

Summary of Calumet Marsh Bird Monitoring at Indiana Dunes National Lakeshore Sites 2018

Report to National Park Service

Compiled by: Stephanie Beilke, Audubon Great Lakes; November 28, 2018

Introduction

Secretive marsh birds are poorly monitored in North America, as species such as bitterns, rails, coots and grebes are inadequately surveyed by the annual North American Breeding Bird Survey (BBS; Sauer, 1999). Despite gaps in distribution and demographic data, it is well recognized that many secretive marsh bird species are declining due to the rapid loss of suitable wetland habitat (Conway, 2011). These losses are expected to grow with climate change because elevated frequencies and intensities of storms, floods, and droughts will give rise to unpredictable changes in water levels and the plant-animal communities on which they depend (NABCI, 2010). Invasive plants, such as reed canary grass (*Phalaris arundinacea*) and common reed (*Phragmites australis*), threaten the limited habitat remaining, therefore placing marsh bird populations at risk (Glisson et al., 2015; Robichaud and Rooney, 2017).

Beginning in 2015, Audubon Great Lakes has led a secretive marsh bird monitoring study in the Calumet region of Illinois and Indiana. Our project goals include the following: 1) establish baseline secretive marsh bird breeding populations and distribution to serve as baseline data, 2) use baseline population data to set goals for habitat restoration, which in turn will enhance marsh bird breeding populations, 3) with the support of landowners, construct a regional conservation action plan (CAP) to inform and coordinate restoration activities throughout the Calumet area, and 4) include recommendations in the CAP that inform best wetland management strategies in response to anticipated future climate change events.

In 2018, we surveyed four wetland routes within the following Indiana Dunes National Lakeshore park units: Cowles Bog, Great Marsh, and Miller Woods, permitted under OMB #1024-0236. Because of its large acreage, Great Marsh was split into two survey routes (referred to as Great Marsh West and Great Marsh East).

Methods

Survey design was adapted from the North American marsh bird monitoring protocol by Conway (2011). Each survey consisted of five minutes of passive listening followed by six minutes of active audio broadcast of five target species vocalizations. This is a change since 2017, when King Rail was not included in the audio broadcast and therefore the total survey length in 2017 was ten minutes. This change was made to make data comparable to surveys conducted in southern Indiana as part of a state-wide survey.

Target species included in the broadcast were Least Bittern (*Ixobrychus exilis*), King Rail (*Rallus elegans*), Sora (*Porzana Carolina*), Virginia Rail (*Rallus limicola*), Common Gallinule (*Gallinula galeata*), and Pied-billed Grebe (*Podilymbus podiceps*). Survey design was adapted from the North American marsh bird monitoring protocol by Conway (2011). No specimens were collected in this survey and the only disturbances to properties were caused by surveyors walking between survey points. Most points were located along roads and trails, further minimizing disturbance.

For the purpose of this study, we only recorded detections of the following 17 focal marsh bird species, which include the aforementioned five target species as well as the following twelve “secondary focal

species”: American Bittern (*Botaurus lentiginosus*), American Coot (*Fulica americana*), Black-crowned Night-Heron (*Nycticorax nycticorax*), Black Tern (*Chlidonias niger*), Blue-winged Teal (*Anas discors*), Little Blue Heron (*Egretta caerulea*), Marsh Wren (*Cistothorus palustris*), Pied-billed Grebe (*Podilymbus podiceps*), Snowy Egret (*Egretta thula*), Swamp Sparrow (*Melospiza georgiana*), Yellow-crowned Night-Heron (*Nyctanassa violacea*) and Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*).

Results

In 2018, four volunteers conducted a total 72 surveys at 24 points within the Indiana Dunes National Lakeshore during three two-week sampling periods from 1 May through 15 June.

Of our 17 focal species, we observed nine species at NPS sites with six species at Cowles Bog: Blue-winged Teal, Common Gallinule, Marsh Wren, Sora, Swamp Sparrow and Virginia Rail (Table 1); seven species at Great Marsh: Black-crowned Night-Heron, Blue-winged Teal, Least Bittern*, Marsh Wren, Sora, Swamp Sparrow, and Virginia Rail (Table 2); and five species at Miller Woods: Blue-winged Teal*, Marsh Wren, Pied-billed Grebe*, Sora* and Swamp Sparrow (Table 3). Starred (*) species were only detected during the first survey visit (May 1-14) and therefore likely represent non-breeding migrant or transient individuals. We had zero detections for American Bittern, American Coot, Black Tern, King Rail, Little Blue Heron, Snowy Egret, Yellow-crowned Night-Heron or Yellow-headed Blackbird.

We calculated the mean number of individuals per survey for just the breeding season (May 15-June 15). Great Marsh had the highest species richness for focal species and Cowles Bog had the highest mean abundance of species/point (Figure 1). Swamp Sparrow had the highest mean abundance across all sites (0.82 birds/point) and Marsh Wren was the second highest (0.68 birds/point). This contrasts with 2017, when Marsh Wren had the highest mean abundance (Figure 2). Note a caveat when comparing the 2017 and 2018 data is that survey length in 2017 was one minute shorter than in 2018. King Rail was also broadcast in 2018 and not broadcast in 2017, but no King Rails were detected at NPS sites during either year.

2018 Calumet Marsh Bird Report – Indiana Dunes National Lakeshore

Table 1. Raw total marsh birds species detections per visit at Cowles Bog.

Cowles Bog	Visit 1	Visit 2	Visit 3	Total Detections
Blue-winged Teal	2			2
Common Gallinule		1		1
Marsh Wren	9	4	4	17
Sora	4	3	2	9
Swamp Sparrow	5	4	4	13
Virginia Rail	2	1	2	5
Total Species	5	5	4	6
Total Individuals	22	13	12	47

Table 2. Raw total marsh birds species detections per visit at Great Marsh.

Great Marsh	Visit 1	Visit 2	Visit 3	Total Detections
Black-crowned Night-Heron	1		3	4
Blue-winged Teal			1	1
Least Bittern	2			2
Marsh Wren	3	2	5	10
Sora	10	4	3	17
Swamp Sparrow	14	8	5	27
Virginia Rail	7	2	5	14
Total Species	6	4	6	7
Total Individuals	37	16	22	75

Table 3. Raw total marsh birds species detections per visit at Miller Woods.

Miller Woods	Visit 1	Visit 2	Visit 3	Total Detections
Blue-winged Teal	6			6
Marsh Wren		3	1	4
Pied-billed Grebe	4			4
Sora	4			4
Swamp Sparrow	2	2	3	7
Total Species	4	2	2	5
Total Individuals	16	5	4	25

2018 Calumet Marsh Bird Report – Indiana Dunes National Lakeshore

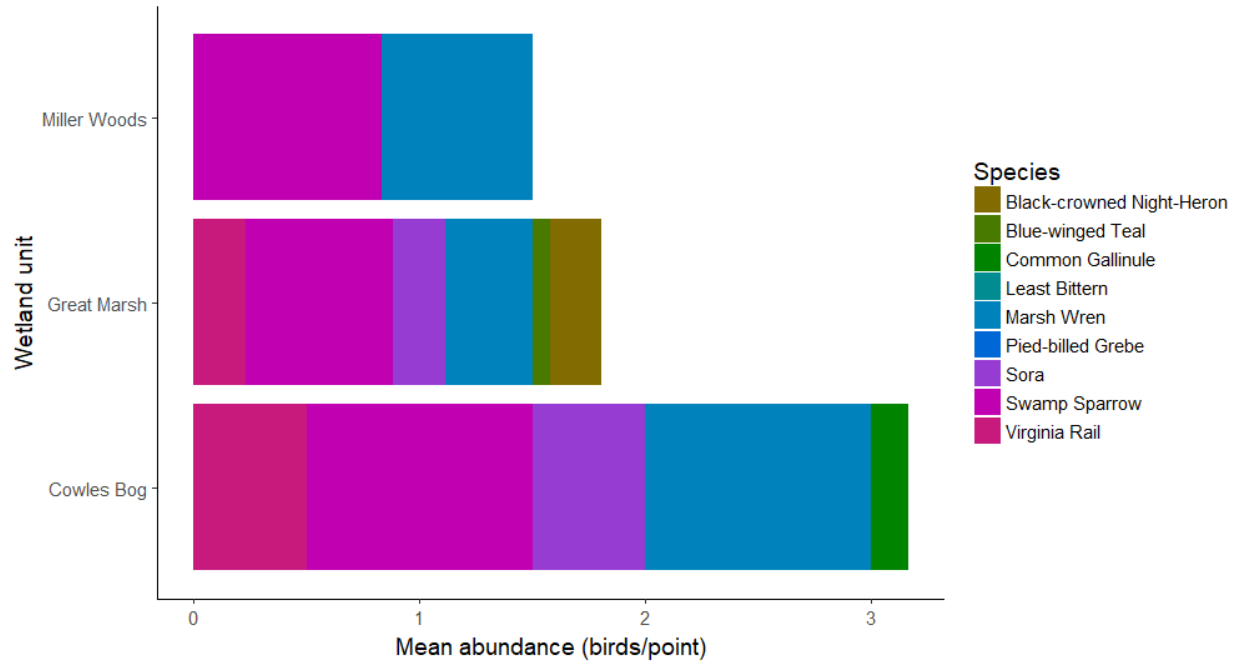


Figure 1. Mean abundance of marsh bird species detected at Indiana Dunes National Lakeshore survey routes during the breeding season (May 15-June 15).

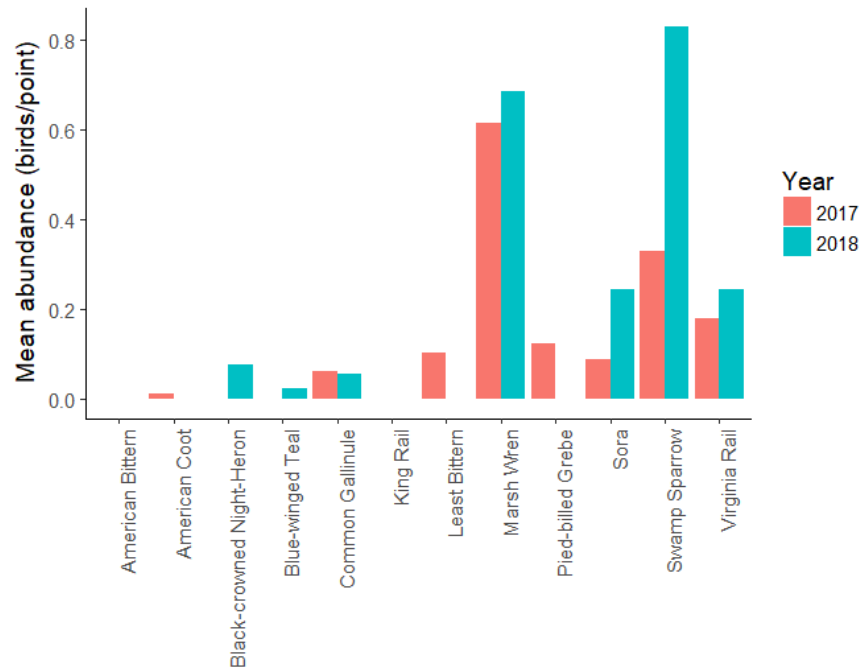


Figure 2. Overall mean abundance (across NPS sites) of marsh bird species detected during the breeding season (May 15-June 15) in 2017 vs. 2018.

Anticipated Outcomes

The resulting dataset from this project will provide us with both densities and territory counts for focal species at each study area. We can use these data to compare future densities and counts to gauge the success of habitat restoration work and to inform land managers in the Calumet region.

In addition, a climate modeling component of this project will address the potential impacts of climate change under future climate change scenarios outlined by the Intergovernmental Panel on Climate Change (IPCC) and bringing landowners and stakeholders together to discuss how wetland restoration would improve resilience and improve ecosystem health. The major output of the project is a conservation action plan that is science-based and fully supported by multiple landowners. The ultimate goal of the project is to restore marsh in the coastal areas of northeast Illinois and northwest Indiana in order to restore and sustain the species dependent on this unique and sensitive habitat while building resiliency to climate change.

Project success will be determined by completion of a conservation action plan (published document with support of landowners). The plan will include a climate change vulnerability assessment, wetland delineated maps and restoration plans, and results from two years of spring surveys (points, acres, bird densities and raw territories) considered indicators of marshland health. In addition, we will measure landowner engagement (number, time, resources committed). The long-term success of the project will be measured in terms of the acres of marshland restored and corresponding increases in marsh birds.

References

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