

Even though American Kestrels and Eurasian Hobbies live on different continents, they have common ancestry within the Falconiformes as they are congeneric (but not closest relatives; J. Figuerola pers. comm.). Given that two related species apparently have the same type of visual signal, we recommend a detailed comparison of ecological and behavioral characteristics of the two species. Such studies may prove fruitful in unraveling the evolution of a seemingly sophisticated trait, which has only been previously described in two genera of nocturnal predators, the pygmy owls of the genus *Glaucidium* (del Hoyo et al. 1994, Handbook of the birds of the world, Lynx Editions, Barcelona, Spain) and the Northern Hawk Owl (*Surnia ulula*; Svensson et al. 2001, Collins Bird Guide, Collins, U.K.). Field experiments using either stuffed or live birds, in which the ocelli can be covered at will by the experimenter, are needed to test the hypothesis that predators are deterred by the ocelli.

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VULTURE WINTER ROOST ABANDONMENT AND REESTABLISHMENT

Turkey Vultures (*Cathartes aura*) and Black Vultures (*Coragyps atratus*) often roost communally in large, mixed-species groups during winter. Use of a traditional roost located at the base of Big Round Top (BRT) hill in Gettysburg National Military Park, Gettysburg, PA (Adams County), by wintering vultures has been well documented for many years (Wright et al. 1986, *J. Raptor Res.* 20:102–107; Thompson et al. 1990, *J. Wildl. Manage.* 54:77–83). The BRT roost consists of several mature white pine (*Pinus strobus*) trees and various hardwood trees located on a southeast-facing slope in the approximate center of the forest stand at BRT hill. We sought to determine the status of the BRT roost and another roost that apparently has been established recently in the vicinity of the BRT roost. The new roost is at Lake Heritage (LH), a gated community about 7 km from the BRT roost, that consists of two distinct clumps of coniferous trees ca. 0.5 km apart within a residential area. One clump contains 12 scotch pines (*Pinus sylvestris*) and the other clump consists of five white pines (Roén 2002, Habitat use and feeding behavior of avian scavengers in Gettysburg National Military Park, M.S. thesis, Pennsylvania State Univ., University Park, PA U.S.A.).

We assessed vulture use of both roosts in winter by monitoring individuals leaving the roosts during early morning hours. We conducted 19 counts at the BRT roost; observations were made from an elevated position 280 m from the roost location (Wright et al. 1986). Counts occurred 1–4 d/wk from December 1999–March 2000 and four times from December 2000–March 2001 (Roén 2002). Counts were not conducted on days with measurable precipitation or dense fog. Each count began 30 min prior to sunrise and continued for 60–90 min.

We first suspected that vultures were present at the LH roost in 1999 because of the large number of vultures (>80) observed circling over the residential community at dusk. Subsequently, we counted vultures at the LH roost 1–3 d/wk from December 2000–March 2001 from a vehicle 30–60 m from each distinct clump of trees (referred to as Jackson and Longstreet after the bordering street names), for a total of 14 counts. Beginning 30 min before dawn, we counted vultures leaving the Jackson clump for 30 min, then we counted vultures remaining on the roost. Next, we traveled by vehicle to the Longstreet clump and conducted our counts there for an additional 60 min or until all vultures had exited the roost trees. This method most likely resulted in an underestimate of the total number of roosting vultures because some vultures may have exited the Longstreet roost trees while we were at the Jackson location. We often observed vultures moving from the Longstreet clump to the Jackson clump, but never observed the reverse. Therefore, some vultures were included in our count as they exited the Jackson trees after previously roosting at the Longstreet location.

We never observed vultures using the BRT roost during any of our counts there. Historically, numbers of vultures at this roost ranged from a mean of 199 over seven counts in late winter 1983 to a mean of 719 over 15 counts in mid-winter 1983 (Wright et al. 1986). Thompson et al. (1990) reported a mean of 665 roosting vultures at BRT over

four counts conducted during the 1986 and 1987 winter seasons. Based on these studies, anecdotal evidence provided by National Park Service personnel (H. Greenley pers. comm.), and the absence of vultures from this roost during our counts in 1999–2001, we believe the BRT roost was abandoned by wintering vultures sometime between 1988 and 1999.

We observed vultures using the LH roost during each of the 14 counts conducted in 2000–01. The number of Turkey Vultures observed per count ranged from 42–157 individuals ($\bar{x}$ = 96, SE = 9) and the number of Black Vultures recorded per count ranged from 9–101 individuals ($\bar{x}$ = 34, SE = 8).

Based on possible factors given for a decline in vulture numbers at other roosts (Taylor 1986, *Great Basin Nat.* 46:305–306) we identified several factors possibly contributing to the apparent abandonment of the BRT roost and subsequent establishment of the LH roost. These include (1) a possible regional decline in vulture population numbers, (2) land-use changes in the vicinity of Gettysburg National Military Park and at the county level, (3) changes in food availability at the BRT roost, and (4) possible impacts of increased disturbance at the BRT roost.

Although some studies have reported a general decline in vulture numbers in the eastern United States (e.g., Tate and Tate 1982, *Am. Birds* 36:126–135), more recent studies have reported an increase (McWilliams and Brauning 2000, *The birds of Pennsylvania*, Comstock Publication Associates, Ithaca, NY U.S.A.). We often observed vultures foraging within 500 m of the BRT roost in winter, despite a lack of vultures using the roost. Although no evidence currently exists for a regional decline in vulture numbers, such a decline, even if it exists, would not explain why vultures abandoned the BRT roost while using the LH roost.

Substantial land-use changes have occurred recently within Adams County, including the building of an outlet mall in 1999, other commercial buildings, and numerous residences within 5 km of the BRT roost. In Adams County, the number of farms decreased by 11% between 1987 and 1997, and the amount of farmland dropped from 75 723 ha to 72 381 ha during the same time period (National Agriculture Statistics Service 1999, 1997 Census of agriculture: geographic area series, Vol. 1, 1A, 1B, 1C, US Department of Agriculture, Washington, DC U.S.A.). Given the close proximity of the LH roost to the abandoned BRT roost and the large home ranges of vultures (Coleman and Fraser 1989, *J. Wildl. Manage.* 53:782–792), we believe that such land-use changes would similarly impact vultures roosting at both sites. Thus, local land use changes would not explain why vultures abandoned the BRT roost while using the LH roost.

Food availability near the BRT roost may have been affected by the efforts of staff at Gettysburg Park to reduce populations of white-tailed deer (*Odocoileus virginianus*). In response to high deer densities at Gettysburg, park managers initiated a shooting program in 1995 (National Park Service 1995, Management guidelines for white-tailed deer reduction—Gettysburg National Military Park and Eisenhower National Historic Site, USDI, Washington, DC U.S.A.), which removed a total of 1495 deer over a 7-yr period (Z. Bolitho pers. comm.). Because road-killed deer comprise a portion of vulture diets (Coleman and Fraser 1987, *J. Wildl. Manage.* 51:733–739; Yahner et al. 1990, *J. Wildl. Manage.* 54:77–83), fewer deer in Gettysburg Park likely led to fewer incidences of vehicle-deer collisions and, hence, the amount of food available to vultures.

Increased levels of disturbance at the BRT roost could have contributed to roost abandonment. Shooting associated with the deer-reduction program occurred at night between October and March each year (National Park Service 1995), which coincides with the months vultures spend at the roosts (McWilliams and Brauning 2000). Shooting occurred throughout the park, including near BRT hill and the immediate vicinity (Z. Bolitho pers. comm.). Increased visitorship at Gettysburg Park could have caused additional disturbance to the roost. The total annual number of visitors to the park increased 40% between 1982 and 1999, and visitorship during winter has risen 25% from 1982–2000 (National Park Service unpubl. data).

Limited information exists regarding the use and dynamics of vulture winter communal roosts (T.M. Sweeney and J.D. Fraser 1986, *Wildl. Soc. Bull.* 14:49–54; Wright et al. 1986; Thompson et al. 1990). We have documented the abandonment of a historic roost at BRT and establishment of a new roost at LH. It is important to note that this change in roost location occurred; however, we only have limited data regarding use of the new roost. Clearly, further study is needed to assess possible causes of roost abandonment, and the establishment and use of new roosts by wintering vultures.

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