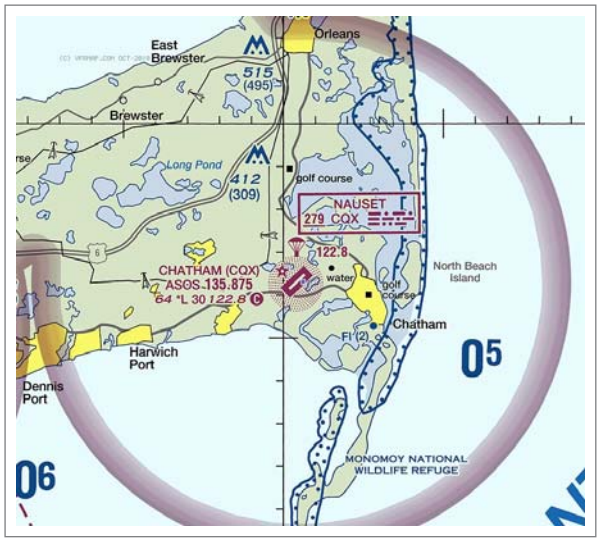
Proactive by Design

WILDLIFE HAZARD MANAGEMENT PLAN
CHATHAM AIRPORT, MASSACHUSETTS

Chatham Municipal Airport
Site Description
240 George Ryder Road
Chatham, MA

Date: January 10, 2020
File No. 15.0166692.00



PREPARED FOR:
Chatham Municipal Airport
Chatham, MA

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January 10, 2020
File No. 15.0166692.00

Matt Caron
Gale Associates
15 Constitution Dr.
Bedford, NH 03110

Re: Chatham Airport (KCQX) Wildlife Hazard Management Plan (WHMP)

Dear Matt:

GZA, in conjunction with Michael McGraw (QAWB), is providing you a Wildlife Hazard Management Plan (WHMP) following our 2019 wildlife hazard site visit report. This plan informs KCQX managers, maintenance staff, FAA Inspectors, and others of the wildlife-related hazards and specific actions for eliminating and/or reducing these hazards at Chatham Airport.

Please feel free to contact us if you require additional information. We are very excited to perform this assessment and minimize the potential wildlife risk in your airport operations and environment.

Very truly yours,

GZA GEOENVIRONMENTAL, INC.

Steven Riberdy, MS, CWB, CERP, CE, PWS
Project Manager / Ecologist

Stephen Lecco
Consultant/Reviewer

Michael J. McGraw, MES, QAWB, ACE
Senior Ecologist

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EXECUTIVE SUMMARY

Pursuant to Code of Federal Regulations (CFR) Title 14 Federal Aviation Regulation 139.337(e), Chatham Municipal Airport (KCQX) prepared this Wildlife Hazard Management Plan (WHMP) in cooperation with GZA GeoEnvironmental, Inc. (GZA). GZA was hired to develop a draft WHMP that is to be directly implemented by the airport after FAA approval. The Airport (with the Wildlife Working Group Members) will periodically, at least once annually, and if changing circumstances warrant, update the WHMP. All changes made to the WHMP will be sent to the Federal Aviation Administration for approval. Action items detailed in this draft final WHMP are strongly advised to be included into the final WHMP, upon approval this document becomes final.

The WHMP emphasizes the identification and reduction of wildlife hazards on the airfield, and KCQX will take measures in a timely manner to address the wildlife hazards as they arise. KCQX will manage the habitat on and around the airfield in a manner that will discourage hazardous wildlife. KCQX (in close cooperation/coordination with FAA) will take active measures to disperse hazardous wildlife when they occur, provide advisories to pilots and airport management, and make operational changes as necessary to address hazardous wildlife issues. The WHMP outlines priorities for habitat and hazardous wildlife management, including target dates for completion. Wildlife attractants within 5 miles (8 kilometers) of the airport operations area are also addressed as they threaten air traffic operations into and out of KCQX.

The WHMP outlines the roles and responsibilities of airport and other personnel involved in reducing wildlife hazards. It states the protocol for monitoring, documenting, and reporting potential wildlife hazards, implemented procedures, and strikes at KCQX. As described in the WHMP, KCQX will identify and respond in a timely manner to hazardous wildlife situations that are detected or reported to Airport Management. The WHMP also details wildlife hazard control measures for birds and mammals. To implement the WHMP, KCQX will maintain an adequate supply of equipment (See Section 5.1 and Appendix F) to disperse and control wildlife. KCQX personnel will be properly trained to identify wildlife and to safely and efficiently use equipment.

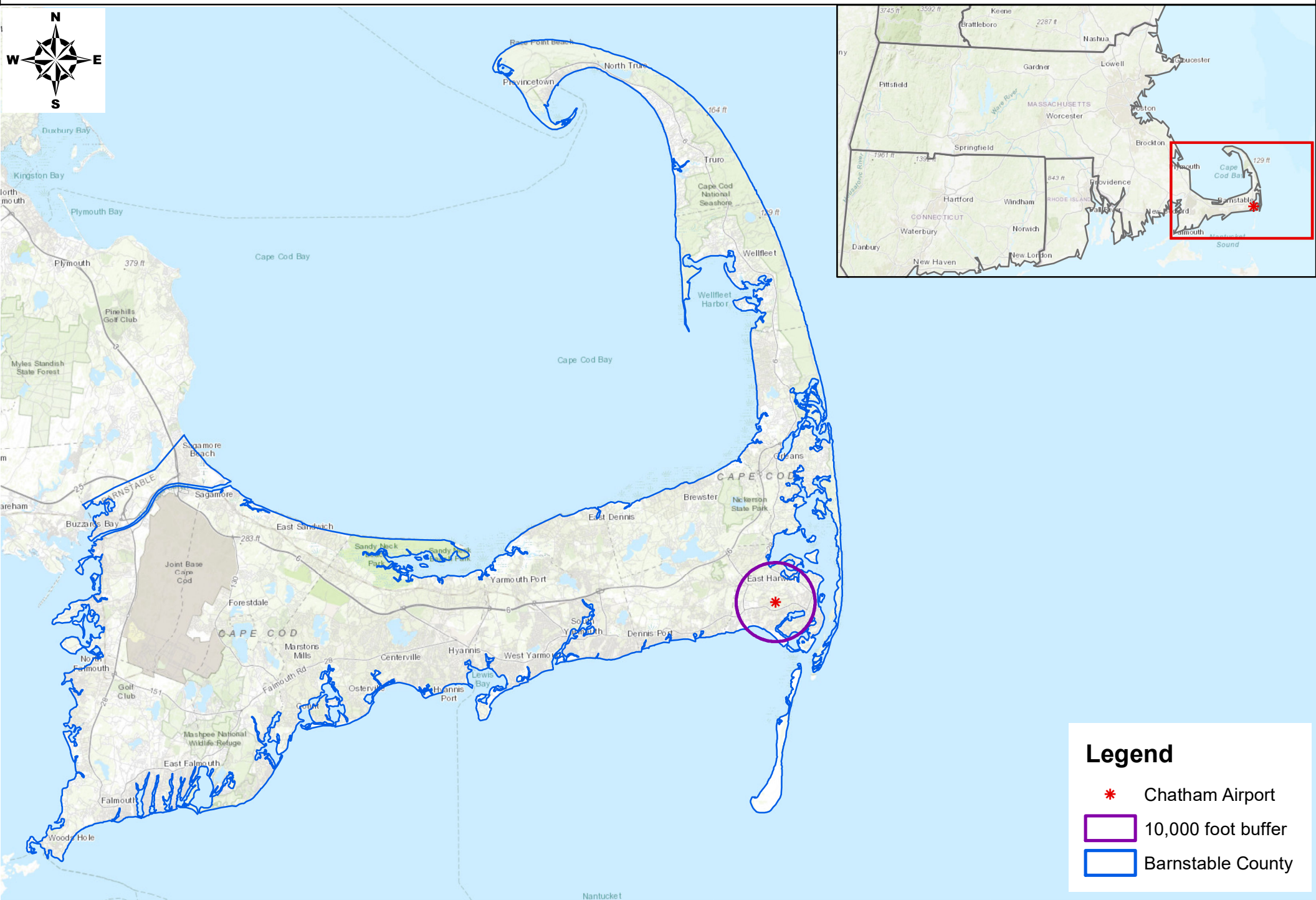
Special permits are required to control most wildlife, which are afforded some type of protection under state or federal regulations. The WHMP discusses laws and regulations governing take or harassment of particular wildlife species. Copies of the state and federal permits will be stored with the KCQX Airport Wildlife Coordinator and made available upon request.

1.0 INTRODUCTION

GZA conducted a Wildlife Hazard Site Visit Assessment (WHSV) in accordance with Title 14 Code of Federal Regulations (CFR) Part 139.337(c)(1–5) of the Federal Aviation Administration (FAA). GZA performed the WHSV over the period of July 2018 to November 2018. The purpose of the WHSV was to identify all potential hazards to air carrier operations and human safety associated with wildlife presence and movements at and near Chatham Municipal Airport (KCQX or airport).

The Wildlife Hazard Assessment (WHA) identified the major attractants/habitats found at KCQX that included a fishing equipment storage area and freshwater and coastal ponds surrounding the aircraft operations area (AOA), which are supporting a wide variety of bird species. Based on WHA results and strike data, the most hazardous birds at KCQX are Gull (Great Black-backed Gull, Herring Gull and Ring-billed Gull), Double-crested Cormorant, Brant, American Crow, Canada Goose, and Mourning Dove. The most hazardous mammals observed at the airport are White Tailed Deer, Eastern Coyote, and Eastern Cottontail.

Figure 1. Location of Chatham Airport in Barnstable County, MA



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SCALE IN MILES

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Engineers and Scientists
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PROJ MGR:	SDR
DESIGNED BY:	JRC
DATE:	01/29/2019

Figure 2: Chatham Airport Natural Community Map

0 450 900
SCALE IN FEET

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DATE:	12/17/2019

1.1 OVERVIEW OF WILDLIFE HAZARD MANAGEMENT PLAN

Over the past century, wildlife–aircraft strikes have resulted in the loss of life, as well as billions of dollars in aircraft damages (FAA Advisory Circular [AC] 150/5200-33B). Title 14 CFR 139.337(b) aims to reduce the potential for wildlife strikes to occur and requires certificated airports to conduct a WHA if a "triggering event" has occurred at their airport. According to 14 CFR 139.337(b), events on or near an airport that has received FAA funding that trigger a WHA includes any of the following:

1. An air carrier aircraft experiences multiple wildlife strikes;
2. An air carrier aircraft experiences substantial damage from striking wildlife;
3. An air carrier aircraft experiences engine ingestion of wildlife; or
4. Wildlife of size or in numbers capable of causing any of the previous events is observed to have access to airport flight patterns or aircraft movement areas.

The FAA Wildlife Strike Database indicates that KCQX has experienced four strike events in recent years. In accordance with 14 CFR 139.337(b), a WHSV was completed for KCQX in 2018 to identify potential hazards to aircraft and human safety associated with wildlife movements at and near the airport. A WHSV also provides the FAA with sufficient information regarding potential wildlife hazards to determine whether the preparation and implementation of a Wildlife Hazard Management Plan (WHMP) is warranted. As stated in 14 CFR 139.337(e), the Airport shall formulate and implement a WHMP, if the FAA determines it is needed, using the WHSV as a basis. The WHMP must include seven required components. Each of these components is sequentially represented as a separate numbered section in this document. These required categories are as follows:

1. A list of persons who have the authority and responsibility for implementing the plan.
2. A list prioritizing actions needed for wildlife population management, habitat modification, and changes in land use identified in the WHSV, with target dates for initiation and completion.
3. Requirements for, and where applicable, copies of local, state, and federal wildlife control permits.
4. Identification of resources that the certificate holder will provide for implementation of the plan.
5. Procedures to be followed during air carrier operations, including at a minimum:
    a. Designation of personnel responsibilities for implementing the procedures;
    b. Specifics on conducting physical inspections of the movement area and other areas critical to wildlife hazard management prior to air carrier operations;
    c. Wildlife hazard control measures; and
    d. Communication between the wildlife control personnel and the air traffic control tower at the airport.
6. Procedures on the evaluation and review of the wildlife hazard management plan for:
    a. Effectiveness in dealing with the wildlife hazard on and in the airport's vicinity; and
    b. Portions of the wildlife hazard, as previously described in the WHSV, to be reevaluated.
7. A training program conducted by an FAA-qualified airport wildlife biologist to provide airport personnel with the knowledge and skills needed to carry out the WHMP as stipulated in AC 150/5200-36B.

1.2 SCOPE OF WILDLIFE HAZARD MANAGEMENT PLAN

In order to enhance the safety of air carrier and other aircraft operations, KCQX intends to implement and maintain a WHMP according to 14 CFR 139.337 to address potential wildlife hazards at the airport and surrounding areas. KCQX followed CertAlert 97-09 (WHMP outline) and AC 150/5200-38 (Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans) for the development of this WHMP. In

addition to addressing general wildlife hazards, this plan will discuss habitat modification, and monitoring and responding to potential wildlife hazards as well as operational and communications procedures to avoid hazardous wildlife. Due to the continual changes in airport scheduling and procedures as well as constant changes to the surrounding environments of airports, 14 CFR 139.337(f) allows for a flexible plan that can incorporate these changes. This allows KCQX to respond rapidly to any changes to ensure the safety of airport patrons in emergency situations. The plan will be reviewed at least annually to ensure that the conditions in which it was established have not changed significantly. If it is decided that the conditions have significantly changed, revisions to the plan's procedures may be necessary.

1.3 OBJECTIVES OF WILDLIFE HAZARD MANAGEMENT PLAN

The purposes of this WHMP are to (1): present actions and priorities to mitigate wildlife hazards at KCQX; (2) list key participants and individuals associated with the WHMP at KCQX; and (3) identify guidelines by which the program will be operated and evaluated. KCQX recognizes that it is not possible to eliminate wildlife strikes entirely, but through the development and implementation of this WHMP, wildlife hazards can be substantially reduced at KCQX.

1.4 CHATHAM MUNICIPAL AIRPORT STRIKE HISTORY

From January 1990 through January 2018, a total of four (4) reported bird strikes to aircraft were reported at KCQX. Of these reported bird strikes, 100% involved medium sized birds (gulls), with no mammal strikes reported. Peak incident occurrence is post fledging and fall migration. After interviews with management and operations, additional strikes were noted that have not been entered into the FAA Wildlife Strike Database. Similar to national averages, most strikes at KCQX occurred below 900 feet AGL. Despite very few (formally and informally) recorded strikes, the wildlife hazards at KCQX are very serious, considering the species involved.

1.5 CURRENT CHATHAM MUNICIPAL AIRPORT STRIKE HAZARDS

The most abundant group of birds observed at, or adjacent to, KCQX includes those from the gull, waterfowl, blackbirds, columbic (doves), and songbird guilds. Because of their abundance, behavior, and body mass, the most hazardous birds at KCQX are Great Black-backed Gull, Herring Gull, Ring-billed Gull, Double-crested Cormorant, Brant, Canada Goose, Mourning Dove, and American Crow. The most hazardous mammals are White Tailed Deer, Eastern Coyote, and Eastern Cottontail.

At KCQX, the largest numbers of birds were attracted to grass shorter than 6 inches, various roosting sites (blacktop and rooftops), fishing equipment storage area, and/or areas devoid of vegetation. The foremost wildlife attractant identified within a 5-mile (8-kilometer [km]) buffer (outside of airport property) is a series of water bodies surrounding the AOA as well as a town operated fishing equipment storage area on airport property, immediately adjacent to the RW 24 approach. Major seasonal wildlife concentrations and wildlife movements occur at these attractants, which often involved crossing KCQX or flying within the approach/departure airspace. As stated in AC 150/5200-33B, the FAA finds water bodies, that are determined to be attractants, within 10,000 feet (3,048 m) of the AOA incompatible with safe airport operations.

2.0 AUTHORITY AND RESPONSIBILITY [14 CFR 139.337(F)(1)]

2.1 CHATHAM AIRPORT COMMISSION AND MANAGEMENT

The Airport Commission has direct supervision and control over all matters connected with the WHMP (see Organizational Chart, Appendix B). The Airport Commission or appropriate designee will be responsible for the following actions regarding the WHMP:

a. Prepare and implement the WHMP.
b. Coordinate the inception of a Wildlife Hazard Working Group (WHWG). The WHWG (if created) will be responsible for reviewing the WHMP at least annually, but more frequently if needed. The WHWG may include the following representatives:
    - Chatham Airport Commission
    - Airport Manager
    - Airport Wildlife Coordinator (AWC)
    - Supporting WHWG Members (advice or review may be solicited at the discretion of the Airport Manager or designee):
        - Fix-based Operators (FBO) and Airport Tenants
        - Pilots
        - Town DPW (compost facility and sewage treatment plant)
        - Town Harbormaster (fishing equipment storage area)
        - Local Law Enforcement
        - Airport Operations Department
        - Neighboring Businesses (Restaurants, Tourist)
        - Neighboring Landowners
        - Non-profit Groups
c. Update the WHMP on a yearly basis.
d. Provide public relations support for wildlife control activities as necessary.
e. Participate in WHMP meetings when requested.

2.2 AIRPORT MANAGER

The Airport Manager assists the Airport Commission in all manners connected with the WHMP (Appendix B). The Airport Manager assumes the WHMP duties and/or responsibilities as directed by the Airport Commission. The Airport Manager will be responsible for the following actions regarding the WHMP:

a) Disseminate information and assignments through the WHWG.
b) Review all plans involving changes in land use or new airport structures/facilities to avoid inadvertently attracting wildlife to the area and consult with a qualified airport wildlife biologist if necessary.
c) Ensure wildlife attractants are reduced through habitat modifications.
d) Work with airport maintenance to alter wildlife habitat as needed.
e) Assist in the appointment of the AWC.
f) Participate in WHMP meetings when requested.

2.3 AIRPORT WILDLIFE COORDINATOR (AWC) (LEAD FROM OPERATIONS AT KCQX)

The AWC is a member of KCQX personnel as designated by the Airport Manager who is responsible for the implementation of the WHMP. This role is currently not filled at KCQX and will be designated by the Airport Manager. In the absence of the assignment of a party to be the AWC the Airport Manager will assume this role. The AWC will be responsible for the following actions regarding the WHMP:

a) Obtain depredation permits to control migratory birds and if necessary, mammals, from federal or state wildlife agencies.
b) Ensure all wildlife control personnel operating on the AOA are properly trained in accordance with FAA regulations (e.g., Security Identification Display Area). Such training includes radio communications, driving on the AOA, and safe use of firearms and pyrotechnics.
c) Maintain 14 CFR 139 certification inspection and training records related to wildlife management.
d) Oversee the recorded actions on wildlife monitoring and reporting forms.
e) Review all known logged wildlife strikes on form FAA 5200-7 (Appendix C) and forward strike reports to FAA as necessary.
f) Ensure that all KCQX personnel, pilots, and lessees are familiar with the requirements and procedures of reporting wildlife strikes by making wildlife strike report forms (FAA Form 5200-7 [see Appendix C]) readily available, and encourage submission of the forms to the appropriate governmental agencies and wildlife control personnel.
g) Oversee determination and response to wildlife hazard conditions during business hours of airport operation.
h) Oversee routine inspections of areas critical to wildlife hazard management and oversee maintenance of recorded actions.
i) Encourage airlines to require pilots to issue pilot reports (PIREPs) relating to wildlife hazards on or near the airport.
j) Assign to maintenance or contract out habitat modifications addressed in the WHA, such as vegetation maintenance along ditches, brush removal, and tree pruning.
k) Assist with wildlife control activities involving introduced mammals, bird abatement, and other programs.
l) Supervise, coordinate, and monitor wildlife control activities as outlined in the WHMP.
m) Implement wildlife control measures (and/or oversee qualified contractors).
n) Alleviate all attractants deemed an imminent hazard and, if necessary, coordinate a runway closure to remedy wildlife hazards.
o) Determine and respond (either personally or via task deliberation to qualified staff) to wildlife hazard conditions for all hours of airport operation and notify the Airport Manager if any control action is taken.
p) Log all known wildlife strikes on form FAA 5200-7 (Appendix C).
q) Update the wildlife section of the Airport Operations database to include wildlife observations, control actions, strike data, and other pertinent wildlife-related information.
r) Issue Notice to Airmen (NOTAM) when wildlife cannot be removed or otherwise mitigated.
s) Harass wildlife from critical areas when appropriate as outlined in Section 6.0 below.
t) Participate in WHMP meetings when requested.

2.4 WILDLIFE HAZARD WORKING GROUP SUPPORTING MEMBERS

KCQX does not have an existing WHWG. KCQX should establish a WHWG following approval of the WHMP by FAA to proactively manage current and future hazards associated with non-airport property land use and habitat management. The agencies and individuals listed in this section are proposed supporting members of the WHWG as initially identified in Section 2.1. While these WHWG supporting members play a role in wildlife hazard management at KCQX, they do not have any formal authority or responsibility for implementing the WHMP, unless their advice or cooperation is solicited at the discretion of the Airport Manager or their designee. Therefore, the below WHWG supporting members, along with those remaining WHWG supporting members not explicitly addressed in this section (i.e., airport law enforcement, airline representatives, neighboring landowners, and non-profit groups), are excluded from the training requirements as detailed in Section 8.0 of the WHMP.

2.4.1 Federal Aviation Administration (FAA)

a) Assist KCQX in reviewing any new construction plans for potential wildlife hazards to aircraft.
b) Review changes and approve updates to the WHMP.

2.4.2 Fixed-base Operators/Airport Tenants

a) Inform pilots and other personnel of reporting all wildlife strikes to Airport Management through appropriate FAA channels.
b) Tenants are responsible for notifying the Airport Management of any hazardous wildlife or attractants.
c) Tenants are responsible for attending all WHWG meetings.
d) Tenants must enforce a no feeding policy.

2.4.3 Pilots

a) Issue a pilot report (PIREP) if potential strike hazard occurs.
b) Report potentially hazardous wildlife to Airport Management or AWC.
c) Report all strikes through the FAA Form 5200-7 or provide the AWC with information to complete the strike report.

3.0 MANAGEMENT ACTIONS [14 CFR 139.337(F)(2)]

3.1 SUMMARY OF MANAGEMENT ACTIONS

Habitat management is a very effective and relatively inexpensive technique for reducing hazardous wildlife. Habitat management includes the elimination, exclusion, or manipulation of areas that attract wildlife. The purpose is to change the habitat so it is fairly homogeneous and unattractive to hazardous species. Although careful consideration should be given to secondary effects prior to any habitat modification, it provides the most effective long-term solution for excluding wildlife populations from airports. In addition to habitat management, non-habitat related management, such as well-established communication protocols and proactive cooperation between airport staff, pilots, and FAA employees can lead to meaningful and potentially life-saving results. Table 1 lists GZA's hazardous wildlife–, habitat–, and non-habitat–based action items to decrease hazardous wildlife on or around KCQX. Table 1 also lists target and completion dates.

Table 1. Management Priorities for Projects to Reduce Wildlife Hazards at KCQX

Action Category	Problem Wildlife Populations	KCQX Wildlife Management Actions	Priority	Target Date	Date Completed
Administrative Actions	All hazardous wildlife and attractants	Develop and maintain an FAA-approved WHMP.	High	July 2020	Review/Update Annually
	All hazardous wildlife	Train employees in the safe and effective application of wildlife dispersal and incident reporting procedures.	High	July 2020	Update Annually
	All hazardous wildlife	Develop a method for updating the existing Airport Management database for recording wildlife strikes, wildlife observations, and management actions.	High	July 2020	Annual Review
	All hazardous wildlife	Coordination with local, state, and federal agencies.	Low	March 2020	Annually or More Frequently As Needed
	All hazardous wildlife	Establish a Wildlife Hazard Working Group.	High	April 2020	Meet Annually or More Frequently as Needed
	Gulls, raptors, blackbird/starlings, Columbids, Passerine, eastern coyote	Remove the fishing equipment from storage area east of the Runway 24 end and relocate >3KM from the airfield. Convert space to turf and manage like OFZ grass.	High	March 2020	Maintain and inspect as needed

Table 1. Management Priorities for Projects to Reduce Wildlife Hazards at KCQX

Action Category	Problem Wildlife Populations	KCQX Wildlife Management Actions	Priority	Target Date	Date Completed
Habitat Modifications	Rodents, ground-foraging birds, raptors	Manage habitat on KCQX, including maintaining the turf at an intermediate and equal height (6-12”). Loam and vegetate areas of exposed soil to turf.	High	April 2020	Continuous Maintenance
	Columbids and Passerine	Conduct test plots in chronically bare areas with supplemental watering, wind blockers, and various grass species to develop a custom solution to bare spots in AOA vegetation.	Low	Summer 2020	6-month interval tests
	Tree nesting birds, small and medium mammals	Remove shrubby and tree vegetation within the perimeter fence (cut and treat with bark-penetrating oil and herbicide). Most immediate concern is along the northern property line where woody vegetation is within 15’ of Taxiway A.	High	ASAP	Work vegetation removal into future VMP projects. Heavy mow shrubs to treeline.
	Medium and large mammals	Repair fence along entire perimeter. Some sections need complete replacement. Maintain a minimum of 10 feet free of vegetation on either side of fence. Eliminate gaps under all gates.	High	Winter/Spring 2020	Conduct daily inspections of perimeter fence. Repair damage immediately.

Table 1. Management Priorities for Projects to Reduce Wildlife Hazards at KCQX					
Action Category	**Problem Wildlife Populations**	**KCQX Wildlife Management Actions**	**Priority**	**Target Date**	**Date Completed**
	Columbids, house sparrows, blackbird/starlings, raptors, and swallows	Assess buildings, hangars, and other structures on the airport and repair, modify, or remove as needed, and add bird deterrents to structures (e.g., terminals).	High	Before May 2020	Annual Inspections/Updates
	Raptor Nest	Discuss with State Game Agency regarding the removal of osprey nests on the property and adding nest deterrents.	Medium	February 2020	For implementation prior to spring migration (March)
	Migrant shorebirds and waterfowl	Haze aggregations of waterfowl and gulls on White pond in coordination with flight schedules (not during any take-offs or landings).	High	Spring and Fall Migrations	As needed

3.2 WILDLIFE POPULATION MANAGEMENT [14 CFR 139.337(F)(2)(I)]

3.2.1 Hazardous Wildlife on and Near KCQX Airport

The most hazardous group of birds observed at or adjacent to KCQX includes those from the gull, waterfowl and wading bird guilds, followed by songbirds and crows because of their abundance, behavior, and body mass. The most hazardous mammals are White Tailed Deer, Eastern Coyote and small rodents. The hazard associated with the presence of Eastern Cottontail and Grey Squirrel is that they attract larger, hazardous predators, such as Red-tailed Hawk and Eastern Coyote. Wildlife control measures are discussed further in Section 6.0.

3.2.2 Fencing and Other Exclusionary Measures

KCQX currently has a fence enclosing the entire AOA. The airport is surrounded by approximately 8,443' of 8-foot high, chain-link perimeter fencing topped with 2 feet of barbed wire. A short section, approximately 480 feet in length, of 4-foot (no barbed wire) chain-link fence is located along George Ryder Road with a pedestrian access gate. The fence age varies, with some notably old sections present. The fence completely encircles the airfield. While this fence is mostly intact, it has a number of gaps in the mesh or at the fence/ground interface where wildlife can easily access the AOA. In addition to gaps and breaks in the fence, in some areas, vegetation, including trees and shrubs growing directly adjacent

to the fence and fallen trees, was observed on the fence and/or had damaged the fence in several locations. Several gates are present around the perimeter of the airfield, and many are mounted with a significant gap below the bottom rail of the gate and the ground surface. Several white-tailed deer and a single coyote have been routinely observed within the AOA fence line. Unfortunately, fences are as effective at confining animals inside as they are at deterring them from entering in the first place. This is especially true when there is suitable habitat inside the fence. The copse of pitch pine on the northwestern and central northern sides of the airfield is premiere forage and bedding location for deer.

The Vegetation Management Plan at KCQX is to be amended to remove as much of the woody stem plants within the airport fence as possible. This should first target the large wooded area in the north-central portion of the airfield as this wooded area is within 10 feet of the taxiway edge and provides limited reaction time for pilots to avoid deer within this wooded area. Several deer are actively living in this copse of trees. Secondarily, vegetation management must target the forested areas that remain between the runway and the southern fence line, along the entire length of the runway and also the forested southwestern corner, near the vernal pool. These areas should be converted to grassland and seasonally mown as the rest of the airfield.

3.2.3 Hazing and Harassment of Hazardous Wildlife

When hazardous wildlife is observed by Airport Operations, pilots, or KCQX staff, the designated AWC will deploy the appropriate hazing and/or harassment methods/equipment using the existing protocols and equipment. At a minimum, pyrotechnics, bioacoustics, and actively chasing are considered appropriate measures. If repeated efforts are unproductive in removing the hazard, then depredation shall be implemented following all applicable laws and regulations.

3.2.4 Depredation/Lethal Control of Wildlife

Currently, KCQX does not have the required state and federal depredation permits and hunting licenses to effectively implement lethal tactics to remove wildlife hazards from the property. The KCQX AWC will obtain these permits and make the determination as to when these methods are necessary and implement. The primary depredation method is shotgun. Seasonal trapping for Canada Geese and gulls, or other wildlife such as coyotes, foxes, and rodents is highly recommended.

3.2.5 Communications and Operational Procedures for Wildlife Management

Adequate and regular radio communications between Airport Operations was observed during all site visits to KCQX during the WHSV data gathering effort. Protocols for ensuring sustained communications and for encouraging PIREPs, NOTAMs, and Operational Modifications to address wildlife hazards shall be upheld. Operational modifications will include delaying flights or diverting take-off and landing operations to different airports as needed to prevent exposure to hazardous wildlife events.

3.3 HABITAT MODIFICATION [14 CFR 139.337(F)(2)(II)]

3.3.1 Wildlife Attractants on and Near Chatham Municipal Airport

Habitat is a broadly used term which has been over-extended in the English language. It is defined by Wilson (1992) as “an environment of a particular kind, such as lake shores or tall-grass prairie”. The Merriam-Webster dictionary defines habitat as, ‘the place or environment where a plant or animal naturally or normally lives and grows’. Since this is a “working landscape” which is nearly completely altered from any native habitat types, and for the expressed purposes of this WHMP

we correlate habitat with animal presence, GZA has modified its definition to represent "a series of natural and anthropogenic physical and chemical factors within a landscape that support the life history of particular animal species and, therefore, provides food, water, and cover necessary for an animal to survive". Chatham Municipal Airport can be described as seven distinct habitat areas. These areas will be referred to for the purpose of this WHMP as open grass, exposed soil, open water, shrubby edge ecotones, forested uplands, buildings/infrastructure, and paved habitat areas. Each provides different combinations of food and cover types that are illustrated in Section 3.3 of the submitted/approved WHSV Report.

Wildlife that are attracted to KCQX seek to find suitable habitat for survival. For this reason, it is necessary to identify existing habitat characteristics at and around KCQX and determine how they relate to wildlife use patterns. The following sections describe the habitat characteristics within the KCQX property and throughout the 5-mile (8-km) buffer surrounding the airport.

Wildlife Attractants at Chatham Municipal Airport

By far the largest problem and greatest liability for the airport is the presence of a significant wildlife attractant (fishing equipment storage area) on airport property, east of the Runway 24 end. This area needs to be mitigated as it attracts birds and mammals to the airport and approach surfaces. Direct observations of eastern coyote, gulls, crows and red-tailed hawks in this area were made during GZA's site visits, and more have been reported by airport staff. Not only does the fish and ocean waste attract birds proximal to the airport, several were observed flying to and from this area through the RW 24 approach surface, which poses direct hazard to flight safety.

Large grass-dominated fields interspersed with bare spots and wildflower patches largely comprises the vegetation found on the airport property. Patches of taller grasses were observed in pockets around the AOA, but for the most part the airport is maintained as a short-cropped field (< 1") through routine mowing. Tall vegetation, such as Fescue grass and minor broad-leaved weedy vegetation, provides wildlife concealment from predators, offers suitable roosting and nesting habitat for some wildlife, and if gone to seed or flower, provides food for wildlife and insects. Tall vegetation can also conceal breaches along the perimeter fence and can camouflage medium-sized to large mammals such as coyote and foxes. Fescue grass is poorly palatable by most birds but is attractive to small mammals such as voles that become a prey attractant to birds such as American kestrel and red-tailed hawks, which represent a wildlife risk.

Areas devoid of vegetation occur throughout the airfield. Primarily, this is represented by pavement/vehicle access areas (aprons, runways, taxiways, perimeter gravel road, etc). Bare areas may provide ideal roosting and loafing sites for Mourning Doves, Killdeer, American Crows, Ring-billed Gulls, and waterfowl (all observed on site). They also provide nesting sites for birds such as Killdeer and grassland passerines and prevent turf management as described above. Bare areas also contain gravel and grit that is highly attractive to birds, such as doves, that use these materials to aid in digestion.

There are significant stands of trees and shrubs within the fence line of the Chatham Airport property. In some areas, vegetation is growing in close proximity to aircraft movement areas. This creates cover for mammals close to active surfaces and is most notable along the northern half of the airfield proximal to Taxiway-A. These areas shelter mammals and birds and provide forage and breeding habitat. Trees are also common within the perimeter fence with a dense stand of pitch pine located along the northern tree line, between the taxiway and northern perimeter fence. Almost the entire length of the southern transitional surface is treed with vegetation ranging from a few feet to over 100 feet in width. Trees in this area are assumed to be within the allowable VMP heights, however they create areas for cover and shelter for birds and mammals within the AOA.

Stands of forest and brush outside the perimeter fence also attract roosting birds and harbor other wildlife such as coyotes, deer and smaller mammals. Such stands can induce wildlife to follow these patches as a corridor for movement onto the field and subsequently provide protection for wildlife once they have entered the field, encouraging them to remain. In addition to the mammals, large bird roosts may also develop in these forested areas. In addition to hunting perches, trees supply wildlife with food, roosting, and nesting sites.

No permanent water features are located within the AOA. Stormwater swales are present that assist surface water drainage off the airfield. KCQX has numerous human-made structures, including hangars, a terminal, runway signs and lights, streetlights, utility line structures, and other aviation aids that provide perching, roosting, and nesting habitat for birds. Several species of birds such as rock pigeons, red-tailed hawks, American kestrels, blackbird species, and other songbirds frequently use hangars and other human-made structures. Hangar B Eatery, is an airport tenant leasing space in the administration building from the Airport Management. This establishment was observed to be conducting generally good housekeeping in picking up trash and food waste and keeping this locked away in a lidded, locked dumpster on site.

Wildlife Attractants within 5 Miles (8 km) of Chatham Municipal Airport

Chatham and the lower cape region are significant summer tourist destinations. Route 6 ("Mid-Cape Highway") provides primary vehicular access to the area. It is approximately a 20-minute automobile ride from Route 6 to the airport in uncongested conditions, but travel time can be significantly longer during the peak tourist season. More locally, the airport is accessed by George Ryder Road, a two-lane, town owned and maintained way. George Ryder Road intersects with Route 28 approximately 1,000' to the southwest of the airport at an uncontrolled intersection. Land neighboring the airport is used for a variety of purposes. Across George Ryder Road from the airport's terminal area is a primarily residential neighborhood where the Chatham Town Hall Annex facility and police department is located. To the east, residential neighborhoods and several ponds bound the airport. To the southwest, a commercial area including a box store, several eating establishments, a Veteran's of Foreign Wars facility with a playground, and a few residences bound the airport.

Located one mile to the west of the airfield is the town transfer station. In general, this area is an attractant due to the combination of trash, refuse and compost which creates an attractant for foraging birds and mammals. Due to its location outside the airport property the attraction of mammals here is not as much of a concern as attraction of medium sized birds such as gulls and crows, both of which were observed using this facility. While this facility is not directly in an approach surface, the location of a significant wildlife attractant in close proximity to the airport should be managed to some degree.

Located next to the transfer station is a town sewage treatment plant. This area contains some open water areas which can attract waterfowl in the winter when other waterbodies may be frozen over. Species that are human adapted such as gulls, mallards and Canada geese would be particularly attracted to these areas. We noted that most of the treatment is through the use of sand filters, limiting the open water present. Nonetheless, management of birds and waterfowl in this area is also important.

Numerous ponds and small fresh, saline and brackish waterbodies dot the landscape within 5KM of the airfield. All are attractants to gulls and waterfowl and are areas outside of the Airport's control. The most notable of these ponds and of the highest concern to the Airport due to its proximity is White Pond. White Pond is located immediately east of the airfield and is a major attractant for gulls, with many seen streaming into this waterbody from the shore south and east of the airfield in late summer. This appears to be an inland foraging and loafing location for Great Black-Back gulls, Herring gulls, and Ring-Billed gulls. From this location gulls were seen leaving mainly to the east and south (toward the coast),

however flights to and from the north were also noted. The other numerous and similar ponds that dot the landscape also have resident and transient gull and waterfowl populations. These ponds are located around the airfield, and travel between ponds by gulls and waterfowl is likely.

Due to the location of the airport on the outer arm of Cape Cod, ocean and shoreline communities are close to the airport to the north, south and east. Numerous bays, inlets and sandbars provide excellent habitat for shorebirds and seabirds. Just south of the airport lies Monomoy National Wildlife Refuge which consists of three islands. These islands contain nesting grounds for large gulls (Great black-backed gull, Herring gull, and Laughing gull), wading birds (Great egret, Snowy egret, Glossy ibis, and Black-crowned night heron), tern colonies (Common tern, Roseate tern and Least tern), and shorebirds (Piping Plover and American Oystercatcher). Spring and fall migration seasons bring in thousands of migratory shorebirds and songbirds to the area as they use the Islands as resting and feeding grounds. The surrounding waters are also large wintering ground for sea ducks. The combination of the highly productive ocean and shoreline habitats, coupled with the numerous inlets, freshwater wetlands and ponds located throughout the general area creates a robust and diverse habitat for coastal birds. Monomoy, located just south and east of the airfield, is an important gull and tern breeding ground and supports substantial colonies of these birds. Numerous coastal birds were seen near or crossing over the airport during our limited time at the airport.

3.3.2 Vegetation Management

Vegetation provides much of the food and cover requirements for wildlife. The areas of greatest concern for wildlife hazards are wetlands, trees, shrubs, grasslands, and edge areas. Habitat management is a very effective and relatively inexpensive technique for reducing hazardous wildlife. Habitat management techniques include turf management, controlled selection of vegetation species, and removal of trees and shrubs that are considered wildlife attractants. The type and diversity of vegetative species as well as the growth height of the species are important factors that can affect the attractiveness of wildlife to an area. The AWC will consult a turf management expert for all vegetation management to determine if the desired effects have occurred or if further changes should be made.

The vegetation management within the AOA at KCQX needs improvement. The open grassland areas appear mown too frequently, creating a very short cropped field attractive to geese and gulls and also promoting bare spots. These short-cropped grasslands abruptly transition to shrubs and trees, often close to the movement areas, which poses a strike hazard as the line of sight and potential reaction time of a pilot of any large mammal entering the AOA is short. Recommendations for improvement include a very active attempt to maximize grass heights between mowing, only cut with mower heads at or above 6” and cut before grass seeds mature. Mowing the vegetation short or allowing it to reach heights where it goes to seed and becomes uneven encourages the growth of broad-leaved weedy vegetation. Such vegetation conditions provide feeding and cover resources that increase bird hazards at the airfield. The prevailing climate and soil conditions in this area allow for rapid growth in the summer months, and mowing operations are a constant effort to keep up with production. Mowing vegetation, especially if mowed short, actually stimulates production (makes the grass grow faster) and encourages weedy vegetation to invade grass stands. Taller grass (6-12 inches) excludes many birds due to limited visibility for flocking species, difficulty for birds to locate invertebrate food sources, and difficulty in predator detection. Grass should not be allowed to exceed 14 inches or go to seed, as it may attract rodents and raptors.

Maintaining grasses at 6-12” per FAA current recommendations breaks up the visual communication of flock foraging species while also preventing the grasses from growing tall enough to allow cover for large predators or going to seed to attract and support small mammals.

Removal of the woody stem vegetation, starting with the areas closest to the taxiway are imperative. The scrubby edge areas could be cut with a heavy mower, which would push the tree line back by tens of feet. Further management of the taller woody vegetation and trees should also be undertaken, with the goal of removing all trees and shrubs within the perimeter fence over time if possible.

Grass Management

FAA CertAlert No. 98-05 advises that "airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport" (Appendix D). The AWC will be included when future decisions are made regarding turf management.

In order to deter attractiveness to birds, careful selection in the species composition of grasses within the KCQX boundary is necessary. The types of grass selected should be those that produce small or no seeds and are unpalatable to grazing birds to prevent potential food sources for wildlife. Additionally, grasses shall be of a variety that can withstand drought, flooding, and other weather events to ensure turf management is minimal. Fescue and other locally adapted varieties are ideal grass species that grow in a dense, sod-forming manner and can eliminate bare spots and out-compete weeds. These species also grow to substantial heights before going to seed and are generally indigestible to the majority of bird species. KCQX will consult with the AWC about the grass type used within the AOA and will include species that contain the previously mentioned specifications.

Vegetation Height

Vegetation on the airfield will be maintained in accordance with FAA AC 150/5200-33B (see Appendix D). When at all possible, grass will be maintained between 6 to 12 inches (15 to 30 cm) in height consistently throughout the airport. Vegetation in the AOA, as well as tall vegetation along the culverts, drainage systems, fences, equipment, and structures, will be maintained in order to minimize wildlife attractiveness. Maintenance of vegetation will be based upon attractiveness to wildlife and will be at the discretion of the AWC and/or any turf management consultants used by KCQX.

An edge is where two or more habitat types are juxtaposed or when a change in successional stages of vegetation occurs. Edges often attract a larger and more diverse number of wildlife because the variety of food, shelter, and other habitat requirements are closer together. KCQX will minimize habitat edges by maintaining a uniform grass height across the entire airfield when possible.

Bare Areas

There are many bare or sparse areas on the airfield. Bare areas may provide ideal roosting, loafing sites, nesting and foraging grounds for Mourning Doves, Killdeer, American Crows, Ring-billed Gulls, and waterfowl (all observed on site). Bare areas should be eliminated (if possible) and seeded with grass to establish a thick turf as described above, and gravel roads should be paved. The airport's long-range plan should address these conditions and target FAA Airport Improvement (AIP) funds to assist in budgeting for such projects. In the interim, it is best to remove the vegetation with herbicides as necessary, crack seal all surfaces to prevent regeneration, and routinely sweep the gravel and grit from cracked surfaces. Access routes and old surfaces can also be sealed with binding agents to limit available grit.

Ornamental Landscaping

Landscaping installed for aesthetic purposes can also provide habitat for wildlife species. Birds and mammals use shrubs and trees as hunting perches, roosting areas, food sources, nesting substrate, or shelter. The most effective approach to reducing this attraction in the AOA is to remove all unnecessary trees, shrubs, and weeds, and establish a non-seeding or small-seeded endophytic stand of grass. The AWC will review all plantings on KCQX property and continue to exclude those species that produce edible fruits, nuts, and berries if these plants create an attraction to hazardous wildlife. The AWC will monitor the landscaping and landscaping plans for its attractiveness to wildlife and potential conflicts. The interior branches of the trees will be trimmed every 5 years in planted areas to reduce potential roosting sites and restrict thermal roosting cover.

3.3.3 Water Management

Water is extremely attractive to a wide variety of wildlife. Pooled water and wetland habitat generally attract a higher abundance and diversity of wildlife. However, multiple water sources occur in properties surrounding KCQX and some have proven capable of attracting birds known to be very hazardous to flight safety.

Wetlands and Water Sources

No wetlands are found within the perimeter fence at KCQX; however, there were wetlands located off site to the west and east of the airfield. Wetland vegetation should be routinely removed from these ditches (they are not jurisdictional wetland areas) allowing the flow of drainage water to prevent ponding, cover and forage within the ditches. One of these wetland areas is a vernal pool located just outside of the perimeter fence approximately 200 feet southwest of the Runway 06 end. This pool is surrounded by forested upland areas and has a small area of semi-permanent open water. Wetland regulations would prohibit the removal of this habitat, however the Airport should do whatever is possible to reduce the attractiveness of this feature to wildlife, particularly waterfowl.

The extensive ponds, wetlands, and Atlantic Ocean near the airport may attract numerous waterfowl and gulls that pose significant hazards to aircraft operating from the facility. These include White Pond east of KCQX, the Atlantic Ocean to the south, north and east of KCQX, Emery Pond, Lovers Lake, and Oyster Pond, which are significant attractants to waterfowl such as resident and migratory ducks, geese, and gulls. KCQX will continue to work with landowners and agencies via the WHWG to reduce the attractiveness of these sites for wildlife.

The town sewage treatment plant contains some open water areas which can attract waterfowl and other waterbirds to the area, though most of the treatment is through the use of sand filters, limiting the open water present. Nonetheless, management of birds and waterfowl in this area is also important. It is imperative that the Airport include water pollution control facility personnel in the WHWG so that they may be involved in discussions and actions regarding reducing potential wildlife hazards to the Airport associated with the facility.

Temporary Standing Water and Ditches

Periodic standing water (puddles) following heavy rains occurs only in limited areas and likely drain quickly given the nature of the site. Areas that may be temporarily filled with water and attract wildlife in the future will be filled and/or graded by KCQX maintenance. Any of these areas should be identified for filling or draining to prevent standing water from occurring on the airfield. Standing water on aprons should also be addressed and can be reduced by sweeping poorly drained areas. Any remaining areas should be addressed in the long-range planning (Master Plans / Capital Improvement

Plans) to eliminate standing water whenever possible. Any new drainage ditches shall be appropriately sloped and maintained so that water leaves the airfield within a reasonable amount of time (48 hours) and does not pool (see section 2-3.a in AC 150/5200-33B, page 6 for exact language). The AWC and/or authorized personnel will monitor these areas for hazardous wildlife and will haze birds that are attracted to temporary standing water. Currently, water management is very good at KCQX but regular inspections of potential problem areas, especially following heavy rainfall events and during migration periods, shall be implemented by the AWC and/or appointed staff.

3.3.4 Structure Management

Wildlife use structures for roosting, nesting, and as hunting perches. Prior to construction of new buildings or other structures, KCQX personnel will review building plans to consider potential wildlife conflicts in order to avoid costly control measures. Buildings and other structures shall be designed so as not to provide nesting, perching, or roosting sites for birds and should exclude mammals, such as rodents. For existing structures and buildings, anti-perching devices, netting, and other deterrents can be used to discourage wildlife.

Airfield Structures

KCQX has numerous human-made structures, including hangars, terminals, runway signs and lights, street lights, utility line structures, instrument landing system equipment, and other aviation aids that provide perching, roosting, and nesting habitat for birds. When practicable, KCQX will place anti-perching devices on permanent structures that routinely attract hazardous wildlife. KCQX will discourage the nesting of hazardous birds by active harassment and hazing techniques, and removal and/or modification of potential or active nest sites, including trees (under permit).

Abandoned Structures

KCQX will remove structures on the airfield that are no longer used or install wildlife deterrents on structures not necessary for air operations that may be used by birds or mammals as roosting or nesting sites.

Osprey Nest Removal

During the site visit, a pair of adult Osprey (*Pandion haliaetus*) were observed nesting on the radio tower of the adjacent police station directly northwest of George Ryder Road from the airfield. These ospreys were directly observed flying over the airfield at 100 feet AGL carrying fish to the nest and also reported from airport personnel landing on the airfield to eat fish caught in the ocean and ponds south of the airfield. As a large bodied animal, a strike with an osprey can result in catastrophic loss of aircraft and severe bodily harm/death. Osprey abandon their nests in the winter, and it is recommended that the Town consider removing the nest in the winter and installing anti-perching devices to prevent future nest building on this tower.

3.3.5 Food/Prey-base Management

Small mammals and invertebrates, such as mice, rats, insects, and earthworms attract predators and will be managed as needed. The modification and/or management of attractive habitats such as vegetation and abandoned structures will limit shelter and prey availability for potentially hazardous wildlife.

Rodents

Rodent guilds such members of the voles (*Crecetidae*), moles (*Tenrecidae*), and mice and rats (*Muridae*) are abundant throughout this region and most likely have established populations in the immediate surrounding areas and on the airfield itself. Rodents attract a variety of raptors such as red-tailed hawks and kestrels that feed on them. Small mammal populations will be monitored when increased numbers of raptors or coyotes are observed on the airfield. Removal by trapping or poisoning in accordance with Massachusetts law may be conducted by pest management personnel or under contract with a certified pesticide applicator. Rodenticides such as phostoxin are most effective and may be used to eliminate burrowing rodents by placing tablets of the poison into burrows, sealing the openings, and allowing the moisture-activated fumigants to permeate the burrow systems.

Insects and Other Invertebrates

Insects and other invertebrates (e.g., earthworms, grasshoppers, spiders, etc.) may attract a wide variety of birds including gulls and raptors to the Airport. Vegetation management can help to manage insect and invertebrate species, but airport personnel will continue to monitor these populations for problems. If problematic populations of insects are discovered on site, a rapid assessment of the attractant source(s) will be conducted, followed by implementation of one or more of the following measures: 1) Habitat Modification (mowing/removal of flowering plants); 2) Lethal Measures (pesticide application); and/or 3) Operational Measures (communications with pilots, flight re-scheduling/delays to allow for adequate control).

Trash, Debris, and Handouts

Trash and debris can be responsible for attracting numerous bird species, but especially gulls, crows, doves, and blackbirds. In addition, these items attract rats and other small mammals which are, in turn, hunted by large raptors and mesocarnivores, both of which pose significant threats to flight safety. No significant trash/debris issues were observed at KCQX. The Airport is currently managing waste effectively by use of secure containers in common areas on airport property and should continue this practice. In the event that trash is accumulating or blowing onto the airfield, KCQX personnel will remove the trash and identify the source to eliminate future issues. Personnel will continue to conduct trash and foreign object debris collection inspections on the airfield, especially after high winds. The AWC will remind personnel and tenants to close all trash receptacles. The public or airport employees will not be allowed to feed birds or mammals around the airport.

The fishing equipment storage area located east of the Runway 24 end supports populations of potentially hazardous bird species including blackbirds, starlings, grackles, and pigeons that are attracted to trash and food waste. The airport may consider an awareness campaign to inform local owners and patrons that deliberately or unintentionally feeding or attracting such birds can pose a significant aviation hazard. News releases or signs strategically placed in areas of noted concern can limit such hazards. We recommend the Town immediately move this facility to prevent attracting large flocks of foraging birds known to be attracted to such sites.

3.4 LAND-USE CHANGES [14 CFR 139.337(F)(2)(III)]

Certain land uses are considered to be incompatible with normal airport operations. These include waste disposal operations, water management facilities, wetlands, and freshwater/saline ponds, among others. The AWC must be consulted regarding land-use changes within and surrounding the airport to avoid wildlife hazards. Draft FAA AC 150/5200-33C (see Appendix D) will provide technical guidance to KCQX in addressing land-use compatibility issues. The AWC's role

is to provide technical and/or operational assistance in addressing issues or concerns associated with the proposed project or land-use change.

4.0 LAWS AND REGULATIONS [14 CFR 139.337(F)(3)]

Several federal, state, and local laws and regulations protect wildlife and their habitats, thereby impacting wildlife management activities at airports. Wildlife control personnel will be educated about these regulations to ensure compliance. In general, harassing and/or taking most types of wildlife are regulated through permit processes, overseen by federal and state agencies. An annual U.S. Fish and Wildlife Service (USFWS) Migratory Bird Depredation permit and Massachusetts hunting/depredation permits for certain mammals and gamebirds are necessary for a successful wildlife control program at KCQX and will be maintained by the AWC (Appendix E).

4.1 FEDERAL REGULATIONS

4.1.1 FAA Advisory Circulars and CertAlerts

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations. Many of these regulations are codified in the Federal Aviation Regulations (FARs). The FAA publishes advisory circulars to provide airport operators with guidance and information on regulations and requirements that are applicable to FAA customers, the industry, the aviation community, and the public. Advisory Circulars (ACs) in the 150 series deal with airport safety issues, including wildlife hazards. Periodically, the FAA issues CertAlerts to provide additional guidance to FAA inspectors and airport personnel regarding Part 139 Airport Certification and other related issues. FARs, ACs, and CertAlerts are frequently modified or updated, and airport personnel will regularly verify their current status by visiting the FAA website: http://www.faa.gov/. ACs and CertAlerts that pertain to this WHMP can be found below and in Appendix D.

Advisory Circulars

a) AC 150/5200-32B, Reporting Wildlife Aircraft Strikes
b) AC 150/5200-33C (Draft), Hazardous Wildlife Attractants On or Near Airports
c) AC 150/5200-34A, Construction or Establishment of Landfills Near Public Airports
d) AC 150/5200-36B, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports
e) AC 150/5200-28D (Draft), Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans

CertAlerts

a) CertAlert No. 97-09: Wildlife Hazard Management Plan Outline
b) CertAlert No. 98-05: Grasses Attractive To Hazardous Wildlife
c) CertAlert No. 06-07: Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports
d) CertAlert No. 08-01: AC 150/5200-28D Notices to Airmen (NOTAMs) for Airport Operators

4.1.2 Environmental Regulations

Several federal regulations that govern various facets of KCQX's wildlife management activities include the Migratory Bird Treaty Act (MBTA), the Endangered Species Act (ESA), the National Environmental Policy Act (NEPA), the Bald and Golden Eagle Protection Act (BGEPA), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The CFR contains

additional federal regulations that may affect wildlife control activities at KCQX and information on which federal agency is responsible for their implementation. Federal wildlife laws are typically administered by the USFWS and involve primarily migratory birds and threatened and endangered species. Copies of permits obtained by KCQX to control wildlife should be appended to this document.

National Environmental Policy Act (NEPA)

NEPA requires that federal agencies study and disclose the environmental effects of their proposed actions and a reasonable range of alternatives in the appropriate level of assessment. There are three levels of assessment under NEPA. In ascending order, they are: Categorical Exclusion (CATEX), Environmental Assessment (EA), and Environmental Impact Statement (EIS). Specifically, NEPA is triggered when an action requires a permit, entitlement, or funding from a federal agency; when an action is jointly undertaken with a federal agency; or when an action is proposed on federal land.

None of the wildlife management actions are expected to require NEPA review. Unrelated to flight safety, but relevant to the site, there are some communications regarding NEPA at KCQX. Some of the data collected to support the FAA regulations for a proper WHA may support these investigations, such as data on seabirds, or updated population data for referencing during any proposed land use changes or airport infrastructure improvements.

Endangered Species Act (ESA)

Section 9 of the ESA prohibits the "take" of any federally listed endangered species (16 USC 1538[a]). The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532[19]). If it is not possible to design an otherwise lawful land use activity so as to avoid take of a listed species, either directly or through habitat modification, Section 10(a)(1)(B) of the ESA (16 USC 1539[a][1][B]) authorizes the USFWS to issue a permit allowing take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

The FAA would need to consult with the USFWS prior to engaging in any management actions on an airport that could impact protected species or a protected species' habitat. FAA and USFWS consultation would be conducted under Section 7 of the ESA and in accordance with the Memorandum of Agreement (MOA). The MOA establishes procedures necessary to coordinate the agencies missions more effectively while addressing environmental conditions that contribute to wildlife strikes.

No federally-listed species were observed during the 2018 WHA. None are breeding on KCQX property, but numerous species are breeding and foraging immediately adjacent to the AOA on Monomoy National Wildlife Refuge property. Species that rely on the project location (AOA and surrounding 5-mile radius) for critical habitat include:

- Rosette Tern
- Piping Plover
- Red Knot

Migratory Bird Treaty Act (MBTA)

The MBTA of 1918 (16 United States Code [USC] 703–712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the USFWS. Even though the MBTA does not have provisions for allowing unauthorized take, the MBTA recognizes that some migratory birds may be killed by aircraft despite implementing measures to avoid take of birds. Acknowledging that large populations of certain bird species can cause damage to aircraft and threaten human safety, the USFWS by regulation and permit has provided for controlled take of certain species in specific areas at specified times, including for the control of migratory birds at airports.

To manage migratory birds at KCQX, the Airport must obtain and keep updated a USFWS Migratory Bird Depredation Permit, which is required to take or kill a migratory bird, their eggs, parts, and active nests. It is important to note that the Migratory Bird Permit Memorandum of the USFWS specifies that the MBTA does not contain any prohibition that applies to the destruction of an inactive bird nest. KCQX has numerous migratory birds as seen in and around the AOA. Monomoy National Wildlife Refuge, which consists of three islands located just south and east of the airfield, is an important nesting and migratory stopover site for many shorebirds, waterfowl, wading birds, and songbirds. These islands contain nesting grounds for large gulls (Great black-backed gull, Herring gull, and Laughing gull), wading birds (Great egret, Snowy egret, Glossy ibis, and Black-crowned night heron), tern colonies (Common tern, Roseate tern and Least tern, and shorebirds (Piping Plover and American Oystercatcher) which are known to exist within these protected areas. Spring and fall migration seasons bring in thousands of migratory shorebirds and songbirds to the area as they use the islands as resting and feeding grounds. The surrounding waters are also large wintering ground for sea ducks. The combination of the highly productive ocean and shoreline habitats, coupled with the numerous inlets, freshwater wetlands and ponds located throughout the general area creates a robust and diverse habitat for coastal birds. Numerous coastal birds were seen near or crossing over the airport during our limited time at the airport.

Animal Control Act of 1931

The U.S. Department of Agriculture (USDA) can manage wildlife damaging to agricultural interests, other wildlife, or human health and safety, including wildlife hazards to aircraft, under the Animal Control Act of 1931. This act permits the USDA to manage wildlife at KCQX if airport personnel retain the USDA to perform these services. This is only applicable under certain circumstances such as goose round-ups or aid in coyote and/or deer control.

Bald and Golden Eagle Protection Act (BGEPA)

The BGEPA of 1940 (16 USC 668) prohibits taking, possession, and commerce of bald eagles and golden eagles or any part, nest, or eggs without a permit issued by the Secretary of the Interior. “Take” is defined as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.” “Disturb” is defined in 50 CFR 22.3 as the act of agitating or bothering a bald or golden eagle to a degree that causes or is likely to cause, based on the best scientific information available, the following: 1) injury to an eagle; 2) a decrease in its productivity by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment by substantially interfering with normal breeding, feeding, or shelter behavior. Furthermore, “disturb” also includes impacts that result from human-induced alterations occurring near a nest site, which was used previously by eagles, during a time when eagles are absent from the area, and if, when the eagle returns, these alterations agitate or bother an eagle to the extent that it interferes with or interrupts normal breeding, feeding, or sheltering habits, and cause injury, death, or nest abandonment.

In limited situations, the USFWS does have a mechanism available to authorize take of bald and golden eagles pursuant to the BGEPA (Federal Register 74:46836). On November 10, 2009, the USFWS authorized limited take of bald and golden eagles under the BGEPA. Title 50 CFR 22.26 authorizes the issuance of permits to take bald and golden eagles where take is incidental to otherwise lawful activities. Permit provisions under 50 CFR 22.27 allow for intentional take of eagle nests under particular, limited circumstances. KCQX would need to coordinate with the USFWS to obtain a permit to harass eagles, if necessary.

US Army Corps of Engineers

The US Army Corps of Engineers regulations broadly define two important terms, "waters of the United States" for the purpose of Section 404 of the Clean Water Act; and "navigable waters of the United States" for Section 10 of the Rivers and Harbors Act. The Clean Water Act (CWA) establishes the basic structure for regulating discharges of dredged or fill material into the waters of the United States. Activities regulated under the CWA include fill for development, water resource projects, infrastructure development and mining projects. The CWA requires a permit before dredged or fill material may be discharged into waters of the United States including wetlands. For most discharges that will have only minimal adverse effects a general permit may be suitable. The United States Department of the Army (Army) and the United States Environmental Protection Agency (EPA) have enforcement authorities for Section 404 of the CWA. Section 10 of the Rivers and Harbors Act of 1899 requires authorization from the Corps of Engineers for the construction of any structure in or over any navigable water of the United States including coastal and inland waters, lakes, rivers and streams. The law applies to any dredging or disposal of dredged materials, excavation, filling, re-channelization, any obstruction or any other modification of a navigable water of the United States. Structures or work outside the limits of navigable waters of the United States require a Section 10 permit if the structure or work affects the course, location, or condition of the water body. There is overlap between Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act where permits for work requiring approval under both laws are processed simultaneously by the U.S. Army Corps of Engineers.

4.1.3 State Laws and Regulations

The Commonwealth of Massachusetts and the Massachusetts Division of Fisheries and Wildlife (MassWildlife) have laws and regulations that affect wildlife management at airports. State wildlife laws administered by the MassWildlife include jurisdiction over resident and migratory birds, mammals, reptiles, amphibians, and threatened or endangered species in Massachusetts. Since no habitat for breeding is present on the AOA for any of the protected species this is of little concern regarding anything except the ability to "take" these species as necessary for maintaining safe airspace. Further, Massachusetts also has agencies that regulate wetlands and general land disturbance, which would come into play if habitat modification efforts affected wetland areas. These agencies are as follows:

Massachusetts Environmental Policy Act (MEPA)

MEPA regulates larger projects that, in general, affect large areas of land and have specific triggers and thresholds. Many of the triggers and thresholds involve water supplies, traffic generation, electrical supplies, which won't affect the implementation of the WHMP at KCQX. Some areas such as wetlands, rare species, or land disturbance, if the impact is large enough and a state action is involved, may trigger MEPA review.

1) Land.
   a) ENF (Environmental Notification Form) and Mandatory EIR (Environmental Impact Report).
      i. Direct alteration of 50 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.
      ii. Creation of ten or more acres of impervious area.
   b) ENF and Other MEPA Review if the Secretary So Requires.
      iii. Direct alteration of 25 or more acres of land, unless the Project is consistent with an approved conservation farm plan or forest cutting plan or other similar generally accepted agricultural or forestry practices.
      iv. Creation of five or more acres of impervious area.
      v. Conversion of land held for natural resources purposes in accordance with Article 97 of the Amendments to the Constitution of the Commonwealth to any purpose not in accordance with Article 97.
      vi. Conversion of land in active agricultural use to nonagricultural use, provided the land includes soils classified as prime, state-important or unique by the United States Department of Agriculture, unless the Project is accessory to active agricultural use or consists solely of one single family dwelling.
      vii. Release of an interest in land held for conservation, preservation or agricultural or watershed preservation purposes.
      viii. Approval in accordance with M.G.L. c. 121A of a new urban redevelopment project or a fundamental change in an approved urban redevelopment project, provided that the Project consists of 100 or more dwelling units or 50,000 or more sf of non-residential space.
      ix. Approval in accordance with M.G.L. c. 121B of a new urban renewal plan or a major modification of an existing urban renewal plan.

2) State-listed Species under M.G.L. c. 131A.
   a) ENF and Mandatory EIR. None.
   b) ENF and Other MEPA Review if the Secretary So Requires.
      i. Alteration of designated significant habitat.
      ii. Greater than two acres of disturbance of designated priority habitat, as defined in 321 CMR 10.02, that results in a take of a state-listed endangered or threatened species or species of special concern.

3) Wetlands, Waterways and Tidelands.
   a) ENF and Mandatory EIR.
      i) Provided that a Permit is required:
         - alteration of one or more acres of salt marsh or bordering vegetating wetlands; or
         - alteration of ten or more acres of any other wetlands.
      ii) Alteration requiring a variance in accordance with the Wetlands Protection Act.
      iii) Construction of a new dam.
      iv) Structural alteration of an existing dam that causes an expansion of 20% or any decrease in impoundment capacity.
      v) Provided that a Chapter 91 License is required, new non-water dependent use or expansion of an existing non-water dependent structure, provided the use or structure occupies one or more acres of waterways or tidelands.
   b) ENF and Other MEPA Review if the Secretary So Requires.
      i. Provided that a Permit is required:
         - alteration of coastal dune, barrier beach or coastal bank;

- alteration of 500 or more linear feet of bank along a fish run or inland bank;
- alteration of 1,000 or more sf of salt marsh or outstanding resource waters;
- alteration of 5,000 or more sf of bordering or isolated vegetated wetlands;
- New fill or structure or expansion of existing fill or structure, except a pile-supported structure, in a velocity zone or regulatory floodway; or
- alteration of one half or more acres of any other wetlands.

ii. Construction of a new roadway or bridge providing access to a barrier beach or a new utility line providing service to a structure on a barrier beach.

iii. Dredging of 10,000 or more cy of material.

iv. Disposal of 10,000 or more cy of dredged material, unless at a designated in-water disposal site.

v. Provided that a Chapter 91 License is required, new or existing unlicensed non-water dependent use of waterways or tidelands, unless the Project is an overhead utility line, a structure of 1,000 or less sf base area accessory to a single family dwelling, a temporary use in a designated port area, or an existing unlicensed structure in use prior to January 1, 1984.

vi. Construction, reconstruction or expansion of an existing solid fill structure of 1,000 or more sf base area or of a pile-supported or bottom-anchored structure of 2,000 or more sf base area, except a seasonal, pile-held or bottom-anchored float, provided the structure occupies flowed tidelands or other waterways.

310 CMR 10.00: The Wetlands Protection Act (WPA)

The Massachusetts Wetlands Protection Act (MGL Ch. 131, Sec. 40) prohibits any filling, excavation or alteration of the land surface, water levels or vegetation in wetlands, floodplains, riverfront areas or other wetland resource areas. A permit from a local Massachusetts Conservation Commission could allow limited work within a bank, bordering vegetated wetland, land under water bodies and waterways, land subject to flooding, buffer zones or riverfront areas protected under the WPA. Regulations for the Act, policy statement, and guidance documents are issued by the Massachusetts Department of Environmental Protection (DEP) (310 CMR 10.00).

321 CMR 10.00: Massachusetts Endangered Species Act (MESA)

Massachusetts Endangered Species Act establishes a comprehensive approach to the protection of the Massachusetts Endangered, Threatened, and Special Concern species and their habitats. Regulations include provisions for the protection of habitat areas where a Project or Activity would result in the "Take" of any Threatened or Endangered species. Any action that may result in a "Take" of a rare species is subject to review and approval. At the time of the development of this WHMP, Black, Bear, Blue and White Ponds to the southeast of the airfield and Emery Pond to the northeast had habitat designated as containing rare species. These maps are updated periodically and should be reviewed annually for any updates that may affect the airport. There are several exemptions to the rare species regulations, as follows:

(1) Except as otherwise provided in 321 CMR 10.04(2) and (3), no person may take, possess, transport, export, process, sell or offer for sale, buy or offer to buy, nor shall a common or contract carrier knowingly transport or receive for shipment, any plant or animal or part thereof on the state list or federal list; provided, however, that ownership, sale, or purchase of real property on which such plant or animal occurs is not prohibited.

(2) Exemptions.
   (a) In Transit. Any person may transport, possess or sell, in accordance with the terms of any necessary state and federal permit, any plant or animal or part thereof on the state list or federal list, which enters Massachusetts from another state or from a point outside the territorial limits of the United States; provided that such plants

or animals or parts thereof are lawfully possessed outside of Massachusetts; and provided further that such plants or animals are possessed not more than 24 hours in Massachusetts and are transported through Massachusetts while in transit to another destination outside of Massachusetts. For the purposes of 321 CMR 10.04(2)(a), necessary state and federal permits shall include, but not be limited to, those required under M.G.L. c. 131 and the regulations promulgated thereunder and any other state or federal permit required for the possession or sale of species on the state list or federal list.

(b) Plant Propagation and Nursery Sales. A person may take, possess, propagate, buy, or sell all plants or parts thereof on the state list or federal list in cultivation, provided that such plants or parts thereof are lawfully held under other state or federal laws and shall not have been taken from the wild in Massachusetts after March 27, 1991 or after the time of subsequent listing of said species pursuant to 321 CMR 10.03.

(c) Animal Possession Prior to Effective Date. Any person may possess any animal, or part thereof, on the state list or federal list, that was lawfully possessed on March 27, 1991 or at the time of subsequent listing of said species pursuant to 321 CMR 10.03, provided however, that no such animal or part thereof may be sold or traded for value.

(d) Federally Authorized Uses of Species on the Federal List.

i. Any person may, in accordance with all applicable federal laws, possess, sell, buy, or trade any finished products, including but not limited to carvings, clothing, jewelry, and similar goods, made from species on the federal list.

ii. Any person may, in accordance with all applicable federal laws, possess parts of plants or animals on the federal list for ceremonial and religious purposes.

(3) Permits for Taking and Possession of Species. Any violation of a permit is a violation of M.G.L. c. 131A, § 2.

(a) Scientific and Educational Use Permits. The Director may in accordance with provisions of M.G.L. c. 131, § 4 and c. 131A, § 3 permit the taking, possession, purchase, sale, transportation, exportation or shipment of any species on the state list for scientific or educational purposes, including but not limited to scientific collecting, educational use, wildlife rehabilitation, salvage, or bird banding.

(b) Conservation and Management Permit. The Director may in accordance with provisions of M.G.L. c. 131A, § 3 permit the taking of a species on the state list for conservation or management purposes pursuant to the criteria and process set forth in 321 CMR 10.23.

(c) Captive Propagation of State Listed Species.

1. Animals. The Director may permit, in accordance with provisions of M.G.L. c. 131, § 23, and 321 CMR 2.12, the artificial propagation and maintenance of animals on the state list. Such permits may be issued only after the Director approves a written propagation program prepared by the applicant.
2. Plants. The Director may permit the artificial propagation and maintenance of plants on the state list. Such permits may be issued only after the Director approves a written propagation program prepared by the applicant.

(d) Falconry. The Director may permit the possession, barter or sale of species of raptors listed on the state list or federal list which have come from captive propagation in compliance with 321 CMR 3.04 and 50 CFR 21, for the purposes of falconry. The Director may permit the taking of Special Concern species for falconry so long as such taking is in accordance with 321 CMR 3.04 and any additional conditions established by the Director designed to insure that such taking does not jeopardize the security of breeding populations of the species within Massachusetts or outside the state.

(e) Public Health. Except as prohibited by federal law, the Director may permit the removal, capture, or destruction of any state listed species to protect human health during the period and within the geographic area of a public health hazard as certified in writing by the Commissioner of Public Health;

provided that the Director has found that all reasonable efforts have been undertaken to avoid the removal, capture or destruction of such species.

(4) Requests for Permits and Information. Requests for information regarding a Conservation and Management permit should be sent to: Environmental Review, Natural Heritage and Endangered Species Program, Division of Fisheries and Wildlife, Rte. 135, Westborough, MA 01581.

FAA CertAlert 06-07 states, in regard to managing onsite land for State-listed threatened and endangered species, that "new techniques may increase wildlife hazards and be inconsistent with safe airport operations. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety." It also states that "Not all state-listed threatened and endangered species or species of concern pose a direct threat to aviation safety. However, these species may pose an indirect threat and be hazardous because they attract other wildlife species or support prey species attractive to other species that are directly hazardous."

State Wildlife and Plant Conservation

For the purposes of this document, feral and free-roaming dogs, cats, and other domestic animals are considered wildlife because of hazards they pose to aircraft, although these are mostly regulated under municipal laws. Wildlife categories include migratory and resident, game and non-game, and threatened and endangered species. Wildlife control personnel will be trained in species identification so they can determine the relevant laws and necessary permits for those species they intend to manage. No rare plant communities are present at KCQX within the airport fence; however, some state listed species are associated with the coastal ponds southeast of the airfield.

Birds

Resident airport songbirds (Black-capped Chickadee, Blue Jay, House Sparrow, Northern Cardinal, Red-winged Blackbird, Gray Catbird) are not as much of a concern as other species; however, the location of numerous trees and shrubs provides many nest sites close to the airfield, and there is enough vegetation on the airfield to host a sizeable population of songbirds. The medium to large sized waterfowl (Mallard, Canada Goose, Brant, Double-crested Cormorant), wading birds (Great Blue Heron, Black-crowned Night-Heron, Great Egret) and gulls (Herring Gull, Ring-billed Gull, Great Black-backed Gull, Laughing Gull) found in areas fairly close to the Airport (White Pond) pose the largest threat because when they take off from nearby waterbodies and head toward the airfield, they cross the airspace at a relatively low altitude, where planes are taking off and landing. Obvious flight patterns were found during our visits where large flocks of gulls and geese loaf in nearby waterbodies and travel to the shoreline area. Reports from airport personnel confirmed that during foggy and rainy conditions, large groups of gulls also loaf on the airfield and runway.

Other nearby areas (cemetery, transfer station, parking lots) are seen as an issue because they attract flocking birds (starlings) or medium sized birds (gulls, crows, ducks and geese). The most immediate concern relative to birds is the fishing equipment storage area east of the Runway 24 end on airport property. Here, Red-tailed Hawks were repeatedly observed foraging on small mammals and flying through the Runway 24 approach. This area also attracts American Crow, European Starling, Mourning Dove, gulls and vultures, which forage on the fish and ocean waste. In the fall, flocking birds such as European Starlings could roost en-masse within vegetation on or adjacent to the airport. Wild turkeys were also reported on the airfield, and efforts to minimize the presence of these large, slow birds within the AOA should be undertaken.

The Commonwealth of Massachusetts recognizes and accepts the Federal MBTA depredation permit to take migratory bird species. However, a state permit may be required from MassWildlife to take resident or non-migratory birds and introduced game mammals. Some migratory birds identified in depredation orders can be taken when committing or about to commit damage (50 CFR 21). Consequently, KCQX personnel shall check with the Commonwealth of Massachusetts prior to conducting wildlife control measures. All personnel applying wildlife control measures are required to have hunting and trapping licenses for taking regulated species that are not within the state or federal depredation permits.

European starlings, Rock pigeons, House sparrows, and Mute swans as well as upland gamebirds such as grouse, turkey and quail are classified as non-migratory and are not protected under the MBTA. No federal permit is required to take them (also see 50 CFR 21.41). A USFWS Migratory Bird Depredation Permit allows control over migratory non-game birds, provided that species are not listed as federal or state threatened or endangered and are listed on the depredation permit. MassWildlife does not require a permit to kill or destroy the nests and eggs for European starlings, Rock pigeons, and House sparrows but requires permits for Mute Swan, grouse, turkey and quail. A MassWildlife hunting license is required for the control of resident and migratory game birds such as Anatidae (ducks, mergansers, geese, and brant), Rallidae (rails and American coot) and Scolopacidae (snipe and woodcock). Timing and length of hunting seasons, the number of birds that can be taken, and hunting methods are strictly regulated. Refer to 321 CMR 3.00: Hunting: https://www.mass.gov/regulations/321-CMR-300-hunting#-3-01-1-public-shooting-grounds-and-wildlife-management-areas for more information.

As stated above, FAA CertAlert 06-07 clearly recognizes that flight safety is the primary objective at all airports and that habitat or population management of a state-listed species cannot be conducted if it compromises this primary objective.

Mammals

Numerous mammals were found at KCQX during the WHSV. The most prominent are white tailed deer (several living within the perimeter fence), eastern coyote and eastern cottontail. Medium sized mammals such as raccoon, opossum, and skunk are also likely present. Small mammals such as eastern chipmunk, grey squirrel, red squirrel, short tailed shrew, deer mouse, meadow vole, and house mouse are also confirmed present. The small mammals do not pose a direct strike risk; however, their presence attracts coyotes, foxes and raptors, which do. Eastern cottontail was found in abundance, particularly in the scrubby edge ecotone between the field and forested area, which are extensive on the airfield. Removal of these shrubby edges can greatly reduce the habitat available to this species. Removal of the deer and coyotes will require depredation permits and repair of the fencing will help deter repopulation of the areas within the fence. Habitat modification of the forested areas within the fence line should be undertaken to make the AOA and areas within the fence line not conducive to these species. Deer, fox, coyote, gray squirrel, eastern cottontail, raccoon, opossum, weasel, and skunk may be hunted/trapped throughout Massachusetts with valid licenses and permits. Fox, coyote, gray squirrel, eastern cottontail, raccoon, opossum, weasel, and skunk may be taken only by trapping during the shotgun deer season as specified in 321 CMR 3.02(4)(b)3.a. Timing and length of hunting seasons, the number of wildlife that can be taken, and hunting methods are strictly regulated. Refer to 321 CMR 3.00: Hunting: https://www.mass.gov/regulations/321-CMR-300-hunting#-3-01-1-public-shooting-grounds-and-wildlife-management-areas for more information.

Reptiles and Amphibians

Due to the sandy and upland nature of the Airport, reptile and amphibian use of the AOA is expected to be very limited. Turtle nesting from nearby waterbodies is possible. Large bodied turtles, such as snapping turtles, could potentially be found along the taxiway or runway edges in May or June (nesting season). Small snakes are present within the forested areas on and near the airport, and while not a strike hazard, snakes are a food source for larger birds and mammals. Amphibians (salamanders and frogs) associated with the vernal pool to the southwest of the airfield are unlikely to be found within the xeric open airport habitats. According to 321 CMR 10.90, in Massachusetts no person shall disturb or harass any species of amphibian or reptile listed as endangered, threatened, or special concern (Spotted Salamander, Four-toed Salamander, Spring Salamander, Northern Leopard Frog, Spotted Turtle, and Eastern Hognosed Snake), except as authorized in a management permit. Common Snapping Turtles, American Bullfrogs, Green Frogs, Pickerel Frogs and Wood Frogs may be taken by hand, or hand-held dip net throughout Massachusetts with valid licenses and permits. Timing and length of hunting seasons, the number of wildlife that can be taken, and hunting methods are strictly regulated. Refer to 321 CMR 3.00: Hunting: https://www.mass.gov/regulations/321-CMR-300-hunting#-3-01-1-public-shooting-grounds-and-wildlife-management-areas for more information.

4.1.4 Regional and Local Regulations

Town of Chatham Conservation Commission

The Town of Chatham Conservation Commission has a local wetland protection bylaw which regulates work in or near (50-200') wetland resource areas including coastal and inland wetlands and areas adjacent to an upland resource. Any work, including habitat modification or vegetation removal, in these areas needs to be coordinated and potentially permitted through this agency. Refer to the Town of Chatham Conservation Commission website for more information: https://www.chatham-ma.gov/conservation-commission.

Chatham Herbicide

The Town of Chatham's Regulation on the Content and Application of Fertilizer Used in the Town of Chatham was adopted on November 19, 2014. This Regulation allows for a reduction of nitrogen and phosphorus going into the Town's waters and wetlands by means of an organized system of education, certification, standardization and regulation of the practice of fertilizer application. The Board of Health, recognized that excessive, inappropriate or improper use of fertilizers is part of the overall problem of nutrient pollution, promulgates the following regulation regarding the use of fertilizer on turf. The Regulation shall apply to turf and to the application of nitrogen and phosphorus containing fertilizer and other materials applied to turf within the Town and is not intended to eliminate the use of fertilizer but only to eliminate excess amounts of phosphorus and nitrogen from reaching our surface water and groundwater. This Regulation adopts the Best Management Practices (BMP) as the normal operating procedures for turf management throughout the Town. Fertilizer Applicators should abide by the Best Management Practices and Performance Standards for Fertilizer Applicators of the regulations when applying fertilizer in the Town of Chatham. Refer to the Town of Chatham website for more information on standards of performance of this regulation:
https://www.chatham-ma.gov/sites/chathamma/files/uploads/final_fertilizer_regs_11-19-14.pdf

In a December 2018 town meeting, the Town of Chatham Selectmen voted to stop using glyphosate products (Roundup) on town-owned land. The change does not apply to private property landowners, but this decision serves to set a good example for private property landowners to consider alternative ways to control weeds.

4.1.5 Pesticides

Federal Insecticide, Fungicide, and Rodenticide Act

The U.S. Environmental Protection Agency oversees the registration, labeling, classification, and use of pesticides, as stated in this Act. Persons using restricted-use pesticides, applying any pesticides to the land of another, or applying any pesticides for hire, must be a Certified Applicator, or working under the direct supervision of a Certified Applicator, and then may only use pesticides covered by the Certified Applicator's certification.

Massachusetts Pesticide Control Act (MPCA, Chapter 132B of the Massachusetts General Laws)

The Federal Insecticide, Fungicide and Rodenticide Act also allows states to have primary enforcement responsibility. The Massachusetts Department of Agricultural Resources, Crop and Pest Services Division is responsible for the regulation of all substances or mixtures of substances that prevent, destroy, repel or mitigate pests (such as mice, ants, termites, etc). Pest Management within the Department of Agricultural Resources carries out these regulatory responsibilities. For example, if KCQX uses a rodenticide to manage the rats and other rodents, then KCQX and its contractor will comply with the Federal Insecticide, Fungicide, and Rodenticide Act and the Massachusetts Pesticide Control Act.

5.0 RESOURCES FOR IMPLEMENTATION OF THE PLAN [14 CFR 139.337(F)(4)]

Habitat management and wildlife control supplies can be purchased from several companies. An adequate supply of equipment for wildlife management will be kept on hand at KCQX for use by trained personnel.

5.1 AUTHORIZED AIRPORT SUPPLIES

KCQX will stock designated wildlife response vehicles (e.g., USDA WS and Airport Ops vehicles) with the supplies listed below to facilitate a timely response to potential wildlife hazards. Personnel responding to wildlife hazards will maintain radio communications with the common traffic advisory frequency (CTAF). Patrols must operate within the air movement area according to FAA guidelines. Basic supplies to be maintained in Airport vehicles may include the following:

a) Field guides for wildlife identification
b) Binoculars
c) Pyrotechnic launcher
d) Pyrotechnic ammunition (e.g., screamers, bangers, etc.)
e) Personal protective equipment (gloves, eye protection, ear protection)
f) Fire extinguisher
g) Shovels and buckets
h) Latex gloves
i) Alcohol wipes
j) Garbage and plastic bags
k) Daily wildlife report forms
l) Birdstrike collection kit
m) Shotgun and ammunition (must be kept in locked storage cabinet when not in use)
n) Pellet gun and ammunition
o) Laser deterrent device (with special FAA permit only)
p) First aid kit

The following list of supplies that are included in the FAA-recommended supplies may be added to the above list of basic supplies that KCQX will maintain in Airport vehicles.

a) Snares, cages, and traps as appropriate
b) Radios for wildlife hazing communication
c) Wildlife Hazard Management at Airports, FAA and USDA Services manual
d) Guidebook for Addressing Aircraft/Wildlife Hazards at Airports, Airport Cooperative Research Program Report 32
e) Field guides for local wildlife identification
f) FAA Form 5200-7, Bird/Other Wildlife Strike Report
g) Night scope attachment for hunting mammals
h) High powered spot light for nighttime hunting activities

5.2 SOURCES OF SUPPLIES

Sources of wildlife management supplies and equipment can be found in Appendix F.

5.3 FEDERAL AVIATION ADMINISTRATION RESOURCES

CertAlerts and Advisory Circulars (see Section 4.1.1 for relevant document titles).

Memorandum of Understanding

- Memorandum of Understanding between the United States Department of Transportation, Federal Aviation Administration, and the United States Department of Agriculture, Animal and Plant Health Inspection Services, Wildlife Services.
- Memorandum of Agreement between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft–Wildlife Strikes.

5.4 REGULATORY AGENCY CONTACT INFORMATION

Federal Aviation Administration
Boston Flight Standards District Office
1200 District Ave.
Burlington, Massachusetts 01803
Main No.: (781) 238-7500
FAX: (781) 238-7550

U.S. Fish and Wildlife Service (Permitting)
Northeast Regional Office
U.S. Fish and Wildlife Service
300 Westgate Center Drive
Hadley, MA 01035-9587
Main No.: (413) 253-8200
FAX: (413) 253-8308

Massachusetts Division of Fisheries and Wildlife
MassWildlife Southeast District office
195 Bournedale Road,
Buzzards Bay, MA 02532
Main No.: (508) 759-3406
FAX: (508) 759-0381

5.5 RELATED INFORMATION

Federal Aviation Administration (FAA):

a) http://wildlife-mitigation.tc.faa.gov/public_html/index.html
b) http://www.faa.gov/faadocs.htm

6.0 PROCEDURES TO BE FOLLOWED DURING AIR CARRIER OPERATIONS [14 CFR 139.337(F)(5)]

6.1 RESPONSIBLE PERSONNEL FOR IMPLEMENTING PROCEDURES [14 CFR 139.337(F)(5)(I)]

Personnel involved in wildlife management consist of the AWC, airport managers, USDA WS, and other personnel trained in control techniques (i.e., firearms, pyrotechnics, or trapping techniques), wildlife identification, and safe operations. These individuals will monitor and respond to wildlife hazards on the airfield to the extent practicable, while maintaining a secure environment for safe airport operations. All personnel will be equipped with radios and will maintain clear communications with the common traffic advisory frequency. As part of the daily protocol, USDA WS and Airport Operations personnel will be responsible for conducting all physical inspections of movement areas, the perimeter fence, and other areas critical to wildlife hazard management. Airport staff and pilots will enter wildlife strike data on FAA Form 5200-7 or submit the information electronically at:

http://wildlifemitigation.tc.faa.gov/wildlife/strikenew.aspx. Further details on the responsibilities of airport personnel implementing procedures are in Section 2.0 of this document.

Airport Management are required to report wildlife activity to the AWC and pilots. Pilots are responsible for reporting all unsafe conditions on or near an airport, including birds that could pose a threat to aircraft safety. If pilots observe birds that could present a potential strike hazard on the ground or even in flight, they should issue a pilot report (PIREP) so that Airport Management can warn other pilots or information can be relayed through direct voice communications, Automatic Terminal Information System (ATIS), NOTAMs or other networks. Blanket or generic advisories will not be issued; rather, specific language that describes the hazard will be issued and terminated when the threat is abated. The fixed-base operator (FBO) should inform pilots and other personnel of the importance of reporting all wildlife strikes to Airport Management through appropriate FAA channels to ensure that all data, including species information, are recorded. Tenants are responsible for notifying the AWC/Airport Management of any hazardous wildlife or attractants.

6.2 PHYSICAL INSPECTIONS OF THE MOVEMENT AREA AND OTHER AREAS CRITICAL TO WILDLIFE HAZARD MANAGEMENT [14 CFR 139.337(F)(5)(II)]

While performing on-airfield duties, AO and USDAS WS personnel will monitor the AOA for hazardous wildlife and attractants. KCQX will record any observations of hazardous wildlife or any management actions. KCQX will monitor wildlife during inspections, take abatement action as required, and enter pertinent data in records stored by the AWC. Maintenance personnel will be on call for vegetation management, fence repair, and refuse removal as needed.

6.3 WILDLIFE HAZARD CONTROL MEASURES [14 CFR 139.337(F)(5)(III)]

Wildlife management activities will be conducted on the Airport as needed. KCQX will give priority to dispersing or removing waterbirds, gulls, wading birds, shorebirds, Columbids, and ground foragers from the taxiways and runways when they are observed. However, each situation will be evaluated and managed in the appropriate manner by the AWC or its appropriate designee (currently USDA WS).

6.3.1 Bird Control

KCQX will aggressively harass hazardous birds using methods such as vehicles and pyrotechnics. If non-lethal dispersal is not effective, KCQX may shoot hazardous birds that fail to depart the movement area. KCQX and the FAA will also remove inactive and active bird nests from trees, buildings, FAA structures, and other structures. KCQX will obtain the necessary permits to conduct lethal management actions; no permits are required for non-lethal methods. All dispersals and removals will be recorded in the wildlife records database.

6.3.2 Mammal Control

AWC, USDA WS, or other trained personnel will attempt to remove all mammals from the airport immediately upon detection. KCQX will prevent animals from digging under the perimeter fence and fix other breach points. Persistent animals may need to be relocated or lethally removed. The most effective method for lethally removing these species is by shooting them at night under conditions of state depredation permits if required.

6.3.3 Harassment and Deterrent Tools

The following is a list of nonlethal methods KCQX may use for harassing and/or deterring hazardous wildlife from the airfield. Other methods may be employed as developed or if conditions warrant.

a) Vegetation management
b) Exclusion
c) Pyrotechnics harassment
d) Vehicle harassment
e) Sirens
f) Shooting harassment

6.3.4 Recording Wildlife Control Measures, Observations, and Strikes

USDA WS personnel will continue to document live and dead animals and potential hazards such as fence breaches and rodent holes. AWC/AO/USDA WS personnel will also continue to record any wildlife management actions conducted by

airport maintenance and operations personnel. Currently, KCQX operations personnel enter the management and wildlife data into the Airport Management database. Airport Management will use these data to determine whether management actions are reducing strikes or animal movements onto the airfield.

6.4 COMMUNICATION BETWEEN WILDLIFE CONTROL PERSONNEL AND LOCAL AIR TRAFFIC CONTROL [14 CFR 139.337(F)(5)(IV)]

Effective communication between wildlife control personnel and air traffic control are essential for the implementation of this WHMP and for the safety of air traffic at KCQX. All personnel conducting wildlife management will carry radios and will have proper training in communicating via the common traffic advisory frequency. If an immediate wildlife hazard exists that may affect the safety of air traffic, the AWC or appropriate designee will coordinate with Airport Management and, if necessary, delay arriving or departing air traffic until the threat is removed. Although the Airport Manager cannot monitor all wildlife hazards, Airport personnel should notify Airport Management immediately if they or a pilot observes any hazards. Advisories will be issued in accordance with FAA Order 7110.65 through direct voice communications, ATIS, or other networks. Generic or blanket advisories shall not be issued in lieu of specific hazard advisories, including the type of bird, location, and direction of movement, if known.

The Airport Management will provide any new FBOs with important information that may be posted within their buildings. KCQX Management will communicate with staff regarding any wildlife strikes or observations of wildlife activity at the airfield. Airport personnel will record any hazardous wildlife observations and wildlife strikes reported by pilots in the wildlife section of the Airport Management database. KCQX personnel will also issue NOTAMs when wildlife cannot be removed or otherwise mitigated.

7.0 EVALUATION AND REVIEW OF THE WILDLIFE HAZARD MANAGEMENT PLAN [14 CFR 139.337(F)(6)]

The WHMP will be reviewed annually and in any event where special circumstances exist, such as a triggering event as defined in 14 CFR 139.337 (b)(1-3). Modifications will be made as necessary to ensure that the plan reflects the current conditions at the airport. The WHWG and those who implement the WHMP are encouraged to contribute in the review and evaluation process. The WHMP will be evaluated by the WHWG on its effectiveness at reducing wildlife strikes at the airport and the status of wildlife management projects and their competition date, as provided in Table 1. The WHWG will meet at least once per year, but the group may convene more often if situations warrant, as determined by the AWC.

7.1 EFFECTIVENESS OF THE PLAN [14 CFR 139.337(F)(6)(I)]

The WHA completed by GZA provided a baseline for wildlife occurrences and uses in and around KCQX; however, the wildlife uses and movements in the area will change as conditions change. KCQX will track the changes in wildlife uses and movements in order to adapt management techniques.

The AWC or a subcontractor will continue monitoring wildlife activity at KCQX on a regular basis to determine whether the numbers of wildlife and strikes decrease as a result of implemented wildlife management practices. KCQX should conduct wildlife surveys of the airfield at least once during each of the four seasons to document the seasonal variation of wildlife abundance each year in perpetuity. The wildlife survey methodology should mimic that of the WHA. The wildlife survey data will be managed in a database that is accessible to the AWC. The AWC will review the data regularly to identify changes in wildlife uses and adapt management actions as necessary. To supplement the wildlife surveys, the FAA strike database will be reviewed annually and the list of KCQX reported strikes will be updated annually in Appendix A. The Airport Wildlife Hazard Continual Monitoring and Report Checklist is provided in Appendix G.

7.2 ASPECTS OF THE WILDLIFE HAZARDS TO BE REEVALUATED [14 CFR 139.337(F)(6)(II)]

The AWC will maintain a database of wildlife strikes and wildlife observations on KCQX. This information will reveal trends and identify any wildlife increases or changes. This information will be most valuable when the WHWG has their yearly meeting to discuss changes to the WHMP. At this time any modifications to the wildlife management and methods can be implemented. Data will be entered into the Airport Management database by Airport Management on a consistent basis. In particular, KCQX will review trends of wildlife observed on the AOA, requests for wildlife dispersal by ATCT, pilots, or others and any increase in the number of strikes.

7.2.1 Quarterly Wildlife Studies

In addition to continual monitoring and hazard response efforts, and if determined necessary by Airport Management, KCQX should conduct or hire a professional wildlife biologist to conduct quarterly wildlife surveys. These surveys will follow the basic protocols set forth for the WHA process to enable direct comparison to the baseline data provided in the 2019 WHSV (data collected in the 2018 calendar year). The completion of these quarterly studies may allow for up to date review of the effectiveness of the current WHMP and, thus, will aid in determining when the WHMP may need to be revised.

8.0 TRAINING PROGRAM [14 CFR 139.337(F)(7)]

Training is an essential component for all individuals who are involved with the WHMP. The personnel working with wildlife deterrence and mitigation will be trained in the following: species identification, basic life histories and behaviors, laws and regulations, record keeping and strike reporting, control methods, communications procedures, and various regional statistics.

Wildlife control personnel will receive annual training from an FAA-approved airport wildlife biologist, as outlined in AC 150/5200-36A. In general, the training will review identifying and mitigating wildlife hazards at airports, including an overview of laws associated with wildlife control, techniques used for prey reduction, effective use of firearms and pyrotechnics, and wildlife identification and dispersal techniques. Airport communications and driving training will also be provided to all employees involved in wildlife control operations that may require them to operate in the aircraft operations area. A record of training will be maintained with other training documents as part of the employees' initial and recurrent training. FAA Hazard Biologists who conduct the training events shall submit for record-keeping documentation of training following completion.

Appendix A

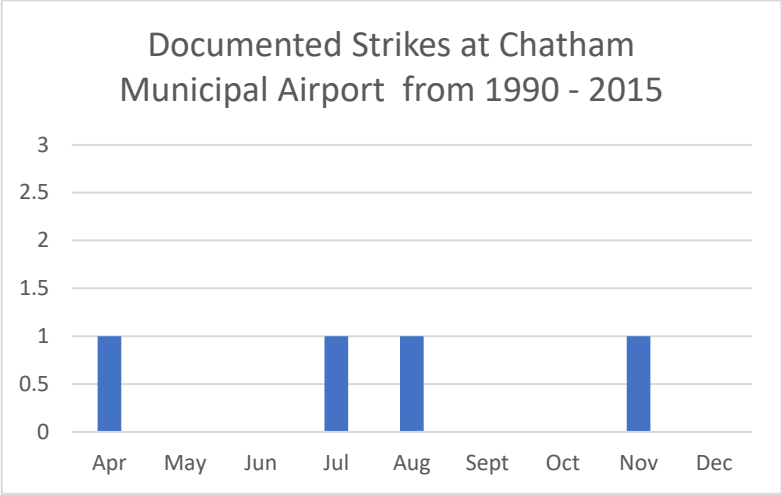
ANNUALLY REPORTED WILDLIFE STRIKES AT
KCQX AIRPORT

Date	State	Airport	Airline	Aircraft	Engine	Species	Damage
11/07/2013	MA	CHATHAM MUNICIPAL ARPT	CAPE AIR	C-402	A	Gulls	N
04/30/2011	MA	CHATHAM MUNICIPAL ARPT	BUSINESS	PILATUS PC12	C	Gulls	N
08/01/1997	MA	CHATHAM MUNICIPAL ARPT	BUSINESS	PA-60 600	A	Gulls	M
07/21/1994	MA	CHATHAM MUNICIPAL ARPT	BUSINESS	C-172	A	Gulls	S

Figure 1. Strike History for CQX from 1 Jan 1990 to 1 Jan 2018

From January 1990 through January 2018, a total of 4 reported bird strikes to aircraft were reported at KCQX. Of these reported bird strikes, 100% involved medium sized birds (gulls), with no mammal strikes reported. Peak incidence occurrence is post fledging and fall migration (late summer/fall, see graph below). After interviews with management and operations, additional strikes were noted that have not been entered into the FAA Wildlife Strike Database. Similar to national averages, most strikes at KCQX occurred below 900 feet AGL. Despite very few (formally and informally) recorded strikes, the wildlife hazards at KCQX are very serious, considering the species involved**.**

Figure 2. Strike history by month per the FAA Wildlife Strike Database



Appendix B

AIRPORT ORGANIZATIONAL CHART

KCQX Organization Chart

Appendix C

FORM FAA 5200-7

Form Approved OMB NO. 2120-0045
3/31/2010

U.S. Department of Transportation
Federal Aviation Administration

BIRD / OTHER WILDLIFE STRIKE REPORT

1. Name of Operator

2. Aircraft Make/Model

3. Engine Make/Model

4. Aircraft Registration

5. Date of Incident
____/____/____
Month Day Year

6. Local Time of Incident
☐ Dawn ☐ Dusk ___ HR ___ MIN
☐ Day ☐ Night ☐ AM ☐ PM

7. Airport Name

8. Runway Used

9. Location if En Route (Nearest Town/Reference & State)

10. Height (AGL)

11. Speed (IAS)

12. Phase of Flight
☐ A. Parked
☐ B. Taxi
☐ C. Take-off Run
☐ D. Climb
☐ E. En Route
☐ F. Descent
☐ G. Approach
☐ H. Landing Roll

13. Part(s) of Aircraft Struck or Damaged

	Struck	Damaged		Struck	Damaged
A. Radome	☐	☐	H. Propeller	☐	☐
B. Windshield	☐	☐	I. Wing/Rotor	☐	☐
C. Nose	☐	☐	J. Fuselage	☐	☐
D. Engine No. 1	☐	☐	K. Landing Gear	☐	☐
E. Engine No. 2	☐	☐	L. Tail	☐	☐
F. Engine No. 3	☐	☐	M. Lights	☐	☐
G. Engine No. 4	☐	☐	N. Other: (Specify)	☐	☐

14. Effect on Flight
☐ None
☐ Aborted Take-Off
☐ Precautionary Landing
☐ Engines Shut Down
☐ Other: (Specify)

15. Sky Condition
☐ No Cloud
☐ Some Cloud
☐ Overcast

16. Precipitation
☐ Fog
☐ Rain
☐ Snow
☐ None

17. Bird/Other Wildlife Species

18. Number of birds seen and/or struck

Number of Birds	Seen	Struck
1	☐	☐
2-10	☐	☐
11-100	☐	☐
more than 100	☐	☐

19. Size of Bird(s)
☐ Small
☐ Medium
☐ Large

20. Pilot Warned of Birds ☐ Yes ☐ No

21. Remarks *(Describe damage, injuries and other pertinent information)*

DAMAGE / COST INFORMATION

22. Aircraft time out of service:
_____ hours

23. Estimated cost of repairs or replacement (U.S. $):
$

24. Estimated other Cost *(U.S. $) (e.g. loss of revenue, fuel, hotels):*
$

Reported by *(Optional)*

Title

Date

Paperwork Reduction Act Statement: The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. We estimate that it will take approximately 6 minutes to complete the form. The information collected is voluntary. Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0045. Comments concerning the accuracy of this burden and suggestions for reducing the burden should be directed to the FAA at: 800 Independence Ave SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ABA-20

U.S. Department
of Transportation

**Federal Aviation
Administration**

800 Independence Ave. S.W.
Washington, D.C. 20561

Official Business
Penalty for Private Use, $300

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 12438 WASHINGTON D.C.

POSTAGE WILL BE PAID BY FEDERAL AVIATION ADMINISTRATION

Federal Aviation Administration
Office of Airport Safety and Standards, AAS-310
800 Independence Avenue, SW
WASHINGTON, DC 20591

FOLD AND TAPE HERE

Directions for FAA Form 5200-7
Bird/Other Wildlife Strike Report

1. Name of Operator - This can be an airline (abbreviations okay - UAL, AAL, etc.), business (Coca Cola), government agency (Police Dept., FAA) or if a private pilot, his/her name.
2. Aircraft Make/Model - Abbreviations are okay, but to include the model (e.g. B737-200).
3. Engine Make/Model - Abbreviations are allowed (e.g., PW 4060, GECT7, LYC 580).
4. Aircraft Registration - This means the N# (for USA registered aircraft).
5. Date of Incident - Give the local date, not the ZULU or GMT date.
6. Local Time of Incident - Check the appropriate light conditions and fill in the hour and minute local time and check AM or PM or use the 24 clock and skip AM/PM.
7. Airport Name - Use the airport name or 3 letter code if a US airport. If a foreign airport, use the full name or 3 letter code and location (city/country).
8. Runway used - Self explanatory.
9. Location if En Route - Put the name of the nearest city and state.
10. Height AGL - Put the feet above ground level at the time of the strike (if you don't know, use MSL and indicate this). For take-off run and landing roll, it must be 0.
11. Speed (IAS) - Speed at which the aircraft was traveling when the strike occurred.
12. Phase of Flight - Phase of flight during which the strike occurred. Take-off run and landing roll should both be 0 AGL.
13. Part(s) of Aircraft Struck or Damaged - Check which parts were struck and damaged. If a part was damaged but not struck indicate this with a check on the damaged column only and indicate in comments (#21) why this happened (e.g., the landing gear might be damaged by deer strike, causing the aircraft to flip over and damage parts not struck by deer).
14. Effect on Flight - You can check more than one and if you check (Other", please explain in Comments (#21).
15. Sky condition - Check the one that applies.
16. Precipitation - You may check more than one.
17. Bird/Other Wildlife Species - Try to be accurate. If you don't know, put unknown and some description. Collect feathers or remains for identification for damaging strikes.
18. Number of birds seen and/or struck - check the box in the Seen column with the correct number if you saw the birds/other wildlife before the strike and check the box in the Struck column to show how many were hit. The exact number, can be written next to the box.
19. Size of Bird(s) - Check what you think is the correct size (e.g. sparrow = small, gull = medium and geese = large).
20. Pilot Warned of Birds - Check the correct box (even if it was an ATIS warning or NOTAM).
21. Remarks - Be as specific as you can. Include information about the extent of the damage, injuries, anything you think would be helpful to know. (e.g., number of birds ingested).
22. Aircraft time out of service - Record how many hours the aircraft was out of service.
23. Estimated cost of repairs or replacement - This may not be known immediately, but the data can be sent at a later date or put down a contact name and number for this data.
24. Estimated other cost - Include loss of revenue, fuel, hotels, etc. (see directions for #23).
25. Reported by - Although this is optional, it is helpful if questions arise about the information on the form (a phone number could also be included).
26. Title - This can be Pilot, Tower, Airport Operations, Airline Operations, Flight Safety, etc.
27. Date - Date the form was filled out.

Appendix D

FAA GUIDANCE AND REGULATIONS

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Reporting Wildlife Aircraft Strikes | **Date:** 5/31/2013 | **AC No:** 150/5200-32B
Initiated by: AAS-300 | **Change:**

1. Purpose.

This Advisory Circular (AC) explains the importance of reporting collisions between aircraft and wildlife, more commonly referred to as wildlife strikes. It also explains recent improvements in the Federal Aviation Administration's (FAA's) Bird/Other Wildlife Strike Reporting system, how to report a wildlife strike, what happens to the wildlife strike report data, how to access the FAA National Wildlife Strike Database (NWSD), and the FAA's Feather Identification program.

2. Applicability.

The FAA provides the standards and practices in this AC as guidance for all public-use airports, aviation industry personnel (e.g., Air Traffic Control, pilots and airline personnel, and engine manufacturers), and others who possess strike information. The FAA strongly recommends that the above aviation representatives and others possessing strike information participate in reporting.

3. Cancellation.

This AC cancels AC 150/5200-32A, Reporting Wildlife Aircraft Strikes, dated December 22, 2004.

4. Background.

The FAA has long recognized the threat to aviation safety posed by wildlife strikes. Each year in the United States, wildlife strikes to U.S. civil aircraft cause about $718 million in damage to aircraft and about 567,000 hours of civil aircraft down time. For the period 1990 to 2011, over 115,000 wildlife strikes were reported to the FAA. About 97 percent of all wildlife strikes reported to the FAA involved birds, about 2 percent involved terrestrial mammals, and less than 1 percent involved flying mammals (bats) and reptiles. Waterfowl (ducks and geese), gulls, and raptors (mainly hawks and vultures) are the bird species that cause the most damage to civil aircraft in the United States, while European starlings are responsible for the greatest loss of human life. Vultures and waterfowl cause the most losses to U.S. military aircraft.

Studies have shown that strike reporting has steadily increased over the past two decades; however, strike reporting is not consistent across all stakeholders (pilots, air carriers, airport operators, air traffic control personnel, etc.) in the National Airspace System. Although larger 14 CFR Part 139 airports and those with well-established wildlife programs have improved strike reporting, there is a wide disparity in overall reporting rates between Part 139 airports and general aviation (GA) airports in the National Plan of Integrated Airport Systems (NPIAS). Less than 6 percent of total strike reports come from NPIAS GA airports, whose reporting rates average less than 1/20th the rates at Part 139 airports. Most Part 139 airports (97 percent) have

reported at least one strike into the database through 2011, while only 43 percent of NPIAS GA airports have documented a strike into the database.

While overall reporting rates are much higher for strikes at Part 139 airports than at NPIAS GA airports, there is also a major disparity in reporting rates among Part 139 airports. Larger Part 139 airports, especially those with well-established wildlife hazard management programs, have reporting rates about four times higher on average compared to other Part 139 airports. The pattern of disparity in strike reporting among Part 139 airports is also found in reporting rates for commercial air carriers. However, the FAA believes the current voluntary reporting rate is adequate to track national trends in wildlife strikes, to determine the hazard level of wildlife species that are being struck, and to provide a scientific foundation for FAA policies and guidance about the mitigation of risk from wildlife strikes.

Ultimately, improvements can be made in the quantity and quality of strike reporting. In addition to the above-mentioned gaps in reporting to the NWSD, there is an overall bias toward the reporting of damaging strikes compared to non-damaging strikes, especially for NPIAS GA airports and certain Part 139 airports. The quality of data within a strike report can also be improved by providing as much information as possible, including species struck and cost of strike.

The FAA has initiated several programs to address this important safety issue, including the collection, analysis, and dissemination of wildlife strike data. The effectiveness of a Wildlife Hazard Management Plan (WHMP) to reduce wildlife hazards both on and near an airport and the reevaluation of all facets of damaging/non-damaging strikes from year to year requires accurate and consistent reporting. Therefore, every WHMP should include a commitment to document and report to the NWSD all wildlife strikes that occur within the separation distances described in sections 1-2 and 1-3 of Advisory Circular 150/5200-33, Hazardous Attractants On or Near Airports (current version), to better identify, understand, and reduce threats to safe aviation.

5. Types of Animals to Report if Involved in a Strike with Aircraft.

a. All birds.

b. All bats.

c. All terrestrial mammals larger than 1 kg (2.2 lbs) (e.g., report rabbits, muskrats, armadillos, foxes, coyotes, domestic dogs, deer, feral livestock, etc., but not rats, mice, voles, chipmunks, shrews, etc.). If in doubt, report the incident with a note in the comment section, and the Database Manager will determine whether to include the report into the NWSD based on body mass.

d. Reptiles larger than 1 kg (2.2 lbs).

6. When to Report a Wildlife Aircraft Strike.

A wildlife strike has occurred when:

a. A strike between wildlife and aircraft has been witnessed.

b. Evidence or damage from a strike has been identified on an aircraft.

c. Bird or other wildlife remains, whether in whole or in part, are found:

(1) Within 250 feet of a runway centerline or within 1,000 feet of a runway end unless another reason for the animal's death is identified or suspected.

(2) On a taxiway or anywhere else on or off the airport that you have reason to believe was the result of a strike with an aircraft. Examples might be:

(i) A bird found in pieces from a prop strike on a taxiway.

(ii) A carcass retrieved within 1 mile of an airport on the final approach or departure path after someone reported the bird falling out of the sky and a report of a probable wildlife strike.

d. The presence of birds or other wildlife on or off the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, or the aircraft left pavement area to avoid collision with wildlife).

7. How to Report a Bird/Wildlife Strike.

The FAA strongly encourages pilots, airport operations, aircraft maintenance personnel, Air Traffic Control personnel, engine manufacturers, or anyone else who has knowledge of a strike to report it to the NWSD. The FAA makes available an online reporting system at the Airport Wildlife Hazard Mitigation web site (http://www.faa.gov/go/wildlife) or via mobile devices at http://www.faa.gov/mobile. Anyone reporting a strike can also print the FAA's Bird/Other Wildlife Strike Report Form (Form 5200-7) at the end of this AC or download it from the web site to report strikes. Paper copies of Form 5200-7 may also be obtained from the appropriate Airports District Offices (ADO), Flight Standards District Offices (FSDO), and Flight Service Stations (FSS) or from the Airman's Information Manual (AIM). Paper forms are pre-addressed to the FAA. No postage is needed if the form is mailed in the United States. It is important to include as much information as possible on the strike report.

Note: These forms are to be used to report strikes that do not have bird remains associated with them (instructions with addresses for sending remains to the Smithsonian Institute Feather Identification Lab are discussed in Paragraph 11, Instructions for Collecting and Submitting Bird/Wildlife Remains for Identification, of this AC). Please do not send bird remains to the FAA.

8. FAA National Wildlife Strike Database Management and Data Analysis.

The FAA NWSD Manager edits all strike reports to ensure consistent, error-free data before entering a single, consolidated report into the database. This information is supplemented with non-duplicated strike reports from other sources. About every six weeks, the FAA posts an updated version of the database on the web site. Annually, the FAA sends a current version of the database to the International Civil Aviation Organization (ICAO) for incorporation into ICAO's Bird Strike Information System (IBIS) Database. Also, the FAA prepares and makes available a report summarizing wildlife strike results from 1990 through the most current year online at http://www.faa.gov/airports/airport_safety/wildlife/.

Analyses of data from the FAA NWSD have proved invaluable in determining the nature and severity of the aviation wildlife strike hazard. The database provides a scientific basis for identifying risk factors, justifying and implementing corrective actions at airports, and judging the effectiveness of those corrective actions. Table 1 below depicts the ranking of 50 bird and mammal species or groups by their relative hazard to aircraft in airport environments. The data for the analysis are from the NWSD. The database is invaluable to engine manufacturers, aeronautical engineers, and wildlife biologists as they develop new technologies for the aviation industry. Each wildlife strike report contributes to the accuracy and effectiveness of the database. Moreover, each report contributes to the common goal of increasing aviation safety and reducing the cost of wildlife strikes.

9. Access to the FAA National Wildlife Strike Database.

On April 24, 2009, the FAA made the NWSD available to the public. The FAA began systematically analyzing wildlife strike data in the 1990s for use by the FAA's Office of Airports, academia, and researchers as a means of improving airport safety and reducing wildlife hazards. The NWSD web site (http://www.faa.gov/go/wildlife) was retooled to make it more user-friendly and to allow more advanced data mining. The site has search fields that enable users to find data on specific airports, airlines, aircraft, and engine types, as well as damage incurred, date of strike, species struck, and state without having to download the entire database.

10. Bird/ Wildlife Identification.

Accurate species identification is critical for wildlife-aircraft strike reduction programs. The identification of the exact species of bird struck (e.g., ring-billed gull, Canada goose, mallard, mourning dove, or red-tailed hawk as opposed to gull, goose, duck, dove, or hawk) is particularly important. This species information is critical for airports and biologists developing and implementing wildlife hazard management programs at airports because a problem that cannot be measured or defined cannot be solved. Wildlife biologists must know what species of wildlife they are dealing with in order to identify local attractants and to make proper management decisions within the framework of the Migratory Bird Treaty Act and state and local regulations. The FAA, the U.S. Air Force, the U.S. Navy, and the U.S. Department of Agriculture – Wildlife Services work closely with the Feather Identification Lab at the Smithsonian Institution, Museum of Natural History, to improve the understanding and prevention of bird-aircraft strike hazards. Bird strike remains that cannot be identified by airport personnel or by a local biologist can be sent (with FAA Form 5200-7) to the Smithsonian Museum for identification. Remains may also be submitted to the Smithsonian for verification of the field identification and for long-term storage of the evidence.

Bird strike identification using feathers, DNA, or other body parts or materials from birds involved in bird-aircraft strikes will be provided free-of-charge to all U.S. airport operators, all U.S. aircraft owners/operators (regardless of where the strike happened), and to any foreign air carrier if the strike occurred at a U.S. airport.

11. Instructions for Collecting and Submitting Bird/Wildlife Remains for Identification.

Please observe the following guidelines for collecting and submitting feathers or other bird/wildlife remains for species identification. These guidelines help maintain species identification accuracy, reduce turn-around time, and ensure a comprehensive FAA National Wildlife Aircraft Strike Database. Many airports have found it beneficial to construct strike reporting kits for use by airport personnel and aircraft operators. Having pre-made kits available improves strike reporting and encourages the sampling of strike remains. A kit suitable for collecting remains from most strikes would include the following materials stored in a 1-quart, re-sealable plastic bag: (1) collection instructions, (2) a pre-packaged alcohol hand-wipe for softening/removing tissue/blood ("snarge"[1]) off of the aircraft, (3) a Whatman FTA® collection card for preserving blood/tissue for DNA identification, and (4) a pair of disposable gloves.

[1] Snarge is the term used for the residue and feathers left on an aircraft after an animal (typically a bird) collides with it.

a. Collect and submit remains from known/suspected bird strikes or strike remains that involved an unknown animal from each impact location as soon as possible and send to the Feather Lab (Smithsonian). If remains are known to be other than those of birds, please contact the Smithsonian before mailing them at (202) 633-0801. Collect remains using the criteria listed in item c below. If you cannot send the remains as soon as possible, refrigerate or freeze them in a sealed plastic bag until you can mail them.

b. Provide complete information about the incident.

(1) Fill out FAA Form 5200-7 – Bird/ Other Wildlife Strike Report.

(i) Print a copy of Form 5200-7 at the end of this AC or download a copy at http://www.faa.gov/go/wildlife.

(ii) File a report online and print a copy to send with the remains.

(2) Mail the report with feather material (see address below).

(3) Provide your contact information if you wish to be informed of the species identification.

c. Collect as much material as possible in a clean plastic/ Ziplock® bag. (Please, do not send whole birds.)

(1) Pluck/pick a variety of many feathers representing color or patterns from the wings, tail, and body.

(2) **Do not** cut off feathers. This removes the downy region needed to aid in identification.

(3) Include any feathers with distinct colors or patterns.

(4) Include any downy “fluff”.

(5) Include beaks, feet, and talons if possible.

(6) Where only a small amount of snarge material is available, such as scrapings from an engine or smears on wings or windshields, send all of it.

(i) **Dry material** – Scrape or wipe off into a clean re-sealable bag **or** wipe the area with pre-packaged alcohol wipe **or** spray with alcohol to loosen material then wipe with clean cloth/gauze. Include the alcohol wipe or piece of cloth in the bag. (Do not use water, bleach, or other cleansers – they destroy or degrade DNA.)

(ii) **Fresh material** – Wipe the area with alcohol wipe and/or clean cloth/gauze **or** apply fresh tissue/blood to an optional Whatman FTA® DNA collecting card.

(1) **Do not** use any sticky substance such as tape or post-it notes to attach feathers.

(2) Collect remains from each impact location and place them in separate, labeled bags. Indicate the location on aircraft from which each sample came (i.e., windshield, radome, etc.) on the bag.

Please send whole feathers (tip and base) whenever possible as diagnostic characteristics are often found in the downy barbules at the feather base. Wings, as well as breast and tail feathers, should be sent whenever possible. Beaks, feet, bones, and talons are also useful diagnostic materials. Even blood smears can provide material for DNA analysis. Do not send entire bird carcasses through the mail. However, photographs of the carcasses can be very useful supplemental documentation.

If you send fresh blood/ tissue samples frequently for DNA identification, you may want to consider getting Whatman FTA® DNA cards. The material is sampled with a sterile applicator and placed onto the surface of the card that "fixes" the DNA in the sample. For more information about ordering these items, contact the Feather Lab. Otherwise, if you only occasionally send blood/ tissue samples, consider using a paper towel soaked with alcohol or an alcohol wipe to collect this type of material. Ethanol is the preferred type of alcohol.

Additional information on sending bird remains to the Smithsonian is available at http://www.faa.gov/go/wildlife.

d. Mail the Bird/Other Wildlife Strike Report and collected material to the Smithsonian's Feather Identification Lab. The lab will forward the report to the National Wildlife Strike Database Manager.

For Material Sent via Express Mail Service:	**For Material Sent via US Postal Service:**
Feather Identification Lab Smithsonian Institution NHB, E600, MRC 116 10th & Constitution Ave NW Washington DC 20560-0116 (This can be identified as "safety investigation material".)	Feather Identification Lab Smithsonian Institution PO Box 37012 NHB, E600, MRC 116 Washington DC 20013-7012 (Not recommended for priority cases.)

The species identification turn-around time is usually 24 hours from receipt if sufficient material is submitted and unless the sample is submitted for DNA analysis. DNA results usually take 6 to 10 days. Once processed, the lab sends the reports and species identification information to the Database Manager for entry into the FAA National Wildlife Strike Database. Persons wishing to be notified of the species identification must include contact information (e-mail, phone, etc.) on the report.

For more information contact the FAA National Wildlife Biologist at (202) 267-8731 or the Smithsonian's Feather Identification Lab at (202) 633-0801.

Michael J. O'Donnell
Director, Office of Airport Safety and Standard

FORM APPROVED OMB No. 2120-0045
Exp. 7/31/2013

BIRD / OTHER WILDLIFE STRIKE REPORT

U S. Department of Transportation
Federal Aviation Administration

Paperwork Reduction Act Statement: The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. A federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number. The OMB Control Number for this information collection is 2120-0045. Public reporting for this collection of information is estimated to be approximately 6 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, completing and reviewing the collection of information. The information collected is voluntary. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to the FAA at: 800 Independence Ave. SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, AES-200.

1. Name of Operator

2. Aircraft Make/Model

3. Engine Make/Model

4. Aircraft Registration

5. Date of Incident
/ /
Month Day Year

6. Local Time of Incident
☐ Dawn ☐ Dusk __HR __MIN
☐ Day ☐ Night ☐ AM ☐ PM

6A. Flight Number

6B. Wildlife/Bird Remains:
☐ Collected ☐ Sent to Smithsonian

7. Airport Name/ID

8. Runway Used

9. Location if En Route (Nearest Town/Reference & State/Airport)

10. Height (AGL)

11. Speed (IAS)

12. Phase of Flight
☐ A. Parked
☐ B. Taxi
☐ C. Take-off Run
☐ D. Climb
☐ E. En Route
☐ F. Descent
☐ G. Approach
☐ H. Landing Roll

13. Part(s) of Aircraft Struck or Damaged

	Struck	Damaged		Struck	Damaged
A. Radome	☐	☐	H. Propeller	☐	☐
B. Windshield	☐	☐	I. Wing/Rotor	☐	☐
C. Nose	☐	☐	J. Fuselage	☐	☐
D. Engine No. 1	☐	☐	K. Landing Gear	☐	☐
E. Engine No. 2	☐	☐	L. Tail	☐	☐
F. Engine No. 3	☐	☐	M. Lights	☐	☐
G. Engine No. 4	☐	☐	N. Other: (Specify)	☐	☐

Bird(s) Ingested? ☐ Yes

Specify if "N. Other" is checked:

14. Effect on Flight
☐ None
☐ Aborted Take-Off
☐ Precautionary Landing
☐ Engines Shut Down
☐ Other: (Specify)

15. Sky Condition
☐ No Cloud
☐ Some Cloud
☐ Overcast

16. Precipitation
☐ Fog
☐ Rain
☐ Snow
☐ None

17. Bird/Other Wildlife Species

18. Number of birds seen and/or struck

Number of Birds	Seen	Struck
1	☐	☐
2-10	☐	☐
11-100	☐	☐
more than 100	☐	☐

19. Size of Bird(s)
☐ Small
☐ Medium
☐ Large

20. Pilot Warned of Birds ☐ Yes ☐ No

21. Remarks *(Describe damage, injuries and other pertinent information)*

DAMAGE / COST INFORMATION

22. Aircraft time out of service
_____ hours

23. Estimated cost of repairs or replacement (US $)
$

24. Estimated other Cost *(U.S. $) (e.g. loss of revenue, fuel, hotels)*
$

Reported by *(Optional)*

Title

Date

Email

Phone

FAA Form 5200-7 (5/13) SUPERSEDES PREVIOUS EDITION

U.S. Department of Transportation

Federal Aviation Administration

800 Independence Ave SW
Washington DC 20591

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Federal Aviation Administration
Office of Airport Safety and Standards, AAS-300
Attn: Wildlife Strike Report
800 Independence Avenue SW
WASHINGTON DC 20591

FOLD AND TAPE HERE

Directions for FAA Form 5200-7
Bird/Other Wildlife Strike Report

1. Name of Operator - This can be an airline (abbreviations okay - UAL, AAL, etc.), business (Coca Cola), government agency (Police Dept., FAA), or if a private pilot, his/her name.
2. Aircraft Make/Model - Abbreviations are okay, but include the model (e.g., B737-200).
3. Engine Make/Model - Abbreviations are allowed (e.g., PW 4060, GECT7, LYC 580).
4. Aircraft Registration - This means the N# (for USA registered aircraft).
5. Date of Incident - Give the local date, not the ZULU or GMT date.
6. Local Time of Incident - Check the appropriate light conditions and fill in the hour and minute local time and check AM or PM or use the 24-hour clock and skip AM/PM.

6A. Flight Number - Self-explanatory.

6B. Wildlife/Bird Remains - If remains were found at the airport or on the aircraft, check “Collected”. If the remains were also sent to the Smithsonian for identification, also check “Sent to Smithsonian”.

7. Airport Name - Use the airport name or 3 letter code if a US airport. If a foreign airport, use the full name or 3 letter code and location (city/country).
8. Runway used - Self-explanatory.
9. Location if En Route - Put the name of the nearest city and state.
10. Height AGL - Put the feet above ground level at the time of the strike (if you don't know, use MSL and indicate this). For take-off run and landing roll, it must be 0.
11. Speed (IAS) - Speed at which the aircraft was traveling when the strike occurred.
12. Phase of Flight - Phase of flight during which the strike occurred. Take-off run and landing roll should both be 0 AGL.
13. Part(s) of Aircraft Struck or Damaged - Check which parts were struck and damaged. If a part was damaged but not struck, indicate this with a check on the damaged column only and indicate in comments (#21) why this happened (e.g., the landing gear might be damaged by deer strike, causing the aircraft to flip over and damage parts not struck by deer).
14. Effect on Flight - You can check more than one. If you check “Other”, please explain in Comments (#21).
15. Sky condition - Check the one that applies.
16. Precipitation - You may check more than one.
17. Bird/Other Wildlife Species - Try to be accurate. If you don't know, put unknown and some description. Collect feathers or remains for identification for damaging strikes.
18. Number of birds seen and/or struck - check the box in the Seen column with the correct number if you saw the birds/other wildlife before the strike and check the box in the Struck column to show how many were hit. The exact number can be written next to the box.
19. Size of Bird(s) - Check what you think is the correct size (e.g. sparrow = small, gull = medium, and geese = large).
20. Pilot Warned of Birds - Check the correct box (even if it was an ATIS warning or NOTAM).
21. Remarks - Be as specific as you can. Include information about the extent of the damage, injuries, anything you think would be helpful to know (e.g., number of birds ingested).
22. Aircraft time out of service - Record how many hours the aircraft was out of service.
23. Estimated cost of repairs or replacement - This may not be known immediately, but the data can be sent at a later date or put down a contact name and number for this data.
24. Estimated other cost - Include loss of revenue, fuel, hotels, etc. (see directions for #23).
25. Reported by - Although this is optional, it is helpful if questions arise about the information on the form (a phone number could also be included).
26. Title - This can be Pilot, Tower, Airport Operations, Airline Operations, Flight Safety, etc.
27. Date - Date the form was filled out.

Table 1. Composite ranking (1 = most hazardous, 50 = least hazardous) and relative hazard score of 50 wildlife species with at least 100 reported strikes with civil aircraft based on three criteria (damage, major damage, and effect-on-flight). Data were derived from the FAA National Wildlife Strike Database.

Wildlife species	% of strikes with:			Mean hazard level[4]	Composite ranking	Relative hazard score[5]
	Damage[1]	Major damage[2]	Effect on flight[3]			
White-tailed deer	84	36	46	55	1	100
Snow goose	77	41	39	53	2	95
Turkey vulture	51	19	35	35	3	63
Canada goose	50	17	28	31	4	57
Sandhill crane	41	13	27	27	5	48
Bald eagle	41	12	28	27	6	48
D.-crested cormorant	34	15	24	24	7	44
Mallard	23	9	13	15	8	27
Osprey	22	7	15	15	9	26
Great blue heron	21	6	16	15	10	26
American coot	24	7	11	14	11	25
Coyote	9	2	21	11	12	19
Red-tailed hawk	15	5	11	10	13	19
Cattle egret	10	3	15	9	14	17
Great horned owl	15	3	6	8	15	14
Herring gull	10	5	9	8	16	14
Rock pigeon	10	4	10	8	17	14
Ring-billed gull	8	3	8	6	18	11
American crow	8	3	8	6	18	11
Peregrine falcon	8	2	5	5	20	9
Laughing gull	5	2	7	5	21	8
American robin	7	1	4	4	22	7
Snow bunting	1	1	9	4	23	7
Red fox	3	0	8	4	23	7
European starling	4	1	5	3	25	6
Amer. golden-plover	4	2	4	3	26	6
Barn owl	4	2	3	3	27	5
Upland sandpiper	4	1	4	3	27	5
Purple martin	5	1	2	3	29	5

Wildlife species	% of strikes with: Damage[1]	Major damage[2]	Effect on flight[3]	Mean hazard level[4]	Composite ranking	Relative hazard score[5]
Mourning dove	3	1	4	3	30	5
Red-winged blackbird	3	0	5	3	31	5
Woodchuck	2	0	4	2	32	4
Northern harrier	2	1	2	2	33	3
Chimney swift	2	0	2	1	34	2
Killdeer	1	0	2	1	35	2
House sparrow	2	0	1	1	35	2
Blk-tailed jackrabbit	1	1	1	1	37	2
American kestrel	1	<1	2	1	38	2
Eastern meadowlark	1	<1	2	1	38	2
S.-tailed flycatcher	0	0	2	1	40	1
Horned lark	1	<1	1	1	41	1
Pacific golden-plover	1	0	1	1	41	1
Barn swallow	1	0	1	1	43	1
Savannah sparrow	1	0	<1	1	43	1
Common nighthawk	1	0	1	1	45	1
Tree swallow	0	0	1	<1	46	1
Burrowing owl	1	0	0	<1	46	1
Western kingbird	0	0	1	<1	48	0
Virginia opossum	1	0	0	<1	48	0
Striped skunk	0	0	0	0	50	0

[1] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[2] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained made it inadvisable to restore aircraft to airworthy condition.

[3] Aborted takeoff, engine shutdown, precautionary landing, or other negative effect on flight.

[4] Based on the mean value for percent of strikes with damage, major damage (substantial damage or destroyed), and negative effect-on-flight.

[5] Mean hazard level (see footnote 4) was scaled down from 100, with 100 as the score for the species with the maximum mean hazard level and thus the greatest potential hazard to aircraft.

U.S. Department
of Transportation

Federal Aviation Administration

Advisory Circular

Subject: HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS	**Date:** 8/28/2007	**AC No:** 150/5200-33B
	Initiated by: AAS-300	**Change:**

1. PURPOSE. This Advisory Circular (AC) provides guidance on certain land uses that have the potential to attract hazardous wildlife on or near public-use airports. It also discusses airport development projects (including airport construction, expansion, and renovation) affecting aircraft movement near hazardous wildlife attractants. Appendix 1 provides definitions of terms used in this AC.

2. APPLICABILITY. The Federal Aviation Administration (FAA) recommends that public-use airport operators implement the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D (Part 139), may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. Airports that have received Federal grant-in-aid assistance must use these standards. The FAA also recommends the guidance in this AC for land-use planners, operators of non-certificated airports, and developers of projects, facilities, and activities on or near airports.

3. CANCELLATION. This AC cancels AC 150/5200-33A, *Hazardous Wildlife Attractants on or near Airports*, dated July 27, 2004.

4. PRINCIPAL CHANGES. This AC contains the following major changes, which are marked with vertical bars in the margin:

a. Technical changes to paragraph references.

b. Wording on storm water detention ponds.

c. Deleted paragraph 4-3.b, *Additional Coordination.*

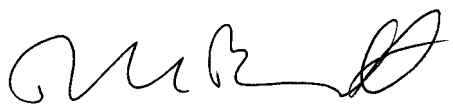
5. BACKGROUND. Information about the risks posed to aircraft by certain wildlife species has increased a great deal in recent years. Improved reporting, studies, documentation, and statistics clearly show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not equally hazardous. Table 1

ranks the wildlife groups commonly involved in damaging strikes in the United States according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the relative abundance and use patterns of wildlife species and help focus hazardous wildlife management efforts on those species most likely to cause problems at an airport.

Most public-use airports have large tracts of open, undeveloped land that provide added margins of safety and noise mitigation. These areas can also present potential hazards to aviation if they encourage wildlife to enter an airport's approach or departure airspace or air operations area (AOA). Constructed or natural areas—such as poorly drained locations, detention/retention ponds, roosting habitats on buildings, landscaping, odor-causing rotting organic matter (putrescible waste) disposal operations, wastewater treatment plants, agricultural or aquaculture activities, surface mining, or wetlands—can provide wildlife with ideal locations for feeding, loafing, reproduction, and escape. Even small facilities, such as fast food restaurants, taxicab staging areas, rental car facilities, aircraft viewing areas, and public parks, can produce substantial attractions for hazardous wildlife.

During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. This AC provides airport operators and those parties with whom they cooperate with the guidance they need to assess and address potentially hazardous wildlife attractants when locating new facilities and implementing certain land-use practices on or near public-use airports.

6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES. The FAA, the U.S. Air Force, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture - Wildlife Services signed a Memorandum of Agreement (MOA) in July 2003 to acknowledge their respective missions in protecting aviation from wildlife hazards. Through the MOA, the agencies established procedures necessary to coordinate their missions to address more effectively existing and future environmental conditions contributing to collisions between wildlife and aircraft (wildlife strikes) throughout the United States. These efforts are intended to minimize wildlife risks to aviation and human safety while protecting the Nation’s valuable environmental resources.



DAVID L. BENNETT
Director, Office of Airport Safety
and Standards

Table 1. Ranking of 25 species groups as to relative hazard to aircraft (1=most hazardous) based on three criteria (damage, major damage, and effect-on-flight), a composite ranking based on all three rankings, and a relative hazard score. Data were derived from the FAA National Wildlife Strike Database, January 1990–April 2003.[1]

Species group	Ranking by criteria			Composite ranking[2]	Relative hazard score[3]
	Damage[4]	Major damage[5]	Effect on flight[6]		
Deer	1	1	1	1	100
Vultures	2	2	2	2	64
Geese	3	3	6	3	55
Cormorants/pelicans	4	5	3	4	54
Cranes	7	6	4	5	47
Eagles	6	9	7	6	41
Ducks	5	8	10	7	39
Osprey	8	4	8	8	39
Turkey/pheasants	9	7	11	9	33
Herons	11	14	9	10	27
Hawks (buteos)	10	12	12	11	25
Gulls	12	11	13	12	24
Rock pigeon	13	10	14	13	23
Owls	14	13	20	14	23
H. lark/s. bunting	18	15	15	15	17
Crows/ravens	15	16	16	16	16
Coyote	16	19	5	17	14
Mourning dove	17	17	17	18	14
Shorebirds	19	21	18	19	10
Blackbirds/starling	20	22	19	20	10
American kestrel	21	18	21	21	9
Meadowlarks	22	20	22	22	7
Swallows	24	23	24	23	4
Sparrows	25	24	23	24	4
Nighthawks	23	25	25	25	1

[1] Excerpted from the *Special Report for the FAA, "Ranking the Hazard Level of Wildlife Species to Civil Aviation in the USA: Update #1, July 2, 2003".* Refer to this report for additional explanations of criteria and method of ranking.

[2] Relative rank of each species group was compared with every other group for the three variables, placing the species group with the greatest hazard rank for $\geq$ 2 of the 3 variables above the next highest ranked group, then proceeding down the list.

[3] Percentage values, from Tables 3 and 4 in Footnote 1 of the *Special Report*, for the three criteria were summed and scaled down from 100, with 100 as the score for the species group with the maximum summed values and the greatest potential hazard to aircraft.

[4] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[5] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained makes it inadvisable to restore aircraft to airworthy condition.

[6] Aborted takeoff, engine shutdown, precautionary landing, or other.

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SECTION 1.

GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS.

1-1. INTRODUCTION. When considering proposed land uses, airport operators, local planners, and developers must take into account whether the proposed land uses, including new development projects, will increase wildlife hazards. Land-use practices that attract or sustain hazardous wildlife populations on or near airports can significantly increase the potential for wildlife strikes.

The FAA recommends the minimum separation criteria outlined below for land-use practices that attract hazardous wildlife to the vicinity of airports. Please note that FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or air operations area (AOA). (See the discussion of the synergistic effects of surrounding land uses in Section 2-8 of this AC.)

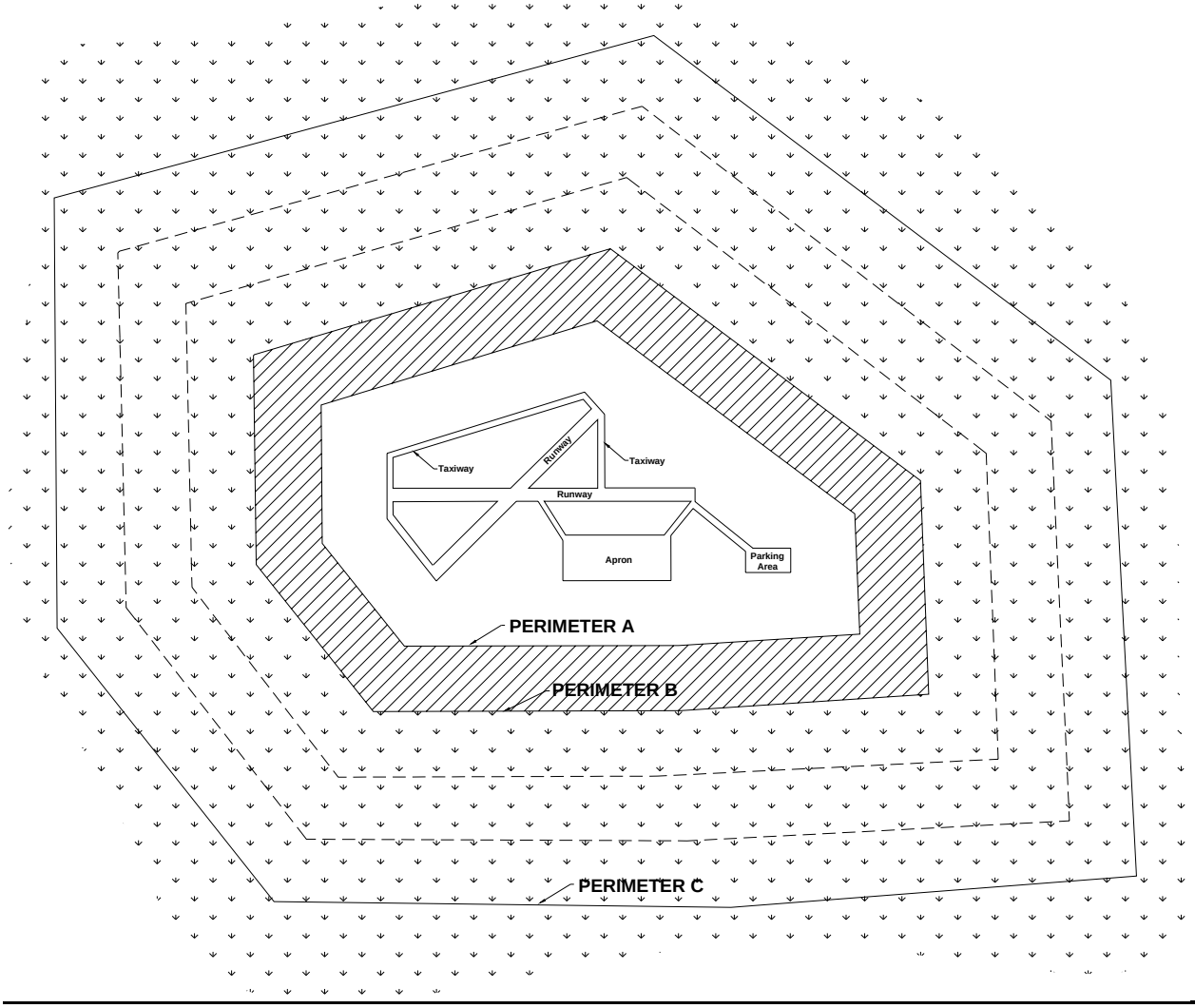
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet and 90 percent occur under 3,000 feet above ground level), and (3) National Transportation Safety Board (NTSB) recommendations.

1-2. AIRPORTS SERVING PISTON-POWERED AIRCRAFT. Airports that do not sell Jet-A fuel normally serve piston-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 5,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance measured from the nearest aircraft operations areas.

1-3. AIRPORTS SERVING TURBINE-POWERED AIRCRAFT. Airports selling Jet-A fuel normally serve turbine-powered aircraft. Notwithstanding more stringent requirements for specific land uses, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractants mentioned in Section 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between an airport's AOA and the hazardous wildlife attractant. Figure 1 depicts this separation distance from the nearest aircraft movement areas.

1-4. PROTECTION OF APPROACH, DEPARTURE, AND CIRCLING AIRSPACE. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

Figure 1. Separation distances within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



PERIMETER A: For airports serving piston-powered aircraft, hazardous wildlife attractants must be 5,000 feet from the nearest air operations area.

PERIMETER B: For airports serving turbine-powered aircraft, hazardous wildlife attractants must be 10,000 feet from the nearest air operations area.

PERIMETER C: 5-mile range to protect approach, departure and circling airspace.

SECTION 2.

LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE.

2-1. GENERAL. The wildlife species and the size of the populations attracted to the airport environment vary considerably, depending on several factors, including land-use practices on or near the airport. This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports,* prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov.). And, *Prevention and Control of Wildlife Damage,* compiled by the University of Nebraska Cooperative Extension Division. (This manual is available online in a periodically updated version at: ianrwww.unl.edu/wildlife/solutions/handbook/.)

2-2. WASTE DISPOSAL OPERATIONS. Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. Because of this, these operations, when located within the separations identified in the siting criteria in Sections 1-2 through 1-4, are considered incompatible with safe airport operations.

a. Siting for new municipal solid waste landfills subject to AIR 21. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports. Before these prohibitions apply, both the airport and the landfill must meet the very specific conditions described below. These restrictions do not apply to airports or landfills located within the state of Alaska.

The airport must (1) have received a Federal grant(s) under 49 U.S.C. § 47101, et. seq.; (2) be under control of a public agency; (3) serve some scheduled air carrier operations conducted in aircraft with less than 60 seats; and (4) have total annual enplanements consisting of at least 51 percent of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

The proposed MSWLF must (1) be within 6 miles of the airport, as measured from airport property line to MSWLF property line, and (2) have started construction or establishment on or after April 5, 2001. Public Law 106-181 only limits the construction or establishment of some new MSWLF. It does not limit the expansion, either vertical or horizontal, of existing landfills.

NOTE: Consult the most recent version of AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports,* for a more detailed discussion of these restrictions.

b. Siting for new MSWLF not subject to AIR 21. If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.

c. Considerations for existing waste disposal facilities within the limits of separation criteria. The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)

d. Enclosed trash transfer stations. Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.

e. Composting operations on or near airport property. Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA), Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

f. Underwater waste discharges. The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.

g. Recycling centers. Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.

h. Construction and demolition (C&D) debris facilities. C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.

i. Fly ash disposal. The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

Since varying degrees of waste consumption are associated with general incineration (not resource recovery power/heat-generating facilities), the FAA considers the ash from general incinerators a regular waste disposal by-product and, therefore, a hazardous wildlife attractant if disposed of within the separation criteria outlined in Sections 1-2 through 1-4.

2-3. WATER MANAGEMENT FACILITIES. Drinking water intake and treatment facilities, storm water and wastewater treatment facilities, associated retention and settling ponds, ponds built for recreational use, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. To prevent wildlife hazards, land-use developers and airport operators may need to develop management plans, in compliance with local and state regulations, to support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

a. Existing storm water management facilities. On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water

after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

Where possible, airport operators should modify storm water detention ponds to allow a maximum 48-hour detention period for the design storm. The FAA recommends that airport operators avoid or remove retention ponds and detention ponds featuring dead storage to eliminate standing water. Detention basins should remain totally dry between rainfalls. Where constant flow of water is anticipated through the basin, or where any portion of the basin bottom may remain wet, the detention facility should include a concrete or paved pad and/or ditch/swale in the bottom to prevent vegetation that may provide nesting habitat.

When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wires grids, pillows, or netting, to deter birds and other hazardous wildlife. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office.

The FAA recommends that airport operators encourage off-airport storm water treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into storm water treatment facility operating practices when their facility is located within the separation criteria specified in Sections 1-2 through 1-4.

b. New storm water management facilities. The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48–hour detention period after the design storm and remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages

the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

c. Existing wastewater treatment facilities. The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.

d. New wastewater treatment facilities. The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

e. Artificial marshes. In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

f. Wastewater discharge and sludge disposal. The FAA recommends against the discharge of wastewater or sludge on airport property because it may improve soil moisture and quality on unpaved areas and lead to improved turf growth that can be an attractive food source for many species of animals. Also, the turf requires more frequent mowing, which in turn may mutilate or flush insects or small animals and produce straw, both of which can attract hazardous wildlife. In addition, the improved turf may attract grazing wildlife, such as deer and geese. Problems may also occur when discharges saturate unpaved airport areas. The resultant soft, muddy conditions can severely restrict or prevent emergency vehicles from reaching accident sites in a timely manner.

2-4. WETLANDS. Wetlands provide a variety of functions and can be regulated by local, state, and Federal laws. Normally, wetlands are attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1).

NOTE: If questions exist as to whether an area qualifies as a wetland, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, or a wetland consultant qualified to delineate wetlands.

a. Existing wetlands on or near airport property. If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. At public-use airports, the FAA recommends immediately correcting, in cooperation with local, state, and Federal regulatory agencies, any wildlife hazards arising from existing wetlands located on or near airports. Where required, a WHMP will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

b. New airport development. Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Sections 1-2 through 1-4. Where alternative sites are not practicable, or when airport operators are expanding an existing airport into or near wetlands, a wildlife damage management biologist, in consultation with the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, and the state wildlife management agency should evaluate the wildlife hazards and prepare a WHMP that indicates methods of minimizing the hazards.

c. Mitigation for wetland impacts from airport projects. Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

(1) Onsite mitigation of wetland functions. The FAA may consider exceptions to locating mitigation activities outside the separations identified in Sections 1-2 through 1-4 if the affected wetlands provide unique ecological functions, such as critical habitat for threatened or endangered species or ground water recharge, which cannot be replicated when moved to a different location. Using existing airport property is sometimes the only feasible way to achieve the mitigation ratios mandated in regulatory orders and/or settlement agreements with the resource agencies. Conservation easements are an additional means of providing mitigation for project impacts. Typically the airport operator continues to own the property, and an easement is created stipulating that the property will be maintained as habitat for state or Federally listed species.

Mitigation must not inhibit the airport operator's ability to effectively control hazardous wildlife on or near the mitigation site or effectively maintain other aspects of safe airport operations. Enhancing such mitigation areas to attract hazardous wildlife must be avoided. The FAA will review any onsite mitigation proposals to determine compatibility with safe airport operations. A wildlife damage management biologist should evaluate any wetland mitigation projects that are needed to protect unique wetland functions and that must be located in the separation criteria in Sections 1-2 through 1-4 before the mitigation is implemented. A WHMP should be developed to reduce the wildlife hazards.

(2) Offsite mitigation of wetland functions. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4 unless they provide unique functions that must remain onsite (see 2-4c(1)). Agencies that regulate impacts to or around wetlands recognize that it may be necessary to split wetland functions in mitigation schemes. Therefore, regulatory agencies may, under certain circumstances, allow portions of mitigation to take place in different locations.

(3) Mitigation banking. Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

2-5. DREDGE SPOIL CONTAINMENT AREAS. The FAA recommends against locating dredge spoil containment areas (also known as Confined Disposal Facilities) within the separations identified in Sections 1-2 through 1-4 if the containment area or the spoils contain material that would attract hazardous wildlife.

2-6. AGRICULTURAL ACTIVITIES. Because most, if not all, agricultural crops can attract hazardous wildlife during some phase of production, the FAA recommends against the used of airport property for agricultural production, including hay crops, within the separations identified in Sections 1-2 through 1-4. . If the airport has no financial alternative to agricultural crops to produce income necessary to maintain the viability of the airport, then the airport shall follow the crop distance guidelines listed in the table titled "Minimum Distances between Certain Airport Features and Any On-Airport Agricultural Crops" found in AC 150/5300-13, *Airport Design*, Appendix 17. The cost of wildlife control and potential accidents should be weighed against the income produced by the on-airport crops when deciding whether to allow crops on the airport.

a. Livestock production. Confined livestock operations (i.e., feedlots, dairy operations, hog or chicken production facilities, or egg laying operations) often attract flocking birds, such as starlings, that pose a hazard to aviation. Therefore, The FAA recommends against such facilities within the separations identified in Sections 1-2 through 1-4. Any livestock operation within these separations should have a program developed to reduce the attractiveness of the site to species that are hazardous to aviation safety. Free-ranging livestock must not be grazed on airport property because the animals may wander onto the AOA. Furthermore, livestock feed, water, and manure may attract birds.

b. Aquaculture. Aquaculture activities (i.e. catfish or trout production) conducted outside of fully enclosed buildings are inherently attractive to a wide variety of birds. Existing aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4 must have a program developed to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should also oppose the establishment of new aquaculture facilities/activities within the separations listed in Sections 1-2 through 1-4.

c. Alternative uses of agricultural land. Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

2-7. GOLF COURSES, LANDSCAPING AND OTHER LAND-USE CONSIDERATIONS.

a. Golf courses. The large grassy areas and open water found on most golf courses are attractive to hazardous wildlife, particularly Canada geese and some species of gulls. These species can pose a threat to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Sections 1-2 through 1-4. Existing golf courses located within these separations must develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. Airport operators should ensure these golf courses are monitored on a continuing basis for the presence of hazardous wildlife. If hazardous wildlife is detected, corrective actions should be immediately implemented.

b. Landscaping and landscape maintenance. Depending on its geographic location, landscaping can attract hazardous wildlife. The FAA recommends that airport operators approach landscaping with caution and confine it to airport areas not associated with aircraft movements. A wildlife damage management biologist should review all landscaping plans. Airport operators should also monitor all landscaped areas on a continuing basis for the presence of hazardous wildlife. If

hazardous wildlife is detected, corrective actions should be immediately implemented.

Turf grass areas can be highly attractive to a variety of hazardous wildlife species. Research conducted by the USDA Wildlife Services' National Wildlife Research Center has shown that no one grass management regime will deter all species of hazardous wildlife in all situations. In cooperation with wildlife damage management biologist, airport operators should develop airport turf grass management plans on a prescription basis, depending on the airport's geographic locations and the type of hazardous wildlife likely to frequent the airport

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

c. Airports surrounded by wildlife habitat. The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.

d. Other hazardous wildlife attractants. Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

2-8. SYNERGISTIC EFFECTS OF SURROUNDING LAND USES. There may be circumstances where two (or more) different land uses that would not, by themselves, be considered hazardous wildlife attractants or that are located outside of the separations identified in Sections 1-2 through 1-4 that are in such an alignment with the airport as to create a wildlife corridor directly through the airport and/or surrounding airspace. An example of this situation may involve a lake located outside of the separation criteria on the east side of an airport and a large hayfield on the west side of an airport, land uses that together could create a flyway for Canada geese directly across the airspace of the airport. There are numerous examples of such situations;

therefore, airport operators and the wildlife damage management biologist must consider the entire surrounding landscape and community when developing the WHMP.

SECTION 3.

PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS.

3.1. INTRODUCTION. In recognition of the increased risk of serious aircraft damage or the loss of human life that can result from a wildlife strike, the FAA may require the development of a Wildlife Hazard Management Plan (WHMP) when specific triggering events occur on or near the airport. Part 139.337 discusses the specific events that trigger a Wildlife Hazard Assessment (WHA) and the specific issues that a WHMP must address for FAA approval and inclusion in an Airport Certification Manual.

3.2. COORDINATION WITH USDA WILDLIFE SERVICES OR OTHER QUALIFIED WILDLIFE DAMAGE MANAGEMENT BIOLOGISTS. The FAA will use the Wildlife Hazard Assessment (WHA) conducted in accordance with Part 139 to determine if the airport needs a WHMP. Therefore, persons having the education, training, and expertise necessary to assess wildlife hazards must conduct the WHA. The airport operator may look to Wildlife Services or to qualified private consultants to conduct the WHA. When the services of a wildlife damage management biologist are required, the FAA recommends that land-use developers or airport operators contact a consultant specializing in wildlife damage management or the appropriate state director of Wildlife Services.

NOTE: Telephone numbers for the respective USDA Wildlife Services state offices can be obtained by contacting USDA Wildlife Services Operational Support Staff, 4700 River Road, Unit 87, Riverdale, MD, 20737-1234, Telephone (301) 734-7921, Fax (301) 734-5157 *(http://www.aphis.usda.gov/ws/)*.

3-3. WILDLIFE HAZARD MANAGEMENT AT AIRPORTS: A MANUAL FOR AIRPORT PERSONNEL. This manual, prepared by FAA and USDA Wildlife Services staff, contains a compilation of information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. The manual is available in three languages: English, Spanish, and French. It can be viewed and downloaded free of charge from the FAA's wildlife hazard mitigation web site: http://wildlife-mitigation.tc.FAA.gov/. This manual only provides a starting point for addressing wildlife hazard issues at airports. Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, qualified wildlife damage management biologists must direct the development of a WHMP and the implementation of management actions by airport personnel.

There are many other resources complementary to this manual for use in developing and implementing WHMPs. Several are listed in the manual's bibliography.

3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139. Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport.

Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

3-5. WILDLIFE HAZARD MANAGEMENT PLAN (WHMP). The FAA will consider the results of the WHA, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a formal WHMP is needed, in accordance with Part 139.337. If the FAA determines that a WHMP is needed, the airport operator must formulate and implement a WHMP, using the WHA as the basis for the plan.

The goal of an airport's Wildlife Hazard Management Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport.

The WHMP must identify hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management techniques to minimize the wildlife hazard. It must also prioritize the management measures.

3-6. LOCAL COORDINATION. The establishment of a Wildlife Hazards Working Group (WHWG) will facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the WHMP. The cooperation of the airport community is also necessary when new projects are considered. Whether on or off the airport, the input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Airport operators should also incorporate public education activities with the local coordination efforts because some activities in the vicinity of your airport, while harmless under normal leisure conditions, can attract wildlife and present a danger to aircraft. For example, if public trails are planned near wetlands or in parks adjoining airport property, the public should know that feeding birds and other wildlife in the area may pose a risk to aircraft.

Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses, that could create hazardous wildlife attractants within the separations identified in Sections 1-2 through 1-4. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators must ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

3-7 COORDINATION/NOTIFICATION OF AIRMEN OF WILDLIFE HAZARDS. If an existing land-use practice creates a wildlife hazard and the land-use practice or wildlife hazard cannot be immediately eliminated, airport operators must issue a Notice to Airmen (NOTAM) and encourage the land–owner or manager to take steps to control the wildlife hazard and minimize further attraction.

SECTION 4.

FAA NOTIFICATION AND REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS

4-1. FAA REVIEW OF PROPOSED LAND-USE PRACTICE CHANGES IN THE VICINITY OF PUBLIC-USE AIRPORTS.

a. The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.

b. For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.

c. Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

4-2. WASTE MANAGEMENT FACILITIES.

a. Notification of new/expanded project proposal. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) limits the construction or establishment of new MSWLF within 6 statute miles of certain public-use airports, when both the airport and the landfill meet very specific conditions. See Section 2-2 of this AC and AC 150/5200-34 for a more detailed discussion of these restrictions.

The Environmental Protection Agency (EPA) requires any MSWLF operator proposing a new or expanded waste disposal operation within 5 statute miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal (40 CFR 258, *Criteria for Municipal Solid Waste Landfills*, Section 258.10, *Airport Safety*). The EPA also requires owners or operators of new MSWLF units, or lateral expansions of existing MSWLF units, that are located within 10,000 feet of any airport runway end used by turbojet aircraft, or within 5,000 feet of any airport runway end used only by piston-type aircraft, to demonstrate successfully that such units are not hazards to aircraft. (See 4-2.b below.)

When new or expanded MSWLF are being proposed near airports, MSWLF operators must notify the airport operator and the FAA of the proposal as early as possible pursuant to 40 CFR 258.

b. Waste handling facilities within separations identified in Sections 1-2 through 1-4. To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

c. Putrescible-Waste Facilities. In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

4-3. OTHER LAND-USE PRACTICE CHANGES. As a matter of policy, the FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 statute miles of their airports to promptly notify the FAA. The FAA also encourages proponents of such land use changes to notify the FAA as early in the planning process as possible. Advanced notice affords the FAA an opportunity (1) to evaluate the effect of a particular land-use change on aviation safety and (2) to support efforts by the airport sponsor to restrict the use of land next to or near the airport to uses that are compatible with the airport.

The airport operator, project proponent, or land-use operator may use FAA Form 7460-1, *Notice of Proposed Construction or Alteration*, or other suitable documents similar to FAA Form 7460-1 to notify the appropriate FAA Regional Airports Division Office. Project proponents can contact the appropriate FAA Regional Airports Division Office for assistance with the notification process.

It is helpful if the notification includes a 15-minute quadrangle map of the area identifying the location of the proposed activity. The land-use operator or project proponent should also forward specific details of the proposed land-use change or operational change or expansion. In the case of solid waste landfills, the information should include the type of waste to be handled, how the waste will be processed, and final disposal methods.

a. Airports that have received Federal grant-in-aid assistance. Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport

development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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APPENDIX 1. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR.

1. **GENERAL.** This appendix provides definitions of terms used throughout this AC.

    1. **Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

    2. **Airport operator.** The operator (private or public) or sponsor of a public-use airport.

    3. **Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.

    4. **Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.

    5. **Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.

    6. **Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.

    7. **Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.

    8. **Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.

    9. **Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.

    10. **General aviation aircraft.** Any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

    11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard

    12. **Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive

other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.

13. **New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.

14. **Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.

15. **Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.

16. **Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).

17. **Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).

18. **Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).

19. **Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

20. **Putrescible-waste disposal operation.** Landfills, garbage dumps, underwater waste discharges, or similar facilities where activities include processing, burying, storing, or otherwise disposing of putrescible material, trash, and refuse.

21. **Retention ponds.** Storm water management ponds that hold water for several months.

22. **Runway protection zone (RPZ).** An area off the runway end to enhance the protection of people and property on the ground (see AC 150/5300-13). The dimensions of this zone vary with the airport design, aircraft, type of operation, and visibility minimum.

23. **Scheduled air carrier operation.** Any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial

operator for which the air carrier, commercial operator, or their representative offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119 or as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

24. **Sewage sludge.** Any solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment process; and a material derived from sewage sludge. Sewage does not include ash generated during the firing of sewage sludge in a sewage sludge incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works. (40 CFR 257.2)

25. **Sludge.** Any solid, semi-solid, or liquid waste generated form a municipal, commercial or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility or any other such waste having similar characteristics and effect. (40 CFR 257.2)

26. **Solid waste.** Any garbage, refuse, sludge, from a waste treatment plant, water supply treatment plant or air pollution control facility and other discarded material, including, solid liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved material in irrigation return flows or industrial discharges which are point sources subject to permits under section 402 of the Federal Water Pollution Control Act, as amended (86 Stat. 880), or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

27. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.

28. **Turbine-use airport.** Any airport that sells Jet-A fuel for fixed-wing turbine-powered aircraft.

29. **Wastewater treatment facility.** Any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes, including Publicly Owned Treatment Works (POTW), as defined by Section 212 of the Federal Water Pollution Control Act (P.L. 92-500) as amended by the Clean Water Act of 1977 (P.L. 95-576) and the Water Quality Act of 1987 (P.L. 100-4). This definition includes any pretreatment involving the reduction of the amount of pollutants, the elimination of pollutants, or the alteration of the nature of pollutant properties in wastewater prior to or in lieu of discharging or otherwise introducing such pollutants into a POTW. (See 40 CFR Section 403.3 (q), (r), & (s)).

30. Wildlife. Any wild animal, including without limitation any wild mammal, bird, reptile, fish, amphibian, mollusk, crustacean, arthropod, coelenterate, or other invertebrate, including any part, product, egg, or offspring thereof (50 CFR 10.12, *Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants*). As used in this AC, wildlife includes feral animals and domestic animals out of the control of their owners (14 CFR Part 139, Certification of Airports).

31. Wildlife attractants. Any human-made structure, land-use practice, or human-made or natural geographic feature that can attract or sustain hazardous wildlife within the landing or departure airspace or the airport's AOA. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

32. Wildlife hazard. A potential for a damaging aircraft collision with wildlife on or near an airport.

33. Wildlife strike. A wildlife strike is deemed to have occurred when:

a. A pilot reports striking 1 or more birds or other wildlife;

b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;

d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;

e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

2. RESERVED.

U.S. Department
of Transportation

**Federal Aviation
Administration**

Advisory Circular

Subject: CONSTRUCTION OR ESTABLISHMENT OF LANDFILLS NEAR PUBLIC AIRPORTS

Date: January 26, 2006 **AC No:** 150/5200-34A
Initiated by: AAS-300 **Change:**

1. Purpose.

This advisory circular (AC) contains guidance on complying with Federal statutory requirements regarding the construction or establishment of landfills near public airports.

2. Application.

The guidance contained in the AC is provided by the Federal Aviation Administration (FAA) for use by persons considering the construction or establishment of a new municipal solid waste landfill (MSWLF) near a public airport. Guidance contained herein should be used to comply with MSWLF site limitations contained in 49 U.S.C. § 44718(d), as amended by section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106-181 (April 5, 2000), "Structures interfering with air commerce." In accordance with § 44718(d), as amended, these site limitations are not applicable in the State of Alaska.

In addition, this AC provides guidance for a state aviation agency desiring to petition the FAA for an exemption from the requirements of § 44718(d), as amended.

3. Cancellation

This AC cancels AC 150/52300-34, *Construction or Establishment of Landfills Near Public Airports*, dated August 8, 2000.

This revision contains no substantive changes to the original. Changes include revised and new website addresses, revised strike statistics, and regulation titles.

4. Related Reading Materials.

AC - 150/5200-33, *Hazardous Wildlife Attractions On or Near Airports*.

Wildlife Strikes to Civil Aircraft in the United States. FAA Wildlife Aircraft Strike Database Serial Reports.

Report to Congress: *Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports,* April 1996, DOT/FAA/AS/96-1.

Title 14, Code of Federal Regulation, Part 139, Certification of Airports.

Title 40, Code of Federal Regulation, Part 258, Municipal Solid Waste Landfill Criteria.

Some of these documents and additional information on wildlife management, including guidance on landfills, are available on the FAA's Airports web site at http://www.faa.gov/airports_airtraffic/airports/ or http://wildlife-mitigation.tc.faa.gov

5. Definitions.

Definitions for the specific purpose of this AC are found in Appendix 1.

6. Background.

The FAA has the broad authority to regulate and develop civil aviation under the Federal Aviation Act of 1958, 49 U.S.C. § 40101, et. seq., and other Federal law. In section 1220 of the Federal Aviation Reauthorization Act of 1996, Pub. L. No. 104-264 (October 9, 1996), the Congress added a new provision, section (d), to 49 U.S.C. § 44718 to be enforced by the FAA and placing limitations on the construction or establishment of landfills near public airports for the purposes of enhancing aviation safety. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (AIR-21), Pub. L. No. 106-181 (April 5, 2000) replaced section 1220 of the 1996 Reauthorization Act, 49 U.S.C. § 44718 (d), with new language. Specifically, the new provision, § 44718(d), as amended, was enacted to further limit the construction or establishment of a municipal solid waste landfill (MSWLF) near certain smaller public airports.

In enacting this legislation, Congress expressed concern that a MSWLF sited near an airport poses a potential hazard to aircraft operations because such a waste facility attracts birds. Statistics support the fact that bird strikes pose a real danger to aircraft. An estimated 87 percent of the collisions between wildlife and civil aircraft occurred on or near airports when aircraft are below 2,000 feet above ground level (AGL). Collisions with wildlife at these altitudes are especially dangerous as aircraft pilots have minimal time to recover from such emergencies.

The FAA National Wildlife Aircraft Strike Database shows that more than 59,000 civil aircraft sustained reported strikes with wildlife from 1990 to 2004. Between 1990-2004, aircraft-wildlife strikes involving U. S. civil aircraft resulted in over $495 million/year worth of aircraft damage and associated losses and over 631,000 hours/year of aircraft down time.

From 1990 to 2004, waterfowl, gulls and raptors were involved in 77% of the 3,493 reported damaging aircraft-wildlife strikes where the bird was identified. Populations of Canada geese and many species of gulls and raptors have increased markedly over the last several years. Further, gulls and Canada geese have adapted to urban and suburban environments and, along with raptors and turkey vultures, are commonly found feeding or loafing on or near landfills.

In light of increasing bird populations and aircraft operations, the FAA believes locating landfills in proximity to airports increases the risk of collisions between birds and aircraft. To address this concern, the FAA issued AC 150/5200-33, *Hazardous Wildlife Attractions On or Near Airport*s, to provide airport operators and aviation planners with guidance on minimizing wildlife attractants. AC 150/5200-33 recommends against locating municipal solid waste landfills within five statute miles of an airport if the landfill may cause hazardous wildlife to move into or through the airport's approach or departure airspace.

7. General.

Using guidance provided in the following sections, persons considering construction or establishment of a landfill should first determine if the proposed facility meets the definition of a new MSWLF (see Appendix 1). Section 44718(d), as amended, applies only to a new MSWLF. It does not apply to the expansion or modification of an existing MSWLF, and does not apply in the State of Alaska. If the proposed landfill meets the definition of a new MSWLF, its proximity to certain public airports (meeting the criteria specified in Paragraph 8 below) should be determined. If it is determined that a new MSWLF would be located within six miles of such a public airport, then either the MSWLF should be planned for an alternate location more than 6 miles from the airport, or the MSWLF proponent should request the appropriate State aviation agency to file a petition for an exemption from the statutory restriction.

In addition to the requirements of § 44718(d), existing landfill restrictions contained in AC 150/5200-33, *Hazardous Wildlife Attractions On or Near Airports* (see Paragraph 5, Background) also may be applicable. Airport operators that have accepted Federal funds have obligations under Federal grant assurances to operate their facilities in safe manner and must comply with standards prescribed in advisory circulars, including landfill site limitations contained in AC 150/5200-33.

8. Landfills Covered by the Statute.

The limitations of § 44718(d), as amended, only apply to a new MSWLF (constructed or established after April 5, 2000). The statutory limitations are not applicable where construction or establishment of a MSWLF began on or before April 5, 2000, or to an existing MSWLF (received putrescible waste on or before April 5, 2000). Further, an existing MSWLF that is expanded or modified after April 5, 2000, would not be held to the limitations of § 44718(d), as amended.

9. Airports Covered by the Statute.

The statutory limitations restricting the location of a new MSWLF near an airport apply to only those airports that are recipients of Federal grants (under the Airport and Airway Improvement Act of 1982, as amended, 49 U.S.C. § 47101, *et se*q.) and primarily serve general aviation aircraft and scheduled air carrier operations using aircraft with less than 60 passenger seats.

While the FAA does not classify airports precisely in this manner, the FAA does categorize airports by the type of aircraft operations served and number of annual passenger enplanements. In particular, the FAA categorizes public airports that serve air carrier operations. These airports are known as commercial service airports, and receive scheduled passenger service and have 2,500 or more enplaned passengers per year.

One sub-category of commercial service airports, nonhub primary airports, closely matches the statute requirement. Nonhub primary airports are defined as commercial service airports that enplane less than 0.05 percent of all commercial passenger enplanements (0.05 percent equated to 352,748 enplanements in 2004) but more than 10,000 annual enplanements. While these enplanements consist of both large and small air carrier operations, most are conducted in aircraft with less than 60 seats. These airports also are heavily used by general aviation aircraft, with an average of 81 based aircraft per nonhub primary airport.

In addition, the FAA categorizes airports that enplane 2,500 to 10,000 passengers annually as non-primary commercial service airports, and those airports that enplane 2,500 or less passengers annually as general aviation airports. Both types of airports are mainly used by general aviation but in some instances, they have annual enplanements that consist of scheduled air carrier operations conducted in aircraft with less than 60 seats. Of the non-primary commercial service airports and general aviation airports, only those that have scheduled air carrier operations conducted in aircraft with less than 60 seats would be covered by the statute. The statute does not apply to those airports that serve only general aviation aircraft operations.

To comply with the intent of the statute, the FAA has identified those airports classified as nonhub primary, non-primary commercial service and general aviation airports that:

1. Are recipients of Federal grant under 49 U.S.C. § 47101, et. seq.;

2. Are under control of a public agency;

3. Serve scheduled air carrier operations conducted in aircraft with less than 60 seats; and

4. Have total annual enplanements consisting of at least 51% of scheduled air carrier enplanements conducted in aircraft with less than 60 passenger seats.

Persons considering construction or establishment of a new MSWLF should contact the FAA to determine if an airport within six statute miles of the new MSWLF meets these criteria (see paragraph 11 below for information on contacting the FAA). If the FAA determines the airport does meet these criteria, then § 44718(d), as amended, is applicable.

An in-depth explanation of how the FAA collects and categorizes airport data is available in the FAA's National Plan of Integrated Airport Systems (NPIAS). This report and a list of airports classified as nonhub primary, non-primary commercial service and general aviation airports (and associated enplanement data) are available on the FAA's Airports web site at http://www.faa.gov/airports_airtraffic/airports/planning_capacity/.

10. Separation distance measurements.

Section 44718(d), as amended, requires a minimum separation distance of six statute miles between a new MSWLF and a public airport. In determining this distance separation, measurements should be made from the closest point of the airport property boundary to the closest point of the MSWLF property boundary. Measurements can be made from a perimeter fence if the fence is co-located, or within close proximity to, property boundaries. It is the responsibility of the new MSWLF proponent to determine the separation distance.

11. Exemption Process.

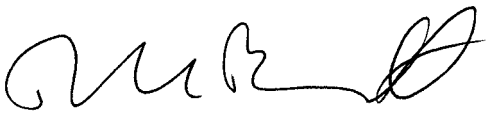
Under § 44718(d), as amended, the FAA Administrator may approve an exemption from the statute's landfill location limitations. Section 44718(d), as amended, permits the aviation agency of the state in which the airport is located to request such an exemption from the FAA Administrator. Any person desiring such an exemption should contact the aviation agency in the state in which the affected airport is located. A list of state aviation agencies and contact information is available at the National Association of State Aviation Officials (NASAO) web site at www.nasao.org or by calling NASAO at (301) 588-1286.

A state aviation agency that desires to petition the FAA for an exemption should notify the Regional Airports Division Manager, in writing, at least 60 days prior to the construction of a MSWLF. The petition should explain the nature and extent of relief sought, and contain information, documentation, views, or arguments that demonstrate that an exemption from the statute would not have an adverse impact on aviation safety. Information on contacting FAA Regional Airports Division Managers can be found on the FAA's web site at www.faa.gov.

After considering all relevant material presented, the Regional Airports Division Manager will notify the state agency within 30 days whether the request for exemption has been approved or denied. The FAA may approve a request for an exemption if it is determined that such an exemption would have no adverse impact on aviation safety.

12. Information.

For further information, please contact the FAA's Office of Airport Safety and Standards, Airport Safety and Operations Division, at (800) 842-8736, Ext. 7-3085 or via email at WebmasterARP@faa.gov. Any information, documents and reports that are available on the FAA web site also can be obtained by calling the toll-free telephone number listed above.



DAVID L. BENNETT
Director, Office of Airport Safety and Standards

APPENDIX 1. DEFINITIONS.

The following are definitions for the specific purpose of this advisory circular.

Construct a municipal solid waste landfill (MSWLF) means excavate or grade land, or raise structures, to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting authority.

Establish a municipal solid waste landfill (MSWLF) means receive the first load of putrescible waste on site for placement in a prepared municipal solid waste landfill.

Existing municipal solid waste landfill (MSWLF) means a municipal solid waste landfill that received putrescible waste on or before April 5, 2000.

General aviation aircraft means any civil aviation aircraft not operating under 14 CFR Part 119, Certification: Air carriers and commercial operators.

Municipal solid waste landfill (MSWLF) means publicly or privately owned discrete area of land or an excavation that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. A MSWLF may receive other types of RCRA subtitle D wastes, such as commercial solid waste, nonhazardous sludge, small quantity generator waste and industrial solid waste, as defined under 40 CFR § 258.2. A MSWLF may consist of either a standalone unit or several cells that receive household waste.

New municipal solid waste landfill (MSWLF) means a municipal solid waste landfill that was established or constructed after April 5, 2000.

Person(s) means an individual, firm, partnership, corporation, company, association, joint-stock association, or governmental entity. It includes a trustee, receiver, assignee, or similar representative of any of them (14 CFR Part 1).

Public agency means a State or political subdivision of a State; a tax-supported organization; or an Indian tribe or pueblo (49 U.S.C. § 47102(15)).

Public airport means an airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(16)).

Putrescible waste means solid waste which contains organic matter capable of being decomposed by micro-organisms and of such a character and proportion as to be capable of attracting or providing food for birds (40 CFR § 257.3-8).

Scheduled air carrier operation means any common carriage passenger-carrying operation for compensation or hire conducted by an air carrier or commercial operator for which the air carrier, commercial operator, or their representatives offers in advance the departure location, departure time, and arrival location. It does not include any operation that is conducted as a supplemental operation under 14 CFR Part 119, or is conducted as a public charter operation under 14 CFR Part 380 (14 CFR § 119.3).

Solid waste means any garbage, or refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved materials in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permit under 33 U.S.C. § 1342, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954, as amended (68 Stat. 923) (40 CFR § 258.2).

U.S. Department
of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports	**Date:** 01/31/2012 **Initiated by:** AAS-300	**AC No:** 150/5200-36A **Change:**

1. Purpose.

This Advisory Circular (AC) has two purposes. First, this AC describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments (WHA) for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139), and at non-certificated airports funded by a Federal Aviation Administration (FAA) Airport Improvement Program (AIP) or Passenger Facility Charge (PFC) Program. We recommend that airports, at a minimum, consult with a qualified airport wildlife biologist when developing a Wildlife Hazard Management Plan (WHMP). However, airports are not required to do so.

Second, this AC addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel who implement an FAA-approved WHMP.

2. Applicability.

The standards and practices in this AC for public-use airports and for those who conduct Wildlife Hazard Assessments and conduct required training are:

a. Mandatory for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR Part 139).

b. Mandatory for airports that have accepted AIP or the Passenger Facility Charge (PFC) Program funds.

c. Highly recommended for all other airports that independently fund Wildlife Hazard Assessments.

See Grant Assurance No. 34, Policies, Standards, and Specifications, and PFC Assurance No. 9, Standards and Specifications.

3. Cancellation.

This AC cancels AC 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports, dated June 28, 2006.

4. Background.

Wildlife biologists conducting Wildlife Hazard Assessments or training airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans at certificated airports must have professional training and experience in wildlife hazard management at airports [§139.337(c) and (f)(7)]. Airport personnel actively involved in overseeing or implementing FAA-approved Wildlife Hazard Management Plans must receive initial training and recurrent training every 12 consecutive months [§139.303(c) and (e) (Personnel)].

5. Related Reading Material.

Please review the most recent versions of the following documents:

a. FAA AC 150/5200-18, Airport Safety Self-Inspection.

b. FAA AC 150/5200-32, Reporting Wildlife Aircraft Strikes.

c. FAA AC 150/5200-33, Hazardous Wildlife Attractions On or Near Airports.

d. FAA AC 150/5200-34, Construction or Establishment of Landfills Near Public Airports.

e. FAA AC 150/5210-20 Ground Vehicle Operations on Airports

f. FAA AC 150/5220-25 Airport Avian Radar Systems

g. FAA AC 150/5300-13 Airport Design

h. FAA AC 150/5340-1K Standards for Airport Markings

i. FAA AC 150/5340-18F Standards for Airport Sign Systems

j. FAA Office of Safety and Standards, Certalert no. 98-05, Grasses Attractive to Hazardous Wildlife.

k. FAA Office of Safety and Standards, Certalert no. 04-09, Relationship Between FAA and WS.

l. FAA Office of Safety and Standards, Certalert no. 04-16, Deer Hazard to Aircraft and Deer Fencing.

m. Cleary, E. C. and Archie Dickey. 2010. Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports. Airport Cooperative Research Program Report #32.

n. Cleary, E. C. and R. A. Dolbeer. 2005. Wildlife Hazard Management at Airports: A Manual for Airport Personnel. 2nd Ed. FAA, Office of Airport Safety and Standards, Washington, DC.

o. Dolbeer, R. A., S. E. Wright, J.R. Weller and M.J. Begier. 2009. Wildlife Strikes to Civil Aircraft in the United States, 1990 – 2008. FAA National Wildlife Aircraft Strike Database Serial Report #15.

p. Dolbeer, R. A. et al. Ranking the Hazard Level of Wildlife Species to Civil Aviation in the United States: Update #1. Special Report for the Federal Aviation Administration, July 2, 2003.

q. Report to Congress: Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports, April 1996, DOT/FAA/AS/96-1.

r. Title 14, Code of Federal Regulation, Part 139, Certification of Airports.

s. Title 40, Code of Federal Regulation, Part 258, Criteria for Municipal Solid Waste Landfills.

t. FAA Grant Assurance No. 34, Policies, Standards, and Specifications

u. FAA Passenger Facility Charge (PFC) Assurance No. 9, Standards and Specifications

v. Aeronautical Information Manual (AIM)

Some of these documents and other information on wildlife management, including FAA Certalerts and guidance on siting hazardous wildlife attractants such as landfills, are available on the FAA website at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

6. Professional Qualifications of Wildlife Biologists Conducting Wildlife Hazard Assessments and Wildlife Hazard Management Training at FAA Certificated Airports.

a. Wildlife biologists conducting airport Wildlife Hazard Assessments must meet certain education, training, and experience standards.

> §139.337(c) reads: Wildlife Hazard Assessment required in paragraph (b) of this section shall be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual.

b. Airports with a FAA-approved Wildlife Hazard Management Plan must provide employees the training needed to carryout the Plan.

> §139.337(f)(7) reads: A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the Wildlife Hazard Management Plan required by paragraph (d) of this section.

c. To meet the requirements of §139.337(c) and (f)(7), a wildlife damage management biologist (from now on referred to as a "qualified airport wildlife biologist") must:

(1) Have the necessary academic coursework from accredited institutions and work experience to meet the qualifications of a GS-0486 series wildlife biologist as defined by the U.S. Office of Personnel Management classification standards (Appendix A) **or** be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org) **and,**

(2) Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix C), **and**;

(3) While working under the direct supervision of a qualified airport wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)). **and,**

(4) Have successfully completed at least one of the following within five years of their initial FAA approved airport wildlife hazard management training course, and every five years thereafter:

(i) An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix C) **or**,

(ii) Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting **or**,

(iii) Other training acceptable to the FAA Administrator.

d. Individuals who work under the direct supervision of a qualified airport wildlife biologist are allowed to conduct Wildlife Hazard Assessments if the airport sponsor and the qualified airport wildlife biologist agree in writing to determine how the qualified airport wildlife biologist will:

(1) Supervise how the individual(s) will conduct the Wildlife Hazard Assessment; and

(2) Report progress of the Wildlife Hazard Assessment; and

(3) Supervise the Wildlife Hazard Assessment report production.

e. Certificate Holders or Airport Sponsors must obtain documentation verifying the qualifications outlined in c (1) – (3) above of any person(s) conducting wildlife hazard assessments or providing requisite training

7. Initial and Recurrent Training for Airport Personnel Actively Involved in Managing Hazardous Wildlife On or Near Airports.

a. Personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. §139.303 requires a specific training regimen for all airport personnel. §139.303(c) and (e) require the holder of an Airport Operating Certificate issued under Part 139 to provide initial training and, every 12 months thereafter, recurrent training in wildlife hazard management to airport personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans. The required training must include "Any additional subject areas required under … §139.337" [§139.303(c)(5)] and, "As appropriate, comply with the following training requirements of this part … §139.337, Wildlife Hazard Management" [§139.303(e)(5)].

b. Appendix D outlines the minimum training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics might be needed.

c. §139.337(f)(1) requires the Wildlife Hazard Management Plan to include a list of the individuals having authority and responsibility for implementing each aspect of the plan. This list identifies the individuals who must complete the required training.

d. §139.337(f) does not prohibit holders of Airport Operating Certificates from using a "train-the-trainer" approach when providing the requisite training, provided the trainers receive and successfully complete their initial and recurrent training from a qualified airport wildlife

biologist. Trainers who are not qualified airport wildlife biologists are limited to providing training to their airport employees.

e. Holders of Airport Operating Certificates issued under Part 139 are required to make and keep records of all training for airport personnel involved in controlling wildlife hazards for at least 24 consecutive calendar months.[§139.301(b)(1) and §139.303(d)].

Michael J. O'Donnell
Director, Office of Airport Safety and Standards

Appendix A.

U.S. Office of Personnel Management Qualification Standards for GS-0486 Series Wildlife Biologists.

To be qualified as a GS-0486 series wildlife biologist, a candidate must have the following:

1. A degree in biological science that includes—

a. At least nine semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, and wildlife management or research courses in the field of wildlife biology; **and**

b. At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, and entomology or research courses in these subjects (excess courses in wildlife biology may be used to meet the zoology requirements where appropriate); **and**

c. At least nine semester hours in botany or the related plant sciences; **or**

2. A combination of education and experience equivalent to a major in biological science (i.e., at least 30 semester hours), with at least nine semester hours in wildlife subjects, 12 semester hours in zoology, and nine semester hours in botany or related plant science, as shown in Paragraph 1 above, plus appropriate experience or additional education; **or**

3. Be designated as a Certified Wildlife Biologist by The Wildlife Society (http://www.wildlife.org).

Appendix B.

Training Resource Requirements and Instructor Qualifications.

The following training resource requirements and instructor qualifications are for any individual wishing to:

- Provide an airport wildlife hazard management course acceptable to the FAA Administrator, for personnel conducting Wildlife Hazard Assessments; or

- Provide training to airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

1. Training Resources and Requirements.

a. A list of training program providers acceptable to the FAA Administrator can be found on the FAA's wildlife strike website: http://wildlife.faa.gov/.

b. Links to the most recent versions of FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues can be found at http://www.faa.gov/airports/ and http://wildlife.faa.gov/.

c. Those proposing to establish a program to train qualified airport wildlife biologists to meet the requirements of 14 CFR §139.337 must submit a complete training syllabus and instructor resume to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations that include as a minimum all curriculum provided in Appendix C. Submit the materials to:

FAA National Wildlife Biologist, AAS-300
Office of Airport Safety and Standards
Federal Aviation Administration,
800 Independence Ave SW
Washington DC 20591

d. The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed in Appendix C.

2. Instructor Qualifications.

The lead instructor for the training should:

a. Be a qualified airport wildlife biologist.

b. Have academic credits in education or instructor/teaching experience.

c. Have a minimum of 2 years experience in all aspects of managing hazardous wildlife on or near airports.

Appendix C.

Training Curriculum Outline for Any Individual Wishing to Provide an Airport Wildlife Hazard Management Course Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments.

1. Training Curriculum Outline.

The goal of the training must be to provide the knowledge, skills, and abilities needed by a GS-0486 wildlife biologist to conduct Wildlife Hazard Assessments [§139.337(c)] and to conduct wildlife hazard training [§139.337(f)(7)]. To be acceptable to the FAA, the course must be at least 24 hours in length and include the curriculum items listed below.

- **a.** Training goals and process
- **b.** Airport familiarization
  - (1) Introduction to the National Plan of Integrated Airport Systems
  - (2) Airport design and layout (AC 150/5300-13 Airport Design)
  - (3) Navigation aids and Air Traffic Control (Aeronautical Information Manual [AIM])
  - (4) Airport operations and safety (AIM)
  - (5) Signs, marking, and lighting (AC 150/5340-1K Standards for Airport Markings and AC 150/5340-18F Standards for Airport Sign Systems)
  - (6) Ground vehicle operator communication (AC 150/5210-20 Ground Vehicle Operations on Airports)
- **c.** Aircraft familiarization
  - (1) Physics of a strike
  - (2) Aircraft nomenclature
  - (3) Civil aviation aircraft categories
  - (4) Aircraft engines
    - (a) Reciprocating
    - (b) Turbo
  - (5) Aircraft certification standards
- **d.** Preview of wildlife hazards to aviation
  - (1) History of major strikes
  - (2) Aviation losses
    - (a) Worldwide
    - (b) United States
- **e.** Controlling laws, regulations, and policies
  - (1) Migratory Bird Treaty Act of 1918, as amended

(2) Animal Damage Control Act of 1931, as amended

(3) Bald Eagle Protection Act of 1940, as amended

(4) Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended

(5) National Environmental Policy Act of 1969, as amended

(6) Endangered Species Act of 1973, as amended

(7) Title 14, Code of Federal Regulation, Part 139, Certification of Airports

(8) Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills

(9) Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management

(10) Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106–181 (April 5, 2000), "Structures Interfering with Air Commerce," section 503

(11) Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management

(12) Applicable FAA Airport Certalerts

(13) Applicable state and local laws, regulations, and ordinances

f. Department of Defense requirements and perspective on military/civilian joint-use airports

g. Other Federal and State agency roles and responsibilities

(1) U.S. Department of Interior, Fish and Wildlife Service

(a) Role and responsibilities related to managing problem wildlife

(b) Migratory Bird Depredation Permits

(c) Salvage Permits

(2) U.S. Department of Agriculture, Wildlife Services

(a) Role and responsibilities related to managing problem wildlife

(3) Other agencies

(a) U.S. Environmental Protection Agency

(i) Siting landfills

(ii) Pesticide registration and use

(b) U.S. Army Corps of Engineers

(i) Wetlands mitigation

(4) Multi-Federal Agency Memorandum of Agreement

(5) Applicable State wildlife regulations

h. FAA National Wildlife Aircraft Strike Database

(1) Strike reporting

(2) Species identification and feather identification

(3) Database access

i. Environmental issues—working with Federal and State agencies

(1) National Environmental Policy Act

(2) U.S. Army Corps of Engineers (wetland loss and mitigation issues)

j. Initial consultations and Wildlife Hazard Assessments (WHAs)

(1) Triggering events for WHAs

(2) Duration and contents of WHAs

(3) Wildlife surveys at airports to assess wildlife hazards

(4) Data analysis and presentation of results

(5) Writing a WHA

k. FAA review of a WHA and determination of need for a Wildlife Hazard Management Plan (WHMP)

l. Drafting and carrying out integrated WHMPs

(1) Contents of WHMPs

(2) FAA review of WHMPs

(3) Endangered Species Act compliance

(4) National Environmental Policy Act review

m. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics

(1) Flight schedule modification

(2) Habitat modification and exclusion

(3) Wildlife dispersal techniques

(4) Wildlife population management

n. Addressing off-airport attractants and community planning and involvement

o. Outline of field trip (to conduct a “mini” WHA)

p. Field trip/site visit

q. Final exam

r. Post exam review

s. Course evaluation

t. Presentation of certificates

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of each.

b. Passing grade/evaluation should be recorded and retained as instructor's records.

c. Instructors should retain course attendance records for a period of three years.

Appendix D.

Training Curriculum Outline for Airport Personnel Actively Involved in Implementing FAA-Approved Wildlife Hazard Management Plans.

1. Training Curriculum Outline.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely, accurately, and effectively implement relevant portions of an FAA-approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must include the following agenda items:

a. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report

b. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months

c. Review of the airport's Wildlife Hazard Assessment is to include—

(1) Existing wildlife hazards and trends in wildlife abundance

(2) Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months

d. Review of the airport's Wildlife Hazard Management Plan, to include the following:

(1) Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.

(2) Review of the airport's wildlife permits (local, State, and Federal)

(3) Review of other airport-specific items:

(a) Wildlife hazard management strategies, techniques, and tools:

(i) Flight schedule modification

(ii) Habitat modification, exclusion

(iii) Repelling methods

(iv) Wildlife population management

(b) Responsibilities of airport personnel for—

(i) Reporting wildlife strikes, control actions, and wildlife observations

(ii) Communicating with personnel who conduct wildlife control actions or who see wildlife hazards and air traffic control tower personnel and others who may require notification, such as airport operations or maintenance departments

(iii) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts

(iv) Documenting and reporting when no hazards are seen during patrols and inspections

e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern

f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual[2]:

(1) Safety, parts, and operation of pyrotechnic launchers

(2) Fundamentals of using pyrotechnics to safely and effectively disperse wildlife

(3) Personnel protective equipment

(4) Cleaning, storage, and transport of firearms and pyrotechnic launchers

(5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics[3]

(6) Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors

(7) For any airport personnel using firearms, live fire training. This training is highly recommended from a qualified individual but not a requirement for this training program[2].

g. Any other training required by local, State, or Federal regulations

2. Recommendations.

a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.

b. The Trainer should retain passing grades/evaluations records.

c. The Trainer should retain course attendance records for a period of three years.

d. Airport personnel responsible for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employees conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

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[2] State Certificated Hunter Safety Instructors, police officers, firearms instructors and other personnel who have been professionally trained in firearms safety should be qualified to teach firearm safety and possibly the safe use of pyrotechnic launchers. Pyrotechnics are classified as high explosives by the Bureau of Alcohol Tobacco and Firearms (ATF) and as Division 1.4 explosives by the U.S. Department of Transportation. There are numerous regulations, security considerations, and ATF licensing requirements that apply to pyrotechnics.

[2] Airport personnel actively involved with the use of firearms for the mitigation of wildlife hazards should receive and maintain current firearms training from either a licensed National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

[3] Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: http://www.atf.gov/explosives/how-to/documents/epcd-flyer.pdf.

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans

Date: 8/20/2018
Initiated By: AAS-300

AC No: 150/5200-38
Change:

1 **Purpose.**

For certificated airports, this Advisory Circular (AC) defines the minimum acceptable standards for the conduct and preparation of Wildlife Hazard Site Visits (Site Visit), Wildlife Hazard Assessments (Assessments) and Wildlife Hazard Management Plans (Plans). This AC provides guidelines that discuss whether a Site Visit can be conducted or whether an Assessment must be conducted under Part 139. In the case of airports that are not Part 139 certificated, this AC provides guidelines as to when a Site Visit or Assessment is recommended. The AC further defines and explains continual monitoring programs. This AC also provides checklists to help people evaluate Site Visits, Assessments and Plans.

2 **Applicability.**

This AC describes an acceptable means, but not the only means, for airports that hold Airport Operating Certificates issued under 14 CFR part 139 subpart D ("Certificated Airports"), to comply with the wildlife hazard management requirements in 14 CFR § 139.337. For non-certificated airports, the standards, practices, and recommendations contained in this AC are recommended during the conduct and preparation of Site Visits, Assessments and Plans. The FAA also recommends this guidance for all Qualified Airport Wildlife Biologists (QAWBs)[1], land-use planners, and developers of projects, facilities, and activities on or near airports. Finally, in accordance with AIP Grant Assurance 34 and PFC Program Assurance B(9), if an airport uses Federal funds or Passenger Facility Charge revenue for Site Visits or Assessments, then the protocols

[1] The term "wildlife damage management biologist" is used in 14 CFR § 139.337. That term is outdated, and "qualified airport wildlife biologist," which is used in this AC, has the same meaning for purposes of complying with part 139.

in Chapter 1 (applicable to Site Visits) or Chapter 2 (for Assessments) must be used in conducting those projects.

3 Background.

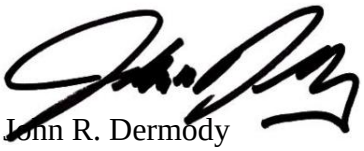
1. 14 CFR § 139.337, *Wildlife Hazard Management,* prescribes the specific reasons why an Assessment must be conducted and what subject matter is minimally required. While minimum standards for Assessments and Plans have existed in the past, there have not previously been standards on preferred methodologies that assess wildlife populations and wildlife hazard attractants. As a result, there have been non standardized, wide ranging methodologies to obtain wildlife and habitat data.
2. An Assessment is defined in § 139.337(c) as an ecological study, conducted by a QAWB. The Assessment analyzes local and transient wildlife populations, habitat, airport operations and strike data (if available) to establish a scientific basis for the development, implementation, and refinement of a Plan. Section 139.337(e) provides in part that a Plan must provide measures to alleviate or eliminate wildlife hazards to air carrier operations and, as authorized by the Administrator, must become a part of the Airport Certification Manual (ACM). While the Assessment ultimately provides a risk analysis of wildlife hazards and gives suggestions on how to mitigate wildlife attractants, the Plan details the agreed upon comprehensive mitigation efforts the airport actually will take.
3. Though parts of the Assessment may be incorporated directly in the Plan, they are two separate documents. Part of the Plan can be prepared by the QAWB who conducts the Assessment. However, some parts can be prepared only by the airport. For example, airport management assigns airport personnel responsibilities, commits airport funds, and purchases equipment and supplies.
4. The intent of a Site Visit is to provide an abbreviated analysis of an airport's wildlife hazards, determine if an Assessment is warranted, and if necessary, and provide actionable information that allows the airport to expedite the mitigation of these hazards. Accordingly, Site Visits should be conducted by a QAWB.
5. Available information about the risks posed to aircraft by certain wildlife species has increased in recent years. Improved reporting, studies, documentation, and statistics show that aircraft collisions with birds and other wildlife are a serious economic and public safety problem. While many species of wildlife can pose a threat to aircraft safety, they are not all equally hazardous. Appendix A provides a composite ranking (1 = most hazardous, 50 = least hazardous) and relative hazard score of 50 wildlife species with at least 100 reported strikes of civil aircraft.[2] We based this ranking on three criteria: damage, major damage, and effect-on-flight. Noticeably missing from this table are several hazardous species that had not been struck with the minimum frequency to allow their inclusion within the analyses.

[2] The data in this Appendix is taken from Table 19, Federal Aviation Administration National Wildlife Strike Database Serial Report No. 19, *Wildlife Strikes to Civil Aircraft in the United States, 1990–2012* (September 2013)

Brown and white pelicans, black vultures, great egrets and other waders as well as several species of waterfowl, raptors, gulls, and shorebirds present a significant hazard to aircraft. Although these hazard rankings can help focus hazardous wildlife management efforts on those species or groups that represent the greatest threats to safe air operations in the airport environment, care should be given to consider any hazardous species of significant mass, flocking or flight behavior, or habitat preferences. Used with a site-specific Assessment to determine the relative abundance and movements of wildlife species, these rankings can help airport operators better understand the general threat level (and consequences) of certain wildlife species and can assist with the creation of a "zero-tolerance"[3] list of hazardous species that warrant immediate attention.

4 **Feedback on this AC.**

If you have suggestions for improving this AC, you may use the Advisory Circular Feedback form at the end of this AC.



John R. Dermody
Director of Airport Safety and Standards

[3] Zero-tolerance designation in the airport environment means wildlife species that represent an unacceptable high risk to safe aircraft operations. Their presence in the airport environment cannot be tolerated and warrants immediate and reasonable management action to remove them from the Air Operations Area (AOA) using appropriate techniques (i.e., harassment, lethal take, capture and relocate, etc.).

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CHAPTER 1. PROTOCOL FOR THE CONDUCT OF A WILDLIFE HAZARD SITE VISIT (SITE VISIT)

1.1 Introduction.

1.1.1 Wildlife Hazard Site Visits can be beneficial for any airport. A Site Visit has three parts: (1) gathering airport information; (2) field observations; and (3) a final report with recommendations. Airports can use a Site Visit to quickly evaluate and mitigate potential hazards on and near airports. An airport can also use a Site Visit to determine whether an Assessment is necessary. An exception to this occurs if the airport is certificated and has had one of the events listed in § 139.337(b). Then the airport must conduct an Assessment[4].

1.1.2 If an airport already has a Plan, airport management can use a Site Visit to investigate wildlife strikes to aircraft or see if the Plan needs to be updated. Airports can also use a Site Visit to decide if a proposed land use in the vicinity of an airport will increase the potential for wildlife hazards at the airport. For non-certificated airports that do not have a Plan, a Site Visit can provide a suitable basis to develop a basic Plan.

1.1.3 During the Site Visit, the QAWB collects and compiles information on the airport's wildlife hazard history, documented and suspected wildlife hazards, habitat attractants, control activities, airport operations and maintenance procedures, communications of hazards through ATC and pilots, aircraft operations and scheduling. A Site Visit is typically conducted over a period of one to three days. A QAWB evaluates the habitat on and surrounding the airport, and records direct or indirect wildlife observations. The QAWB also reviews the current Plan, current wildlife management activities, and airport wildlife strike data. Appendix B has a checklist that airports can use to ensure a complete and detailed Site Visit. The checklist can also be used to review the Site Visit protocol and report.

1.1.4 It is recommended that a QAWB conduct Site Visits. Standards for becoming a QAWB are found in AC 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculum for Airport Personnel Involved in Controlling Wildlife Hazards on Airports.*

1.2 Applicable Airport Information.

1.2.1 A QAWB may request the following information, if available, from the airport operator to prepare for a site visit:

1. Personnel and departments responsible for airport operations
2. Number of aircraft operations per year

[4] If a certificated airport has already had an Assessment conducted and a Wildlife Hazard Management Plan (Plan) developed based on that Assessment, then the airport must evaluate the Plan following an event described in § 139.337(b)(1) -(3).

3. Type of operations (i.e., % private, civil, and military)
4. Recent airport construction or airfield changes
5. Past and present land management practices
6. Records of strikes and damage, flight delays, injuries, and fatalities due to strikes. Wildlife strike data may help determine hazardous species on an airport. Data on reported wildlife strikes are available through the FAA National Wildlife Strike Database (available at http://wildlife.faa.gov). Airports may maintain their own local database which can be compared with the National Database. It is recommended that a Site Visit include an analysis of wildlife strike records. If possible, include summaries of strike data by species, time of day, on and off-site airport locations, and weather conditions. At minimum, it is recommended that a wildlife strike analysis include, if available:
    a. Bird and mammal species involved
    b. Frequency distribution by month and year
    c. Number per 10,000 aircraft movements
    d. Location on the airfield
7. Any existing wildlife hazard management efforts and related maintenance procedures, if applicable – Records of past management efforts may be helpful during this initial consultation. It is recommended that attempts to exclude, deter, or remove wildlife from the airport be noted. If not already in place, it is recommended that a wildlife log be created and maintained by airport operations to document all wildlife activity observed on the airport.
8. Description of current wildlife hazard threats or concerns
9. Presence / absence of perimeter fence, condition of fence and its effectiveness[5]
10. Any current Federal and State depredation/ wildlife control permits and annual permit reports
11. Current U.S. Geological Survey (USGS) topographic maps, airport maps, and/ or aerial photographs
12. Other pertinent information present in airport records

1.2.2 Airport records may be incomplete or may not exist. Interviews with airport personnel often yield useful information that is missing from written records. It is recommended that the QAWB discuss the history of wildlife hazard problems at the airport with the

[5] If an airport is non-certificated and does not have an effective or complete perimeter fence to exclude hazardous wildlife, then the Site Visit report should include this recommendation. If the airport desires fencing it must follow FAA procurement protocols and develop a condensed or short plan to mitigate wildlife hazards. This outline demonstrates an airport's commitment to maintain the fence as part of a comprehensive wildlife mitigation program; it is not required to incorporate all of the components of a full Wildlife Hazard Management Plan under 14 CFR § 139.337.

airport manager and staff. The control tower supervisor and chief of operations may also give useful background information on the severity and frequency of the problem.

1.3 Observations.

FAA recommends that the QAWB make observations from a variety of locations to ensure complete visual coverage of the airport. Minimum coverage shall include observations of the airport's Air Operations Area (AOA).[6] These observations maybe brief; they are not as rigorous as a full Assessment. At a minimum, it is recommended that the observations include:

1. *Birds* – Record bird species present and note abundance, activity, and location, type of habitat used, time and date of observations. Note evidence of bird activity such as fecal material and regurgitated pellets (boluses) under structures used for perching.
2. *Mammals* – Document mammals observed and evidence of mammal activity such as scats, tracks, runs, and burrows and include time and date of observations, activity, location, and type of habitat used. Estimate relative abundance, activity, and habitat use.
3. *Habitat Attractants* – Assess habitats and man-made attractants on and around airport property. Note potential wildlife attractants. Review maps and aerial photographs, noting waste management facilities, wildlife refuges, water bodies, agriculture, stock yards, picnic areas, restaurants, and other features or habitats that may attract wildlife within a five-mile radius around the airport. As noted in AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, Section 1.4, Protection of Approach, Departure, and Circling Airspace, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.
4. *Wildlife/Habitat Relationship* – Observe and record how the wildlife observed is using the habitat on the airport.
5. *Wildlife Interactions with Aircraft Operations* – Assess the potential for wildlife interactions with aircraft operations in the AOA, traffic patterns, approach and departure airspace, and surrounding areas. Evaluate aircraft movements to see if these operations increase the risk of wildlife strikes. Review airport hazard advisories to see if they are specific to the hazards at the airport.

1.4 Site Visit Report.

It is recommended that the QAWB provide the airport manager with a letter report summarizing field data and any management recommendations following the Site Visit.

[6] Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.

It is recommended the FAA Regional office receive a copy of this report from the Airport Manager. The findings in a Site Visit report could lead the FAA to require an Assessment. See § 139.337(b)(4) ("wildlife of a size, or in numbers, capable of causing an event" like a multiple wildlife strike, substantial damage from a strike, or engine ingestion). The airport is advised to retain copies of the report. FAA recommends that the Site Visit report contain:

1. List of wildlife species or wildlife signs, such as deer tracks observed during the visit or identified as wildlife hazards by other sources
2. Federal and State status of the species observed
3. Habitat features that may encourage wildlife to use the airport
4. Natural and artificial wildlife attractants on or near the airport
5. Strike data analysis
6. Recommendations to:
    a. Reduce wildlife hazards identified (if data is available to substantiate conclusions)[7]
    b. Conduct an Assessment, if needed
    c. Modify an existing Plan, if needed
    d. Improve communications and hazard advisories between Air Traffic Control, pilots, airlines, airport operations, and other airport users
    e. Consider potential short-term alteration of aircraft operations, if feasible, to avoid identified hazardous wildlife concentrations
    f. No action required, if applicable

[7] Reduce wildlife hazards through the use of habitat management, exclusion/repulsion techniques, active harassment, population control, and operational considerations.

CHAPTER 2. PROTOCOL FOR THE CONDUCT OF A WILDLIFE HAZARD ASSESSMENT (ASSESSMENT)

2.1 Introduction.

2.1.1 The first step in preparing an airport Plan is to conduct an Assessment. A QAWB conducts the Assessment, which gives the scientific basis for developing, implementing, and refining a Plan. Though parts of the Assessment may be incorporated directly into the Plan, they are two separate documents.

2.1.2 The objective of an Assessment is to provide a baseline of data and understanding of wildlife species considered hazardous on or near an airport, and of attractants that provide food, water, and shelter[8]. An Assessment typically takes a year to complete. FAA recommends that assessment methodologies be reproducible. It is also recommended that data collection procedures such as point counts, trapping indices and vehicle routes be set up and used to allow future repetition for consistent, continued monitoring or comparison to previous findings. The Assessment identifies wildlife populations and trends at the airport, such as the location and seasonality of wildlife hazards. It also identifies how these fluctuations in behavior and abundance may affect aviation safety, with particular emphasis on wildlife strikes to aircraft. Assessments promote an integrated approach for wildlife mitigation to effectively:

1. Modify the environment (e.g., changes in mowing and drainage clearance procedures)
2. Exclude wildlife (e.g., installation of fences, netting and perch excluders)
3. Implement harassment procedures (e.g., pyrotechnics and propane cannons)
4. Remove wildlife (e.g., lethal and capture/relocate methodologies)
5. Communicate wildlife hazard advisories through Air Traffic Control voice communications, Automatic Terminal Information Service (ATIS), Pilot Report (PIREPS), Notices to Airmen (NOTAMS)
6. Direct pilot responses to identified hazards
7. Report strikes or hazardous situations
8. Potentially alter flight routes, traffic patterns, or schedules to avoid locations and times of identified wildlife hazards.

2.1.3 A properly conducted Assessment can help a QAWB quantify wildlife hazards to aviation and understand the risk presented by each species for a particular airport. In this context, the most hazardous wildlife species are those which are most likely to cause aircraft damage when struck. Risk is the product of hazard level and abundance

[8] An Assessment identifies and describes wildlife hazards and attractants, whether known, suspected or otherwise unknown, on and near an airport within the separation criteria recommended in Section 1-2 through 1-4 of AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports,* to an extent that allows for the creation of a sufficient basis for mitigation measures.

in the critical airspace, and is thus defined as the probability of a damaging strike with a given species.

2.1.4 The Assessment provides baseline data for an airport to prepare a Plan, and evaluate the efficacy of its existing wildlife hazard management program. For example, an Assessment could help an airport with an existing Plan determine the recurrence of species-specific wildlife hazards, monitor reduction of onsite damaging strikes, monitor wildlife program communication and response efficiency, and improve the overall wildlife program through annual review. Better information regarding wildlife hazards and their attractants should result in better use of resources. Appendix C has a checklist that QAWBs and airports can use to ensure the Assessment and report meet the requirements within 14 CFR § 139.337.

2.2 Requirements for Wildlife Hazard Assessments.

Section 139.337(b) requires that, in a manner authorized by the Administrator, each certificate holder must ensure that an Assessment is conducted when any of the following events occurs on or near the airport:

1. An air carrier aircraft experiences multiple wildlife strikes
2. An air carrier aircraft experiences substantial damage from striking wildlife
3. An air carrier aircraft experiences an engine ingestion of wildlife
4. Wildlife of a size, or in numbers, capable of causing an event described in paragraph (b)(1), (2), or (3) of 14 CFR § 139.337 is observed to have access to any airport flight pattern or aircraft movement area.

Table 1: Additional guidance for 14 CFR § 139.337(b)

The following table provides additional guidance in complying with § 139.337(b).

14 CFR § 139.337	Guidance
(b) In a manner authorized by the Administrator, each certificate holder shall ensure that a Wildlife Hazard Assessment is conducted when any of the following events occurs on or near the airport.	
(b)(1) An air carrier aircraft experiences a multiple wildlife strike	Aircraft strikes multiple animals during a single incident (i.e., flock of birds).
(b)(2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph, substantial damage means damage or structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft	

14 CFR § 139.337	Guidance
and that would normally require major repair or replacement of the affected component;	
(b) (3) An air carrier aircraft experiences an engine ingestion of wildlife; or	Engine damage does not have to result from the ingestion.
(b) (4) Wildlife of a size, or in numbers, capable of causing an event described in paragraph (b)(1), (2), or (3) of this section is observed to have access to any airport flight pattern or aircraft movement area.	Airports with a standing Notice to Airmen (NOTAM), announcements on their Automatic Terminal Information Service (ATIS), or comments in Airport/Facility Directory (A/FD) warning pilots of wildlife hazards on or near the airport meet this condition. Permanent or blanket generic advisories should not be issued without the airport conducting actionable mitigation measures.

2.3 Necessary Elements of a Wildlife Hazard Assessment.

Section 139.337(c) sets forth the minimum content in a Wildlife Hazard Assessment.

Table 2: Guidance on 14 CFR § 139.337 (c)(1) – (5).

The following provides guidance on the required elements in a Wildlife Hazard Assessment.

14 CFR 139.337	Guidance
(c) The Wildlife Hazard Assessment … shall be conducted by a wildlife damage management biologist… having training or experience in wildlife hazard management at airports or an individual working under the direct supervision of such an individual.	An Assessment must be conducted by a QAWB. Additional guidance on the training and experience for a QAWB can be found in the most recent version of AC 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports.*
(c) (cont.) … the Wildlife Hazard Assessment shall contain:	
(c)(1) Analysis of the event or circumstances that prompted the assessment.	Who, what, when, where, and why of the situation prompting the Assessment.
(c)(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.	What wildlife species have access to the airport? What are their movement and seasonal patterns? Data should cover 12 consecutive months. What is the Federal and State protective status of notable wildlife?

14 CFR 139.337	Guidance
(c)(3) Identification and location of features on and near the airport that attract wildlife.	Wildlife are attracted to an airport because something exists on or near the airport that they desire. Wood lots near the AOA and large open areas provide relatively safe loafing, nesting and feeding locations. Food and water sources can vary seasonally or temporarily. These attractants and others, such as easily accessible travel corridors, should be analyzed.
(c)(4) A description of wildlife hazards to air carrier operations.	Consider the types of wildlife observed. Also consider wildlife documented in the strike database and the severity of damage they caused.
(c)(5) Recommended actions for reducing identified wildlife hazards to air carrier operations.	Prioritize recommendations for mitigating hazardous wildlife and their attractants. Also recommend operational and maintenance changes in response to wildlife hazards (e.g., airport operations personnel, Air Traffic Control (ATC), air carriers, and pilots).

2.4 Necessary Elements of a Wildlife Hazard Assessment Report.

2.4.1 The final Assessment report must discuss elements within § 139.337(c). If there was no triggering event or circumstance that prompted the Assessment, then the discussion of triggering event (required under § 139.337(c)(1)) may be omitted. Although there are many acceptable formats to present the findings of an Assessment, it must include those key components listed in § 139.337(c). The required components include sections summarizing methodologies, results, and any recommendations. The report should be submitted to the FAA regional office within 90 days following completion of field work and must contain the name of the QAWB who conducted the Assessment.

2.4.2 It is recommended that Assessment procedures such as point counts, trapping indices, vehicle routes, and avian radar be described to allow duplication of procedures for consistent, continued monitoring or comparison to previous findings. FAA recommends that the report include any maps, imagery and/or detailed descriptions whenever location information is necessary, such as assessment techniques, wildlife hazard attractants, or airport layout. **It is recommended the report cite the presence or absence of Federal or State listed species identified during the Assessment.** If enough data is available, it is recommended that the discussion include whether the species is resident on or near the airport or is considered transient to the location observed. The FAA recommends the report contain an evaluation of all available wildlife strike data for the airport. The National Wildlife Strike Database (http://wildlife.faa.gov) is available to the public and is the primary repository for wildlife strikes to civil aircraft in the U.S., although strike records may be available from other sources such as the airport, airlines and engine manufacturers. FAA

recommends that when available, key strike data such as species, number struck, phase of flight, altitude, time of day, time of year, and damage (if any) be summarized in the report.

2.4.3 The analysis of strike data may include different methodologies that can provide a key component for a comprehensive risk analysis and assessment. Beyond descriptive statistics that summarize strike characteristics at an airport it is recommended that a QAWB determine the number of overall strikes and damaging strikes per number of operations.[9] Another useful alternative for analysis may include determining the amount of biomass struck equated to number of operations or strikes. These analyses can provide a better understanding of risk and as a metric to evaluate the effectiveness of an airport's wildlife program.

2.4.4 Recommended actions for reducing identified wildlife hazards may include detailed, task-specific objectives or general measures. Pay attention to both proactive mitigation such as habitat modification and exclusion techniques, and reactive measures that involve harassment, dispersal and removal procedures. When applicable, airports are encouraged to maintain Federal and State depredation permits. Guidance for acquiring these permits is provided in FAA Certalert No. 13-01, *Federal and State Depredation Permit Assistance* (January 30, 2013).

2.5 Minimum Number of Wildlife Surveys Required and Duration of Wildlife Hazard Assessment.

2.5.1 Conducting an Assessment under § 139.337(c)(2) requires the *"identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences."* The following protocols meet the requirements of § 139.337(c)(2). Alternative protocols may be proposed to the FAA and accepted if they are comparable.

2.5.2 In most cases, conducting a 12-month Assessment would meet this requirement so the seasonal patterns of birds and other wildlife using the airport and surrounding area can be documented. Most regions of the USA have dramatic seasonal differences in numbers and species of migratory birds. Even for non-migratory wildlife, such as deer and resident Canada geese, behavior and movement patterns can change significantly throughout the seasons.

2.5.3 To adequately identify wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences, the QAWB may choose from several objective standardized procedures. These standardized survey procedures ensure that QAWBs consistently collect quality, representative data for hazardous wildlife species in the airport environment. These procedures can then be repeated in future years for comparison. Appendix D is an example of a Wildlife Survey Data Sheet.

[9] Strikes per number of operations typically use a ratio of 10,000 or 100,000 operations.

2.5.4 Various wildlife species are active throughout all hours of the day and night. Inventory and monitoring techniques should account for these movement dynamics. Daytime surveys in the morning, midday, and evening should account for the daily patterns for most birds, and nocturnal surveys or tracking indices should account for the daily patterns of mammals.

2.5.4.1 **Avian Surveys.**

1. Minimum of twelve months data collection
2. Minimum of two data collection trips/month
3. Minimum of two survey samples/month for each of the survey points during the diurnal periods of morning, midday and evening
4. Minimum of one sampling trip/quarter (four total sampling trips) for off-site survey points to sample avian use of significant attractants out to five miles, including general observations of sign (tracks, scat, nests, etc.)[10]

2.5.4.2 **Mammalian Surveys.**

1. Minimum of one sampling trip per quarter (four total over twelve months), including general observations of sign such as tracks, scat, etc.

2.5.4.3 **Data from Other Sources.**

1. Published data
2. University studies
3. Federal and State studies
4. National Environmental Policy Act (NEPA) documents
5. Radar studies
6. ATC and airport "event logs" or wildlife management, patrol, monitoring logs
7. Other acceptable data sources

2.6 Basic Wildlife Survey Techniques for Wildlife Hazard Assessments.

Not all species are equally detectable. However, an Assessment should assess the presence or absence of known or suspected hazardous species on or near the airport. This is especially important for those species documented within the facility's strike

[10] See AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, Section 1-4, Protection of Approach, Departure, and Circling Airspace. For all airports, the FAA recommends a distance of 5 statute miles between the farthest edge of the airport's AOA and the hazardous wildlife attractant if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace.

data. Hazardous avian species on or near airports are typically medium to large birds or small birds that congregate in large flocks.

2.6.1 Avian Survey.

2.6.1.1 Any standardized survey may be used provided it is designed to comprehensively identify wildlife on or near the airport. One objective procedure for assessing bird populations, based on the North American Breeding Bird Survey (BBS) methodology, is creating standardized survey points about half a mile apart throughout the airport. The number of observation points required to obtain adequate coverage of the sample area will depend on the size, complexity, and physical features of the airport. This is one example of a specific type of survey, however, and this particular survey is not required.

2.6.1.2 Using a standardized survey methodology gives a baseline estimate of bird species and numbers on the airport that can be compared with other airports and the same airport in the future. Data on species and numbers are collected from established observation points along a survey route. A survey is defined as one visit to all observation points along a survey route. A survey-day consists of one or more independent surveys conducted during one day (i.e., morning, midday, evening).

2.6.1.3 Although forested areas can provide attractive perching or roosting locations for hazardous avian species such as raptors and blackbirds, woodland interior birds are usually of limited concern unless they frequent open habitats which will be surveyed. In many cases, observation points in forested areas are more important for the systematic or ancillary identification of animals and less critical for identifying hazardous avian species. Data relating to forested areas may also be collected by general observations.

2.6.1.4 In addition, it is recommended that observation points also be considered at selected areas within five miles of the airport's AOA if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. Examples of such attractants include, but are not limited to large water impoundments, reservoirs, roosting sites, feedlots, landfills, and agriculture such as sunflowers. The observation points at these areas within the five miles do not need to be surveyed during every data collection trip, but it is recommended that they be surveyed at least quarterly.

2.6.1.5 One method used to conduct a survey would be to start at one end of the survey route and stop the vehicle at each observation point. Record the numbers and species of all birds heard at any distance and all birds detected visually (with or without binoculars) within a quarter-mile radius for 3-5 minutes. During the survey, significant birds (e.g., a flock of

geese; an endangered species) observed outside the quarter-mile radii around observation points or outside the 3-5 minute periods (e.g., while driving between stops) should be noted on a separate data form and reported under general observations.

2.6.1.6 QAWBs may choose to develop a coding procedure to record birds observed actually on or over a runway during the 3-5 minute observation periods. By knowing the percent of total airport runway area covered by the observation points, you can estimate the number of birds on or crossing the runways per hour. For example, if ten observation points on an airport survey route cover 25% of the runway area, and you recorded an average of 1.5 birds per 3-5 minute observation on or over a runway, then you would estimate that the airport averaged 120 birds on or crossing runways per hour. Assigning each bird or bird flock observed during a point count to a grid location can be useful in further refining spatial distributions of birds on the airport.

2.6.1.7 For the area within a ¼ mi. radius of each avian observation point, make a visual estimate of the proportion of each major habitat type [e.g., pavement, short (< 8 in.) grass, tall grass (>8 in.), water, shrub]. It may be useful to analyze data for certain species by observation point to associate that species with a certain habitat type or location on the airport. For example, if waterfowl are consistently observed at one observation point that has aquatic habitat, this should be stated in the analysis and presentation of results.

2.6.1.8 Ultimately, the overall survey design (i.e., number and location of survey points, frequency of survey counts per month, time between visits to airport) and analysis of data will vary between airports and depend on the individual airport's wishes. The focus of this AC is to provide minimum standards for data collection and identify limited examples of acceptable data collection techniques. Airports and QAWBs may choose to collect additional data or use more rigorous data collection techniques.[11]

2.6.2 General Observations.

2.6.2.1 In addition to the standardized survey, it is important to make general wildlife observations in areas outside the survey points. These observations can provide important information on significant bird hazards and/or zero tolerance species (e.g., Canada geese) and issues (e.g., endangered species) not fully covered by a standardized survey. Record observations of wildlife use and movements around and within structures

[11] For further information on avian survey methodologies and analyses specific to airport environments can be found in *Wildlife in Airport Environments: Preventing Animal-Aircraft Collisions through Science-Based Management, (DeVault et al., 2013).*

and other unique areas of the airport environment not covered in the standardized bird survey.

2.6.2.2 QAWBs may choose to perform additional analysis. Each airport is different and may require special analysis to document bird activity. For example, if a certain flocking species is present in large numbers, the QAWB may want to present an analysis of mean flock size. If a large number of birds migrate through the airport area over a two-week period, a graphic presentation showing numbers at two-week intervals instead of monthly or seasonal intervals might be appropriate. In addition, the general bird observations made outside of the standardized survey should be incorporated in the report. For example, tables might list the number of goose flocks recorded on the airport by month, the mean number of gulls seen per observation by month at a trash transfer facility within two miles from the airport, or the mean number of pigeons seen in a hangar per observation by season. The report may include descriptive summaries of general observations about flight patterns of a certain species over the airport or the habitat use by another species on the airport.

2.6.3 Data Recording.

Encoding data helps data analysis and database entry. Using bird species codes is recommended. The American Ornithologists' Union (AOU) has established a standard four letter alphabetic code for most bird species (http://www.birdpop.org/alphacodes.htm). Bird codes may need to be developed for special situations. For example, in some situations a code for an unknown gull may be "UNGU". Appendix D has an example of a form that QAWBs may use to record survey data. This sample data form also has standardized codes for weather and time.

2.6.4 Data Analysis and Descriptive Statistics.

2.6.4.1 Appropriate data analysis and interpretation helps accurately assess hazards and make management recommendations. Data also serves as a baseline from which the effectiveness of management actions can be measured.

2.6.4.2 For each survey, calculate the total and average number of birds observed per species and the number of observation points recording the species (frequency of sightings on the airport). The number of birds observed gives a measure of species density on the airport. The frequency of sightings at each location shows the distribution of the species on the airport. Surveys can then be grouped to calculate mean number and frequency of birds by species seen per survey by time of day, month, and season.

2.6.4.3 If desired, statistical tests used to identify significant differences among months or seasons can be conducted using analysis of variance (ANOVA) and chi-square calculations.

2.6.5 Seasonal Patterns.

Seasonal patterns or trends for species can be represented by graphing the mean number of birds and mean frequency of sightings per month or season. The graph gives a visual representation of obvious seasonal trends or patterns for each bird species observed in all habitat types (i.e., the entire airport). In many cases it will be useful to simplify presentations by combining species into groups/guilds (e.g., birds of prey, gulls, waterfowl) in these summary graphs, presenting the detailed data for individual species in a table or appendix.

2.6.6 Mammal Surveys.

2.6.6.1 The collection of data pertaining to mammal populations is often time consuming and labor intensive. However, these data are an important and necessary part of an Assessment and wildlife hazard analysis, and should be collected to determine the presence or absence of large mammals and predators. Whether to collect data for all or for selected mammal species found on an airport depends on past and present wildlife hazards and the initial observations of the QAWB. The QAWB should collect data related to identified and suspected hazardous mammal species, including ungulates (i.e., deer, elk), canids (i.e., coyotes, domestic dogs), lagomorphs (i.e., rabbits, hares), and if necessary, rodents.

2.6.6.2 A number of survey designs developed for mammal species rely upon trapping and marking animals (e.g., mark-recapture studies). Mark-recapture studies are usually time consuming, labor intensive, and costly. FAA recommends that the QAWB consider a combination of data collection procedures that best identify a specific airport's hazardous species. Systematic vehicle surveys, tracking indices, catch-per-unit-effort survey, and spot mapping are commonly used techniques. Vehicle surveys should provide adequate data on large mammals such as ungulates, canids, and lagomorphs. Various tracking methods can be used to assess relative abundance or to help identify mammals beyond the scope of vehicle surveys which have varying degrees of success dependent on method (e.g., spotlight, night vision or Forward-Looking Infra-Red [FLIR]). Relative abundance data for small mammals are collected by catch-per-unit-effort sampling (snap traps). Data related to miscellaneous mammals can also be collected by spot mapping.

2.6.6.3 **Vehicle Surveys.**

2.6.6.3.1 Vehicle surveys at night using a spotlight, night vision equipment, or a FLIR unit are performed along predetermined routes. The survey can be one continuous route around the airport or several routes covering different areas. FAA recommends that survey routes include areas near runways, if feasible, and habitat types where ungulates, predators, or other target species are suspected or known to occur. Satellite imagery, aerial photographs, topographic maps, and maps that contain airport roadway

systems can help in establishing survey routes. Preliminary examinations will be helpful to establish appropriate night time survey routes without excessive obstructions that limit viewing. It is recommended that survey routes be established carefully and remain constant throughout the study. Coordination with Air Traffic Control is essential during spotlight surveys to ensure no aircraft are in the AOA or traffic pattern in the line of spotlight beams. Additionally, FAA recommends spotlight surveys ideally be scheduled at times when aircraft operations are limited or not present. **Spotlights must not be pointed at aircraft, other vehicles, or the airport tower.** It is recommended that the survey be conducted at least quarterly for the duration of the study.

2.6.6.3.2 Observations may be performed starting one half hour after sunset and ending after two to three hours, or delayed, dependent on times of limited scheduled aircraft operations. In general, the survey route(s) should be run once per night, but multiple runs may be made if time permits. All mammals and birds observed should be recorded by species and location. It is recommended that the start and end time of each survey and total distance driven be recorded so that numbers seen per hour and distance can be calculated. FAA recommends that wildlife surveys be conducted in most types of weather according to schedule, but it may sometimes be necessary to postpone survey periods during severe weather. FAA further recommends that surveys not be conducted in excessive wind or heavy rain as mammal activity may be significantly affected by weather.

2.6.6.4 **Catch-Per-Unit-Effort (small mammals).**

2.6.6.4.1 Small mammal populations may be measured if birds of prey or mammalian predators occur in the strike record or if direct observations or alternative data suggest high predator densities. The number of transects and traps will depend on the size of the habitat being surveyed. Traps are generally set in daylight hours and checked within 24 hours. FAA recommends that transects be run for two to four consecutive nights in spring and again in autumn.

2.6.6.4.2 When checking traps, it is recommended that the following data be collected for each trap: status of trap (sprung or unsprung) and species, if any, captured. Trapping results are recorded, by species, as the number of animals caught per 100 adjusted trap nights. Small mammal trapping is not required. It is optional depending on the hazardous wildlife present at the airport.

2.6.6.5 **Spot Mapping.**

Spot mapping consists of plotting on a grid map the location, date, and time of mammal observations and provides a general overview of mammal activity on the airport. Often airport operations officers, who are required to perform runway sweeps, can assist in collection of this data, as can

pilots or other airport personnel. Additionally, mammal observations made while performing designated bird and mammal surveys can be mapped and used to augment spot observations. Spot mapping is not required. However, any general observations of mammals and/or their sign should be reported and described in the Assessment report.

2.7 Basic Habitat Surveys for Wildlife Hazard Assessments.

2.7.1 Habitat evaluation is an essential part of an Assessment and is required under § 139.337(c)(3). Many natural and artificial habitats are attractive to wildlife, and evaluation of these should provide the QAWB with information about the quantity, quality, and seasonal nature of their use. Wildlife exploit these habitats for food, water or cover, which may vary seasonally and/or throughout an animal's life cycle. Although they may be considered either a direct or indirect attractant,[12] it remains essential for safe air traffic operations to fully understand their influence.

2.7.2 Land-use practices that attract or sustain hazardous wildlife populations on or near airports, specifically those listed in AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports,* Section 2, can significantly increase the potential for wildlife strikes. FAA criteria include land uses that cause movement of hazardous wildlife onto, into, or across the airport's approach or departure airspace or AOA.

2.7.3 The FAA recommends the minimum separation criteria defined in AC 150/5200-33 Section 1 for land-use practices that attract hazardous wildlife to the vicinity of airports. This separation criterion provides predetermined boundaries of concern around airports to be considered while conducting comprehensive, detailed studies and evaluations of wildlife populations and attractants.

2.7.3.1 **Pre-existing Habitat Data.**

Pre-existing habitat inventory and geospatial information can prove useful regarding soils, vegetative species, topography, geography, habitat type, location and size. This data may be found in various locations or with various agencies such as:

1. Airport Layout Plan
2. Airport Master Plan
3. Airport Environmental Assessment
4. Airport Environmental Impact Statement
5. U.S. Fish and Wildlife Service

[12] Direct attractants (i.e., favorable vegetation for foraging) or indirect attractants (e.g., brushy vegetation may result in increased rodent populations which attracts hazardous raptors) can create equally hazardous environment for safe air operations.

6. U.S. Geological Survey
7. U.S. Army Corps of Engineers
8. USDA – Natural Resources Conservation Service
9. State Departments of Natural Resources
10. State Departments of Transportation

2.7.3.2 **Descriptive Habitat Data.**

The Assessment should include a general description of the study area and describe natural and artificial attractants both on-site and off-site within the separation criteria recommended in AC 150/5200-33 Section 1.

2.7.3.2.1 Natural Habitat Data.[13]

This may include characteristics such as geographic location, topography, soils, climate, vegetation, agriculture, and wetlands/water features, such as drainages, ponds, lakes, rivers, and water impoundments.

2.7.3.2.2 Artificial Environment Data.[14]

This may include items such as airport buildings, jet bridges, towers, antennas, runways, taxiways, ramp, hangars, waste disposal operations and waste containers.

2.7.3.3 **Food.**

2.7.3.3.1 Naturally occurring wildlife foods such as insect and other invertebrate populations should be noted with descriptions, time of year, weather conditions, and environmental factors such as soil type, vegetative cover, and drainage conditions. In addition, FAA recommends that management practices that enhance the production of these natural foods be documented. An evaluation of small mammal populations as a food source for predators can be addressed in the sampling strategy discussed previously.

2.7.3.3.2 Plant seeds, fruits, and berries are other food attractants on airports for birds and mammals. Seasonal wildlife hazards may develop when seeds or fruits are abundant. Documentation of these food sources is an important component of the habitat analysis.

2.7.3.3.3 Review environments within five miles from the airport's AOA and record food sources that attract wildlife. Agricultural fields, grain elevators, food

[13] Natural habitat is defined for this purpose as biotic habitats including vegetation (e.g., grass, forest, shrub scrub, wetland, agriculture, or desert) and water features (e.g., ponds, rivers, lakes, marine, retention/detention ponds, or drainages).

[14] Artificial environment is defined for this purpose as man-made features (e.g., buildings, structures, towers, paved/hard surfaces, waste disposal operations, or waste containers).

product industries, fast food restaurants, livestock operations, wildlife refuges and sanctuaries, and waste handling facilities may attract significant numbers of birds and/or mammals, increasing the hazard to human safety and aircraft. It is recommended that a Wildlife Hazard Assessment contain information relative to identified notable sites such as the names and locations, and a description of the attractant and the potential hazard.

2.7.3.4 **Vegetation.**

Vegetation and cover requirements vary by species and time of year. Relationships between wildlife species and cover types provide information necessary to develop appropriate wildlife management strategies. In reviewing vegetative areas on an airport, it is important to record observations of species, management practices, seasonal growth, density, percent cover, and any noted wildlife associations. Use of specific areas by animals in the airport environment may assist the observer in identifying vegetative attractants.

2.7.3.5 **Water.**

Water sources are wildlife attractants, especially fresh water sources in coastal areas. Reservoirs, streams, ponds, drainage basins, seep areas, and ephemeral water sources should be identified and mapped. Gulls, waterfowl, shorebirds, and marsh birds may be attracted to the airport because of abundant food or drinking and resting sites available in existing water resources.

2.7.3.6 **Structures.**

2.7.3.6.1 Buildings, areas adjacent to buildings, and equipment on airports are readily used by some wildlife species, such as European starlings, pigeons, gulls, sparrows, crows, raptors, mice, rats, skunks, and woodchucks. Wildlife use of structures can present threats to human safety and aircraft, and may cause unsanitary working conditions or damage to structures.

2.7.3.6.2 The reasons for use of most structural features by wildlife are usually easily determined, while others are less obvious. For example, feral pigeons may loaf on just one ledge of a particular building because it provides shelter from the wind or protection from predators. The QAWB should determine what features are attractive to problem species, and why. A strategy can then be developed to reduce or eliminate the problem.

2.7.3.7 **Soil.**

2.7.3.7.1 The type(s) and fertility of soils present on an airport is a general indicator of biological productivity. Habitat quality is directly related to soil fertility and other soil conditions. The nutritive value, quantity, and attractiveness of plant and animal food organisms varies widely with soil

types and conditions. For example, sandy, well-drained soils that dry quickly after rainfall generally produce less biomass and are less likely to harbor an abundant population of earthworms and other invertebrates.

2.7.3.7.2 It is recommended that identification and documentation of soil types and conditions on the airport and vicinity be an integral part of an overall assessment or study. In most states, information on soil types and conditions can be acquired from soil survey publications available from the USDA Natural Resource Conservation Service (NRCS) or the Cooperative Extension Service. These publications contain soil maps and descriptions, formations, morphology and soil classifications. However, on airports where large scale soil disturbance, such as grading, leveling, and filling, have been conducted, soil maps may be of limited value.

2.7.3.8 **Spot Mapping.**

Because attractants may vary seasonally and following precipitation, spot mapping the location and date of features such as fruit and seed bearing vegetation, ephemeral pools and temporary ponding of water or puddles throughout the AOA will help identify food sources, drainage problems and grade deficiencies.

2.8 Evaluation of Airport and Aircraft Operations.

2.8.1 The assessment of airport and aircraft operational procedures is an essential part of an Assessment. Hazardous wildlife only present a risk to aviation if aircraft and wildlife occupy the airspace or movement areas at the same time and location. Persons conducting Assessments should gather general observation data and other information related to airport and aircraft operations regarding wildlife hazards. FAA recommends that QAWBs monitor NOTAMs, ATIS advisories, and published Airport/Facilities Directory information to ensure that specific information and not blanket advisories are issued. It is recommended that QAWBs assess ATC's involvement in identifying potential hazards or hazards relayed by pilots or airport operations personnel. FAA recommends that the Assessment also include a determination that wildlife dispersal is coordinated with ATC to insure hazards are not inadvertently increased by dispersing wildlife into the path of aircraft movements. ATC permits wildlife control teams access to movement areas of the airfield and communicates with them during the implementation of mitigation measures to ensure dispersal paths are observed and de-conflicted with aircraft movements.

2.8.2 QAWBs may also query users of the airport for their inputs on wildlife observed on and around the airport. For example, pilots may be interviewed about their experience in the local area as they have a perspective not available to ground-based personnel. Congregations of towering raptors or gulls over off-airport facilities such as landfills and food-processing plants are often detected this way as are major roost sites of blackbirds, starlings, vultures, or crows. Fixed-base operators (FBOs) may also be visited and personnel interviewed for their experience with hazardous wildlife in the

local area. Pilots, especially those operating non-commercial or private aircraft, must be aware that they have the discretion to delay takeoffs or departures, ask for wildlife dispersal action, or requests alternate runways, departure or approach paths to avoid identified hazards.

2.8.3 Airline and private maintenance personnel may be interviewed for their perspective on local hazardous wildlife and their reporting procedures when strikes are detected on post-or pre-flight inspections of aircraft.

2.8.4 Other airport users may be interviewed and included in the Assessment process. Aircraft Rescue and Fire Fighting (ARFF) and Airport Security Personnel are always present on airports during operations and have a unique view of the airfield. It is recommended that they also be notified should major dispersal operations be conducted, such as with pyrotechnics, where the slight chance for grass fires or security concerns are present.

CHAPTER 3. PROTOCOL FOR THE PREPARATION OF A WILDLIFE HAZARD MANAGEMENT PLAN (PLAN)

3.1 Introduction.

3.1.1 When complete, the Assessment is submitted by the airport to the FAA for review and approval. The FAA will also use it to determine if the airport must prepare and implement a Plan. In reaching this decision, the FAA considers the Assessment, the aeronautical activity at the airport, the views of the certificate holder and airport users, and any other pertinent information. *See* § 139.337(d)(1)-(6).

3.1.2 The goal of an airport's Plan is to minimize the risk to aviation safety, airport structures or equipment, or human health posed by populations of hazardous wildlife on and around the airport. The Plan accomplishes this through the identification of hazardous wildlife and their attractants, suitable proactive and reactive management techniques, necessary resources and supplies to successfully implement a wildlife hazard management program and personnel responsibilities and training requirements. The Plan includes appropriate federal, state and possible local wildlife control permits and describes a schedule and methodology to evaluate and update the Plan. If the FAA determines that a Plan is needed to alleviate or eliminate wildlife hazards to air carrier operations under § 139.337(e), the FAA will notify the airport to develop a Plan using the Assessment as a basis. The FAA recommends that airports developing an initial Plan submit the document to the FAA regional office within six months of this notification, and that airports updating an existing Plan submit the modified document to the FAA regional office within 60 days of notification.

3.2 Wildlife Hazard Management Plan Regulatory Requirements and Methodology.

Section 139.337(f) provides specific guidance as to what must be addressed in a Plan. A checklist is provided for clarification in Appendix E.

3.2.1 14 CFR 139.337(f)(1). "A list of the individuals having authority and responsibility for implementing each aspect of the plan."

This list assigns or delegates specific responsibilities for various sections of the Plan to airport departments and other interested federal, state or local agencies, such as:

1. Airport Director
2. Operations Department
3. Maintenance Department
4. Security Department
5. Planning Department
6. Finance Department
7. Wildlife Coordinator
8. Wildlife Hazards Working Group

9. Air Traffic Control
10. Airlines
11. Pilots
12. Fixed-base operators
13. Air-side tenants
14. Land-side tenants
15. State wildlife agency
16. Local law enforcement authorities
17. U.S. Fish and Wildlife Service (USFWS)

3.2.2 14 CFR 139.337(f)(2). "A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion."

3.2.2.1 The Plan should provide a prioritized list of problem wildlife populations and wildlife attractants (food, cover, and water) identified in the Assessment, proposed mitigation actions, and target starting and completion dates. A list of completed wildlife population management projects and habitat modification projects designed to reduce the wildlife strike potential can be included to provide a history of work already accomplished. It is helpful to group attractants by areas and ownership.

AIRPORT PROPERTY	**NON-AIRPORT PROPERTY**
Air Operations Area (AOA)	Within 2 miles of AOA
Within 2 miles of AOA	Within 5 miles of AOA
Airport structures	

3.2.2.2 Wildlife mitigation techniques at commercial airports involve integrated and systematic methodologies that typically progress (based on necessity) from proactive measures to reactive measures. The reduction of wildlife threats at an airport is often the **unintended or secondary consequence of ongoing habitat management** such as mowing, tree removal, drainage reparations, out-of-grade surface restoration and the establishment or maintenance of perimeter fencing.

3.2.2.3 **14 CFR 139.337(f)(2)(i). "Wildlife population management."**

3.2.2.3.1 This section includes species-specific population management plans (e.g., deer, gulls, geese, and coyotes). The progression of techniques employed to mitigate hazardous species include:

1. Habitat Management (habitat modification and resource protection)
2. Exclusion (fencing, netting, anti-perch/ nesting devices)

3. Repellents (chemical, audio, visual)
4. Harassment (pyrotechnics, falconry, dogs, radio-controlled
5. models, etc.)
6. Capture (chemical, live traps, lethal traps)
7. Toxicants (oral and contact); Fumigants
8. Shooting

3.2.2.3.2 When applicable, it is recommended that airports identify resident or seasonal "zero-tolerance" hazardous species based on historical strike records or recognized threat posed by such species at the facility. It is recommended that the ranking of hazard level for birds and terrestrial mammals in Appendix A also be considered when an airport determines zero-tolerance species and subsequent management protocols. The FAA encourages airports to consider any hazardous species of significant mass, flocking or flight behavior that were not included in the table because of low strike frequency. Brown and white pelicans, black vultures, great egrets and other waders as well as several species of waterfowl, raptors, gulls, and shorebirds can represent a significant hazard to aircraft although not found in Appendix A. Ungulates (e.g., deer or elk), canids (e.g., coyotes or domestic dogs) and certain avian species (e.g., Canada geese or snow geese) are universal candidates for zero-tolerance management protocols. Flocking birds such as European starlings and gulls pose a significant and increasing hazard to aircraft as flock size increases. Therefore, an airport may choose to require zero-tolerance management protocol for these (or similar) species only after an unacceptable flock size has been reached. Determination of action based on flock size is often difficult and requires experienced consideration of variables such as hazard relative to species, airport operation type, and current aircraft activity.

3.2.2.4 **14 CFR 139.337(f)(2)(ii). "Habitat modification."**

This section addresses natural and artificial habitats that may provide a food, water or cover source to hazardous species to reduce their attractiveness. Advisory Circular 150/5200-33, *Hazardous Wildlife Attractants On or Near the Airports*, provides in-depth discussion on acceptable/unacceptable habitats and land-use practices on and near airports. Management of the vegetative/prey food items for hazardous species is often season or weather related and may include rodent control, garbage storage, landscaping, and management of standing water. This section should clearly identify the existing management and maintenance techniques used, as background information. Only new techniques (or changes to existing management and maintenance operations) should be included in recommended actions.

1. Vegetative/prey food items for hazardous species

a. Prey items (rodents, earthworms, insects)
b. Vegetative food items (grain/seeds, fruit, desirable grasses)
c. Garbage (handling, storage)
d. Handouts (feeding wildlife)

2. Vegetation management may include:
   a. AOA vegetation
   b. Drainage ditch vegetation
   c. Landscaping
   d. Agriculture
3. Water management may include:
   a. Permanent Water
   b. Wetlands
   c. Canals / ditches / streams
   d. Holding ponds
   e. Sewage (glycol) treatment ponds
   f. Ephemeral water
   g. Runways, taxiways, aprons
   h. Other wet areas
4. Airport buildings may include:
   a. Airfield structures
   b. Abandoned structures
   c. Terminal
   d. Airport construction
   e. Leased facilities

3.2.2.5 **14 CFR 139.337(f)(2)(iii). "Land use changes."**

When feasible, the FAA recommends that off-site attractants within the defined separation criteria such as agricultural activities, waste handling facilities that are not fully enclosed, surface mining, urban development, wildlife refuges and storm water management systems be eliminated or modified to reduce the attractiveness to wildlife. Advisory Circular 150/5200-33 includes an in-depth discussion on acceptable and unacceptable land use practices on and near airports.

3.2.3 14 CFR 139.337(f)(3). "Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits."

3.2.3.1 Certain species of wildlife are protected at all levels of government—local, state, and federal. This section addresses the specific species involved and their legal status in this section. It also describes the wildlife management permitting requirements and procedures for all levels of government having jurisdiction.

1. Federal (50 CFR parts 1-199)
2. State (Fish and Game Code, or its equivalent)
3. City and County ordinances
4. If pesticides are to be used, the following are also needed:
   a. Pesticide use regulations and licensing requirements
   b. Federal regulations and licensing: Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)
   c. State regulations and licensing (varies by State)

3.2.3.2 For the purpose of the Plan, summaries are generally adequate. It is not necessary to quote federal, state, and local laws and regulations.

3.2.4 14 CFR 139.337(f)(4). "Identification of resources that the certificate holder will provide to implement the plan."

This section provides information identifying what resources the airport will supply in terms of personnel, time, equipment (e.g., radios, vehicles, guns, traps, or propane cannons), supplies (e.g., pyrotechnics), pesticides (restricted and non-restricted use) and application equipment, and supply sources for equipment and supplies.

3.2.5 14 CFR 139.337(f)(5). "Procedures to be followed during air carrier operations that at a minimum includes—"

3.2.5.1 **14 CFR 139.337(f)(5)(i). "Designation of personnel responsible for implementing the procedures."**

This section complements the list of individuals required under § 139.337(f)(1) and describes the personnel and duties for successful mitigation of wildlife hazards in the airport environment.

1. Wildlife Control Personnel
2. Wildlife Coordinator
3. Operations Dept.
4. Maintenance Dept.
5. Security Dept.
6. Air Traffic Control

7. Pilots
8. Airlines
9. Fixed-base Operators
10. Airside/landside tenants

3.2.5.2 **14 CFR 139.337(f)(5)(ii). "Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin."**

This section provides a description of known or anticipated locations that should be monitored for successful mitigation of wildlife hazards in the airport environment.

1. Runway, taxiway
2. AOA
3. Perimeter fence
4. Other areas attractive to wildlife

3.2.5.3 **14 CFR 139.337(f)(5)(iii). "Wildlife hazard control measures."**

This section complements the list of prioritized actions required under § 139.337(f)(2)(i) and details current or anticipated techniques that may be implemented for successful mitigation of wildlife hazards in the airport environment. It should clearly identify and explain how current techniques already in use at the airport help alleviate some of the hazards, and how anticipated techniques may complement those already in use. Techniques discussed in this section typically represent an integrated approach and include exclusion, repellent, harassment, capture, lethal control or even relocation measures in specific instances. In addition, operational control measures (such as scheduling of flights, air traffic control advisories, Pilot Reports (PIREPS), UNICOM advisories, avoidance procedures, delayed takeoffs and approaches and use of alternate runways or traffic direction) must be considered.

3.2.5.4 **14 CFR 139.337(f)(5)(iv). "Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower."**

This section provides a description of regulated and site-specific protocols for the communication and/or notification of wildlife control activities, identified and current wildlife hazards on or near the airport environment or imminent wildlife threats to aircraft operations on or near the airport. Protocols may include training in airport communication and the development of notification procedures for airport personnel and Air Traffic Control when wildlife control procedures are implemented or in response to immediate wildlife threats to safe air operations to ensure dispersal activities do not inadvertently increase wildlife hazards.

Communication and/or notification procedures within the Plan should recognize pilot reports, ATC advisories and NOTAMS and establish responsibilities for reporting wildlife strikes. This section may also provide equipment requirements that include radios, cellular phones, and lights and an official call list with numbers.

3.2.6 14 CFR 139.337(f)(6). "Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:"

At a minimum, the Plan must be fully reviewed once annually. This review must be documented and may be accomplished as a routinely scheduled event or following a triggering incident as defined in § 139.337(b)(1)-(3). The airport should maintain documentation of all triggering incidents and corresponding reviews of the Plan to ensure its effectiveness mitigating the hazardous species involved in the triggering incident. It is often helpful for the airport manager to appoint a Wildlife Hazards Working Group to periodically review the Plan and the Plan's implementation to recommend further refinements or modifications. Appendix F is an example of a Plan review form.

3.2.6.1 **14 CFR 139.337(f)(6)(i). "The plans effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and:"**

Input should be provided from all airport departments, Air Traffic Control, and the QAWB as to the effectiveness of the Plan. Good records are necessary to properly evaluate the effectiveness of a program.

3.2.6.2 **14 CFR 139.337(f)(6)(ii). "Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated."**

3.2.6.2.1 The reevaluation, for example, should consider:

1. Number of times wildlife is seen on the AOA
2. Requests for wildlife dispersal from air traffic control, pilots, or others
3. Increased number of strikes

3.2.6.2.2 Section 139.337(f)(6) cannot be effectively implemented or evaluated without documentation of wildlife strikes. The effectiveness of a Plan to reduce wildlife hazards both on and near an airport and the reevaluation of all facets of damaging/nondamaging strikes from year to year require accurate and consistent reporting. Therefore, every Plan should include a commitment to document all wildlife strikes that occur within the separation distances described in sections 1-2 and 1-3 of Advisory Circular 150/5200-33 to better identify, understand and reduce threats to safe aviation.

3.2.7 14 CFR 139.337(f)(7) "A training program conducted by a wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section."

Initial and recurrent training conducted by a QAWB required under § 139.303 and described in AC 150/5200-36 should equip personnel actively involved in an airport's wildlife hazard management program with sufficient resources needed to comply with the requirements in the Airport Certification Manual and the requirements of § 139.337. Personnel identified in § 139.337(f)(5)(i) should be considered for inclusion within this recurrent training. Pesticide user training and certification requires its own regulated training and certification schedule and should be monitored.

3.3 **Pertinent Laws and Regulations.**

Under § 139.337(e), the FAA may direct an airport operator to develop a Plan or to update an existing Plan. The FAA's action in approving a Wildlife Hazard Management Plan submitted by an airport operator under part 139 is considered a Federal action, as defined in the Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, and Order 1050.1F, Environmental Impacts: Policies and Procedures. However, that Order also stipulates that "A grant to fund the preparation of a WHMP or the approval of that plan normally qualifies for categorical exclusion…". The FAA may also have to delineate which specific measures within the plan may be implemented without further review, versus other measures that may require further interagency coordination and permitting. Such delineation would normally involve measures that have independent utility from one another. Below are some of the more common laws that may require coordination and/or consultation. Note that violations of some of these laws can result in significant fines and/or imprisonment, even for a first offense. Penalties increase substantially for additional offenses, and in some cases violations will be classified as felony criminal offenses.

3.3.1 The Endangered Species Act (Federal and similar State laws).

3.3.1.1 This paragraph generally outlines procedures for complying with Section 7 of the ESA, the Magnuson-Stevens Act, and state laws protecting wildlife. It also describes procedures for responding to requests by state wildlife agencies to facilitate and encourage habitats for State-listed threatened and endangered species or species of special concern that may occur on airports and pose a threat to aviation safety. It is the FAA's responsibility as the action agency to determine whether the proposed Plan may affect federally protected species or habitat for such species on or near the airport. To make this determination, the FAA should first consult the USFWS Information for Planning and Consultation (IPAC) website (https://ecos.fws.gov/ipac/). This webpage will help FAA determine if a particular measure within a Plan may affect any federally listed species or critical habitat. If the FAA cannot determine the presence of federally listed or proposed species or designated or proposed critical habitat

occurring on or near the airport, the FAA representative may contact the local USFWS Ecological Services Field Office for additional assistance. In cases of doubt, contact APP-400 and the FAA Environmental Protection Specialists for further guidance about whether to seek assistance from the USFWS, National Marine Fisheries Service (NMFS), or relevant state and local wildlife agencies.

3.3.1.2 However, the airport's AOA is an artificial environment that has been created and maintained for aircraft operations. Because an AOA can be markedly different from the surrounding native landscapes, it may attract wildlife species that do not normally occur, or that occur only in low numbers in the area. Some of the grassland species attracted to an airport's AOA are at the edge of their natural ranges, but are attracted to habitat features found in the airport environment. Also, some wildlife species may occur on the airport in higher numbers than occur naturally in the region because the airport offers habitat features the species prefer. Some of these wildlife species may be Federal or State-listed threatened and endangered species or have been designated by State resource agencies as species of special concern.

3.3.1.3 Many agencies have requested that airport operators facilitate and encourage habitat on airports for state-listed threatened and endangered species or species of special concern. State-Listed threatened and endangered species and species of special interest are not afforded the level of protection of federally listed species. These species, or the habitat needed to support them should not be allowed on airport property if direct or associated hazards are caused by their promotion in the airfield environment. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety.

3.3.1.4 Airport sponsors should reevaluate existing and evaluate future agreements with Federal, State, or local wildlife agencies where the terms of the agreements are or may be contrary to federal obligations concerning hazardous wildlife on or near public-use airports and aviation safety. Whenever practicable, wetland mitigation for Federal or State-listed threatened and endangered species or species of special concern should be sited off-airport and outside separation distances recommended in AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, Section 1.

3.3.1.4.1 Procedures for Federal Threatened and Endangered Species on Airports.

1. The ESA directs all Federal agencies to work to conserve endangered and threatened species, and to use their authorities to further the purposes of the Act. Section 7 of the Act, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not

jeopardize the continued existence of any listed species. Section 7 of the ESA, as amended, sets forth requirements for consultation that a federal agency shall use if that agency believes a listed species or critical habitat for such a species may be in the area affected by the project. If the FAA determines that an action "may affect" a threatened or endangered species, then Section 7(a)(2) requires the FAA to consult with the USFWS or the NMFS, as appropriate, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat. (The effects on fish, wildlife, and plants include the destruction or alteration of habitat and the disturbance or elimination of fish, wildlife, or plant populations). If the Secretary of the Interior has developed a recovery plan for an affected species pursuant to section 4(f) of the ESA, that plan should be reviewed by FAA environmental protection specialists to ensure that assessments of impacts from FAA actions consider the management actions and criteria for measuring recovery identified in the plan. If a species has been proposed for Federal listing as threatened or endangered, or a critical habitat has been proposed, section 7(a)(4) states that each agency shall confer with the Services. Refer to the FWS and NMFS *"Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act,"* March 1998.

2. Section 9 of the ESA prohibits a Federal agency from taking, without an incidental take permit, any listed species. Where a conservation plan has been developed pursuant to a permit under ESA section 10 (incidental take permit), the FAA environmental protection specialists should ensure that the impact analysis for the affected species contained in the NEPA document is consistent with the predicted impacts described in the conservation plan. Under the Magnuson-Stevens Act, Federal agencies must consult with the NMFS with regard to any action authorized, funded, or undertaken that may adversely affect any essential fish habitat identified under the Act. The consultation procedures are generally similar to ESA consultation requirements.

    a. **No Consultation Required.** If there are no federally listed or proposed species or designated or proposed critical habitat occurring on or near the airport and the FAA has determined there is no effect to a listed species, no further action is required to fulfill the ESA.

    b. **Consultation May Be Required.** If federally listed or proposed species or designated or proposed critical habitat occur on or near the airport, the following additional actions may need to be taken.

i. If the FAA determines that a particular measure proposed within the Plan may affect Federally listed or proposed species or designated or proposed critical habitat, then the FAA Regional Coordinator must contact the local USFWS Ecological Services Field Office/and or the NMFS Office responsible for section 7 consultations and coordinate to determine next steps. Depending on the nature of the effects, the FAA may informally or formally consult with the Services. Formal consultation occurs when the Federal agency makes a determination of "may affect, likely to adversely affect" a species. Informal consultation occurs if a Federal agency determines, and the service supports, a determination of "may affect, not likely to adversely affect."

1. The airport operator may need to prepare a Biological Assessment (50 CFR 402.13) assessing the effects of the particular measure in the Plan on the federally listed or proposed species or designated or proposed critical habitat. The airport operator would submit the Biological Assessment to the FAA along with the draft Plan. Under the ESA, it is FAA's obligation to consult with the USFWS or NMFS. Therefore, the FAA must review the Biological Assessment and determine if it is accurate and adequate for use in Section 7 consultation with the appropriate Service.

ii. FAA must complete the Section 7 consultation before the FAA tells the airport sponsor they may implement the particular measure(s) and the sponsor implements any actions in the Plan that may affect federally listed or proposed species or designated or proposed critical habitat.

3.3.1.4.2 Procedures for State Listed Species and Species of Special Concern on Airports.

If State-listed or proposed species or designated or proposed critical habitat occur on or near the airport, the airport operator shall take this information into consideration when developing its Plan. Because each State maintains requirements specific to its natural resources, it is recommended the airport operator: (1) coordinate with the State Department of Natural Resources to determine whether a Biological Assessment or monitoring program is required; (2) determine whether special permits are required to allow routine maintenance operations, harassment or other management alternatives involving the species.

3.3.2 The Bald and Golden Eagle Protection Act.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), is another law that must be considered when evaluating the potential impacts of a proposed Plan. This law was enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

3.3.2.1 **50 CFR § 22.26.**

The regulation set forth in 50 CFR § 22.26 provides for issuance of permits to take bald eagles and golden eagles where the taking is associated with but not the purpose of the activity and cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance; however, permits may authorize non-purposeful take that may result in mortality.

3.3.2.2 **50 CFR § 22.27.**

The regulation at 50 CFR § 22.27 establishes permits for removing eagle nests where: (1) necessary to alleviate a safety emergency to people or eagles; (2) necessary to ensure public health and safety; (3) the nest prevents the use of a human-engineered structure; or (4) the activity or mitigation for the activity will provide a net benefit to eagles. Only inactive nests may be taken, except in the case of safety emergencies. Inactive nests are defined by the continuous absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days leading up to the time of take.

3.3.3 The Migratory Bird Treaty Act of 1918 (MBTA).

3.3.3.1 The MBTA (16 U.S.C. §§ 703–712) implements the convention for the protection of migratory birds between the United States and Great Britain (acting on behalf of Canada). The statute makes it unlawful without a waiver to pursue, hunt, take, capture, kill or sell birds listed therein

("migratory birds"). The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs and nests.

3.3.3.2 The USFWS issues permits for otherwise prohibited activities under the MBTA. These include permits for taxidermy, falconry, propagation, scientific and educational use, and depredation15, an example of the latter being the killing of geese near an airport, where they pose a danger to aircraft.

3.3.4 National Environmental Policy Act (NEPA) Review.

3.3.4.1 The FAA's approval of a Plan normally falls within the scope of a categorical exclusion under NEPA, as implemented by FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015), paragraph 5-6.2.e, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects* (April 28, 2006), paragraph 209b. To determine whether approval of the Plan qualifies for categorical exclusion, the FAA must determine whether the measures in the Plan involve extraordinary circumstances (see FAA Order 1050.1F, paragraphs 5-2 a and b, and FAA Order 5050.4B, paragraph 209b). Extraordinary circumstances include significant impacts on federally protected species, species of state concern, or habitat for such species.

1. The FAA may categorically exclude approval of the Plan itself under FAA Order 1050.1F.
2. In addition, however, the specific measures within the Plan must be examined for extraordinary circumstances.
3. If specific measures within the Plan involve extraordinary circumstances, the FAA may still approve the Plan as a whole, but must clearly delineate which specific measures may be implemented without further coordination or permitting from those that may need additional review.

3.3.4.2 Once a draft Plan is approved, the Plan is returned to the airport sponsor for inclusion in the airport's Airport Certification Manual and is enforceable. Appendix G is a template for a Letter of Approval. Appendix H is a template for a Letter of Mixed Approval.

[15] For further information, see CertAlert No. 13-01, *Federal and State Depredation Permit Assistance* (01/30/2013). This CertAlert assists airport operators with the acquisition of Federal or State depredation permits.

CHAPTER 4. PROTOCOL FOR CONTINUAL MONITORING

4.1 Introduction.

4.1.1 When an airport completes an Assessment and Plan, it should consider implementing a continual monitoring program for wildlife hazards. A continual monitoring program is a best management practice and not a requirement. Recurrent wildlife monitoring would be outlined in the Plan. The goal of systematic, long-term wildlife hazard monitoring in an airport environment is to identify changes to wildlife composition, numbers, attractants, travel corridors and the general airport environment in a timely manner that can affect the presence or behavior of wildlife. Continual monitoring enhances safety because it allows the airport operator to regularly determine trends in wildlife, and target mitigation practices to reduce the possibility of strikes. The airport can use this information to quickly and efficiently implement mitigation techniques and evaluate the efficacy of its mitigation program. Ultimately, the frequent hazard identification and adaptable mitigation will reduce the likelihood of wildlife strikes. Additionally, continual monitoring should decrease the time, effort, personnel hours, and money spent on mitigation because hazards will be identified before they pose a high risk.

4.1.2 In contrast to an assessment or inventory of wildlife hazards in an airport environment, a monitoring program over time assesses changes and trends of the resources. It is recommended that consideration be given to data points and techniques tested and incorporated into an airport's Assessment for use in its long term monitoring protocol. Ultimately, the techniques used for long term monitoring may change over time dependent on the airports goals or management objectives, personnel changes, availability of improved methodologies or equipment, and recommendations based on systematic evaluation of the monitoring program.

4.2 Continual Monitoring Protocol.

It is recommended that the monitoring consist of monthly wildlife surveys and identification of significant changes to natural/ artificial habitats and other attractants.

4.2.1 Avian Surveys.

1. Twelve months data collection
2. Minimum one survey per month for each of the survey points during the diurnal periods of morning, midday and evening; unless the Assessment, strike records or monitoring data justifies the elimination of a survey time period (e.g., elimination of midday surveys).

4.2.2 Mammalian Surveys.

1. It is recommended that airports that have documented hazardous terrestrial mammals (e.g., deer or canids) conduct a minimum of one survey per quarter, and that airports without recognized terrestrial mammal hazards consider a minimum of 2 to 4 surveys throughout the year.

4.2.3 Monitoring of Airport Procedures.

It is recommended that monitoring airport procedures include:

1. ATC and airport "event logs" or wildlife management, patrol, monitoring logs
2. Wildlife/aircraft strike reports
3. Federal/State Depredation Permit use or Special Permit use (e.g., Eagle Disturbance or Nest Removal Permits)

4.3 **Continual Monitoring Annual Report.**

As part of a continual monitoring program, an airport should consider preparing an annual report to best evaluate the efficacy of its wildlife mitigation program summarizing:

1. Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences
2. Identification and location of features on and near the airport that attract wildlife
3. Description of wildlife hazards to air carrier operations
4. Description of wildlife strikes during the year
5. Discussion of any significant modifications on or near the airport property
6. Summary of ATC and airport "event logs" or wildlife management, patrol, monitoring logs
7. Summary of Federal/State Depredation Permit use; Special Permit use (e.g., Eagle Disturbance or Nest Removal Permits)

APPENDIX A. COMPOSITE RANKING OF HAZARDOUS WILDLIFE SPECIES

Composite ranking (1 = most hazardous, 50 = least hazardous) and relative hazard score of 50 wildlife species with at least 100 reported strikes with civil aircraft based on three criteria (damage, major damage, and effect-on-flight). Data were derived from the FAA National Wildlife Strike Database, 1990–2012.[1]

Wildlife species	% of strikes with:			Mean hazard level[5]	Composite ranking	Relative hazard score[6]
	Damage[2]	Major damage[3]	Effect on flight[4]			
White-tailed deer	84	36	46	55	1	100
Snow goose	77	41	39	53	2	95
Turkey vulture	51	19	35	35	3	63
Canada goose	50	17	28	31	4	57
Sandhill crane	41	13	27	27	5	48
Bald eagle	41	12	28	27	6	48
D.-crested cormorant	34	15	24	24	7	44
Mallard	23	9	13	15	8	27
Osprey	22	7	15	15	9	26
Great blue heron	21	6	16	15	10	26
American coot	24	7	11	14	11	25
Coyote	9	2	21	11	12	19
Red-tailed hawk	15	5	11	10	13	19
Cattle egret	10	3	15	9	14	17
Great horned owl	15	3	6	8	15	14
Herring gull	10	5	9	8	16	14
Rock pigeon	10	4	10	8	17	14
Ring-billed gull	8	3	8	6	18	11
American crow	8	3	8	6	18	11

Wildlife species	% of strikes with:			Mean hazard level[5]	Composite ranking	Relative hazard score[6]
	Damage[2]	Major damage[3]	Effect on flight[4]			
Peregrine falcon	8	2	5	5	20	9
Laughing gull	5	2	7	5	21	8
American robin	7	1	4	4	22	7
Snow bunting	1	1	9	4	23	7
Red fox	3	0	8	4	23	7
European starling	4	1	5	3	25	6
Amer. golden-plover	4	2	4	3	26	6
Barn owl	4	2	3	3	27	5
Upland sandpiper	4	1	4	3	27	5
Purple martin	5	1	2	3	29	5
Mourning dove	3	1	4	3	30	5
Red-winged blackbird	3	0	5	3	31	5
Woodchuck	2	0	4	2	32	4
Northern harrier	2	1	2	2	33	3
Chimney swift	2	0	2	1	34	2
Killdeer	1	0	2	1	35	2
House sparrow	2	0	1	1	35	2
Black-tailed jackrabbit	1	1	1	1	37	2
American kestrel	1	<1	2	1	38	2
Eastern meadowlark	1	<1	2	1	38	2
S.-tailed flycatcher	0	0	2	1	40	1
Horned lark	1	<1	1	1	41	1
Pacific golden-plover	1	0	1	1	41	1

Wildlife species	% of strikes with:			Mean hazard level[5]	Composite ranking	Relative hazard score[6]
	Damage[2]	Major damage[3]	Effect on flight[4]			
Barn swallow	1	0	1	1	43	1
Savannah sparrow	1	0	<1	1	43	1
Common nighthawk	1	0	1	1	45	1
Tree swallow	0	0	1	<1	46	1
Burrowing owl	1	0	0	<1	46	1
Western kingbird	0	0	1	<1	48	0
Virginia opossum	1	0	0	<1	48	0
Striped skunk	0	0	0	0	50	0

Notes:

[1] Excerpted from Table 19 of Serial Report No. 19, "Wildlife strikes to civil aircraft in the United States, 1990-2012. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Washington, DC., USA. Refer to this report for additional explanations of criteria and method of ranking.

[2] Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

[3] Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained made it inadvisable to restore aircraft to airworthy condition.

[4] Aborted takeoff, engine shutdown, precautionary landing, or other negative effect on flight.

[5] Based on the mean value for percent of strikes with damage, major damage (substantial damage or destroyed), and negative effect-on-flight.

[6] Mean hazard level (see footnote 5) was scaled down from 100, with 100 as the score for the species with the maximum mean hazard level and thus the greatest potential hazard to aircraft.

APPENDIX B. AIRPORT WILDLIFE HAZARD SITE VISIT AND REPORT CHECKLISTS

Airport Wildlife Hazard Site Visit Checklist

Airport Name:		
Date of Site Visit:		**Time:**
Airport Representative:		
Qualified Airport Wildlife Biologist:		
FAA Reviewer:		
	Y or NA	**Comments**
1.2 Applicable Airport Information		
Personnel and departments responsible for airport ops		
Type of airport/annual operations		
Recent construction or upgrades		
Strike records (in database and/or airport records)		
Wildlife hazard management efforts		
Description of current wildlife concerns		
Depredation permits		
Airport maps/aerial photographs		
1.3 Observations		
Birds (species, activity, location, type of habitat used, time and date of observations, status if listed species, and evidence of activity, i.e., fecal material, nests, tracks, etc.)		
Mammals (species, activity, location, type of habitat used, time and date of observations, status if listed species, and evidence of activity, i.e., scat, tracks, burrows, etc.)		
Habitat attractants on movement and non-movement areas (assess both natural and man-made attractants)		
Habitat attractants within the separation distances 5,000ft, 10,000 ft., 5 miles as described in AC 33 (assess both natural and man-made attractants)		

Airport Wildlife Hazard Site Visit Report Checklist

1.4 Site Visit Report	Y or NA	Comments
General airport information		
Strike data analysis		
List of bird/mammal species observed and times of observations		
State and federal status of species		
Description of habitat features (natural and man-made) that may attract wildlife within movement and non-movement areas		
Description of habitat features (natural and man-made) that may attract wildlife within the separation distances 5,000ft, 10,000ft and 5 miles		
Map of airport with location of wildlife attractants within the movement and non-movement areas		
Map of airport with location of wildlife attractants within the separation distances 5,000ft, 10,000ft. and 5 miles with the separation distances depicted		
Recommended actions for reducing identified wildlife hazards to air carrier operations		
Recommendation regarding whether a 12-month wildlife hazards assessment should be conducted or if an existing Wildlife Hazard Management Plan should be modified		

APPENDIX C. AIRPORT WILDLIFE HAZARD ASSESSMENT AND REPORT CHECKLISTS

Airport Wildlife Hazard Assessment Checklist

Airport Name:
Airport Representative:
Qualified Airport Wildlife Biologist:
Assessment Dates (Initiation/Completion):
Assessment Report – Date Completed:
Assessment Report – Date Approved by FAA:
FAA-Reviewer:

	Y or NA	**Comments**
Analysis of the event or circumstances that prompted the assessment		
Personnel and departments responsible for airport ops		
Type of airport/annual operations		
Recent construction or upgrades		
Strike data analysis (in database and/or airport records)		
Depredation permits		
Wildlife hazard management plan (if applicable)		
Review of current habitat management activities		
Review of current wildlife management activities		
Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences		
Assessment = Minimum of 12 consecutive months		
Locate standardized observation points on airport (observation points off airport are optional) to adequately observe wildlife and their movements		

	Y or NA	Comments
Point count surveys conducted morning, midday and evening		
Avian surveys conducted a minimum of twice monthly		
Mammal surveys conducted a minimum of once per quarter (4 total)		
Record results of point count surveys and all general wildlife observations. Include species, number of individuals, specific location, activity, direction of movement.		
Record presence of state and/or federally listed species		
Small mammal trapping (optional)		
Identification and location of features on airport that attract wildlife		
Identification and location of features near airport (within 5 miles) that attract wildlife		

Airport Wildlife Hazard Assessment Report Checklist

	Y or NA	Comments
Description and qualifications of biologist(s) who conducted the WHA.		
Analysis of the event or circumstances that prompted the study		
Personnel and departments responsible for airport operations		
Type of airport/annual operations		
Description of recent construction or upgrades, if any		
Strike data analysis (in database and/or airport records)		
Depredation permits (do they have valid permit)		
Wildlife hazard management plan (if applicable)		
Description of current habitat management activities		
Description of current wildlife management activities		
Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences: • Description of methodologies used to collect data • Results of point count surveys and all general wildlife observations. Include species, number of individuals, specific location, activity, direction of movement and discuss the presence / absence of Federal or State listed species identified during Assessment • Results of mammal surveys. Include species, number of individuals, specific location, activity, direction of movement • Map of airport with location and description of observation points		
Identification and location of features on and near the airport that attract wildlife: • Description of habitat features (natural and man-made) that may attract wildlife on the movement and non-movement areas		

	Y or NA	Comments
• Description of habitat features (natural and man-made) that may attract wildlife within the 5,000ft, 10,000ft, and 5mile separation distances as described in AC 33 • Map of airport with location of wildlife attractants on movement and non-movement areas • Map of airport with location of wildlife attractants near airport within 5,000 ft, 10,000 ft, and 5mile separation distances (include the location of the separation distances relative to the airport		
Description of the wildlife hazards to air carrier operations at the subject airport		
Recommended actions for reducing identified wildlife hazards to air carrier operations: • List of prioritized recommendations that are unique to this airport (is a Section 7 Consultation required based on these recommendations?)		

APPENDIX D. WILDLIFE SURVEY DATA SHEET EXAMPLE

Airport Observation Sheet

AIRPORT NAME OBSERVER SURVEY PERIOD DATE

TIME TEMPERATURE WIND DIR / SPEED WEATHER SUNRISE SUNSET

TIME	PT	LOC	SPP	#	ACT	COV	DIR	COMMENTS

SU - sunny
PS - partly sunny
CL - cloudy
RN - rain
SN - snow/sleet
FG - fog
PC - partly cloudy

FD - feeding
LF - loafing
RS- roosting
NS - nesting
VO - vocalizing
FL - flying local
FP - flying passing

RN – running
BD - bedded
P – perched
ST – standing
TW- towering
HW - hawking
SW- swimming

RWY - runway
TWY - taxiway
RMP - ramp
ASP - asphalt
UNP - unpaved road
STR - structure
DTC - ditch

PND - pond
RES - reservoir
RIV - river
WDL – woodland
MAR - marsh/wetland
CRK - creek/stream
TSW - temp standing water
TR - single/sm group of trees

GSH grass, short
GLG - grass, long
SHB - shrubs
GRV - gravel
AGF - ag field
SHR - shoreline

PAGE_____ of _____

APPENDIX E. AIRPORT WILDLIFE HAZARD MANAGEMENT PLAN CHECKLIST

Airport Name:
Airport Representative:
Plan Preparation Date:
Plan FAA Review Date:
FAA Reviewer:

	Y or NA	**Comments/Observations**
BRIEF introduction describing hazards identified in the Assessment and the wildlife attractants on and near the airport		
A list of individuals having authority and responsibility for implementing each aspect of the plan: • Decision making roles and responsibilities including: Airport Director, Wildlife Coordinator, Operations Supervisor, Maintenance Supervisor, Security Dept., Planning Dept., Finance Dept., Wildlife Hazard Working Group • Other		
A list prioritizing the following actions identified in the Assessment and target dates for their initiation and completion: • (i) Wildlife population management (list of problem wildlife populations and mitigation actions/target dates) • (ii) Habitat modification (list of wildlife attractants and mitigation actions/target dates) • (iii) Land use changes (list of land use on and near airport that attract wildlife and mitigation actions/target dates) • Ongoing data collection and analysis • Recordkeeping • Do any proposed activities require NEPA review or Section 7 Consultation with USFWS?		

	Y or NA	Comments/Observations
Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits (Copies of all valid permits must be included in Plan)		
Identification of resources that the certificate holder will provide to implement the plan • Personnel • Field identification guides • Pyrotechnics • Vehicles • Pesticide and application equipment • Other (binoculars, traps, guns, radios, etc.) • Sources of supplies		
Procedures to be followed during air carrier operations that at a minimum includes:		
(i) Designation of personnel responsible for implementing the procedures (Wildlife patrol staffing and primary responsibilities, hours of availability, etc.)		
(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin • Routine inspection procedures, • Documentation of inspections and observations • Runway/taxiway sweeps, perimeter fence inspections		
(iii) Wildlife hazard control measures • Monitoring • Recordkeeping • Dispersal/harassment procedures • Procedures for wildlife control during different seasons and heavy air traffic times		
(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower		

	Y or NA	Comments/Observations
• Training in communication procedures • Procedures for immediate coordination and response to pilot-reported wildlife strikes or observations		
Other		
Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following a triggering event		
Include a log at the beginning of the plan to record dates plan is reviewed and reason for review		
(i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and (ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated • One or more meetings with Wildlife Hazard Working Group to review Plan • Procedures for documentation of wildlife observations and wildlife control activities • Protocol to meet training requirements		
A training program conducted by a qualified airport wildlife biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan • Certification that training meets requirements in AC 150/5200-36 • Training participation documentation		

APPENDIX F. AIRPORT WILDLIFE HAZARD MANAGEMENT PLAN REVIEW

Once a Wildlife Hazard Management Plan is in place, it must be evaluated every 12 consecutive months or following a triggering event as per 14 CFR part 139.337(f)(6). Those triggering events are:

- An air carrier aircraft experiences multiple wildlife strikes
- An air carrier aircraft experiences substantial damage from striking wildlife
- An air carrier aircraft experiences an engine ingestion of wildlife

The foundation for these evaluations is not only the documentation of wildlife strikes but the maintenance of consistent records of wildlife surveys and wildlife control activities. Based on the annual evaluation the WHMP should be updated as needed to ensure the information adequately addresses known wildlife hazards. As these changes are adopted, approved, and implemented at the airport, it is of the utmost importance that all documentation is well prepared and available during FAA inspections.

To assist airport operators in documenting this review, the following sample review forms are provided. One form is for the "annual" review (every 12 consecutive months), and one for a review following a triggering event. These forms represent examples and may be used as provided or modified to suit specific needs to review a Wildlife Hazard Management Plan.

Subject: Wildlife Hazard Management Plan Annual Review Date: _____

Airport: _____ Airport ID: _____

On _____ we conducted the annual review of the Wildlife Hazard Management Plan, as per the requirements of 139.337(f) (6). General Information/ Significant findings:

- **Name of review coordinator-** (Person facilitating discussions and writing plan updates; usually the Wildlife Coordinator, Wildlife Biologist, or Airport Manager) & **participating airport personnel and representatives of other organizations** (As listed in 139.337(f)(1); may include members of airport management, the wildlife coordinator, airport operations/ wildlife staff, wildlife Biologist who conducted Wildlife Hazard Assessment, members of the wildlife hazard working group*). Attach a sign-in sheet.

- **Summary of results of annual data analysis-** Example: ranking of highest priority species based on the analysis. (Per standardized continual monitoring procedures of 139.337(f)(6); data for analysis may include logs of wildlife strikes, wildlife observations and control measures, standardized wildlife monitoring surveys, and wildlife data from off-airport sites of concern.)

- **Summary of progress and challenges in management of the most significant wildlife attractants and/or habitats on or near the airport -** (Review of habitat management priorities listed in 139.337(f)(2))

- **Summary of progress and challenges in direct wildlife hazard management (i.e., dispersals, strike response) on the airfield -** (Review of procedures to be followed during air carrier operations as listed in 139.337(f)(5))

- **Changes to management strategies identified**

- **Changes to documentation identified**

- **Changes to Wildlife Hazard Working Group membership or objectives identified**

- **Changes to airport training program identified**

- **Changes/ updates to Wildlife Hazard Management Plan identified**
  (Submit any changes to the WHMP to the assigned FAA Airport Certification Safety Inspector)

_____
Airport Manager/Director

*The wildlife hazard working group is made up of representatives that own and/or manage properties, attractants, and habitats for wildlife (both on- and off-airport property) that impact airport safety. The function of the wildlife hazard working group, or the airport's relationships with such representatives, is to cooperatively address the airport's specific wildlife hazard issues. During the annual review of the Plan, the effectiveness in addressing the issues should be evaluated, with any needed changes documented.

Subject: Wildlife Hazard Management Plan Review Following a Triggering Event

Date: _____ Airport: _____ Airport ID: _____

On _____ we conducted a review of the Wildlife Hazard Management Plan, as per the requirements of 139.337(f) (6).

Description of Triggering Event:

- **Date/Time -** Provide details of the event which triggered the review. Attach strike report, if available and any pertinent information; runway used, airline, take-off, landing, species, damage, etc.

General Information/ Significant findings:

- **Name of review coordinator-** (Person facilitating discussions and writing plan updates; usually the Wildlife Coordinator, Wildlife Biologist, or Airport Manager) & **participating airport personnel and representatives of other organizations** (As listed in 139.337(f)(1); may include members of airport management, the wildlife coordinator, airport operations/ wildlife staff, wildlife Biologist who conducted Wildlife Hazard Assessment, members of the wildlife hazard working group*). Attach a sign-in sheet.

- **The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity-** Example: Review the current wildlife control log and evaluate recent strike reports or events. Make a determination as to whether the current program is working and what can be improved.

- **Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated –** Review assessment to determine if everything is being addressed that was previously identified as a hazard or if other species are now present. Note: If other/additional new species are now present on or in the vicinity of the airport, another Wildlife Hazard Assessment may be needed.

- **Summary of progress and challenges in direct wildlife hazard management (i.e., dispersals, strike response) on the airfield -** (Review of procedures to be followed during air carrier operations as listed in 139.337(f)(5))

- **Changes to management strategies identified**

- **Changes to airport training program identified**

- **Changes/ updates to Wildlife Hazard Management Plan identified**
  (Submit any changes to the WHMP to the assigned FAA Airport Certification Safety Inspector)

_____

Airport Manager/Director

The wildlife hazard working group is made up of representatives that own and/or manage properties, attractants, and habitats for wildlife (both on-and off- airport property). The function of the wildlife hazard working group, or of the airport's relationships with such representatives, is to cooperatively address the airport's specific wildlife hazard issues. During the annual review of the Plan, the effectiveness in addressing the issues should be evaluated, with any needed changes documented.

APPENDIX G. LETTER OF APPROVAL OF WILDLIFE HAZARD MANAGEMENT PLAN (WHMP) FOR AIRPORTS

U.S. Department of Transportation
Federal Aviation Administration

Federal Aviation Administration
_____Regional Office

Address_____
City, State, Zip_____

Date

Name
Title
Airport
Address
City/State/Zip

Subject: Approval of Wildlife Hazard Management Plan (WHMP) for [Insert name of airport]

Dear _____:

The Federal Aviation Administration (FAA) has completed its review and approved the above-referenced Wildlife Hazard Management Plan (WHMP), as submitted to the FAA on [insert date]. The FAA based this approval on the adequacy of the WHMP to comply with the requirements of 14 CFR §139.337(f). The WHMP is a required element of the Airport Certification Manual (ACM) for your airport. Please insert this letter of approval and the attached plan to the ACM. We will retain one copy of this plan for our official file copy of your ACM.

The specific actions identified in the WHMP are categorically excluded from further National Environmental Policy Act (NEPA) review in accordance with FAA Order 1050.1F ("Environmental Impacts: Policies and Procedures"). The FAA's review included verification that there was no evidence of extraordinary circumstances in connection with any of the specific measures.

The FAA may have to reevaluate this environmental determination if environmental circumstances change or if new information becomes available that could bear upon particular actions. It is also important to note that the FAA has not evaluated the WHMP (or the specific actions it identifies) with respect to state, county or local requirements.

Any additions or modifications to the WHMP may require additional documentation and interagency coordination, particularly if resource categories of special concern (such as wetlands, floodplains, threatened/endangered species, cultural resources, etc.) are likely to be impacted. Such resources usually require permits or approvals from a Federal or State environmental resource agency.

It is the airport's responsibility to initiate and complete required environmental coordination with the appropriate FAA Airports District Office (or Regional Office), as well as any other relevant Federal and State agencies prior to implementation of these actions.

However, nothing in this letter shall limit the legal authority or responsibility of the certificate holder to undertake operational safety measures that would not, on their own, trigger a Federal action for review and approval.

Approval of the WHMP does not constitute a commitment of Federal funds from the Airport Improvement Program (AIP) for any capital development projects. AIP funding requires evidence of eligibility and justification when a funding request is ripe for consideration. Please identify any such requests well in advance, typically as part of the periodic Capital Improvement Plan process, in order to ensure that you address all statutory and regulatory requirements, and technical and operational issues, in a timely manner.

Please include a copy of this letter when coordinating with FAA on any ALP changes or funding requests.

If you have questions or need more information, please contact me at (___) ___-____.

Sincerely,

_____
Airport Certification/Safety Inspector

Enclosures

cc: _____, Manager, [insert] Airports District Office
_____, Environmental Protection Specialist
_____, Planning/Programming Specialist

APPENDIX H. LETTER OF MIXED APPROVAL OF WILDLIFE HAZARD MANAGEMENT PLAN (WHMP) FOR AIRPORTS

U.S. Department
of Transportation
Federal Aviation Administration

Federal Aviation Administration
_____Regional Office

Address_____
City, State, Zip_____

Date

Name
Title
Airport
Address
City/State/Zip

Subject: Mixed Approval of Wildlife Hazard Management Plan (WHMP) for [insert name of airport]

Dear _____:

The Federal Aviation Administration (FAA) has completed its review and approved the above-referenced Wildlife Hazard Management Plan (WHMP), as submitted to the FAA on [insert date]. The FAA based this approval on the adequacy of the WHMP to comply with the requirements of 14 CFR §139.337(f). The WHMP is a required element of the Airport Certification Manual (ACM) for your airport. Please insert this letter of approval and the attached plan to the ACM. We will retain one copy of this plan for our official file copy of your ACM.

Please note, however, that not all of the specific actions identified in the WHMP have full clearance to proceed into implementation. Certain action items and components (identified below) may require further review under the National Environmental Policy Act (NEPA) and/or other special purpose environmental laws or regulations. Future consideration of these action items and components, and any additions or modifications to the WHMP, may require additional documentation and interagency coordination, particularly if resource categories of special concern (such as wetlands, floodplains, threatened/endangered species, cultural resources, etc.) are likely to be impacted. Such resources usually require permits or approvals from a Federal or State environmental resource agency.

The following items and components are categorically excluded from further NEPA review in accordance with FAA Order 1050.1F ("Environmental Impacts: Policies and Procedures"). The actions that may proceed to implementation without further environmental review are:

1. [insert]
2. [insert]
3. [insert]

The FAA may have to reevaluate this environmental determination if environmental circumstances change or if new information becomes available that could bear upon particular actions. It is also important to note that the FAA has not evaluated the WHMP (or the specific actions it identifies) with respect to state, county or local requirements.

Although the following actions are included in the approved WHMP, they may require further review under NEPA and/or other special purpose environmental laws or regulations as discussed above:

1. [insert]
2. [insert]
3. [insert]

It is the airport's responsibility to initiate and complete required environmental coordination with the appropriate FAA Airports District Office (or Regional Office), as well as any other relevant Federal and State agencies prior to implementation of these actions.

However, nothing in this letter shall limit the legal authority or responsibility of the certificate holder to undertake operational safety measures that would not, on their own, trigger a Federal action for review and approval.

Approval of the WHMP does not constitute a commitment of Federal funds from the Airport Improvement Program (AIP) for any capital development projects. AIP funding requires evidence of eligibility and justification when a funding request is ripe for consideration. Please identify any such requests well in advance, typically as part of the periodic Capital Improvement Plan process, in order to ensure that you address all statutory and regulatory requirements, and technical and operational issues, in a timely manner.

Please include a copy of this letter when coordinating with FAA on any ALP changes or funding requests.

If you have questions or need more information, please contact me at (___) ___-____.

Sincerely,

_____
Airport Certification/Safety Inspector

Enclosures

cc: _____, Manager, [insert] Airports District Office
_____, Environmental Protection Specialist
_____, Planner

Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Safety and Operations Division, Federal Aviation Administration ATTN: AAS-300, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of AAS-300 at (202) 267-8663.

Subject: AC 150/5200-38 Date: _____

Please check all appropriate line items:

☐ An error (procedural or typographical) has been noted in paragraph _____ on page _____.

☐ Recommend paragraph _____ on page _____ be changed as follows:

_____
_____
_____

☐ In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

_____
_____
_____

☐ Other comments:

_____
_____
_____

☐ I would like to discuss the above. Please contact me at (phone number, email address).

Submitted by: _____ Date: _____

C E R T A L E R T

ADVISORY * CAUTIONARY * NON-DIRECTIVE

FOR INFORMATION, CONTACT AIRPORT WILDLIFE SPECIALIST, AAS-317 (202) 267.3389

DATE: **17 November, 1997** **No. 97-09**

TO: **AIRPORT CERTIFICATION SAFETY INSPECTORS**

TOPIC: **WILDLIFE HAZARD MANAGEMENT PLAN OUTLINE**

An increasing number of questions are being received concerning the preparation and content of a FAA approved airport wildlife hazard management plan. Title 14 Code of Federal Regulations, part 139.337, *Wildlife Hazard Management,* prescribes the specific issues that a wildlife hazard management plan must address for FAA approval and inclusion in the ACM.

A wildlife hazard assessment, defined as an ecological study in part 139.337 (a), conducted by a wildlife damage management biologist, provides the scientific basis for the development , implementation, and refinement of a wildlife hazard management plan. Though parts of the wildlife hazard assessment may be incorporated directly in the wildlife hazard management plan, they are two separate documents. Part of the wildlife hazard management plan can be prepared by the biologist(s) who conducts the wildlife hazard assessment. However, some parts can be prepared only by the airport. For example, airport management assigns airport personnel responsibilities, commits airport funds, and purchases equipment and supplies. Airport management may request the wildlife biologist to review the finished plan.

The wildlife damage management biologist's primary responsibilities are:

- to provide information on the wildlife attractants that have been identified on or near the airport,
- to identify wildlife management techniques,
- to prioritize appropriate mitigation measures,
- to recommend necessary equipment and supplies, and
- to identify training requirements for the airport personnel who will implement the wildlife hazard management plan.

It is often helpful for the airport manager to appoint a Wildlife Hazard Management Group that has responsibility for the airport's wildlife management program. The biologist should assist the Wildlife Hazard Management Group with periodic evaluations of the plan and make recommendations for further refinements or modifications.

The following details the requirements of part 139.337 (e) and (f) and how those requirements should be addressed in a FAA approved wildlife hazard management plan.

FAR 139.337 REQUIREMENTS	WILDLIFE HAZARD MANAGEMENT PLAN CONTENTS
139.337(e). The (wildlife hazard management) plan shall include at least the following :	The wildlife hazard management plan must include, and/or identify the responsibility of, and/or actions to be taken, –
139.337(e)(1). The persons who have authority and responsibility for implementing the plan.	Specific responsibilities for various sections of the wildlife hazard management plan must be assigned or delegated to various airport departments such as: Airport Director Operations Dept. Maintenance Dept. Security Dept. Planning Dept. Finance Dept. Wildlife Coordinator Wildlife Hazard Group Local law enforcement authorities that provide wildlife law enforcement and other support also have a role to play: State Fish and Game U. S. Fish and Wildlife Service City police County Sheriff
139.337(e)(2). Priorities for needed habitat modification and changes in land use identified in the ecological study with target dates for completion.	Attractants (food, cover, and water) identified in wildlife hazard assessment, with priorities for mitigation and completion dates. Attractants can be grouped by areas and ownership. (A list of completed habitat modification or other projects designed to reduce the wildlife/aircraft strike potential can be included, and provides a history of work already accomplished.) Airport property: Aircraft Operations Area (AOA). Within 2 miles of aircraft movement areas. Within 5 miles of aircraft movement areas. Airport structures Non-airport property Within 2 miles of aircraft movement areas. Within 5 miles of aircraft movement areas. Structures

FAR 139.337 REQUIREMENTS	WILDLIFE HAZARD MANAGEMENT PLAN CONTENTS
Habitat/population management recommendations	Management plans for specific areas, attractants, species, or situations, as identified in ecological study (wildlife hazard assessment). This section may include any or all of the following: Food/Prey-base Management Rodents Earthworms Insects Other prey Trash and debris - handling, storage. Handouts Species specific population management i.e. deer, gulls, geese, coyotes Repelling Exclusion Removal Habitat Management Vegetation Management AOA vegetation Drainage ditch(s) vegetation Landscaping Agriculture Water Management Permanent Water Wetlands Canals/drainage ditches Detention/retention ponds Sewage (glycol) treatment ponds Other water areas Ephemeral water Runways, taxiways, & aprons. Other wet areas Airport Buildings Airfield structures Abandoned structures Terminal Airport construction Resource Protection Exclusion Repelling Chemical Auditory Visual

FAR 139.337 REQUIREMENTS	WILDLIFE HAZARD MANAGEMENT PLAN CONTENTS
139.337(e)(3). Requirements for and, where applicable, copies of local, state and Federal wildlife control permits.	Wildlife can be protected at all levels of government – city, county, state, federal, or may not be protected at all, depending on location and species. Therefore the section should address the specific species involved and their legal status. Wildlife management permitting requirements and procedures (spelled out) Federal - 50 CFR parts 1 to 199. State - Fish and Game Code (or equivalent) City, county - ordinances If pesticides are to be used, then the following are also needed. Pesticide use regulations Federal- [Federal Insecticide, Fungicide, and Rodenticide Act, as amended (FIFRA)] State (varies by state) City/county (if applicable) Pesticide use licensing requirements State regulations
139.337(e)(4). Identification of resources to be provided by the certificate holder for implementation of the plan.	Lists identifying what the airport will supply in terms of: Personnel Time Equipment, (i.e. radios, vehicle(s), guns, traps). Supplies (i.e. shellcrackers, mylar tape) Wildlife Patrol Personnel Vehicle(s) Equipment Supplies Pesticides Restricted/non-restricted Application equipment Sources of Supply
139.337(e)(5). Procedures to be followed during air carries operations, including at least…	
139.337(e)(5)(i). Assignment of personnel responsibilities for implementing the procedures;	Who, when, what circumstances Wildlife Patrol Wildlife Coordinator Operations Dept. Maintenance Dept. Security Dept. Air Traffic Control
139.337(e)(5)(ii). Conduct of physical inspections of the movement areas and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be effective;	Who, when, how, what circumstances -- Runway(s), taxiway(s), and ramp(s) sweeps, AOA monitoring Un-mitigated attractants

FAR 139.337 REQUIREMENTS	WILDLIFE HAZARD MANAGEMENT PLAN CONTENTS
139.337(e)(5(iii). Wildlife control measures;	Who, what circumstances, when, how is the Wildlife Patrol contacted. Wildlife Patrol Bird Control repel capture kill Mammal control repel capture kill
139.337(e)(5)(iv). Communication between wildlife control personnel and any air traffic control tower in operation at the airport.	Communication procedures Training in communication procedures Equipment needed Radios, mobile phones, etc. Lights
139.337(e)(6). Periodic evaluation and review of the wildlife hazard management plan for:	At a minimum the airport operator should hold annual meetings, or after an event described in 139.337(a)(1 to 3), with representatives from all airport departments involved in the airport's wildlife hazard management efforts and the wildlife damage management biologist who did the original ecological study (wildlife hazard assessment).
139.337(e)(6)(i). Effectiveness in dealing with the wildlife hazard;	Input from all airport departments, ATC, wildlife biologist, as to effectiveness of plan. Good records are a must for evaluating the effectiveness of a program. Therefore need to know what records are kept, by whom, how, where, and when.
139.337(e)(6(ii). Indications that the existence of the wildlife hazard, as previously described in the ecological study, should be reevaluated.	Wildlife seen on AOA Request for wildlife dispersal from Tower, pilots, or others Wildlife strike database and other records. Good records are a must.
139.337(e)(7). A training program to provide airport personnel with the knowledge and skills needed to carry out the wildlife hazard management plan required by paragraph (d) of this section.	Wildlife Patrol personnel training All airport personnel - wildlife hazard awareness training Pesticide use training and certification

FAR 139.337 REQUIREMENTS	WILDLIFE HAZARD MANAGEMENT PLAN CONTENTS
139.337(f). Notwithstanding the other requirements of this section, each certificate holder shall take immediate measures to alleviate wildlife hazards whenever they are detected.	Although not required as part of wildlife hazard management plan, this information should be included to fulfill part 139 requirements. Procedures and personnel responsibilities for notification regarding new or immediate hazards by and to: Wildlife Patrol Operations NOTAM issuance/cancellation criteria and procedures Maintenance Security Air Traffic Control Others Rapid response procedures for new or immediate hazards by: Wildlife Patrol Operations Maintenance Security Air Traffic Control Others
139.337(g). FAA Advisory Circulars in the 150 series contain standards and procedures for wildlife hazard management at airports which are acceptable to the Administrator.	AC 150/5200--33 Hazardous Wildlife Attractants on or Near Airports.

OSB

Benedict D. Castellano, Manager
Airport Safety and Compliance Branch

C E R T A L E R T

ADVISORY CAUTIONARY NON-DIRECTIVE

FOR INFORMATION, CONTACT AIRPORT WILDLIFE SPECIALIST, AAS-317 (202) 267.3389

DATE: **September 21, 1998** **No. 98-05**

TO: **Airport Operators,**
FAA Airport Certification Safety Inspectors

TOPIC: **Grasses Attractive To Hazardous Wildlife**

Recently, several reports have been received of airport owners or airport contractors planting disturbed areas (construction sites, re-grading projects, etc) with seed mixtures containing brown-top millet. All millets are a major attractant to doves and other seed eating birds.

Doves can be a major threat to aircraft safety. In the United States, between 1991 and 1997, doves were involved in 11% of all reported bird/aircraft strikes, 8% of the reported strikes that resulted in aircraft down time, and 8% of the reported strikes causing aircraft damage or other associated monetary losses.

Airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass.

For airport property already planted with seed mixtures containing millet or other large-seed producing grasses, it is recommended that disking, plowing, or other suitable agricultural practice be employed to prevent plant maturation and seed head production.

For specific recommendations on grass management and seed selection, contact the State University Cooperative Extension Service, or the local office of the USDA, Wildlife Services.

Benedict D. Castellano, Manager
Airport Safety and Compliance Branch

September 21, 1998

CERTALERT

ADVISORY CAUTIONARY NON-DIRECTIVE
AIRPORT SAFETY AND OPERATIONS DIVISION AAS-300

FOR INFORMATION, CONTACT Ed Cleary, AAS-300, (202) 267-3389

Date: **11/21/2006** **No. 06-07**

To: **Airport Operators, FAA Airport Certification Safety Inspectors**

Topic: **Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports**

PURPOSE:

This Certalert describes procedures for responding to requests by state wildlife agencies to facilitate and encourage habitats for state-listed threatened and endangered species or species of special concern that occur on airports and may pose a threat to aviation safety. This Certalert does not apply to federally listed threatened and endangered species. Federal Aviation Administration (FAA) guidance on dealing with federally listed threatened and endangered species can be found in FAA Order 1050.1E, *Environmental Impacts - Policies and Procedures*, Appendix A, Section 8.

BACKGROUND:

An airport's air operations area (AOA) is an artificial environment that has been created and maintained for aircraft operations. Because an AOA can be markedly different from the surrounding native landscapes, it may attract wildlife species that do not normally occur, or that occur only in low numbers in the area. Some of the grassland species attracted to an airport's AOA are at the edge of their natural ranges, but are attracted to habitat features found in the airport environment. Also, some wildlife species may occur on the airport in higher numbers than occur naturally in the region because the airport offers habitat features the species prefer. Some of these wildlife species are state-listed threatened and endangered species or have been designated by state resource agencies as species of special concern.

Many state wildlife agencies have requested that airport operators facilitate and encourage habitat on airports for state-listed threatened and endangered species or species of special concern. Airport operators should exercise great caution in adopting new management techniques; new techniques may increase wildlife hazards and be inconsistent with safe airport operations. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety.

DISCUSSION:

Hazardous wildlife are those species of wildlife (50 CFR 10.12), including feral animals and domesticated animals not under control (14 CFR 139.5, Definitions), that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard. (FAA Advisory Circular 150/5200-33A, *Hazardous Wildlife Attractants on or Near Airports*, July 27, 2004.) Not all state-listed threatened and endangered species or species of concern pose a direct threat to aviation safety. However, these species may pose an indirect threat and be hazardous because they attract other wildlife species or support prey species attractive to other species that are directly hazardous. Also, the habitat management practices that benefit these state-listed threatened and endangered species and species of special concern may attract other hazardous wildlife species. For example, the grassland habitat preferred by grasshopper sparrows, which are listed as threatened in New York[1], also supports a wide variety of insects and small mammals. These insects and small mammals are an indirect threat to aviation safety because they are very attractive to hawks, owls, gulls and other birds. It is these large birds that can pose a direct threat to aviation safety. On-airport habitat and wildlife management practices designed to benefit wildlife that directly or indirectly create safety hazard where none existed before are incompatible with safe airport operations.

Airport operators must decline to adopt habitat management techniques that jeopardize aviation safety. Adopting such techniques could place them in violation of their obligations and subject to an FAA enforcement action and possible civil penalties under 49 U.S.C. §44706, as implemented by 14 CFR § 139.337. In particular, an airport operator that has received federal grant-in-aid assistance is obligated through its grant assurances to maintain compatible land uses. Failure to do so may lead to noncompliance with its grant obligations. Further, airports that serve commercial air carriers are required to be certificated under 49 U.S.C. §44706, as implemented by 14 CFR Part 139. Title 14 CFR § 139.337(a) requires airport operators holding a Part 139 certificate to "take immediate action to alleviate wildlife hazards whenever they are detected." Accordingly, Part 139-certificated airport operators should make state wildlife agencies aware of the airport's FAA-approved Wildlife Hazard Management Plan (WHMP), AC 150/5200-33A, and the joint FAA-Wildlife Services manual, *Wildlife Hazard Management at Airports* (6/05) (joint FAA/WS manual). Before making any changes in land management practices, the airport operator should carefully review the above documents to assure that any changes are consistent with its obligations under federal law to control wildlife hazards and attractants in the AOA. For ease of reference, the key land management practices bearing upon aviation safety are summarized and highlighted below:

RECOMMENDATIONS:

1. Adhere to the turf, landscaping, and habitat management practices described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual. Do not change these practices specifically to encourage the presence of, or to attract hazardous wildlife species even if the species are state-listed or of special concern.

    a. Do not deliberately preserve or develop on-airport wildlife habitats such as wetlands, forest, brush, or native grasslands having characteristics that attract

[1] Those species listed by states as threatened, endangered, or species of special concern vary from state to state. For information on state listed species, contact the appropriate state wildlife management Agency.

hazardous wildlife (See the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS Manual.)

b. Manage the airport's AOA vegetation as recommended in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual.

2. Adhere to the wildlife harassment and repellant techniques described in the airport's WHMP, AC 150/5200-33A, and the joint FAA/WS manual to prevent hazardous wildlife species from becoming established and complicating the ability to adhere to prescribed habitat management practices.

3. Do not allow hazardous state-listed threatened and endangered species or species of special concern to remain on the airport if it requires managing the airport environment contrary to FAA recommendations.

4. Reevaluate existing and evaluate future agreements with federal, state, or local wildlife agencies where the terms of the agreements are or may be contrary to federal obligations concerning hazardous wildlife on or near public-use airports and aviation safety.

5. Whenever practicable, wetland mitigation for state-listed threatened and endangered species or species of special concern should be sited off-airport (see AC 150/5200-33A, §2-4.c (1)).

OSB — 11/21/2006

Ben Castellano, Manager
Airport Safety & Operations Division — Date

DISTRIBUTION

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U.S. Department of Transportation

Federal Aviation Administration

Advisory Circular

Subject: NOTICES TO AIRMEN (NOTAMS) FOR AIRPORT OPERATORS | **Date:** 1/28/08 | **Initiated by:** AAS-300 | **AC No.:** 150/5200-28D | **Change:**

1. PURPOSE. This advisory circular (AC) provides guidance on using the NOTAM system for airport condition reporting.

2. FOCUS. This material is intended primarily for airport operators, or their agents, who monitor and manage the day-to-day operation of the airport and who may also have operational responsibility for certain airport-related facilities.

3. CANCELLATION. AC 150/5200-28C, *Notices to Airmen (NOTAMS) for Airport Operators,* dated July 24, 2006, is canceled.

4. BACKGROUND. In the National Airspace Review (NAR) conducted by the Federal Aviation Administration (FAA) for government and industry airspace users, it was agreed that airport operators, as frequent contributors to the NOTAM system, should be provided with an AC to assist them in formulating NOTAM material. The goal expressed by the group was twofold: to promote effective use of the NOTAM system by airport operators and to reduce the need for FAA specialists to recast NOTAM submissions into systems-compatible language and format. The airport operator and pilot group members of the NAR, in particular, expressed confidence that better NOTAM submissions from airport operators would require less recasting for systems acceptance and would reduce the chance of inadvertent alteration of the message during processing.

FAA policy changes have resulted in significant changes to the format of Distant (D) and Local (L) NOTAMs:

- Prior civil "L" NOTAMs will be reclassified as "D" NOTAMs (Military L series will remain unchanged).

- All D NOTAMs must have one of the following keywords as the first part of the text: RWY, TWY, RAMP, APRON, AD, OBST, NAV, COM, SVC, AIRSPACE, (U), or (O) (see Paragraph 13 for an explanation of keywords).

- For the purpose of NOTAMs, the term Movement Area includes Runways, Taxiways, Ramps, Aprons, and Helipads.

- The United States NOTAM Office (USNOF) is the authority ensuring NOTAM formats. To ensure that the NOTAMs issued are consistent with NOTAM Policy, submitters must comply with USNOF personnel directions.

- All NOTAMs will be processed, stored and distributed by the United States NOTAM System (USNS).

5. RELATED CODE OF FEDERAL REGULATIONS (CFRs). The related CFRs are 14 CFR Part 139, *Certification of Airports,* and Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports.*

6. RELATED REFERENCE MATERIAL. The following are FAA regulations and publications (see current versions) from which material has been extracted for the preparation of this AC. They will continue to be the authoritative source of revisions to this AC. These references also contain additional resource material that may be useful in special situations, but their immediate availability to airport operators is not considered necessary to accomplish the basic operational purpose of this AC. Technical terms and contractions used in this AC are explained in Appendices A through C. Electronic versions of these documents are available online. Electronic CFRs are available at Tecfr.gpoaccess.gov. Air Traffic publications are available at www.faa.gov/airports_airtraffic/air_traffic/publications/. Airport ACs (150 series) are available at www.faa.gov/airports_airtraffic/airports/. The Airport/Facility Directory (A/FD) is available at naco.faa.gov. AC 70/7460-1, *Obstruction Lighting and Marking*, is available at wireless.fcc.gov/antenna/index.htm?job=documentation_faa.

a. 14 CFR Part 139, *Certification of Airports.*

b. 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports.*

c. 47 CFR Part 17, *Construction, Marking, and Lighting of Antenna Structures.*

d. 49 CFR Part 1542, *Airport Security.*

e. 49 CFR Part 1544, *Aircraft Operator Security: Air Carriers and Commercial Operators.*

f. FAA Order 7110.10, *Flight Services.*

g. FAA Order 7110.65, *Air Traffic Control.*

h. FAA Order 7210.3, *Facility Operation and Administration.*

i. FAA Order 7340.1, *Contractions.*

j. FAA Order 7350.7, *Location Identifiers.*

k. FAA Order 7930.2, *Notices to Airmen (NOTAMS).*

l. FAA Notice N JO 7930.2L, *Notice to Airmen (NOTAMs).*

m. *Aeronautical Information Manual (AIM).*

n. *Airport/Facility Directory (A/FD).*

o. AC 70/7460-1, *Obstruction Lighting and Marking*.

p. AC 150/5200-30, *Airport Winter Safety and Operations.*

q. AC 150/5370-2, *Operational Safety on Airports during Construction.*

r. *Pilot/Controller Glossary (P/CG).*

7. USE OF THIS AC. The NOTAM system discussed in this AC is tailored to airport condition reporting needs. Further information can be found in the references listed in paragraph 6 above. This AC provides guidance as follows:

a. Paragraphs 8 through 11 introduce basic characteristics of the NOTAM system and responsibilities of the participants concerned.

b. Paragraphs 12 through 14 provide guidance for the NOTAM initiating process with example NOTAMs.

c. Paragraph 15 discusses special reporting considerations for conditions, such as braking action, winter conditions, runway light obscuration, and obstacle lights with example NOTAMs.

d. Paragraph 16 provides guidance and examples for Personnel and Equipment Working NOTAMs.

e. Paragraph 17 provides guidance and examples for Certificated Airport Rescue and Fire Fighting NOTAMs.

f. Paragraph 18 provides information about dissemination of NOTAMs.

g. Paragraph 19 discusses extended period NOTAMs.

h. Paragraph 20 provides suggestions for NOTAM control and record keeping.

i. Appendix A contains definitions and usage, plus contractions where applicable, of technical terms to understand this AC and participate in the NOTAM system.

j. Appendix B lists authorized contractions and abbreviations.

k. Appendix C lists airport facility condition descriptions and contractions.

l. Appendix D is a sample NOTAM form.

8. FUNCTION OF THE NOTAM SYSTEM. The NOTAM system provides essential information to personnel concerned with flight and airport operations. NOTAMs provide timely information on unanticipated or temporary changes to components of or hazards in the National Airspace System (NAS). Component changes may pertain to facilities, services, procedures, or hazards in the NAS. A NOTAM provides information that becomes available too late to publicize in the associated aeronautical charts and related publications.

The NOTAM system is not intended to be used to impose restrictions on airport access for the purpose of controlling or managing noise, or to advertise data already published or charted.[1]

9. AIRPORT MANAGEMENT RESPONSIBILITY. The management of a public use airport is expected to make known, as soon as practical, any condition on or in the vicinity of the airport, existing or

[1] After October 1, 1990, noise restrictions for airports must be cleared through the FAA's notice and review process, as required by the Airport Noise and Capacity Act of 1990. The process for compliance with this law is set forth in 14 CFR Part 161, *Notice and Approval of Airport Noise and Access Restrictions*. Contact the local Airports District Office for guidance on complying with 14 CFR Part 161.

anticipated, that will prevent, restrict, or present a hazard during the arrival or departure of aircraft.[2] Airport management is responsible for observing and reporting the condition of airport movement areas.

Normally notification should be made not more than 3 days before the expected condition is to occur. Public notification is usually accomplished by the NOTAM system. This same notification system should be used when the condition has been corrected or otherwise changed. Airport operators are also responsible for canceling NOTAMS that are no longer applicable to airport facilities.

Some facilities components; such as pavements, runway lights, and airport guidance sign systems; are always the responsibility of the airport operator. Others, such as navigation facilities and approach lights, are usually the responsibility of the FAA. To avoid confusion, airport operators should initiate a NOTAM on a facility only when its operation and maintenance are clearly within their area of responsibility. However, airport operators should make every effort to alert the responsible party when outages/discrepancies are observed in facilities that fall outside their area of responsibility.

Specific airport management responsibilities are outlined in 14 CFR Part 139, *Certification of Airports,* and 14 CFR Part 157, *Notice of Construction, Alteration, Activation, and Deactivation of Airports*. Airport managers of Certificated Airports are required to abide by applicable provisions of these Parts and pertinent regulations referenced in this AC.

Airport operators and pilots should also be aware of Temporary Flight Restrictions (TFR) that may affect airport operations. TFR information is available at www.faa.gov/pilots/flt_plan/notams/ or by calling any flight service station for a pilot briefing.

10. CERTIFICATED AIRPORTS. Airports certificated under 14 CFR Part 139 have certain requirements set by regulation for disseminating information about conditions on and in the vicinity of their airports that may affect the safe operation of aircraft. For detailed information, see 14 CFR Part 139 and the airport's *Airport Certification Manual*.

11. AIR TRAFFIC CONTROL (ATC) RESPONSIBILITIES. Air Traffic personnel must accept all airmen information regardless of the source or subject matter, provided the occurrence is no more than 3 days in the future.

NOTE: *Situations that present an immediate hazard should be reported to the ATC facility most concerned. Other situations should be reported on a first priority basis to the Flight Service Station (FSS).*

Air Traffic then obtains the name, title (if appropriate), address, and telephone number of the person furnishing the information. The data is then forwarded to the appropriate tie-in FSS. FSS specialists are responsible for the classification, accuracy, format, dissemination, and cancellation of NOTAM information. All information submitted by FSS specialists is subject to verification with the US NOTAM Office (1-877-4US-NTMS (877-487-6867)) before distribution as a NOTAM. Flight Data Center (FDC) NOTAMs are issued by the US NOTAM Office/National Flight Data Center and pertain to changes such as navigational facilities, instrument approaches, and flight restrictions. FDC NOTAMs refer to information that is regulatory in nature.

[2] Local coordination with airport users such as air carriers and other commercial operations should be conducted as far in advance as possible to minimize the impact construction projects, planned surface closures, or other conditions have on the operation of the airport.

NOTE: *FSSs are no longer responsible for TFR notifications to ATC facilities, except in Alaska. The System Operations Support Center (SOSC) through the respective service centers is now performing these duties.*

12. AUTHORITY TO INITIATE NOTAM. Airport management is responsible for observing and reporting the condition of:

- Runways – applies to landing, take-off surfaces, and associated lighting and signage.
- Taxiways – Conditions pertaining to single or multiple taxiways. Include lighting (centerline; edge lights) status if applicable.
- Ramps
- Aprons
- Helipads
- Snow, ice, slush, and water that affects the movement areas
- Aircraft Rescue and Fire fighting (ARFF)
- Any obstruction more than 200 feet above ground level (AGL) and located within 5 statute miles (SM) (4.3 nautical miles (NM)) radius. Any obstruction that is 200 feet AGL or less and more than 5 SM from an airport does not constitute a hazard.
- Obstruction light outages located within 5 SM (4.3 NM) radius of an airport regardless of height or located outside a 5 SM (4.3 NM) radius and exceeds 200 feet AGL.
- Services (fuel availability)

In addition, airport management is also responsible for providing an up to date list of airport employees who are authorized to issue NOTAMs to the FSS air traffic manager at the FSS listed in the Airport/Facility Directory (A/FD)). At public airports without an airport manager, the FSS air traffic manager will coordinate with the appropriate operating authority to obtain a list of persons delegated to provide NOTAM information. Using authorized airport personnel will help to expedite the NOTAM processing because information obtained from unauthorized personnel must be confirmed by the FSS before a NOTAM will be issued.

Authorized airport personnel submit information for NOTAMs to Flight Service Stations (FSS) that receive and manage it.

Letters of agreement should be executed between airport management and ATC facilities outlining procedures to be used for originating NOTAMs. For example, at some controlled airports, the Airport Traffic Control Tower (ATCT) might ask to be in the NOTAM origination loop with the airport management and the FSS.

NOTE: *Although the airport operator has primary NOTAM origination responsibilities for the movement areas, the ATC facility managing the NOTAM system is responsible for, and has the authority to ensure the systems compatibility of the format and content of the proposed NOTAM message.*

13. INITIATING A NOTAM.

a. Composing the NOTAM. Wherever possible, NOTAMs must use official contractions and abbreviations. Official contractions are in FAA Order 7930.2, *Notices to Airmen (NOTAM),* and in Appendices A through C[3]. They should be inserted during the process and it is best if airport personnel know and use them when working with the NOTAM system. Most required airport NOTAM terms are described in this AC. If the terms described below do not fit a specific situation, use clear and concise plain language for the text of the message, or consult with the FSS for preferred terminology. A NOTAM must **always state** the **abnormal** condition – **do not state** a **normal** condition. The only exception to the preceding is for data that is already published and is being replaced; for example, a runway that was previously closed and is now open.

NOTE: *For illustrative purposes only in this AC, XYZ is used where an accountability or location identifier would normally appear in a NOTAM message.*

NOTAMs must contain the following elements in left to right order:

(1) ADP code. This will be an exclamation point "!".

(2) Three letter identifier code, XYZ, for the accountability location.

(3) Three letter identifier code, XYZ, for the affected facility or location.

NOTE: *Location identifiers used in the NOTAM system are in FAA Order 7350.7, Location Identifiers.*

(4) One of the following twelve keywords as the first part of the text:

Keywords and definitions:

NOTE: *See Section 13b for examples of typical airport employee authored NOTAMs.*

- **AD (Aerodrome)**

  Applies to any hazard to aircraft operations on or within 5 statute miles (SM) of an aerodrome which encompasses airport, heliport, helipad, and movement areas that are not under runways, taxiways, ramps, aprons, obstructions, NAVAIDs, services, communications or airspaces.

- **AIRSPACE**

  Applies to hazards associated with special use airspace, Central Altitude Reservation Facility (CARF), aircraft operations, aerial refueling, unmanned rockets, balloons, fireworks, parachute jumping/skydiving, and high altitude balloons.

[3] FAA Order 7930.2 is the authority for contractions used in this AC. Any contraction changes in FAA Order 7930.2 supersede the contractions used in this AC.

- **APRON**

  Applies to hazards associated with defined surface areas on an aerodrome. The terms "ramp" and "apron" are synonymous.

  Definition of ramp/apron: a defined area on a land aerodrome intended to accommodate aircraft for purposes of loading or unloading passengers, mail/cargo, fueling, parking, or maintenance.

  NOTE: *Ramps and aprons may be identified by a name specific to them.*

- **COM** (Communications)

  Applies to communication outlet commissioning, decommissioning, outage, unavailability, and Air Traffic Control frequency status.

- **NAV** (Navigation Aids)

  Applies to navigation aid status: VORs, ILS, WAAS, NDB, TACAN, etc.

- **OBST** (Obstructions, including obstruction lighting outages)

  Applies to obstructions, including obstruction lighting outages, moored balloons, kites, towers, cranes, smoke stacks, etc.

- **RAMP** (synonymous with **APRON**)

- **RWY (Runway)**

  Applies to landing and take-off surfaces, and associated lighting and signage. Identify runways with the prefix RWY followed by the magnetic bearing indicator, e.g., RWY 12/30, RWY 12, or RWY 30. Where the magnetic bearing indicator has not been assigned, identify the runway to the nearest eight points of the compass, e.g., RWY NE/SW, RWY N/S N 200 CLSD.

- **TWY (Taxiway)**

  Applies to single or multiple taxiways. Identify taxiways with the prefix TWY followed by the taxiway identifier letter or letter/number as assigned. For multiple taxiways, preface the initial taxiway identifier with TWY, and separate additional taxiway identifiers by commas, or specify "all." If not identified, describe as adjacent to a runway or direction from the runway. Some examples are: TWY C, B3 CLSD, TWY ADJACENT RWY 9/27 CLSD.

- **SVC** (Services)

  Applies to facilities and services.

- **(U)** (Unverified Aeronautical Information):

  - Conditions pertaining to the movement area or other information received that meets NOTAM criteria and has not been confirmed by the Airport Manager (AMGR) or their designee.

  - For use only where authorized by Letters of Agreement.

  - If Flight Service is unable to contact airport management, Flight Service must forward (U) NOTAM information to USNS. Subsequent to USNS distribution of a (U) NOTAM, Flight Service will inform airport management of the action taken as soon as practical. Any such NOTAM will be prefaced with '(U)' as the keyword and followed by the appropriate keyword contraction, as set forth in this Policy, following the Location Identifier.

- **(O)** (Other)

  Aeronautical information received from any authorized source that may be beneficial to aircraft operations and does not meet defined NOTAM criteria. Any such NOTAM will be prefaced with '(O)' as the keyword following the Location Identifier.

NOTE: *Personnel and Equipment Working (PAEW) is **not** a keyword. PAEW must be associated with a keyword: RAMP/APRON, TWY, or RWY, and a direction from the affected movement area.*

(5) After the keyword, enter the Surface Identification (optional - this must be the runway identification for runway-related NOTAMs, the taxiway identification for taxiway-related NOTAMs, or the ramp/apron identification for ramp/apron-related NOTAMs).

Example: !XYZ XYZ **RWY** 12/30

!XYZ XYZ **TWY** A,A1

If a facility component has not been given a specific identifying designation, such as an unnumbered or unlettered parking apron, associate it with a component that does have a positive identification.

Example: !XYZ XYZ **APRON** PARKING APRON ADJ TWY B

Describe the condition that prompted the NOTAM. See Appendix C for listings of facilities conditions and their contractions that are eligible for NOTAM dissemination.

Example !XYZ XYZ **RWY** 12/30 CLSD or !XYZ XYZ RWY 12/30 RCLL OTS

(6) Furnish the year, month, day, and the time for the beginning and end of the condition or the effective time (i.e. with effect from (WEF), or effective from). NOTAMs are issued in Coordinated Universal Time (UTC) time only. In addition to listing the outage time, NOTAMs should specify an expected time of return to service or previous condition. If you are not sure of the UTC time, confirm the time with the appropriate FSS. Absence of a return to service time will mean that the condition will continue until further notice.

Example: !XYZ XYZ RWY 12/30 CLSD WEF 0705041300-0705041700

Translation: *runway 12/30 closed effective May 4, 2007, at 1300 hours UTC until May 4, 2007, 1700 hours UTC.*

b. Keyword Usage and Examples. The following examples show typical NOTAMs that might be issued by an airport using keywords (shown below in bold text).

NOTE: *All keywords are in bold and underlined text for reference only. Keywords are not to be underlined or in bold text for NOTAMs.*

(1) RWY

Examples:

- !STL STL **RWY** 12L/30R CLSD EXC TXG
- !PRC SJN **RWY** 13/31 NOW RWY 14/32

(2) TWY

Examples:

- !LNS LNS **TWY** A LGTS OTS
- !DSM DSM **TWY** P1, P3 CLSD

(3) APRON

Examples:

- !ATL ATL **APRON** NORTH TWY L3 APRON CLSD
- !BNA BNA **APRON** NORTH APRON CLSD

(4) RAMP

Example:

- !DSM DSM **RAMP** SOUTH CARGO RAMP CLSD

(5) AD

Examples:

- !LAL LAL **AD** GRASS LDG STRIP LCTD 400 S RWY 9R/27L 1700 X 55 AVBL VMC DALGT PPR SUN N FUN WEF 0804151100-0804232359
- !CDB AK05 **AD** CLSD PERM
- !RIU O88 **AD** HELI DCMSND

- !AOO PA06 **AD** CLSD TSNT
- !BET BET **AD** CLSD EXC SKI
- !AOO 29D **AD** CLSD EXC PPR 0330-1430 MON-FRI
- !BUF D67 **AD** CLSD EXC HI-WING ACFT
- !CEW CEW **AD** CLSD WEF 0709041400-0709041800
- !CDB AKA **AD** OPEN
- !CLE 15G **AD** NOW PUBLIC

(6) OBST

Examples:

- !MIV N52 **OBST** TOWER 580 (305 AGL) 7 SW LGTS OTS (ASR NUMBER) TIL 0712302300
- !PIE CLW **OBST** CRANE 195 (125 AGL) .25 NE (2755N08241W) TIL 0711032000

NOTE: *Insert latitude/longitude (if known) immediately after cardinal direction per format shown above.*

(7) SVC

Examples:

- !MIV MIV **SVC** FUEL UNAVBL TIL 0709301600
- !MSP MSP **SVC** MU OTS
- !FTW FTW **SVC** ARFF NOW INDEX A TIL 0709072300

(8) Using PAEW

Examples:

- !CHO CHO **RWY** 23 PAEW FIRST 500 ALONG SE SIDE
- !SBY SBY **TWY** E PAEW SOUTH SIDE BTN RWY 5/TWY G
- !MEM MEM **RAMP** PAEW FEDEX CARGO RAMP EAST SIDE

c. Submitting the NOTAM. Airport operators are to submit NOTAM material to their local air traffic facility (see (1) below). This method is appropriate for material that becomes available after Flight Information Publication (FLIP) cut-off. See inside front cover of Airport/Facility Directory (A/FD) for FLIP cut-off dates. See Appendix D for a sample NOTAM form.

(1) Filing with the Local ATC Facility. Enter the message into the Air Traffic Control (ATC) system in accordance with a local letter of agreement if there is one in effect. Otherwise, contact the appropriate Air Traffic facility for your airport. This is normally the associated FSS identified in the A/FD. If you encounter difficulty in contacting the FSS identified in the AF/D, you may call the US NOTAM Office at 877-4US-NTMS (877-487-6867). The US NOTAM Office will route the call to the proper flight service center. FSS facility managers are required to ensure that lists of airport employees authorized to issue NOTAMs are available and kept current. To avoid delays in NOTAM dissemination, you should assist the FSS in keeping your airport's list of authorized personnel up to date.

d. Allowing Verification. When using the above filing method, be sure that you provide the air traffic facility receiving your NOTAM submission with the name, position, title (if appropriate), address, and telephone number of a responsible airport official who the FSS should contact if confirmation of the NOTAM information is required. If you phone in your message, you should ask for the operating initials of the FSS specialist who receives your call and the number assigned to the NOTAM. Allow a minimum of thirty minutes for the FSS specialist to format and input the NOTAM into the NOTAM system. Call the FSS back to get the current NOTAM and NOTAM number. Each specialist is officially identified in the facility by operating initials. Knowing the initials and NOTAM number will make follow-up or other reference easier. Airport personnel can review their NOTAMs on the FAA website at: http://www.faa.gov/airports_airtraffic/air_traffic/publications/notices/.

e. Airport operators are responsible for canceling NOTAMS that are no longer applicable to airport facilities.

14. PUBLISHING CRITERIA FOR AIRPORT NOTAMs. The following conditions or categories of information are the basis for NOTAMs:

a. FAA ATC facilities. Commissioning, decommissioning, or changes in hours of operation.

b. Surface areas/airspace. Changes in hours of operations, hazards such as pavement issues, wildlife, snow, surface conditions, etc.

c. Weather reporting stations. Commissioning, decommissioning, failure, non-availability or unreliable operations.

d. Public airports. Commissioning, decommissioning, openings, closings, and abandonments.

e. Aircraft rescue and fire fighting (ARFF) capability. Restrictions to air carrier operations.

f. Changes to runway identifiers, dimensions threshold placements, and surface compositions.

g. NAS lighting systems. Commissioning, decommissioning, outages, change in classification or operation.

(1) Approach Lighting System (ALS)

(2) Runway Lights/Runway Edge Lights (RWY LGT)

(3) Touchdown Zone Lighting (TDZ LGT)

(4) Runway Center Line Lights (RCLL)

(5) Runway End Identifier Lights (REIL)

(6) Visual Approach Slope Indicator (VASI)

(7) Precision Approach Path Indicator (PAPI)

(8) Boundary Lights

Reference:
Aeronautical Information Manual (AIM)
FAA Order 7930.2, *Notices to Airmen (NOTAMS)*

15. SPECIAL REPORTING CONSIDERATIONS FOR CONDITIONS, SUCH AS BRAKING ACTION, WINTER CONDITIONS, RUNWAY LIGHT OBSCURATION, OBSTRUCTIONS, AND OBSTRUCTION LIGHTS. The following conditions require special care when composing NOTAM messages to ensure that they provide the maximum benefit to the NOTAM system user and do not include misleading statements.

NOTE: *All keywords are in bold and underlined text for reference only.*

a. Friction Measurement.[4] If friction-measuring equipment is used, friction value (MU) readings are issued for each third for all active runways. Do not combine runways into a single NOTAM. NOTAMs are not issued if all readings are above 40. If a NOTAM was previously issued and the airport manager finds that readings are above 40, the previous NOTAM must be cancelled. Include the abbreviation of the name of the FAA approved friction measuring device and the effective time.

Friction Measuring Equipment Abbreviations:

- BOW Bowmonk Decelerometer (Bowmonk Sales)
- BRD Brakementer−Dynometer
- ERD Electronic Recording Decelerometer (Bowmonk)
- GRT Griptester (Findlay, Irvine, LTD)
- MUM Mark 6 Mu Meter (Douglas Equipment LTD)
- RFT Runway friction tester (K.J. LAW Engineers)
- SFH Surface friction tester (high pressure tire) (SAAB, Airport Surface Friction Tester AB)
- SFL Surface friction tester (low pressure tire) (SAAB, Airport Surface Friction Tester AB)
- SKH Skiddometer (high pressure tire) (AEC, Airport Equipment Co.)
- SKL Skiddometer (low pressure tire) (AEC, Airport Equipment Co.)

[4] Either MU Value and/or braking action reports are acceptable for reporting pavement conditions to the NOTAM system. However, there is no correlation between the two. **THEY ARE NOT INTERCHANGEABLE.**

- TAP Tapley Decelerometer (Tapley Sales)
- VER Vericom (VC3000)

(1) Example:

!DCA DCA **RWY** 1/19 BOW MU 20/20/20 WEF 0712121000

(2) If the equipment used to obtain these readings becomes unserviceable, a NOTAM should be issued until the equipment is restored to service.

Example: !DCA DCA **SVC** MU OTS

b. Braking Action.[5] When reported by airport management, braking action is described as "fair," "poor," and "nil." Classify braking action according to the most critical term used. "Good" braking action is not a reportable condition. When reporting braking action, do not give the type of vehicle making the report. Include the observed time of the braking action in the NOTAM.

(1) Example:

!ANC ANC **RWY** 14/32 BA POOR WEF 0702061500

(2) Example:

!ANC Z15 **RWY** 1/19 BA NIL WEF 0709041100

The FSS should process a braking action report from a landing aircraft as a pilot report (PIREP). Combining airport management and PIREP information is appropriate only with airport management authorization.

c. Winter Conditions. When reporting winter conditions, use the following sequence to assist the FSS in formatting the NOTAM: runway affected, coverage, depth, and condition. These terms are defined in Appendix A.

d. Depth of Snow. When reporting the depth of snow, frozen slush, etc. on the runway or taxiway, express it in terms of thin (less than 1/4 inch), 1/4 inch, 1/2 inch, and 1 inch. After 1 inch, report additional accumulation in whole inches and discontinue the use of fractions. If a variable depth is encountered, such as 3 to 5 inches, report the greater depth. After a snow depth of 35 inches is reached, report additional amounts in whole feet only.

NOTE: *The term "BARE" is not to be used in NOTAMs.*

(1) Example:

!FAI INR **RWY** 16/34 18 IN LSR WEF 0711250900

Translation: McKinley Park's runways 16 and 34 have 18 inches of loose snow covering the runways.

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[5] Either MU Value and/or braking action reports are acceptable for reporting pavement conditions to the NOTAM system. However, there is no correlation between the two. **THEY ARE NOT INTERCHANGEABLE.**

e. Plowed Runways. When reporting a portion of a runway plowed (PLW), give the width plowed in feet and its condition if not entirely cleared. Describing the plowed portion in terms of percentages or fractions of the surface is likely to be misleading and should be avoided. A plowed report is used only if a portion of the surface is plowed. If the whole surface has been plowed, PLW is not used although the surface condition (such as Snow and Ice on Runway (SIR)) might still be appropriate. PLW/Swept is used when indicating that a portion of a surface is plowed or swept and is either bare or has depth, coverage, and conditions different than the surrounding area. When known, the surrounding area will be specified as RMNDR and listed after the plowed information. Plowed/Swept is omitted when the entire runway, taxiway, ramp, or apron has been plowed. For example, a 150 foot wide runway that has been plowed for the center 100 feet along its entire length and that inside 100-foot strip is covered with 1/2 inch of packed snow and ice, would be reported as the following:

(1) Example:

!OQU OQU **RWY** 16/34 PLW 100 WIDE RMNDR 1/2 IN SIR WEF 0711132112

Translation: Quonset State's runway is wider than 100 feet and the area inside the center 100 feet is bare. The ½-inch of packed or compacted snow and ice (SIR) is outside the plowed area.

(2) Example:

!MOT MOT **TWY** ALL PLW 50 WIDE RMNDR 6 IN LOOSE SN WEF 0712202200

(3) Example:

!MEM MEM **RAMP** FEDEX FEEDER RAMP PTCHY THN ICE WEF 0712202000

(4) Example:

!BNA BNA **APRON** AIR CARGO APRON EAST 1000 PLW WEF 0712201200

f. Runway Sanding or Deicing. When reporting a runway treated by sanding or deicing, the entire published dimensions of the surface are assumed to be treated unless qualifying length/width information is also given. When deicing is reported, also report the material used as either solid or liquid, as this may have operational significance to the pilot. An example of an icy runway sanded for a portion of its surface is:

(1) Example :

!MGW MGW **RWY** 18/36 1/2 IN IR SA WEF 0712061530

Translation: 1/2 inch of ice on the runway 18/36 with the entire runway sanded.

(2) Example:

!YAK YAK **RWY** 11/29 THN SIR SA 80 WIDE RMNDR BA POOR WEF 0712231100

Translation: Less than the full width of the runway is sanded, and the condition outside of the sanded area has poor braking action.

(3) An example of a full runway deicing is:

!IAD IAD **RWY** 12/30 DEICED LIQUID WEF 0712251700

!IAD IAD **RWY** 12/30 DEICED SOLID WEF 0712251700

g. Snowbanks. When reporting snowbanks, indicate when the depth is greater than 12 inches and location of the snow bank. Remember that unless specified otherwise, it is assumed that snowbanks are at the edge of the movement area or, when PLW is used, at the edge of the plowed area.

(1) Example:

!BTV BTV **RWY** 15/33 3 IN SN 24 IN SNBNK WEF 0712251700

(2) Example:

!BTV BTV **RWY** 15/33 3 IN LSR PLW 100 WIDE 24 IN SNBNK WEF 0712251700

h. Continuous Snow Removal Operations on Multiple Runways. A single NOTAM may be issued for continuous snow on alternating runways when all of the following conditions are met:

(1) The air traffic control tower is in operation during the valid period of the NOTAM.

(2) Anticipated alternating closure time for each runway is two hours or less.

(3) Maximum valid time is limited to the period of continuous alternating snow removal.

(4) Operations are based on a Letter of Agreement between airport management and the FSS and Air Traffic Control Tower.

Examples:

- !DEN DEN **RWY** ALL RWYS ALTNLY CLSD SNOW REMOVAL WEF 0710231500
- !SLC SLC **RWY** INST RWYS ALTNLY CLSD SNOW REMOVAL WEF 0711241600
- !DEN DEN **RWY** ALL RWYS ALTNLY CLSD ICE REMOVAL WEF 0712251700
- !SLC SLC **RWY** INST RWYS ALTNLY CLSD ICE REMOVAL WEF 0711261800

i. Runway Light Obscuration. When reporting runway light obscuration due to snow and ice, report only the lights that are completely obscured. Lights that are partially obscured should not be reported. Be specific about which lights are affected, such as the last 2000 feet of Runway 9. Do not report the reason for the obscuration; it is assumed from the context of the report.

Example: !BTV BTV **RWY** LGTS OBSC WEF 0710131300-0710132000

j. Runway Lights.

(1) Runway Centerline Lights (RCLL).

Example: !ATL ATL **RWY** 8R/26L RCLL OTS

(2) Touchdown Zone Lights (TDZ LGT).

Example: !ATL ATL **RWY** 8R TDZ LGT OTS

(3) Runway Edge Lights. Once commissioned and published, runway edge lights must only be shown as RWY LGTS.

Example: !ATL ATL RWY 8R/26L RWY LGTS OTS

(4) Airport total runway power failure. Note the use of the keyword, AD.

Example: !SPA SPA **AD** LGT OTS

(5) Pilot controlled lighting (PCL). When used for controlling runway or approach lights. Note the use of keywords.

Examples:

- !SBY SBY **SVC** PCL OTS
- !SBY SBY **SVC** NOW 122.8
- !BFD 8G5 **RWY** 18/36 RWY LGTS PCL OTS

k. Runway Cracks and Ruts.

(1) Example:

!ORT TSG **RWY** 12/30 NMRS 6 IN CRACKS WEF 0712251700

(2) Example:

!TAL TAL **RWY** 6/24 4 IN RUTS W 1000 WEF 0712251700

l. Lighted Signage.

Examples:

- !ABQ ELP **RWY** 4 TWY M SIGN UNLGTD
- !SEA SEA RWY 16R STOP BAR LGT OTS

m. Taxiway and taxiway centerline lights.

Examples:

- !SHD SHD **TWY** ALL TWY LGTS OTS
- !ROA ROA **TWY** A CNTRLN LGTS OTS FRM A TO D

n. Runway Thresholds. When reporting the relocation or displacement of a threshold, avoid language that confuses the two. Standard NOTAM phraseology includes a temporary threshold displacement. Report threshold relocation as closure of a portion of the runway until the actual physical appearance is altered so the closed runway segment no longer looks like a landing area. If appropriate, request the FSS to insert a reopening date, and remember that you are obligated to track that date and revise or cancel it as necessary.

Example: !ALS ALS **RWY** 20 THR DSPLCD 600 NONSTD MARKING

Translation: The first 600 feet of runway 20 is closed to landing aircraft. Aircraft departing on runway 20 or landing or departing runway 2 may use the full length. The threshold displacement is marked by nonstandard markings.

o. Obstructions and Obstruction Lights. Types of obstructions are towers, cranes, stacks, etc. Height is identified as MSL (when known) and AGL. LGTS OTS refers to a top light or flashing obstruction light regardless of its position. Cranes marked by a flag or when the boom is lowered during the night hours do not require the issuance of a NOTAM. Obstruction lights on terrain (hills) are identified as MSL only. When reporting an obstruction or obstruction light(s) failure located within the airport boundaries, identify the outage per the following:

(1) Height (see Appendix A, paragraph d, Altitude and Height),

(2) Distance from the Airport Reference Point (ARP) (nautical miles), and

(3) Direction from the Airport Reference Point (ARP) (16 point compass: N; NNE; NE; ENE; E; ESE; SE; SSE; S; SSW; SW; WSW; W; WNW; NW; NNW).

(4) Tower registration number or ASR number (if applicable). The tower registration number can be found at: wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp

Obstruction light outages that meet one or more of the following criteria must include a return-to-service time:

(5) All obstruction light outages within a 5-statute mile (4.3 nautical miles) radius of an airport, or obstruction light outages outside a 5-statute mile radius that exceed 200 feet above ground level (AGL).

Examples:

- !MIV N52 **OBST** TOWER 580 (195 AGL) 1.44 SW LGTS OTS (ASR NUMBER) TIL 0811302300

- !GSP GSP **OBST** TOWER 1528 (564 AGL) 12 E LGTS OTS (ASR NUMBER) TIL 0810291930

- !PWK PWK **OBST** TOWER 1049 (330 AGL) OBK014007 LGTS OTS (ASR NUMBER) TIL 0809301915

(6) Location is within 500 feet either side of the centerline of a charted helicopter route. Use a fix-radial-distance as the reference point with the affected location being the nearest public-use airport in your flight plan area.

Examples:

- !MIV 2N6 **OBST** TOWER 314 (231 AGL) 4.3 NNW LGTS OTS (ASR 1055889) TIL **0711**302300

The ASR number should be obtained from the tower owner when the outage is called in, and will be put in the text of the NOTAM. The ASR number may also be obtained from the FCC website at: wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp.

See AC 70/7460-1, *Obstruction Lighting and Marking,* for additional guidance about obstruction light failure notification requirements.

Example:

- !MIV 06/001 2N6 **OBST** TOWER 314 (231 AGL) 4.3 NNW LGTS OTS (ASR 1055889) TIL 0712302300

p. Off-airport Obstructions. Persons or organizations that operate an obstruction must report the improper functioning of any obstruction light or lights immediately by telephone to the nearest local FSS or by calling the US NOTAMS Office at 877-4US-NTMS (877-487-6867). The US NOTAM Office will route the call to the appropriate FSS. Callers should be prepared to provide the tower registration number (ASR number) and the name of the nearest airport.

q. Reporting the operating status of obstruction lights on communication towers is the responsibility of the communication tower operator (47 CFR § 17.48).

r. If there is a report of an obstruction light outage on a tower outside the airport, airport personnel with the responsibility of initiating NOTAMs should first check that for any existing Flight Safety NOTAMs via the FSS or at: https://pilotweb.nas.faa.gov. If a NOTAM is not found, contact and advise the tower operator about the outage. If the tower operator is not known, the information can be found at the FCC website: wireless2.fcc.gov/UlsApp/AsrSearch/asrRegistrationSearch.jsp.

16. Personnel and Equipment Working. Any NOTAM associated with Personnel and Equipment Working (PAEW) on or adjacent to a runway, taxiway, ramp, or apron must begin with one of the following keywords: RWY, TWY, RAMP, or APRON. Additionally, the appropriate direction should be specified. This criteria is used for runway checks and other events of short durations. Otherwise the runway should be closed.

Examples:

- !IAD IAD RWY 1L/19R PAEW
- !IAD IAD RWY 1L/19R PAEW ADJ
- !CHO CHO RWY 23 PAEW FIRST 500 ALONG SE SIDE
- !SBY SBY TWY E PAEW SOUTH SIDE BTN RWY 5 / TWY G
- !MEM MEM RAMP WEST FEDEX FEEDER RAMP PAEW TIL 0712260400
- !BNA BNA APRON AIR CARGO APRON PAEW TIL 0712232000

17. Certificated Airport Aircraft Rescue and Fire Fighting. NOTAM (D) for airports (not runways) certificated under 14 CFR Part 139 is required when ARFF equipment is inoperative/unavailable and replacement equipment is not available. Except as indicated in Part 139.319(c), airport management has 48 hours to replace or substitute equipment before the index changes. Air carriers and others must be notified that ARFF equipment is out of service. Airport management is responsible for providing an ending time for each NOTAM. If airport management does not furnish an ending time, the specialist at the FSS will add 48 hours to the time of receipt and advise.

a. ARFF Index. The ARFF Index for each certificated airport is published in the AF/D. Legend item 16 in the AF/D lists indicates Index and ARFF equipment requirements. ARFF Index Limited is not a NOTAM. At certificated airports listed in the AF/D, the certificate holder (airport management) is required to notify air carriers by NOTAM when required ARFF equipment is inoperative/unavailable and replacement equipment is not available immediately. If the required Index level of capability is not restored within 48 hours, airport management is required to limit air carrier operations to those compatible with the index corresponding to the remaining operative rescue and firefighting equipment.

b. Permanent changes to the ARFF Index occurring during publication cycles are issued as FDC NOTAMs.

Examples (note the use of the keyword, **SVC**)**:**

- !FTW FTW **SVC** ARFF VEHICLE OTS INDEX

  UNCHANGED TIL 0710242100

- !FTW FTW **SVC** ARFF VEHICLE OTS INDEX

  UNCHANGED TIL 0709072200

c. If the ARFF vehicle is still out of service after 48 hours, the airport manager must notify the AFSS/FSS of a temporary index change and approximate duration time.

Example:

!FTW FTW **SVC** ARFF NOW INDEX A TIL 0709072300

Translation: Though the ARFF Index is now A, four or less Index B aircraft may still operate into Fort Worth.

d. If the ARFF Index is listed in the AF/D as A and the ARFF vehicle is out of service:

Example: !STS STS **SVC** ARFF UNAVBL/AP CLSD TO ACR MORE THAN 30 PAX

18. DISSEMINATION OF NOTAMs. While airport operators are not responsible for determining how a NOTAM is disseminated, they should be aware of the criteria that the FSS must apply in making that determination. As a general rule, the actual circulation that an airport condition report receives results from the nature of the reported item and the NOTAM service qualification of the airport (see Appendix A, NOTAM Subject Categories). Exceptions to this rule are noted in subparagraphs (1) and (2) below.

a. (D) Distant NOTAMs. NOTAM (D) information is distributed for all public use airports, seaplane bases, and heliports listed in the Airport/Facility Directory (A/FD) and all navigational facilities that are part of the NAS. NOTAM (D) is distributed automatically. However, distribution to designated civil airport authorities is accomplished through Air Traffic Control or the tie-in FSS via letters of agreement. Air traffic facilities, primarily FSSs, have access to the entire database of NOTAMs. These NOTAMs remain available for the duration of their validity or until published.

The complete file of all NOTAM (D) information is maintained in a computer database at the Weather Message Switching Center (WMSC) located in Atlanta, Georgia, and the Master US NOTAM System (USNS) database located in Herndon, Virginia.

(1) Airports listed in the Alaskan and Pacific supplements are not qualified for NOTAM (D) dissemination except for those annotated with a symbol. Conditions on non-NOTAM (D) airports, listed in these supplements, are transmitted one time to adjacent FSS facilities.

(2) Exceptions to the rule involve FDC NOTAMs and Special Data NOTAMs. These NOTAMs are used primarily to advertise NAS changes and regulatory material. The origination and processing of these items are normally within the purview of FAA personnel, and the applicable procedures in FAA instructions are not repeated here. Operators of airports affected by 14 CFR Part 139, *Certification of Airports*, 49 CFR Part 1542, *Airport Security,* and 49 CFR Part 1544, *Aircraft Operator Security: Air Carriers and Commercial Operators,* may, however, have special reporting responsibilities covered by instructions contained in those regulations and the Airport Certification Manual.

b. Local NOTAMs. NOTAM (L) information is now classified as NOTAM (D) information.

19. EXTENDED PERIOD NOTAMs. To reduce data circuit congestion, the FAA publishes NOTAM information that is expected to remain in effect for extended periods (more than 7 calendar days) in the *Notices to Airmen Publication (NTAP)* issued every 28 days. The most recently published NTAP is available on the FAA web site at www.faa.gov/airports_airtraffic/air_traffic/publications/notices/.

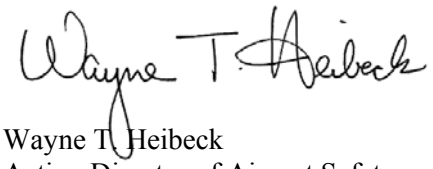
20. AIRPORT RECORDS AND CONTROLS. You should keep and maintain a log of NOTAMs that you originate so that at all times you are aware of how your airport is represented to the aviation public. You should make the NOTAM status of your airport a regular checklist item in the daily routine. Also, you should arrange to obtain a copy of the NOTAM as transmitted for future reference and to demonstrate regulatory compliance where this is a factor. The provision of transmitted NOTAMs is not a routine FSS function and will have to be arranged through a mutually acceptable local agreement. Current NOTAMs

are available on the FAA web site. Additionally, airports certificated under 14 CFR Part 139 may have requirements for maintaining records.

21. QUESTIONS AND COMMENTS. If you have questions about this AC, contact:

Federal Aviation Administration
Office of Airport Safety and Standards
Airport Safety and Compliance Division, AAS-300
800 Independence Avenue, SW
Washington, DC 20591
Telephone (202) 267-3085

Comments and suggestions for changing or improving this AC should be submitted in writing.



Wayne T. Heibeck
Acting Director of Airport Safety and Standards

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APPENDIX A. TECHNICAL TERMS—DEFINITIONS AND USAGE.

1. EXPLANATION AND REFERENCES. Technical terms and contractions used in this AC, and needed for the preparation of NOTAM material, have been extracted from several sources. Some of the sources are internal FAA directives or technical publications not always readily available to airport personnel. For optimum utility of this AC, the most critical and/or most frequently used terms and contractions are explained in this appendix. The source of the term or contraction is shown in brackets and italics following the explanation. While every effort will be made to update this listing, there may be times when a new or revised term or contraction is published in one of the reference sources before this appendix can be changed. In the event of an apparent conflict, the user should compare the dates of the reference document and the appropriate page(s) of this appendix and follow the latest version.

REFERENCES:
Pilot/Controller Glossary (P/CG)
Aeronautical Information Manual (AIM)
FAA Order 7110.10, *Flight Service*
FAA Order 7340.1, *Contractions*
FAA Order 7350.7, *Location Identifiers*
FAA Order 7930.2, *Notices to Airmen* (NOTAMS)

2. DEFINITIONS.

a. AIR NAVIGATION FACILITY (ANF). Any facility used in, available for use in, or designed for use in, aid of air navigation, including landing areas; lights, any apparatus or equipment for disseminating weather information, for signaling, for radio-directional finding, or for radio or other electrical communication, and any other structure or mechanism having a similar purpose for guiding or controlling flight in the air or the landing and take-off of aircraft. *[AIM, FAA Order 7110.10]*

b. AIRPORT/FACILITY DIRECTORY, UNITED STATES (A/FD). A publication designed primarily as a pilot's operational manual containing all airports, seaplane bases, and heliports open to the public including communications data, navigational facilities, and certain special notices and procedures. This publication is issued in seven volumes according to geographical area. It can be purchased by subscription from the National Ocean Service (NOS). A copy is normally available in the FSS for reference. These volumes have green covers. See Supplement-Alaska and Pacific. *[AIM, FAA Orders 7110.10 and 7930.2]*

c. AIRPORT REFERENCE POINT (ARP). The approximate geometric center of all usable runway surfaces. It is the latitude and longitude of the approximate center of the airport.

d. ALTITUDE AND HEIGHT. Vertical distance expressed as feet above mean sea level (MSL) through 17,999 feet and flight levels (FL) for 18,000 feet and above. Feet and MSL are not written in the NOTAM. When MSL is not known, specify by writing AGL (above ground level); e.g., 1304 AGL, etc.

Format:

2500 = 2,500 feet above mean sea level.
FL 250 = 25,000 feet above mean sea level.
2500 AGL = 2,500 feet above ground level.

e. CERTIFICATED AIRPORT. An airport certificated under 14 CFR Part 139 serving:

(1) Scheduled passenger-carrying operations of an air carrier operating aircraft designed for more than 9 passenger seats, and

(2) Unscheduled passenger-carrying operations of an air carrier operating aircraft designed for at least 31 passenger seats.

f. COORDINATED UNIVERSAL TIME (UTC). See Time.

g. FLIGHT SERVICE STATION (FSS). Air traffic facilities which provide pilot briefing, en route communications, and visual flight rules (VFR) search and rescue services; assist lost aircraft and aircraft in emergency situations; relay ATC clearances; originate NOTAMs; broadcasts aviation weather and NAS information; receive and process IFR flight plans; and monitor NAVAIDS. In addition, at selected locations, FSSs provide En Route Flight Advisory Service (Flight Watch), issue airport advisories, and advise Customs and Immigration of trans-border flights. In the A/FD airport listings, the associated FSS is shown under the COMMUNICATIONS heading along with its local or toll-free telephone number. *[FAA Order 7110.10]*

h. LOCATION IDENTIFIERS. Sets of characters composed of letters, or letters and numbers that take the place of the name and location of an airport, navigational aid, weather station, or manned ATC facility. Identifiers are used in air traffic control, telecommunications, computer programming, weather reports, and related services. Airports are assigned location identifiers according to specified criteria. Identifiers are composed of three letters, one number and two letters, one letter and two numbers, or two letters and two numbers. Identifiers are published in FAA Order 7350.7, *Location Identifiers*. In the A/FD airport listings, the airport identifier is set in parentheses following the airport name. *[FAA Order 7350.7]*

i. MILES (MI). Nautical miles unless otherwise stated. *[FAA Order 7930.2]*

j. NATIONAL AIRSPACE SYSTEM (NAS). The common network of U.S. airspace; air navigation facilities, equipment, and services; airports or landing areas; aeronautical charts, information, and services; rules, regulations, and procedures; technical information; and manpower and material. Included are system components shared jointly with the military. *[FAA Order 7110.10]*

k. NATIONAL FLIGHT DATA CENTER (NFDC). A facility in Washington, DC, established by the FAA to operate a central aeronautical information service for the collection, validation, and dissemination of aeronautical data in support of the activities of government, industry, and the aviation community. The NFDC monitors the NOTAM system for compliance with established criteria and procedures. *[FAA Orders 7110.10 and 7930.2]*

l. NAVIGATIONAL AID (NAVAID). Any visual or electronic device airborne or on the surface that provides point-to-point guidance information or position data to aircraft in flight. *[FAA Order 7110.10]*

m. NOTAM DISSEMINATION CLASSIFICATIONS. Classifications into which NOTAMs are grouped according to the dissemination they receive. *[FAA Order 7930.2]*

(1) Distant Dissemination (D). A NOTAM given distant dissemination beyond the area of responsibility of the Flight Service Station. These NOTAMs are stored and available until cancelled. Local Dissemination (L) NOTAMs are now classified as (D) NOTAMs.

(D) NOTAMS must use one of twelve keywords (see Appendix B for *[FAA Orders 7110.10 and 7930.2]*

(2) Flight Data Center (FDC) Dissemination. Accomplished by the National Flight Data Center (NFDC) to give system wide dissemination. *[FAA Order 7110.10]*

n. NOTAM SUBJECT CATEGORIES. Categories into which NOTAMs are divided according to their subject area. They are as follows:

(1) Movement Area NOTAMs.

(2) Lighting Aid NOTAMs.

(3) Air Navigation Aid (NAVAID) NOTAMs.

(4) Communications Outlets NOTAMs.

(5) Services NOTAMs.

(6) Special Data NOTAMs.

(7) Flight Data Center (FDC) NOTAMs. *[FAA Order 7930.2]*

o. NOTICE TO AIRMEN (NOTAM). A notice containing information (not known sufficiently in advance to publicize by other means) concerning the establishment, condition, or change in any component (facility, service, or procedure) of, or hazard in, the National Airspace System (NAS); the timely knowledge of which is essential to personnel concerned with flight operations. *[AIM, FAA Order 7930.2]*

p. PATCHY (PTCHY). Reported condition of a landing area not completely covered should be described as having patches of snow, ice, etc. The term is used in conjunction with the description for the surface contaminant and depth. Example: PTCHY 1/2 IN SN. *[FAA Order 7930.2]*

q. PILOT REPORT (PIREP). A report of a meteorological phenomena encountered by aircraft in flight and on the ground.

r. PUBLIC USE. Refers to an airport that is available for use by the general public without a requirement for prior approval of the owner or operator.

s. SNOW, ICE, SLUSH, AND WATER CONDITIONS

(1) Measurement. The depth is always expressed in terms of thin (less than 1/4 inch), 1/4 inch, 1/2 inch, and 1 inch. When 1 inch is reached, additional reports should be in multiples of 1 inch and the use of fractions discontinued. If a variable amount is reported, such as 3 to 5 inches, show the greater depth. When a snow depth of 35 inches is reached, additional reports should be in multiples of feet only. If a report is halfway between two reportable values, roundoff to the next higher reportable value.

(2) Coverage. Do not express the condition in terms of percentage of coverage. A surface not completely covered should be described as having patches of snow, ice, etc.; e.g., PTCHY 1/2 IN SN (surface). The absence of a described surface indicates the entire landing area. *[FAA Order 7930.2]* Also see Patchy.

t. SUPPLEMENT-ALASKA AND PACIFIC. Joint civil military flight information publications similar to the Airport/Facility Directory in purpose, format, and content. The Alaska Supplement has a salmon colored cover and the Pacific Supplement has a blue cover. The issuing authority agreements include the Department of Defense. *[FAA Order 7930.2]*

u. TIME. FAA uses Coordinated Universal Time (UTC) for all operations. UTC is stated in 10-digits (year, month, day, hour and minute). Four digits represent the hour and minutes. The word "local" or the time zone equivalent is used to denote local when local time is given during radio and telephone communications. When written, a time zone designator is used to indicate local time; e.g. "0205M" (Mountain). The local time may be based on the 24-hour clock system. For NOTAM system purposes the day begins at 0000 and ends at 2359. **NOTE:** *The end-of-day time expressed as 2400 may be encountered in other, non-NOTAM, contexts in aviation communications. The terms sunrise and sunset* ***are not used*** *as expressions of time in reporting NOTAM data.*

Format:

0612251630 = 4:30 pm, December 25, 2006. (UTC)

0611080700 = 7:00 am, November 8, 2006

[P/CG, FAA Orders 7110.10 and 7930.2]

v. VIRGULE(/). Read as the word “and” when used in NOTAM text.

w. WEEKDAYS (WKDAYS). Monday through Friday. *[FAA Order 7930.2]*

x. WEEKEND (WKEND). Saturday and Sunday. *[FAA Order 7930.2]*

APPENDIX B. AUTHORIZED CONTRACTIONS AND ABBREVIATIONS.

1. FACILITIES AND THEIR CONTRACTIONS. In NOTAM composition, authorized contractions and abbreviations are to be used to minimize message length and maximize clarity. The Facilities listed in this appendix have been extracted from various reference sources. This listing is not intended to be all-inclusive but should satisfy most of the needs of airport operators who originate NOTAMs. The facilities are grouped according to the NOTAM Subject Categories shown in Appendix A. While every effort will be made to update this listing, there may be times when a new or revised term or contraction is published in one of the reference sources before this appendix can be changed. In the event of an apparent conflict, you should compare the dates of the reference document and the appropriate page(s) of this appendix and follow the latest version.

REFERENCES:
Pilot/Controller Glossary (P/CG)
FAA Order 7340.1, *Contractions*
FAA Order 7930.2, *Notices to Airmen (NOTAMS).*

2. MOVEMENT AREA.

a. Airport Surfaces.

Aerodrome (keyword)	AD
Airport	AP
Apron (keyword)	APRON
Safety Area[6]	---
Ramp (keyword)	RAMP
Runway (keyword)	RWY
Taxiway (keyword)	TWY

b. Surface Composition.

Asphalt/tar	ASPH
Concrete	CONC
Gravel	GRVL
Turf[7]	TURF

[6] Use plain language or consult with FSS for preferred terminology.

3. LIGHTING AIDS.

Airport Beacon	ABN
Approach Lighting System	ALS
Approach Lighting System with Sequenced Flashers in ILS Cat-I	ALSF-1
Approach Lighting System with Sequenced Flashers in ILS Cat-II. The ALSF-2 may operate as an SSALR when weather conditions permit.	ALSF-2
Approach Lighting System, Medium Intensity	MALS
Approach Lighting System, Medium Intensity with Sequence Flashers	MALSF
Approach Lighting System, Medium Intensity with Runway Alignment Indicator Lights	MALSR
Light	LGT
Obstruction	OBST
Obstruction Light	OBST LGT
Omnidirectional Approach Lighting Systems	ODALS
Pilot Controlled Lighting	PCL
Precision Approach Path Indicator	PAPI
Runway Alignment Indicator Lights	RAIL
Runway Center Line Lights	RCLL
Runway End Identifier Lights	REIL
Runway Lead-in Light System	RLLS
Runway Lights, High Intensity	HIRL
Runway Lights, Low Intensity	LIRL
Runway Lights, Medium Intensity	MIRL
Sequenced Flashing Lights	SFL
Simplified Short Approach Lighting with Sequenced Flashers	SSALF

Simplified Short Approach Lighting with Runway Alignment Indicator Lights	SSALR
Simplified Short Approach Lighting System	SSALS
Touchdown Zone Lights	TDZ LGT
Visual Approach Slope Indicator	VASI

4. AIR NAVIGATION AIDS.

Azimuth	AZM
Compass Locator at ILS Middle Marker	LM
Compass Locator at ILS Outer Marker	LO
Distance Measuring Equipment	DME
Elevation	ELEV
Fan Marker	FAN MKR
Glide Path	GP
Global Positioning System	GPS
Inner Marker	IM
Instrument Landing System	ILS
Localizer	LLZ
Localizer Type Directional Aid	LDA
Microwave Landing System	MLS
Middle Marker	MM
Nondirectional Radio Beacon	NDB
Outer Marker	OM
Runway Visual Range	RVR
Simplified Directional Facility	SDF
Tactical Air Navigational Aid (Azimuth and DME)	TACAN

VHF Omnidirectional Radio Range	VOR

5. COMMUNICATIONS AND SERVICES.

Aeronautical Advisory Station	UNICOM
Aircraft Rescue and Firefighting	ARFF
Airport Traffic Control Tower	TWR
Automatic Terminal Information Service	ATIS
Common Traffic Advisory Frequency	CTAF
Automated/Flight Service Station	FSS
Low Level Wind Shear Alert Systems	LLWAS

6. SPECIAL DATA FACILITIES, SITUATIONS.

Balloon Release	BLN RLS
High Altitude Balloon	HIBAL
Parachute Jumping Exercise	PJE
Weather Reporting Service (includes AWOS and other systems associated with an instrument approach)	WX REP

APPENDIX C. FACILITY CONDITION DESCRIPTIONS AND CONTRACTIONS.

1. FACILITY CONDITIONS AND THEIR CONTRACTIONS. Facility condition descriptions and their contractions listed in this appendix are authorized for NOTAM composition. They have been extracted from various reference sources. The facility conditions are grouped in the same NOTAM Subject Categories as are the facilities themselves in Appendix B. This listing is not intended to be all-inclusive but should satisfy most of the needs of airport operators who originate NOTAMs. If the listed conditions do not seem to cover a particular situation, consult with the FSS. While every effort will be made to update this listing, there may be times when a new or revised term or contraction is published in one of the reference sources before this appendix can be changed. In the event of an apparent conflict, the user should compare the dates of the reference document and the appropriate page(s) of this appendix and follow the latest version.

REFERENCES:
Pilot/Controller Glossary (P/CG)
FAA Order 7340.1, *CONTRACTIONS*
FAA Order 7930.2, *NOTICES TO AIRMEN (NOTAMS), Appendix 5*

2. LANDING AREA.

Bird Activity, Landing Area or Approaches[7]	BIRDS ON AND IN VC ARPT
Braking Action Fair	BA FAIR
Braking Action Nil	BA NIL
Braking Action Poor	BA POOR
Closed Commissioned	CLSD
Decommission	DCMSN
Decommissioned	DCMSND
Displaced	DSPLCD
Except	EXC
Runway Friction Value	MU
Friction Measuring Equipment Out of Service	MU OTS
Frozen	FRZN
Ice On Runway(s)	IR
Inches	IN
Light	LGT
Lighted	LGTD
Loose Snow on Runway(s)	LSR

[7] Use plain language or consult with FSS for preferred terminology.

Obscured, Obscure or Obscuring	OBSC
Over	OVR
Packed Snow on Runway	PSR
Packed or Compacted Snow/Ice on Runway(s)	SIR
Patchy	PTCHY
Personnel and Equipment Working	PAEW
Plow, Plowed	PLW
Rough	RUF
Rubber Accumulation	RUBBER ACCUM
Sand or Sanded	SA
Slush on Runway(s)	SLR
Snow	SN
Snowbank(s) Containing Earth/Gravel	BERM
Snowbank(s) Caused by Wind Action	DRFT
Snowbank(s) Caused by Plowing (Windrow/s)	SNBNK
Takeoff	TKOF
Thin	THN
Unlighted	UNLGTD
Water on Runway(s)	WTR
Wet Snow on Runway(s)	WSR

3. LIGHTING AIDS.

Commissioned	CMSND
Decommission	DCMSN
Decommissioned	DCMSND
Obscured, Obscure or Obscuring	OBSC
Out of Service	OTS
Return to Service	RTS
Unlighted	UNLGTD

4. AIR NAVIGATION AIDS, COMMUNICATIONS AND SERVICES.

Commissioned	CMSND
Decommission	DCMSN

Decommissioned	DCMSND
Operating Normally	OK
Out of Service	OTS
Return to Service	RTS
Unavailable	UNAVBL
Unmonitored	UNMNT
Unusable	UNUSBL

5. SPECIAL DATA FACILITIES, SITUATIONS.

Avoid	AVOID
Except	EXC
Temporary	TEMPO
Unavailable	UNAVBL
Unreliable	UNREL
With Effect From or Effective From	WEF

APPENDIX D. SAMPLE NOTAM.

_____ **AIRPORT**

FAA NOTAM # _____ **DATE:** _____

AIRPORT I.D. # _____ **TIME:** _____

NOTAM TEXT:

NOTIFICATION:

# # # # TOWER	_____	_____	_____
PHONE #	INITIALS	TIME	CALLED IN BY

_____

# # # # AFSS	_____	_____	_____
PHONE #	INITIALS	TIME	CALLED IN BY

_____

AIRLINES

_____
_____
_____

CANCELLED:

NOTIFICATION:

# # # # TOWER	_____	_____	_____
PHONE #	INITIALS	TIME	CALLED IN BY

_____

# # # # AFSS	_____	_____	_____
PHONE #	INITIALS	TIME	CALLED IN BY

_____

AIRLINES

_____
_____
_____

Federal Aviation Administration

National Part 139 CertAlert

AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

Date: **08/03/2016** **No. 16-03**

To: **Airport Operators and FAA Airport Certification Safety Inspectors (ACSIs)**

Subject: **Recommended Wildlife Exclusion Fencing**

Point of Contact: Amy Anderson, AAS-300, (202) 267-7205
Email: amy.anderson@faa.gov

1. Purpose.

This CertAlert contains airfield exclusion methods for deer and other large mammals.

2. Cancellation.

This CertAlert cancels Certalert 01-01, Deer Aircraft Hazard, dated February 1, 2001; CertAlert 02-09, Alternative Deer Fencing, dated December 12, 2002; and CertAlert 04-16, Deer Hazard to Aircraft and Deer Fencing, dated December 13, 2004.

3. Background.

Elevated deer and coyote populations in the United States represent an increasingly serious threat to both Commercial and General Aviation Aircraft. According to the National Wildlife Strike Database, deer and coyote are the most frequently struck terrestrial mammals (37 and 34 percent, respectively). Deer are responsible for 92 percent of the mammal strikes that resulted in damage. From 1990 to 2015, over 1,107 deer-aircraft collisions and 487 coyote-aircraft collisions were reported to the Federal Aviation Administration (FAA). Of these reports, 932 of the deer strikes (84%) and 43 of the coyote strikes (9%) indicated the aircraft was damaged as a result of the collision.

The FAA reminds airport operators that controlling deer and other medium to large terrestrial mammals on and around airfields is very important. Two recent incidents include a Cessna 195B sustaining significant damage on landing as a result of veering off the runway to avoid striking white-tailed deer in Virginia and a Cessna 310 that was destroyed on approach to an airport in Michigan when it collided with a white-tailed deer.

4. Recommendations.

Proper fencing is the best way of keeping deer and coyotes off aircraft movement areas. In some cases, deer have been observed jumping over 8-foot fencing and coyotes have been observed scaling 6-foot fencing. Deer and coyotes can fit through very small gaps between

gates and under fencing. Deer have been observed squeezing through a 7.5-inch gap at the bottom of a fence. Coyotes can fit through 6 inch x 4 inch gaps under a fence and they will also dig under the fence to access the airfield.

The FAA recommends a 10-foot fence[1] with 3-strand barbed wire outriggers. In some cases, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers, depending on the amount of deer activity in a local area.

A 4- to 5-foot skirt of fencing material, attached to the bottom of the fence and buried at a 45-degree angle on the outside of the fence, is ideal to prevent animals from digging under the fence and reduce the chance of washouts. If the fence skirting cannot be installed at a 45-degree angle, then it is acceptable to install it horizontally underground several inches beneath the surface. This type of fencing also greatly increases airport security and safety. A concrete base[2] along the bottom of the fence is also an option to prevent burrowing or digging under the fence. Airport Operators should keep the fence line right-of-way free of excess vegetation. The fence line should be inspected daily, and a fence inspection schedule should be included in an airport's Wildlife Hazard Management Plan (WHMP). If the proposed inspection schedule is less than daily, it should be approved by an ACSI for Part 139 certificated airports. Washouts, breaks, or other holes in the fence need to be repaired as soon as they are discovered.

Gates should close with less than 6-inch gaps to prevent entry by deer or coyotes. If the gates have gaps along the bottom, installation of concrete "speed bumps" under the gate can be a solution. If the gaps are between the gates or the poles, a heavy brush material or interlocking metal bars can also be installed to preclude entry by deer or coyote. In some cases, a single strand of barbed wire strung between the bottom of the fence and the ground where there are gaps will minimize the potential for wildlife access.

Chain link fencing is a type of wire-mesh fencing. Other types of wire-mesh fencing that are suitable for exclusion of wildlife at airports include woven-wire and v-mesh fencing. Also, high tensile welded-wire fencing has been used successfully at different airports to exclude deer and coyotes. However, these types of fencing must be researched thoroughly when choosing an adequate fencing material for an airport due to the variability in durability, life span, and the spacing of mesh and welded wire.

In some cases, electric fencing or matting may offer a suitable alternative. Recent improvements in fencing components and design have greatly increased the effectiveness and ease of installation of electric fences. Tests by the U.S. Department of Agriculture (USDA), National Wildlife Research Center, have shown that some 4- to 6-foot, 5- to 9-strand electric fences designs can be 99% effective at stopping deer. Installation of some of the newer electric fences requires neither specialized equipment nor training; however, they may require more maintenance than other types of fence and must be consistently electrified. Airport sponsors must contact their local Airport District Office (ADO) to

[1] AC No: 150/5370-10G, *Standards for Specifying Construction of Airports* (Part 8 – Fencing), provides details on different fencing and post materials (e.g., chain link, welded and woven wire mesh, galvanized or pvc coating, etc.).

[2] Additional information regarding underground skirting, fence base materials, vegetation clearance recommendations, and installation procedures can be found in AC 150/5370-10G.

discuss eligibility for AIP funding or requirements for a Modification to Standards (MOS).

In limited situations, the use of non-conductive, composite, frangible electric fence posts and fence conductors may allow the installation of electric fence closer to the aircraft movement area than would normally be allowed with standard link fencing material. Please note that electric fencing may produce radio frequency interference that could be disruptive to NAVAIDS and airport communications and should be considered when determining types of fencing.

The key for excluding deer and coyotes is the proper installation and maintenance of a fence that is:

- Of sufficient height to deter jumping and scaling
- Constructed of a material that is difficult to penetrate
- Constructed fully around the airfield without gaps below the fence or at the gates or that mitigates the gaps with other exclusionary materials
- Constructed to deter digging or burrowing under the fence

The most suitable fence for an airport depends on many factors, including the observed wildlife hazards, the potential impacts of certain types of fencing, seasonality of hazards, costs (both for construction and maintenance), and adjacent habitat types. Airport sponsors must contact their local ADO to discuss what types of fencing are eligible for AIP funding.

For proposed fencing that will intersect wetlands or surface waters (streams, rivers, etc.), the airport sponsor should determine what state and federal permits will be required prior to installation. Fencing that is located in wetlands or over surface waters typically requires additional maintenance and/or cleaning due to debris getting caught and potentially damaging the fence. If a culvert is located along the perimeter fence, grates or some other barrier should be placed over the culvert to ensure wildlife cannot access the airfield through the culvert. The barrier should allow for water movement and should be inspected and cleared of debris regularly to ensure water is flowing efficiently.

Airport sponsors should include new and/or improved wildlife fencing in their WHMP as a prioritized action item. If deer are observed on or near the aircraft movement area, immediate action must be taken to remove them.

Airport operators can contact the State Wildlife Management Agency or the nearest USDA, Wildlife Services Office for assistance with deer problems.

Brian Rushforth, Manager
Airport Safety and Operations Division, AAS-300

Appendix E

PERMITS

WHAT YOU SHOULD KNOW ABOUT A FEDERAL DEPREDATION PERMIT

A federal depredation permit authorizes you to capture or kill birds to reduce damage caused by birds or to protect other interests such as human health and safety or personal property. A depredation permit is intended to provide short-term relief for bird damage until long-term, non-lethal measures can be implemented to eliminate or significantly reduce the problem.

You should review Title 50 parts 10, 13 and 21.41 of the Code of Federal Regulations (CFR) with your application. You are responsible for reviewing and understanding these regulations before you request and accept a permit. These regulations are on our website at: https://www.fws.gov/birds/policies-and-regulations/permits/permit-policies-and-regulations.php.

1. *What is Depredation?*

Depredation is damage or loss caused by birds. Depredation includes agricultural damage, private property damage, threats to human health and safety, and threats to recovery of protected wildlife.

2. *What is a Migratory Bird?*

Almost all birds, including their nests and eggs native to the United States are protected under the Migratory Bird Treaty Act (MBTA). Protection is not limited to only individual birds or species that migrate. In this fact sheet, "bird" refers to any bird species protected by the MBTA. A list of protected species is published in the Code of Federal Regulations at 50 CFR 10.13. You can view the list at: https://www.fws.gov/birds/management/managed-species/migratory-bird-treaty-act-protected-species.php. Nonnative species such as European starlings, rock (feral) pigeons, house sparrows, and mute swans as well as upland gamebirds such as grouse, turkey and quail are NOT protected under the MBTA. (See 70FR12710 for a complete list)

3. *What activities can I do without a depredation permit?*

You do not need a federal depredation permit to simply harass or scare birds (except eagles and federally listed threatened or endangered species), provided (a) birds are not killed or injured and (b) birds sitting on active nests (nests with eggs or chicks present) are not disturbed to the point that it causes the eggs to not hatch or the chicks to die or become injured.

4. *Do I need a federal permit to destroy bird nest?*

A permit is not needed to destroy inactive bird nests, provided the nest is destroyed and not kept. An inactive bird nest is one without eggs or chicks present. The Nest Destruction Migratory Bird Permit Memorandum (MBPM-2; April 15, 2003) provides additional guidance on nest destruction (http://www.fws.gov/policy/m0208.pdf).

A permit is required to destroy an active bird nest (one with eggs or chicks present). A different permit is required to disturb or destroy nests of Bald Eagles or Golden Eagles and birds listed as federally threatened or endangered. A list of threatened or endangered species can be found at: https://www.fws.gov/endangered/

5. What is a federal depredation order or control order?

Depredation and control orders allow the take of specific species of birds for specific purposes without a depredation permit. Make sure you read the depredation or control order very closely before taking birds under it because each has very specific restrictions and conditions that apply. Although a permit is not required, you must report any take conducted under a depredation or control order to be in compliance with the Order and so the Service can monitor potential population impacts. The depredation and control orders in place are listed in the following table.

Regulation	Species	Interest Harmed	States
50 CFR 21.43	Blackbirds, Cowbirds, Grackles, Crows, Magpies	Ornamental shade trees, agricultural crops, livestock, wildlife, when concentrated in such numbers and manner that they are a health hazard or other nuisance	All
50 CFR 21.44	Horned Larks, Golden-crowned, White-crowned and other Crowned Sparrows, House finches	Agriculture, horticulture	CA
50 CFR 21.45	Purple gallinules	Rice	LA
50 CFR 21.46	Scrub Jay, Steller's Jay	Nut Crops	OR, WA
50 CFR 21.49	Resident Canada Geese	Public safety at airports and military airfields	Lower 48 States (implemented by States and Tribes)
50 CFR 21.50	Resident Canada Geese (nests and eggs)	People, property, agricultural crops, or other interests	See registration website (https://epermits.fws.gov/eRCGR/)

50 CFR 21.51	Resident Canada Geese	Agriculture	Atlantic, Central, and Mississippi Flyway portions of AL, AR, CO, CT, DE, FL, GA, IL, IN, IA, KS, KY, LA, ME, MN, MS, MO, MT, NE, NH, NM, NJ, NY, NC, ND, OH, OK, PA, RI, SC, SD, TN, TX, VT, VA, WV, WI, WY (implemented by States and Tribes)
50 CFR 21.52	Resident Canada Geese	Human health	Lower 48 States (implemented by States and Tribes)
50 CFR 21.53	Purple swamphens	(Invasive)	All States, Puerto Rico, U.S. Virgin Islands.
50 CFR 21.54	Muscovy Duck	(Invasive)	All States except TX Counties: Hidalgo, Starr, and Sapata
50. CFR 21.55	Barn Owl, Cattle Egret	(Invasive)	Hawaii and the Pacific Islands

6. *What can I do with a depredation permit?*

A depredation permit is intended to provide short-term relief for bird damage until long-term nonlethal measures can be implemented to eliminate or significantly reduce the problem. A depredation permit authorizes "take" of birds protected under MBTA. Take includes killing birds, trapping birds, egg addling (oiling), and destruction of active nests. Capture or killing of birds cannot be the primary methods used to address depredation and will ONLY be authorized in conjunction with ongoing nonlethal measures.

7. What are nonlethal measures?

Nonlethal measures are methods that prevent or minimize bird damage without take (take includes killing or trapping birds). Methods include harassment (e.g., loud noises, pyrotechnics, propane cannons, scarecrows, dogs, trained raptors), habitat management (e.g., grass management, vegetative barriers, fencing and netting), cultural practices (e.g., seasonal timing, landscape placement), and policies (e.g., no feeding policies). Wildlife Services, part of the USDA, can provide information and expertise about preventing depredation and nonlethal methods. Visit their website: www.aphis.usda.gov/aphis/ourfocus/wildlifedamage.

8. *Who can apply for a depredation permit?*

The entity who is (a) experiencing the damage, (b) responsible for compliance with the permit, AND (c) has authority to implement nonlethal measures should apply for the permit. Applicants are most commonly the landowner, occasionally a land manager or resource manager. Private landowners, managers of public lands, State, Tribal, and local governments, and other entities, such as homeowners associations, with legal jurisdiction for the property involved may apply for depredation permits.

Pest control and other contractors may assist permittees in completing an application as well as conducting the work as a subpermittee, but may not apply for the depredation permit.

9. *What is a Form 37 and what is the role of Wildlife Services?*

Wildlife Services is part of the U.S. Department of Agriculture (USDA) and provides expertise to help resolve wildlife conflicts. They can assess your particular situation and provide recommendations of short-term measures to provide relief from bird damage and long-term measures to help eliminate or significantly reduce the problem. Wildlife Services also provides a "Form 37 Permit Review Form". This form is required as part of your Depredation Permit application. You must call Wildlife Services (866-487-3297) to obtain a Form 37.

10. *What information do I need to include with my application:*

Your federal depredation permit application will consist of two forms:

(1) The Service application form 3-200-13, including Section E questions 1-15 along with a completed take table; and

(2) A current "Form 37 Permit Review Form".

Your application will be considered incomplete and returned if you provide incomplete answers, do not answer all of the questions or provide the information on each of these pages or do not include a current WS-37..

11. *What is the application fee for a depredation permit?*

The permit application processing fee is $100 for most permittees. The fee is $50 for homeowners experiencing damage to their personal residence or property. The application fees are processing fees and nonrefundable, whether or not a permit is issued (50 CFR 13.11(d) (1)).

Government agencies (Federal, State, Tribal, and municipal governments) are exempt from the fee. Persons acting on behalf of a government agency are fee exempt provided documentation of this status is submitted with the application. Please clearly state in your application if you consider yourself fee exempt.

12. *Will my permit be restricted to certain methods and species and numbers of birds?*

Yes. Your permit will list the species and numbers of birds you are authorized to take and the method(s) you are authorized to use. You must describe the species and numbers you are requesting to take and the method(s) you propose to use on your application. The take of some species of birds may be further restricted due to their conservation status.

13. *May I request to take Bald Eagles or Golden Eagles?*

No. Bald Eagles and Golden Eagles receive additional protection under the Bald and Golden Eagle Protection Act. Please use the eagle depredation permit application to apply to take (this includes disturbance, harassment, and/or trap-relocate) Bald Eagles or Golden Eagles (http://www.fws.gov/forms/3- 200-16.pdf).

14. *Do I have to use nontoxic ammunition when using a firearm to take birds?*

Yes. We require the use of non-toxic ammunition when using firearms. You may request the use of lead shot and provide a justification in the methods section of your application.

15. *How do I dispose of dead birds?*

Typically, dead birds must be (a) turned over to USDA for official purposes, (b) donated to a public educational or scientific institution, or (c) completely destroyed by burial or incineration. Alternative disposal methods may be requested with appropriate justification.

16. *Do I need any additional permits or other authorizations to conduct depredation activities?*

Some States require a permit in addition to the Federal depredation permit. Additionally, you must comply with local ordinances, such as discharging firearms. This permit does not authorize you to use Federal, State or Tribal lands or other public or private property without appropriate authorization. It is your responsibility to make sure you comply with these requirements.

17. *Where do I submit my depredation permit application?*

Submit your application to the Service Regional Migratory Bird Permit Office that is responsible for the State in which the permitted activity will take place. A list of permit offices, their area of responsibility, and contact information is included in the application package.

18. *Who are the personnel identified on my permit and what are they authorized to do?*

a) Principal Officer. For permits issued to organizations, a Principal Officer is identified on the permit. The Principal Officer is the person in charge of the organization and is responsible for the application and any permitted activities.

b) Primary Contact. The Primary Contact is the person in the organization who is available to answer questions about the application or permitted activities. This person may be the same or different than the Principal Officer. The Primary Contact is not listed on the permit unless the individual is also listed as a subpermittee.

c) Subpermittee. A subpermittee is an individual authorized to conduct some or all of the permitted activities without the permittee present. You must identify any subpermittees in your application. Your subpermittees must have either a copy of your permit that identifies them as a subpermittee, or a copy of your permit and a letter from the Permittee (Principal Officer) listing activities (including location and duration) they are authorized to conduct.

19. *Will I be required to keep records of my depredation activities? Will they be inspected?*

Yes. You must maintain accurate records, legibly written or reproducible in English, of operations on a calendar-year basis of the information required by your permit. By accepting a Federal Depredation permit, you authorize an agent of the Service to enter your premises at any reasonable hour to inspect the wildlife you hold, your books or records. (50 CFR 13.47)

20. *Will I be required to submit an annual report of my depredation activities?*

Yes. You will receive an annual report form from your Regional Migratory Bird Permit Office. The report form can also be found on our website at: http://www.fws.gov/forms/3-202-9.pdf. This report must be completed and submitted to your issuing office by the date specified in your permit even if no take activity occurred.

21. *How long is a depredation permit valid? Can it be renewed?*

Depredation permits may be valid for up to 1 year. Permits may be restricted to less than 1 year depending on the species involved and the nature of the damage being experienced.

Depredation permits may be renewed. If you wish to renew your permit, you must submit a renewal application to your Regional Migratory Bird Permit Office at least 30 days prior to the expiration of your permit and include a copy of your current State permit, if one is required, along with a new Permit Review form from Wildlife Services. If we receive your renewal request at least 30 days prior to the expiration of your permit, your permit will remain valid beyond the expiration date for the activity authorized on your permit until a decision on your renewal is made. If we receive your renewal request fewer than 30 days prior to expiration of your permit and we are not able to process your request before the expiration date, your permit will expire and you will no longer be authorized to conduct your activity. If you allow your permit to expire before requesting renewal, you may be required to submit a new application. (See 50 CFR 13.11(c) and 13.22))

Department of the Interior
U.S. Fish and Wildlife Service

Federal Fish and Wildlife Permit Application Form

OMB Control No.
1018-0022 Expires
XX/XX/XXXX

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: Depredation

☐ **New Application**
☐ **Requesting Renewal or Amendment of Permit #** _____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details.
See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual			
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Occupation	4. Affiliation/ Doing business as (see instructions)	
5.a. Telephone number	5.b. Alternate telephone number	5.c. Fax number	5.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency, Tribe, or institution			
1.a. Name of business, agency, Tribe, or institution	1.b. Doing business as (dba)		
2. Tax identification no.	3. Description of business, agency, or institution		
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title	6. Primary contact name		
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information				
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1.Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE **in the amount of $100.00 ($50.00 Homeowner) nonrefundable processing fee.**. Federal, Tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – ***attach documentation of fee exempt status as outlined in instructions.*** (50 CFR 13.11(d))

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No ☐

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in ***Title 50, Part 13 of the Code of Federal Regulations*** and the other ***applicable parts in subchapter B of Chapter I of Title 50***, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

_____
Signature of applicant/Principal Officer (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

SECTION E. MIGRATORY BIRD DEPREDATION
(Migratory Bird Treaty Act, 50 CFR 21.41)

A Federal Migratory Bird Depredation Permit is required to capture or kill migratory birds to reduce depredation or to protect other interests such as human health and safety or personal property. You should apply for a depredation permit only after deterrents such as hazing and habitat modification prove unsuccessful. If a permit is issued, you will be expected to continue nonlethal measures in conjunction with any killing or trapping authorized.

Please read "What You Should Know About a Federal Migratory Bird Depredation Permit" before you sign and submit your application. You should review Title 50 Parts 10, 13, and 21.41 of the Code of Federal Regulations (CFR). ***You are responsible for reviewing and understanding these regulations before you request and accept a permit.*** *These regulations can be found on our website at: https://www.fws.gov/birds/policies-and-regulations/permits/need-a-permit.php .*

Resident Canada goose nests and eggs: If you are only destroying or addling resident Canada goose eggs and your state is one that accepts Federal registration, you may register for free online at https://epermits.fws.gov/eRCGR in lieu of obtaining a depredation permit. The States that accept Federal registration are listed in the "State Agency Contacts and Information" link on the registration website.

Please provide the information requested below on a separate sheet of paper with your responses numbered according to the questions. You must answer all of the questions even if the same information is included in your Form 37 (see question 9 below). You should be as thorough and specific as possible in your responses. We may request additional information as appropriate to the activities you are requesting (50 CFR 13.21(d)). Incomplete applications will be returned. Failure to respond in the time required may delay processing of your application and may be considered abandoned.

Processing time depends on the complexity of the request and completeness of the application. In general, applicants may expect a response within 90 days of our receipt o a complete application.

1. Complete and submit the Take Request Table.

2. Describe your requested method(s) of take and your experience with the method(s).

3. Provide the exact location of the property or properties where the control activity would be conducted (State, county, physical address of the specific site and the latitude/longitude in decimal degrees if available).

4. Provide the information below for each species. Including photographs or other documentation can assist us in reviewing your request.
- (a) A detailed description of the specific migratory bird damage or injury you are experiencing. Include details such as types of crops destroyed or property damage incurred. Include any human health and safety hazards involved.
- (b) How long it has been occurring (the number of days, months, or years).
- (c) What times or seasons of the year does it occur?
- (d) How large is the area affected (e.g., 1-acre pond; 50-acre vineyard)?

5. Describe the extent of the damage and estimate the economic loss suffered as a result, such as percentage of acres of crop and dollar loss, cost to replace damaged property, or cost of injuries. Attach copies of any receipts, invoices, contracts, or other available documentation to support your estimate.

6. Describe deterrents you have used to discourage depredating migratory birds and the results of the following nonlethal measures. Photographs or other documentation of the situation can assist us in reviewing your request.
- (a) Hazing or harassment techniques (e.g. horns, pyrotechnics, propane cannons, silhouettes, etc.), including how long (e.g. number of weeks, months, year(s)) and how often you have conducted these deterrents.
- (b) Habitat management measures (e.g. vegetative barriers, longer grass management, fencing, netting, etc.) you have taken to discourage migratory birds from using the area.
- (c) Cultural practices (e.g. crop selection and rotation, predator protection practices, no feeding policies) you have established to discourage migratory birds from using the area.

7. A depredation permit is not considered a long-term solution for most situations. What long-term measures do you plan to take to eliminate or significantly reduce the continued need for killing or removal of birds, or destroying eggs/nests?

8. If this is a renewal application, submit a completed annual report form. The Annual Report form can be found online at: https://www.fws.gov/forms/3-202-9.pdf

9. Your application for a depredation permit must include a recommendation from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, for addressing your depredation problem. Contact Wildlife Services at (866) 487-3297. If Wildlife Services recommends that a permit be issued to capture or kill birds, they will complete a Wildlife Services Permit Review Form (Form 37). Attach a copy of the completed Wildlife Services Permit Review Form (Form 37). Your application will be considered incomplete if you fail to include a current Form 37 with your application.

Please note: The information contained on the Form 37 has similar information that is requested below. You must also complete each section below that is applicable to your situation.

11. If you are applying on behalf of an airport for a permit to control birds in flight zones, indicate whether you are operating under a Federal Aviation Administration-approved Wildlife Hazard Management Plan.

12. Identify any subpermittees in your application. Your subpermittees must have either a copy of your permit that identifies them as a subpermittee, or a copy of your permit and a letter from the Permittee (Principal Officer) listing activities (including location and duration) they are authorized to conduct. The permittee is responsible for ensuring subpermittees are trained and adhere to the conditions of your permit. Subpermittees must be at least 18 years of age. Individuals younger than 18 may assist you, but must have a permittee or subpermittee present when conducting activities.

13. You must retain records, legibly written or reproducible in English, relating to the activities conducted under your permit for at least 5 years from the date of expiration of your permit.

Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?

☐ Yes ☐ No If "no," provide the physical address.

14. Any permit issued as a result of this application is not valid unless you also have any required State or Tribal permits or approvals associated with the activity. Have you obtained all required State or Tribal permits or approvals to conduct this activity?

☐ Yes If "yes," attach a copy of the approval(s). ☐ Have applied (Send copy when issued.) ☐ None required

15. A conviction, or entry of a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act disqualifies any such person from receiving or exercising the privileges of a permit, unless such disqualification has been expressly waived by the Service Director in response to a written petition. (50 CFR 13.21(c)) Have you or any of the owners of the business, if applying as a business, been convicted, or entered a plea of guilty or nolo contendere, forfeited collateral, or are currently under charges for any violations of the laws mentioned above?

☐ Yes ☐ No (must check one)

If you answered "Yes," provide: (a) the individual's name, (b) date of charge, (c) charge(s), (d) location of incident, (e) court, and (f) action taken for each violation. (*list all – use additional pages as necessary*)

Instructions: Complete the following table for each species of migratory bird(s) you request to take under a Depredation Permit. If you propose multiple methods of take for one species, use a separate line for each method; in such a case, the "estimated total number of birds involved in the damage or safety concern" for each line should be the same, as in the example below.

Species (Common name)	Estimated total number of birds causing damage or safety concern	PROPOSED METHOD OF TAKE					Proposed disposition (bury; incinerate; release; food bank; falconer (specify name/State/permit number); institution; other (specify)
		Number of birds you propose to:			Number of nests (not individual eggs) you propose to:		
		Kill	Trap & Relocate	Other (specify quantity & method)	Addle (oil/shake)	Destroy	
EXAMPLE: Canada goose	*50*	*10*	*0*	*0*	*0*	*0*	*Bury*
Canada goose	*50*	*0*	*0*	*0*	*25*	*0*	*Other – leave*

MIGRATORY BIRD DEPREDATION PERMIT APPLICATION - TAKE REQUEST TABLE

Supplemental Page Number:

Species (Common name)	Estimated total number of birds causing damage or safety concern	PROPOSED METHOD OF TAKE					Proposed disposition (bury; incinerate; release; food bank; falconer (specify name/State/permit number); institution; other (specify)
		Number of birds you propose to:			Number of nests (not individual eggs) you propose to:		
		Kill	Trap & Relocate	Other (specify quantity & method)	Addle (oil/shake)	Destroy	

PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in 50 CFR 13 address the permitting process. For simplicity, all licenses, permits, registrations, and certificates are referred to as a permit.

GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, C, D, and E.
- **An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.**
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application. Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- **Keep a copy of your completed application.**
- **Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)**
- Applications are processed in the order they are received.
- Additional forms and instructions are available from http://permits.fws.gov/.

COMPLETE EITHER SECTION A OR SECTION B:

Section A. **Complete if applying as an individual:**

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. ***Fax and e-mail are not required if not available.***
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba)**: business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will **not** accept *doing business as* affiliations for individuals.

Section B. **Complete if applying as a business, corporation, public agency, Tribe, or institution:**

- Enter the complete name of the business, agency, Tribe, or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, Tribe, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, Tribe, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is **required**. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

ALL APPLICANTS COMPLETE SECTION D:

Section D.1 **Application processing fee:**

- An application processing fee is required at the time of application; unless exempted under 50 CFR13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied**. We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, Tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies**. Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

Section D.2 **Federal Fish and Wildlife permits:**

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

Section D.3 **CERTIFICATION:**

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

ALL APPLICANTS COMPLETE SECTION

APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT

Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:
(Authorizing statutes can be found at:http://www.ecfr.gov and https://www.fws.gov/birds/policies-and-regulations/permits/permit-policies-and-regulations.php)
   a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
   b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50 CFR 17;
   c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
   d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq*.), 50 CFR 18;
   e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
   f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
   g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), http://www.cites.org/ , 50 CFR 23;
   h. General Provisions, 50 CFR 10;
   i. General Permit Procedures, 50 CFR 13; and
   j. Wildlife Provisions (Import/export/transport), 50 CFR 14.

2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.

4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)

   a. Routine disclosure to subject matter experts, and Federal, Tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish an FWS function related to this system of records.

   b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
   c. Routine disclosure to Federal, Tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
   d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
   e. Routine disclosure to Federal, Tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
   f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
   g. Routine disclosure to the appropriate Federal, Tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
   h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
   i. Routine disclosure to the Government Accountability Office or Congress when the information is required for the evaluation of the permit programs.
   j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.

5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.

6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Migratory Bird Depredation permit application varies from 1.5 hours for individuals to 3 hours for businesses and state/local/tribal governments. The burden for recordkeeping is 15 minutes for individuals and 30 minutes for businesses and state/local/tribal governments. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, 5275 Leesburg Pike, MS: BPHC, Falls Church, VA 22041-3803.

Freedom of Information Act – Notice

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.26 – 2.33].

U.S. Fish & Wildlife Service

Migratory Bird Regional Permit Offices

FWS REGION	AREA OF RESPONSIBILITY	MAILING ADDRESS	CONTACT INFORMATION
Region 1	**Hawaii, Idaho, Oregon, Washington**	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 American Blvd. West Suite 990 Bloomington, MN 55437-1458	Tel. (612) 713-5436 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	1875 Century Blvd., NE Atlanta, GA 30345	Tel. (404) 679-7070 Email *permitsR4MB@fws.gov*
Region 5	**Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia**	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Email *permitsR5MB@fws.gov*
Region 6	**Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming**	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Room W-2606 Sacramento, CA 95825	Tel. (916) 978-6183 Email *permitsR8MB@fws.gov*

Form 3-200-13 (Rev. 07/2019)
U.S. Department of the Interior

OMB Control No. 1018-0022
Expires 04/30/2021

FEDERAL FISH AND WILDLIFE PERMIT APPLICATION FORM

Migratory Bird Depredation
(Migratory Bird Treaty Act, 50 CFR 21.41)
U.S. Fish and Wildlife Service
Division of Migratory Bird Management

TYPE OF REQUEST

☐ New Application
☐ Renewal
☐ Amendment

BEFORE FILLING OUT THIS FORM, *please access the Return Addresses (to obtain the email/postal mail addresses where this form can be returned), and read the Frequently Asked Questions and Instructions. Please retain the "NOTICES" page for your records.*

If requesting a renewal or amendment, provide Permit # _____

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details. **See instruction page(s) for information on how to make your application complete and help avoid unnecessary delays.**

A.	**Complete if applying as an individual**		
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3.a. Telephone number	3.b. Alternate telephone number	3.d. E-mail address

B.	**Complete if applying on behalf of a business, corporation, public agency, Tribe, or institution**		
1.a. Name of business, agency, Tribe, or institution	1.b. Doing business as (dba)		
2. Tax identification no.	3. Description of business, agency, or institution		
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title	6. Primary contact name		
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C.	**All applicants complete address information**			
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete

1. A **nonrefundable processing fee** is required to process this permit, please attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE. Federal, Tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – Please see ***link for processing fee cost and fee exempt status as outlined in*** 50 CFR 13.11(d). *Click here for Processing Fees*

2. Do you currently have or have you ever had any Federal Fish and Wildlife permits?
Yes ☐ No ☐ If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue:

3. Certification: I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13 of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.

Signature of applicant/Principal Officer (No stamped signatures. Electronic signatures accepted.) **Date of signature (mm/dd/yyyy)**

Please continue to next page

OMB Control No. 1018-0022
Expires 04/30/2021

FEDERAL FISH AND WILDLIFE PERMIT APPLICATION FORM

Migratory Bird Depredation

(Migratory Bird Treaty Act, 50 CFR 21.41)

U.S. Fish and Wildlife Service
Division of Migratory Bird Management

Note: A Federal Migratory Bird Depredation Permit is required to take (capture or kill) migratory birds to reduce depredation or to protect other interests such as human health and safety or personal property. You should apply for a depredation permit only after deterrents such as hazing and habitat modification prove unsuccessful. If a permit is issued, you will be expected to continue nonlethal measures in conjunction with any killing or trapping authorized. Please read the "Frequently Asked Questions" and the pertinent regulations before you sign and submit your application. You should review Title 50 Parts 10, 13, and 21.41 of the Code of Federal Regulations (CFR). You are responsible for reviewing and understanding these regulations before you request and accept a permit. These regulations can be found on our website at: https://www.fws.gov/birds/policies-and-regulations/permits/permit-policies-and-regulations.php. You must be at least 18 years old to apply for this permit.

Please provide the information requested below. If additional information needs to be provided that does not fit in the designated spaces, add additional sheets to your application submission. You may use as many additional sheets as needed. Please number pages accordingly using the page number box provided at the bottom of the sheet, and the corresponding question number.

We may request additional information as appropriate to the activities you are requesting (50 CFR 13.21(d)). You should be as thorough and specific as possible in your responses. Incomplete applications will be returned. If you are requesting renewal, you only need to provide information that has changed since your prior application. You must answer all of the questions even if the same information is included elsewhere in the application.

If you are requesting renewal, all required reporting must be up to date or the renewal will not be processed. The report form can be found at https://www.fws.gov/forms/3-202-9.pdf. If you are requesting renewal, you still need to complete the entire application and provide all the requested information.

As the permittee, you are legally responsible for ensuring that your subpermittees, staff, and volunteers adhere to the terms of your permit.

Resident Canada goose nests and eggs: If you are only destroying or addling resident Canada goose eggs and your state is one that accepts Federal registration, you may register for free online at https://epermits.fws.gov/eRCGR in lieu of obtaining a depredation permit. The States that accept Federal registration are listed in the "State Agency Contacts and Information" link on the registration website.

Protected Species:The species listed in the Code of Federal Regulations at 50 CFR 10.13 are protected under the Migratory Bird Treaty Act (MBTA). A list of species in the U.S. and their status under the MBTA is available at the following website: https://www.fws.gov/birds/management/managed-species/migratory-bird-treaty-act-protected-species.php

SECTION E.

Questions

1) Attachments - In addition to this form, you should also attach the following to complete your application:

   a) Your application for a depredation permit must include a recommendation from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, for addressing your depredation problem. Contact Wildlife Services at (866) 487-3297. If Wildlife Services recommends that a permit be issued to capture or kill birds, they will complete a Wildlife Services Permit Review Form (Form 37). Attach a copy of the completed Form 37. Your application will be considered incomplete if you fail to include a current Form 37 with your application. The information contained on the Form 37 is similar to the information that is requested below. You must also complete each section below that is applicable to your situation;

   b) Copies of any receipts, invoices, contracts, or other available records documenting any deterrent measures can be helpful in processing your application;

   c) Take Request Table listing the species you wish to take (you will find this table at the end of this application). Please be sure to include the location(s) where take will occur in the fields provided at the top of the table. Be as specific as possible. Please include photographs of the species causing the damage if you are uncertain of the species;

   d) Any other supporting documentation (example photographs of damages);

   e) The report form for this application can be found at: <https://www.fws.gov/forms/3-202-9.pdf>

2) Any permit issued as a result of this application is not valid unless you also have any required State or tribal permits or approvals associated with the activity. Have you obtained all required State or tribal permits or approvals to conduct this activity?

☐ Yes, Have Attached

☐ None Required

☐ Have Applied, Will Provide Upon Request

3) Provide the information requested below for each species. Include photographs or other documentation to assist us in reviewing your request.

(a) What are the specific details for the depredation or injuries you are experiencing? Include details such as types of crops/livestock destroyed or property damaged. Include number livestock injured or killed, if applicable. Include risks to human health and safety hazards. What is the extent of the damage and estimate the economic loss suffered as a result, such as percentage of acres of crop and dollar loss, cost to replace damaged property, or cost of injuries? Attach copies of any receipts, invoices, contracts, or other available documentation to support your estimates.

(b) How long has this depredation been occurring (provide number of days, months, or years)?.

(c) When during the year does this depredation or human safety hazard occur?

(d) What is the size of the area affected (e.g. 1-acre pond, 50-acre vineyard, 500-acre airfield)?

(e) How long are you requesting the permit for and how often will you be conducting depredation activities?

4) What is location of the property or properties where the take activity would be conducted? Include state, county, physical address, and latitude/longitude in decimal degrees (e.g. 36.87998 N/ 88.3435 W). For assistance determining the latitude/longitude for a specific location in decimal degrees, please visit https://earthexplorer.usgs.gov/

5) Describe the following with your justifications:

(a) your requested method(s) of take, including type(s) of trap(s);

(b) your proposed trapping methods;

(c) who will be conducting any trapping and describe their previous experience;

(d) if you are requesting authorization for trap and relocation, identify the areas to be used for relocation. (Always ask for landowner and state permission to release relocated birds.)

6) Describe the deterrents that you have used previously to address this depredation situation, specifically addressing the following nonlethal measures. Photographs or other documentation of the situation can assist us in reviewing your application.

(a) What hazing or harassment techniques (e.g., horns, pyrotechnics, propane cannons) have you used to manage or eliminate the problem? Of these tools, how often and how long did you use these deterrents (e.g., number of weeks, months, year(s))?

(b) What habitat management measures (e.g., vegetative barriers, longer grass management, fencing and netting) have you used to discourage depredation by birds?

(c) What cultural practices (e.g., crop selection, crop placement, animal and pet management, feeding schedules, and no-bird-feeding policies) have you established to discourage depredation in the areas you have identified?

7) A depredation permit is not considered a long-term solution for most situations. What long-term measures do you plan to take to eliminate or significantly reduce the continued need for killing or removal of birds, or destroying eggs/nests? Discussing how you will continue to use the non-lethal deterrents described in question 5 above can help with answering this question. (Recall that no permit is needed to remove nests without eggs, except for eagles and endangered birds.)

8) If you are applying on behalf of an airport for a permit to control birds in flight zones, indicate whether you are operating under a Federal Aviation Administration-approved Wildlife Hazard Management Plan. If you are operating under an FAA-approved WHMP, please provide an electronic copy of the most recent plan.

☐ I am not applying on behalf of an airport

☐ I am applying on behalf of an airport

- ☐ An approved WHMP is attached
- ☐ We do not have a WHMP

9) You must retain records legibly written or reproducible in English relating to the activities conducted under your permit for at least 5 years after the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?

☐ Yes

☐ No
If “no,”provide the physical address:

10) Anyone who will be assisting you with the permitted activities or acting as your agent must either have their own Federal migratory bird permit for the activity or be identified by you, in writing, as a subpermittee under your permit. They may also require a State permit. Subpermittees must be at least 18 years old. As the primary permittee, you will be responsible for ensuring that your subpermittees are properly trained and adhere to the terms of your permit. Provide the name of any subpermittees who will be conducting activities under your permit. Include any commercial company that may be contracted to conduct the work.

11) Disqualification factor. Have you, the permittee, or your client (if a broker on behalf of your client):
(a) Been assessed a civil penalty or convicted of any criminal provision of any statue or regulation relating to the activity for which the application is filed (50 CFR 13.21(b) (1)?

(b) Been convicted, or entered a plea of guilty or nolo contendere, for a felony violation of the Lacey Act, the Migratory Bird Treaty Act, or the Bald and Golden Eagle Protection Act. (50 CFR 13.21 (c)(1))?

(c) Had a permit revoked within the last five years for willfully violating any Federal or State statute or regulation, or any Indian tribal law or regulation, or any law or regulation of any foreign country, which involves a violation of the conditions of the permit or of the laws or regulations governing the permitted activity (50 CFR 13.28 (a)(1)) or failing to correct deficiencies that were the cause of a permit suspension within 60 days (50 CFR 13.28 (a)(2))?

Answer "yes" if ANY of the events listed immediately above (11-14) have occurred. Answer "no" if none of the events listed immediately above have occurred.

☐ Yes
☐ NO

If you answered "Yes", provide: a) the individual's name; b) date of conviction, civil penalty assessment or revocation; c) charge(s), or reason(s) for revocation; d) location of the incident; e) court (if applicable, ticket, federal/state/tribal court etc.); and f) legal action taken for each violation (i.e. fine, incarceration, probation, or other). Please be aware that a "Yes" response does not automatically disqualify you from getting a permit.

15) Are you eligible for Fee Exempt Status? Fee exempt status applies to government agencies (Federal, State, Tribal, and municipal governments). Applicants acting on behalf of such agencies must submit either a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency, or the agencies tax exempt form.

☐ Yes = Government Agency

☐ Yes = Acting on behalf of Government Agency
Documentation Included

☐ No = not eligible for Fee Exempt Status

16) I acknowledge that I have read the form Instructions and FAQ, have accessed the page with the Return Addresses to obtain the address where I should return this form, and have filled out all fields and questions. I have also obtained a completed Form 37 from Wildlife Services and will include it with my application. Check this box to acknowledge: ☐

NOTICES

PRIVACY ACT STATEMENT

Authority: The information requested is authorized by the following: the Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22; the Endangered Species Act (16 U.S.C. 1531-1544), 50 CFR 17; the Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21; the Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15; the Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16; Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), 50 CFR 23; General Provisions, 50 CFR 10; General Permit Procedures, 50 CFR 13; and Wildlife Provisions (Import/export/transport), 50 CFR 14.

Purpose: The collection of contact information is to verify the individual has an eligible permit to conduct activities that affect protected species. The information the individual provides helps the FWS monitor and report on protected species and assess the impact of permitted activities on the conservation and management of species and their habitats.

Routine Uses: The collected information may be used to verify an applicant's eligibility for a permit to conduct activities with protected wildlife; to provide the public and the permittees with permit related information; to monitor activities under a permit; to analyze data and produce reports to monitor the use of protected wildlife; to assess the impact of permitted activities on the conservation and management of protected species and their habitats; and to evaluate the effectiveness of the permit programs. More information about routine uses can be found in the System of Records Notice, Permits System, FWS-21.

Disclosure: The information requested in this form is voluntary. However, submission of requested information is required to process applications for permits authorized under the listed authorities. Failure to provide the requested information may be sufficient cause for the U.S. Fish & Wildlife Service to deny the request.

PAPERWORK REDUCTION ACT STATEMENT

In accordance with the Paperwork Reduction Act (44 U.S.C. 3501), the U.S. Fish and Wildlife Service collects information necessary to monitor take and disposition of migratory birds, under the applicable laws governing the requested activity, for which a permit is requested, and to respond to requests made under the Freedom of Information Act and the Privacy Act of 1974. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number. OMB has approved this collection of information and assigned Control No. 1018-0022.

ESTIMATED BURDEN STATEMENT

We estimate public reporting for this collection of information to average 1.5 hours for individuals to 3 hours for businesses and state/local/tribal governments. The burden for recordkeeping is 15 minutes for individuals and 30 minutes for businesses and state/local/tribal governments. This includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, Fish and Wildlife Service, U.S. Department of the Interior, 5275 Leesburg Pike, MS: BPHC, Falls Church, VA 22041-3803, or via email at Info_Coll@fws.gov. Please do not send your completed form to this address.

FREEDOM OF INFORMATION ACT

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.26 – 2.33].

Take Request Table

OMB Control No. 1018-0022
Expires 04/30/2021

Instructions: Complete the following table for each species of migratory bird(s) you request to take under a Depredation Permit. If you propose to conduct take activities at multiple locations, please fill out a separate table for each location. If you propose multiple methods of take for one species, use a separate line for each method; in such a case, the "estimated total number of birds involved in the damage or safety concern" for each line should be the same, as in the example below.

Activity Location (required): _____ **County/State (required):** _____

Provide the exact location of the property or properties where the activity would be conducted including state, county, and physical address, and latitude/longitude in decimal degrees (e.g. 36.87998/ -88.3435). For assistance determining the latitude/longitude for a specific location in decimal degrees, please visit https://earthexplorer.usgs.gov/

Species (Common name)	Estimated total number of birds causing damage or safety concern	PROPOSED METHOD OF TAKE					Proposed disposition (bury, incinerate, release, food bank,falconer (specify name/State/ permit number), other permit (give permittee name and permit number), institution, other (give name))
		Number of birds you propose to:			Number of nests (not individual eggs) you propose to:		
		Kill	Trap & Relocate	Other (specify quantity & method)	Addle (oil/shake)	Destroy	
EXAMPLE: Canada goose	*50*	*10*	*0*	*0*	*0*	*0*	*Bury*
Canada goose	*50*	*0*	*0*	*0*	*25*	*0*	*Other – leave*

OMB Control No. 1018-0022
Expires 04/30/2021

MIGRATORY BIRD DEPREDATION PERMIT APPLICATION - TAKE REQUEST TABLE

Supplemental Page Number:

Activity Location (required):

Provide the exact location of the property or properties where the activity would be conducted including state, county, and physical address, and latitude/longitude in decimal degrees (e.g. 36.87998/ -88.3435). For assistance determining the latitude/longitude for a specific location in decimal degrees, please visit https://earthexplorer.usgs.gov/

Species (Common name)	Estimated total number of birds causing damage or safety concern	PROPOSED METHOD OF TAKE					Proposed disposition (bury, incinerate, release, food bank,falconer (specify name/State/ permit number), other permit (give permittee name and permit number), institution, other (give name))
		Number of birds you propose to:			Number of nests (not individual eggs) you propose to:		
		Kill	Trap & Relocate	Other (specify quantity & method)	Addle (oil/shake)	Destroy	

Appendix F

SOURCES FOR WILDLIFE MANAGEMENT SUPPLIES AND EQUIPMENT

Wildlife Hazard Vendor and Equipment Supply List

Vendors	
Pyrotechnics	Wildlife Management Supplies
	Website -WildlifeMA.com
Optics, Firearms, and Ammunition	Wildlife Management Supplies Website -WildlifeMA.com

Wildlife Hazard Response Equipment Inventory at Station	
Quantity	**Item**
150	15mm Bangers
150	15mm Screamers
200	6mm Caps
50	12 Gauge 8-shot
50	12 Gauge 6-shot
50	12 Gauge 4-shot
10	12 Gauge Slug
300	.177 Hunting Pellet
1	15mm Pyrotechnics Pistol
1	.177 GAMO Air Rifle
1	12 Gauge Shotgun
1	Bird Identification Guide

Vehicle Supply List to be in all Vehicles Designated for Wildlife Control	
Quantity	**Item**
25-75	15mm Bangers
25-75	15mm Screamers
50-150	6mm Caps
1	15mm Pyrotechnics Pistol
1	Pair of 8x (or greater) Roof-Prism Binoculars
1	Bird Identification Guide

Other Wildlife Management Equipment	
Quantity	**Item**
1	Propane Cannon

Appendix G

AIRPORT WILDLIFE HAZARD CONTINUAL MONITORING AND REPORT CHECKLIST

Airport Wildlife Hazard Continual Monitoring and Report Checklist

Airport Name: Chatham Municipal Airport (KCQX)
Airport Wildlife Hazard Coordinator:
Date:
Time:
Monitoring Participants:
Survey # (if multiple surveys in 1 day):

Temperature:	**Other Weather Comments:**
Sky Conditions: Clear / Partly Cloudy / Mostly Cloudy / Overcast	
Wind Speed and Direction:	

	Yes/No	Comments
Monitoring Checklist		
Perimeter Fence Inspection (document any breaches)		
Recent Improvements		
New Attractants		
Any Birds Observed		Attached separate list/notes with location, directional movement, estimated numbers, and species or type of bird
Any Mammals Observed		
Land management Recommendations		
Communications/Operational Recommendations		
Additional Customized Notes and Checklist Items (add below)		

Appendix H

Qualifications of Preparers

Michael McGraw, MES, QAWB, ACE

Senior Wildlife Biologist, Ecologist / Pennsylvania Branch Manager

EDUCATION

M.E.S., Environmental Biology, University of Pennsylvania, Philadelphia, PA , 2015

B.S., Environmental Science, Drexel University, Philadelphia, PA, 2002

PROFESSIONAL INFORMATION

Safety Management Systems - Airport Certified Employee

FAA Qualified Airport Wildlife Biologist

Adjunct Professor of Ornithology, University of Pennsylvania, Philadelphia

Bander in Charge, The Rushton Farm Preserve Saw Whet Owl Research Station, Willistown, PA

AFFILIATIONS

The Wildlife Society
United States Bird Strike Committee
Association of Northeastern Biologists
Greater Philadelphia Herpetological Society
Northeastern Partners for Amphibian and Reptile Conservation
Pennsylvania Audubon Society
New Jersey Audubon Society
Delaware Valley Ornithological Club
Ned Smith Center for Art and Nature
Delaware County Birding Club
Cape May Bird Observatory
Academy of Natural Science (Philadelphia)
The Nature Conservancy Citizen Science Program
Pennsylvania Botanical Society

SUMMARY OF EXPERIENCE

Michael McGraw is a Wildlife Biologist and Ecologist. Since 2002, Michael has performed an extensive variety of reptile, amphibian, and avifaunal surveys in the Eastern and Midwestern U.S. with a strong emphasis on endangered, threatened, and species of concern. Beyond survey and research, his work as a consulting scientist includes project design, permitting, project management, and client relations, as well as writing technical reports and proposals.

Michael is currently managing numerous projects and functioning as a lead biologist on a variety of AES projects, including wildlife surveys, ecological assessments, threatened and endangered species surveys, population biology research, wetland mitigation, sensitive habitat restoration, FAA-mandated wildlife hazard management plans for airports, land management and site master planning, and energy development projects.

SELECT PROJECT EXPERIENCE

Wildlife Hazard Assessment and Wildlife Hazard Management Plan of Lihue Airport, Lihue, Kauai, Hawaii.

Wildlife Site Visits and Wildlife Hazard Management Plan, 6 GA Airports in Minnesota.

Wildlife Hazard Assessment and Wildlife Hazard Management Plan for the Willard Airport. Savoy, IL.

FAA-funded Marine Radar Research for Improving Wildlife Hazard Assessment Methodology at Airports, Partnership with Center for Excellence in Airport Technology, University of Illinois, Champaign, IL.

Wildlife Habitat Management Plan for Badger Mining Corporation. Taylor, WI.

Wildlife Habitat Management Plan for Shullsburg Mine. Shullsburg, WI.

Wildlife Survey of the Lower Buffalo River. Buffalo, NY.

Ecological Assessment of St. Joe's at Providence Creek. Clayton, Kent County, DE.

Ecological Assessment of the Dismal Swamp Conservation Area. Edison, Middlesex County, NJ.

Faunal Inventories at Albany Pine Bush Landfill Restoration. Albany, NY.

Faunal Inventories at Seneca Meadows Landfill Restoration. Waterloo, NY.

Stream Restoration, Wildlife Inventory and Trail Re-alignment at The New York Botanical Garden. Bronx, NY.

Breeding and Migratory Bird Survey. Minden, MI.

Breeding Bird Survey. Blue Mountain Ski Area, Carbon County, PA.

OTHER PROFESSIONAL EXPERIENCE

Various Comprehensive Herpetofaunal, Avifaunal, and Rare Plant Inventories for Herpetological Associates (2002-2008). NJ, NY, & PA.

Volunteer Bird Bander/Field Ornithologist at Owl and Songbird Research Stations (Spring 2013-Present). Ruston Farm Preserve, Willistown, Chester County, PA.

EMBRY-RIDDLE
Aeronautical University
PRESCOTT, ARIZONA

The title of

Qualified Wildlife Biologist

Is awarded to

Michael J. McGraw

In recognition of successful completion of the requirements stipulated under FAA Advisory Circular 150/5200-36A

July 21, 2014

Dr. Archie Dickey, Center for Wildlife and Aviation

RESUME

Steven D. Riberdy, M.S., CWB®, PWS, CE, CERP, PSS

Senior Ecologist

Summary of Experience

Mr. Riberdy is an experienced wetland ecologist and wildlife specialist, employed at GZA since 2001. His relevant experience includes wetland ecology, herpetology, botany, soil science, ecological restoration and wildlife biology along with a strong background in GIS. Mr. Riberdy's current work at GZA includes a variety of natural resource projects throughout southern New England, specifically focusing on the wetlands, flora and fauna of the region. Mr. Riberdy manages many of his natural resource projects directly or works as part of a larger team of scientists on larger or multi-phase projects. Mr. Riberdy has designed and conducted many vernal pool and endangered species surveys, (both flora and fauna) with special emphasis on the plants, herpetiles, lepidoptera and other species of New England, in addition to preparing and contributing to many conservation permits under MESA along with habitat management plans for affected rare species. Mr. Riberdy has also conducted hundreds of wetland evaluations throughout the area and has also authored many general wildlife habitat assessments ranging from small lots to parcels over 800 acres in size. Mr. Riberdy has completed the training course and has the educational prerequisites to qualify as a Qualified Airport Wildlife Biologist and has co-authored both WHSV's and WHMP's. Mr. Riberdy has attended bat training courses and has conducted over 50 Phase I habitat assessments for federally and locally rare bat species in New England in addition to Phase II acoustic work. Mr. Riberdy is also adept at conducting aquatic surveys of streams and ponds, with skills in identification of aquatic macrophytes, invertebrates and habitats. Mr. Riberdy has also conducted numerous wetland delineations and permitting projects in both MA and CT following State and Federal criteria. Permitting efforts include MA WPA, MEPA, 401 Water Quality, Section 404, in addition to local wetland permits and peer review of wetland permits for other clients. Mr. Riberdy has also designed and oversaw construction of many wetland and ecological replication and restoration sites in his years with GZA including invasive species management, stream daylighting and ecological restoration. Mr. Riberdy is also an accomplished Soil Scientist.

Relevant Project Experience

Senior Project Scientist/Project Manager, Marshfield Airport, Marshfield, Massachusetts. Lead natural resource scientist and project manager for field investigations and natural resource permitting in support of runway reconstruction. Work included preparation of a Vegetation Management Plan, Invasive Species Control Plan, design of wetland replacement and enhancement sites; Eastern Box Turtle habitat assessment and three-year telemetry population studies and conservation and management planning; wetland delineation; and wetland permitting. Following permitting, Mr. Riberdy was project manager and lead ecologist in charge of construction oversight for permit compliance, designated Wetland Scientist and Environmental Specialist by MA DEP, and on-site turtle biologist by MA NHESP in charge with overseeing the two-year project for compliance with wetland and rare species regulations including a Turtle Protection Plan authored and implemented by Mr. Riberdy. This project also saw the Mr. Riberdy oversee the

Education

M. S., 2011, Wetland Ecology, University of Massachusetts- Amherst
B. S., 2000, Environmental Science/Biology, Westfield State University

Registrations & Certificates

Certified Ecologist
Certified Soil Scientist
Professional Wetland Scientist
Certified Wildlife Biologist
Certified Ecological Restoration Practitioner

Affiliations

- Society of the Study of Amphibians and Reptiles (SSAR)
- New England Botanical Club
- Ecological Society of America (ESA)
- Society of Wetland Scientists (SWS)
- Assoc. MA Wetland Scientists (AMWS)
- CT Association of Wetland Scientists (CAWS)
- The Wildlife Society, New England Chapter (TWC)
- New England Wildflower Society Plant Conservation Volunteer (PCV)
- Soil Science Society of Southern New England

Areas of Specialization

- Wetland Ecology
- Herpetology
- Botany & Botanical Studies
- Rare Species Surveys, Permitting, Mgmt.
- Wildlife Habitat Assessment
- Wetland Assessment/Delineation & Mitigation
- Soil Science
- Aquatic Surveys and Stream Restoration Design

Steven D. Riberdy, M.S., CWB®, PWS, CE, CERP, PSS

Senior Ecologist

implementation of a mile-long restoration of Bass Creek as well as the 5 years of post construction monitoring of this successful tidal stream restoration.

ECOLOGICAL RESTORATION

Senior Environmental Scientist, Beatties Pond Salt Marsh Restoration Evaluation & Impact Assessment. Guilford, Connecticut. Performed the environmental evaluations for CTDOT and CTDEEP relative to reconstruction of a highway bridge and removal of tidal flow restriction for the purposes of salt marsh restoration in 60± acre flooded former saltmarsh. Evaluations included an inventory of subaqueous soils, existing flora/fauna biodiversity, including documentation of existing salt marsh fringe areas, as well as assessment of potential for successful saltmarsh restoration.

Project Scientist, Springfield Lakes Assessment, Springfield, Massachusetts. Mr. Riberdy was an integral part of the survey team responsible for aquatic vegetation surveys of over 50 acres distributed over five waterbodies in Springfield, MA. In addition to aquatic community characterization, Mr. Riberdy also contributed to the wildlife habitat assessments and reporting for existing and proposed impacts to the waterbodies as part of a lake management effort with aquatic herbicides to control excessive growth of nuisance aquatic vegetation. Mr. Riberdy also designed and conducted both short term and long-term post treatment monitoring of these aquatic communities as part of this project.

Project Scientist, Invasive Species mapping and control plan, Fort Washington Park, New York, New York. One of several field biologist tasked with mapping and developing an invasive species management plan for Ft. Washington Park, New York, NY.

Project Scientist, ATV Trail Siting Study, Connecticut. Part of a team of scientists whom conducted an onsite assessment of all trails within three large state parks (Shenipsit, Cockaponsett, and Pachaug) in CT for the Connecticut DEP. Trails assessments include trial condition in addition to potential impacts of trail use on nearby wetlands and rare species.

Project Scientist, Papoose Lake Assessments, Heath, Massachusetts. Mr. Riberdy is also the principal scientist responsible for ongoing long term monitoring efforts of Papoose Lake, Heath MA in response to an Order of Conditions issued by the Heath Conservation Commission following aquatic herbicide treatment. Ongoing reports include yearly assessments and characterization of aquatic and bordering terrestrial communities of the 12+ acre pond. Reports also include a detailed assessment of vegetation regrowth following treatment, wildlife habitat, flora and fauna inventories.

Senior Ecologist, Long Wharf Coastal Resiliency Planning, New Haven, Connecticut. Mr. Riberdy is senior ecologist in charge with conducting coastal habitat assessments in support of this coastal resiliency design and planning project. Several inland, inter tidal and subtidal habitats were analyzed and mapped and rare species habitats were also assessed and mapped as part of this project.

Senior Ecologist/Project Manager, Runnins River Invasive Species Management, East Providence, Rhode Island. Mr. Riberdy was in charge of developing, implementing and conducting long term monitoring of a 40-acre wetland restoration project along a tributary of Runnins River that has been completely occluded by dense phragmites in-growth over the last 50 years. Work included wetland assessment, permitting, invasive species management planning, design and oversight of implementation. Mr. Riberdy designed the long term monitoring protocols utilizing floristic quality assessment mythology to monitor baseline and long term effects of the management to restore this wetland to more natural conditions.

Senior Ecologist/Project Manager, Willow Brook Restoration, Fort Devens, Devens, Massachusetts. Mr. Riberdy is project manager and senior scientist in charge with designing and overseeing the implementation and the construction of a 500 linear foot stream and riparian habitat along Willow Brook which has been culverted since circa 1930.

Senior Ecologist/Project Manager, City of Springfield City-wide Lake and Pond Management Planning, Springfield, Massachusetts. Mr. Riberdy is project manager and senior scientist for this City-wide plan and permitting effort to manage 22 of the city's waterbodies. Work included assessment of the waterbodies as well as designing the management plan and conducting permitting at the state and local level.

Steven D. Riberdy, M.S., CWB®, PWS, CE, CERP, PSS

Senior Ecologist

AIRPORTS

Project Scientist, Barnes Airport Permitting, Westfield, Massachusetts. Part of a team of scientists that evaluated natural resources and prepared vegetation management plan, invasive species control plan and environmental permits at Barnes Airport, Westfield, MA. Work at this site included rare species surveys for eastern box turtle, marbled salamander, frosted elfin, pine barren pine barrens itame, and other rare moth species and associated host plants as well as rare grassland birds. In addition, other work at Barnes Airport included permitting and monitoring for vegetation management activities, wetlands delineation and permitting, and MEPA permitting.

Invasive Species mapping and Control Plan, Chatham Airport, Chatham, Massachusetts. Lead Scientist and author on a comprehensive invasive species and control plan for Chatham Airport. Conducted associated field surveys and mapping of existing invasive species at the airport.

Project Scientist, Turners Airport Biological Assessments, Montague, Massachusetts. Project scientist, designed and conduced rare species assessments for eastern box turtle and assisted in surveys for rare sandplain plants (Nantucket shadbush). Also assisted in conduction nighttime blacklight trapping for rare moth species and assist in the transplantation of host plants for rare butterflies also found at this airfield.

Senior Ecologist / Project Manager, Orange Airport MA NHESP Permitting, Orange, Massachusetts. Mr. Riberdy was the project manager and lead scientist on several permitting and survey projects at this airport. Recent projects include the development of a plant and rare grassland bird survey and MESA permitting in support of the re-construction of TW-D. Plant surveys for papillose nut sedge and rare grassland bird habitat assessments were conducted in 2016 in support of a MESA Review filing. Mr. Riberdy was the primary interface with MA NHESP and obtained MESA permits for this project to occur with mitigation measures designed to protect rare grassland birds and rare plant populations.

Senior Ecologist / Project Manager, Mansfield Airport Phase III VMP Implementation, Mansfield and Norton, Massachusetts. Mr. Riberdy is the lead scientist and project manager responsible for all permitting, field surveys, construction observation and reporting for this multi-year 50 acre VMP clearing project in Mansfield and Norton, MA. As part of this project Mr. Riberdy designed cutting protocols in and around the sensitive vernal pool areas, and observed work for compliance in these areas. Multiple years of monitoring of vernal pool habitat post cutting was conducted and reported to the Conservation Commission. Other work involved updates to the VMP, development of site specific implementation and invasive species control plans, compliance monitoring during cutting and reporting to the Conservation Commissions in the two towns where this project occurred.

Senior Ecologist / Project Manager, Nantucket Airport Rare Plant Assessment, Nantucket, Massachusetts. Mr. Riberdy is lead botanist and project manager for this project that required extensive botanical survey in support of the re-location of the localizer for the FAA. As part of this project Mr. Riberdy designed and implemented and NHESP approved multi-season plant surveys of the 2-acre work area for multiple species of rare sandplain grassland plants (Sandplain Blue Eyed Grass, Lino's Foot, Purple Needlegrass, New England Blazing Star, Sandplain Flax). These protocols and final report were approved by MA NHESP.

Project Scientist, MAC-Airport Vegetation and Management Plans, Various Locations, Massachusetts. Mr. Riberdy has been actively involved in the Vegetation Management Plan (VMPs) implementation and design at ten municipal airports thought the Commonwealth between 2001 and 2005. Responsibilities included yearly designation and vegetation monitoring of set test plots to monitor regrowth at these airports in response to a VMP approved in 1999. Mr. Riberdy has also conducted yearly wildlife habitat assessments of several areas at each airport for inclusion into yearly monitoring reports. In addition to on-site monitoring activities Mr. Riberdy has also been involved in the preparation and issuance of the Bid Specification package for herbicide treatment as well as the pre and post assessment of the effectiveness of the treatments.

Project Scientist, Rentschler Field Permitting, East Hartford, Connecticut. Worked as part of a larger team of scientists whom conducted extensive wetland delineation and natural resource assessment of this former airfield, for conversion to other uses. Natural resource assessments

Steven D. Riberdy, M.S., CWB®, PWS, CE, CERP, PSS

Senior Ecologist

included wetlands, wildlife habitat, rare species (box turtle) and grassland birds.

Project Scientist, Martha's Vineyard Airport Biological Assessments, Edgartown, Massachusetts. Project scientist, assisted with rare sandplain plant surveys and mapping as well as conducted daytime larval surveys for the state listed barrens buck moth.

Senior Ecologist/Project Manager, Gardner Airport, Gardner and Templeton, Massachusetts. Mr. Riberdy is project manager for this project with tasks including grassland bird surveys and habitat assessments, wetland delineation, and wetland and rare species permitting.

Senior Ecologist/Project Manager, Fitchburg Airport, Fitchburg and Leominster, Massachusetts. Mr. Riberdy is project manager and senior scientist responsible for overseeing implementation of the Vegetated Management Plan cutting as well as permitting and in-field natural resource investigation for the shift of the primary runway and removal of the cross wind runway.

Senior Ecologist/Project Manager, Orange Airport TW-Delta, Orange, Massachusetts. Mr. Riberdy is project manager and senior ecologist in charge of all permitting and natural resource assessment for the reconstruction of Taxiway Delta at Orange Municipal Airport. This project involved the delineation and assessment of wetland resources as well as assessment, survey, permitting and NHESP coordination for the extensive rare species located at this airfield which included surreys for the grasshopper sparrow, vesper sparrow and a rare plant (papillose nut sedge).

Senior Ecologist/Project Manager, Nantucket Airport Rare Plants, Nantucket, Massachusetts. Mr. Riberdy is project manager and senior ecologist in charge of rare plant surveys in this sandplain grassland habitat and maritime heathland community for several rare plant species for several projects at the airport.

Senor Ecologist/Project Manager, Marshfield Airport Fence Wildlife Fence, Marshfield, Massachusetts. Mr. Riberdy is project manager and senior ecologist in charge of conducting MA NHESP coordination and permitting along with mitigation design and rare species surveys during construction for the installation of new wildlife fencing within eastern box turtle habitat at this airport.

Senior Ecologist / Project Manager, Marshfield Airport Perimeter Fence Rare Species Permitting, Marshfield, Massachusetts. Mr. Riberdy is project manager and lead scientist in charge with developing MA NHESP permits relative to the extension of airport perimeter fencing through rare species habit for eastern box turtle. Mr. Riberdy has extensive experience with eastern box turtle at this airport, having conducted a three-year radio telemetry program for the population of rare turtles at this airport. Mr. Riberdy successfully secured MA NHESP approvals for the fence extension and developed a turtle protection protocols as part of these approvals.

GZA GeoEnvironmental, Inc.