

Fish Crows (*Corvus ossifragus*) Prey on Eggs of Virginia Rail (*Rallus limicola*) and Common Tern (*Sterna hirundo*)

Jan G. Reese¹, Peter C. McGowan², Lorie W. Staver³, and Carl R. Callahan²

¹*P.O. Box 298, St. Michaels, Maryland 21663; reesejan@ymail.com*

²*United States Fish and Wildlife Service, Chesapeake Bay Field Office, 177 Admiral Cochrane Drive, Annapolis, Maryland 21401*

³*University of Maryland, Center for Environmental Science, P.O. Box 775, Cambridge, Maryland 21613*

ABSTRACT: Game camera photographs captured individual Fish Crows (*Corvus ossifragus*) preying on eggs at active nests of Virginia Rail (*Rallus limicola*) and Common Tern (*Sterna hirundo*) found in smooth cordgrass (*Spartina alterniflora*) tidal marsh in the Poplar Island archipelago in central Chesapeake Bay. This is the first photographic documentation of Fish Crow predation on eggs of these species.

Keywords: Common Tern eggs, Fish Crow predator, island, smooth cordgrass, tidal marsh, Virginia Rail eggs

The omnivorous Fish Crow (*Corvus ossifragus*) feeds on seeds, berries, insects, mussels, crabs, fish, small mammals, and various forms of carrion (Barrows 1888, Fargo 1927, Bent and Collaborators 1946). Fish Crows are most notorious for preying on bird and turtle eggs, and frequently focus their activities and/or nest among colonial nesting waterbird colonies (Burger and Hahn 1977, Montevecchi 1977, Miller and Burger 1978, Shields and Parnell 1986, Bildstein et al. 1990, Post and Seals 1991, Voigts 1999, Lauro and Tanacredi 2003). Here, we provide photographic evidence of Fish Crows preying on eggs of Virginia Rail (*Rallus limicola*) and Common Tern (*Sterna hirundo*) in unattended active nests.

STUDY AREA

The Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island (PSERPPI) is a cosponsored island restoration project of the Maryland Port Administration and the Baltimore District of the United States Army Corps of Engineers. The location of the project site in Chesapeake Bay is approximately 25 km (15.5 mi) south-southeast of Annapolis, Maryland and 4.0 km (2.5 mi) offshore of the Delmarva Peninsula Coastal Plain. PSERPPI comprises a dike rising 3.0 m (9.8 ft) or more above mean low tide, extending for 11.9 km (7.4 mi) to form an elongated 461 ha (1139.2 ac) oval shape with exterior rock riprap protection. A

seabed area, 4.3 km (2.7 mi) long and 0.8 km (0.5 mi) wide, remained after pumping dry the engulfed area. The hollow interior, initially subdivided by dikes into six containment cells ranging 12.6-131.9 ha (31-326 ac) apiece in 2002, subsequently received further subdivision increasing the number of containment cells (ranging 10.1-98.3 ha [25-243 ac] apiece) to 17 by 2014. Maintenance dredge materials from northern Chesapeake Bay shipping channels are deposited into the containment cells for materials drying management and eventual engineer-designed and contractor-built-and-planted beneficial tidal wetlands and upland forest. Several years are required for completion of these processes. Consequently, wildlife and location of a specific habitat within the construction site are constantly evolving from one season and/or year to the next. Artificial herbaceous wetland habitat consisting primarily of smooth cordgrass (*Spartina alterniflora*) in the low marsh and saltmeadow cordgrass (*S. patens*) in the high marsh, plus sparse woody shrubs on two bird-nesting islands in the marsh, characterized about 71.3 ha (176.2 ac) in five cells in 2014. Additionally, fallow herbaceous vegetation grows on many dike slope areas throughout the site, while only a few small trees exist largely in close proximity to buildings. A complex of ten building structures on the north side of intersecting interior dike roads near the center of the island support approximately 30 management and machine-operator personnel working most days. Within the archipelago are two uninhabited islets (3.5 ha [8.7 ac] and 14 ha [34.6 ac]) from 61 m (200 ft) to 343 m (1125 ft) east of PSERPPI. Forest and tidal marsh comprise these islets, while both also host colonial nesting waterbirds. The archipelago's inaccessibility and lack of terrestrial predators enabled nesting of greater than 3000 birds from 1 March through 30 September 2014, including several colonial nesting species (McGowan et al. 2013, Prosser 2013, Reese 2013, McGowan and Callahan 2014, Prosser [2014 draft]).

OBSERVATIONS

In early June 2013, while assisting United States Geological Survey biologists conducting Common Tern nest monitoring, United States Fish and Wildlife Service (USFWS) personnel placed several motion-activated game cameras within a mixed colony of Common Tern and Forrester's Tern (*Sterna forsteri*) nests located on drift debris in one of the islet marshes. Cameras were placed randomly in the colony, and individually positioned to monitor a maximum number of active nests to capture predator events. Data storage cards from each camera were checked, replaced, and images downloaded weekly until colony nesting activities ceased. Some camera images show crows within the colony while a 3 July 2013 image shows a Fish Crow beside a nest with a Common Tern egg in its bill (Figure 1).

On 27 June 2014, University of Maryland personnel found a Virginia Rail nest with seven eggs while working among a homogeneous *Spartina alterniflora*



Figure 1. Fish Crow beside a Common Tern (*Sterna hirundo*) nest with a tern egg in its bill. Poplar Island archipelago (uninhabited islet), 3 July 2013 (Game camera image).



Figure 2. Fish Crow (*Corvus ossifragus*) beside the Virginia Rail (*Rallus limicola*) nest with a rail egg in its bill. Poplar Island archipelago (PSERPPI), 7 July 2014 (Game camera image).

portion of an engineer-designed, and contractor-built-and-planted, tidal wetland in the central northeast portion of PSERPPI. The nest appeared unchanged on 30 June 2014, when USFWS personnel placed a motion-activated game camera in the wetland approximately 1.5 m (4.9 ft) from the nest to monitor nest success. Camera images during 30 June-9 July 2014 showed that at least two rail eggs hatched. The camera also captured an image on 7 July 2014 of two Fish Crows beside the nest, one of which had a rail egg in its bill (Figure 2).

DISCUSSION

Of the 26 waterbird species nesting in the Poplar Island archipelago, Fish Crows reportedly prey on 12 of them (Table 1). Other studies (Maxwell and Kale 1977, Reese 1977, Parsons 1995) have implied Fish Crow predation on eggs of Great Blue Heron (*Ardea herodias*), Great Egret (*A. alba*), Snowy Egret (*Egretta thula*), Cattle Egret (*Bubulcus ibis*), and Osprey (*Pandion haliaetus*), but provide no substantiating evidence. Additionally, other waterbird species, Anhinga (*Anhinga anhinga*), Brown Pelican (*Pelecanus occidentalis*), Little Blue Heron (*Egretta caerulea*), White Ibis (*Eudocimus albus*), Clapper Rail (*Rallus crepitans*), Wilson's Plover (*Charadrius wilsonia*), Piping Plover (*C. melodus*), Laughing Gull (*Leucophaeus atricilla*), and Black Skimmer (*Rynchops niger*), are reported to have their eggs preyed on by Fish Crow (Fargo 1927, Forbush and May 1955, Meanley 1955, Dusi and Dusi 1968, Burger and Hahn 1977, Montevecchi 1977, Shields and Parnell 1986, Bildstein et al. 1990, Lauro and Tanacredi 2002).

Burger and Gochfeld (1991) observed Fish Crows preying on Common Tern eggs; our observations are the first such documentation for Virginia Rail, plus the first photographic evidence of predation on both species. Among the thousands of nesting waterbirds on the island, only 46% of the species are known to be preyed upon by Fish Crow which may equate to future opportunities to confirm other species preyed upon by the opportunistic crows (Table 1).

ACKNOWLEDGMENTS

The authors gratefully acknowledge the 2013-2014 contract support from the United States Army Corps of Engineers to the United States Fish and Wildlife Service for wildlife management services at the project site, and the Maryland Port Administration 2014 support to the Maryland Environmental Service, who contract with the University of Maryland Center for Environmental Science to conduct sediment and vegetation research at the island. Observations reported here are collected incidental to these contract activities. The authors thank two anonymous reviewers for suggestions improving the article.

Table 1. Waterbird species nesting in the Poplar Island archipelago with citations for species known to be preyed upon by Fish Crows (*Corvus ossifragus*).

Nesting Waterbird Species in the Archipelago	Citations of Known Fish Crow Predation
Canada Goose, <i>Branta canadensis</i>	
American Black Duck, <i>Anas rubripes</i>	
Mallard, <i>Anas platyrhynchos</i>	
Double-crested Cormorant, <i>Phalacrocorax auritus</i>	Forbush and May 1955; Post and Seals 1991
Great Blue Heron, <i>Ardea herodias</i>	
Great Egret, <i>Ardea alba</i>	Parsons 1995
Snowy Egret, <i>Egretta thula</i>	
Cattle Egret, <i>Bubulcus ibis</i>	Dusi and Dusi 1968
Black-crowned Night Heron, <i>Nycticorax nycticorax</i>	Burger and Hahn 1977
Glossy Ibis, <i>Plegadis falcinellus</i>	Burger and Hahn 1977; Miller and Burger 1978
Osprey, <i>Pandion haliaetus</i>	
Northern Harrier, <i>Circus cyaneus</i>	
Virginia Rail, <i>Rallus limicola</i>	(this documentation)
Common Gallinule, <i>Gallinula chloropus</i>	
Killdeer, <i>Charadrius vociferus</i>	
American Oystercatcher, <i>Haematopus palliatus</i>	Forbush and May 1955; Denmon et al. 2013
Black-necked Stilt, <i>Himantopus mexicanus</i>	
Willet, <i>Tringa semipalmata</i>	Fargo 1927
Herring Gull, <i>Larus argentatus</i>	
Great Black-backed Gull, <i>Larus marinus</i>	
Common Tern, <i>Sterna hirundo</i>	Burger and Gochfeld 1991; (this documentation)
Forster's Tern, <i>Sterna forsteri</i>	
Least Tern, <i>Sternula antillarum</i>	Burger and Gochfeld 1991; Voigts 1999
Seaside Sparrow, <i>Ammodramus maritimus</i>	
Red-winged Blackbird, <i>Agelaius phoeniceus</i>	Mitchell et al. 1996
Common Grackle, <i>Quiscalus quiscula</i>	Fink 1975

LITERATURE CITED

- Barrows, W.B. 1888 (1889). The food of crows. Pp. 498-535 in: *Report of the Commissioner of Agriculture 1888*. Government Printing Office, Washington, DC. 708 pp.
- Bent, A.C., and Collaborators. 1946. *Life Histories of North American Jays, Crows, and Titmice (Part II)*. United States National Museum Bulletin 191. Smithsonian Institution Press, Washington, DC. 495 pp. [Parts I & II].
- Bildstein, K.L., W. Post, J. Johnston, and P. Frederick. 1990. Freshwater wetlands rainfall, and the breeding ecology of White Ibises in coastal South Carolina. *Wilson Bulletin* 102(1):84-98.
- Burger, J., and M. Gochfeld. 1991. *The Common Tern: It's breeding biology and social behavior*. Columbia University Press, New York, NY. 413 pp.
- Burger, J., and D.C. Hahn. 1977. Crow predation on Black-crowned Night Heron eggs. *Wilson Bulletin* 89(2):350-351.
- Denmon, P., B.D. Watts, and F.M. Smith. 2013. Investigating American Oystercatcher (*Haematopus palliatus*) nest failure on Fisherman Island National Wildlife Refuge, Virginia, USA. *Waterbirds* 36(2):156-165.
- Dusi, J.L., and R.T. Dusi. 1968. Ecological factors contributing to nesting failure in a heron colony. *Wilson Bulletin* 80(4):458-466.
- Fargo, W.G. 1927. Feeding station habit of Fish Crow. *The Auk* 44(4):566-567.
- Fink, L.C. 1975. Changing status of the Fish Crow inland. *The Chat* 39(3):67-71.
- Forbush, E.H., and J.B. May. 1955. *A Natural History of American Birds of Eastern and Central North America*. Bramhall House, New York, NY. 552 pp.
- Lauro, B., and J. Tanacredi. 2002. An examination of predatory pressures on Piping Plovers nesting at Breezy Point, New York. *Waterbirds* 25(4):401-409.
- Lauro, B., and J. Tanacredi. 2003. Habitat use of sympatrically nesting Fish Crows and American Crows. *Wilson Bulletin* 115(4):382-387.
- Maxwell, G.R., II, and H.W. Kale II. 1977. Breeding biology of five species of herons in coastal Florida. *The Auk* 94(4):689-700.
- McGowan, P.C., and C.R. Callahan. 2014. Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island, 20 November 2014, Poplar Island Working Group Meeting, Wildlife Management, presentation.

- McGowan, P.C., C.R. Callahan, and C.P. Guy. 2013. Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island, 20 November 2013, Poplar Island Working Group Meeting, Wildlife Management, presentation.
- Meanley, B. 1955. A nesting study of the Little Blue Heron in eastern Arkansas. *Wilson Bulletin* 67(2):84-99.
- Miller, L.M., and J. Burger. 1978. Factors affecting nesting success of the Glossy Ibis. *The Auk* 95(2):353-361.
- Mitchell, M.C., L.B. Best, and J.P. Gionfriddo. 1996 Avian nest-site selection and nesting success in two Florida citrus groves. *Wilson Bulletin* 108(3):573-583.
- Montevocchi, W.A. 1977. Predation in a salt marsh Laughing Gull colony. *The Auk* 94(3):583-585.
- Parsons, K.C. 1995. Heron nesting at Pea Patch Island, upper Delaware Bay, USA: abundance and reproductive success. *Colonial Waterbirds* 18(1):69-78.
- Post, W., and C.A. Seals. 1991. Breeding biology of a newly-established Double-crested Cormorant population in South Carolina, USA. *Colonial Waterbirds* 14(1):34-38.
- Prosser, D.J. 2013. Post Phase 1 Dike Construction Faunal Component Surveys of the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island (2013 Assessment of Waterbird Nesting), Final report to the Maryland Environmental Service and United States Army Corps of Engineers, Baltimore District. 12 pp.
- Prosser, D.J. [2014 draft]. Post Phase 1 Dike Construction Faunal Component Surveys of the Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island (2014 Assessment of Waterbird Nesting), Final report to Maryland Environmental Service and United States Army Corps of Engineers, Baltimore District. 12 pp.
- Reese, J.G. 1977. Reproductive success of Ospreys in central Chesapeake Bay. *The Auk* 94(2):202-221.
- Reese, J.G. 2013. Paul S. Sarbanes Ecosystem Restoration Project at Poplar Island Bird Monitoring. August report to the United States Army Corps of Engineers, Baltimore District and Maryland Port Administration, Baltimore, Maryland.
- Shields, M.A., and J.F. Parnell. 1986. Fish Crow predation on eggs of the White Ibis at Battery Island, North Carolina. *The Auk* 103(3):531-539.
- Voigts, D.K. 1999. Observations of a colony of roof-nesting Least Terns, 1988-1997. *Florida Field Naturalist* 27(3):103-108.