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Keep Your Eye on the Birdie: Aircraft Engine Bird Ingestion

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BIRDS ARE ONE of the most serious and persistent natural threats to aircraft at airports throughout the world. Aviators have long recognized that flocks of birds at or near airports are a safety hazard. During the early years of aviation, birds easily avoided the comparatively slow flying aircraft. But the problem, generally referred to as “bird strike,” has increased with the speeds of modern aircraft and is a particular hazard to turboprop and jet aircraft. Bird strikes, however, are not well publicized, possibly due to the fact that there has not been a fatal air carrier accident involving birds in the United States in more than twenty years. One expert stated: “Maybe people don’t care because we haven’t lost an airliner full of passengers to a bird strike in a while.”

In the United States, more than 1,400 bird strikes occur each year. Bird strikes cause an estimated twenty million

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1 Graham, Birdland: Confrontation In The Skies, AUDOBON, Jan. 1983, at 22.
3 Graham, supra note 1, at 22. However, a prominent transcontinental pilot named Calbram “Cal” Perry Rodgers was killed at Long Beach, California, in 1912, when the carcass of a gull he had struck jammed the exposed control cables of his biplane. Id.
4 Hingorani, Air Disasters, 9 AIR L. 100, 102 (1984). The problem is also called “BASH” (Bird Aircraft Strike Hazard). Id. at 102.
5 Graham, supra note 1, at 22. The increase in bird strikes is also due to the large diameter of jet engines. Id. Helicopters are also subject to bird strikes.
7 Id.
8 Graham, supra note 1, at 22. This figure applies to civil aviation. Military aircraft, which frequently fly high speed, low level missions, have a greater inci-
dollars in damage annually to aircraft, together with the possibility of injury or death to crew and passengers. Birds may endanger the flight of a turboprop or jet aircraft, particularly at a crucial stage such as landing or take-off, when birds are sucked into the turbine induction system causing the engine to fail or malfunction.

This article addresses the hazard posed to aircraft when birds are ingested into aircraft engines. The federal regulations that attempt to prevent bird ingestion through powerplant design and construction, and the regulations concerning bird hazard reduction at airports will be explored. The article will also discuss the reported decisions involving aircraft crashes caused by bird ingestion, focusing on the various theories of liability proposed by

dence of bird strikes. In 1983, over 2,300 strikes were reported by the Air Force Bird/Aircraft Strike Hazard (BASH) Team, located at Tyndall Air Force Base, Florida, which, since 1975, has been responsible for maintaining all Air Force Bird/Aircraft strike data. Kull, 1983 Air Force Bird Strikes, in PROCEEDINGS, CONFERENCE, AND TRAINING WORKSHOP ON WILDLIFE HAZARDS TO AIRCRAFT, at 49 (1984) [hereinafter cited as WILDLIFE HAZARDS].

9 Graham, supra note 1, at 22. The principal dangers of bird strikes are collisions with windshields (also referred to as cockpit intrusion or penetration), tail structures, and engine ingestion. See Steenblik, supra note 6, at 18. While birds are not generally viewed as dangerous objects, a four pound bird hitting an aircraft at two hundred miles per hour impacts with a force of nine tons. Safety Corner, AOPA PILOT, Nov. 1973, at 83.

10 N.T.S.B. ANN. REP. 15 (1976). While cockpit intrusion can be fatal, engine ingestion is viewed as the more serious threat. The problem is described as follows:

The engines of these planes have large intake openings which are likely to ingest birds. The birds, when ingested, may damage one or more of the rotating blades of an engine which, in turn, break off or bend the other rotating blades in the engine. The result is that the compressors in the engine become inoperative and the plane loses its power.


"There is concern that the bird ingestion problem may become more serious as new-generation turbofan-powered [commercial] aircraft with only two engines becomes [sic] operational in significant numbers over the next several years." Birds v. Aircraft: No Winners, 39 ACCIDENT PREVENTION BULLETIN, FLIGHT SAFETY FOUNDATION (Feb. 1982).

11 While the focus of this article is aircraft engine bird ingestion, the theories presented are applicable to incidents involving bird strike to other aircraft structures. See supra note 9 and accompanying text.

12 See infra notes 18-31 and accompanying text.
plaintiffs and the legal defenses available. Finally, possible methods and procedures for avoiding bird ingestion and subsequent litigation will be suggested.

I. Federal Regulations

Federal regulations recognize the hazard that birds pose to aircraft by requiring aircraft engines to continue operation following bird ingestion. Since the possibility of bird ingestion is most prevalent, and dangerous, at take-off and landing, the regulations make it clear that the most effective method for preventing bird ingestion is reducing the hazard at the airport. Limiting or preventing the presence of birds at airports lessens the likelihood that birds will constitute a serious hazard to aircraft.

A. Powerplant Regulations

The ingestion of foreign matter, particularly birds, into an aircraft engine is a recognized hazard which must be considered in the design and construction of turboprop or jet turbine engines. Prior to the issuance of an engine type certificate, the engine must comply with the regulations pertaining to foreign object ingestion. The regulations require that the engine manufacturer design and locate or protect the air induction system of the turbine engine to minimize the ingestion of foreign matter during take-off, landing, and taxiing.

The common kinds of foreign matter ingested into en-

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13 See infra notes 32-171 and accompanying text.
14 See infra notes 189-196 and accompanying text.
15 See infra notes 18-24 and accompanying text.
16 See infra notes 25-31 and accompanying text. "80% of reported bird strikes occur on or near airports — usually below 2,000 feet a.g.l." Horne, Safety Corner: Feathers in the Fan, AOPA PILOT, June 1983, at 126.
17 "Scores of species have been involved in bird strikes, but a few types pose most of the threat. According to the FAA, gulls (which come in 44 species worldwide) account for 40 to 43 percent of all strikes reported; migratory waterfowl (primarily ducks and geese) about 11 percent." Steenblik, supra note 6, at 20.
Engines are ice, hail, water, and birds. The regulations require bird ingestion tests using three sizes of birds. A turbine engine must withstand the ingestion of a four pound bird without catching fire, bursting (releasing hazardous fragments through the engine case), generating loads greater than ultimate loads, or losing the capability of being shut down. The engine must also be able to withstand the ingestion of three ounce birds and one and one-half pound birds without sustaining a twenty-five percent power or thrust loss, requiring the shut down of

21 14 C.F.R. § 33.77(e) (1985). Sand and gravel were included in the foreign object ingestion regulations, but deleted when it was determined that sand and gravel ingestion did not constitute a serious power loss threat. See 49 Fed. Reg. 6841 (1984).

22 14 C.F.R. § 33.77 (1985). The manufacturer must test an engine under the following ingestion conditions:

<table>
<thead>
<tr>
<th>Foreign object</th>
<th>Test quantity</th>
<th>Speed of foreign object</th>
<th>Engine operation</th>
<th>Ingestion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three Ounce Bird</td>
<td>One for each 50 square inches of inlet area or fraction thereof up to a maximum of 16 birds. Three ounce bird ingestion not required if a one and one half pound bird will pass the inlet guide vane into the rotor blades.</td>
<td>Litoff speed of typical aircraft</td>
<td>Takeoff</td>
<td>In rapid sequence to simulate a flock encounter and aimed at selected critical areas.</td>
</tr>
<tr>
<td>One and One Half Pound Bird</td>
<td>One for the first 300 square inches of inlet area, if it can enter the inlet, plus one for each additional 500 square inches of inlet area or fraction thereof up to a maximum of eight birds.</td>
<td>Initial climb speed of typical aircraft.</td>
<td>Takeoff</td>
<td>In rapid sequence to simulate a flock encounter and aimed at selected critical areas.</td>
</tr>
<tr>
<td>Four Pound Size Bird</td>
<td>One, if it can enter the inlet</td>
<td>(1) Maximum climb speed of typical aircraft if the engine has inlet guide vanes (2) Litoff speed of typical aircraft, if the engine does not have inlet guide vanes.</td>
<td>(1) Maximum cruise (2) Takeoff</td>
<td>(1) Aimed at critical area (2) Aimed at critical area</td>
</tr>
</tbody>
</table>

Id.

To perform the bird ingestion test, a bird is fired from a special cannon into the inlet of an engine operating at takeoff power. Horne, supra note 16, at 126.

the engine within five minutes from the time of ingestion, or resulting in a potentially hazardous condition.\textsuperscript{24}

B. Airport Regulations

The government began its airport certification program in 1972.\textsuperscript{25} All airports serving any scheduled or unscheduled passenger operation of an air carrier conducted with an aircraft having a seating capacity of more than thirty passengers must have an airport operating certificate.\textsuperscript{26} The Federal Aviation Administration (FAA) will issue a certificate if, after investigation, the FAA finds that the airport is properly and adequately equipped and able to conduct a safe operation.\textsuperscript{27} An applicant for an airport operating certificate must establish instructions and procedures for the prevention or removal of factors at the airport that attract, or may attract, birds.\textsuperscript{28} However, an applicant need not establish these instructions and procedures if the FAA finds that a bird hazard does not exist and is not likely to exist.\textsuperscript{29} Furthermore, an applicant for an airport operating certificate must show that it has appropriate procedures for identifying, assessing, and disseminating information to air carrier users of the airport by “Notices to Airmen” (NOTAM) or other such means, concerning conditions on and in the vicinity of the airport that effect or may effect the safe operation of aircraft.\textsuperscript{30} The procedures must cover the presence of a large number of birds.\textsuperscript{31}

\textsuperscript{24} \textit{Id.} at § 33.77(b)(1-3). Other aircraft structures must be able to withstand collision with birds. See 14 C.F.R. § 25.631 (1985), which provides that the “empennage structure must be designed to assure capability of continued safe flight and landing after impact with an 8 pound bird.” \textit{Id.}


\textsuperscript{26} 14 C.F.R. § 139.3 (1985).

\textsuperscript{27} 14 C.F.R. § 139.11(b) (1985).

\textsuperscript{28} 14 C.F.R. § 139.67 (1985). This section is titled “Bird Hazard Reduction.”

\textit{Id.} Birds are attracted to airfields by open space, food, shelter, and water. Solman, \textit{Birds and Aviation} in \textit{WILDLIFE HAZARDS}, supra note 8, at 1.

\textsuperscript{29} 14 C.F.R. § 139.67 (1985).

\textsuperscript{30} \textit{Id.} at § 139.69.

\textsuperscript{31} \textit{Id.} at § 139.69(b)(7).
II. BIRD INGESTION CRASHES & CASES

Bird ingestion litigation is a relatively new development in aviation tort law.\(^3\) As a result, there are few reported decisions discussing the feathery menace to aviation.\(^3\) However, the existing body of bird ingestion case law may be misleading due to recent developments which vitiate prior theories of liability presented in the reported decisions.\(^3\) The modern decisions reflect a trend of placing liability for bird ingestion on the airport operator and the pilot.

A. Early Decisions

1. The “Boston Electra” Litigation

The first major aircraft crash caused by bird ingestion was the October 4, 1960 crash of a Lockheed Electra at Boston’s Logan International Airport.\(^3\) The crash, caused by engine ingestion of starlings and gulls, resulted in over 150 actions for personal injury and wrongful death against the airline, the aircraft and engine manufacturers, the United States, and the airport operator.\(^3\) \textit{Rapp v. Eastern Airlines} discusses liability for the crash.\(^3\) While the decision is less than satisfying in that it is written as findings of fact and conclusions of law, \textit{Rapp} is the seminal

\(^{33}\) In Ingham v. Eastern Airlines, 373 F.2d 227 (2d Cir.), \textit{cert. denied}, 389 U.S. 931 (1967), bird strike was presented as a defense. The airline argued that a bird strike momentarily distracted the crew making it impossible to execute a missed approach. A dead bird was found near the crash site but this was “hardly convincing proof that it was the cause of the accident” since the bird had been dead three or four days before the crash. \textit{Id.} at 232-33.
\(^{34}\) See infra notes 174-182 and accompanying text.
\(^{35}\) Hingorani, supra note 4, at 102.
\(^{37}\) 264 F. Supp. 673 (E.D. Penn.), \textit{aff’d}, 399 F.2d 14 (3d Cir. 1967), \textit{cert. denied}, 393 U.S. 979 (1968), \textit{vacated by agreement and without opinion}, 521 F.2d 1399 (3d Cir. 1970). Fifty-nine passengers and three crew died. There were only ten survivors. \textit{Id.} at 675.
decision because it catalogues the theories of liability that appeared in early bird ingestion cases.

The sole issue decided by the Rapp court concerned the liability of the United States. The plaintiffs raised four theories of government liability for the crash. First, the plaintiffs claimed that the FAA issued a certificate of airworthiness for a plane that it knew or should have known would ingest birds on take-off, resulting in the loss of power at a critical period of the flight. Second, the plaintiffs alleged that the FAA negligently issued a certificate of airworthiness for a plane that it knew or should have known would ingest birds on take-off, with no limitations in the certificate against the use of that plane where birds were likely to be encountered. Third, it was alleged that the FAA acted negligently in failing to require the airport operator to remove from the airport premises ponds, weeds, and a garbage dump which the FAA knew or should have known attracted birds. Finally, the plaintiffs alleged that the FAA negligently permitted the aircraft to take-off under conditions then existing at the airport without some protection or inspection when they knew or should have known that birds were a hazard and could damage the aircraft. The Government answered that there was no hazard, and even if there were, no reason existed to suspect that the accident would occur.

In response to the allegations of negligently certifying the engine and aircraft, the Government argued that the regulations set minimum standards, and if these minimum

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39 Id. at 679.
40 Id. Prior to certification, the FAA required engines to be subjected to the chicken test. The chicken test consisted of injecting four pound chicken carcasses into the engine to determine the effect of bird ingestion. The test conducted on the Electra's engines indicated bird ingestion could cause internal damage resulting in power loss. Id. See supra note 22 and accompanying text for the present bird ingestion test requirements.
41 Rapp, 264 F. Supp. at 679.
42 Id.
43 Id. The court based the FAA's knowledge on a 1949 study of bird strikes in commercial aviation. Id. at 677.
44 Id. at 679.
standards were met, the Government was justified in issuing the certificates.\footnote{Id.}

In determining the liability issue, the court applied general negligence principles.\footnote{Id. at 680. The court stated: We of course must place ourselves in the perspective of a jury in deciding this case. Needless to say, we would advise them, that generally speaking and without detail, negligence is the doing of some act which a reasonably prudent person would not do, or the failure so to do; that ordinary care is such as a person would exercise in the management of his own affairs to avoid injury to the person or property of others. We would also ask them to consider the reasonable foreseeability of an event looking back to the negligent act if it existed, and whether they should have reasonably envisioned the events which unfolded and caused the accident. Id. at 680.} The district court held that the FAA was negligent in issuing a type certificate for the aircraft attesting to its airworthiness when the FAA knew the engine was capable of ingesting birds on take-off and that the resulting loss of power could pose a serious threat to the aircraft.\footnote{Id. at 681.} The district court also found that the FAA negligently failed to require the airport operator to remove the attractions to birds at the airport.\footnote{See 521 F.2d 1379 (3d Cir. 1970). \footnote{Id. at 1366.}} However, the opinion was subsequently vacated by agreement,\footnote{Sellfors v. United States, 697 F.2d 1362 (11th Cir. 1983). \"Rapp was vacated and has no precedential value. At the most, the Rapp holding would only be persuasive.\" Id. at 1366.} and is not considered to have precedential value.\footnote{See infra notes 172-182 and accompanying text.} The opinion is nonetheless noteworthy in that, up to 1984, it provided an argument for the imposition of liability upon the United States for negligent certification.\footnote{Id.}

2. The "Executive Aviation" Litigation

On July 28, 1968, a Falcon Mystere jet struck a flock of gulls seconds after take-off from Burke Lakefront Airport...
in Cleveland, Ohio. The plane suffered a substantial loss of power, struck the airport perimeter fence, hit a pick-up truck, and finally came to rest in Lake Erie. While no one was injured, the soaked aircraft was a total loss. The named defendants were the municipal airport operator, the airport manager, and the air traffic controller on duty at the time of the accident.

The complaint, filed in admiralty, alleged that the loss of the aircraft resulted from the airport operator’s negligence in clearing the aircraft for takeoff, in failing to warn plaintiffs of the seagulls on the runway, and in failing to remove the seagulls from the runway. The court dismissed the action for lack of admiralty jurisdiction, because the alleged tort did not have a maritime locality. The United States Supreme Court, in an unanimous opinion, held that federal admiralty jurisdiction does not extend to aviation tort claims arising from flights between points within the continental United States. While the issue of liability was not addressed, the district court opinion is noteworthy in its listing of possible theories and defendants.

3. The “Miree” Litigation

On February 26, 1973, a Lear jet crashed shortly after take-off from the DeKalb-Peachtree Airport in Georgia. The crash was caused by the ingestion of cowbirds that were attracted to the airport area in large numbers by an

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52 Executive Jet Aviation v. City of Cleveland, 448 F.2d 151, 152 (6th Cir. 1971), aff’d. 409 U.S. 249 (1972).
53 448 F.2d at 152.
54 Id.
55 Id.
56 Id.
57 Id. at 154. The court stated: “[T]he dispositive issue is whether the alleged tort arose on land or on navigable water.” Id. at 152. The court concluded the alleged tort occurred on land. Id.
58 409 U.S. 249, 274 (1972). The suit was brought in admiralty to invoke federal jurisdiction. Id. at 273 n.24.
59 See supra notes 55-56 and accompanying text.
60 Miree v. United States, 526 F.2d 679, 681 (5th Cir. 1976).
adjacent county garbage dump. All on board the aircraft died; the plane was destroyed, burning jet fuel falling from the disabled plane severely burned an individual on the ground, and property at the crash site was extensively damaged. The plaintiffs asserted theories of negligence and nuisance. The plaintiffs also sued for breach of a contract entered into by the FAA and the county under the Airport and Airway Development Act of 1970 (AADA). The plaintiffs also argued that the county’s purchase of liability insurance waived the immunity defense. The United States District Court for the Northern District of Georgia deemed the county immune from suit and dismissed the actions. The district court

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61 Id. The Miree crash prompted the FAA to issue Order 5200.4 in 1974 to attempt to deal with the hazard posed by garbage dumps located near airports. See Harrison, FAA Policy Regarding Solid Waste Disposal Facilities in WILDLIFE HAZARDS, supra note 8, at 213.
62 Miree, 529 F.2d at 681.
63 Id.

As a condition precedent to his approval of a project, the Administrator shall receive in writing, satisfactory to him that . . . [T]he aerial approaches to such airport will be adequately cleared and protected by removing, marking, or lighting, or otherwise mitigating existing airport hazards and by preventing the establishment or creation of future airport hazards.

49 U.S.C. § 1701(3). “Airport Hazard” was defined as:

[A]ny structure or object of natural growth located on or in the vicinity of a public airport, or any use of land near such airport, which obstructs the airspace required for the flight of aircraft in landing or taking off at such airport or is otherwise hazardous to such landing and takeoff of aircraft.

65 Miree, 529 F.2d at 686. See generally C. RYNE, AIRPORTS AND THE LAW 59 (1979)(listing cases where immunity was waived by procurement of liability insurance).
66 Miree, 529 F.2d at 679. County immunity was provided for by GA. CODE ANN. § 23-1502 (1971). “A county is not liable to suit for any cause of action unless made so by statute.” Id. Under the doctrine of “sovereign immunity,” a government cannot be sued by one of its subjects unless it consents to the suit. The doctrine is based upon the English maxim “the King can do no wrong.” See W. PROSSER, HANDBOOK OF THE LAW OF TORTS, at 970 (4th ed. 1971).
also found that under Georgia law, the purchase of liability insurance neither waives the immunity of the county nor creates a direct cause of action against the insured.67

The United States Court of Appeals for the Fifth Circuit agreed that the county was immune from suit on theories of negligence, nuisance, and insurance, but ruled that the county could be liable on the theory that the plaintiffs were third-party beneficiaries of the contract between the FAA and the county, in which the county agreed to operate the airport safely.68 The Fifth Circuit, en banc, granted rehearing and held that federal, not state law, controlled in determining whether the plaintiffs were third-party beneficiaries of the contract and ruled that federal law barred the third-party beneficiary action.69

The United States Supreme Court vacated the en banc decision and held that state law applied rather than federal law.70 The Court remanded the case for reconsideration under Georgia law.71 The Court justified its decision on the fact that only the rights of private litigants were at issue and that no duties of the United States hinged on the outcome of the litigation.72 The Court did acknowledge the argument that such lawsuits could “be thought to advance federal aviation policy by inducing compliance with FAA safety provisions.”73 On remand, the Fifth Circuit certified questions for submission to the Supreme Court of Georgia to determine whether the county was immune from suit under the third-party beneficiary theory.74 The Georgia Supreme Court held that the action could not be maintained against the county.75

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67 Miree, 526 F.2d at 686.
68 Id.
69 Miree v. United States, 538 F.2d 643 (5th Cir. 1976).
71 Id. at 33.
72 Id. at 30-31.
73 Id. at 32. The Court did not find this argument convincing since “the issue of whether to displace state law on an issue such as this is primarily a decision for Congress.” Id.
74 Miree v. United States, 565 F.2d 1354, 1355 (5th Cir. 1978).
75 Miree v. United States, 242 Ga. 126, 249 S.E.2d 573, 578-80 (1978). The
In subsequent Miree proceedings, the county airport manager, a named defendant in the original litigation, moved for summary judgment, asserting immunity because of his status as an official of the county. The district court stated that the immunity issue would be resolved by determining whether the airport manager's actions were discretionary or ministerial acts. The court stated that a public official enjoys protection from liability in the performance of his discretionary duties, but undertakes ministerial acts at his own risk. In reviewing the airport manager's efforts to control the bird hazard problem, the court noted that the manager had the responsibility to abate or mitigate the hazard the birds posed. The court did not consider this responsibility to be a discretionary duty. The district court denied summary judgment, finding that the manager could be held liable for failing to take precautions possible at his level to end the bird hazard.

court stated: "The mere fact that a member of the public would have benefited from the performance does not create third party intended beneficiary status under Georgia law." 249 S.E.2d at 580. The Miree decision was considered dispositive of the issues raised in the related case of Selfors v. DeKalb County, 157 Ga. App. 731, 278 S.E.2d 489 (1981), even though Miree was an advisory opinion not binding on the Georgia Court of Appeals. 278 S.E.2d at 490. Mr. Selfors piloted the ill-fated Lear jet that gave rise to the Miree litigation. Id.

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77 Id. at 771.
78 Id. at 772-74. The court stated:
A ministerial act is commonly one that is simple, absolute, and definite, arising under conditions admitted or proved to exist, and requiring merely the execution of a specific duty. A discretionary act, however, calls for the exercise of personal deliberation and judgment, which in turn entails examining the facts, reaching reasoned conclusions, and acting on them in a way not specifically directed. This dichotomy is maintained, for the most part, by stressing the nature of the act involved, the degree of responsibility entrusted to the official, and his position in his employer's hierarchy.

Id. at 774.
79 Id. at 772-73.
80 Id. at 774-75.
81 Id.
82 Id. at 775 n.1.
In *Selifors v. United States*, the plaintiff brought suit alleging government negligence for failure to enforce statutory obligations under the AADA. The plaintiff also alleged negligence on the part of the FAA air traffic controllers on duty at the time of the crash for failing to observe and warn of the presence of birds near the runway. The trial court dismissed the action, finding no evidence to indicate that the controllers had sighted any birds, and found that the AADA would not support the plaintiff's claim.

On appeal, the Eleventh Circuit noted that the deceased pilot was fully aware of the bird hazard at the airport. Additionally, the court noted that the aviation flight charts (Jeppeson charts) in the deceased pilot's possession contained the bird hazard warning. The Eleventh Circuit affirmed the finding that the air traffic controllers were not negligent in failing to warn the pilot, since no birds were sighted by the controllers prior to the accident. The Eleventh Circuit considered the allegation that liability was created under the Federal Tort Claims Act (FTCA) for negligent failure of the FAA to enforce compliance of the airport operator's contractual assurances in the AADA. The Government contended

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85 *Selifors*, 697 F.2d at 1364.
86 Id.
87 Id. The fatal crash occurred on Selifors' second flight from the airport that day. Id.
88 Id. The warning read: "Turbojet take offs between 5 p.m. and 30 minutes after sunset prohibited. High density bird activity between 5 p.m. and 30 minutes after sunset." *Safety Corner, AOPA Pilot*, Nov. 1973, at 82. The accident occurred at 10 a.m. Id.
89 Id. at 1365.
90 Id. at 1364. The FTCA, 28 U.S.C. §1346(b) (1982), waives the sovereign immunity of the United States for injuries caused by the negligent or wrongful act or omission of any employee of the Government while acting within the scope of his office or employment, under circumstances where the United States, if a pri-
that the FAA owed no duty of care to the pilot, and that, if a duty existed, the acts or omissions complained of fell within the discretionary function exception to the FTCA.  

The court reviewed the legislative history of the AADA and found no congressional intent for the AADA to create any duties owed by the Government owed to private individuals using sponsored airport facilities. The court stated that the purpose of the AADA was to provide federal funds for developing and modernizing airports and related facilities in conjunction with a national transportation policy, not to regulate the operation of airports. The legislative history showed no intent on the part of Congress to impose a legal duty on the FAA, running to each user of a federally funded airport, to insure the absolute safety of each facility constructed or maintained with federal funds. The court held that the AADA does not create a statutory duty in the federal government to protect private persons using federally-funded airports.

Similarly, the court found no basis for imposing liability on the Government under the “Good Samaritan” doctrine. The court noted that interpretations of the

vate person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred.

91 Sellfors, 697 F.2d at 1365.
92 Id. at 1366.
93 Id.
94 Id.
95 Id. at 1367.
96 Id. See generally Indian Towing Co. v. United States, 350 U.S. 61 (1955)(The Coast Guard undertook operation of a lighthouse. Suit was brought by a boat owner who had relied on the guidance of the lighthouse and wrecked while the light was not working. The Court held that once operation had begun, the Coast Guard had a duty to use due care to make certain that the light was kept in working order.) See also Restatement (Second) Of Torts § 323 (1965) which provides that:

One who undertakes, gratuitously or for consideration, to render service to another which he should recognize as necessary for the protection of the other’s person or things, is subject to liability to the other for physical harm resulting from failure to exercise reasonable care to perform the undertaking, if

(a) his failure to exercise such care increases the risk of such harm, or
doctrine have uniformly held that where one does not create the dangerous condition and takes no remedial measures, one is not liable as a good samaritan.\textsuperscript{97} The court concluded that the FTCA did not apply, and affirmed the dismissal of the suit.\textsuperscript{98}

4. The “Hawaiian Airlines” Litigation

In Hawaiian Airlines, Inc. v. United States,\textsuperscript{99} a Lockheed Electra L-188 sustained damage on July 3, 1977, when the aircraft ingested egrets into two engines while landing at Patrick Air Force Base in Florida.\textsuperscript{100} The plaintiff asserted that the Government was negligent in permitting conditions to exist at Patrick that encouraged the nesting of birds, in permitting birds to nest at or near the facility, particularly the runways, and in failing to divert or delay the landing of the aircraft until the birds had left the area.\textsuperscript{101}

The plaintiff brought the suit under the FTCA.\textsuperscript{102} Under Florida law, the airport operator has the duty “to use proper care, precaution and diligence in providing and maintaining the air field in a reasonably safe condition for the purposes to which it is adopted and is apparently designed to be used.”\textsuperscript{103} The court, recognizing that “there is a problem at most every airport with birds,” noted that Patrick has an Airfield Operations Branch charged with the duty to implement the bird control

\textsuperscript{97} Sellfors, 697 F.2d at 1368.
\textsuperscript{98} Id.
\textsuperscript{99} 16 Av. Cas. (CCH) 17,744 (M.D. Fla. May 7, 1981).
\textsuperscript{100} Id. at 17,745. The same type aircraft was involved in the “Boston Electra” crash. \textit{See supra} notes 35-51 and accompanying text.
\textsuperscript{101} Hawaiian Airlines, 16 Av. Cas. (CCH) at 17,745.
\textsuperscript{102} \textit{See supra} note 90 for the text of the FTCA.
\textsuperscript{103} Hawaiian Airlines, 16 Av. Cas. (CCH) at 17,745 (citing Peavy v. City of Miami, 1 So. 2d 614, 615 (Fla. 1941)). \textit{See generally} 2 S. Speiser & C. Krause, \textit{Aviation Tort Law} § 21:1, at 592-600 (1979)(discussing general principles of airport liability).
The program in force at Patrick required airport personnel to report the observation of birds at the airfield. A vehicle equipped with a radio and loudspeaker system played tapes containing sounds of a dying sea gull and the sound of a firing pistol. A shotgun and a permit to kill birds were obtained. When birds were sighted or reported, employees drove the vehicle to the area, played the tapes, and fired the gun to disperse the birds. The airfield was inspected more than once each day. "Notices to Airmen" (NOTAMs) were routinely issued to pilots stating: "Caution, birds can be expected in or near the airfield."

The district court stated that the "defendant was required to exercise reasonable care to maintain and operate the airfield in a reasonably safe manner, to warn aircraft of any known danger such as the existence of birds on or near the runway, and to use proper precaution and care to keep the runways free of any such birds."

Reviewing the bird control program, the court found that the government had used proper care and diligence in maintaining and operating the airfield. The court accordingly dismissed the complaint.

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104 Hawaiian Airlines, 16 Av. Cas. (CCH) at 17,746.
105 Id.
106 Id.
107 Id. An Airport Depredation Permit must be obtained from the Department of the Interior, U.S. Fish & Wildlife Service, to shoot migratory birds which are protected by federal law. See The Feather Curtain, FAA General Aviation News, July-August 1984 at 10.
108 Hawaiian Airlines, 16 Av. Cas. (CCH) at 17,746.
109 Id.
110 Id. The court also stated that information concerning a bird hazard could be communicated to incoming pilots by use of Air Traffic Information Services (ATIS). Id. Pilots can be warned of birds in flight since large flocks of birds will show up on radar. See Horne, supra note 16, at 129.
111 Hawaiian Airlines, 16 Av. Cas. (CCH) at 17,746. There were approximately one hundred thousand operations a year from Patrick and bird strikes were "very minimal." Id.
112 Id. at 17,746-47.
113 Id.
B. The Modern Trend

In Safeco Insurance Co. v. City of Watertown, a Saberliner jet crashed at Watertown Municipal Airport, South Dakota, on June 14, 1975, after ingesting gulls into both engines. The pilot, co-pilot, and one passenger were injured; the aircraft was a total loss. The plaintiff's first ground for recovery alleged that the FAA negligently certified the airport and subsequently failed to enforce its airport certification regulations.

The plaintiff brought suit under the FTCA, contending that the airport certification regulations imposed a duty on the Government. However, the court stated that a regulation which does not purport to establish civil liability, but merely makes provision to secure the safety or welfare of the public as an entity, is not subject to a civil liability construction. The court did suggest that liability could be imposed on the Government under factual circumstances falling within the good samaritan doctrine. The court stated that the defendant "in some positive way must have contributed to the injury, either by increasing risk of harm, . . . by interposing himself between another person and the duty that the other person owed to someone else, . . . or by inducing reliance on his undertaking."

In applying the doctrine to the facts in Safeco, the court found the crucial inquiry to be whether the Government's inspection of the airport created a duty under South Da-

115 Safeco, 529 F. Supp. at 1222.
116 Id.
117 Id. See supra notes 26-31 and accompanying text for the airport regulations found in 14 C.F.R. §§ 139.1-139.127 (1985).
118 Safeco, 529 F. Supp. at 1223. See supra note 90 for the applicable provision of the FTCA.
119 Id.
120 Id. at 1224. See supra note 96 and accompanying text for a discussion of the good samaritan doctrine.
121 Safeco, 529 F. Supp. at 1224.
The district court found that the plaintiff failed to prove the elements of the good samaritan doctrine since the plaintiff could not prove that the FAA's certification and inspection program increased the risk of bird strikes at certificated airports. The court stated that pilots generally rely on the airport operator, rather than the Government, to ensure that an airport is free of hazards. The court rejected the theory that the airport certification regulations imposed any duty on the Government that would give rise to a tort action.

The plaintiff also alleged negligence on the part of the airport operator. The court stated the elements of a negligence action to be: "That there be a duty owed by the defendant to the plaintiff, that there was a breach of this duty, and that the breach was the proximate cause of the plaintiff's injury." The court had no difficulty in finding that the airport operator had a duty, independent of federal regulations, to the pilots using the airport to use reasonable care to keep the airport free from hazards or to warn of hazards not known to the pilots.

The controlling issue was whether a bird problem existed at the airport which required the issuing of warnings. The court considered the testimony of ornithologists as to what attracted the birds to the air-

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122 Id. at 1225.
123 Id. at 1224-25.
124 Id. at 1225. The court noted that the FAA's airport certification program had been in operation only since 1973. Id.
125 Id.
126 Id.
127 Id. at 1225-26.
128 Id. at 1226. The court cites the following:
A possessor of land who holds it open to the public for entry for his business purposes is subject to liability to members of the public while they are upon the land for such purpose, for physical harm caused by the accidental . . . harmful acts of . . . animals, and by the failure of the possessor to exercise reasonable care to (a) discover that such acts are being done or are likely to be done, or (b) give a warning adequate to enable the visitors to avoid the harm, or otherwise protect them against it.
129 Safeco, 529 F. Supp. at 1226.
field. The court also discussed the physical attributes and habits of the birds, finding that gulls pose a particular danger to aircraft because, when frightened, the gulls take off in a mass, moving straight up with their long wings outstretched.

The court, acknowledging the difficulty in completely eliminating a bird problem, found the airport operator could have utilized a NOTAM to inform pilots about the bird hazard. Failure to issue the NOTAM was the controlling factor in the court’s imposition of liability on the airport operator. The court found that since the regulations require airport operators to issue NOTAMs, the failure to issue a NOTAM is “additional proof of the [airport operator’s] negligence.” The court held that the proximate cause of the crash was the failure to warn the pilot of the presence of birds. The court did not find any negligence on the part of the Flight Service Station (FSS) personnel on duty at the airport. It based this finding on the fact that airport inspection is not a duty of the FSS personnel, but the duty of the airport management.

130 Id. at 1227.
131 Id. The ornithologist testified that birds are particularly drawn to runways during wet weather since rain forces worms out of their holes onto the runway and the runway also provides firm footing for the birds. Id. at 1227.
132 Id. at 1228. “Virtually nothing . . . would guarantee that gulls would not be present.” Id.
133 Id.
134 Id. The regulation requiring the issuance of a NOTAM for birds is 14 C.F.R. § 139.69 (1985). See supra notes 30-31 and accompanying text.
135 Safeco, 529 F. Supp. at 1229.
136 Id.
137 Id. at 1229-30. The court stated: “Federal regulations in 14 C.F.R. Part 139 indicate that it appears to be the airport operator’s duty to identify safety problems on the airport and to disseminate this information by NOTAMs.” Id. at 1230. See also 14 C.F.R. § 139.91 (1985) which provides that:

(a) The operator of each certificated airport shall continually review its self-inspection program to insure that prompt and accurate corrective action is taken to eliminate unsafe conditions on the airport.
(b) The operator shall—

(1) Conduct a safety inspection of the airport at least once each day, except as otherwise authorized in its approved airport operations manual; and
Furthermore, the district court did not find any negligence on the part of the pilot for his failure to see the birds on the runway prior to takeoff. The court, acknowledging that the "pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft," found that the pilot and copilot followed normal operating procedures, took reasonable precautions, and most importantly, checked for any NOTAMs issued for the airport. The court found that the pilot did not blindly or heedlessly proceed into a "zone of danger." Judgment for the full value of the destroyed aircraft was entered against the airport operator.

In Insurance Co. of North America v. City of New Haven, a Cessna Citation crashed at the Tweed-New Haven Airport, Connecticut, on October 16, 1975, after ingesting gulls on takeoff. The district court noted that "during the mid-1960's, it became increasingly apparent to those involved in aviation that birds were a serious hazard to air traffic." Birds were a known hazard at the airport. In determining whether the operator acted negligently, the court applied traditional negligence principles: the plaintiff had to establish that the airport operator owed them a duty of due care, that this duty was breached, and that the breach of the duty proximately caused the loss.

The court found that an airport operator has "the duty of exercising reasonable care and control to protect its invitees from dangers which might reasonably be antici-
pated to arise from the condition of the premises or the activities taking place there."\textsuperscript{148} Since birds were a known hazard at the airport, it was evident that the airport operator owed a duty to pilots using the airport to exercise reasonable care to remedy the existing bird hazard, or at least to warn unsuspecting pilots of the peril.\textsuperscript{149}

The court reviewed the measures taken by the airport operator to reduce the bird hazard.\textsuperscript{150} The court found no evidence showing that the airport operator maintained any bird attractions.\textsuperscript{151} To scare birds from the airfield, the airport operator drove an automobile at the flocks while sounding the horn.\textsuperscript{152} The plaintiff contended that the operator should have used alternative scare devices, namely a recorded gull's distress call coupled with the use of a shotgun firing shellcrackers and, on occasion, live ammunition.\textsuperscript{153}

The court disagreed with the plaintiff's contention, finding that at the time of the accident, the car horn was a reasonable scare device.\textsuperscript{154} However, the court did note that the NOTAM "is and was" the generally accepted method of advising pilots of a bird hazard.\textsuperscript{155} The airport operator had failed to issue a NOTAM and, consequently, the court found the failure to do so constituted negligence.\textsuperscript{156}

Although the airport operator was negligent in failing to issue a NOTAM, the court found that the proximate

\textsuperscript{148} Id. at 377.
\textsuperscript{149} Id.
\textsuperscript{150} Id. at 377-79.
\textsuperscript{151} Id. at 377-78.
\textsuperscript{152} Id. at 378.
\textsuperscript{153} Id.
\textsuperscript{154} Id.
\textsuperscript{155} Id. at 379. "It is reasonable to assume that pilots, if on notice that there were bird concentrations at an airport, in the exercise of due care, would take cautionary measures to avoid possible bird strikes." Id. NOTAMs are available to pilots at Flight Service Stations and are printed in the Airmen's Information Manual. Id. at 378-79.
\textsuperscript{156} Id. at 379. "In the court's opinion, prudent care required the issuance of a NOTAM concerning the bird aircraft hazard . . . . The failure to do so constituted negligence." Id.
cause of the crash was the failure of the co-pilot to inform the pilot of his sighting of birds prior to the takeoff roll.\textsuperscript{157} The court found that the pilot was familiar with the airport and that if he had been informed by his co-pilot of the presence of birds, he would have taken actions to minimize the possibility of bird ingestion.\textsuperscript{158} The court found no negligence on the part of the air traffic controllers at the airport, since it was not their responsibility to perform physical inspection of the runway areas.\textsuperscript{159}

The decision in \textit{New Haven}, like prior bird ingestion cases, is a product of extensive data gathering and intensive analysis of the bird problem at the airport, including the testimony of a bird expert. The decision also notes the factor of the pilot's responsibility and negligence which can be presented as a defense by the airport operator.\textsuperscript{160} However, it would not be advisable to place great reliance on the court's approval of the car horn as the sole scare device.\textsuperscript{161} The general consensus is that a variety of scare devices and tactics must be used, and varied, so the birds do not get used to them.\textsuperscript{162}

\textit{Overseas National Airways v. United States}\textsuperscript{163} represents the most recent bird ingestion case. The action arose out of the crash and explosion of a DC-10 aircraft at New York's John F. Kennedy International Airport on November 12, 1975.\textsuperscript{164} The aircraft struck a flock of seagulls during takeoff causing one of the engines to catch fire.\textsuperscript{165} No one was injured but the aircraft was destroyed.\textsuperscript{166} The case highlights the possible disastrous consequences of bird ingestion involving a widebody passenger jet. There were no serious injuries since all one hundred and thirty-nine

\textsuperscript{157} \textit{Id.}
\textsuperscript{158} \textit{Id.} at 380.
\textsuperscript{159} \textit{Id.}
\textsuperscript{160} \textit{Id.}
\textsuperscript{161} See \textit{supra} notes 152-154 and accompanying text.
\textsuperscript{162} See Graham, \textit{supra} note 1, at 24.
\textsuperscript{163} 766 F.2d 97 (2d Cir. 1985).
\textsuperscript{164} \textit{Id.} at 98.
\textsuperscript{165} \textit{Id.}
\textsuperscript{166} \textit{Id.} at 99.
passengers were airline employees who had prior emergency aircraft evacuation training.167

The plaintiff brought suit in federal court under the FTCA claiming that the FAA acted negligently in certifying the aircraft's engines, in certifying the airport, and in clearing the plane for takeoff.168 The United States initiated a third party action against the airport operator claiming that the city negligently operated a garbage dump close to the airport that attracted the birds.169

While the decision does not directly address the issue of the imposition of liability, the crash itself is noteworthy in that it prompted the National Transportation Safety Board (NTSB) to make recommendations for a more effective bird control system at JFK and nearby LaGuardia and Newark International, as well as changes in the design of the engine to make it more "birdproof."170 The aircraft accident report states: "The complexity of controlling bird populations on or around airports requires ecological and ornithological studies before an effective program can be formulated."171 The statement highlights the need for preventive measures rather than mere dispersal of birds on an airport.

C. Varig

A majority of the reported bird ingestion decisions have alleged negligence on the part of the Government in certi-
fying aircraft and airports. Although, with the exception of *Rapp*, the Government escaped liability, it appeared that there was a possibility of liability for negligent certification. In 1984 that possibility was put to rest. The United States Supreme Court in *United States v. S.A. Empresa de Viacao Aerea Rio Grandense (Varig Airlines)* held that the Government was not liable for negligence in certifying aircraft for use in commercial aviation. The Government was sued under the FTCA for negligently certifying an aircraft which did not comply with FAA standards. The Court held that these actions were barred by the discretionary function exception of the FTCA.

The opinion can be summed up by the following language: “[T]he FAA has a statutory duty to *promote* safety in air transportation, not to insure it.” The decision, as one commentator states, “safeguards the certification process of the FAA in its entirety.” The net effect in a bird ingestion case is that, unless the good samaritan doctrine can be invoked, the Government is no longer a viable defendant. *Varig* would seem to preclude suit for negligent certification of aircraft, engines, and airports. The regulations merely set the minimum standards and place the full burden of compliance on the manufacturer, carrier, or airport operator.

172 For a discussion of *Rapp*, see supra notes 35-51 and accompanying text.
175 Id. at 2769.
177 *Varig*, 104 S. Ct. at 2755.
178 Id.
179 See Note, supra note 176, at 108.
180 Id. For a discussion of the good samaritan doctrine see supra note 96 and accompanying text.
181 See Note, supra note 176, at 108.
182 Id.
III. Strategies

The reported decisions, when read in the light of Varig, establish the various limitations on the theories of liability and defense in bird ingestion cases. The cases also demonstrate that bird ingestion litigation is a sophisticated, complex, and factually dependent undertaking. From the plaintiff's perspective, it is elementary that the airport operator, and possibly the airport manager individually, should be named as defendants. However, if the airport operator is a governmental entity, it may be immune from suit. If immunity is determined not to exist or if immunity is waived by the presence of liability insurance, the plaintiff may proceed under a two-prong negligence attack. The first prong is under general negligence principles. The second is alleging specific violations of airport regulations, if the airport is certificated. \(^{183}\) The most successful litigation strategy is proving that a bird hazard was known to exist and the airport operator failed to warn those using the airport of the hazard by use of a NOTAM.

If the factual circumstances merit, a suit against the United States might be maintained under the good samaritan doctrine. \(^{184}\) To date, the carrier has escaped liability as a defendant. \(^{185}\) Liability could be predicated on the carrier's disregard of the presence of birds, or warnings of the presence of birds, at or near the airport. Likewise, the engine manufacturer has escaped liability. A suit might be maintained if the facts demonstrate a disregard for the engine regulations. \(^{186}\)

For counsel representing an airport operator defendant, it is paramount to establish that a bird hazard did not exist, or if one did exist, that the airport operator had done all that could reasonably be expected to control the hazard. The most effective defense is to show compliance

\(^{183}\) See supra notes 25-31 and accompanying text.

\(^{184}\) See supra note 96 and accompanying text.

\(^{185}\) 2 S. Speiser & C. Krause, Aviation Tort Law § 10:5 at 583 (1979).

\(^{186}\) See supra notes 18-24 and accompanying text.
with the airport regulations, especially the issuing of NOTAMs. A second effective defense is to prove that the pilot's failure to take notice of the bird hazard was the proximate cause of the crash. The pilot's negligence may also be used to mitigate the amount of damages, particularly if the pilot was familiar with the airport or had knowledge of the hazard. Pilots can assist in the reduction of bird hazards by first, becoming aware of the frequency and danger of a bird strike; second, reporting the presence of birds to the airport operator; and third, filing a Bird Strike/Incident Report with the FAA if a strike occurs.

The reported decisions establish the need for exhaustive investigation and documentation. It is essential to obtain an ornithologist to assist in evaluating the bird population at the airport. In sum, the burden falls on the airport operator to prevent or remedy the presence of birds at or near the airport.

IV. CONCLUSION

Birds constitute a definite aviation hazard. The cases and literature discussing the problem of bird control suggest that there is no way to completely solve the problem birds may create at airports other than wholesale slaughter of the birds upon arrival. This "scorched earth" policy is a choice of last resort. If a bird hazard does not exist, the airport operator should make sure that condi-

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187 See Steenblik, supra note 6, at 22. The Bird Strike/Incident Report is FAA Form 5200-7. The "standard advice" given to pilots in the event they should encounter a flock of birds in flight is to climb, since birds in flight usually descend when frightened. When flying in the vicinity of birds, it is recommended to reduce airspeed below cruise where feasible, to give the birds a chance to avoid the aircraft. Reducing speed also reduces the force of impact should a collision occur. The use of the external aircraft lights, particularly strobe lights, has been recommended to make the aircraft more conspicuous to birds. See The Feather Curtain, FAA General Aviation News, July-Aug. 1984 at 9.

tions do not develop which might attract birds. If a bird problem exists, a system of bird detection and control must be employed. Bird control takes two forms: short term dispersal techniques and long term preventive measures. Both are necessary for the implementation of an effective bird control program.\textsuperscript{189}

A system of airport bird control should include regular logged runway patrols. Inactive runways should be inspected prior to activation. Patrols should utilize vehicles which can be used to scare birds and to insure that bird control personnel can proceed quickly to the birds' location. Any natural or man-made bird attractions which provide food sources or roosting areas should be removed.\textsuperscript{190} Species specific distress calls played over loudspeakers mounted on the airfield or on the bird control vehicles, the use of shellcrackers, carbide cannons, and even live ammunition should be used to disperse the birds.\textsuperscript{191} Falconry has been used at some airports with success.\textsuperscript{192} Some airports display dead birds or model predatory birds as scare devices.\textsuperscript{193} Also, chemicals may be applied to the area or tainted food could be used to repel the birds. Ornithologists should be consulted to devise methods to reduce or remove bird populations.

According to the current law, at least one measure is imperative: A warning must be issued to those who use the airport.\textsuperscript{194} While the above methods will not com-

\textsuperscript{189} For an excellent collection of international materials on bird hazard see WILDLIFE HAZARDS, supra note 8, which contains 38 papers, the majority dealing with bird hazard reduction. The report, D.O.T. Rep. No. DOT/FAA/AAS/84-1, is available from the National Technical Information Service, Springfield, Virginia 22161. See also Hughes, Air Traffic Control And Airport Authorities — The U.K. Viewpoint, 9 AIR L. 202, 210-211 (1984).

\textsuperscript{190} See Horne, supra note 16, at 128.

\textsuperscript{191} See Steenblik, supra note 6, at 21.

\textsuperscript{192} See Horne, supra note 16, at 128.

\textsuperscript{193} Id.

\textsuperscript{194} See supra notes 114-159 for a discussion of cases where the airport operator was found to be negligent for failing to issue a NOTAM. See also 50 Fed. Reg. 43,114 (1985) (to be codified at 14 C.F.R. pt. 139) (proposed Oct. 25, 1985) which provides:

(a) Each certificate holder shall provide at least one of the following
pletely insulate an airport operator from liability, they do represent currently accepted methods of dealing with a possibly devastating natural hazard. Based on the reported decisions, the airport operator is generally the

means for disseminating to pilots who may wish to use the airport information concerning conditions on, and in the vicinity of, the airports that affect, or may affect, the safe operation of aircraft:

(1) The Notices to Airmen System.
(2) Any other means acceptable to the Administrator.
(b) Each certificate holder shall report the following conditions:
(7) The presence of a bird hazard or potential bird hazard.

Id. See also 50 Fed. Reg. 43,113-114 (1985) (to be codified at 14 C.F.R. pt. 139) (proposed Oct. 25, 1985) which provides:
(a) Each certificate holder shall indicate to the Administrator whether or not a bird hazard exists on the airport. If a hazard exists, an ecological study shall be conducted by a qualified biologist. The study shall —
(1) Identify the species, numbers, locations, local movements and daily and seasonal occurrence of birds observed in the airport area; and the species that have been or are likely to be involved in bird/aircraft strikes;
(2) Identify and locate features on and near the airport that attract birds, such as garbage disposal and water areas: and
(3) Assess the potential hazard from various bird species within the airport area.
(b) The results of the ecological study shall be the basis for the development by the certificate holder, with technical assistance from the Administrator, of an airport bird management plan. The plan shall provide measures to alleviate bird hazards at the airport and shall include the following:
(1) To the extent practicable, priorities for needed habitat modification and changes in land use, with target dates for completion.
(2) Procedures for:
(i) The operation of bird patrols, and for coping with daily and seasonal high hazard periods.
(ii) Communications between air traffic control towers, pilots, and airport bird-management personnel.
(iii) Evaluation and review of the bird management plan.
(3) Personnel and equipment needs.
(4) Training programs.
(c) When a bird hazard exists, the certificate holder shall show that it has the capability and equipment for dispersing potentially hazardous birds. When such occasions arise, the certificate holder shall comply with the following:
(1) For an airport with an operating air traffic control tower, conduct physical inspections of a runway and adjacent areas prior to that runway being designated the active runway or prior to aircraft operations on other than the active runway. Bird dispersal proce-
party who bears liability for the birds.¹⁹⁶

There is no way to eliminate the possibility of bird strike or ingestion. But, the hazard may be reduced and controlled by land modification, scare devices, and by alerting those using the airport of the presence of birds by the use of Notices to Airmen (NOTAM). The long term solution is to determine what specific species constitute the bird hazard and then develop a system of habitat manipulation tailored to that species. Man and bird have and will continue to share the skies, save an occasional run in. In the interim, the best advice to those who must share airspace with our feathered friends is “keep your eye on the birdie.”

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¹⁹⁶ Id. The FAA states: “It is not anticipated that the proposal would require any airport to change or expand its bird management program.” Id. at 43,103. However, when compared with the present regulation, 14 C.F.R. § 139.67 (1985) (discussed supra at notes 26-31), the proposal arguably places a heavier burden on the airport operator.
