

TOXIC PERCHES FOR CONTROL OF PEST BIRDS IN AIRCRAFT HANGARS

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Abstract

The United States Air Force Bird-Aircraft Strike Hazard (BASH) Team has taken a special interest in resolving problems with pest birds in aircraft hangars. A variety of pest bird removal methods has provided limited or unsatisfactory results, causing concern at several CONUS bases. The toxic perch method was evaluated in large hangars supporting as many as 20,000 Rock Doves, House Sparrows, and European Starlings. The perches contained a liquid solution of endrin or fenthion, which was absorbed through the birds' feet while perched. Results from six Air Force bases indicate the toxic perches successfully removed 95-100% of pest birds from inside the structures within 4-30 days without complications or secondary poisoning of non-target species.

INTRODUCTION

The United States Air Force's Bird-Aircraft Strike Hazard (BASH) Team has taken a special interest in resolving problems with pest birds in aircraft hangars. These structures are extremely alluring to birds, which seek the roof-supporting I-beams and bars for nesting sites and shelter. Aircraft hangars typically harbor thousands of pest birds in close proximity to the runway. The pest birds not only pose a significant BASH potential, but create costly maintenance problems. Bird nesting materials, feathers, and droppings fall onto aircraft and equipment causing damage to aircraft parts and corrosion of skin paint. Facility cleanup costs, personnel morale problems, and support equipment damage all further necessitate removal of pest birds from hangars.

Aircraft hangars are built with the intent of creating a sheltered environment in which to perform maintenance, conduct inspections, and otherwise operate on aircraft. Although some hangars have been converted to storage facilities, training centers, and even office space, all hangars were originally constructed to accommodate one or more aircraft with their high tails and wide wingspans. To avoid using support columns for the roofs of hangars, which would limit space and access, a system of metal trusses, reinforced by bricks, concrete and iron rods, serves to hold the roof in place. High bay doors, which roll on railroad tracks, provide the space necessary to bring aircraft into and out of the hangar.

The high, protected areas created by hangars provide excellent roosting habitat for three pest bird species: Rock Doves (domestic pigeon), (Columba livia), European Starling (Sturnus vulgaris), and House Sparrows (Passer domesticus). Even when doors are closed, birds are able to find access through broken windows, small holes, and ventilation ducts. Once inside, birds usually search for suitable nesting/roosting sites in the overhead structure.

A variety of pest bird control methods have provided limited or unsatisfactory results causing concern at many U.S. Air Force bases, while other methods have proved extremely successful. The BASH Team has monitored these methods and noted degrees of success for specific cases.

The purpose of this paper is to provide a better knowledge of structural pest bird problems and to summarize control methods which offered varied success on Air Force installations.

METHODS

Structural Design

Rarely are birds considered when designing any aircraft facility, but there are several alterations which could decrease pest bird problems. One new concept in hangar design suggests moving the support beams to the outside of the structure. This makes roost sites less available, and keeps any droppings away from people and planes. Some Air Force hangars have been fitted with a "false ceiling" just below the level of the superstructure. Although birds can still roost in the support beams, droppings and feathers fall onto the false ceiling and don't reach the floor. With some thought from planners, a variety of other design features could easily incorporate methods to reduce pest bird problems inside hangars.

Netting

Plastic netting can be used to exclude birds from the hangar superstructure. The BASH Team observed two hangars employing the netting method, and found it successful, though its use restrictive. The netting excluded birds from the

superstructure, but because of the design features of both hangars, birds had access to other inside areas such as above hangar doors, on wall and window ledges, and through vents in the roof. Although birds were fewer, the hangars were not bird-free; and while no birds were intentionally killed, many were caught inside the netting.

Plastic Strips/Netting over hangar doors

Vertical plastic strips and netting can be used to seal off hangar doors. Netting must be raised and lowered to allow aircraft to pass through the doors. Both these methods prevent some of the birds from entering, but do nothing about birds already in the hangar. Additionally, birds can still roost in the door bay or directly over the doors.

Sharp Projections

The chief problem with wire projections for bird control is the number of roosting sites which must be covered inside the hangar. Since the cost of such a plan is so prohibitive, the Air Force has never tried to bird-proof a hangar in this way. There are, however, many smaller areas where projections could be useful, such as perches outside hangar entry points, or along ledges on the outside of the hangar.

Rotating beacons/Shiny objects

Lights, reflectors, etc., can affect birds by initially distracting them and frightening them into hiding. Building managers have attested, however, to the brevity of their usefulness, as the birds quickly become familiar with the steady sweep of the light or movement of the reflector. Even strobes have shown no lasting results, since the birds sense no real threat.

Stuffed owls/Rubber snakes

Sometimes known as "scarecrows for buildings," these items have had very little or no effect on birds. The reason they are even included in this list is because so many pest managers and building supervisors have purchased them based only on the merchant's recommendation. They are placed on overhead beams and ledges only to have the birds stand on them or peck at them a few days after installation.

Ultrasonic Devices

Air Force policy bans the use of ultrasonics, since birds are incapable of perceiving ultrasonic frequencies. No high-frequency, sound-generating equipment has shown success in removing birds from Air Force structures.

Loud music/Other noises

Some hangar managers have reported success playing loud music or variable noise generators. The typical response is for birds to move as far as possible from the sound source, perhaps to the next bay area, but not out of the hangar. Problems result when workers become irritated by the noise, and when the birds realize there is no threat. Birds invariably return at night when the music is turned off.

Night harassment

If birds can be repeatedly disturbed at night, they will search for other areas to roost. Methods used to annoy birds have included high-pressure water to knock them off perches, and falcons which attack individual birds, scaring off the others. Night harassment is very labor-intensive, and often aircraft and equipment must be removed from the hangar before any action is taken. Very little is known on how long it takes to dislodge birds from a hangar roost, or how long they will stay away once removed. There is a great probability,

however, that they will simply move from one hangar to another if harassment is the only approach taken.

Hawks/Falcons

These hunting birds can be very effective in removing pest birds. The base currently using this technique reported that hangars were bird free for two to three months before the hawk was brought back to clear pigeons. This procedure is labor-intensive, and requires specialized training and coordination to be effective.

Shooting

The BASH Team frequently recommends shooting hangar pest birds with pellet guns. Shooting has been particularly effective in smaller open structures. However, it is difficult to remove all the birds in a hangar since many only return at night, and others are very adept at hiding in support beams.

Trapping

Many bases have used trapping effectively, especially for pigeons. The best programs employ Australian Crow traps large enough for a man to stand in. These have one-way entrances for birds and provide perches and food/water for captives which serve as decoys.

Chemical Irritants

These usually come in the form of a gel or liquid, and create a chemical "hotfoot," or a tacky surface, making it uncomfortable to stand wherever the chemical is applied. Tanglefoot, Roost-no-More, and 4 the Birds are products which have been used in Air Force hangars with limited success. Hangar personnel have reported that reapplication of chemicals was frequent because of dust and dirt accumulation. In hot conditions, some brands will melt and run down walls or drip to the floor. Although companies claim that their products last for over a year, this has not been proved by the Air Force. Also, hangars were never really free of birds because there were too many surfaces where the chemical could not be applied, leaving areas where birds could still roost. The number of beams and ledges in an aircraft hangar makes this method very difficult.

Avitrol

Avitrol has been effective in structures where birds can be confined or where a food source can be established. A variety of poisons are available for pest birds, but until recently, Avitrol was the only one used in connection with Air Force hangar problems. It is very important to ensure prebaiting is done properly to allow the entire population adequate time to adjust to the food source. Sometimes more than one population may be involved, and multiple feeding stations may be required.

Toxic Perches

The BASH Team examined toxic perch use at six bases for pest bird control. The toxic perch concept is not a new one, though this was its first use in aircraft hangars. Tube perches are filled with 9.4% endrin or 11% fenthion in an oil base. The perches act as a reservoir for the chemical solution which is fed from the interior of the perch through a wick to the top of the perch. When birds light on the perch the solution is absorbed through the feet. Perches are designed 30 inches in length and round or flat to accommodate various pest birds. The perches are then strategically placed inside the hangar after observing perching habits of the birds. The following observations are not conclusive, nor are they part of a scientific study.

Beale AFB, California. Seven hangars (20,000 ft²) contained approximately 100 pigeons in each. A total of 318 endrin perches were installed in the 7 structures. Fifty-percent of the pigeons were reported to be eliminated within 3 days; 75%, 5 days; and 90%, 7 days. Six hundred birds were recovered at the site. No non-target species and no secondary poisonings were reported.

Vance AFB, Oklahoma. Six hangars (6,000-57,000 ft²) contained approximately 600 starlings, sparrows, and pigeons. Fifteen to 125 endrin perches were installed per hangar. Fifty-percent of the birds were eliminated within 2 days; 75%, 3 days; 95%, 4 days; and 100%, 6 days. No non-target species and no secondary poisonings were reported.

Dyess AFB, Texas. One hangar (80,000 ft²) contained starlings, sparrows, and pigeons. Two hundred thirty-three fenthion perches were installed. Fifty-percent of the birds were eliminated within 15 days; 90%, 20 days; and 95%, 30 days. All starlings and pigeons were eliminated. No non-target species and no secondary poisonings were reported.

Dobbins AFB, Georgia. One hangar (30,000 ft²) contained approximately 50 starlings and 50 sparrows. One hundred fifty endrin perches were installed. Ninety-five percent of birds were eliminated within 10 days and 100% within 30 days. No non-target species and no secondary poisonings were reported.

Bergstrom AFB, Texas. One hangar (62,500 ft²) contained approximately 1000 pigeons, starlings, and sparrows. Forty endrin perches were installed. Fifty-percent of the birds were eliminated with 10 days; 75%, 30 days; and 90%, 45 days. Sixty additional fenthion perches were added to remove entire population. No non-target species and no secondary poisonings were reported.

Altus AFB, Oklahoma. One hangar (160,000²) contained 20 30,000 starlings and 200 pigeons. Three hundred fifty fenthion starling perches were installed. Ninety-nine percent of the starlings and 25% of the pigeons were reduced within 30 days. Seventy pigeon perches were added to eliminate the remainder of the pest population. No non-target species and no secondary poisonings were reported.

These case studies represent positive results with toxic perch use within aircraft hangars. Endrin perches successfully reduced 95 100% of pest birds from inside structures within 4 to 10 days while fenthion perches reduced 95% within 30 days (Figure 1). None of these case studies resulted in reported secondary poisoning; however, a potential does exist. Since endrin and fenthion produce the same results within a reasonable period of time, the Air Force position will be to use fenthion as the active toxicant for subsequent studies until controlled tests showing secondary poisoning effects are completed.

Denver Wildlife Research Center conducted a preliminary test for the potential secondary hazards of fenthion-killed starlings and pigeons to avian predators/scavengers. Two cold-stressed Black-billed Magpies (*Pica pica*) and two heat-stressed magpies which were fed poisoned birds died within 4 days. Two non-temperature stressed magpies were unaffected even though a large amount of bait was consumed.

These results indicate the concentration of fenthion used in perches is near the limit for causing secondary toxicity in avian scavengers. Further testing is required to determine appropriate chemical and concentration to minimize secondary toxicity to other animals.

CONCLUSION

The BASH Team will continue to evaluate methods of dealing with pest birds in hangars. The toxic perch method has provided the best results for our worst-case situations; however, several issues need to be resolved concerning secondary poisoning effects. Total reliance on one technique is still impractical, and the BASH Team will continue to maintain a diversified approach to meet the requirements of all Air Force hangars. A reduction in hangar pest birds will reduce BASH at our airfields and will ensure the skies are safer for our aviators.

TOXIC PERCH

HANGAR PEST BIRD CONTROL

FIGURE 1

