

Personal and corporate liability in the aftermath of bird strikes: a costly consideration

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Abstract. This paper details liability issues inherent in bird–aircraft collisions (bird-strike) incidents at airports and discusses how airport managers and operators must strive to conduct accurate assessments and develop and implement an effective wildlife management plan. Such efforts are mandated by Federal Aviation Administration (FAA) regulations, and failure to follow them may result in loss of human life and property, as well as large financial penalties for managers and operators and adverse media attention and public criticism for the airport authority.

Key words: airport, bird strike, human–wildlife conflicts, liability, permits, regulations, wildlife strike

EACH YEAR, THE AVIATION INDUSTRY is faced with the potential for extensive loss of life and property due to birds colliding with aircraft (bird strikes). As many species of birds compete for airspace with departing and approaching aircraft at airports worldwide, resulting bird strikes contribute to a substantial jeopardy to the safety record and financial well-being of airport operators and their managers (Dolbeer and Wright 2009, Dove et al. 2009, Klope et al. 2009). The Federal Aviation Administration Wildlife Strike Database, compiled by the U.S. Department of Agriculture, documents the widespread and diverse nature of this problem. A total of 82,057 wildlife strike reports (98% involving birds) from 1,418 U.S. airports and 207 foreign airports has been entered for the period January 1990 through December 2007, with 7,666 strikes occurring in 2007. Sandra Wright, manager of the FAA Wildlife Strike Database, estimates that 80% of wildlife–aircraft strikes go unreported (Wright 2008).

In the past, federal, state, and provincial wildlife management programs have contributed to population increases in large-bodied birds, such as cormorants (*Phalacrocorax* spp.), cranes (*Grus* spp.), geese (*Branta* spp.), gulls (*Larus* spp.), herons (e.g., *Ardea herodias*), pelicans (*Pelecanus* spp.), raptors (e.g., hawks [*Buteo* spp.], owls (*Bubo* spp., *Strix* spp.), eagles (*Haliaeetus* spp., *Aquila* spp.; Figure 1), vultures (*Cathartes* spp., *Coragyps* spp.), and wild turkeys (*Meleagris gallopavo*; Cleary and Dolbeer 2005). Wildlife strikes cost the U.S. civil aviation industry approximately \$500 million and commercial air carriers worldwide

>\$1.2 billion annually. More than 194 people have died, and 164 aircraft have been destroyed as a result of bird and other wildlife strikes with civil and military aircraft from 1988 to 2004 (Richardson and West 2000, Thorpe 2003, Cleary et al. 2004).

The frequency and devastating consequences of bird strikes dictate that airport operators and managers must address the issues of organizational and personal liability. Airport managers and operators are being sued personally for human injuries and death, as well as property damage, in the aftermath of bird strikes. Further, regulatory agencies are using their law enforcement divisions to enforce permitting regulations to the extent that airport managers can face civil and criminal prosecution for violating federal regulation or taking either inappropriate action or no action at all to mitigate wildlife strikes. In such cases, liability may extend to members of the airport's governing body. Moreover, the expenses for the ensuing legal defense are high. This paper details liability issues inherent in bird-strike incidents and discusses how airport managers must conduct accurate assessments and develop and implement an effective wildlife damage management plan, as directed by FAA regulations (FAA 2004).

Defining liability

The majority of wildlife strikes occurs within the immediate airport environment, and 74% of all strikes happens ≤152 m above ground level (Cleary and Dolbeer 2005). Airports must be managed to be as unattractive to birds as



Figure 1. Raptors, such as this American bald eagle perched atop an airport runway sign at the Orlando Sanford International Airport, Florida, are among the birds that may pose a threat to aviation.

possible. The goal of wildlife managers on and around airports is to eliminate or minimize the carrying capacity of habitat for species that are hazardous to aviation (Cleary and Dolbeer 2005). Airport managers must accept the responsibility of implementing a wildlife damage management plan and carry out the many different aspects of such a plan that will make it successful.

One of the most common liabilities to the airport manager is his failure to take the appropriate actions that are legally required. Airport sponsors and managers have a responsibility under federal regulations (FAA 2004) to ensure the airport maintains a safe operating environment. They must take immediate action to alleviate wildlife hazards whenever they are detected. They must ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport:

1. An aircraft experiences a multiple wildlife strike;
2. An aircraft experiences substantial damage from striking wildlife;
3. An aircraft experiences an engine ingestion of wildlife; and
4. Wildlife capable of causing damage is observed to have access to any airport flight pattern or aircraft movement area (Cleary and Dolbeer 2005).

If any one of these events occurs, the airport operator must begin a wildlife hazard assessment to be conducted by a qualified wildlife damage management biologist over a 12-month period (FAA 2004). If the FAA determines that a wildlife hazard management plan is needed, the airport operator must then formulate and implement one using the wildlife hazard assessment as its basis (FAA 2004, Cleary and Dolbeer 2005). If federally listed or proposed endangered or threatened species are involved, or if designated or proposed critical habitat are present, the airport operator must prepare a biological assessment of the impacts of the wildlife hazard management plan on these species or habitats (FAA 2004, Cleary and Dolbeer 2005).

The FAA has issued ≥ 2 advisory circulars (FAA Advisory Circulars 2004) concerning wildlife and airports, actively encouraging the reporting of wildlife strikes and providing guidance on certain land uses that have the potential to attract wildlife on or near public-use airports (FAA 2004, Cleary and Dolbeer 2005).

Regulatory implications

Wildlife often is protected by overlapping federal, state, and local laws, regulations, and ordinances (Cleary and Dolbeer 2005). Airport

managers must have a clear understanding of the responsibilities placed on them by these various restrictions. The U.S. Fish and Wildlife Service (FWS) has management authority for migratory birds and federally listed threatened and endangered wildlife species and has been given the primary regulatory responsibilities for such species and their habitat (FAA 2004, Cleary and Dolbeer 2005). Airport operators must know when to consult with FWS and obtain required permits prior to modifying designated or proposed critical habitat, taking wildlife (i.e., killing, removing eggs or relocating chicks), and harassing animals or excluding them (i.e., minimizing exposed areas that birds can use for perching and nesting; Cleary and Dolbeer 2005). Currently, no method exists to obtain an FWS permit to remove American bald eagle (*Haliaeetus leucocephalus*) nests, eggs, or chicks.

The regulatory authority for resident nonmigratory birds rests with the various state wildlife management agencies. States also may list certain wildlife as threatened or endangered that are not considered as such at the federal level (Cleary and Dolbeer 2005). Airport operators must first obtain a state depredation permit to take state-protected species or game birds outside the legal hunting season or beyond the established bag limits (Cleary and Dolbeer 2005). In August 2007, when FWS de-listed the American bald eagle from the threatened and endangered species list, the state of Florida followed suit and also de-listed the bald eagle. However, the Florida Fish and Wildlife Conservation Commission has since adopted a bald eagle management plan that requires airport operators to obtain a bald eagle nest removal permit. It is doubtful, however, that such a permit will be issued until FWS adopts a similar management plan for the bald eagle. It is important that airport operators understand that the American bald eagle is still protected by the Bald and Golden Eagle Act of 1940, as amended in 1978, but this act has no provisions for permits of any kind. Given the ever-changing and conflicting regulatory environment, there is great potential for airport managers to become confused over this issue. The old adage that ignorance of the law is no excuse must weigh heavily on the airport manager's decisions for action.

Airport managers must still secure harass-

ment permits from the FWS and state agencies that allow only nonlethal methods of harassing bald eagles by using pyrotechnics (e.g., propane cannons, sirens, horns). But managers may not fire pyrotechnics directly at bald eagles. Accurate records of the methods and results of harassment must be kept by the airport manager, and these records must be sent to both federal and state agencies prior to the renewal of agency permits. Take- (i.e., kill) permits are still available to airport operators when it may be necessary to shoot certain other species as a control method at airports, but the airport manager must ensure that required federal and state wildlife kill-permits are in place and that accurate records, by species and date, of birds killed are kept. Further, city permits may be necessary to discharge a firearm within the city limits, and all local laws must be adhered to regarding certain distances of discharges from buildings and highways (Cleary and Dolbeer 2005).

In some states, such as Florida, water management districts have jurisdiction over any habitat modifications that have impacts on wildlife habitat (especially wetlands). The airport operator must obtain an environmental resource permit before altering any viable wildlife habitat on the airport. If a wetland habitat is to be modified, it may be necessary to mitigate unavoidable wetland impacts before those impacts occur. The U.S. Army Corps of Engineers (COE) also has jurisdiction over certain wetlands, and airport managers should contact a professional wetland consultant qualified to delineate wetlands before any modifications are made to airports. If the COE has jurisdiction, then the airport must obtain a permit, along with a mitigation strategy, before any modification to wetlands can be undertaken (Cleary and Dolbeer 2005).

The U.S. Environmental Protection Agency (EPA) has some jurisdiction over endangered species. In some cases, the airport operator may wish to use chemical repellents, toxicants, and drugs to capture wildlife on the airport. One of the responsibilities of the EPA is the proper registration of these chemicals that are permitted through state and local governments (Cleary and Dolbeer 2005). Only certified applicators (i.e., persons working under a certified applicator's direct supervision) may

purchase and use restricted-use pesticides, and these are restricted to those uses covered by the applicator's certification (Cleary and Dolbeer 2005). Airport managers must make absolutely certain that application of these types of chemicals is in strict compliance with these rules.

The USDA and the FAA recommend elimination of any cover required by birds for resting, roosting, escape, and reproduction (Cleary and Dolbeer 2005). Airport operators should clear dense stands of trees and undergrowth on the airport to eliminate food or cover for wildlife (Seamans et al. 2007, Washburn et al. 2007, Bernhardt et al. 2009, Linnell et al. 2009). Airport managers should check with local jurisdictions to determine if arbor permits are needed before removing or trimming trees.

One can thus see that wildlife hazard management on and around airports is heavily regulated. The airport manager should require that training of personnel strictly adheres to all federal, state, and local regulations, as well as secure all necessary permits, licensing and certifications. Failure of the airport manager to comply with all regulations could be a severe liability to the airport operator. This liability could range from the loss of the airport manager's job to the possible loss of the airport operating certificate. Federal and state permits pertaining to threatened and endangered species, species of special concern, and species protected by law contain strict permit conditions. Large civil fines can be imposed on airport managers who violate permit conditions. The biggest regulatory liability that airport managers or airport directors face is imposition of felony criminal charges against them for infractions of permit conditions. For this reason, airport managers should seek professional assistance from the USDA/Wildlife Services, FAA staff wildlife biologist, environmental lawyers, professional environmental consultants, Audubon Birds of Prey Center experts, forestry rangers, and tree removal experts. Ironically, some agency permits have such severe conditions concerning criminal prosecution that it is advisable for the airport manager to refuse the permit and, of course, disregard the actions for which the permit was required.

Sanford Airport Authority (SAA), Florida, for

example, was issued a permit to use paintball guns to disperse bald eagles, but the SAA refused to take the risk of accidentally killing an American bald eagle and returned the permit. A professional golfer from Orlando is currently being prosecuted for animal cruelty when he accidentally hit and killed a hawk with a golf ball during an instructional video shoot. Imagine the possibilities if an airport operator accidentally kills an American bald eagle. Other agencies, such as state water management districts, COE, EPA, state environmental protection agencies, U.S. Food and Drug Administration, and local departments of cities and counties may take enforcement action against an airport manager who fails to secure required permits or licensing or fails to comply with permit and licensing conditions.

Inadequate public awareness and support

If bird-strike mitigation efforts involve environmentally and socially sensitive bird species (e.g., bald eagles, ospreys [*Pandion haliaetus*], sand hill cranes [*Grus canadensis*], great blue herons [*Ardea herodias*]), airport managers may receive criticism from such groups as the Audubon Society, the Sierra Club, and the Society for the Prevention of Cruelty to Animals, as well as from concerned residents. When these critics call the local newspaper and television and radio stations, any resulting adverse media attention will focus on airport managers and operators. Airport management must learn to ignore criticism and well-meaning, but uninformed, journalism and proceed with the legal responsibility to mitigate wildlife strikes. If airport managers meet all of the legal obligations, they will greatly reduce liability in the event of a tragic crash due to a bird strike on or near their airport.

Property damage, personal injuries, and fatalities

Should a plane crash occur on or near an airport due to a wildlife strike or bird strike, civil and criminal liability suits due to negligence of the airport manager and other airport officials can be devastating to the airport sponsor. Even if the aircraft does not crash, but rather aborts takeoff or makes a precautionary landing, the damage caused by a bird strike can be

enormous, as the following examples suggest. (Unless otherwise noted, data are taken from Cleary and Dolbeer 2005, Wright 2008, and Dolbeer unpublished data).

- On May 25, 2008, a Kalitta Airlines cargo B-747-200 (based in Michigan) struck a Eurasian kestrel (*Falco tinnunculus*) on the takeoff run at Brussels National Airport. Even though the pilot was able to stop the takeoff, the aircraft overran the runway, broke in half and was destroyed. The B-747 came within 500 m of housing.
- On August 23, 2000, a B-747 struck a flock of geese on the takeoff run at Philadelphia International Airport. The B-747 ingested 1 or 2 birds in the #1 engine, and the high-speed aborted takeoff resulted in 9 flat tires. The engine was a total loss, and the repair cost was \$3 million.
- On July 24, 2008, an Air Mauritius aircraft with 241 people on board caught fire after colliding with a bird just as it was taking off from the Delhi, India, airport. "Had the fire not extinguished in time or the plane had taken off, it would have definitely blown up either on ground or mid-air," an official said (CAA Airport News 2008).
- On June 9, 2001, an Airbus 300, during its climb, struck a Canada goose at 700 m above ground level. The goose was ingested into the #2 engine. A precautionary landing was made. Cost to replace the engine was \$2 million.
- On February 17, 2004, a B-757-200 struck a flock of mallards (*Anas platyrhynchos*) on its takeoff run at Portland International Airport, Washington. At least 1 bird was ingested, and a precautionary landing was made. The cost to replace the engine was \$2.5 million.
- On June 24, 2005, an Airbus 310 struck multiple Philippine ducks (*Anas luzanica*) on its takeoff run at Subic Bay airport, resulting in an aborted takeoff. The fan blades were badly damaged, a large section of the nose

cowl was torn from the nacelle (i.e., exterior protective covering), and the fan cowling was damaged. Engine shrapnel damaged the #3 flap fairing. The cost to repair the damage was \$9,456,000.

- On March 22, 2006, an Airbus 319 struck a flock of Canada geese while it was on its 4-km final approach to General Mitchell International Airport, Wisconsin. One or 2 geese were ingested, and the engine shut down. The pilot reported an emergency and was able to land safely. There was major damage to the engine's core, and the engine was replaced at a cost of \$2,675,600.

Damage to general aviation aircraft and helicopters also can be costly.

- On August 17, 2005, a Cessna 421 descending to 600 m above ground level, struck a black vulture (*Coragyps atratus*) at Merritt Island, Florida. The collision ripped the aircraft wing causing fuel to spray out and damage the landing gear recognition light, so the pilot was not sure if the gear was down. The Florida Secretary of Transportation was on board along with other dignitaries.
- On September 1, 2005, a Falcon 20 struck a flock of mourning doves (*Zenaidura macroura*) shortly after rotation at Lorain County, Ohio, causing the #1 engine to flame out. As the gear was retracted, the plane hit another flock, which caused the #2 engine revolutions to roll back. The pilot crash-landed, sliding through a ditch and an airport perimeter fence, crossing a road, and coming to a stop in a cornfield. Both pilots were taken to the hospital. Costs totaled \$1.4 million.
- On December 30, 2005, a Bell 206 helicopter was at 150 m above ground level near Washington, Louisiana, when it struck a large vulture (*Cathartes aura*) that crashed into the windshield, temporarily blinding the pilot. The pilot tried to land in a bean field, but the

bird's blood hampered his vision. The left skid hit the ground first, causing the aircraft to tip on its side. The pilot had several surgeries to repair his face, teeth and eye. The cost to repair the helicopter was \$1.5 million.

Liability for damage from bird strikes is not, of course, limited to destruction of aircraft or persons on board. In many instances, the aircraft may crash into either a busy highway or occupied buildings, and the devastation from the initial impact and sometimes horrendous fires can be catastrophic. Even if no injuries or fatalities occur, the financial liability for damage to structures or vehicles on the ground can be tremendous.

- On August 27, 2000, a B-747, during its climb out of Los Angeles International Airport, struck a western gull (*Larus occidentalis*) at 150 m above ground level. The jet engine ingested the gull, and the pilot made an emergency landing with the jet spewing 3- to 4-m-long flames. Three pieces of the engine fell to the ground, with one 2-m piece landing on a beach where people were having a cookout (luckily no one was injured). The pilot dumped 75 metric tons of fuel over the ocean before landing.
- On February 26, 1973, a Learjet 24 departing from Peachtree-Dekalb Airport, Georgia, struck a flock of brown-headed cowbirds (*Molothrus ater*). Engine failure resulted, and the aircraft crashed, killing 8 people and seriously injuring 1 person on the ground.

A more serious liability (both emotionally and financially) is a crash on or near the airport that involves serious injuries or fatalities to people both onboard the aircraft and on the ground.

- On July 8, 2003, a Cessna 172 struck a vulture at 250 m above ground level near McKinney, Texas. The pilot made a Mayday call to the airport tower after the bird struck the left wing, announcing that he could not keep

the aircraft straight with the power on and that he was going to land in a field. The plane came to rest upright with the engine separated from the firewall. The left wing was separated at the wing attach points, and the fuel tanks had ruptured and were leaking. Witnesses on the ground saw the plane hit with left wing first; 2 people on board were killed.

- On July 8, 2007, a Cessna 182 swerved to avoid an eagle at 20 m above ground level on its approach to Matinicus Island, Maine. The plane hit the treetops near the runway and crashed, destroying the aircraft and injuring 2 people.
- On October 23, 2007, a Piper 44 disappeared on a night-training flight at 1,000 m above ground level out of Browerville, Minnesota. The instructor and student pilot did not report any difficulties, but wreckage was found 36 hours later, partially submerged upside down in a bog. From part of a wing and some remains inside, the Smithsonian Institution, Division of Birds, identified the bird that struck the left horizontal stabilizer as a Canada goose. Both pilots were killed.
- In March 2008, a Citation II, departing from the Wiley Post, Oklahoma, airport during its ascent, struck a number of unidentified birds. A witness heard a series of bangs and observed the jet trailing smoke and plunge straight down into the ground. All 5 people on board were killed on impact (Birdstrike News 2008).
- In October 2007, the University of North Dakota's twin-engine Seminole trainer was en route at about 1,200 m above ground level when it struck a flock of Canada geese. The airplane had multiple impact points and crashed into a swamp, killing both crew members (Birdstrike News 2008).
- On May 25, 2000, a Cessna 310 climbing out of L. M. Clayton Airport, Montana, collided with several Canada geese at 183 m above ground level. The

windshield was shattered, and the right wing and fuel tank were ripped off on impact, destroying the aircraft in a post-crash fire. The pilot was hospitalized with burns and lacerations.

Civil lawsuits

Many civil lawsuits have been filed, citing the negligence of airport managers and airport operators contributing to property loss, serious injuries, and fatalities after a bird strike attributed aircraft incident on or near airports.

- A significant court precedent was established when a Learjet 24 crashed on departure from Peachtree-Dekalb Airport, Georgia, in 1973. The plane crashed after striking a flock of cowbirds; 8 people were killed, and 1 person on the ground was seriously injured. The crash generated a lengthy legal case, called the Miree litigation. The court determined that the airport manager could be held liable for failing to take the precautions possible at his level of authority to end bird hazards (Michael 1986).
- On November 12, 1975, a DC 10 ingested several gulls into the #3 engine during the takeoff run at John F. Kennedy International Airport. The engine caught fire; several wheels and tires disintegrated, and the landing gear collapsed during the aborted takeoff. The aircraft then caught fire and was destroyed; 30 of the 139 passengers and crew (all airline employees being ferried overseas) were injured, but there were no fatalities. The National Transportation Safety Board noted that ineffective control of bird hazards by the airport was one of the factors contributing to the incident. A complex legal battle in federal and state courts ensued in 1979, with the airline and the aircraft owner suing the FAA, the Port Authority of New York and New Jersey, New York City, and several aerospace companies. The total settlement, reached in 1985, exceeded \$15 million. Amounts paid by each party and their insurance companies were undisclosed.
- On September 22, 1995, an AWACS B-707 out of Elmendorf Air Force Base, Alaska, ingested 4 Canada geese into the #1 and #2 engines during takeoff. The resulting crash killed all 24 people on board. Investigators found the “worst possible combination of operational conditions,” including infrequent and inadequate wildlife patrols. The senior tower controller was reported by witnesses as saying he “observed geese lift off and turn directly into the path of the aircraft.” Both controllers on duty at the time of the accident invoked their Fifth Amendment rights to remain silent, but the investigator concluded that both controllers “had a duty to warn the flight crew and that failure was a contributing factor.” After the investigation, people in the top 3 leadership positions at the air base were reassigned.
- On June 3, 1995, an Air France Concorde, while landing at John F. Kennedy International Airport, ingested 1 or 2 Canada geese into the #3 engine at about 3 m above ground level. This caused an uncontained failure. Shrapnel from the #3 engine destroyed the #4 engine and cut hydraulic lines and control cables. The pilot made a successful emergency landing, but damage to the Concorde was >\$7 million. The French Aviation Authority sued the Port Authority of New York and New Jersey and eventually settled out of court for \$5.3 million.
- On June 7, 1989, a TNT Air Cargo BAE 146 departing Genoa Airport, Italy, at night flew through a flock of gulls at rotation. Three engines were damaged, but the pilot managed to return the severely damaged aircraft to the airport. The carrier sued a number of entities for damages. The Civil Court of Genoa in 2001, after 11 years of litigation, awarded the carrier \$2 million. Liability was assigned as 50% to the Ministry of Transport, 30% to the private company operating the airport, and 20% to the port authority. (Battistoni 2003).

- On December 12, 1973, a Falcon Business Jet with 9 people on board struck common gulls (*Larus canus*) and black-headed gulls (*Chroicocephalus ridibundus*) on takeoff from Norwich Airport, England. One minor injury resulted from the crash, which destroyed the aircraft. The judge presiding over the case wrote that the airport operator owed the aircraft operator and occupants the "common duty of care." The judge decided that the airport operator failed to show due diligence in managing the airport's bird hazards, and there must be judgment for the aircraft operator (Michael 1986, MacKinnon et al. 2001).
- On June 14, 1975, a Sabreliner ingested gulls in both engines at rotation from Watertown Airport, South Dakota. The aircraft crashed, and a severe fire ensued, injuring 3 of the 6 people on board and destroying the aircraft. When a suit was brought against the airport operator, the court maintained that the proximate cause of the crash was the failure to warn the pilot of the presence of birds. Judgment for the full value of the destroyed aircraft was entered against the airport operator (Michael 1986, MacKinnon et al. 2001).
- When a B-737 ingested a gull and aborted the takeoff at Pula, Croatia, the airline sent a bill to the airport, which the airport refused to pay, stating that it "had a permanent (NOTAM) [i.e., notice to airmen] to warn air carriers of birds in the vicinity of the runway. When the insurance company sued the airport, the appeals court ruled in favor of the insurance company. The court noted that the airport acknowledged that a problem existed by having a permanent NOTAM regarding bird hazards, and yet failed to undertake all measures at its disposal to alleviate the hazard (Pula County Court 2000).
- When an Air France A-320 hit a flock of gulls during the takeoff run at Marseille Provence, France, the engine was destroyed. In January 2005

the airline was awarded \$4 million because of negligence in operating the airfield. A hedgehog (*Erinacedae* sp.) had been struck by an earlier flight (which attracted the gulls), but airport operations personnel had failed to remove the carcass.

Criminal charges

Criminal negligence charges can be brought against airport managers, some as serious as involuntary manslaughter when fatalities are involved from a bird-strike crash on or near an airport.

- On January 20, 1995, a Falcon 20 struck a flock of birds during takeoff from Le Bourget Airport, France. The jet ingested birds in the left engine, causing the aircraft to crash, killing all 10 people on board. An investigation found that the airport staff failed to perform routine bird-scaring operations prior to the crash. In 1998, French authorities laid charges for involuntary manslaughter against the Paris Airport Authority and 3 former officers for their roles in the accident. The airport authority was accused of "negligently failing to follow normal security procedures" (MacKinnon et al. 2001, Cleary and Dolbeer 2005).
- When a U.S. Air Force AWACS B-707 engine ingested geese and crashed in Alaska, killing all 24 people on board, the senior controller and another controller at the tower had to invoke their Fifth Amendment right to remain silent when investigated for their part in the crash.

Conclusion

The courts have ruled that airport operators must exercise due diligence in undertaking all measures at their disposal to alleviate bird hazards at airports. Failing to do so could bring civil judgments and criminal charges upon airport managers and operators. When civil suits and criminal charges are filed, court cases can drag out through the court system for years. Court costs, attorney fees, and expert fees can cost the airport manager and operator

millions of dollars in defense fees and settlement judgments.

To avoid potential liability issues, airport managers and operators must:

- Clearly meet the legal responsibilities placed on them by the overlapping federal, state, and local regulations;
- Have a working knowledge of all required permits, licenses, and certificates required by these agencies;
- Clearly understand the legally enforceable permit conditions and be absolutely certain that these conditions are met and documented;
- Ensure that all personnel have received the required training necessary for wildlife management on the airport;
- Seek out advice from environmental lawyers, professional assistance from the USDA, Wildlife Services, FAA staff biologists, environmental consultants, and experts from such groups as the Audubon Society and Centers for Birds of Prey; and
- Complete a wildlife assessment of hazards at the airport and implement a wildlife hazard management plan, as required in the U.S. Code of Federal Regulations (CFR; U.S. Code 1973).

Wildlife hazard management at airports is a publicly-sensitive and complex undertaking, and airport managers will receive public criticism and negative news coverage when carrying out their duties (especially if the bird species are socially sensitive, as are bald eagles). Nonetheless, airport managers must diligently pursue their legal duty to protect the traveling public and their airport authority.

Acknowledgments

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LARRY A. DALE is President and CEO of the Orlando Sanford International Airport, Florida. He has a varied background as a developer, contractor, real estate broker, ATP pilot, elected official, civic leader, and most recently, a certified law-enforcement officer (2006). In addition to his multifaceted responsibilities at the airport, he continues to serve on the Seminole County Development Advisory Board, METROPLAN Orlando, and the Private Business Association of Seminole County. In his spare time, he enjoys hunting, fishing, sporting clays competition, spending time with his family, and of course, flying airplanes.