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# Response of Roosting Turkey Vultures to a Vulture Effigy<sup>1</sup>

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**ABSTRACT.** Increasing populations of turkey vultures (*Cathartes aura*) and black vultures (*Coragyps atratus*) cause concerns for human health and safety in areas where large roosting concentrations occur. Dead bird effigies are one proposed method of dispersing roosting vultures. In 1999 and 2000, tests were conducted using a supine and hanging turkey vulture effigy (a taxidermy mount) to disperse a vulture roost in a tower in northern Ohio. In all tests, fewer ( $P \leq 0.04$ ) vultures were observed in the roost during the treatment period when compared to the pretreatment period. In tests ending in fall migration the posttreatment period differed ( $P < 0.01$ ) from the pretreatment period. In tests ending in summer the pre- and posttreatment periods did not differ ( $P > 0.23$ ). Vulture effigies are promising tools that may be used as part of integrated programs to disperse vultures from problem roosting sites.

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## INTRODUCTION

Turkey vulture (*Cathartes aura*) and black vulture (*Coragyps atratus*) populations have increased at annual rates of 3.4% and 2.3%, respectively, in eastern North America, 1966–2000 (Sauer and others 2001). Both species generally roost in trees or abandoned buildings and may form flocks in excess of 100 birds (Rabenold 1983; Mossman 1989). Roost and nest sites isolated from humans have become limited due to increased urbanization (Rabenold and Decker 1989). Urban vulture roosts often become a concern to landowners due to the excrement and vomit produced by roosting vultures as well as the property damage caused by vultures (Tyler 1961; Davis 1998; Lowney 1999). In addition, soaring vultures pose hazards to aircraft (Lovell and Dolbeer 1999).

Problematic vulture roosts are a relatively new issue; therefore, knowledge of roost dispersal techniques is limited. Numerous harassment and frightening techniques are available to disperse vultures from roost sites (Booth 1994), but many of these techniques produce only temporary results, require continuous harassment, or have not been evaluated quantitatively (Lowney 1999). Use of pyrotechnics, erection of exclusionary devices, and shooting (de Haan 1994; Davis 1998) have been effective, but are limited in use due to noise, architectural esthetics of exclusionary devices, safety considerations, and constraints in the issuance of permits to kill vultures.

Effigies are a potential dispersal tool that may be used in areas close to human occupation. Realistic dead bird effigies of gulls (Laridae) have shown promise as species specific frightening devices (Saul 1967; Stout and others 1975; Stout and Schwab 1979). The effigies are thought to work by presenting an image of danger for an individual of the same species attempting to roost in that location. There have been anecdotal reports that the presence of dead turkey vultures hanging in roosts has temporarily repelled vultures (E. Davis, personal communication). My objective in this study was to quantify the response of turkey vultures to a turkey vulture effigy.

## MATERIALS AND METHODS

This study was conducted from April–October 1999 and May–September 2000 at the 2200-ha National Aeronautical and Space Administration, Plum Brook Station (PBS), in Erie County, OH. An abandoned 68-m tall tower with a 14 × 14-m base at PBS was used as the test site because turkey vultures have been roosting in the tower since the mid-1970s (R. Dolbeer, personal communication), and access to the tower is restricted so no other human disturbance would occur at the roost during the study. The I-beam construction tower is exposed on three sides, has a roof and an open central area that was designed to hold rocket engines for test firings.

A turkey vulture was collected by US Department of Agriculture/Wildlife Service biologists in Texas and prepared (freeze-dried taxidermy mount) by staff of the Smithsonian Institution's Office of Exhibits Central to resemble a vulture in a non-natural pose. A remote video camera was set to film a frequently used area of the roost in the tower for the first 2.5 hours after sunrise and the 2.5 hours prior to sundown. The camera viewed 75 m<sup>3</sup> of a heavily used portion of the roost. Videotapes were changed on Tuesday and Friday each week during the middle of the day to reduce roost disturbance. Videotapes of the roost were reviewed, and when turkey vultures were observed to be consistently using the area for 7 days, an effigy was centered in the coverage area of the camera.

A total of four tests were conducted, two each in 1999 and 2000. The first 3 tests each consisted of three 1-week periods (pretreatment, treatment, and post-treatment). The first or supine test ran from 20 April–11 May 1999. The effigy was laid in a supine position (hereafter referred to as supine) on a walkway that vultures frequented during the pretreatment period. The second test, which is designated as fall-hanging, ran from 21 September–13 October 1999. The effigy was hung (hereafter referred to as hanging) by its feet so that it was head down over the same walkway frequented by vultures in the pretreatment period. In 2000, the same area of the roost was observed as in 1999 and both tests used the hanging effigy. The third test, designated as spring-hanging, ran from 16 May–6 June 2000. The fourth test, designated as long-term

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hanging, ran from 5 July – 3 October 2000 and consisted of a 1-week pretreatment period, an 8-week treatment period and a 4-week posttreatment period.

Spot counts were conducted from the videotape once every 5 minutes for the duration of the recorded session. Only vultures in contact with the tower at the 5-minute mark were counted. Not all tapes presented a full 2.5 hours of observation; therefore, the total number of birds observed was converted to the mean number of vultures per 5-minute mark per day.

Because the data consisted of observations on a sequence of vulture counts and there was but one test site, I analyzed the video count data using the Cox and Stuart test for trend (Conover 1980). The null hypothesis was that no trend existed between mean number of vultures in pretreatment, treatment, and posttreatment periods.

## RESULTS

In each test, fewer (supine  $T = 7$ ,  $P = 0.04$ ; fall-hanging  $T = 8$ ,  $P < 0.01$ ; spring-hanging  $T = 6$ ,  $P = 0.01$ ; long-term hanging  $T = 7$ ,  $P < 0.01$ ) vultures were observed when the effigy was in place when compared to the pretreatment number (Table 1). However, in the supine test, by day three, vultures were observed sitting on and pulling feathers from the supine effigy. Vultures returned to the tower after the treatment period in the supine ( $T = 6$ ,  $P = 0.14$ ) and spring-hanging tests ( $T = 4$ ,  $P = 0.23$ ), which finished during the summer months. However, vultures did not return after the treatment period in the fall-hanging ( $T = 8$ ,  $P < 0.01$ ) and long-term tests ( $T = 7$ ,  $P < 0.01$ ), which finished during the fall migration period.

## DISCUSSION

Turkey vultures exhibited a consistent, negative reaction to the presence of a turkey vulture effigy in an established roost. Vultures did exhibit habituation to the supine effigy by the end of the treatment week.

TABLE 1

*The mean (SD) number of turkey vultures observed at a roost per 5-minute spot count during the 2.5 hours after sunrise and the 2.5 hours prior to sunset with and without a turkey vulture effigy (supine, 20 April – 11 May 1999; fall-hanging, 21 September – 13 October 1999; spring-hanging, 16 May – 6 June 2000; long-term hanging, 5 July – 3 October 2000) in the roost, Erie County, OH.*

Test	Mean number (SD) of vultures/5 minute-spot count		
	Pretreatment	Treatment	Posttreatment
Supine	2.3 (2.9)	0.6 (1.1)	1.3 (1.9)
Fall-hanging	2.3 (2.7)	0.1 (0.3)	0.7 (1.7)
Spring-hanging	1.4 (1.5)	0.1 (0.2)	1.0 (1.9)
Long-term hanging	2.2 (2.1)	0.0 (0.2)	0.0 (0.0)

Vultures did not exhibit any habituation to the hanging effigy. When vultures appeared on videotape during hanging tests, they generally did not stay for more than 1 minute within view of the effigy.

The fall-hanging test was conducted just prior to the normal migration period of turkey vultures from northern Ohio (Lovell, unpubl. data). This timing may have contributed to the positive results. However, in the spring-hanging and long-term hanging tests, the effigy was placed during a non-migratory time when only local birds that were habituated to the roost site were present. In 2000, vultures clearly responded to the effigy by leaving the roost both in May during the spring-hanging test and from July – October during the long-term hanging test. In the spring-hanging test, vultures continued to use outer parts of the tower and areas near the tower for perching in the early morning. However, their numbers within the area of the tower exposed to the effigy were reduced. In the long-term hanging test, vultures essentially abandoned the roost for the 12 weeks after the effigy was placed in the tower. Turkey vultures did not abandon PBS during any test as they were occasionally observed on top of the tower during the day as well as foraging and roosting throughout PBS.

Based upon the 1999 results that indicated that a hanging, moving effigy to be more effective than a supine effigy and the 2000 results which confirmed these results, I conclude that hanging, moving turkey vulture effigies can have a negative effect on roosting turkey vultures. The effigy must be in view of roosting vultures for it to be effective. I suggest that the use of vulture effigies would enhance current hazing tactics (Lowney 1999) and result in an improved nonlethal approach to roost dispersal.

There is a need to develop a synthetic (perhaps plastic) vulture effigy. The effigies currently in use are stiff taxidermy mounts of vultures and require the user to have a possession permit from the US Fish and Wildlife Service. A synthetic effigy would remove permit limitations, be less expensive than a mounted vulture, and not be as subject to deterioration from weather as a mounted specimen. Furthermore, if the synthetic effigy was flexible and could be manipulated into various poses, effectiveness might be enhanced and habituation minimized.

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