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Recent Advances in Eastern Black Rail (*Laterallus jamaicensis jamaicensis*) Research: An Introduction

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This special section is the result of two symposia focused on the Eastern Black Rail (*Laterallus jamaicensis jamaicensis*) that were held during the 40th and 43rd meetings of the Waterbird Society. The meetings held in New Bern, North Carolina, USA (21-23 September 2016) and Princess Anne, Maryland, USA (6-9 November 2019) were well attended and brought together scientists from throughout the range to share recent findings. Paper topics included breeding ecology, habitat use, distribution, trends, information gaps and conservation strategies. The symposia reflected both a more than thirty-year period of concern about the future of the population and a recent acceleration in research. The long-held concern has led to a federal listing of Threatened by the U. S. Department of the Interior, Fish and Wildlife Service (USFWS). The wave of research has led to a new era of interest in and understanding of this unique species and its populations. In the following, we provide a brief historical timeline for the symposia and some context for the publications included within this special section.

Due to their habitat preferences and secretive nature Black Rails, including the Eastern Black Rail subspecies, have been one of the most understudied birds in North

America (Eddleman *et al.* 1994). Although Black Rails were documented to be among the North American avifauna nearly two hundred years ago (Audubon 1838; Allen 1900), even the most rudimentary understanding of calls (Kellogg 1962), breeding (Stone 1937) and distribution (Forbush 1929) would not begin to emerge until a century later. Attempts to quantify status were not initiated until decades after some of the most catastrophic habitat losses had already occurred. The lack of information on basic demographics and habitat requirements continues to be an impediment to conservation planning.

Concern for the Eastern Black Rail population in North America began to coalesce in 1987 when the Office of Migratory Bird Management of the USFWS produced a publication entitled "Migratory Nongame Birds of Management Concern" that included Black Rails among 30 species with population declines, small or restricted populations or dependent on restricted or vulnerable habitats (U.S. Fish and Wildlife Service 1987). The objective of the list was to initiate actions to prevent the species from becoming Federally Threatened or Endangered. This acknowledgment prompted assessments within two USFWS regions including the Midwest (in the north central United

States) (Hands *et al.* 1989) and the Northeast United States (Davidson 1992), as well as three benchmark surveys including New Jersey (Kerlinger and Sutton 1989), Maryland (Brinker and Terres 1992) and South Carolina (Cely *et al.* 1993). Despite this early engagement and subsequent attempts to highlight concerns (e.g., Hunter 1990), very little work was conducted on Eastern Black Rails during the subsequent 15 years.

The Eastern Black Rail Conservation and Management Working Group was established in 2009. The establishment of this group by The Center for Conservation Biology at the College of William & Mary was precipitated by the results of a 2007 survey of Black Rails in Maryland (McCann 2007). When compared to the benchmark survey conducted in 1990 (Brinker and Terres 2002), results suggested a dramatic decline of Black Rails within the region (Watts *et al.* 2021). This along with anecdotal accounts of declines within historic strongholds suggested that urgent action was needed. The objectives of the working group included building a coalition of biologists and agencies focused on moving conservation forward, identifying and filling information gaps and developing a cohesive conservation strategy. Between 2009 and 2015 several presentations were given about Eastern Black Rails to regional and national meetings. During 2013 two regional workshops were held within the Northeast (Prime Hook National Wildlife Refuge on 10 - 11 September) and Southeast (Savannah National Wildlife Refuge on 12 - 14 November). These workshops were attended by representatives of all coastal states within the breeding range, university biologists, federal agencies and non-governmental organizations. Collaborators developed population estimates based on the best available information for each state. Attendees also compiled lists of factors believed to contribute to declines, identified information needs and suggested possible management solutions.

One of the early priorities identified by the working group was to locate, collect and compile all information pertaining to the Eastern Black Rail with the intention of developing the information and historical context needed to inform conservation efforts. A status assess-

ment of the Eastern Black Rail was completed in 2016 that included all Atlantic and Gulf of Mexico Coast states, USA (Watts 2016). The assessment developed: (1) a working bibliography; (2) a digital library of materials; and (3) a geo-referenced occurrence database derived from all available materials. In 2017 both the working bibliography and associated occurrence database were expanded to include the Midwest and Great Plains (west central United States) portions of the range (Watts *et al.* 2017). The final working bibliography included nearly 1,200 citations and the database included 2,300 documented occurrences from 1836 to 2016. The status assessment provided a state-by-state accounting of survey efforts, habitat use, distribution, documented trends and a population estimate. In general, the population has experienced a 450 km range contraction from Massachusetts south to New Jersey and an ongoing population decline that is highest throughout the northern portion of the range.

In 2016, the Atlantic Coast Joint Venture (ACJV) adopted the Eastern Black Rail as one of three focal species for the program and assumed responsibility for the working group. Since that time the ACJV has organized and rapidly mobilized a consortium of individuals and organizations on behalf of Black Rail conservation. The ACJV has convened several in-person meetings to advance conservation efforts and continues to host regular discussions to coordinate activities. The group formed a core working group that developed short and long-term population objectives and a conservation plan (ACJV 2020) that outlines six major implementation strategies designed to achieve objectives. The six strategies are: (1) create new non-tidal Black Rail habitat; (2) promote targeted impoundment management; (3) develop and promote Black Rail-friendly fire best management practices (BMPs); (4) develop and promote Black Rail-friendly agricultural BMPs; (5) develop and implement BMPs to facilitate marsh migration; and (6) develop a landowner assurances program. The ACJV has facilitated several on-the-ground projects and has worked with researchers to establish an adaptive management project to help optimize efforts and information.

In 2017, the Texas Parks and Wildlife Department in partnership with the Texas Comptroller's Office initiated the Texas Black Rail Working Group. The main purpose of the group is to provide a forum for collaboration between researchers and stakeholders. Objectives include sharing information about Eastern Black Rails, identifying information needs and supporting conservation actions. The group has held multiple meetings and has expanded to include the entire western Gulf of Mexico Coast and Great Plains portions of the breeding range. The group produced a conservation planning report in 2018 to serve as a foundation for future conservation efforts and covered discussions on stakeholder engagement, research gaps and conservation planning (Horndeski 2018).

In 2018, USFWS completed a Species Status Assessment for the Eastern Black Rail, which evaluated the subspecies' biology and factors that influence its overall viability (U.S. Fish and Wildlife Service 2018). USFWS found that the primary threats to the Eastern Black Rail were habitat loss and degradation, largely from development, sea level rise, and tidal flooding, incompatible land use and management practices, and increasing storm intensity and frequency. The status assessment served as the biological underpinning of USFWS's decision to protect the bird as a threatened species under the Endangered Species Act (U. S. Fish and Wildlife Service 2020). A threatened species is likely to become an endangered species (in danger of extinction) within the foreseeable future throughout all or a significant portion of its range.

A dramatic mobilization of researchers and managers has materialized throughout the range since the establishment of the working group and has continued since the federal listing, and advances made during this wave of activity are represented within this volume. Surveys have been conducted in nearly every coastal state and within inland regions including the completion of more than 15,000 point-counts. Some of these surveys are beginning to fill geographic information gaps and are rapidly expanding our understanding of Black Rail ecology within previously unknown or poorly studied locations. One of the great

est barriers to conservation planning has been our general lack of understanding about habitat requirements that is needed to delineate areas for protection and to identify conservation endpoints for management efforts. Between 2015 and 2018 Haverland *et al.* (2021) and Tolliver *et al.* (2019) have used occupancy models and radio telemetry to study the habitat use and spatial ecology of Black Rails in coastal Texas. Their results have improved our understanding of space requirements within coastal habitats and will allow for the identification of essential habitat along the Texas Coast, USA. Between 2017 and 2019, Johnson and Lehman (2021) used point counts (breeding season) and rope drags (nonbreeding season) to document a previously unknown population of Black Rails in coastal Louisiana, USA. Their work examined habitat use, space requirements and seasonality and has implications for management along the Gulf of Mexico Coast. Stevens and Conway (2021) used a habitat model to delineate habitat on a range-wide scale. This effort identified habitat hotspots at the state and range-wide scale that are needed for conservation planning. They examined overlaps between Black Rail habitat and anthropogenic threats that may be useful for targeted management actions and identified overlaps between high-quality habitat clusters and conservation ownership. Due to the lack of historic surveys for Black Rails, we have had very limited information on trends for important populations. In recent years, efforts have been made to resurvey the few existing historic point networks in order to provide some general trend estimate. Watts *et al.* (2021) analyzed a serial dataset (1990, 2007, 2014) collected within the Chesapeake Bay, USA to estimate trends in occupancy and abundance. Because Black Rails require dense overhead vegetation during all stages of their life cycle, one of the most difficult aspects of their ecology to study is breeding biology and reproductive performance. Hand *et al.* (2021) used a novel approach (motion-activated camera traps) to investigate breeding ecology within managed impoundments and tidal marsh of South Carolina. They utilized large numbers of images to painstakingly piece together patterns of breeding phenology, brood devel-

opment and breeding behaviors that provide some of the first insights into the breeding ecology of Eastern Black Rails.

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