2019

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Recommended Citation

Watts, B. D. and B. J. Paxton. 2019. Baseline bird surveys of Plum Tree Island National Wildlife Refuge: 2018 Season. The Center for Biology Technical Report Series, CCBTR-19-03. College of William and Mary and Virginia Commonwealth University. 14 pp.

BASELINE BIRD SURVEYS OF PLUM TREE ISLAND NATIONAL WILDLIFE REFUGE: 2018 SEASON
Interim Report: Winter 2018/2019

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Context

The Chesapeake Bay is one of the most productive aquatic ecosystems in the world and plays an important role in the life cycle of many bird species (Duerr and Watts 2012). Each year, the rich resources of the Bay attract millions of waterbirds of 140 species from throughout the western hemisphere (Erwin et al. 2007, Watts 2013). Dependency on the Bay varies from species that stopover for a few days during migration to species that live out their entire life cycle within a single tributary. Because many waterbirds are top consumers and collectively require a broad array of resources they represent sensitive, cost-effective indicators of overall ecosystem health. Many species that depend on the Bay are of high international, national or regional conservation concern (Watts 1999, 2016).

Plum Tree Island National Wildlife Refuge includes some of the most significant marsh habitat within the lower Chesapeake Bay. Established in 1972 when the site was transferred from the U. S. Department of Defense to the U. S. Department of the Interior, the site supports the largest contiguous patch of tidal salt marsh within the lower Chesapeake Bay including extensive low marsh (dominated by smooth cordgrass - *Spartina alterniflora* and black needlerush - *Juncus roemerianus*), high marsh (dominated by salt grass - *Distichlis spicata* and salt meadow hay – *S. patens*), a long marsh-upland ecotone (dominated by shrubs including saltbush - *Iva frutescens* or *Baccharis hamilifolia* and wax myrtle – *Myrica cerifera*), and scattered hummocks of maritime forest and low-profile dunes and beaches. Although the site is included within an Important Bird Area (Watts 2006) and is known to support bird species of conservation concern (e.g., Watts and Rottenborn 2002, Wilke et al. 2005, Watts and Smith 2015) there has been no attempt to survey the site in order to build a baseline dataset needed to understand the importance and role of the site within a regional context.

Objectives

Monitoring is an essential component of conservation. Within the conservation community, information on the status and distribution of species is the basis for management decisions and often the primary measure of management success. The overall objective of this effort is to collect baseline information on the status of birds using Plum Tree Island National Wildlife Refuge that may inform future management decisions.

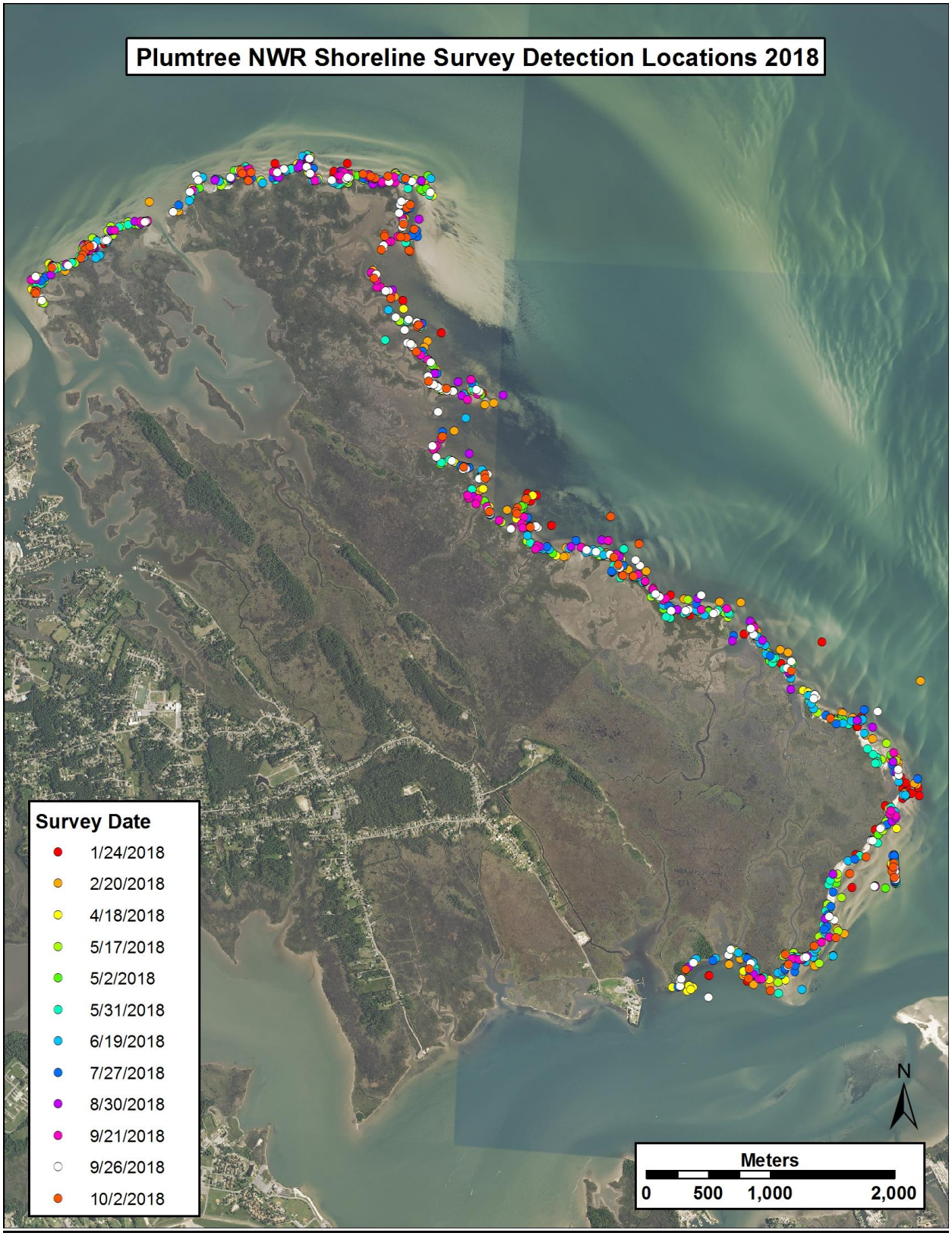
Methods

Shoreline Surveys

We established a 100-m wide band transect positioned along the outer shoreline of Plum Tree Island to conduct surveys of birds using the shoreline and near-shore waters (Figure 1). We piloted a boat approximately 30 to 40 m offshore and parallel to the shoreline and surveyed all birds within the band transect. All birds were counted and identified to species (except on rare occasions when conditions or circumstances did not allow for identification to species). Birds detected were plotted on a GPS-enabled laptop that was loaded with a recent aerial photograph of the study area (Figure 2). Birds observed beyond the shoreline (within the marsh) were not recorded with the exception of species of conservation interest (e.g., peregrine falcon, bald eagle, northern harrier).

Figure 1. Map of the 100-m wide band transect positioned along the outer shoreline of Plum Tree Island to conduct bird surveys.

Figure 2. GPS locations of birds detected in 2018 over recent aerial photograph of the study area.



Marsh Point Count Survey

We established a network of ten point-count locations within the marsh habitat of Plum Tree Island, NWR to survey for breeding marsh birds (Figure 3). Due to the ongoing unexploded ordinance problems within the site, we restricted points to locations that could reliably be accessed and surveyed by boat. These included sites that were along navigable tidal creeks. We used standardized, off-road, point-count techniques that were developed for secretive marsh-nesting birds (Conway and Nadeau 2006, Conway 2011) to survey breeding marsh birds. The approach uses distance estimation to improve effective sample area, a series of play-back calls to improve detection probabilities, and stratification of count data by time. We used a variation of this technique that was developed for the coastal area of the mid-Atlantic and southern New England (Shriver et al. 2008) and has been used by project SHARP. We used a modified Sharp collection protocol that did not include calls of species most likely found in freshwater systems and thus unlikely to occur at our survey points and recorded data on forms that have been used within the region by project SHARP (Appendix I).

Figure 3. Map of the ten point-count locations within the marsh habitat of Plum Tree Island used for the point count survey.

Statement of Progress: Winter 2018/2019

This project is currently on schedule and all seasonal surveys have been conducted as planned.

Shoreline Surveys

Twelve shoreline surveys have been conducted from January, 2018 through October, 2018 including two in the winter, four during spring migration, two during the summer breeding season and four during fall migration (Appendix II &IV). Shorebirds and gulls/terns were the most numerous species groups by both number of species and individuals (Table 1). Dunlin was the most numerous species detected accounting for nearly 55% of the individuals detected.

Table 1. Summary of 2018 shoreline surveys by species group.

Species Group	Species No.	Individuals
Seabirds	4	553
Gulls and Terns	9	2,197
Waterfowl	7	509
Herons and Egrets	4	233
Shorebirds	14	11,620
Raptors	5	197
Passerines and Others	9	494
Total	**52**	**15,803**

Marsh Point Count Survey

We completed two rounds of point counts during the breeding season (Appendix III & IV). The most common birds detected were passerines and associates (Table 2) with seaside sparrows and clapper rails accounting for more than 35% of all detections.

Table 2. Summary of 2018 point-count surveys by species group.

Species Group	Species No.	Individuals
Gulls and Terns	2	55
Waterfowl	2	2
Herons and Egrets	3	58
Shorebirds	2	31
Raptors	2	11
Passerines and Others	6	240
Total	**17**	**395**

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Appendix I. SHARP point-count/callback data form used for the 2018 Plum Tree Island National Wildlife Refuge avian survey.

SHARP Point-Count/Callback Survey Data Sheet

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Date *(e.g. 10-May-12)*: _____ **Region:** 9 Western Chesapeake Bay **Hexagon/Unit :** _____

Main Observer: _____ **Add'l Observer(s):** _____ **Survey Point ID(s) :** _____

Tide (circle one): (High) (High/Rising) (High/Falling) **State (circle one):** MD VA **Survey method (if by boat, include type):** _____

(Low) (Low/Rising) (Low/Falling) **Visit Number (circle one) :** 1 2 3 **Survey Window (circle one) :** 1 (April 15 - May 31) 2 (June 1 - June 25) 3 (June 26 - July 15)

Point ID	Start Time (military)	Temp (F)	Sky	Wind (Beaufort)	Background noise	Species	Distance Band			Responded During												Call Type(s)	Distance (meters)	Location Notes	Comments
							0 - 50m	51 - 100m	>100m	Min 1	Min 2	Min 3	Min 4	Min 5	Min 6 (BLRA)	Min 7 (LEBI)	Min 8 (VIRA)	Min 9 (KIRA)	Min 10 (CLRA)	Min 11 (COMO)	Outside survey period				

Sky: 0 clear or a few clouds, 1 partly cloud or variable sky, 2 cloudy or overcast, 4 fog or smoke, 5 drizzle, 7 snow, 8 showers

Wind - Beaufort scale: 0 smoke rises vertically, 1 wind direction shown by smoke drift, 2 wind felt on face; leaves rustle 3 leaves, small twigs in constant motion; light flag extended, 4 raises dust and loose paper; small branches are moved, 5 small trees with leaves sway; crested wavelets on inland waters

Background noise: 0 no noise, 1 faint noise, 2 moderate noise (probably can't hear some birds beyond 100m), 3 loud noise (probably can't hear some birds beyond 50m), 4 intense noise (probably can't hear some birds beyond 25m)

Appendix II. Avian shoreline survey totals by 2018 survey date at Plum Tree Island National Wildlife Refuge in Poquoson, Virginia.

Species	Grand Total	1/24	2/20	4/18	5/2	5/17	5/31	6/19	7/27	8/30	9/21	9/26	10/2
ABDU	22		22										
AMOY	131		8	14	14	18	25	21	15	6	4	3	3
AMWI	30		30										
ATBR	40	40											
BAEA	72		3	2	5	6	7	3	7	7	28	3	1
BARS	51			5	10	8	10	6	12				
BBPL	365	61		45	51	21	5		1	55	44	42	40
BEKI	3		1									1	1
BLSK	23						11			12			
BRPE	19			2		3	13					1	
BTGR	340	17	18	2	15	12	18	33	2	25	14	153	31
BUFF	133		132	1									
CAGO	76	2	28	23	17	3	3						
CLRA	2											2	
COGR	2												2
DCCO	528			77	80	46	28	7	58	67	26	43	96
DUNL	8627	2608	2844	1544	841	790							
FICR	14			4	1		7	1		1			
FOTE	104			19	12	12	1	2		56		2	
GBBG	128	36	22	7	12			3	16	7	3	10	12
GBHE	104		3	5	3	2	3	5	14	7	17	30	15
GREG	96			5	13		6	3	26	6	10	24	3
GRYE	10	6		3						1			
HERG	716	328	104	33	75	16	6	3	11	45	14	28	53

Species	Grand Total	1/24	2/20	4/18	5/2	5/17	5/31	6/19	7/27	8/30	9/21	9/26	10/2
HOGR	2			1		1							
LAGU	169				5	4	3	3	12	65	19	41	17
LETE	32						20	4	3	5			
LEYE	1				1								
MALL	7		2	2		3							
NOHA	4	2	2										
NOMO	1											1	
OSPR	108			6	2	7	8	17	34	18	1	8	7
PEEP	623					474	79			3	16	48	3
PEFA	1								1				
RBGU	70	45	20								5		
RBME	201	11	126	47	8	4	3	1	1				
ROYT	695			2	12	100	50	6	55	201	12	226	31
RTLO	4	4											
RUTU	36	6	15			8	4		1		2		
RWBL	77		1			4	6	11	11	42		2	
SAND	110	4	101							1		4	
SATE	260					6		4	70	120	30	30	
SBDO	103					10	4		5	42	8	34	
SEPL	1007				20	509	81	1	192	198	5	1	
SESA	480					22			205	244	7	2	
SESP	4					1		1			2		
SNEG	28				1	1		3	9	5	5	4	
SPSA	39				3	22	2		10	1	1		
TCHE	5								3	1		1	
TUVU	12				5	5		1					1
WILL	88			4	5	9	23	37	2	3	5		
Grand Total	15803	3170	3482	1853	1211	2127	428	176	776	1244	278	744	316

Appendix III. Rail callback survey totals for 2018 at Plum Tree Island National Wildlife Refuge in Poquoson, Virginia.

Species Code	Grand Total	6/29/2018	7/16/2018
AMAV	4		4
BAEA	1	1	
BARS	3	2	1
BLSK	1		1
BTGR	53	21	32
CLRA	69	35	34
GBHE	9	4	5
GREG	42	15	27
LAGU	54	21	33
OSPR	10	7	3
PUMA	1	1	
RWBL	42	25	17
SESP	72	38	34
SNEG	7	4	3
WILL	27	20	7
Grand Total	**395**	**194**	**201**

Appendix IV. American Ornithologist Union four-letter avian species codes and common names included in the 2018 survey.

AOU Code	Species Name
ABDU	American Black Duck
AMAV	American Avocet
AMOY	American Oystercatcher
AMWI	American Widgeon
ATBR	Atlantic Brant
BAEA	Bald Eagle
BARS	Barn Swallow
BBPL	Black-bellied Plover
BEKI	Belted Kingfisher
BLSK	Black Skimmer
BRPE	Brown Pelican
BTGR	Boat-tailed Grackle
BUFF	Bufflehead
CANG	Canada Goose
COGR	Common Grackle
CLRA	Clapper Rail
DCCO	Double-crested Cormorant
DUNL	Dunlin
FOTE	Forster's Tern
GBBG	Great Black-backed Gull
GBHE	Great Blue Heron
GREG	Great Egret
GRHE	Green Heron
GRYE	Greater Yellowlegs
HERG	Herring Gull
HOGR	Horned Grebe
LAGU	Laughing Gull
LETE	Least Tern
LEYE	Lesser Yellowlegs
MALL	Mallard
NESP	Nelson's Sparrow
NOHA	Northern Harrier
OSPR	Osprey
NOMO	Norther Mockingbird
PEEP	unidentified small shorebird
PEFA	Peregrine Falcon
RBGU	Ring-billed Gull
RBME	Red-breasted Merganser

AOU Code	Species Name
ROYT	Royal Tern
RTLO	Red-throated Loon
RUTU	Ruddy Turnstone
RWBL	Red-winged Blackbird
SAND	Sanderling
SATE	Sandwich Tern
SBDO	Short-billed Dowitcher
SEPL	Semipalmated Plover
SESA	Semipalmated Sandpiper
SESP	Seaside Sparrow
SNEG	Snowy Egret
SPSA	Spotted Sandpiper
TCHE	Tricolored Heron
TUVU	Turkey Vulture
WESA	Western Sandpiper
WILL	Willet