RED-TAILED HAWK ATTACKS WILD TURKEY ON BAIT: CAN BAITING AFFECT PREDATION RISK?

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Introduction

Red-tailed Hawks (*Buteo jamaicensis*) typically hunt from elevated perches because of the low aspect ratio of their wings, which makes the species a marginal aerial hunter (Fitch et al. 1946, Janes 1985). Thus, the species is generally a mammalian specialist with as much as 85-99% of its diet consisting of small mammals (Smith and Murphy 1973, Preston and Beane 1993). Common mammalian prey items include voles (*Microtus* spp.), mice (*Peromyscus* spp., *Reithrodontomys* spp., *Mus musculus*), rats (*Sigmodon hispidus, Oryzomys palustris, Rattus* spp.), rabbits (*Sylvilagus* spp.), Eastern Chipmunk (*Tamias striatus*), and squirrels (*Sciurus* spp.) (Fitch et al. 1946, Preston and Beane 1993).

Although Red-tailed Hawks primarily consume mammals, they are opportunistic predators and will also consume reptiles, insects, and birds (Knight and Erickson 1976, Marti and Kochert 1995). Avian prey are typically limited to ground-dwelling birds such as Ring-necked Pheasant (*Phasianus colchicus*) and Northern Bobwhite (*Colinus virginianus*) (Fitch et al. 1946, Preston and Beane 1993). Predation of Northern Bobwhite by hawks has been cause for concern in areas managed specifically for quail, particularly in relation to wildlife food plots and supplemental feeding lanes (Haines et al. 2004). Red-tailed Hawks in our study area are known to be attracted to bobwhite supplemental feeding sites, presumably because of increased small mammal densities (Turner et al. 2008).

Supplemental feeding of wildlife is a common practice used in research, wildlife viewing, and hunting. This practice can be controversial, particularly when used during hunting seasons (Brown and Cooper 2006). Relatively little is known about the influences of bait stations on non-target wildlife species (but see Morris et al. 2010). During a study of the effects of Coyote (*Canis latrans*)

depredation on White-tailed Deer (*Odocoileus virginianus*) fawns, we observed an unprecedented Red-tailed Hawk predation attempt on a female Wild Turkey (*Meleagris gallopavo*) over a bait pile meant to attract deer. We discuss whether this was a fluke encounter, or if point-source baiting may increase vulnerability of adult Wild Turkeys and other prey species to atypical predation attempts because of increased prey and predator densities.

Study Area and Methods

Our study was conducted on the Joseph W. Jones Ecological Research Center at Ichauway, a 11,735-ha facility located in Baker County, 16 km south of Newton, Georgia. The area is dominated by longleaf pine (*Pinus palustrus*) overstory and wiregrass (*Aristida stricta*) understory. Prescribed fire is the primary management tool used at Ichauway to maintain the longleaf pine ecosystem. Northern Bobwhite management practices used on the site include supplemental feeding, planting food plots (*Sorghum bicolor*, *Zea mays*, *Pennisetum glaucum*), and removing mammalian predators. Forest management includes biennial prescribed fire, hardwood removal in the uplands, and longleaf pine restoration.

In an attempt to capture White-tailed Deer as part of a study on the effects of Coyote depredation on fawns, whole corn was placed 15 m from an elevated shooting platform located in a live oak tree (*Quercus virginianus*). The bait was placed at the edge between an agricultural field and a riparian hardwood hammock. Species frequently seen visiting the bait included Hispid Cotton Rats (*Sigmodon hispidus*), Northern Cardinals (*Cardinalis cardinalis*), White-throated Sparrows (*Zonotrichia albicollis*), Fox Squirrels (*Sciurus niger*), Gray Squirrels (*Sciurus carolinensis*), White-tailed Deer, and Wild Turkey. Wild Turkeys were often observed at the bait site at dusk prior to roosting in adjacent hardwoods.

Results

On 23 March 2011, we observed a predation attempt of an adult female Wild Turkey by a Red-tailed Hawk. The hawk was perched approximately 25 m above ground in a snag across a field and approximately 250 m from the bait. The raptor flapped its wings twice upon leaving the perch and soared across the field toward the turkey. The turkey uttered alarm calls seconds before impact, but did not attempt to avoid the hawk. The impact between hawk and turkey

drove the latter off the bait, but the hawk was unable to kill or carry the larger bird, and promptly flew back to its perch. Minutes later the turkey returned to the bait where she continued feeding before roosting in a nearby live oak. The hawk remained on the perch for several minutes before flying in the opposite direct of the bait.

Discussion

Point-source baiting may cause shifts in predator behavior in terms of foraging location and prey item selection (Godbois et al. 2004, Turner et al. 2008). Supplemental feeding alters the behavior and movement patterns of prey species, often increasing concentrations of these animals, potentially making them easier targets for predators (Boutin 1990). For example, supplemental feeding of White-tailed Deer increased depredation rates on nearby artificial turkey nests by Raccoons (*Procyon lotor*) and Striped Skunks (*Mephitis mephitis*) in Texas (Cooper and Ginnett 2000). On our study site, Red-tailed Hawks occurred closer to supplemental feeding locations than random locations, presumably because of increased Hispid Cotton Rat densities (Turner et al. 2008).

We were unable to find reports in the literature indicating that Red-tailed Hawks are a known source of mortality for adult Wild Turkeys, although the species is known to occasionally prey upon turkey poults (Peoples et al. 1995). In contrast, Great Horned Owls are known avian predators of adult turkeys of both sexes (Miller et al. 1998). Although sometimes considered the diurnal ecological equivalent of the Great Horned Owl, Red-tailed Hawks typically select different prey than those consumed by owls (Marti and Kochert 1995). We are unaware of any other documented avian predator of adult Wild Turkeys in the southeastern United States.

We were unable to age the Red-tailed Hawk in this study as adult or immature. Immature and inexperienced raptors may be more impetuous than their adult counterparts in prey selection, occasionally pursuing prey items normally too large, impractical, or dangerous to kill. In one author's (VRL) experience, while falconing with a male/female pair of Harris's Hawks (*Parabuteo unicinctus*) in New York, the immature female Harris's Hawk attempted to take a male Wild Turkey. The hawk and turkey had to be separated by the master falconer; both birds were released alive (Herb Cytryn, pers. comm.). Harris's Hawks are known to hunt cooperatively, enabling individual hawks to dispatch prey larger than themselves (Bednarz 1988). However, there are no published records of

wild Harris's Hawk predation on prey as large as an adult Wild Turkey. If the Red-tailed Hawk we observed was immature, the bird's attempt to kill an adult turkey may have been a simple juvenile mistake. If the hawk was an adult, was the attempt a calculated risk, perhaps influenced by increased small mammal densities and more frequent encounters with Wild Turkeys?

Small mammals were more abundant in "fed" versus "unfed" experimental plots on our study site (Morris et al. 2011), which may have improved the physiological condition of individual predators that hunted near bait piles. This, in turn, could have increased the likelihood of a hawk attacking unusually large prey. Optimal foraging theory predicts predators will forage in a manner that maximizes net energetic gains; therefore, foraging locations and prey choices are selected based on caloric profitability and not simply prey abundance (MacArthur and Pianka 1966). Although small mammal densities may be greater around bait sites (Turner et al. 2008), predators may preferentially select larger prey when the opportunity occurs. For example, Great Tits (*Parus major*) preferentially selected large mealworms at high prey densities, but were not selective when prey density was low (Krebs 1978). In contrast, foraging behavior by prey species seeks to balance predation risk with net energetic gains (Lima and Dill 1990). Will Wild Turkeys and other prey species reduce their use of bait piles when faced with increased predation risk, or are the potential energetic benefits gained from bait worth the increased risk? In Canada, small mammals stopped visiting feeding stations due to increased predation risk by Black Bears (*Ursus americanus*) (Morris 2005). More research is needed to determine if Wild Turkey use of bait piles and supplemental feeding sites influences predation risk.

Wild Turkey populations in some areas of the country have declined in recent years, often coinciding with increases in meso-mammalian abundance (Hamilton and Vangilder 1992). Wildlife managers have often resorted to installing bait stations in an effort to reverse these declines. However, little is known about potential negative impacts associated with providing supplemental feed for Wild Turkeys. Bait piles may affect feeding patterns and densities of predators and prey, potentially increasing the vulnerability of large prey species such as turkeys to depredation by relatively smaller, opportunistic predators.

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