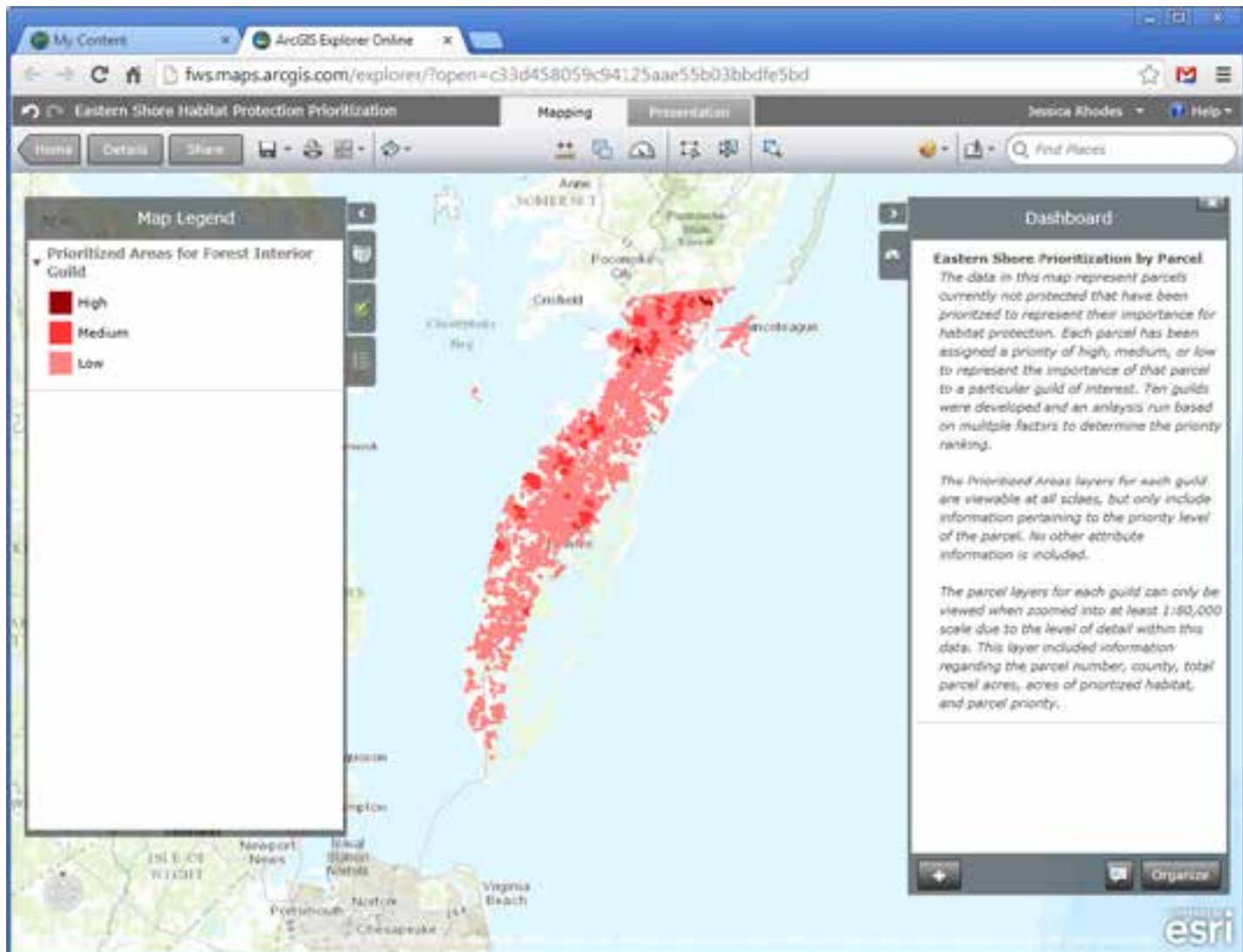
Guild	High Priority		Medium Priority		Low Priority	
	# of Parcels	Acres	# of Parcels	Acres	# of Parcels	Acres
Coastal/beach	6	382	21	426	1,805	687
Riparian	11	514	109	1,864	598	1,321
Forest interior	2	1,587	70	7,251	4,348	23,648
Forest edge	123	10,169	1,308	34,964	28,040	36,294
Scrub/shrub	39	832	262	1,847	18,330	5,590
Grassland	30	2,543	376	13,472	10,014	20,263
Freshwater wetland/marsh	1	75	17	467	2,852	863
Forested wetland	74	10,655	516	17,504	16,912	21,818
Saltmarsh	47	13,480	119	6,566	20,545	7,362
Pine	3	504	220	5,656	10,251	12,050

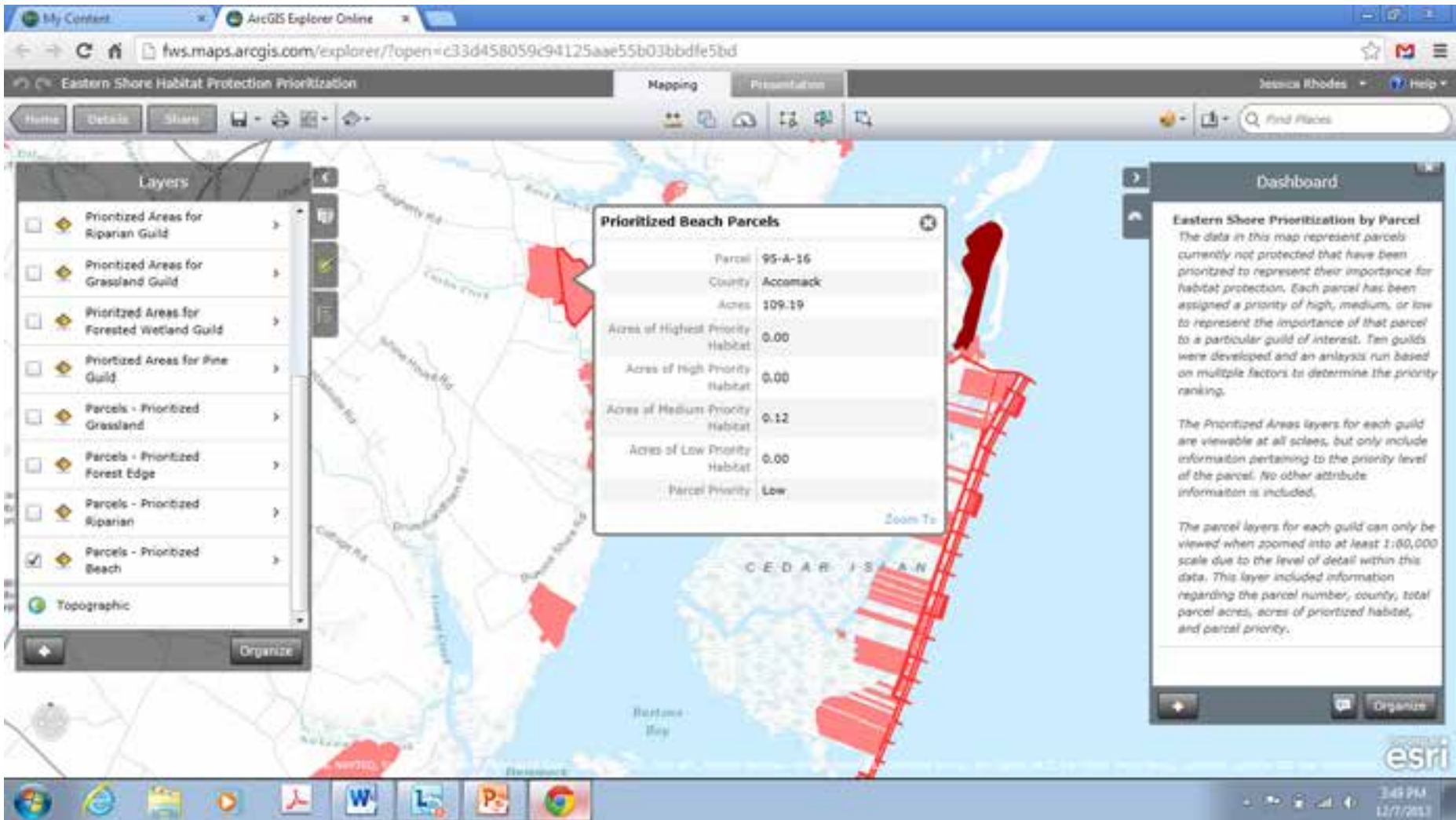
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Web Mapping Application





Layers

- Prioritized Areas for Riparian Guild
- Prioritized Areas for Grassland Guild
- Prioritized Areas for Forested Wetland Guild
- Prioritized Areas for Pine Guild
- Parcels - Prioritized Grassland
- Parcels - Prioritized Forest Edge
- Parcels - Prioritized Riparian
- Parcels - Prioritized Beach
- Topographic

Organize

Prioritized Beach Parcels

Parcel	95-A-16
County	Accomack
Acres	109.19
Acres of Highest Priority Habitat	0.00
Acres of High Priority Habitat	0.00
Acres of Medium Priority Habitat	0.12
Acres of Low Priority Habitat	0.00
Parcel Priority	Low

Zoom To

Dashboard

Eastern Shore Prioritization by Parcel

The data in this map represent parcels currently not protected that have been prioritized to represent their importance for habitat protection. Each parcel has been assigned a priority of high, medium, or low to represent the importance of that parcel to a particular guild of interest. Ten guilds were developed and an analysis run based on multiple factors to determine the priority ranking.

The Prioritized Areas layers for each guild are viewable at all scales, but only include information pertaining to the priority level of the parcel. No other attribute information is included.

The parcel layers for each guild can only be viewed when zoomed into at least 1:60,000 scale due to the level of detail within this data. This layer included information regarding the parcel number, county, total parcel acres, acres of prioritized habitat, and parcel priority.

Organize

Discussion

- Analysis identifies priority parcels bases on a broad landscape scale
- High priority parcels most important
- Prioritizations comparison within guild only
- Analysis did not consider habitat quality
- Priority of each guild was not determined
- Habitat shape was not incorporated
- Restoration vs. protection

Next Steps

- Develop a method to incorporate habitat quality
- Add economic consideration to prioritization analysis
- Incorporate web mapping application into other map mapping application
- Expand analysis to include priority sites for habitat restoration

Acknowledgements

- Dr. Joseph A. Bishop - Penn State Advisor
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Questions?



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