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Compressed Air, Wooden Clappers, and Other Non-Traditional Methods for Dispersing European Starlings from an Urban Roost

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COMPRESSED AIR, WOODEN CLAPPERS, AND OTHER NON-TRADITIONAL METHODS FOR DISPERSING EUROPEAN STARLINGS FROM AN URBAN ROOST

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Abstract: During autumn 2003, several thousand European starlings (*Sturnus vulgaris*) began roosting on exposed I-beams in a newly constructed, decorative glass canopy that covered the passenger pick-up area at the terminal building for Cleveland Hopkins International Airport, Ohio. The use of lethal control or conventional dispersal techniques, such as pyrotechnics and fire hoses, were not feasible in the airport terminal area. The design and aesthetics of the structure precluded the use of netting and other exclusion materials. In January 2004, an attempt was made to disperse the birds using recorded predator and distress calls broadcast from speakers installed in the structure. This technique failed to disperse the birds. In February 2004, we developed a technique using compressed air to physically and audibly harass the birds. We used a trailer-mounted commercial air compressor producing 185 cubic feet per minute of air at 100 pounds per square inch pressure and a 20-foot long, 1-inch diameter PVC pipe attached to the outlet hose. One person slowly (< 5 mph) drove a pick-up truck through the airport terminal at dusk while the second person sat on a bench in the truck bed and directed the compressed air from the pipe into the canopy to harass starlings attempting to enter the roost site. After 5 consecutive nights of compressed-air harassment, virtually no starlings attempted to roost in the canopy. Once familiar with the physical effects of the compressed air, the birds dispersed at the sound of the air. Only occasional harassment at dusk was needed through the remainder of the winter to keep the canopy free of starlings. Similar harassment with the compressor was conducted successfully in autumn 2004 with the addition of a modified leaf blower, wooden clappers, and laser. In conclusion, we found compressed air to be a safe, unobtrusive, and effective method for dispersing starlings from an urban roost site. This technique would likely be applicable for other urban-roosting species such as crows, house sparrows, and blackbirds.

Key words: blackbird, compressed air, European starling, roost dispersal

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INTRODUCTION

The European starling (*Sturnus vulgaris*; hereafter referred to as starling) is a gregarious bird commonly found in airport environments. Starlings nesting and roosting in and on airport hangers, structures, and buildings pose a variety of public health concerns and other problems (Dolbeer et al. 1988). Accumulated feces can cause immediate esthetic problems and long-term structural deterioration of property (Belant et al. 1998). Fecal material from nesting and roosting birds also can create an environment for the transmission of histoplasmosis and other diseases to humans (Toft et al. 1970, Stickley and Weeks 1985). In particular, the emergence of West Nile Virus (Brownstein et al. 2004)

and Avian Influenza (Senne 2003) as human health issues has heightened concern about concentrations of birds and bird feces in public areas.

In addition to causing esthetic problems, property damage, and public health concerns at airports, starlings traversing aircraft movement areas on a daily basis to and from roosting sites present a collision danger to aircraft (Cleary et al. 2005). Starlings were at fault in the most deadly civil and military aircraft disasters caused by birds, the former in 1960 where 62 fatalities were recorded at Boston Logan International Airport (Cleary et al. 2005) and the latter at Eindhoven, Netherlands in 1996 where 34 people were killed (Richardson and West 2000). The body density of a starling is about 25% greater than that of a herring gull (*Larus argentatus*), causing starlings to be referred to sometimes as "feathered bullets" (Seamans et al. 1995). This increased body density is further magnified because starlings typically fly in dense flocks. From 1990-2004, 41% of reported starling strikes with civil aircraft in the USA involved multiple birds (Cleary et al. 2005). This shotgun-like effect can cause a wide range of damage to the aircraft and sometimes results in engine failure.

BACKGROUND

Since at least the mid 1990s, several thousand starlings have roosted in the vicinity of Cleveland Hopkins International Airport in Cleveland, Ohio each fall and winter. The birds generally roosted in trees and did not cause serious problems.

In the fall of 2003, the airport completed a decorative glass and steel canopy (width of 40 feet and total length of 750 feet) at the passenger departure and pick up area of the airport. Despite concerns about the creation of roosting habitat expressed by airport officials during the design phase, the designers used exposed I-shaped steel beams rather than tubular steel for aesthetic reasons. Starlings quickly found the heated (from lights illuminating the structure), glass-covered, I-beam structure a highly desirable roosting site. By December 2003, several thousand starlings were using the canopy and nearby trees. Feces marred the structure and accumulated on the concrete passenger walkways below.

The location of the canopy in close proximity to passengers and the coinciding peaks in bird and passenger arrival and departure activity at dusk and dawn severely limited control techniques. Pyrotechnics, lethal control by shooting or toxicants, and chemical repellents (Clark 1998) were not feasible. Installation of a distress and predator call system in the canopy during December 2003 had proven ineffective. Lights, lasers (Blackwell et al. 2002), sirens, and horns utilized by airport personnel in December 2003 and January 2004 also were unsuccessful in dispersing the roost. The design of the structure did not allow for the use of netting or other material to restrict bird access to the structure. USDA Wildlife Services (WS), just beginning a long-term agreement with the airport to manage wildlife hazards to aviation, was requested by airport management during late January 2004 to remedy the situation.

2003-2004 HARASSMENT

In February 2004, we developed a technique using compressed air to physically and audibly harass the birds without disturbing people in the airport terminal area or disrupting airport operations. We used a trailer-mounted commercial air compressor producing 185 cubic feet per minute of air at 100 pounds per square inch pressure with a 20-foot long, 1-inch diameter PVC pipe attached to the outlet hose. One person slowly (< 5 mph) drove a pick-up truck through the airport terminal at dusk while

the second person sat on a bench in the truck bed and directed the compressed air from the pipe into the glass canopy to harass starlings attempting to enter the roost site. Once familiar with the physical effects of the compressed air, the birds dispersed at the sound of the air. Initially we estimated there were 5,000 starlings roosting in the canopy. After 5 consecutive nights of compressed-air harassment, less than 500 starlings returned to the general area with less than 30 attempting to roost in the canopy. Only occasional harassment at dusk (approximately 4 nights per week) was needed through the remainder of the winter to keep the canopy free of starlings.

2004-2005 HARASSMENT

Starlings began to return to the canopy to roost in October 2004. Harassment at dusk began after approximately 7,000 birds were noticed roosting in the canopy and immediate surrounding area. After two nights of harassment with compressed air, less than 2,000 starlings returned the third night. Most of these birds roosted in trees that were still fully leafed within ¼ mile of the canopy.

Harassment responsibilities at this time were transferred to airport personnel to allow WS personnel to continue their daytime activities on the airfield. Harassment efforts became intermittent and less intensive due to the airport employees' other responsibilities, and subsequently the starlings quickly reentered the canopy area. By November 2004, 1 month after initially starting harassment activities, inconsistent harassment resulted in over 10,000 starlings roosting in the canopy and surrounding trees.

WS again became involved in the harassment. We noted that starlings were readily startled by clapping hands, and we therefore began using wooden clappers in conjunction with the compressed air. The clappers were 16 inches long with a 7-inch piece hinged near the center of the longer piece so they could be slammed together producing a loud clapping noise. We also noted that although lasers had been ineffective on their own the previous year, when used in conjunction with compressed air and the clappers, they were effective once the starlings were disturbed. Many of the starlings were only dispersing from the canopy into nearby trees and shrubs where they were unreachable with the vehicle-drawn compressor. We thus modified a backpack leaf blower producing 742 cubic feet per minute at a velocity of 174 miles per hour through a 1.5 inch opening with a 10-foot piece of 1.5 inch diameter PVC pipe. The modified backpack leaf blower allowed a person on foot to use compressed-air harassment where the vehicle-drawn compressor could not go. The 10-foot PVC pipe allowed for penetration into thick, coniferous shrubbery and trees. The combination of compressed air from the vehicle-drawn compressor and the leaf blower, wooden clappers, and lasers was effective when intensively employed on a consistent basis. Starling numbers were reduced to less than 500 in 1 week of harassment, and less than 100 for the remainder of the winter. Harassment continued on an intermittent basis (2-4 times per week) throughout the winter months until the birds naturally dispersed for nesting in the spring 2005.

CONCLUSION

Because of concerns regarding public health and aviation safety, there should be zero tolerance for starlings roosting in close proximity to people or on airport property. We found compressed air to be a safe, unobtrusive, and effective method for dispersing starlings from an urban roost site at an airport terminal. The

addition of wooden clappers and lasers resulted in a highly effective combination for dispersing this urban roost of European starlings without disturbing passengers or disrupting airport operations. This technique would likely be appropriate for other urban-roosting species such as crows, house sparrows, and blackbirds. Utilizing compressed air as a more permanent solution may be possible by installing a pipe system into a structure and intermittently releasing compressed air through the system. Furthermore, incorporating rubber tubing attached to the air outlets to produce a whipping movement and snapping sound might enhance the success of a permanently installed compressed air system in structures.

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