

Details of Eastern Coyote, *Canis latrans*, Predation on Great Black-backed Gull, *Larus marinus*, Eggs on Boot Island National Wildlife Area, Nova Scotia

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We detail field observations of Eastern Coyote eating Great Black-backed Gull eggs for the first time in the literature. Photographic evidence of the remaining egg shells allowed us to identify the Coyote as the predator.

Key Words: Eastern Coyote, *Canis latrans*, Great Black-backed Gull, *Larus marinus*, seabird, egg predation, Boot Island National Wildlife Area, Nova Scotia, Canada.

Parker (1995) discussed in detail the recent colonization of eastern Canada by the Eastern Coyote *Canis latrans*. The coyote arrived in New Brunswick from Maine around 1970 and this expansion continued eastward; it was found in mainland Nova Scotia by 1980 and on Prince Edward Island by 1983. Studies of coyotes in eastern Canada have reported that White-tailed Deer (*Odocoileus virginianus*) and Snowshoe Hare (*Lepus americanus*) are important prey species (Moore and Miller 1986; Parker 1986; Morton 1988; Patterson and Messier 2001). However, throughout their range Coyotes are opportunistic and have a diversified diet (Berg and Chesness 1978; Parker 1995). In recent years, tracks and scats of coyotes have been found on a number of off-shore islands in eastern Canada including areas important to nesting seabirds (MacKinnon et. al. 2006*). However, actual detailed descriptive information on coyote depredation on seabirds (adults, eggs, or chicks) is generally lacking in the literature.

Colonial nesting birds typically prefer remote islands to escape terrestrial predators and mammalian disturbance. One such colonial seabird colony is located on Boot Island, Kings County, Nova Scotia (45°08'N, 64°16'W). Boot Island is a 144 ha protected area (Boot Island National Wildlife Area) consisting of 135 ha of saltmarsh and two upland islands adjacent to the marsh. The smaller island (0.5 ha), referred to as "Cyril's Island", is surrounded by saltmarsh and is located along the northwest border of the NWA. The main island, Boot Island proper (8.5 ha), is bordered by saltmarsh to the southwest and 5 m cliffs to the northeast. Boot Island and Cyril's Island are predominantly long-abandoned farm land (6.5 ha) dominated by two species of wild mustard – Wild Radish, *Raphanus raphanistrum*, and Hairy-pod Hedge Mustard, *Sisymbrium officinale*. The highest ground is dominated by a small area (2.0 ha) of dead and dying White Spruce, *Picea glauca*, with an understory of predominantly Red Elderberry, *Sambucus racemosa*, (Newell et. al.

2006). The western side of Boot Island is separated from the nearest mainland by a narrow creek (340 m across water at low tide).

In 2006, the island supported the following colonial-nesting birds: Great Black-backed Gull, *Larus marinus*; Double-crested Cormorant, *Phalacrocorax auritus*; Great Blue Heron, *Ardea herodias*; and Herring Gull, *Larus argentatus*, with 943, 151, 52 and 22 breeding pairs, respectively (MacKinnon et. al. 2006*). The heron and cormorant nests were in trees and restricted to the forested area while the Great Black-backed Gull nests were scattered throughout the old field habitat. Herring Gull nests were relegated to a few small pockets within the much larger Great Black-backed Gull colony.

Evidence of Coyote activity (tracks and scats) had been recorded on earlier visits to Boot Island (personal observations). On 10 May 2004, the authors directly observed a Coyote in the act of egg depredation. We arrived on the island near high tide, around 06:50 AST, and began a nest survey of the gull colony. By 12:50, the survey was completed and C. M. M. and D. W. C. were at the extreme northwestern edge of the main island. At that time we observed a Coyote walking towards us in an easterly direction, across the saltmarsh. Its coat was wet (the day was sunny and clear, 14°C) suggesting the animal had just swum across the narrow creek between Boot Island and the mainland. When the coyote was first observed, D. W. C. was sitting on the shore behind a large piece of driftwood, and C. M. M. was standing, in full view, in the saltmarsh just east of Cyril's Island, about 100 m from D. W. C. Observations of Coyote behaviour were made at ~ 50 m using 10 × 40 Leitz Trinovid binoculars. The Coyote proceeded east, passing within 25 m of the senior author, before changing direction towards the gull colony on the main island. Upon reaching the high water mark on the main island (site of the Great Black-backed Gull colony), the Coyote slowed and purposefully hunted the upper edge of the seaweed

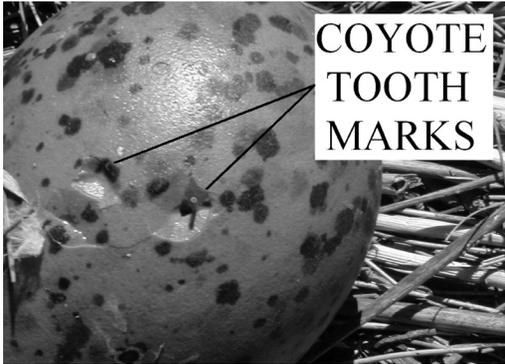


Figure 1. Dimple marks made by Coyote's teeth (probably the premolars) when carrying a Great Black-backed Gull egg, Boot Island National Wildlife Area, Nova Scotia, 2004. (A. Kennedy photo)

"wrack" line apparently searching for gull nests. It immediately encountered a Great Black-backed Gull nest, picked up an egg with its mouth and carried it a few meters carefully cradled in its jaws, before slicing it open and eating the contents. Upon seizing the egg, the Coyote left several small tooth impressions (indentations), next to each other, on one side of the egg (Figure 1). The Coyote opened the egg by positioning it in its jaws allowing one side of its canine teeth to make a "slice" across the thickest portion (Figure 2). As a result of this lateral cut through the egg, the shell fragments along the edge of the slice appeared oriented in the direction of the cut as opposed to facing uniformly inward as would be expected from a puncture. The Coyote then dropped the damaged egg on the ground, spilling the contents (mostly yolk) into the grass where it was quickly lapped up. The Coyote consumed a number of eggs (> 5) from different nests in the same manner. It then continued eastward, away from our point of observation, presumably preying more nests and paying little attention to the observers or the hundreds of very vocal Great Black-backed Gulls. The Coyote was of average size (~15 kg) and appeared to be healthy and in good physical shape.

The process of how the Coyote opened the gull eggs prior to consuming the contents, as well as the tell-tale marks left on the egg remnants, was not expected. Had we encountered similar broken gull eggs, without knowing that they had been depredated by a Coyote, we probably would have attributed this predation to American Crow, *Corvus brachyrhynchos*, or Common Raven, *Corvus corax*. are frequently observed foraging in seabird colonies and depredated eggs with puncture marks are routinely attributed to these birds by researchers. Causes of predation are particularly important if one is trying to determine survival rates of eggs of various seabird species.

The gull colony on Boot Island National Wildlife Area has been declining in recent years with a near lin-



Figure 2. Lateral 'slice' made by the canine teeth of a Coyote to open a Great Black-backed Gull egg, Boot Island National Wildlife Area, Nova Scotia, 2004. (A. Kennedy photo)

ear decrease in Herring Gull nests from 727 in 1986 to only 22 in 2006 (MacKinnon et al. 2006*). Great Black-backed Gulls have also experienced a less drastic, although similar, decline. It is as yet unclear to what extent Coyote predation may have on the decline in gull numbers being observed on Boot Island. This note provides recognizable characteristics on depredated gull eggs which may help identify egg loss from Coyotes versus other predators.

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