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## **Marshbird Callback Surveys of Highmarsh Patches along the Southeastern Shore of the Albemarle-Pamlico Peninsula, North Carolina**

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October 2002

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# TABLE OF CONTENTS

<b>Executive Summary</b> .....	iii
<b>BACKGROUND</b> .....	1
Context .....	1
Objectives.....	1
<b>METHODS</b> .....	2
Study Area.....	2
Survey Techniques.....	2
Data Analysis .....	5
<b>RESULTS</b> .....	6
<b>DISCUSSION</b> .....	8
<b>ACKNOWLEDGMENTS</b> .....	9
<b>LITERATURE CITED</b> .....	10
<b>APPENDIX I</b> .....	11

## **Executive Summary**

Assessing the presence, distribution and abundance of rail is a difficult task. Their secretive nature, nocturnal habits, infrequent vocalizations and preference for often inaccessible habitats results in under sampling on most call count surveys. Detection rates can be increased 93-1,320% by broadcasting recorded species specific call during surveys. The primary objective of this study was to collect baseline data on the species presence, distribution, and abundance of rails in high marsh patches along the southeastern shore of the Albemarle-Pamlico Peninsula, including portions of Alligator River National Wildlife Refuge, Swanquarter NWR, North Carolina Wildlife Resource Commission's Gull Rock game land, and private land.

Twenty eight observation points were established along roadway adjacent to highmarsh habitats and were surveyed with the aid of call back equipment on 3 different occasions between 30 May 2001 and 7 July 2001. Results from surveys were used to determine species occurrence and frequency of occurrence for the route as a whole and the individual land tracts.

Surveys resulted in the detection of 150 individuals representing 11 species. Four species of rails were encountered including 3 black rails on or near Swanquarter NWR. The presence of black rails during separate survey rounds and the abundance of suitable habitat suggests that Swanquarter NWR supports a breeding population of black rails. To determine the distribution and abundance of black rails within Swanquarter NWR, a systematic survey of suitable habitats should be conducted.

## **BACKGROUND**

### **Context**

One of the primary goals of the United States Fish and Wildlife Service is the conservation of migratory birds in North America (USFWS, 1990). Rails are a group of birds that contain a disproportionately high number of species of management concern (USFWS, 1995). A primary reason for concern is the recent degradation and loss of wetland habitat utilized by this group of birds. Approximately 54% of the U.S. population, or over 133,000,000 individuals, live within the 673 coastal counties of the United States. During the last 20 years the coastal fringe of the lower continental United States has accounted for nearly half of all new development and construction completed within all the contiguous 48 states (NOS/NOAA, 2000). With continued population increases expected within these coastal area, conservation of coastal habitats is vital to preserving avian diversity within these same areas.

Many rail species rely on the often isolated and inaccessible tidal marshes for breeding and foraging habitats. This affinity for restricted habitat, along with their secretive nature, often nocturnal habits, and infrequent vocalizations, make surveying rails difficult (Glahn, 1974). Because of this difficulty in accurately surveying rails, unreliable detection rates often result in rails being under sampled or overlooked completely by most call count surveys, including the Breeding Bird Survey (Bystrak, 1981). However, with the broadcast of recorded species specific calls, detectability of marshbirds can increase by 93-1,320% over passive observation (Gibbs and Melvin, 1993)

In April of 1998, a Marshbird Monitoring Workshop was held at the National Wildlife Visitor Center in Laurel, Maryland. At this meeting, experts developed preliminary recommendations for marshbird callback survey protocols (USFWS, 1999). These recommended protocols were used as a basis for surveys of rails along the southeastern shore of the Albemarle-Pamlico Peninsula, North Carolina,

### **Objectives**

Prior to the breeding season of 2001, no systematic marshbird survey had been conducted along the southeastern shore of the Albemarle-Pamlico Peninsula, North Carolina. Therefore, other than sparse observations, there was little known about the presence of rail species within this area. The primary objective of this study was to provide baseline data on the species presence, distribution, and abundance of rails in high marsh patches along the southeastern shore of the Albemarle-Pamlico Peninsula.

## **METHODS**

### **Study Area**

The marsh bird callback study area is located within portions of Dare and Hyde counties in North Carolina, along the southeastern shore of the Albemarle-Pamlico Peninsula. The entire study area is situated within the Atlantic Coastal Plain physiographic province along the shores of the Pamlico Sound and includes portions of the Alligator River National Wildlife Refuge, Swanquarter NWR, North Carolina Wildlife Resource Commission's Gull Rock game land, and private land situated next to public roads (Figure 1). Land cover types of the study area consist primarily of coastal marsh bordering open water, forested wetlands, agricultural and developed areas. The coastal marsh is dominated by black needlerush (*Juncus roemerianus*) with high marsh patches of Salt Meadow Grass (*Spartina patens*), Salt Grass (*Distichlis spicata*) and Salt Bush (*Baccharis halimifolia* and *Iva frutescens*).

### **Survey Techniques**

Study sites were selected based upon ease of access and favorable habitat characteristics. A survey route, consisting of 28 individual survey points was established in mid May of 2001, with each point adjacent to or near a high marsh patch (Figure 2). Six points were located on ARNWR, 4 on SQNWR, 3 on the Gull Rock game lands, and the remaining 15 were located on private land. To maximize survey effort all sites were situated along roadways (see Table 1 for list of point coordinates and ownership). Adjacent points were separated by a minimum of 500m to minimize the possibility of recording the same individual bird twice. Survey points were marked with flagging tape and wire flags bearing the point number, and their position recorded using a Garmin eTrex Legend GPS unit.

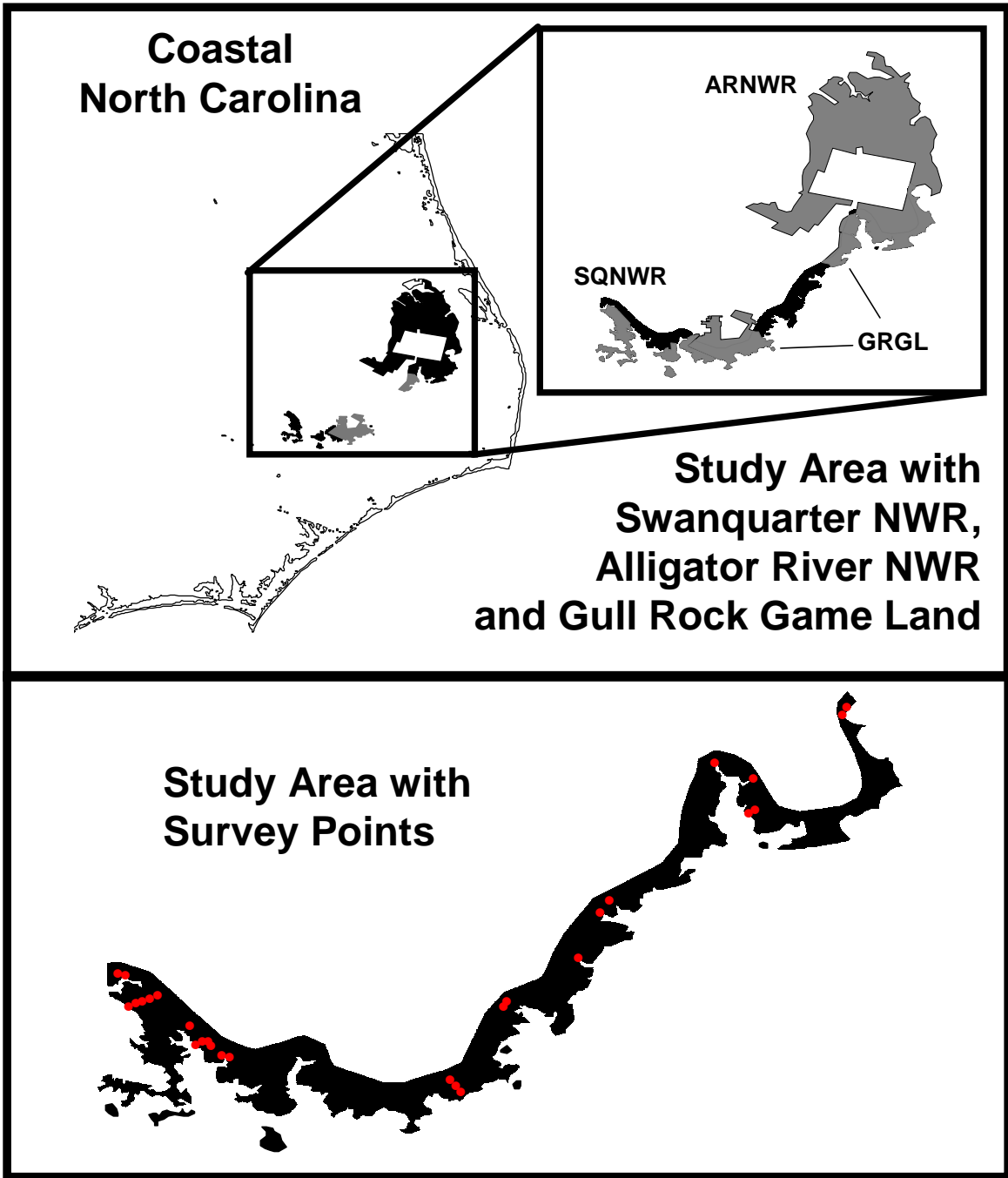
Surveys were conducted by qualified technicians between 30 May 2001 and 7 July 2001. Each point was surveyed 3 times during the study period with surveys beginning no earlier than 2200 hours and concluding no later than one-half hour before sunrise. Surveys were only conducted during period of favorable weather conditions. No surveys were conducted during any precipitation or when wind speeds exceeded 10 mph.

Birds were surveyed at each point by arriving at survey point and listening for a period of 5 minutes followed by a 5 minute callback period and concluding with 1 minute of passive listening. The 5 minute callback period consisted 30 seconds of territorial calls and 30 seconds of silence for 5 different marsh bird species. The marsh bird species broadcasted during the callback period included black rail (*Laterallus jamaicensis*), least bittern (*Ixobrychus exilis*), king rail (*Rallus elegans*), Virginia rail (*Rallus limicola*) and, clapper rail (*Rallus longirostris*). All birds detected were identified to species and recorded

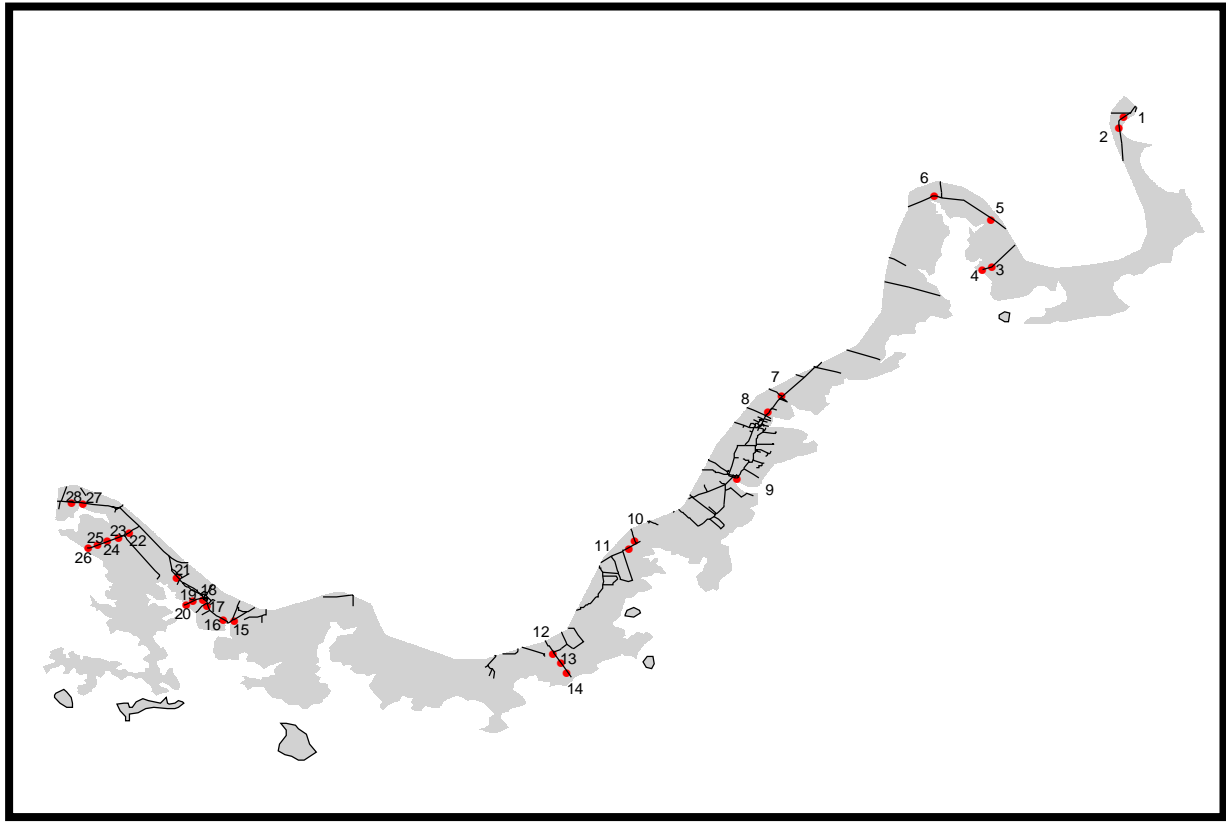
Table 1. List of marsh bird callback study survey points with coordinates and ownership.

<b>POINT NUMBER</b>	<b>X COORDINATE</b>	<b>Y COORDINATE</b>	<b>OWNERSHIP</b>
1	-75.77790	35.69377	ARNWR
2	-75.78134	35.68724	ARNWR
6	-75.89106	35.64646	ARNWR
5	-75.85783	35.63225	ARNWR
3	-75.85695	35.60430	ARNWR
4	-75.86257	35.60251	ARNWR
7	-75.98278	35.52632	Private
8	-75.99121	35.51672	Private
9	-76.00936	35.47734	Private
10	-76.07080	35.43997	Private
11	-76.07423	35.43565	Private
12	-76.11993	35.37267	State
13	-76.11500	35.36652	State
14	-76.11144	35.36131	State
15	-76.31080	35.39241	Private
16	-76.31683	35.39255	Private
17	-76.32682	35.40093	Private
18	-76.32953	35.40508	Private
19	-76.33479	35.40474	Private
20	-76.33951	35.40218	Private
21	-76.34521	35.41798	Private
22	-76.37329	35.44501	Private
23	-76.37978	35.44181	SQNWR
24	-76.38612	35.43992	SQNWR
25	-76.39212	35.43791	SQNWR
26	-76.39753	35.43597	SQNWR
27	-76.40071	35.46237	Private
28	-76.40735	35.46291	Private





**Figure 1.** Map of marshbird callback study area along the southeastern shore of the Albemarle-Pamlico Peninsula.



**Figure 2.** Map of survey points along the southeastern shore of the Albemarle-Pamlico Peninsula.

on data sheets with the date, time, point number, observer, wind speed, wind direction, cloud cover and temperature. Also recorded were the time period the bird was detected in and whether the bird was less than or greater than 100 m from the survey point.

Equipment used for the broadcasting consisted of a compact disk recorded with 5 minutes of silence and 30 seconds of the target species territorial call and 30 seconds of silence for each of the 5 target species, a battery operated portable CD player, a mini amplifier speaker, and a stereo audio cable with 1/8 inch stereo phone plugs. During callback surveys the CD was played on the portable player at full volume and broadcasted with the mini amplifier speaker held chest height and directed towards the survey area.

## **Data Analysis**

All data from field sheets were entered into an Excel spread sheet. Data was associated with the recorded positions to produce GIS data layer of the survey route and detections. Species occurrence was calculated for Alligator River NWR, Swanquarter NWR, Gull Rock game land, and the entire survey route. Frequency of occurrence, for Alligator River NWR, Swanquarter NWR, Gull Rock game land, and the entire survey route, was calculated by dividing the number of points on which a species was detected by the total number of points sampled.

## RESULTS

Surveys resulted in the detection of 150 individuals representing 11 species (Appendix I). Chuck-will's-widow was the most common species detected, occurring 83 times on 71% of the survey points. Marsh wrens were the next most abundant with 25 individual detected on 36% of the survey points. Four species of rails were detected during surveys. Virginia rails were found to be the most abundant, occurring on 25% of the survey points with 11 detections. Clapper rails were detected 7 times on 3 different survey points, and Black rails were detected a total of 3 times at points 22 and 25. A single king rail was detected on two occasions at point 13 (Table 2).

Table 2. List of species detected during marsh bird callback surveys, with total number of detections and frequency of occurrence.

Common Name	Total Individuals Detected	Frequency of Occurrence
Great Blue Heron	5	7%
Clapper Rail	7	11%
King Rail	2	4%
Virginia Rail	11	25%
Black Rail	3	7%
Great Horned Owl	9	11%
Eastern Screech-Owl	3	7%
Chuck-will's-widow	83	71%
Marsh Wren	25	36%
Northern Mockingbird	1	4%
Common Yellowthroat	1	4%

From the 6 survey points within the ARNWR, 9 birds representing 3 species were detected. Chuck-will's-widow was the most abundant species, occurring 4 times at 2 locations. Three Virginia rails were detected at 2 survey points, and 2 Eastern screech-owls were detected at one location (Table 3).

Table 3. List of species detected on points within ARNWR during marsh bird callback surveys, with total number of detections and frequency of occurrence.

Common Name	Total Individuals Detected	Frequency of Occurrence
Virginia Rail	3	34%
Eastern Screech-Owl	2	17%
Chuck-will's-widow	4	34%

Two species comprised of 18 individuals were detected on the 4 points located with SQNWR. Chuck-will's-widows were present at all 4 points, with 17 individuals detected, and a single black rail was detected at point 25 (Table 4). Two additional black rails were detected at point 22, approximately 350 m from the refuge border.

Table 4. List of species detected on points within SQNWR during marsh bird callback surveys, with total number of detections and frequency of occurrence.

<b>Common Name</b>	<b>Total Individuals Detected</b>	<b>Frequency of Occurrence</b>
Black Rail	1	25%
Chuck-will's-widow	17	100%

Seven detections of 2 species were made at the 3 points on the Gull Rock state game lands. Marsh wrens were detected 5 times on two points, and a single king rail was detected on two occasions at point 13 (Table 5).

Table 5. List of species detected on points within the Gull Rock state game lands during marsh bird callback surveys, with total number of detections and frequency of occurrence.

<b>Common Name</b>	<b>Total Individuals Detected</b>	<b>Frequency of Occurrence</b>
King Rail	2	33%
Marsh Wren	5	67%

## DISCUSSION

The high marsh patches within Alligator River NWR, Swanquarter NWR, Gull Rock State Game Land, and private lands along the southeastern shore of the Albemarle-Pamlico Peninsula appear to support good numbers Chuck-will's-widows and all 4 species of rails that have been documented as breeding in coastal North Carolina. Clapper, king, and Virginia rails are considered to be uncommon to common during the summer months in coastal North Carolina and have all been confirmed as breeders in the immediate vicinity (Fussell, 1994; Pearson et al, 1942). Results of the surveys support these statuses. Clapper and Virginia rails were detected often at numerous points. The occurrence of only one king rail is likely due more to this species habitat preference than its rarity on the peninsula. King rails are typically found associated with freshwater marshes (Bent, 1926). Fussell classifies black rails as uncommon in spring and summer. However, this species is very local and can be quite common in some areas such as Cedar Island NWR, located approximately 45 km south and across the Pamlico Sound from our study area. While black rails can be considered locally common, they receive significantly rare status by the North Carolina Natural Heritage Program and are listed as a Federal Species of Concern (LeGrand, 2001).

Black rails were detected on points in and within close proximity to the boundaries of Swanquarter NWR. Surveys conducted during this study were of an exploratory nature, and as such were focused along easily accessible roadways. Therefore, only a small representative sample of Swanquarter NWR habitat was surveyed. Based upon the presence of black rails on two survey rounds and the abundance of suitable habitat, it is likely that the refuge supports a breeding population of black rails.

To determine the distribution and abundance of black rails within Swanquarter NWR, a systematic survey of suitable habitats needs to be conducted. Areas of particular interest include Judith Marsh, Judith Island, the areas on Juniper Bay, and the portion of the refuge southwest of Rose Bay. These areas appear to have patches of high marsh habitat favored by black rails.

## **ACKNOWLEDGEMENTS**

This project would not have been possible without the efforts of many people. Chuck Hunter provided the opportunity to conduct the study. Dennis Stewart and John Stanton provided insight into potential field sites and logistical support within study areas. We appreciate the dedicated efforts of Fletcher Smith and Sean Flint in conducting bird surveys. Lydia Whitaker, Carlton Adams, and Renee Peace, Anne Womack, Gloria Sciole, Mark Roberts, and Cheryl Pope provided important administrative support from the College of William and Mary. Financial support was provided by the U.S. Fish and Wildlife Service (Region 4) and the Center for Conservation Biology at the College of William and Mary.

## LITERATURE CITED

- Bent, A. C. 1926. Life Histories of North American marsh birds. Smithsonian Institution United States National Museum Bulletin 135.
- Bysrtak, D. 1981. The North American Breeding Bird Survey. *Studies in Avian Biology* 6:34-41.
- Fussell, J. O. III. 1994. A birder's guide to coastal North Carolina. University of North Carolina Press, Chapel Hill, North Carolina.
- Gibbs, J. P. and S. M. Melvin. 1993. Call response surveys for monitoring breeding water birds. *Journal of Wildlife Management*. 57(1):27-34.
- Glahn, J. F. 1974. Study of breeding birds with recorded calls in north-central Colorado. *Wilson Bulletin*. 86:206-214.
- LeGrand, H. E. Jr, S. P. Hall and J. T. Finnegan. 2001. Natural heritage program list of the rare animal species of North Carolina. North Carolina Natural Heritage Program, Division of Parks and Recreation, North Carolina Department of Environment and Natural Resources.
- National Ocean Service, National Oceanic and Atmospheric Administration. 2000. Population and development in coastal areas. Retrieved 15 October 2002 from <http://spo.nos.noaa.gov/projects/population/populations.html>.
- Pearson, T. G., C. S. Brimley and H. H. Brimley. 1942. Birds of North Carolina. Bynum Printing Company, Raleigh, North Carolina.
- U.S. Fish and Wildlife Service. 1990. Conservation of avian diversity in North America. Office of Migratory Bird Management, Washington D.C. 22pp.
- U.S. Fish and Wildlife Service. 1995. Nongame birds of management concern-the 1995 list. Office of Migratory Bird Management, Washington D.C.
- U.S. Fish and Wildlife Service. 1999. Marshbird Callback Survey (Working Draft). Office of Migratory Bird Management, Washington D.C.



**Appendix I:** List of Species detected during callback surveys.

<b>Common Name</b>	<b>Scientific Name</b>
Great Blue Heron	<i>Ardea herodias</i>
Clapper Rail	<i>Rallus longirotris</i>
King Rail	<i>Rallus elagans</i>
Virginia Rail	<i>Rallus limicola</i>
Black Rail	<i>Laterallus jamaicensis</i>
Great Horned Owl	<i>Bubo virginianus</i>
Eastern Screech-Owl	<i>Otus asio</i>
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>
Marsh Wren	<i>Cistothorus palustris</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Common Yellowthroat	<i>Geothlypis poliocephala</i>