



American Bittern depredation of Bobolink and Eastern Meadowlark nests: An unusual predator of two threatened grassland birds

Alice Pintaric

The Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) are Threatened species in Canada (COSEWIC 2010, 2011), their population trends corresponding with the steep and constant decline of the grassland bird guild in North America (Brennan and Kuvlesky 2005). These ground-nesting species rely heavily on agricultural land in Ontario, such as hayfields, to provide nesting habitat during the breeding season (Cadman *et al.* 2007). Unless nests are situated in habitats of high agricultural intensity such as mowed hayfields or pastures with high livestock densities, predation is the leading cause of nest mortality for most ground-nesting birds (e.g., Dion *et al.* 2000, Winter *et al.* 2004, Kerns *et al.* 2010, Perlut and Strong



Figure 1. American Bittern nest found on 1 June 2015 in a hayfield where Bobolink and Eastern Meadowlark nests were being monitored in the Carden Alvar. Photo by Alice Pintaric

2011). Other factors such as distances to habitat edges, vegetation structure and height can also affect rates of nest loss (Dion *et al.* 2000, Kerns *et al.* 2010). The recorded nest predators of ground-nesting grassland birds are typically mammals, including ground squirrels (*Idiomys* spp.), raccoons (*Procyon lotor*), weasels (*Mustela* spp.), canids such as foxes and coyotes (*Vulpes* or *Canis* spp.), striped skunks (*Mephitis mephitis*), domestic cats (*Felis catus*), cows (*Bos taurus*) and white-tailed deer (*Odocoileus virginianus*). Other occasional predators include snakes, and birds such as Brown-headed Cowbirds (*Molothrus ater*), Northern Harriers (*Circus cyaneus*), *Buteo* spp. and if mowing occurs, Ring-billed Gulls (*Larus delawarensis*), American Crows (*Corvus brachyrhynchos*) and Common Ravens (*Corvus corax*) (Dion *et al.* 2000, Renfrew and Ribic 2003, Perlut *et al.* 2006, Ribic *et al.* 2012).

The American Bittern (*Botaurus lentiginosus*), a secretive bird typically associated with wetlands, sometimes nests in grasslands and hayfields (Svedarsky 1992, Dechant *et al.* 2002, Lor and Malecki 2006). Its breeding season often overlaps with that of Bobolink and Eastern Meadowlark (COSEWIC 2010, 2011). The American Bittern has been recorded as a carnivore, insectivore, crustacevore and piscivore water ambusher with small fish, amphibians, crayfish, aquatic insects, small mammals and some birds included in its diet (DeGraaf *et al.* 1985, McBride 1993, Austin and Slivinski 2000, Lowther *et al.* 2009, Baschuk *et al.* 2012). I report here a previously unrecorded type of interaction between American Bittern, and Bobolink and Eastern Meadowlark.

Observations

These observations were recorded while conducting a study in an Important Bird Area, the Carden Alvar, near Kirkfield, Ontario which is a region characterized by limestone bedrock with shallow soil (Wildlife Preservation Canada *et al.* 2008). The study involved determining the reproductive success of Bobolink and Eastern Meadowlark in hayfields and pastures from 2015-2016. On 1 June 2015, while searching for Bobolink nests in a hayfield site (H4), I discovered an American Bittern nest containing five eggs (Figure 1). The nest was later depredated by an unknown predator. During the same breeding season, a field technician and I frequently observed what we assumed to be a second pair of American Bitterns in a marshland bordering another hayfield site (H2) (4 kms away from H4) as both

pairs were commonly active during morning point counts.

The following year, 2016, my field technicians and I continued the study searching for Bobolink and Eastern Meadowlark nests at the same sites. Once again, we observed two pairs of American Bittern which we assumed to be the same individuals that had been seen the preceding year as American Bitterns have relatively high site fidelity (Lor 2007). Two Bobolink nests (H4-1 and H4-2 both containing five eggs found on 2 June 2016) were being monitored in the H4 hayfield in the same area where a pair of American Bitterns was usually spotted. On 17 June 2016, while doing normal nest checks, we noticed prominent trails in the hayfields which led us to an American Bittern which we flushed. When we went to monitor H4-1 and H4-2, the trails arrived at these points and much of the grass was flattened around the nests. We interpreted the flattened grass as evidence of the American Bittern(s) potentially searching for the Bobolink nests or landing in that location. H4-1 only contained one nestling and one egg, although it had five offspring on 12 June 2016 during the previous nest check. Similarly, H4-2 was left with three nestlings and one egg although it contained three nestlings and two eggs on 12 June 2016. The next subsequent nest monitoring day, 19 June 2016, we once again saw signs of the tracks left by the American Bittern(s) and both nests were empty.

At the other hayfield site (H2), where the second pair of American Bitterns had commonly been observed in the bordering wetland, we were monitoring an



Figure 2. Eastern Meadowlark nest H2-M1 found on 12 June 2016, presumably depredated by an American Bittern. All four eggs had large puncture holes.

Figure 3. American Bittern feather found in front of the depredated Eastern Meadowlark nest H2-M1 (Figure 2) at a hayfield in the Carden Alvar.

Photos by Alice Pintaric

Eastern Meadowlark nest, H2-M1, which was found on 31 May 2016 with four eggs. During our regular nest monitoring on 12 June 2016, we arrived at H2-M1 to find all four eggs punctured with the contents removed (Figure 2) and an American Bittern feather in front of the nest (Figure 3). This was the only nest of 47 depredated nests in the study which was found with large puncture holes in the eggs. All other nests had the contents removed or offspring crushed due to cattle trampling. Typically, nest

contents are removed by predators with little to no disturbance to the nest. Mice, weasels and avian predators will occasionally leave eggs at the nest with puncture marks (Wilson *et al.* 1998, Pietz and Granfors 2000, Renfrew and Ribic 2003).

Discussion

American Bitterns are known as generalist ambush predators which forage in wetlands (De Graaf *et al.* 1985). Although American Bittern have previously been observed feeding on Sora (*Porzana carolina*) and sparrows (McBride 1993, Austin and Slivinski 2000), this is the first observation of an American Bittern possibly depredate Bobolink or Eastern Meadowlark nests. That both of the prey species were Threatened obligate grassland birds makes the observation even more notable. This observation highlights the range of threats that grassland birds are currently facing. Apart from human induced threats such as mowing, pasture management and other forms of habitat loss, these Threatened species may be depredated by a broader range of predators than previously assumed. Peterjohn (2003) summarized the population trends of North American birds and emphasized the need for further studies on the interactions of predator populations of nesting birds. Considering that in a great number of grassland bird species, including Bobolink and Eastern Meadowlark, productivity can be substantially reduced by predation (e.g., Renfrew and Ribic 2003, Klug *et al.* 2010, Vickery *et al.* 2017), having an

understanding of predator species is valuable. Studies that have directly identified the predators of Bobolink and Meadowlarks have been conducted in the United States (Pietz and Granfors 2000, Renfrew and Ribic 2003, Ribic *et al.* 2012). Depending on the specific geography of the study, the range of potential predator species could be different than in Ontario. Novel interactions such as the ones recorded here among the American Bittern, Bobolink and Eastern Meadowlark are evidence that we still lack a thorough understanding of the dynamics of predation on grassland breeding birds. The long-term protection of Bobolink and Eastern Meadowlark is a priority for bird conservation programs in Ontario (McCracken *et al.* 2013) but a better grasp of the drivers of productivity in agricultural habitats is needed for effective management.

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Alice Pintaric

Trent University, 1600 West Bank Dr.
Peterborough, Ontario K9J 0G2
E-mail: apintaric@trentu.ca

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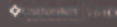
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