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## Assessment of black rail status in North Carolina, Interim report: Spring 2018

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## **ASSESSMENT OF BLACK RAIL STATUS IN NORTH CAROLINA**

### **Interim Report: Summer 2018**

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#### **Context**

The black rail (*Laterallus jamaicensis*) is the most secretive of the secretive marsh birds and one of the least understood species in North America. The eastern black rail (*L. j. jamaicensis*) is one of two subspecies that occur in North America. The form is listed as endangered in six states along the Atlantic Coast and is a candidate for federal listing. Black rails require dense vegetation for cover during all stages of their life cycle. They require wetlands with minimal water coverage during the breeding season. Historic population size was likely in the tens of thousands (25,000 to 100,000; Wetlands International) but is now believed to be in the low thousands to hundreds. Eastern black rails breed within three geographic areas within North America including the Atlantic Coast, the Gulf Coast and the Midwest. The Atlantic Coast has generally been considered to support the largest breeding population throughout the range with pairs mostly confined to the highest elevations within tidal salt marshes. Breeding range along the Atlantic Coast has contracted south more than 450 kilometers and the population is estimated to be declining by 9% annually. The primary driver of declines over the past three decades is believed to be sea-level rise and associated tidal inundation during the nesting season.

North Carolina has long been recognized as a stronghold for black rails along the Atlantic Coast. The historic record of black rails in North Carolina is long and unusual being concentrated in the Piedmont and mountains in the late 1800s and early 1900s and along the outer coast over the past 40 years. Black rails appear to have thrived in the post-civil war agricultural setting but were lost along with this farming culture. Black rails have been recorded from 16 counties and breeding has been confirmed within five counties. The marsh complex in lower Pamlico Sound including Cedar Island and Piney Island has the distinction of supporting one of the largest concentrations and highest densities of black rails throughout their range. The black rail population in North Carolina appears to have declined dramatically since the 1970s. The number of calling birds within accessible parts of Cedar Island has declined from 80 to below

10. Birds have been lost from some historic sites and declined in others. Prior to 2014 no systematic surveys to assess the status and distribution in North Carolina had been conducted. During the 2014 and 2015 breeding seasons, a total of 262 points was surveyed for the presence of black rails within the outer Coastal Plain. Rails were detected within 20 points (7.6%) including an estimated 22 individuals.

## **Objectives**

The overall objective of this effort is to assess the status and distribution of the black rail population breeding in North Carolina. Our objectives during the 2017-2018 field seasons are 1) to build on the effort conducted during the 2014-2015 field seasons and expand the extent of spatial coverage and 2) survey inland sites to determine population levels of rails at freshwater inland marshes within North Carolina.

## **Statement of Project Activities: Spring 2018**

Development of a survey frame for 2018 – In consultation with biologists from the North Carolina Wildlife Resources Commission and the U.S. Fish and Wildlife Service, we developed a sampling frame for the 2018 field season. The agreed upon focus of survey efforts would include 1) the best examples of inland freshwater marsh habitat that were accessible within the inner Coastal Plain, 2) areas on the outer Coastal Plain with previous Black Rail detections, and 3) areas in the interior (>500m from road) within Cedar Island National Wildlife Refuge.

Refine survey protocol – We reviewed national and state protocols that are in use or have been used to survey for breeding black rails. In consultation with USFWS biologists, we adopted a survey protocol that is consistent with what has been used previously in Maryland, Virginia, North Carolina and elsewhere. We have attached protocol (much of the structure and text taken from recent USFWS protocol; Smith and Wiest) as Appendix I. We used this survey protocol along the North Carolina and Georgia coast during the 2017 and 2018 field seasons. We used the unmodified Smith and Wiest protocol for 2018 inland points due to the problem of frog calls at freshwater or brackish marshes.

Selection of survey pool of survey points for 2018 – We created a study grid of the inner Coastal Plain of North Carolina, and decided that the highest density of marsh habitat was centered on La Grange, NC ±80km. Potential survey points were placed on the landscape and a database of point coordinates was created. The point dataset was examined for natural clusters to improve sampling efficiency. Outlier points were excluded from the pool. The final pool included over 220 total points. We also created a pool of points that had previous Black Rail detections (points from eBird, detections between 2000 and 2017). A total of 28 points was laid out based on previous detections of Black Rails.

Ground truth and adjusting survey pool – Between 190 and 220 point locations within the pool of potential inland survey sites were visited on the ground to assess feasibility and accessibility. Points that fell on private lands that could not be accessed efficiently or that lacked safe pull-off

sites were excluded from the final set of survey points. The final set covered during 2018 inland surveys included 168 points.

Hire field technicians for 2018 field season – From a large number of applications, we hired two field technicians including a lead technician to manage the day to day operation of the project.

Train field technicians – Field technicians for our North Carolina black rail project and the Georgia black rail project were trained between 24 April and 1 May 2018 on survey protocols and all aspects of the field operations. We utilized housing at Altama WMA near Brunswick, Georgia, for the week long training of technicians.

Set up logistics for 2018 field season – We prepared FoxPro game callers, datasheets, GPS units and other field equipment for deployment into the field with the crew. A house in La Grange, NC, was rented to establish a central field station for surveys. We deployed 2 university vehicles with the field crew for transportation.

Conduct field surveys for black rails – Three rounds of field surveys of the point network are being conducted between 1 May and 15 July 2018.

Enter survey results into project database – Survey results are being entered by the field crew into a project database.

### **Survey Results for Spring-Summer 2018**

We have conducted two full rounds of surveys and are beginning our third round of surveys at each point. We conducted an interior marsh survey at Cedar Island National Wildlife Refuge with zero detections. We have had no inland detections of Black Rails thus far during the 2018 field season.

### **Appendix I.**

**Coastal Black Rail Survey Protocols (used in Maryland, Virginia, North Carolina, Georgia).**

**Fletcher Smith, Center for Conservation Biology (fmsmit@wm.edu)**

**Protocols modified from A. Smith and W. Wiest 2017.**

#### **Survey Playback Sources:**

Ki-ki-kerr: Sourced from Cornell Lab of Ornithology, Macaulay Library in 2007.

Churt: Sourced from Christy Hand, South Carolina DNR

Growl: Sourced from Cornell Lab of Ornithology, Macaulay Library in 2007.

Eek-eek call: Sourced from Cornell Lab of Ornithology, Macaulay Library, Florida call.

**Survey Windows:** All surveys will take place between 1 May and 15 July, with survey window one between 1 May and 24 May, window 2 between 25 May and 19 June, and window 3 between 20 June and 15 July.

All coastal surveys will take place between a half hour after sunset and will conclude by a half hour prior to sunrise. All inland surveys will take place between two survey windows: between an hour before sunrise to 3 hours after sunrise, and between 3 hours prior to sunset to 1 hour after sunset (inland survey times coordinated to reduce impact of frog call issues, and similar protocol as used in South Carolina and by USFWS scientists).

**Survey Routes:** A survey route is a set of points that can be surveyed together during the same night. The number of points per route will depend primarily on logistics. The factor most limiting the number of points per route is the time needed to travel between points. The playback/listening period lasts for 10 minutes. Plan to spend around 12-15 minutes per survey point. It might be possible to survey up to 3-4 points per hour on routes where points are close together and where you can drive from point to point. Routes with more complicated logistics (long distance between points/boat based points) will include fewer points. Surveyors should carefully consider safety and convenience when planning routes, and find safe places to park when doing road based points. Routes can be reorganized during the field season, and care should be taken not to sample the same point repeatedly at the same time of day (e.g., alternate the order of locations along a given route on subsequent visits).

**Survey Points and Broadcast Equipment Placement:** Surveyor(s) will stand at pre-selected survey point coordinates. Survey points should be marked with pin flagging (and labeled with survey point ID with a permanent marker in a nook of the flagging) during scouting, if visited, or the first survey of the season for ease of location through the rest of the season. Each point should be surveyed at least 3 times, with a 10-day minimum between surveys of the same point.

The game caller should be placed on the ground near the center of the point (on road based surveys) or the bow of the boat during playback surveys. Surveyor should stand 5m away from caller if possible to better hear responses. When surveyors are surrounded completely by marsh, orient the caller toward magnetic north. At survey points located on the edge of open water or upland habitat, orient the broadcast caller towards the center of appropriate marsh habitat. Do not rotate the speaker during the broadcast survey. Speakers should not face the surveyors. Both speakers of the broadcast callers should be operational in open marsh and only the forward speaker operational when the surveying from the edge of open water or upland habitat. Sound pressure should be 70-80 dB at 3 feet in front of the speaker; the appropriate volume level on the FoxPro NX3 or NX4, in combination with this project's audio file, is illustrated in the figure below. When viewed straight on, the centerline of the volume knob should align with the trailing edge of the last marked volume setting. Replace batteries in game caller with freshly charged batteries at least every other day of surveys and daily, if necessary.

**Figure1. NX4 or NX3 volume level during surveys.**



**Surveyors:** If two observers survey the same point, each surveyor should fill out a separate data sheet and record their data separately without pointing out or discussing bird observations with the other surveyor. Each surveyor should stand 1-2 meters away from each other and avoid cueing the other surveyor with sudden writing activity. Once that evening survey window is completed, surveyors may discuss their observations and any discrepancies, but the original data sheets must not be altered; obvious mistakes should be noted in the comments section of the data sheet, but the original data must not be changed. If a change is necessary while conducting the survey, strike a line through the data and proceed to correct the data on the next available line, but do not erase data from the data sheet. Similarly, if a surveyor must be accompanied by an untrained individual for safety reasons, the surveyor should instruct the accompanying individual neither to collect data nor influence the surveyor in any way (e.g., call out bird sightings during the survey).

**Weather Restrictions:** Surveys should only be conducted when wind speed is <20 kph (moderate breeze; dust and loose paper raised; small branches begin to move), and not during periods of sustained rain or heavy fog. Even winds <20 kph affect the detection probability of marsh birds, especially Black Rail, and perhaps even suppresses their calling behavior. Surveyors should postpone surveys if they believe winds (or other ambient noise) are dramatically affecting the detection probability of marsh birds. If wind speed increases to >20 kph, or sustained rains/fog begin during a morning or evening survey window, surveyors should cease surveys for that window and visit unsurveyed sites at another time.

**Recording Bird Detections:** We distinguish between primary and secondary species, which differ in the way data are recorded as described below. Primary Species & 4-letter AOU codes: Each individual is recorded on a separate line and record minute by minute data.

**BLRA - Black Rail**

**CLRA – Clapper Rail**

**KIRA – King Rail**

**CLING – Clapper/King**

**LEBI – Least Bittern**

**VIRA - Virginia Rail**

**SORA – Sora Rail**

**CWWI – Chuck Will’s Widow**

**WPWI – Whip Poor Will**

**Secondary Species & 4-letter AOU codes:** All individuals in a given distance band are recorded on a single line

**SESP – Seaside Sparrow**

**MAWR – Marsh Wren**

**SEWR – Sedge Wren**

**Incidental Species:** record all species heard or seen, including owls, herons, etc... in this portion of the data sheet.

**Distance and direction:** For Black Rail, the only primary species, record an estimate of the exact distance and the general direction (N, NE, E, SE, S, SW, W, or NW, or to the degree marker on a compass) to the initial detection of each individual. Recalling the orientation of the broadcast caller can make this determination more efficient. For secondary species, record the estimated distance band at the time of first detection.

**Time of detection:** Detections of each individual marsh bird should be recorded minute-by-minute during the 10-minute survey period. The beginning of each passive minute during the survey period is indicated by “start”. Surveyors should distinguish and indicate the call type(s) of all Black Rail detections during a given survey minute using the call type codes on the provided “cheat sheet”; multiple call types may be recorded in a given minute (e.g., a Black Rail *ki-ki-kerr* followed by a *growl* would be recorded K, GR). For secondary species, indicate the number of individuals detected in each minute using dot and

line notation. Remember that for secondary species, each line of the data corresponds to a single distance band. Examples are provided below.

**Species Identification:** *King Rail vs. Clapper Rail:* These species make similar vocalizations. King Rails typically breed in freshwater marshes and Clapper Rails breed in saltwater marshes. In brackish marshes or inland salt marshes (e.g., N. Pamlico Sound), however, surveyors may not be able to confidently identify vocalizations to species and should, in these situations, record these individuals as KCRA (King-Clapper Rails).

**Birds detected at a prior survey point:** If a surveyor suspects that a marsh bird detected during a survey is an individual detected at a previous survey point, the surveyor should proceed to record the requisite detection data and record “detected at a previous point” in the comments column. When in doubt, be conservative as to whether an individual bird detected at the current point was the same individual recorded at a previous point (i.e., make a note in the *comments* column).

**Birds detected outside the survey period (approaching or leaving):** Record any Black Rail detected outside of the survey period by recording the distance and direction of the detection, indication the call type(s) in the “outside survey period” column, and recording your coordinates at the time of detection in the notes column. For example, if a Black Rail is detected while moving between survey points, record the detection data on the data sheet for the prior (or forthcoming) survey point as described, and record coordinates of the location where you detected the rail.

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