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January 1996

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Eric Douglas Stolen

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### Recommended Citation

Stolen, Eric Douglas (1996) "Black and Turkey Vulture Interactions with Bald Eagles in Florida," *Florida Field Naturalist*. Vol. 24 : Iss. 2 , Article 4.

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## BLACK AND TURKEY VULTURE INTERACTIONS WITH BALD EAGLES IN FLORIDA

ERIC DOUGLAS STOLEN

*Department of Biology, University of Central Florida,  
Orlando, Florida 32816*

Although there are few published accounts of interactions of either the Black Vulture (*Coragyps atratus*) or the Turkey Vulture (*Cathartes aura*) with large predatory birds, competitive interactions due to overlap in use of carrion might be expected. Crested Caracara (*Caracara plancus*) routinely harass Turkey Vultures around carcasses causing them to disgorge food items that the caracara then eats (Glazener 1964). Reports of eagles interacting with vultures are uncommon. Oberholser (*in Bent* 1937) recounted that Bald Eagles (*Haliaeetus leucocephalus*) do not “. . . hesitate even to pursue the vultures and compel them to disgorge, when if it fails to catch the coveted morsels before they reach the ground it alights and devours them. Audubon relates that on one occasion he saw [a Bald Eagle] kill a vulture that for some reason was unable completely to disgorge”. Audubon (*in Bent* 1937) wrote that when eagles appear at a carcass vultures “. . . retire and patiently wait until their betters are satisfied”. Coleman and Fraser (1986) reported that an immature Golden Eagle (*Aquila chrysaetos*) startled several hundred Black and Turkey Vultures and then attacked a Black Vulture that subsequently escaped after regurgitating. They provided indirect evidence that the eagle then ate the regurgitate. Although both species of vultures have been said to lack major predators in North America away from their nests (Townsend 1937, Jackson 1988a, 1988b), these observations suggest that they have reason to be wary of large predatory birds.

During experiments in central Florida where small mammal carcasses were used to attract vultures, I saw two interactions between vultures and Bald Eagles. At 1318 EST on 20 February 1993, while baiting in a cow pasture near Kissimmee, Florida, I watched vultures feed on the carcass of a raccoon (*Procyon lotor*). After several hours of observation, I saw the seven Black and three Turkey Vultures present on the ground near the carcass fly away. As the birds departed an immature Bald Eagle flew approximately 1 m above the ground following the departing vultures. The eagle flew out of sight and the vultures kettled and drifted off. Nine minutes later one Black and one Turkey Vulture flew over the carcass. Four minutes later, two Black Vultures landed at the carcass and began feeding. A similar event occurred on 9 October 1993, while I was baiting in the same field with another raccoon carcass. At 1348 EST nine Black Vultures and one Turkey Vulture were on the ground near the carcass when all suddenly flew away. I watched them leave, then looked back at the carcass and saw an adult Bald Eagle flying approximately 10 m above the carcass. The bird turned sharply just before it flew over me and then flew out of sight. The vultures kettled and drifted off. No birds returned to feed at the carcass for the remainder of the day. In both instances I believe that the interaction between the eagle and vultures was abbreviated due to my presence.

While conducting research at a vulture communal roost near Kissimmee, Florida, I observed Bald Eagles near the roost on five separate occasions and noted their affect on Black Vulture behavior. In the late afternoon on 28 February 1993 and the morning of 6 May 1993, I observed Bald Eagles harassing Ospreys (*Pandion halietus*) within 100 m of roosting Black and Turkey Vultures. On both occasions the Black Vultures appeared agitated in the presence of the eagles, as they flew between perches and looked around more than I usually observed. On the morning of 8 April 1993, I arrived at the roost shortly after sunrise and found an adult Bald Eagle in the main roost tree. There were no

Black Vultures in sight, although I observed numerous Black Vultures at this roost in the early morning on over 50 other visits. There was one Turkey Vulture near the eagle and I was able to locate several other Black Vultures and Turkey Vultures approximately 200 m from the roost site perched low in trees.

On two other occasions the presence of Bald Eagles at this roost did not have apparent influence on Black Vulture behavior. During the afternoon of 17 December 1993, two adult Bald Eagles were at the roost between 1502 and 1608 EST. During this time several Black Vultures arrived at the roost. Also during this time at least 11 Black Vultures and 13 Turkey Vultures were flying above the roost. Cathartid vultures often fly above a communal roost in the late afternoon in what has been described as a roost display (Rabenold 1983). The vulture's behavior did not seem to be modified by the eagles presence. On the morning of 27 December 1993, I arrived at the roost shortly after sunrise and observed one adult Bald Eagle, 53 Black Vultures, and seven Turkey Vultures. Fifteen of the Black Vultures and four of the Turkey Vultures were within 50 m of the eagle.

These observations suggest that interactions with large predatory birds may constitute a selective pressure on Black and Turkey Vulture behavior. Such interactions appear most important at carcasses, although Bald Eagle presence at communal roosts has some effects on Black Vulture behavior. Further evidence of the importance of harassment by large predatory birds or mammals may be found in the vulture's familiar habit of regurgitating when confronted. Although Stewart (1983) has suggested that this behavior may lack purpose, I believe that this behavior does have use. By providing a potential predator or aggressor with food the vulture may distract the predator allowing time for escape. Maynard (1881) eluded to this same idea. An alternative explanation may be that by jettisoning food the vulture reduces its weight to facilitate escape. If the purpose of regurgitation were solely to facilitate flight, it would have no function in the flightless chicks. But numerous observers have noted that chicks of the cathartids regularly regurgitate in response to intruders at the nest (Brown and Amadon 1968, Jackson 1988a, 1988b, Ritter 1983, Townsend *in* Bent 1937). The fact that the Black and Turkey Vulture possess this behavior may suggest that they are subject to selective pressures resulting from aggressive competition or predation.

I thank Megan Stolen, Richard Thompson, and Pat Harden for assisting with this project. David Breininger, Jerome A. Jackson, Brian Millsap, Ron Schaub, and Walter K. Taylor provided helpful editorial suggestions.

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