EASTERN BLACK RAIL (*Laterallus jamaicensis jamaicensis*)

Eastern black rail, credit: David Siebel

The eastern black rail (*Laterallus jamaicensis jamaicensis*) is a small, highly secretive marsh bird. The bird is most often heard and hardly ever seen. It is one of four recognized subspecies of black rail, two of which occur in North America. Adults range from 10-15 centimeters (cm) in total length and have a wingspan of 22-28 cm (Eddleman et al. 1994). Males and females are similar in size and adults are generally pale to blackish gray, with a small blackish bill and bright red eyes. The eastern black rail is found mainly along the Atlantic and Gulf Coasts (Watts 2016). Sea level rise and loss of high marsh breeding habitat has reduced its abundance and range.

This species is critically imperiled and highly rare in Maryland, where it is also state listed as Endangered (Maryland Natural Heritage Program 2016). The current Atlantic Coast population is estimated at between 355 to 815 breeding pairs with an estimated rate of decline of 9 percent per year since the 1990s. The decline represents a loss of more than 90 percent of the population (ACJV 2020). In 2016, the breeding pairs in Maryland was estimated at 15 to 30 pairs. (Watts 2016). In 2020, the U.S. Fish and Wildlife Service (Service) listed the species as threatened under the Endangered Species Act.

LIFE HISTORY

It is suspected that the northern portion of the Atlantic coast population (Mid-Atlantic) is migratory and winters further south on the Atlantic coast (e.g., the Carolinas and Florida) and also in the Caribbean and Central America (Eddleman et al. 1994; Taylor and van Perlo 1998). Black rails typically migrate to Maryland from March to May and then leave from September to November, although birds are occasionally detected as far north as New Jersey during the winter on the Atlantic coast (Root 1988 in Eddleman et al. 1994).

Egg laying lasts for approximately 7 days, followed by 19 days of incubation depending on the clutch size. Adult females lay one egg per day and have an average clutch size of seven eggs (Legare and Eddleman 2001). Eggs are laid in a bowl constructed of live and dead fine-stemmed emergent grasses, rushes, or other herbaceous plant species, often with a canopy and a ramp (Harlow 1913; Davidson 1992a; Flores and Eddleman 1993). Black rail nests are typically well hidden in a dense clump of vegetation over moist soil or shallow water (Harlow 1913; Flores and Eddleman 1993). Dense overhead vegetation is an essential requirement for all life stages.

Vegetation type is not as important as a vegetation structure that allows movement under the canopy. Black rail chicks are covered in black down with an oily greenish sheen and have dark gray or dark brownish olive eyes upon hatching (Bent 1926; Eddleman et al. 1994). Chicks can be found from May through September. It takes approximately 42 days for chicks to fly. A year after hatching, birds become mature and are able to breed at one year of age (Eddleman et al. 1994). Eastern black rails fly little during the breeding and wintering seasons and will typically flush only for a short distance when pursued (Bent 1926). Typically, the birds will remain on the ground, running quickly through dense vegetation likely using the runways of rodents and rabbits (Armistead 2001; Taylor and van Perlo 1998) Eastern black rails forage on a variety of small (<1 cm) aquatic and terrestrial invertebrates, especially insects, and seeds and are probably opportunistic foragers (Taylor and van Perlo1998).

HABITAT

In the northeastern United States, the eastern black rail is typically found in Atlantic Coast salt and brackish marshes, with dense cover of salt meadow cordgrass (*Spartina patens*); smooth cordgrass (*S. alterniflora*); big cordgrass (*S. cynosuroides*); coastal saltgrass (*Distichlis spicata*); black needlerush (*Juncus roemerianus*); blackgrass (*J. gerardii*); and chairmaker's bulrush (*Schoenoplectus americanus*). Birds may also occupy the more upland extents of these marshes, which include shrubs such as marsh elder (*Iva frutescens*) and grounsel tree or high-tide bush (*Baccharis halimifolia*), and the invasive common reed (*Phragmites australis*). Wet meadows and freshwater marshes of cattail (*Typha angustifolia*) and river bulrush (*Bolboschoenus fluviatilis*) are also occupied (Davidson 1992b).

Eastern black rails occupy relatively high elevations along heavily vegetated wetland gradients, with soils moist or flooded to a shallow depth (Eddleman et al. 1988; Nadeau and Conway 2015). They have been found in a variety of salt, brackish, and freshwater marsh habitats that are tidally or non-tidally influenced (Flores and Eddleman 1995). High marsh areas in brackish environments are the historical habitats in Maryland where the few remaining black rails have been found. However, surveys in nontraditional habitats (freshwater wetlands and hunting impoundments) have found black rails using these areas as well. These additional habitat types hold promise where appropriate vegetation and water regimes occur. Permanent water is essential but must be shallow, from moist soil to 3cm in depth and topographic diversity helps to allow resiliency in water depth variation (Watts 2020).

Due to their highly secretive nature very few people have seen them in Maryland. The birds typically call at night so they are not often heard. Historical black rail breeding areas in Maryland include Dorchester and Somerset Counties. Other counties where they have been seen

or heard over the years, although infrequently, include Queen Anne's, Kent, Talbot Worcester, Wicomico, Anne Arundel, Howard, and Carroll.

Little is known about their use of non-traditional sites, including freshwater impoundment. Past surveys haven't looked outside historical saltmarsh areas. However the survival of these birds could depend on development and management of freshwater impoundments as tidal marshes are changing so rapidly.

HABITAT RESTORATION RECOMMENDATIONS

Restoration Approaches

Restoration efforts should focus on enhancing or restoring, salt or brackish tidal marshes, creating or managing freshwater wetlands and wet meadows, and consider unique opportunities including the use of effluent from sewage treatment plants to create habitat. The recommendations are based on the best available science. Black rail habitat requirement in both tidal and freshwater wetlands include these parameters:

1. Vegetation: Dense overhead herbaceous vegetation (not *Phragmites*) that also allows the birds to move along the ground between the stems of vegetation.
2. Hydrology: Black rails have short little legs and primarily occupy areas with saturated soil up to 1.2 inches (3 cm) of standing water- a very thin veneer of water. In tidal marshes it is assumed the birds adjust their daily movements with the moving tides.
3. Microtopography: Variable topography is important to allow birds to retreat to slightly higher ground when tides rise above normal levels or heavy rain increases the depth of water in freshwater wetlands.

Tidal Marshes

Protecting and restoring high marsh habitat is the primary objective of actions to improve habitat for black rails in tidal marshes. The estimated home range of eastern black rails in tidal salt marshes is 3.24 hectares (Weske 1969).

- Thin Layer Spread - This technique uses pumped dredge material over a marsh to build up the elevation of a high marsh to combat the advance of sea level rise. This has proven to be an effective technique although this can be logistically difficult and is very expensive.
- *Phragmites* Control - herbicide treatment of areas to promote native high marsh vegetation where the rails nest. The birds do not nest in *Phragmites* marshes.
- Marsh Migration - create areas for high marsh to migrate into forest and agricultural areas. These actions can include enrolling salt damaged crop fields in a USDA program, and planting and maintaining the field as a meadow. In forested areas, experimental techniques have proven beneficial to cut trees in advance of sea level rise and allow a marsh to migrate.

Freshwater Nontidal Marshes

Black rails have been found in natural wetlands in the north central region of Maryland that also harbor the federally threatened bog turtle. These wetlands are wet meadows with mucky substrate fed by springs.

- Maintaining Hydrology - Protecting the spring seeps and water source to the springs is a key action to protect these wetlands. This could include protection of watershed areas that drain into the wetlands. This can also include using stream restoration techniques to maintain stream-bed elevations of headwater stream channels that often meander through these wetlands.
- Managing Trees and Shrubs - As beaver and livestock are removed from these areas, trees and shrubs tend to encroach on the wetlands. Managing woody vegetation is a key action that needed to maintain the herbaceous cover in these wetlands.

Constructed Freshwater Wetlands or Impoundments
Hundreds of these types of wetlands exist and continue to be constructed mostly in agricultural settings.

- Moist Soil Management - promote native vegetation and proper hydrology in existing impoundments on public and private lands
- Create Impoundments - build impoundments to incorporate proper hydrology, microtopography, and vegetation that provide adequate habitat for the black rail.
- Wetland Buffer: Make sure shallow wetlands and impoundments have an adequate tall grass/meadow buffer and are not naked (with only crops or mowed grass around the edge) (Watts personal comm. 2020).

Artificial Wetlands From Pumped Water

- Long term research from professors and students at UC Berkeley in the Sierra Nevada foothills of California have located many black rails in small wetlands that are created with leaky irrigation ditches/pipes. See article: https://www.researchgate.net/publication/250270654_California_black_rails_depend_on_irrigation-fed_wetlands_in_the_Sierra_Nevada_foothills

  This article also references experimental projects that were successful in creating habitat for black rails by pumping water through a perforated pipe at the top of a gentle slope. The water trickling down the slope allowed wet meadow plants to thrive and created the correct shallow hydrology for black rails.

- Artificial wetlands created with effluent from a wastewater plant: At the Easton, MD wastewater treatment plant, several black rails used wet meadow habitat that was created with the plants effluent that was trickled across gently graded fields to remove pollutants. The shallow water and dense vegetation was ideal for the rails. In 2008, the wet meadow habitat ceased to exist as the plant was upgraded. Efforts are underway to restore a portion of these fields to a wet meadow.

LONG-TERM MAINTENANCE
Eastern black rail habitat requires proper hydrology and vegetation structure

1) Existing Habitat

- Species presence should continue to be documented using survey protocols and schedule from Maryland Department of Natural Resources
- If present, evaluate existing conditions and delay any disturbance or management until fall or winter after birds have migrated from the area

2) Restored Habitat

- Conduct surveys or use citizen science to monitor occupancy and adjust management based on survey results
- Evaluate habitat conditions during breeding season and delay any disturbance or management until fall or winter after birds have migrated from the area
- Mowing: Only mow when necessary. Mow between Nov 1st and April 1st. Only mow 1/3-1/2 of the area and allow the dead stalks of previous years vegetation to persist as birds returning from migration in May need adequate cover until the new plant growth can provide cover.
- Hydrology: Maintain proper hydrology and water sources during breeding season (April to September)

LITERATURE CITED

Atlantic Coast Joint Venture (ACJV). 2020. Black Rail Conservation Plan. https://acjv.org/black-rail/

Armistead, G. L. 2001. Rails, Gallinules, and Coots. In C. Elphick, J. B. Dunning Jr., & D. A. Sibley, The Sibley Guide to Bird Life & Behavior (pp. 246-250). New York, New York: Alfred A. Knopf.

Bent, A. C. 1926. Life histories of North American marsh birds. Smithsonian Institution, United States National Museum, Bulletin 135. Reprint edition, 1963. New York, New York: Dover Publications.

Davidson, L. M. 1992a. Black Rail, *Laterallus jamaicensis*. In K. J. Schneider, & D. M. Pence, Migratory nongame birds of management concern in the Northeast (pp. 119-134). Newton Corner, Massachusetts: U.S. Fish and Wildlife Service.

Davidson, L. M. 1992b. The Nature Conservancy Species Management Abstract: Black Rail, *Laterallus jamaicensis*. Retrieved January 14, 2018, from http://ibrarian.net/navon/paper/The_Nature_Conservancy_Species_Management_Abstrac.pdf?paperid=2519852

Eddleman, W. R., Flores, R. E., and M. Legare 1994. Black rail (*Laterallus jamaicensis*), version 2.0. (A. F. Poole, F. B. Gill, Editors, & Cornell Lab of Ornithology, Ithaca, New York) Retrieved January 2, 2017, from The Birds of North America: https://birdsna.org/Species-Account/bna/species/blkrai/introduction

Eddleman, W. R., Knopf, F. L., Meanley, B., Reid, F. A., and R. Zembal. 1988. Conservation of North American rallids. Wilson Bulletin, 458-475.

Flores, R. E. and W. R. Eddleman. 1995. California black rail use of habitat in southwestern Arizona. The Journal of Wildlife Management, *59*, 357-363.

Flores, R. E. and W. R. Eddleman. 1993. Nesting biology of the California black rail in southwestern Arizona. Western Birds, 24, 81-88.

Harlow, R. C. (1913). Nesting of the black rail (*Creciscus jamaicensis*) in New Jersey. Auk, *30*, 269.

Legare, M. L. and W. R. Eddleman. 2001. Home range size, nest-site selection and nesting success of black rails in Florida. Journal of Field Ornithology, 72, 170-177.

Maryland Natural Heritage Program. 2016. List of Rare, Threatened, and Endangered Animals of Maryland. Maryland Department of Natural Resources, 580 Taylor Avenue, Annapolis, MD 21401.

Nadeau, C. P. and C. J Conway. 2015. Optimizing water depth for wetland-dependent wildlife could increase wetland restoration success, water efficiency, and water security. Restoration Ecology, 23, 292-300.

Richmond, Orien & Chen, Stephanie & Risk, Benjamin and Tecklin, Jerry & Beissinger, Steven. (2010). California black rails depend on irrigation-fed wetlands in the Sierra Nevada foothills. California Agriculture. 64. 85-93. https://www.researchgate.net/publication/250270654_California_black_rails_depend_on_irrigation-fed_wetlands_in_the_Sierra_Nevada_foothills

Root, T. R. 1988. Atlas of Wintering North American Birds: An Analysis of Christmas Bird Count Data. Chicago, Illinois: University of Chicago Press.

Taylor, B., and B. van Perlo. 1998. Rails: A Guide to the Rails, Crakes, Gallinules and Coots of the World. New Haven, Connecticut: Yale University Press.

Watts, B. D. 2016. Status and distribution of the eastern black rail along the Atlantic and Gulf Coasts of North America. Williamsburg: College of William and Mary/Virginia Commonwealth University

Watts, B.D. 2020, April 17. BLRA CEAP discussion [E-mail].

Weske, J. S. 1969. An ecological study of the black rail in Dorchester County, Maryland. Ithaca, New York: Cornell University.