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Evolution of the DFW International Airport Wildlife Management Program – Lessons Learned

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Abstract

On January 7, 1997, Dallas-Fort Worth International Airport experienced its first large bird strike event, involving the collision of over 350 European starlings with an American Airlines MD-80. This prompted a serious assessment of existing wildlife control procedures, and eventually resulted in the formation of the DFW Wildlife Control Program. The number of reported strikes has dropped from 157 in 1996 to 52 in 1998. The success of DFW's program is the result of long, hard hours and extensive trial and error. However, wildlife management personnel at other airfields do not have to go through all the growing pains and exertions that DFW encountered. This paper describes the evolution of the DFW Wildlife Control Program, and provides wildlife control personnel and administrators with information that would reduce the hassle and heartache associated with starting a wildlife control program. Furthermore, this paper describes the useful and often necessary roles of consultants in establishing and monitoring airfield wildlife control programs.

Introduction

Specifically, this paper (1) provides background information regarding the wildlife hazard situation at DFW prior to 1997, (2) presents the key components of an effective airfield wildlife management program based on the experiences at DFW, and (3) describes the role of consultants in establishing and monitoring wildlife management programs.

Background

In 1993, DFW Airport Operations, started a minimal program of wildlife harassment, in which the operations officers were given rudimentary training in the use of shotguns and cracker shells. The plan was to have the officers disperse flocks of birds during their shifts when necessary. To that end, we purchased two single shot shotguns and cracker shells and placed them in the airfield vehicles. There were no written procedures, no routine bird dispersal, no training, and no continuous or accurate record keeping. With these constraints, personnel functioned as well as they could.

On January 7th, 1997, DFW International Airport experienced a multiple bird strike involving an American Airlines MD-80. The aircraft departed on Runway 36R and encountered a large flock of blackbirds about midpoint on the Runway. The pilot of the aircraft then declared an emergency and came back around to land on the same runway at 1640L. When the Runway was inspected by operations personnel, they discovered the remains of approximately 350 European starlings, part of a flock that the pilot stated was several thousand in number who were heading to their roost area in the central terminal area.

The final estimate of damage to the aircraft including down-time and lost revenue came to a little over \$1 million dollars. The Federal Aviation Administration mandated that the airport conduct an ecological survey. Consequently, Geo-Marine, Inc. was contracted to perform yearlong study of the airfield habitats, bird movements, and wildlife control procedures. This study was the initial step toward developing a comprehensive wildlife control program. In the ensuing 18 months, several procedures have been

implemented to strengthen the program. The next section describes the key components of airport wildlife control programs, based on the experiences at DFW International Airport.

Key Components of Implementing Wildlife Control Programs

Administration

One of the most important aspects of a wildlife program is administration. The most important aspect of program administration is record keeping. The records are the basis for developing baseline information on wildlife populations, movements, and strikes. This information is also an essential tool in tracking and proving the effectiveness of wildlife programs. Types of records kept at DFW include wildlife observations (species type, numbers, locations, local weather conditions, type of activity, and time of day), dispersal or harassment actions taken by wildlife personnel, reported bird strikes (FAA form 5700), and wildlife remains found on the airfield (deceased wildlife found on paved surfaces but not reported as a strike).

This record keeping allows DFW to compile accurate and detailed statistics. For example, we can look at bird strike data from the month of April over the last three years and tell if there has been an increase or decrease in reported strikes. This capability, in conjunction with observation records, may help explain changes in wildlife strike numbers.

DFW compiles records both monthly and at the end of each year to generate reports that reflect trends in wildlife strikes. Thus, we are able to self-evaluate the program and assess the effectiveness of dispersal techniques. Accurate and detailed record keeping is an indispensable part of any wildlife program.

BASH Committee

When an airport is faced with implementing a wildlife program, the very first component should be the formation of a Bird Aircraft Strike Hazard (BASH) committee. The committee should include individuals that are or shall be tasked with implementing various parts of the wildlife management program. All involved parties should have a vested interest in bird strike hazard reduction. These individuals will likely include wildlife personnel, operations and maintenance personnel, risk management staff, real estate or planning and design staff, public safety representatives, and individuals from tenant airlines.

The function of this group is to make recommendations and advise the owner/operators on all matters concerning wildlife hazards, and to disseminate information to all concerned departments and agencies. The BASH committee will also function as an oversight authority on the implementation of the wildlife program, setting goals and priorities based on the reports received from wildlife personnel. This group should meet at least once each quarter, and preferably would meet each month. The most important point is that all interested parties attend and participate in the committee.

Wildlife Control Procedures

The core of every wildlife management program is the wildlife control procedures. These procedures outline methods for: (1) dispersal and/or removal of nuisance wildlife from critical areas such as runways or approach and departure paths, (2) methods to identify different species identified as nuisance wildlife, (3) inspections and reporting criteria, and (4) other pertinent information required in the day to day operation of your program.

The owner/operator of the airfield must ensure that wildlife control efforts meet acceptable standards with respect to liability, and that the methods being implemented are proven effective as demonstrated at other airports or airfields. Outside contractors are useful in this respect, and in many cases, will provide recommendations for modifications to existing practices that will strengthen the wildlife program. The procedures are the "operator's manual" for wildlife programs, so they should be specific in the areas of duties, responsibilities, authority, and organization.

One important thing to remember is that once your procedures are put into writing, it is imperative that they are followed precisely. Failure to do so may make the airport vulnerable in the area of liability should a wildlife strike result in injury or damage. The wildlife management supervisor and the BASH committee should review wildlife control procedures at least once a year and amend or rewrite them as needed. There is no need to bog your procedures down with being that minute detail regarding methodology. It is preferable to state the methods to be employed and let the wildlife personnel decide when and where to use them.

Routine Patrol Components

In addition to habitat management and active harassment, wildlife officers should be responsible for routine inspections.

Perimeter Wildlife Inspections: This inspection should be done on a daily basis - once in the morning at sunrise and again at sunset. The purpose of this inspection is for the observation of wildlife activity on and around the airport, roosting activity, etc. These inspections should be documented on the daily Patrol Log.

Perimeter Fence Inspection: The wildlife officer should perform a perimeter fence inspection on a weekly basis. The purpose of this inspection is to find and document any areas that may allow wildlife easy access onto the AOA, such as holes under the fence or gates that do not close tightly enough. All discrepancies should be documented in the fence inspection report and a copy forwarded to maintenance for repair action.

Facility Inspections: Once a month, the wildlife officer should inspect facilities around the airfield for any areas or situations that may contribute to the wildlife hazard situation. Any deficiency should be documented in the monthly report and a copy sent to the responsible party for action.

Agricultural Area Inspections: At least once daily during the daily patrol, the wildlife officer should inspect agricultural areas for possible wildlife attractants or for bird movement and take appropriate action. This inspection should be documented in the daily Patrol Report.

Construction Site Inspections: Wildlife control personnel should also patrol construction sites on the airfield and maintain an immediate response capability to birds attracted to construction sites.

Resources

Resources will be the most flexible component of any wildlife control program. The size of the area to be covered and the types of wildlife hazards present determine the quantity and type of resources necessary.

The most basic resource of any wildlife control program is manpower. That is, the personnel tasked with observation and harassment duties. At DFW, the individual tasked with these duties is the Wildlife Management Officer. Ideally, the Wildlife Management Officer should be assigned full time to wildlife control duties. This will give the program the continuity it needs to be effective and will also allow the Wildlife Officer to focus on wildlife hazard management, resulting in a safer airfield. Currently, DFW has one Wildlife Officer, with the airport operations department and maintenance/pest control personnel providing back-up. Occasionally, heavy wildlife activity, such as roosting in terminal areas, warrants the assigning of other temporary personnel. Another option is to staff a full-time wildlife control section. At the present time, DFW has a proposed budget initiative for FY 2000 to fund a full time section consisting of five individuals and equipment to cover the entire airport property from dawn to dusk, 365 days per year. As stated previously, the requirements for particular airfields vary radically, dependent on size, geographic location, and the unique wildlife hazard situation.

Wildlife personnel must always have sufficient equipment and supplies to disperse, depredate, or capture nuisance wildlife that pose a hazard to air operations. These requirements will vary, however, there are basic items that are essential in virtually every wildlife control program:

- Vehicle (preferably a truck for ease of transporting bulky equipment)
- Propane cannons
- 6mm pistols/blanks
- 12 gauge shotguns
- 15mm shells - banger and screamers
- 12 gauge shot shells - #6, slugs, steel
- 12 gauge cracker and screamer shells
- Snare pole
- Live traps/transportation cages
- Wildlife distress call equipment/tapes
- Air horns and sirens
- Spot lights/multicolored emergency lights
- Wildlife identification manuals
- High-power binoculars and spotting scope
- Laptop computer with vehicle adapter

Permits and Licenses

Federal, state, and local governments have laws that protect wildlife and their habitats. These laws affect how wildlife control is performed at all airfields. In 1993, DFW applied for a depredation permit with the U.S. Fish and Wildlife Service were subsequently approved. Recently, however, DFW was again faced with the need to harass certain protected species (e.g., those protected by the Migratory Bird Treaty Act) and found that the original permit had lapsed without renewal. This caused a great deal of inconvenience to the airport since it was the time of year when birds such as egrets, gulls, and hawks pose threats to aircraft. As soon as this problem was discovered, DFW made another application for a permit. However, the process takes time. The main issue here is to be certain of the permits required in your area and maintain the permits. Follow all reporting requirements imposed by the regulatory agency.

Another permit issue is the use of poisonous baits or pesticides. If these types of products are to be employed in a wildlife program, it is vital that appropriate federal, state, and local permits be acquired. The final license that may be of benefit to airfield wildlife control personnel is a permit that allows the administration of tranquilizer darts to wildlife. These permits are generally issued by state game and fish commissions.

Motivation and Persistence

Arguably, the most important component of any airfield wildlife program is motivation. Just as in every other endeavor, a highly motivated and persistent individual will always outperform one who is not. Wildlife control can be very frustrating and even the most persistent and motivated person can get discouraged. Therefore, it is necessary for airports to select individuals who are interested in wildlife for wildlife control programs. This seems natural, however, an uninterested individual will not learn bird identification or behavior and will be much more prone to using control techniques improperly or without regard for the animals welfare. Another frequent problem with motivation in wildlife control programs results when personnel are laterally tasked. If airfield personnel already have assigned duties that occupy a large portion of their time it is unlikely that they will conscientiously disperse wildlife. In effect, both duties (airfield and wildlife control) will suffer.

After selecting qualified individuals, it is vital to ensure that they stay motivated. To ensure this an employer could offer bonus incentives, time off, or something as simple as involving the wildlife control

personnel in decision-making on the airfield. Proper praise for a job well done is also a great motivational tool. Sometimes, outside contractors are hired to perform airfield wildlife control. Ostensibly, these groups are self-motivated to preserve their professional reputations. It may take a year to thin out a blackbird roost, but it only takes a few days for it to fill up again. This is why persistence and motivation are the keys to effective wildlife control.

Evaluations

The final component of airport wildlife control programs is evaluation. Regular and impartial evaluations are vital to these programs as they are the only means of ensuring consistent and successful wildlife control. There are two types of evaluations: (1) regular self evaluations and (2) periodic outside evaluations. Self evaluations provide a method for supervisory control of personnel, equipment, and procedures to ensure that established protocols are being followed. Periodic outside evaluations provide an objective and impartial look at wildlife control programs in their entirety. In these evaluations, outside experts will scrutinize wildlife observation logs, strike records, actual control/dispersal methods, etc. to determine if and where programmatic changes need to occur to increase the effectiveness of wildlife control programs. Outside evaluations are well suited to private consultants, as will be described below.

Role of Consultants in Airfield Wildlife Control Programs

Under contract from the DFW International Airport Board, pursuant to Federal Aviation Regulation (FAR) 139.337, Geo-Marine conducted an ecological study of the airport from December 1997 through November 1998. The study incorporated observations of bird movements with an analysis of attractive habitats or features contributing to the hazard. In addition to merely fulfilling the provisions of FAR 139.337, the Airport Board requested an evaluation of DFW's wildlife control program. In this capacity, Geo-Marine biologists observed bird dispersal efforts, habitat management practices, and general airfield operations with an eye toward increasing the effectiveness of wildlife control personnel and reducing the hazard to air carriers.

As the yearlong study at DFW progressed, Geo-Marine provided numerous other services to the airport. These services included answering questions for the BASH committee regarding appropriate plant species for landscaping, obtaining necessary depredation permits, and assistance in authoring the DFW International Airport Wildlife Hazard Management Plan. Private consultants can provide valuable assistance with several components of airfield wildlife management programs. Frankly, there are certain necessary functions that outsiders are able to perform better than airport/airfield employees. For example, who at an airport is in a position to objectively evaluate wildlife control procedures? Generally, the only people at airports who have knowledge of such procedures are the very people who are to be evaluated.

Services that consultants can provide to airports or military airfields include personnel and program evaluations, scientific expertise to solve particular airfield problems, personnel training, and countless miscellaneous services. Consultants have two major advantages in providing these types of services: (1) consultants are viewed as objective observers with no ties to either airport/airfield administrators or wildlife control personnel and (2) because of this objectivity, consultants can be brutally honest with all parties – and honesty fosters safer airfields. The key services that consultants can provide for airports or airfields are discussed below.

Objective Evaluations

As mentioned above, periodic evaluations by outside observers can vastly improve airfield wildlife control programs. Outside observers provide a “fresh set of eyes,” providing effective and objective evaluations of personnel and procedures. Furthermore, consultants often have the unique experience of having

reviewed policies and procedures at airfields in all parts of the world and can apply this accumulated knowledge to specific wildlife hazard problem.

Scientific Expertise

Often, airfield wildlife control personnel are faced with wildlife hazard problems involving a single species or species group. On the surface, these types of problems seem simple. But often, they involve complex ecological relationships. In order to identify the source or sources of the problem, hours, days, or months of observations may be required. Airports simply do not have the manpower or time to take these types of routine, scientific observations. Additionally, these observations must be analyzed, which increasingly involves spatial analyses most conveniently performed using Geographic Information Systems (GIS). Many consultants are on the cutting edge of applied GIS technology and can employ it effectively to clear up the most perplexing questions.

Increasingly, bird movement studies are being performed using radar data. This allows scientists to look at bird movement problems from a remote site in real-time. This technology has been changed the study of bird migration and overturned many long-held beliefs on the subject. The only parties currently using this new hazard-reducing tool are the military and private consultants.

Training

As mentioned above, experienced consultants have seen wildlife hazard problems and solutions at airfields all over the world. For this reason, they are in the best possible position to train airfield wildlife control personnel. Consultants are familiar with the wide array of bird dispersal techniques, observation and record-keeping methods, laws pertaining to wildlife control, and federal regulations pertinent to airfield wildlife hazards. Consultants can tailor training for any airfield environment or hazard profile - whether the airfield is too small for dedicated personnel or so large and hazardous that it has eight full-time wildlife control officers.

Miscellaneous Services

While under contract at DFW International Airport, we found that the array of services consultants can offer to airports is staggering. Consulting companies, like Geo-Marine, often have full-service natural resource management capabilities. During our relationship with DFW International Airport, we have answered questions pertaining to state laws concerning nuisance wildlife removal, landscaping to reduce attractiveness to certain bird species, and provisions of the Migratory Bird Treaty Act. As DFW learned the capabilities of our staff, they began to use our services more effectively. The confidence that DFW has in our ability to accurately and clearly respond to a wide array of environmental and ecological issues results in more frequent inclusion of wildlife hazard concerns in airport decision-making. In essence, DFW is able to get answers so they ask more questions, which is good for everybody.

Other natural resource management services that consulting companies can provide include: wetland delineation/permitting/mitigation, GIS services, endangered species management, land-use planning, noise studies, and environmental clean-up/remediation activities. A relationship begun in wildlife hazard reduction could blossom into a convenient means of handling the full scope of environmental and natural resource problems at civil, commercial, and military airfields.

Conclusion

The efforts at DFW are beginning to pay off but the work is far from over. DFW has made a commitment to continuously improve its wildlife hazard reduction program. There are two types of airfields – those that are improving their programs and those that are falling behind the problem.

Establishment and maintenance of an airport wildlife management program is a daunting task. However, incorporation of the key components described in this paper will ensure a well-rounded and functional program. Additionally, the use of consultants to provide objective evaluations, effective training, and scientific expertise will increase the effectiveness of any airfield wildlife control program. A combination of all these factors is the foundation for efficient wildlife control programs and safe airfields. Most importantly, the partnerships forged between consultants and airport wildlife control operators increase the effectiveness of the profession through the transfer of information and technology.