(FINAL) Wildlife Hazard Management Plan

Turners Falls Municipal Airport (0B5)
Turners Falls (Montague), MA

July 14, 2022

Prepared for:

Turners Falls Airport Commission
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Executive Summary

Stantec Consulting Services Inc. (Stantec) has prepared this Wildlife Hazard Management Plan (Plan) on behalf of the Turners Falls Municipal Airport (Airport or 0B5). The Plan is based on the findings of the Wildlife Hazard Assessment (Assessment) conducted from April 16, 2020, through March 25, 2021 (Stantec 2021). The Assessment is a separate companion document and contains data upon which this Plan is based. This Plan was prepared according to the Federal Aviation Administration's (FAA) regulatory requirements per Section 139.337(f) and protocol for the preparation of a Plan as described in FAA Advisory Circular (AC) 150/5200-38. This Plan incorporates the Airport's current management practices with additional recommendations based on the current information and wildlife data gathered during the year-long Assessment. Note that 0B5 is a general aviation (GA) facility and that FAAs wildlife management requirements are substantially applied to Part 139 airports. As such, many of the references and directives contained herein may appear disproportionate to a smaller GA facility such as 0B5. Interpretation of some of the directives relative to the size and activity levels of the subject facility is necessary.

As per AC 150/5200-38, the goal of this 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 addresses the implementation of appropriate federal, state, and local wildlife control permits and describes a schedule and methodology for periodic evaluation and updates.

The Assessment found large mammals and large-bodied birds are likely 0B5's most significant hazards. The birds closely associated with riparian habitat off of the northwest runway end. This Plan recommends 0B5 implement a suite of measures for minimizing the airport's attractiveness to birds and deterring birds, as well as a fence for large mammal control. The Plan recommends regular wildlife inventories and record-keeping of significant wildlife events and measures used to mitigate those events.

Abbreviations

AC	Advisory Circular
Airport	Turners Falls Municipal Airport
AOA	air operations area
Assessment	Wildlife Hazard Assessment
CFR	Code of Federal Regulations
CTAF	Common Traffic Advisory Frequency
FAA	Federal Aviation Administration
MassWildlife	Massachusetts Division of Fisheries and Wildlife
NOTAM	Notice to Airmen
0B5	Turners Falls Municipal Airport
Plan	Wildlife Hazard Management Plan
UNICOM	Universal Communications
USC	United States Code
USDA	US Department of Agriculture
USFWS	US Fish and Wildlife Service

1.0 AUTHORITY AND RESPONSIBILITY

This Wildlife Hazard Management Plan is a companion document to the Wildlife Hazard Assessment completed for the Turners Falls Municipal Airport (0B5) in February 2022. In the WHA it is explained that 0B5 is a general aviation (GA) facility and not subject to the requirements of certificated airports. Pursuant to Federal Aviation Administration (FAA) regulation 14 Code of Federal Regulations (CFR) 139.337, Part 139 certificated airports must conduct a Wildlife Hazard Assessment (Assessment) if certain conditions have occurred at the airport that would indicate wildlife hazards are present. The need for an Assessment is triggered if any of the following events occur on or near the airport:

a) An air carrier aircraft experiences multiple wildlife strikes;

b) 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 and that would normally require major repair or replacement of the affected component(s);

c) An air carrier aircraft experiences an engine ingestion of wildlife; or

d) Wildlife of a size, or in numbers, capable of causing an event described in items 1, 2, or 3 above, is observed to have access to any airport flight pattern or aircraft movement area (14 CFR 139.337 (b)).

GA airports, such as 0B5 are not bound by the regulations established in Part 139. However, states and municipalities use 14 CFR 139 and FAA Advisory Circulars (ACs) to develop their own civil aviation regulations. All airports, GA as well as commercial, have a legal responsibility to provide a safe environment for aircraft operations and this includes implementing measures to control hazardous wildlife within the airport environment. Additionally, if a GA airport receives funding from the FAA through the Airport Improvement Program (AIP), they must evaluate their need for conducting an Assessment per the AIP grant assurances. 0B5 has elected to conduct this Assessment and Management Plan to review and improve safety at their facility.

14 CFR 139.337(f)(1)

This section provides the “list of the individuals having authority and responsibility for implementing each aspect of the Plan” at the subject airport. The list below defines the specific responsibilities for the various sections of the Plan at the Turners Falls Municipal Airport or 0B5. Note that airport staff at 0B5, including the airport manager, are part-time and there is no night-time coverage of municipal staff at the facility. As such, the airport staff are only capable of addressing their wildlife monitoring and management responsibilities during their normal business hours and during days when they’re physically at the facility. Many of the responsibilities noted in the following paragraphs pertain to certificated airports with full-time coverage with sufficient staff for dedicated wildlife managers. 0B5 management is directed to interpret listed responsibilities commensurate with staffing levels at their facility.

Airport Manager: has primary authority over the Plan.

e) Review and update the Plan, as necessary. This is a living document and must be updated to reflect changing conditions at the Airport.

f) Review and submit the Annual Report Form/Depredation Permits with the U.S. Fish and Wildlife Service (USFWS) and MA Div. of Fisheries and Wildlife (MassWildlife), as required.

g) Renew Depredation Permits with USFWS and MassWildlife annually to react to changes in hazardous wildlife populations observed at the Airport.

h) Review Federal Aviation Administration (FAA) Forms 5200-7 submitted for wildlife strikes annually to identify possible trends.

i) Establish Annual Recurrent Wildlife Training per 14 Code of Federal Regulations (CFR) 139.337(f)(7).

j) Direct the issuance of any wildlife-related Notice to Airmen (NOTAM), as required.

k) Approve or designate appropriate individuals to conduct lethal action when necessary.

l) Take necessary actions to eliminate and/or disperse wildlife hazards as they are reported, and record actions taken on the “Wildlife Hazard Control Report” form.

m) Initiate proactive control and harassment efforts to prevent wildlife hazards on the airfield, especially during migration and breeding seasons.

n) Respond to wildlife strikes as necessary when reported by pilots and other personnel - take appropriate action as required.

o) Report wildlife activity that may pose an imminent danger to aircraft that are taxiing, departing, or arriving at the Turners Falls Municipal Airport (Airport or 0B5).

p) Ensure work is completed to control wildlife (i.e., perimeter fence and gate damage, woody habitat maintenance, grass height)

q) Report for the Daily Self Inspection, wildlife strikes involving known and unknown aircraft, sightings of wildlife on the Airfield, and any significant wildlife activities observed on, or near the airport. Complete reports of wildlife strike events as they occur including the submission of FAA Form 5200-7.

r) Solicit the services of contractors/vendors to supplement the Plan as necessary.

WILDLIFE HAZARD MANAGEMENT PLAN

Authority and Responsibility

Airport Maintenance Staff have the responsibility for the following:

a) Provide resources necessary to support the provisions of the Plan.

b) Conduct wildlife removal/harassment procedures.

c) Take necessary actions to eliminate and/or disperse wildlife hazards as they occur, and record actions taken on the “Wildlife Hazard Control Report” form.

d) Report wildlife activity that may pose an imminent danger to aircraft that are taxiing, departing, or arriving at 0B5.

e) Conduct removal and disposal of wildlife that have been hit on the airfield or the public roadway system. Wildlife found dead within 200 feet of the centerline of any runway or taxiway will be reported as a wildlife strike and appropriate paperwork (FAA-5200-7 Wildlife Strike Form) filled out and submitted.

f) Respond to all work requests concerning wildlife issues.

g) When requested, provide personnel to assist in implementing wildlife control measures.

h) Report wildlife activity that may pose an imminent danger to aircraft that are taxiing, departing, or arriving at the Airport.

i) Take necessary actions to eliminate and/or disperse wildlife hazards as they are reported, and record actions taken on the “Wildlife Hazard Control Report” form.

j) Respond to wildlife strikes as necessary when reported by pilots, and other personnel - take appropriate action as required.

k) Conduct physical inspections of the airfield and fencing for wildlife hazards, habitat, and access points.

l) Identify nesting and burrowing areas and take elimination actions if needed.

m) Ensure there are adequate supplies used in dispersing wildlife are available.

n) Complete and submit reports containing wildlife activity on the “Wildlife Hazard Control Report” Form or FAA Form 5200-7 “Wildlife Strike Form” to the appropriate record keeper in Airport Administration. Report appropriate entries on the Daily Safety Inspection Log as required.

The Common Traffic Advisory Frequency (CTAF) has the following responsivities: (0B5 CTAF: **123.0**)

a) Report to pilots who are taxiing, arriving, departing, or transitioning through 0B5 airspace any significant wildlife activity observed or reported to the CTAF by airport personnel or pilots.

b) Advise Airport personnel of significant wildlife activity that is observed on the airfield by the CTAF or pilots that may pose an imminent danger to pilots arriving or departing at 0B5.

c) Completes the FAA-5200-7 Wildlife Strike Form when applicable and provides a copy to Airport Management.

d) When notified of wildlife hazards on or near the airport, contact the on-duty Airport Operations personnel and brief him/her of the situation at hand.

e) Log all wildlife activities in the daily log and fill out the appropriate wildlife log.

Airport Administration (Turners Falls Airport Commission of TFAC) has the following responsibilities:

a) Upon request, and as necessary, assist with public relations and news media interviews concerning wildlife issues. All information will be reviewed with the TFAC for accuracy.

b) Provide plans of proposed airport improvement projects to the TFAC to review for input on design that may attract wildlife.

c) Remain involved with off-airport development plan review within the Airport vicinity to ensure no new wildlife attractants are constructed.

d) Provide financial support for necessary wildlife controls.

Pilots, fixed-base operators, and Airport tenants have following responsibilities:

a) Notify Airport Traffic, Manager, and Maintenance staff on duty of hazardous wildlife conditions on approach, departure, or movement area.

b) Facilitate wildlife strike reporting by using the FAA Wildlife Strike Database or Wildlife Strike Report Form and notify Airport Manager.

2.0 MANAGEMENT ACTIONS

14 CFR 139.337(f)(2)

This Plan has prioritized actions for addressing problem wildlife populations and attractants (food, cover, and water) identified in the Wildlife Hazard Assessment (Assessment), proposed mitigation, and target starting and completion dates for the actions. 0B5 has several on-going and one proposed new management action.

Wildlife attractants on and near the airport can be managed by 0B5 staff to reduce the numbers and types of wildlife that may impact airport operations. Proposed projects are reviewed following the guidance provided in relevant Advisory Circulars (AC) and Cert Alerts (Appendix B) and in Certification Bulletins. Land use on and around the airport should be monitored routinely to check that facilities do not create wildlife attractants.

0B5 has some limited service of turbine-powered aircraft, for which the FAA recommends a separation distance of 10,000 feet for hazardous wildlife attractants or new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between the closest point of the airport's air operations area (AOA) and the hazardous wildlife attractant.

For all airports, the FAA recommends a distance of 5 miles between the closest point of the AOA and the hazardous wildlife attractant. Special attention should be given to hazardous wildlife attractants that could

cause hazardous wildlife movement into or across the approach or departure airspace. Continuous active involvement with local zoning and planning boards of the municipalities surrounding the Airport is critical in addressing this item.

2.1 WILDLIFE POPULATION MANAGEMENT

14 CFR 139.337(f)(2)(i)

Population control is utilized, in conjunction with other management efforts, when attractant and habitat management and harassment efforts are not adequate to deter hazardous species. The occurrence of large mammals on the airfield is scheduled to be minimized through the completion of the perimeter security fencing, i.e., 8-foot-tall chain-link fence with multiple gates at access points, and three strands of barbed wire along top. The short-term plan to improve the perimeter fencing, particularly along the northeast quadrant of the Airport, will greatly remove large mammals from consideration in this Plan. The Assessment noted frequent runway crossings by large mammals particularly during late-summer and early-fall.

To date, 0B5 has not implemented direct wildlife population control. 0B5 will obtain a USFWS permit to take Canada geese. 0B5 will also begin employing pyrotechnic devices to harass and deter Canada geese and other large-bodied birds, from resting on the taxiways and infield areas. The Runway 16 end and associated taxiway entrance were determined to be critical goose resting sites during the Assessment.

2.2 HABITAT MODIFICATION

14 CFR 139.337(f)(2)(ii)

The Plan addresses measures for reducing attractiveness of natural and artificial habitats. AC 150/5200-33C, *Hazardous Wildlife Attractants On or Near the Airports*, provides in-depth discussion on acceptable/unacceptable habitats and land-use practices on and near airports.

2.2.1 Current Practices

Tree-trimming Program: Less than 5% of the AOA at 0B5 has woody vegetation, mostly shrubs and sapling trees confined to the extreme periphery of the AOA. The outer portions of the Airport contain significant woody habitat, extending to off-property areas particularly to the east and south. In 2020, the Airport removed woody vegetation from along the northern side of the runway extending from mid-runway southeastward to West Mineral Road. This effort removed both potential obstructions and attractive wildlife habitat. 0B5 continues to manage woody vegetation to maintain the existing perimeter fence, eliminate brush along drainages, and prevent the development of obstructions. Recent equipment acquisition (shown), assisted by MassDOT-Aeronautics, has greatly assisted the small 0B5 maintenance staff with the control of woody regrowth.

Grass Height Management: 0B5's current practice for maintaining grass height between 2 and 10 inches appears to be keeping small mammal populations at an acceptable level within the infield areas, but significant rodent populations exist along the northeast side of the runway based on small mammal trapping results and other observations during the Assessment. State-listed rare species concerns (both grassland bird and sandplain grassland vegetation issues) in the habitat areas north of the runway impede full control of vegetation heights beyond the AOA; the difference in grass heights between the AOA and the area beyond is shown below. The mowing regime for the sandplain grasslands and "pitch pine savannah" areas north of the Airport runway are quite reduced over the frequency in the AOA due to past and present permitting issues pursuant to the Massachusetts Endangered Species Act Regulations (321 CMR 10.00). The Airport currently operates with several "special conditions" imposed by the MESA regulators as a part of past permits issued for Airport improvement projects. These conditions are partially contradictory to proper airport wildlife management.

0B5 will continue to implement their current mowing practices until new information indicates that these practices are no longer ideal for managing hazardous wildlife; a mowing plan for 0B5 is contained in the Assessment. Mowing practices will also continue to help manage woody vegetation depressions and shallow drainages. New grass plantings as a part of future Airport improvement projects will be seeded with fescue varieties or mixes, recommended by the U.S. Department of Agriculture (USDA) Wildlife Services, to reduce seed development and palatability and decrease diversity of vegetation on the airfield.

Building Maintenance and Tenant Control: 0B5 management has recently acquired new buildings and hangars associated with the Pioneer Aviation. Maintenance of the building exteriors and the surrounding landscaped areas is critical to controlling urban-adapted, flocking bird species close to the AOA. The acquisition of this parcel and structures, and the immediate renovation and improvement of the property by 0B5 management has had positive impacts on bird control. Further maintenance and improvement is scheduled for the property further eliminating attractive structural habitat for small birds.

Other on-airport structures, several of which are owned by tenants, have been found to be in good condition. The continued maintenance of building exteriors and working with tenants to avoid practices that attract hazardous wildlife is a component of this Plan.

2.2.2 Proposed Practice

Stakeholder Involvement: Two important off-Airport attractants are Barton Cove and associated public recreational venues, operated by the Town of Montague and the Massachusetts Department of Conservation and Recreation (MADCR), and nearby wildlife management area, operated by the MADCR. Involving these stakeholders would be beneficial for implementation of the Airport's Plan. 0B5 is encouraged to work closely with these parties to discourage practices and activities that provide food sources for problem wildlife species. 0B5 may need to meet regularly with the Town to discuss wildlife control, particularly during the migration seasons. Of importance is the continued maintenance and replacement of signage at Barton Cove (including the boat ramp and camping area) restricting the feeding of wildlife. Signage was present and in good condition at the time of the preparation of the Assessment. Another stakeholder would be the Turners Falls Water Department that operates a wellfield and treatment plant involving two open water bodies off the Runway 34 end. Ensuring continued practices that deter waterfowl usage of the waterbodies is critical to the approach airspace. 0B5 will meet regularly with these entities to discuss wildlife issues. To facilitate stakeholder involvement, the Airport Manager will use the following measures:

a) Develop a line of communication with Stakeholders to document wildlife hazards when they occur. The Airport will have regular, documented communication with the neighboring facilities to track development of and implementation of any recommended measures for reducing incidences of hazardous wildlife.

b) Discuss with the Town of Montague about the possibility for developing a process and schedule for conducting harassment and exclusion of geese from Unity Park and associated maintained lawn areas.

c) Meet with water department officials to discuss practices that could improve the exclusion of waterfowl from Green Pond and Lake Pleasant.

d) Interactions with Airport tenants should include discussions of reducing and eliminating hazardous wildlife attractants, particularly as it involves maintenance of on-airport structures and surrounding landscaping.

2.3 LAND USE CHANGES

14 CFR 139.337(f)(2)(iii)

The FAA recommends that certain off-site attractants within the defined separation criteria be eliminated or modified to reduce the attractiveness to wildlife. Again, AC 150/5200-33C includes an in-depth discussion on acceptable and unacceptable land use practices on and near airports.

The Airport Manager reviews the design of new development and land use changes on or near the airport to prevent projects that may create wildlife attractants. It would be necessary to make inroads with the surrounding municipalities including Greenfield, Bernardston and Erving. Where practical, habitat modifications are implemented by Airfield Maintenance personnel or are specified during the design phase in the construction of new development.

On-going efforts to reduce wildlife hazards resulting from land use changes include, but are not limited to, the following:

a) Review construction design plans.

b) Prohibit land uses identified in AC 150/5200-33C on or near airport property to the extent practicable.

c) Prohibit the development of new detention/retention ponds that hold water for more than 48 hours near the airport property within the guidelines established in A/C 150/5200-33C.

d) Modify and repair buildings and surrounding spaces to control birds and other wildlife. Investigate the possibility of repairing those buildings that are left open and provide access to nesting birds, such as starlings and rock pigeons.

e) Reduce ponding caused by poor draining in areas located on the airfield. If stormwater detention is necessary, then retention ponds will be installed that hold water no longer than 48 hours during 100-year flood events.

In summary, the Airport will continue to review design changes on the AOA and within 10,000 feet to prevent the development of projects that may unintentionally create wildlife attractants.

2.4 PROTECTED SPECIES

The Airport is considerably limited in habitat maintenance due to the documented presence of several state-listed plant and wildlife species as documented in the Assessment. Additionally, the routine presence of bald eagle off the Runway 16 end in the Barton Cove environment is well documented.

2.4.1 Federal

Endangered Species Act

At the time the Assessment was conducted, and the subsequent Plan was prepared, information did not indicate that species listed under the federal Endangered Species Act of 1973 (16 United States Code [USC] 1531-1544, 87 Statute 884), as amended, would be affected by the Plan's management actions to address prioritized hazardous wildlife. 0B5 recognizes that FAA may in the future determine that a particular measure proposed within this Plan may affect federally listed or proposed species or designated or proposed critical habitat. Should this finding ever occur, the Airport Manager will work with the FAA Regional Coordinator to address Endangered Species Act section 7 consultation/conference and coordination to determine next steps. Section 7 consultation is between the Airport, FAA and the U.S. Fish and Wildlife Service (USFWS). There is an established protocol for such consultations that is provided on the USFWS website at https://www.fws.gov/service/section-7-consultations.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (1940, as amended, 16 USC 668-668d) provides for the protection of bald and golden eagles by prohibiting, except under certain specified conditions, the take, disturbance, possession, and commerce of eagles. A permit from the USFWS is required for harassing or taking eagles. Bald eagles were delisted under the federal Endangered Species Act; they are a species of special concern in Massachusetts.

Bald eagles are known to occur at the Airport and Barton Cove and were detected during the Assessment. The Assessment detected infrequent bald eagles flying over the AOA, and detections occurred during most months. The Airport property does not contain suitable nest sites, but nearby waterbodies are documented to support nesting bald eagles. Two nesting pairs are documented for Barton Cove as of the date of this Plan. Further nesting pairs have recently occurred up- and downriver along the Connecticut River supported partly by the anadromous fish runs that occur in the river.

2.4.2 State

Massachusetts Endangered Species Act (321 CMR 10.00)

The Turners Falls Municipal Airport is known to contain habitat for various state-listed plant and wildlife species closely associated with the sandy, outwash soils that dominate the Airport and support pitch pine barren and sandplain grassland ecosystems. During wildlife inspections, if the Airport Manager and Airfield Maintenance discover actions may affect state-listed species, the Airport Manager will coordinate

with MassWildlife to determine if additional monitoring or permits will be required. Several permits have been issued to 0B5 pursuant to the Massachusetts Endangered Species Act (321 CMR 10.00) for past airport improvement projects. It is probable that future coordination will be necessary to support other improvement efforts and possibly for modifications to grassland management.

3.0 WILDLIFE CONTROL PERMITS

14 CFR 139.337(f)(3)

The Airport Biologists have recommended the Airport obtain a USFWS Migratory Bird Treaty Act Depredation Permit. This permit is necessary for the management of hazardous, large-bodied birds at the Airport, particularly Canada geese. This permit will allow for taking species that pose regular risk at the Airport. When obtained, the permit is reviewed periodically for additions and/or deletions and revised to provide the maximum effort and ability to control/manage bird hazards. The permit has periodic reporting requirements, to which the Airport must adhere.

As indicated in Section 2.4.1, bald eagles occur and are regularly present off the Runway 16 end in the airspace above Barton Cove. At this time, we do not anticipate 0B5 needs to obtain a USFWS Eagle Permit for the harassment of bald eagles at the Airport but continued monitoring of the use of Barton Cove by bald eagle should be conducted by 0B5 staff and supporting consultants to determine if the frequency of their presence in approach airspace increases as the eagle population rebounds in this region.

4.0 RESOURCES FOR PLAN IMPLEMENTATION

14 CFR 139.337(f)(4)

The effective implementation of the Plan is dependent upon adequate resources as identified below.

4.1 PERSONNEL

4.1.1 On Airport

Airfield Maintenance personnel are properly trained to recognize hazards and take proper and effective action. Equipment and supplies for wildlife harassment are available in sufficient amounts and kept in the vehicles used for daily inspections of airfield/perimeter and wildlife activity.

4.1.2 Off Airport

In addition to the Airfield Maintenance personnel, outside resources are vital for addressing wildlife issues effectively and thoroughly. The Airport will routinely seek the services of the following agencies to help support the Plan.

FAA Airport Safety and Operations Division: The Airport Safety and Operations Division includes the Safety and Certification Program. The division holds primary responsibility for the safety and certification of airports; airport operations and safety practices, including the mitigation of wildlife hazards. The division provides guidance in interpreting and implementing the provisions of Title 14 CFR Part 139, and Certification Inspectors assist the Airport Operator in identifying and correcting deficiencies in complying with sections of Title 14 CFR Part 139. The Certification Inspector has access to methods and techniques of wildlife hazard management that have been proven successful at other airports. The benefits derived from this information can be invaluable in achieving an effective wildlife program.

Other Federal and State Agencies: MassWildlife and USDA Wildlife Services are valuable resources for the Airport. Local representatives from these agencies are familiar with the requirements of Title 14 CFR Part 139.337. Officials work closely with Airport personnel to identify wildlife species, habitats, and migratory patterns. Their knowledge of wildlife and tested management procedures and methods helps the Airport determine effective means for managing hazardous wildlife management. Additionally, the USDA Wildlife Services personnel provide the training curriculum for those Airport personnel that implement the Plan's actions, per regulations under Title 14 CFR Part 139.337(f)(7) and guidance under AC 150/5200-36B.

Contractors: 0B5 will contract with certified pest control service providers to provide service to clean out and control rats, mice, roaches, weevils, bed bugs, lice, fleas, ants, silverfish, mosquitoes, termites, wasps, crickets, spiders, bees, mites, carpet beetles, flies and moths within Airport buildings and the exterior of some buildings when applicable.

4.2 EQUIPMENT/SUPPLIES

0B5 has the following equipment for implementing the Plan:

- Operations and Airfield Maintenance vehicles
- Ground control radios/maintenance radios/telephones
- Heavy brush mowing equipment for habitat maintenance
- Standard grass mowing equipment to maintain proper grass heights in the AOA

5.0 PROCEDURES DURING AIR CARRIER OPERATIONS

(taken from 14 CFR 139.337(f)(5) *Recommended actions for reducing identified wildlife hazards to air carrier operations* provided in Appendix A)

5.1 PERSONNEL

14 CFR 139.337(f)(5)(i)

The Airport Manager is responsible for the direct oversight of the Plan. He is also responsible for developing procedures and ensuring compliance with Title 14 CFR Part 139.337. The Airport Manager works directly with Airfield Maintenance staff to conduct all assigned procedures as described below.

Airfield Maintenance staff perform inspections on the airfield and perimeter areas on a daily basis. Wildlife inspections are conducted as frequently as necessary, depending on the time of year, to eliminate hazards. At all times during wildlife removal operations, the Airfield Maintenance personnel must be in communication with the CTAF. Should the wildlife be sufficient in number or size to pose a significant hazard on the airfield, the affected area will be closed until the hazard is eliminated. Airfield Maintenance personnel have the responsibility and discretion to determine the best method to eliminate wildlife hazards. Airfield Maintenance personnel are authorized and responsible for determining if a wildlife hazard exists on the airfield or airport perimeter and if lethal or non-lethal control measures will be used. For purposes of this procedure, a wildlife hazard exists to aircraft operations when the following occurs:

- Wildlife of size, or in number, is observed to have access to any airport flight pattern or movement/non-movement area and is capable of causing damaging collision with aircraft, and/or where there is a threat of loss of life, property, or serious injury.

Any closures are coordinated through use of the CTAF. All wildlife inspections/patrols and any action taken are reported in the Daily Safety Inspection forms, and Wildlife Hazard Control Report forms are completed, as necessary.

In addition to specifications stated in Title 14 CFR Part 139.329 Ground Vehicles, all vehicles used for airfield inspections are equipped with a radio for rapid dissemination of information and coordination in the event of a wildlife hazard. All vehicles are equipped with yellow beacons and/or other means of identification in accordance with the Airport Driving Rules and Regulations while operating on the airfield.

Contact through use of the CTAF the Airport Manager or Airfield Maintenance when wildlife is observed or reported by pilots.

Pilots will contact the Airport Manager, Airfield Maintenance, or report through the CTAF when wildlife is observed.

5.2 WILDLIFE INSPECTIONS

14 CFR 139.337(f)(5)(ii)

During their shifts, Airfield Maintenance personnel conduct airfield, perimeter, and wildlife inspections. These inspections include a survey of airfield paved and safety areas, in compliance with Title 14 CFR Part 139.327 Self-inspection Program, and survey for the presence of wildlife that may be hazardous to aircraft movement.

Periodic perimeter fence inspections are conducted by Airfield Maintenance personnel to ensure the fence is secured. These inspections also include identifying any animal dig sites located under the fence and checking that perimeter gates are tightly secured to prevent animal access. In addition, Airfield Maintenance personnel will take appropriate actions to reduce any other observed wildlife activity. (Note: the perimeter fence at 0B5 is presently incomplete. Future improvement plans include closure of the final sections of the airport perimeter. Such fence inspections will be necessary at the time of final fence closure at 0B5).

Airfield Maintenance is required to respond to calls received through the CTAF to disperse or retrieve wildlife from the runways and adjacent areas. In addition to Airfield Maintenance, the Animal Control Officer at the Montague Police Department may also be contacted to respond to the following:

- Domestic or wildlife animal bites
- Domestic dog at large
- Wild or domestic animal that is sick or injured
- Wild or domestic animals at large in a building

The Airport Manager and Airfield Maintenance will increase the frequency of wildlife inspection patrols during migratory seasons or when other wildlife activity warrants more frequent inspections.

5.3 WILDLIFE HAZARD CONTROL MEASURES

14 CFR 139.337(f)(5)(iii)

This section of the Plan provides current or anticipated techniques that may be implemented for successful mitigation of identified wildlife hazards and complements the list of prioritized actions provided in Section 2.1 (per 14 CFR 139.337(f)(2)(i)).

5.3.1 Non-Lethal Control

The current, incomplete perimeter fence at 0B5 is largely a security fence and does not completely restrict wildlife. The fence gap along the northeast side of the Airport is particularly problematic due, in part, the extensive wooded habitat afforded to wildlife along that side of the runway. A full perimeter fence is needed to address the principal wildlife hazard at 0B5; white-tailed deer. For deterring wildlife, a

fence is only effective if it is maintained routinely. We recommend monthly, if not weekly, inspections for gaps and “dig-unders” (entrances mammals created where the fence meets the ground). Routinely remove all vegetation within 10 feet of the fence on either side. Woody vegetation can damage a fence quickly and also provides places for animals to easily crawl up and over. Pursuit of the perimeter fence should be initiated immediately.

A preliminary layout of new perimeter fence was provided in the Assessment to close the gap along the northeast property boundary at 0B5. This layout approximates the recommended perimeter fence contained in the February 2019 Airport Master Plan Update (AMPU). The AMPU recommended completion of the perimeter fence in the mid-term phase of the plan approximately 10 years out. The approved Airport Layout Plan contained in the AMPU showed fencing along the northeast Airport boundary, but also along the terminal area and the recently acquired Pioneer Aviation property. Completion of the full perimeter is recommended in this Plan. The fence route design for the terminal area will require additional study as a result of the recent Pioneer Aviation acquisition and thus a conceptual fence route for that area is not provided here.

0B5 staff currently do not use repellant techniques other than vehicle dispersal. Other recommended techniques include pyrotechnics and predator decoys. These techniques can be utilized as Airport staff see fit. We recommend the Airport acquire pyrotechnic devices and use them regularly to repel geese, killdeer and crows. Killdeer harassment in the early spring could reduce the current high level of nesting that occurs along the pavement edges at 0B5. March and April would be critical months for this harassment and nest destruction.

0B5 staff should carefully document any efforts implemented to deter and repel wildlife congregations. Valuable information recorded during these efforts may include identification of assumed attractant, deterrent technique and devices used, wildlife behavioral response, timing and frequency of deterrence efforts, and perceived efficacy. For the purpose of this procedure/directive, non-lethal control includes the use of approved pyrotechnic and other similar devices, live capture mammal traps, and life-sized decoys.

As authorized by the Airport Manager in the future, Airfield Maintenance will use approved pyrotechnic and other similar devices for harassing wildlife that may be hazardous to aircraft operations. Ammunition for non-lethal control will be Screamer and Exploder type devices. All applicable federal/state wildlife permits and local ordinances governing the handling, use and discharge of firearms at the Airport will be closely followed.

Notification of Wildlife Harassment: Prior to discharging the firearm(s), Airport staff will notify through the CTAF of the action being taken and the location on the airfield as necessary.

Traps: It is illegal in Massachusetts to live-capture and relocate any wildlife. If trapping is necessary for wildlife removal, Airfield Maintenance or a Contractor will use lethal traps for certain medium-sized mammals, such as beaver. All trapping efforts will include coordinating with MassWildlife on any necessary permits and assistance. The Airport Manager and all Airfield Staff will be notified whenever lethal traps are implemented. Trap locations will be properly identified to avoid injury to people or damage

to equipment. When not in use, traps will be stored at the Airfield Maintenance Facility. They will be kept secured at all times and protected against unauthorized handling.

Decoys: Airport Manager and Airfield Maintenance may use a variety of life-sized decoys throughout the airfield to deter animals. Decoys are positioned away from the Airport movement area but in places known for the incidence of wildlife.

Trail Cameras: Airport Manager and Airfield Maintenance may use remotely operated trail cameras to track wildlife use and identify high-use areas on the airfield.

5.3.2 Lethal Control

For the purpose of this procedure/directive, lethal control will be the utilization of a shotgun/firearm. No other firearm will be used unless authorized by the Airport Manager. Lethal control by means of shooting nuisance animals will be limited to areas on the Airport property. Authorization to shoot nuisance animal(s) is given by the Airport Manager. Before authorization is granted, the requestor should provide; type of animal(s), type of threat/hazard, location, affected flight pattern on movement/non-movement area, and all other methods of harassment attempted to mitigate the threat(s). In the event that prior authorization cannot be obtained during circumstances that warrant immediate lethal control, the Airport Manager will be informed of the actions taken at the earliest opportunity. The date and time the Airport Manager grants authorization or advises of the action taken will be noted on the report mentioned herein.

This procedure/directive will be in accordance with all applicable federal/state wildlife permits and local ordinances governing the handling, use, and discharge of firearms at the Airport. Permits/Authorizations will be kept current and on file in the Airport Manager’s office.

The Airport staff currently do not use any lethal control. We recommend 0B5 acquire a depredation permit from the U.S. Fish and Wildlife Service to address the regular occurrence of Canada geese and killdeer. Airport staff could use lethal control when non-lethal tactics are not effective.

Shooting of Nuisance Animals

Notification of Lethal Control: After determining that lethal control is necessary, a designated shooter will be notified. The designated shooter will be briefed on the wildlife hazard and the other methods of control attempted to eliminate the hazard. Prior to the discharge of firearm(s), the Airport Manager may elect to notify airport users through the CTAF as necessary to support safe airport operations.

Designated Shooters: Any individual considered a designated shooter will provide statements of qualification and experience. Experience should include, but may not be limited to, the following and should be considered as criteria for selection:

- Military/Police experience
- Hunting experience (what type of firearm(s) and number of years)
- Hunter/Safety course attended

- Recreational target shooting (what type of firearm(s) and number of years)

Designated shooters for lethal control should have received firearms training and safety instruction prior to commencing duties under the Plan.

5.3.3 Additional Procedures

Instruction and Authorization

In addition to and in conjunction with training required described in Section 7 (per Title 14 CFR Part 139.337(f)(7)), where lethal or non-lethal procedures are employed; training by certified instructors will include, but may not be limited to, the following areas:

- Instruction on the use of the selected deterrence device or firearm and its characteristics
- Safe shooting techniques
- Types of ammunition/application
- Instruction on hunter safety

Carcass Disposal

Carcass disposal will be in accordance with established procedures when not otherwise required by law. The wildlife carcass must be completely destroyed by burial or incineration or donated to public museums or public scientific and educational institutions for exhibition.

Hunting and Trapping

Legal hunting for game animals or migratory birds and trapping of fur bearing animals may be allowed on Airport property only by individuals listed on the Airport's USFWS Depredation Permit or MassWildlife permits. These activities will be conducted safely when they will benefit the Airport by removing wildlife that is hazardous to aircraft. Those species must be legally taken under proper license and permitting as required by federal and state laws and is the responsibility of the individual to comply with those requirements and the daily bag limits, if any. Any violations or failure to comply with the above requirements and those implemented by the Airport Manager will result in immediate loss of these privileges. Hunting and trapping locations on the airport property will be approved by the Airport Manager.

5.4 COMMUNICATION OF WILDLIFE HAZARDS

14 CFR 139.337(f)(5)(iv)

The Plan 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.

The Airport Manager, Airfield Maintenance, pilots, and tenants work together to report hazardous wildlife conditions and to take appropriate action, as necessary. Airfield Maintenance personnel will immediately notify airport users through the CTAF when wildlife is observed in a movement area or the runway approach areas and deemed a likely hazard to aircraft operations. All vehicles used for airfield inspections are equipped with radio communications for rapid dissemination of information and coordination of mitigation efforts if a wildlife hazard is observed.

When exiting a runway, the vehicle will pass the hold short line if wildlife activity needs to be addressed in the close proximity to the runway area but out of the safety area. As usual, the operator of the airfield inspection vehicle will report clear of the runway. If wildlife activity is in the safety area of a runway, the operator of the airfield inspection vehicle will advise airport users through use of the CTAF their intent to stay in that area to continue wildlife control operations. All wildlife control activities on any runway, taxiway, or safety area MUST be addressed through use of the CTAF prior to commencing wildlife control.

If the wildlife hazard requires any lethal or non-lethal action, affected movement areas will be closed locally through use of the CTAF while the hazard exists. Areas to be closed should be determined by the Airport Manager. A NOTAM will be issued if the closure is determined to be for an extended time.

6.0 PLAN REVIEW AND EVALUATION

14 CFR 139.337(f)(6)

The Plan cannot be effectively implemented or evaluated without documentation of wildlife strikes. A review of the effectiveness of a Plan to reduce wildlife hazards, both on and near an airport, is dependent upon accurate and consistent wildlife strike reporting and the reevaluation of all facets of damaging and non-damaging strikes from year to year. Therefore, to better identify, understand and reduce threats to safe aviation, 0B5 and its Plan is committed to documenting all discovered wildlife strikes that occur within the separation distances indicated in Section 2 of this Plan and as described in sections 1-2 and 1-3 of AC 150/5200-33.

The Airport Manager will review the Plan annually at a minimum. This review will be documented and conducted as a routinely scheduled event or following a triggering incident as defined in Title 14 CFR Part 139.337(b)(1)-(3). The airport will document all triggering incidents and corresponding reviews to confirm the Plan’s effectiveness for mitigating hazardous wildlife.

6.1 EFFECTIVENESS

14 CFR 139.337(f)(6)(i)

0B5 monitors effectiveness of the procedures and methods used to mitigate wildlife hazards. Revisions to procedures and the Plan are made as necessary to ensure compliance with Title 14 CFR Part 139 and as local conditions dictate. The Airport Manager and Airfield Maintenance personnel routinely consider new

methods and techniques for wildlife control to potentially improve effectiveness. The Airport Manager and Airfield Maintenance personnel attend airport wildlife training annually.

6.2 EVALUATION

14 CFR 139.337(f)(6)(ii)

6.2.1 Internal Evaluation

The Airport Manager and Airfield Maintenance staff will evaluate the Plan and its implementation. These evaluations will occur at least annually and on an as needed basis to review the effectiveness of the Plan and determine the need for special operations or actions not included in the Plan. In addition, the group will meet annually to conduct the following:

a) Review previous wildlife strikes,

b) Review status of habitat modification projects,

c) Review future airport projects that may affect wildlife,

d) Review individual staff responsibilities and procedures,

e) Make recommendations and prioritize new habitat modification projects based on previous wildlife strikes and recorded observations, and

f) Evaluate changes needed in the wildlife control procedures.

6.2.2 External Evaluation

The Airport Manager and Airfield Maintenance personnel will work closely with the USDA Wildlife Services, MassWildlife, and/or Contractor (Qualified Airport Wildlife Biologist) to identify new hazards and review existing efforts recommended by the Assessment. Recommendations are made periodically, as required, to revise existing permits to meet changing needs. At a minimum, conditions are reevaluated yearly in conjunction with permit renewals and more frequently as needed when circumstances affecting wildlife change.

7.0 TRAINING PROGRAM

14 CFR 139.337(f)(7)

The Airport Manager and Airfield Maintenance personnel involved in implementing this Plan will receive initial and recurrent training conducted by a Qualified Airport Wildlife Biologist from USDA Wildlife Services as required under 14 CFR 139.303 and described in AC 150/5200-36. These personnel will be equipped with sufficient resources needed to comply with the requirements in the Airport Certification Manual and 14 CFR 139.337.

In addition to and/or in conjunction with annual training as administered by USDA Wildlife Services, the Airport Manager, Airfield Maintenance staff, and other personnel with supporting duties pursuant to the Airport's Plan will, at a minimum, complete training of the procedures described in the following sections.

7.1 NON-LETHAL CONTROL

The Airport Manager and designated Airfield Maintenance personnel will be required to successfully complete recurrent training on the safe handling and discharge of the authorized firearms and their harassment ammunition and other devices used to deter wildlife. During these periods of training, the designated personnel will receive recurrent instruction on the non-lethal control procedures as follows:

a) When not in use, the pyrotechnic devices and ammunition will be kept secured at all times and protected against unauthorized use and handling.

b) The pyrotechnic devices will be kept unloaded at all times until in the field and ready for use.

c) When transported, the pyrotechnic devices will be properly secured in a vehicle and protected from sight at all times. The transportation of the firearm(s) will be in accordance with all state and local laws.

d) Proper eye and ear protection will be worn when using pyrotechnic devices.

7.2 LETHAL CONTROL

The handling and discharge of live/lethal ammunition in firearms will be performed by designated shooters. Selection of designated shooters will be in accordance with criteria established by the Airport Manager. Training will be provided for all designated shooters. Designated shooters will successfully complete annual training administered by a certified firearms instructor on the safe handling and discharge of the authorized firearms. The annual training will include firearm nomenclature, disassembly/assembly, and proper care of the authorized firearm. During these periods of training, the designated shooter will receive recurrent instruction on the lethal control procedures stated herein, selection of proper firearm and ammunition for the circumstances, and the proper authorization procedures that are necessary before lethal control can be implemented.

Training by certified instructors will include, but not limited to, the following areas:

- Instruction on the use of the selected firearm and its characteristics
- Safe shooting techniques
- Safe handling of the firearm
- Disassembly and cleaning of the firearm
- Types of ammunition and their applications
- Instruction on hunter safety

Ammunition for lethal control with a shotgun should be: #4 non-toxic shot, #6 non-toxic shot, BB/BBB non-toxic shot, or deer slugs. All shooters will be properly trained to make decisions on what type of ammunition to use. The use of ammunition appropriate for the wildlife hazard will be determined by the designated shooter. A shotgun should also be utilized for firing exploding shells (shell crackers) when available. The treatment and handling a shotgun will be the same and not vary when using live ammunition or shell crackers for non-lethal harassment.

It is 0B5's policy that the lethal control of nuisance animals is performed with the utmost of safety. Proper training and strict compliance with procedures stated herein should ensure a safe and effective means of wildlife control at the Airport. The Airport will provide to all those who perform lethal control a map of the 0B5 property indicating safe "lines of fire" locations.

The handling and transportation of firearms will be in accordance with all applicable state and local laws and subject to procedures established by 0B5.

- When not in use, the shotgun and /or other approved firearm(s) and ammunition will be kept secured at all times and protected against unauthorized use and handling.
- The approved firearms will be kept unloaded at all times until in the field and ready to use.
- When transported, the approved firearms, will be properly secured in a case or other approved device while in the vehicle and protected from sight to the greatest extent possible.
- The transportation of a firearm will be in accordance with all state and local laws.
- If possible, perform lethal control in teams of at least two individuals with one individual being a designated shooter and the other observing for safety concerns.
- Periodically, the Airport Manager will review the designated shooters' proficiency in lethal control procedures and the safe handling and discharge of the authorized firearm(s) to ensure that all safety measures are followed during lethal control actions.

8.0 REPORTING

Airport personnel that perform wildlife control measures will complete the Wildlife Hazard Control Report Forms and record the activity in the Daily Self Inspection Log. The Wildlife Hazard Control Report Form provides vital information documenting the action taken to eliminate the wildlife hazard. The Wildlife Hazard Control Reporting Forms are kept either electronically on a computer of as hard copies in the Airport Manager's office.

The information obtained from these reports is entered into a database where it is divided into categories for statistical purposes and annual reporting to the federal and state agencies. The wildlife hazard database allows the Airport to organize information by type of action, i.e., Non-lethal Control and Harassment, Lethal Control, and Aircraft Strikes.

Annual wildlife activity reports are submitted to USDA Wildlife Services if requested. USDA Wildlife Services may make subsequent recommendations that they may forward to USFWS for their consideration in amending the Airports depredation and harassment permits. The summary of the reports includes the following:

- Date of actions
- Types and numbers harassed
- Types and numbers killed by lethal control
- Types and numbers killed by aircraft strike
- Disposition of animals killed

9.0 REFERENCES

Stantec. 2022. Wildlife hazard assessment, Turners Falls Municipal Airport. Stantec Consulting Services Inc., Northampton, Massachusetts. February.

APPENDICES

Appendix A FEDERAL AVIATION REGULATIONS TITLE 14 CFR 139.337 WILDLIFE HAZARD MANAGEMENT

obstructions that are acceptable to the Administrator.

§ 139.333 Protection of NAVAIDS.

In a manner authorized by the Administrator, each certificate holder must—

(a) Prevent the construction of facilities on its airport that, as determined by the Administrator, would derogate the operation of an electronic or visual NAVAID and air traffic control facilities on the airport;

(b) Protect—or if the owner is other than the certificate holder, assist in protecting—all NAVAIDS on its airport against vandalism and theft; and

(c) Prevent, insofar as it is within the airport's authority, interruption of visual and electronic signals of NAVAIDS.

§ 139.335 Public protection.

(a) In a manner authorized by the Administrator, each certificate holder must provide—

(1) Safeguards to prevent inadvertent entry to the movement area by unauthorized persons or vehicles; and

(2) Reasonable protection of persons and property from aircraft blast.

(b) Fencing that meets the requirements of applicable FAA and Transportation Security Administration security regulations in areas subject to these regulations is acceptable for meeting the requirements of paragraph (a)(l) of this section.

§ 139.337 Wildlife hazard management.

(a) In accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected.

(b) In a manner authorized by the Administrator, each certificate holder must ensure that a wildlife hazard 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. 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 and that would normally require major repair or replacement of the affected component;

(3) An air carrier aircraft experiences an engine ingestion of wildlife; or

(4) Wildlife of a size, or in numbers, capable of causing an event described in paragraphs (b)(1), (b)(2), or (b)(3) of this section is observed to have access to any airport flight pattern or aircraft movement area.

(c) The wildlife hazard assessment required in paragraph (b) of this section must 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. The wildlife hazard assessment must contain at least the following:

(1) An analysis of the events or circumstances that prompted the assessment.

(2) Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.

(3) Identification and location of features on and near the airport that attract wildlife.

(4) A description of wildlife hazards to air carrier operations.

(5) Recommended actions for reducing identified wildlife hazards to air carrier operations.

(d) The wildlife hazard assessment required under paragraph (b) of this section must be submitted to the Administrator for approval and determination of the need for a wildlife hazard management plan. In reaching this determination, the Administrator will consider—

(1) The wildlife hazard assessment;

(2) Actions recommended in the wildlife hazard assessment to reduce wildlife hazards;

(3) The aeronautical activity at the airport, including the frequency and size of air carrier aircraft;

(4) The views of the certificate holder;

(5) The views of the airport users; and

(6) Any other known factors relating to the wildlife hazard of which the Administrator is aware.

(e) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder must formulate and implement a plan using the wildlife hazard assessment as a basis. The plan must—

(1) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations;

(2) Be submitted to, and approved by, the Administrator prior to implementation; and

(3) As authorized by the Administrator, become a part of the Airport Certification Manual.

(f) The plan must include at least the following:

(1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.

(2) A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion:

(i) Wildlife population management;

(ii) Habitat modification; and

(iii) Land use changes.

(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 to implement the plan.

(5) Procedures to be followed during air carrier operations that at a minimum includes—

(i) Designation of personnel responsible for implementing the procedures;

(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;

(iii) Wildlife hazard control measures; and

(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.

(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:

(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.

(7) 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.

(g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

§ 139.339 Airport condition reporting.

In a manner authorized by the Administrator, each certificate holder must—

(a) Provide for the collection and dissemination of airport condition information to air carriers.

(b) In complying with paragraph (a) of this section, use the NOTAM system, as appropriate, and other systems and procedures authorized by the Administrator.

(c) In complying with paragraph (a) of this section, provide information on the following airport conditions that may affect the safe operations of air carriers:

(1) Construction or maintenance activity on movement areas, safety areas, or loading ramps and parking areas.

(2) Surface irregularities on movement areas, safety areas, or loading ramps and parking areas.

(3) Snow, ice, slush, or water on the movement area or loading ramps and parking areas.

(4) Snow piled or drifted on or near movement areas contrary to §139.313.

(5) Objects on the movement area or safety areas contrary to §139.309.

(6) Malfunction of any lighting system, holding position signs, or ILS critical area signs required by §139.311.

(7) Unresolved wildlife hazards as identified in accordance with §139.337.

(8) Nonavailability of any rescue and firefighting capability required in §§139.317 or 139.319.

(9) Any other condition as specified in the Airport Certification Manual or that may otherwise adversely affect the safe operations of air carriers.

(d) Each certificate holder must prepare and keep, for at least 12 consecutive calendar months, a record of each dissemination of airport condition information to air carriers prescribed by this section.

(e) FAA Advisory Circulars contain methods and procedures for using the NOTAM system and the dissemination of airport information that are acceptable to the Administrator.

§ 139.341 Identifying, marking, and lighting construction and other unserviceable areas.

(a) In a manner authorized by the Administrator, each certificate holder must—

(1) Mark and, if appropriate, light in a manner authorized by the Administrator—

(i) Each construction area and unserviceable area that is on or adjacent to any movement area or any other area of the airport on which air carrier aircraft may be operated;

(ii) Each item of construction equipment and each construction roadway, which may affect the safe movement of aircraft on the airport; and

(iii) Any area adjacent to a NAVAID that, if traversed, could cause derogation of the signal or the failure of the NAVAID; and

(2) Provide procedures, such as a review of all appropriate utility plans prior to construction, for avoiding damage to existing utilities, cables, wires, conduits, pipelines, or other underground facilities.

(b) FAA Advisory Circulars contain methods and procedures for identifying and marking construction areas that are acceptable to the Administrator.

§ 139.343 Noncomplying conditions.

Unless otherwise authorized by the Administrator, whenever the requirements of subpart D of this part cannot be met to the extent that uncorrected unsafe conditions exist on the airport, the certificate holder must limit air carrier operations to those portions of the airport not rendered unsafe by those conditions.

Appendix B FAA ADVISORY CIRCULARS AND CERTIFICATION ALERTS RELATED TO WILDLIFE MANAGEMENT

AC No: 150/1500-33C, Hazardous Wildlife Attractants On or Near Airports, February 21, 2020

AC No. 150/5200-34A Construction or Establishment of Landfills Near Public Airports, January 26, 2006

Certalert No. 98-05, Grasses Attractive to Hazardous Wildlife

Certalert No. 13-01, Federal and State Depredation Permit Assistance, January 30, 2013

Certalert No. 14-01, Seasonal Mitigation of Hazardous Species at Airports: Attention to Snowy Owls, February 26, 2014

Certalert No. 16-03, Recommended Wildlife Exclusion Fencing, August 3, 2016

U.S. Department
of Transportation
Federal Aviation
Administration

Advisory Circular

Subject: Hazardous Wildlife Attractants on or near Airports	**Date:** 02/21/2020 **Initiated By:** AAS-300	**AC No:** 150/5200-33C **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 **Cancellation.**

This AC cancels AC 150/5200-33B, *Hazardous Wildlife Attractants on or near Airports,* dated August 28, 2007.

3 **Application.**

The Federal Aviation Administration recommends the guidance in this AC for land uses that have the potential to attract hazardous wildlife on or near public-use airports. This AC does not constitute a regulation, is not mandatory, and is not legally binding in its own right. It will not be relied upon as a separate basis by the FAA for affirmative enforcement action or other administrative penalty. Conformity with this AC is voluntary, and nonconformity will not affect rights and obligations under existing statutes and regulations, except as follows:

1. Airports that hold Airport Operating Certificates issued under Title 14, Code of Federal Regulations (CFR), Part 139, Certification of Airports, Subpart D, may use the standards, practices and recommendations contained in this AC as one, but not the only, acceptable means of compliance with the wildlife hazard management requirements of Part 139.
2. The FAA recommends the guidance in this AC for airports that receive funding under Federal grant assistance programs, including the Airport Improvement Program. See Grant Assurance #34.

3. The FAA recommends the guidance in this AC for projects funded by the Passenger Facility Charge program. See PFC Assurance #9.
4. The FAA recommends the guidance in this AC for land-use planners and developers of projects, facilities, and activities on or near airports.

4 Principal Changes.

Changes are marked with vertical bars in the margin. Change in this AC include:

1. Clarification by the FAA that non-certificated airports are recommended to conduct a Wildlife Hazard Assessment (Assessment) or a Wildlife Hazard Site Visit (Site Visit);
2. Table 1, Ranking of Hazardous Species, has been moved to Advisory Circular 150/5200-32, *Reporting Wildlife Aircraft Strikes* (5/31/2013);
3. Consolidation and reorganization of discussion on land uses of concern; and updated procedures for evaluation and mitigation. Discussion addresses off-airport hazardous wildlife attractants, followed by discussion of on-airport attractants. It also clarifies language regarding the applicability of the AC.

5 Background.

1. 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 risk[1] to aircraft safety, they are not equally hazardous[2]. These hazard rankings can help focus hazardous wildlife management efforts on those species or groups that represent the greatest risk to safe air and ground operations in the airport environment. Used in conjunction with a site-specific Assessment that will determine the relative abundance and use patterns of wildlife species, these rankings combined with a systematic risk analysis can help airport operators better understand the general threat level (and consequences) of certain wildlife species. Also, the rankings can assist with the creation of a "high risk" list of hazardous species that warrant immediate attention.
2. 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 aircraft operations area. Constructed or natural areas— such as

[1] Risk is the relationship between the severity and probability of a threat. It is the product of hazard level and abundance in the critical airspace, and is thus defined as the probability of a damaging strike with a given species.
[2] Hazardous wildlife are species of wildlife (birds, mammals, reptiles), including feral and domesticated animals, not under control that may pose a direct hazard to aviation (i.e., strike risk to aircraft) or an indirect hazard such as an attractant to other wildlife that pose a strike hazard or are causing structural damage to airport facilities (e.g., burrowing, nesting, perching).

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, wetlands, or some conservation-based land uses — 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.

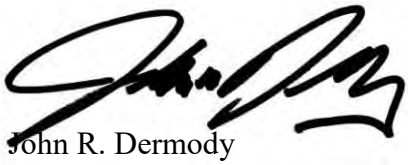
3. During the past century, wildlife-aircraft strikes have resulted in the loss of hundreds of lives worldwide, as well as billions of dollars in aircraft damage. Hazardous wildlife attractants on and near airports can jeopardize future airport expansion, making proper community land-use planning essential. 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) 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.

7 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

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CHAPTER 1. GENERAL SEPARATION CRITERIA FOR HAZARDOUS WILDLIFE ATTRACTANTS ON OR NEAR AIRPORTS

1.1 Introduction.

1.1.1 Airport operators should maintain an appropriate environment for the safe and efficient operation of aircraft, which entails mitigating wildlife strike hazards by fencing, modifying the landscape in order to deter wildlife or by hazing or removing wildlife hazardous to aircraft from congregating on airports. When considering proposed land uses, operators and sponsors of airports certificated under Part 139, 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, specifically those listed in Chapter 2, can significantly increase the potential for wildlife strikes.

1.1.2 The FAA urges regulatory agencies and planning and zoning agencies to evaluate proposed new land uses within the separation criteria and prevent the creation of land uses that attract or sustain hazardous wildlife within the separation distances.

1.1.3 The FAA recommends the use of 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 aircraft operations area. (See the discussion of the synergistic effects of surrounding land uses in Paragraph 2.8 of this AC.). For the purpose of evaluating distance criteria, the delineation of the aircraft operations area may also consider future airport development plans depicted on the Airport Layout Plan (e.g., planned runway extension).

1.1.4 The separation distances are based on (1) flight patterns and performance criteria 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 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 from these airports for any of the hazardous wildlife attractants discussed in Chapter 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant. Figure 1 depicts an example of the 5,000-foot separation distance measured from the nearest aircraft operations area.

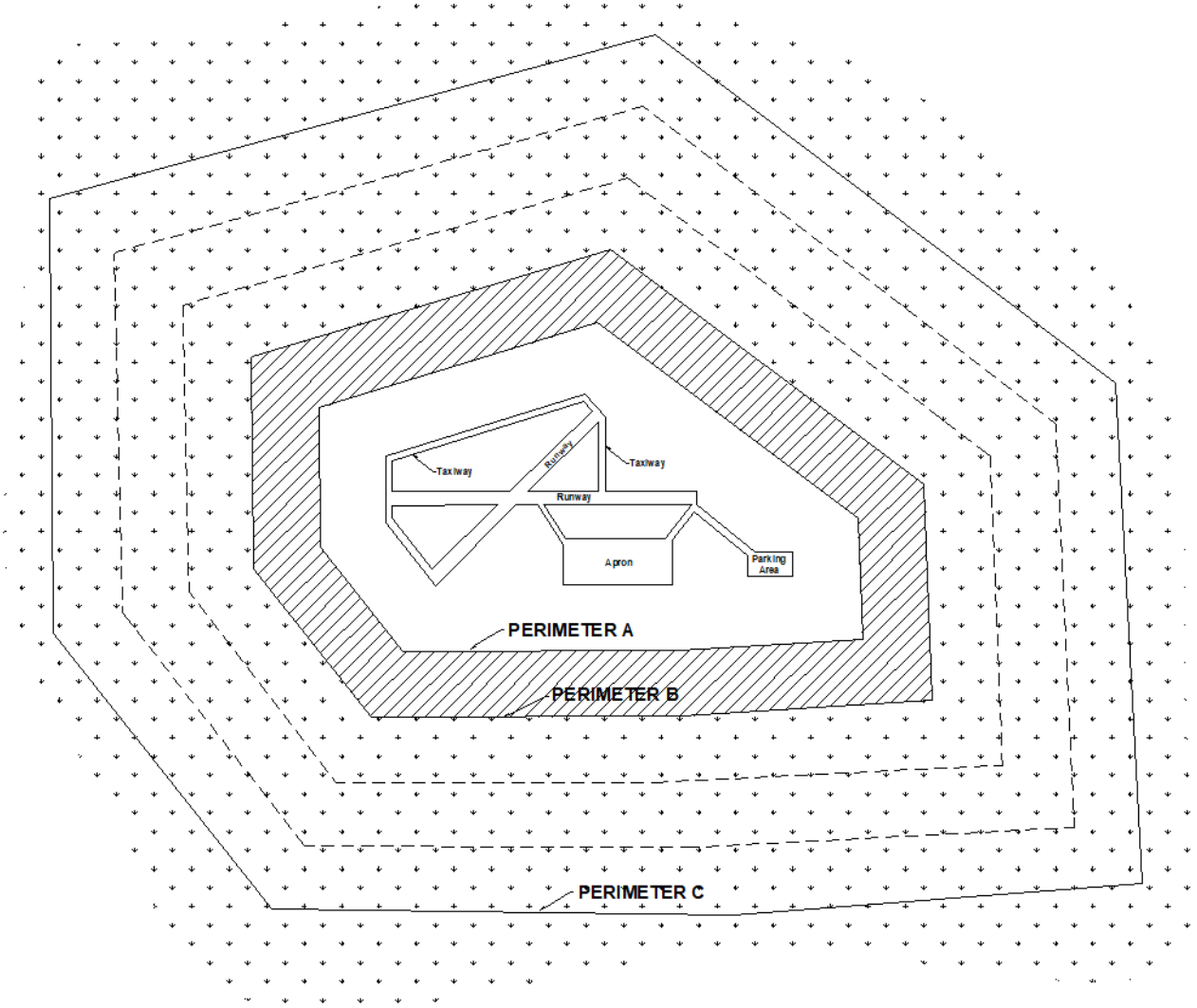
1.3 Airports Serving Turbine-Powered Aircraft.

For airports serving turbine-powered aircraft, the FAA recommends a separation distance of 10,000 feet from these airports for any of the hazardous wildlife attractants discussed in Chapter 2 or for new airport development projects meant to accommodate aircraft movement. This distance is to be maintained between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant. Figure 1 depicts an example of the 10,000-foot 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 miles between the closest point of the airport's aircraft operations area and the hazardous wildlife attractant. Special attention should be given to hazardous wildlife attractants that could cause hazardous wildlife movement into or across the approach or departure airspace. Figure 1 depicts an example of the 5-mile separation distance measured from the nearest aircraft operations area.

Figure 1. Example of recommended separation distances described in Chapter 1 within which hazardous wildlife attractants should be avoided, eliminated, or mitigated.



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

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

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

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CHAPTER 2. LAND-USE PRACTICES ON OR NEAR AIRPORTS THAT POTENTIALLY ATTRACT HAZARDOUS WILDLIFE

2.1 General.

2.1.1 Many types of vegetation, habitats and land use practices can provide an attractant to animals that pose a risk to aviation safety. Hazardous wildlife use the natural or artificial habitats on or near an airport for food, water or cover. 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. In addition to the specific considerations outlined below, airport operators should refer to *Wildlife Hazard Management at Airports* manual, prepared by FAA and U.S. Department of Agriculture (USDA) staff. (This manual is available in English, Spanish, and French). This manual, as well as other helpful resources can be viewed and downloaded free of charge from the Wildlife Strike Resources section of the FAA's wildlife hazard mitigation web site: http://www.FAA.gov/airports/airport_safety/wildlife).

2.1.1.1 The USDA / Animal and Plant Health Inspection Service (APHIS) / Wildlife Services developed a new publication series on wildlife damage management and is available online. The Wildlife Damage Management Technical Series highlights wildlife species or groups of wildlife species that cause damage to agriculture, property and natural resources, and/or impact aviation and human health and safety. The publications can be found at: https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/sa_reports/ct_wildlife+damage+management+technical+series.

2.1.1.2 Additional resources have been provided by the USDA / APHIS / Wildlife Services National Wildlife Research Center (NWRC) at: https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/programs/nwrc/sa_publications/ct_research_gateway. The NWRC Research Gateway contains research articles, reports, factsheets, technical notes, data and other materials on wildlife hazard mitigation, risk reduction, animal ecology, habitats, and advanced technologies and methodologies.

2.1.2 This section discusses land-use practices having the potential to attract hazardous wildlife and threaten aviation safety. The FAA has determined that the land uses listed below are generally not compatible with safe airport operations when they are located within the separation distances provided in Paragraphs 1.2 through 1.4.

2.1.3 As a reminder, these types of land uses or facilities often require permits from the appropriate permitting agency. The FAA may work with the permitting agency to include conditions for monitoring and mitigation measures, if necessary. Ultimately, the permittee is responsible for compliance to these conditions and the permitting agency is responsible for tracking compliance.

2.2 Waste Disposal Operations.

Municipal solid waste landfills (municipal landfills) 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 Paragraphs 1.2 through 1.4, are considered incompatible with safe airport operations.

2.2.1 Siting for New Municipal Solid Waste Landfills Subject to AIR 21.

2.2.1.1 Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (P. L. 106-181) (AIR 21), 49 U.S.C. § 44718(d), prohibits the construction or establishment of a new municipal landfill within 6 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.

2.2.1.2 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.

2.2.1.3 The proposed municipal landfill must (1) be within 6 miles of the airport, as measured from airport property line to the landfill property line, and (2) have started construction or establishment on or after April 5, 2001. Section 44718(d) only limits the construction or establishment of some new landfills. It does not limit the expansion, either vertical or horizontal, of existing landfills.

2.2.1.4 Regarding existing municipal landfills and lateral expansions of landfills, 40 CFR § 258.10 requires owners or operators of a landfill units located within the separation distances provided in Paragraphs 1.2 through 1.4 to demonstrate that the unit is designed and operated so that it does not pose a bird hazard to aircraft. To accomplish this, follow the instructions provided in Paragraphs 3.2 and 3.3, document the wildlife monitoring and mitigation procedures that are cooperatively developed, and place this documentation in the operating permit of the facility.

2.2.2 Siting for New Municipal Landfills Not Subject to AIR 21.

If an airport and a municipal landfill do not meet the criteria of § 44718(d), then FAA recommends against locating the landfill within the separation distances identified in Paragraphs 1.2 through 1.4. In determining this distance separation, measurements should be made from the closest point of the airport property boundary to the closest point of the landfill property boundary.

2.2.3 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 landfill operations located within the separations identified in Paragraphs 1.2 through 1.4. In addition, in accordance with 40 CFR § 258.10, owners or operators of existing landfill units that are located within the separations listed in Paragraphs 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 Paragraph 4.3.2 of this AC for a discussion of this demonstration requirement.)

2.2.4 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 constructed and operated properly and are not located on airport property or within the Runway Protection Zone. 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; or store uncovered quantities of municipal solid waste outside, even if only for a short time; or use semi-trailers that leak or have trash clinging to the outside; or 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 fully enclosed waste-handling facilities constructed or operated incorrectly incompatible with safe airport operations if they are located closer than the separation distances specified in Paragraphs 1.2 through 1.4.

2.2.5 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 unless effective, risk-reducing mitigations are in place. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any aircraft operations area 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, Obstacle Free Zone, Threshold Siting Surface, 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.

2.2.6 Underwater Waste Discharges.

The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Paragraphs 1.2 through 1.4 because it could attract scavenging hazardous wildlife.

2.2.7 Recycling Centers.

Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, aluminum, electronic, and household wastes such as paint, batteries, and oil, are, in most cases, not attractive to hazardous wildlife and are acceptable.

2.2.8 Construction and Demolition Debris Facilities.

2.2.8.1 Construction and demolition landfills generally do not 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, construction and demolition landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, construction and demolition landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities.

2.2.8.2 Therefore, a construction and demolition landfill co-located with another waste disposal operation should be located outside of the separations identified in Paragraphs 1.2 through 1.4.

2.2.8.3 Airport operators should be aware that on-site storage of construction and maintenance debris, as well as out-of-service aircraft or aircraft components, may provide an attractant for hazardous species (e.g., nesting or perching locations). The FAA recommends these on-site areas be monitored and/or mitigated, if necessary.

2.2.9 Fly Ash Disposal.

2.2.9.1 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 admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

2.2.9.2 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 Paragraphs 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, ponds

and fountains for ornamental purposes, and ponds that result from mining activities often attract large numbers of potentially hazardous wildlife. Development of new open water facilities within the separation criteria identified in Paragraphs 1.2 through 1.4 should be avoided to prevent wildlife attractants. If necessary, 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. The FAA recommends these plans be developed in consultation with a Qualified Airport Wildlife Biologist[3], to minimize hazardous wildlife attractants.

2.3.1 Existing Stormwater Management Facilities.

2.3.1.1 On-airport stormwater 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 stormwater, protect water quality, and control runoff. Because they slowly release water after storms, they may create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan, Part 139 regulations require the immediate correction of any wildlife hazards arising from existing stormwater 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 Qualified Airport Wildlife Biologist.

2.3.1.2 Where possible, airport operators should modify stormwater detention ponds to allow a maximum 48-hour detention period for the design storm. The combination of open water and vegetation is particularly attractive to waterfowl and other hazardous wildlife. Water management facilities holding water longer than 48 hours should be maintained in a manner that keeps them free of both emergent and submergent vegetation. 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. Drainage basins with a concrete or paved pad should be maintained to prevent or remove any sediment build-up to prevent vegetation growth.

2.3.1.3 When it is not possible to drain a large detention pond completely, airport operators may use physical barriers, such as bird balls, wire grids, pillows,

[3] See Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports.*

or netting, to deter birds and other hazardous wildlife. When physical barriers are proposed, airport operators must evaluate their use, effectiveness and maintenance requirements. Airport operators must also ensure physical barriers 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.

2.3.1.4 The FAA recommends that airport operators encourage off-airport stormwater treatment facility operators to incorporate appropriate wildlife hazard mitigation techniques into stormwater treatment facility operating practices when their facility is located within the separation criteria specified in Paragraphs 1.2 through 1.4.

2.3.2 New Stormwater Management Facilities.

The FAA recommends that storm water management systems located within the separations identified in Paragraphs 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 to remain completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap or concrete lined, narrow, linear-shaped water detention basins. When it is not possible to place these ponds away from an airport's aircraft operations area (but still on airport property), airport operators may use physical barriers, such as bird balls, wire grids, floating covers, vegetation barriers (bottom liners), or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. Caution is advised when nets or wire grids are used for deterring birds from attractants. Mesh size should be < 5 cm (2") to avoid entangling and killing birds and should not be made of a monofilament material. Grids installed above and across water to deter hazardous birds (e.g., waterfowl, cormorants, etc.) are different than using a small mesh covering but also provides an effective deterrent. Grid material, size, pattern and height above water may differ on a case-by-case basis. 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, a review by a Qualified Airport Wildlife Biologist should be conducted, prior to 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 because they are less attractive to wildlife.

2.3.3 Existing Wastewater Treatment Facilities.

2.3.3.1 The FAA recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport.

2.3.3.2 Where required, a wildlife management plan will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a Qualified Airport Wildlife 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.

2.3.4 New Wastewater Treatment Facilities.

The FAA recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Paragraphs 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 or elimination of pollutants prior to introducing such pollutants into a treatment facility. When a wastewater treatment facility is proposed within the separation criteria, the airport operator, project proponent, and local jurisdiction should discuss the proposed project location with regard to its location near the airport and the separation distances identified in Paragraphs 1.2 through 1.4. If possible, a more suitable location for the proposed facility should be identified. If no other suitable location exists, FAA recommends that the proposed facility plans be reviewed by a Qualified Airport Wildlife Biologist to identify measures to avoid or reduce the facility's potential to attract hazardous wildlife. If appropriate measures cannot be incorporated to reduce potential wildlife hazards, airport operators should document their opposition in a letter to the local jurisdiction.

2.3.5 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 recommends against establishing artificial marshes within the separations identified in Paragraphs 1.2 through 1.4.

2.3.6 Wastewater Discharge and Sludge Disposal.

The FAA recommends careful consideration regarding the discharge of wastewater or biosolids (i.e., secondarily treated sewage sludge) on airport property. Such discharges might improve soil moisture and quality on unpaved areas and lead to improved turf growth. Depending on the airfield plant communities and habitats present, this can be an attractive food source for many species of animals or, conversely, could result in limited attractiveness to hazardous wildlife. Also, improved turf requires more frequent mowing and could attract geese. Airports should improve their turf with the goal of a monoculture of turf that is least attractive to wildlife. Wastewater or biosolids

applications might assist in achieving this goal. Caution should be exercised when discharges saturate airfield areas adjacent to paved surfaces. The resultant soft, muddy conditions could 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. Wetlands can be attractive to many types of wildlife, including many which rank high on the list of hazardous wildlife species (Table 1 - AC 150/5200-32). Some types of wetlands are not as attractive to wildlife as others and they should be reviewed on a case-by-case basis to determine the likelihood of proposed wetlands increasing the numbers of hazardous wildlife at the airport. Factors such as size, shape, location, canopy cover and vegetative composition among other things should be considered when determining compatibility.

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

2.4.1 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 within 5 miles of the aircraft operations area. Where required, a wildlife management plan will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a FAA Qualified Airport Wildlife Biologist.

2.4.2 New Airport Development.

Whenever possible, the FAA recommends locating new airports using the separations from wetlands identified in Paragraphs 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 Qualified Airport Wildlife Biologist, in coordination 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 wildlife management plan that indicates methods of minimizing the hazards.

2.4.3 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 Paragraphs 1.2 through 1.4.

2.4.3.1 **Onsite Mitigation of Wetland Functions.**

Wetland mitigation/conservation easements 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 and grant assurance compliance. Early coordination with the FAA is encouraged for any proposal to use airport land for wetland mitigation. A Qualified Airport Wildlife 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 Paragraphs 1.2 through 1.4 before the mitigation is implemented. A wildlife management plan should be developed to reduce the wildlife hazards.

2.4.3.2 **Offsite Mitigation of Wetland Functions.**

2.4.3.2.1 The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Paragraphs 1.2 through 1.4 unless they provide unique functions that must remain onsite (see 2.4.3.1). 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.

2.4.3.2.2 The FAA encourages landowners or communities supporting the restoration or enhancement of wetlands to do so only after critically analyzing how those activities would affect aviation safety. To do so, landowners or communities should contact the affected airport sponsor, FAA, and/or a Qualified Airport Wildlife Biologist.

2.4.3.2.3 Those parties should work cooperatively to develop restoration or enhancement plans that would not worsen existing wildlife hazards or create such hazards. See Paragraphs 4.1.1 – 4.1.3 for land-use modifications evaluation criteria.

2.4.3.2.4 If parties develop a mutually acceptable restoration or enhancement plan, the landowner or community proposing the restoration or enhancement must monitor the restored or enhanced site. This monitoring must verify that efforts have not worsened or created hazardous wildlife attraction or activity. If such attraction or activity occurs, the landowner or community should work with the airport sponsor, or a Qualified Airport Wildlife Biologist to reduce the hazard to aviation.

2.4.3.3 **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 Paragraphs 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 Paragraphs 1.2 through 1.4 if the containment area or the spoils contain material that would attract hazardous wildlife. Proposals for new dredge spoil containment areas located within the separation distances should be reviewed on a case-by-case basis to determine the likelihood of resulting in an increase in hazardous wildlife. The FAA recommends that airport sponsors work with a Qualified Airport Wildlife Biologist and/or the FAA to review proposals for dredge spoil containment areas located within separation criteria.

2.6 Agricultural Activities.

Many agricultural crops can attract hazardous wildlife and should not be planted within the separations identified in Paragraphs 1.2 through 1.4. Corn, wheat, and other small grains in particular should be avoided. If the airport has no financial alternative to agricultural crops to produce the income necessary to maintain the viability of the airport, then the airport should consider growing crops that hold little food value for hazardous wildlife, such as grass hay. Attractiveness to hazardous wildlife species during all phases of production, from planting through harvest and fallow periods, should be considered when contemplating the use of airport property for agricultural production. Where agriculture is present, crop residue (e.g., waste grain) should not be left in the field following harvest. Also, airports should consult AC 150/5300-13, *Airport Design,* to ensure that agricultural crops do not create airfield obstructions or other safety hazards. Before planning or initiating any agricultural practices on airport property, operators should get approval from the appropriate FAA regional Airports Division Office and demonstrate that the additional cost of wildlife control and potential accidents is offset by revenue generated by agricultural leases. Annual review of the Airport Certification Manual by the Certification Inspector does not constitute approval and is insufficient to meet this requirement.

2.6.1 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 blackbirds, starlings, or pigeons that pose a hazard to aviation. Therefore, the FAA recommends against such facilities within the separations identified in Paragraphs 1.2 through 1.4. The airport operator should be aware of any wildlife hazards that appear to be attracted to off-site livestock operations and consider working with a Qualified Airport Wildlife Biologist to identify reasonable and feasible measures that may be proposed to landowners to reduce the attractiveness of the site to the potentially hazardous wildlife species.

2.6.1.1 In exceptional circumstances, and following FAA review and approval, livestock may be grazed on airport property as long as they are off the airfield and separated behind fencing where they cannot pose a hazard to aircraft. The livestock should be fed and watered as far away from the airfield and approach/departure space as possible because the feed and water may attract birds. The wildlife management plan should include monitoring and wildlife mitigation for any areas where the livestock and their feed/water is located in case a wildlife hazard is detected. Airports without wildlife management plans should equally consider monitoring and mitigation protocols to identify and address any wildlife hazards associated with livestock and their feeding operations.

2.6.2 Alternative Uses of Agricultural Land.

2.6.2.1 Habitat modification both on and surrounding an airfield is one of the best and most economical long term mitigation strategies to decrease risk that wildlife pose to flight safety. Alternative land uses (e.g., solar and biofuel) at airports could help mitigate many of the challenges for the airport operator, developers, and conservationists. However, careful planning must first determine that proposed alternative energy production at airports does not create wildlife attractants or other hazards.

2.6.2.2 Some airports are surrounded by vast areas of farmed land within the distances specified in Paragraphs 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, among others, flood their land to attract waterfowl or for conservation efforts. This is often done during waterfowl hunting season to obtain additional revenue by renting out duck blinds.

2.6.2.3 The waterfowl hunters then use decoys and call in hundreds, if not thousands, of birds, creating a threat to aircraft safety. It is recommended that a Qualified Airport Wildlife Biologist review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate mitigating measures into the wildlife management plan, when possible.

2.7 Aquaculture.

Aquaculture is the breeding, rearing, and harvesting of fish, shellfish, and plants in all types of water environments including ponds, rivers, lakes, and the ocean. Aquaculture is used to produce food fish, sport fish, bait fish, ornamental fish, and to support restoration activities. Aquacultured species are grown in a range of facilities including tanks, cages, ponds, and raceways. When an aquaculture facility is proposed within the separation criteria, the airport operator, project proponent, and local jurisdiction should discuss the proposed project location with regard to its attraction to hazardous species, location near the airport and the separation distances identified in Paragraphs 1.2 through 1.4. If a facility is identified as a possible significant attraction, a more suitable location for the proposed facility should be identified. If no other suitable location exists, it is recommended that the proposed facility plans be reviewed by a Qualified Airport Wildlife Biologist to identify measures to avoid or reduce the facility's potential to attract hazardous wildlife.

2.7.1 Freshwater Aquaculture.

2.7.1.1 Freshwater aquaculture activities (e.g., catfish, tilapia, trout or bass production) are typically conducted outside of fully enclosed buildings in constructed ponds or tanks and are inherently attractive to a wide variety of birds and therefore pose a significant risk to airport safety when within the separation distances specified in Paragraphs 1.2 through 1.4. Freshwater aquaculture should only be considered if extensive mitigation measures have been incorporated to eliminate attraction to hazardous birds. Examples of such mitigation include:

1. Netting or other material to exclude hazardous birds (e.g., eagles, osprey, gulls, cormorants);
2. Acoustic hazing including pyrotechnics, propane cannons, directional sonic/hailing devices and other similar technologies;
3. Feeding procedure cleanliness, exclusion techniques prohibiting birds from perching or accessing food; efficiency of feeding operation procedures that reduce fish food attraction to hazardous birds;
4. Operation procedure efficiency transferring live fish to and from enclosures or removal of dead fish; maintenance and upkeep of facility;
5. Monitoring, mitigation and communication protocols with nearby airports as a proactive safety feature in response to specific hazardous species in the event they are identified at the facility in unacceptable numbers.

2.7.2 Marine Aquaculture.

Marine aquaculture (Mariculture) refers to the culturing of species that live in the ocean. When appropriately managed and mitigated as necessary, mariculture facilities do not pose a significant risk to airport safety.

2.7.2.1 **Finfish Mariculture.**

2.7.2.1.1 U.S. finfish mariculture primarily produces salmon and steelhead trout as well as lesser amounts of cod, moi, yellowtail, barramundi, seabass, and seabream. Maricultures use rigid and non-rigid enclosures (e.g., cages) at the surface or submerged in the water column. These enclosures may be fully enclosed, or be open at the top or covered with netted material to negate losses from depredation by birds or other predators. Different facilities employ different designs and operational protocols.

2.7.2.1.2 While mariculture operations typically do not pose a significant attractant to hazardous birds, design and operational features can be incorporated as permit conditions to mitigate attraction and effectively reduce this risk. Examples of such mitigation include:

1. Fully enclosed cages using netting or other material to exclude hazardous birds (e.g., gulls, cormorants, pelicans) and to insure retention of fish;
2. Submerged enclosures to reduce attraction to hazardous birds;
3. Feed barge cleanliness, exclusion techniques prohibiting birds from perching or accessing food; efficiency of feeding operation procedures that reduce fish food attraction to hazardous birds;
4. Operation procedure efficiency transferring live fish to and from enclosures or removal of dead fish; maintenance and upkeep of facility;
5. Monitoring, mitigation and communication protocols with nearby airports as a proactive safety feature in response to specific hazardous species in the event they are identified at the facility in unacceptable numbers.

2.7.2.2 **Shellfish Mariculture.**

U.S. shellfish mariculture primarily produces oysters, clams, mussels, lobster and shrimp. Shellfish may be grown directly on the bottom, in submerged cages or bags, or on suspended lines. These types of mariculture operations do not typically present a significant attractant to hazardous birds. For those operations that are found to pose a significant risk, design and operation features that diminish possible attraction to hazardous bird species (e.g., reducing areas for perching or feeding) can effectively reduce this risk.

2.7.2.3 **Plant Mariculture.**

2.7.2.3.1 Microalgae, also referred to as phytoplankton, microphytes, or planktonic algae constitute the majority of cultivated algae. Macroalgae, commonly known as seaweed, also have many commercial and industrial uses.

2.7.2.3.2 While few commercial seaweed farms exist, the sector is growing. These types of mariculture operations do not typically present an attractant to hazardous birds.

2.8 Golf Courses, Landscaping, Structures and Other Land-Use Considerations.

2.8.1 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. If golf courses 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. Accordingly, airport operators should develop, at a minimum, onsite measures to minimize hazardous wildlife attraction in consultation with a Qualified Airport Wildlife Biologist. Existing golf courses located within these separations that have been documented to attract hazardous wildlife are encouraged to develop a program to reduce the attractiveness of the sites to species that are hazardous to aviation safety. The FAA recommends against construction of new golf courses within the separations identified in Paragraphs 1.2 through 1.4 if determined that the new facility would create a significant wildlife hazard attractant by a Qualified Airport Wildlife Biologist. 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.

2.8.2 Landscaping and Landscape Maintenance.

2.8.2.1 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. Vegetation that produces seeds, fruits, or berries, or that provides dense roosting or nesting cover should not be used. Airports should develop a landscape plan to include approved and prohibited plants. The landscape plan should consider the watering needs of mature plants. A Qualified Airport Wildlife 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.

2.8.2.2 Turf grass areas on airports have the potential to 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 airfield vegetation management regimen will deter all species of hazardous wildlife in all situations. The composition and height of airfield grasslands should be properly managed to reduce their attractiveness to hazardous wildlife. In many situations, an intermediate height, monoculture turf grass might be most favorable. In cooperation with a

Qualified Airport Wildlife Biologist, airport operators should develop airport turf grass management plans on a prescription basis, including cultivar selection during reseeding efforts, that is specific to the airport's geographic location, climatic conditions, and the type of hazardous wildlife likely to frequent the airport.

2.8.2.3 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 Airport Wildlife Biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a Qualified Airport Wildlife Biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

2.8.3 Structures.

2.8.3.1 Certain structures attract birds for loafing and nesting. Flat rooftops can be attractive to many species of gulls for nesting, hangars provide roosting / nesting opportunities for rock doves, towers, light posts and navigation aids can provide loafing / hunting perches for raptors and aircraft can provide loafing / nesting sites for European starlings, blackbirds and other species. These structures should be monitored and mitigated, if located on-site. Off-site structural attractions may require additional coordination to effectively mitigate their use by hazardous species.

2.8.3.2 Cellular communications towers are becoming increasingly more attractive to large birds (e.g., osprey, eagles, herons, vultures) for nesting and rearing their young. This problem is a growing concern because once the young fledge from nests built on manmade structures they are more likely to return to these kinds of sites to reproduce in future years.

2.8.4 Other Hazardous Wildlife Attractants.

Other land uses (e.g., conservation easements, parks, wildlife management areas) or activities not addressed in this AC may have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, each certificate holder must take prompt remedial action(s) to protect aviation safety and all non-certificated airports should take prompt remedial action(s) to protect aviation safety.

2.9 Habitat for State and Federally Listed Species on Airports.

An airport's air operations area is an artificial environment that has been created and maintained for aircraft operations. Because an aircraft operations area 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 aircraft operations area 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 Federal or state-listed threatened and endangered species or have been designated by state resource agencies as species of special concern.

2.9.1 State-Listed Species Habitat Concerns.

2.9.1.1 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 caution in adopting new management techniques because they 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.

2.9.1.2 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. 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.

2.9.2 Federally Listed Species Habitat Concerns.

2.9.2.1 The FAA supports efforts to protect threatened and endangered species, as a matter of principle and consistent with the Endangered Species Act of 1973. The FAA must balance these requirements with our requirements and mission to maintain a safe and efficient airport system. Requests to enhance or create habitat for threatened and endangered species often conflict with the safety of the traveling public and may place the protected species at risk of mortality by aircraft collisions. The FAA does not support the creation, conservation or enhancement of habitat or refuges to attract endangered species on airports. If endangered species are present on an airport, specific obligations may apply under the Endangered

Species Act, 16 U.S.C. § 1531 et seq. and the airport operator should contact the Airports District Office Environmental Protection Specialist.

2.9.2.2 The designation of critical habitat for listed species under the Endangered Species Act on airport lands may be an incompatible land use in conflict with the intended and dedicated purpose of airport lands and may limit or preclude the ability of the airport to develop new infrastructure and growth capacity to meet future air carrier service demand. In addition, depending on the listed species (primarily but not limited to avian species), the designation of critical habitat within the separation distances provided in paragraphs 1.2 - 1.4 can represent a hazardous wildlife attractant in conflict with 14 CFR Part 139.337.

2.10 Synergistic Effects of Surrounding Land Uses.

There may be circumstances where two or more different land uses would not, by themselves, be considered hazardous wildlife attractants or are located outside of the separations identified in Paragraphs 1.2 through 1.4 but collectively may create a wildlife corridor directly through the airport and/or surrounding airspace. An example involves 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. These two land uses, taken together, could create a flyway for Canada geese directly across the airspace of the airport. Airport operators must consider the entire surrounding landscape and community when developing the wildlife management plan.

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CHAPTER 3. PROCEDURES FOR WILDLIFE HAZARD MANAGEMENT BY OPERATORS OF PUBLIC-USE AIRPORTS AND CONDITIONS FOR NON-CERTIFICATED AIRPORTS TO CONDUCT WILDLIFE HAZARD ASSESSMENTS AND WILDLIFE HAZARD SITE VISITS

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 recommends all airports conduct a Wildlife Hazard Site Visit or Wildlife Hazard Assessment unless otherwise mandated after an initial triggering events defined in Part 139 Section 139.337. After the airport has completed the site visit or assessment and implemented a wildlife management plan, investigations should be conducted following subsequent triggering events to determine if the original assessment and plan adequately address the situation or if conditions have changed that would warrant an update to the plan. In this section, airports that are certificated under 14 C.F.R. § 139.337 are referred to as "certificated airports" and all others are referred to as "non-certificated airports." When a statement refers to both certificated and non-certificated airports, "airport" or "all airports" is used.

3.2 Coordination with Qualified Airport Wildlife Biologists.

Hazardous wildlife management is a complex discipline and conditions vary widely across the United States. Therefore, only airport wildlife biologists meeting the qualification requirements in Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports,* can conduct Site Visits and Assessments. Airports must maintain documentation that the Qualified Airport Wildlife Biologist meets the qualification requirements in Advisory Circular 150/5200-36.

3.3 Wildlife Hazard Management at Airports: A Manual For Airport Personnel.

3.3.1 The Wildlife Hazard Management at Airports 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 wildlife management plans at airports. The manual includes specific information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, Assessments, Plans, 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: https://www.faa.gov/airports/airport_safety/wildlife. This manual only provides a starting point for addressing wildlife hazard issues at airports. FAA recommends that airports consult with a Qualified Airport Wildlife Biologists to assist with development of a wildlife management plan and the implementation of management actions by airport personnel.

3.3.2 There are many other resources complementary to this manual for use in developing and implementing wildlife management plans. Several are listed in the manual's bibliography or on the FAA Wildlife Mitigation website: https://www.faa.gov/airports/airport_safety/wildlife

3.4 Wildlife Hazard Site Visits and Wildlife Hazard Assessments.

3.4.1 Operators of certificated airports are encouraged to conduct an initial assessment regardless of whether the airport has experienced one of the triggering events. Doing so would allow the airport to take proactive action and mitigate the wildlife risk before experiencing an incident. All other airports are encouraged to conduct an assessment or site visit (as defined in FAA Advisory Circular 150/5200-38) conducted by a Qualified Airport Wildlife Biologist (as defined in FAA Advisory Circular 150/5200-36). Part 139 certificated airports are currently required to ensure that an assessment is conducted consistent with 14 C.F.R. § 139.337.

3.4.2 The intent of a site visit is to provide an abbreviated analysis of an airport's wildlife hazards and to provide timely information that allows the airport to expedite the mitigation of these hazards. The FAA also recommends that airports conduct an assessment or site visit as soon as practicable in order to identify any immediate wildlife hazards and/or mitigation measures.

3.4.3 Non-certificated airports should submit the results of the site visit or assessment to the FAA for review. The FAA will review the submitted site visit or assessment and make a recommendation regarding the development of a wildlife management plan. A wildlife management plan can be developed based on a site visit and will be required if the non-certificated airport is going to request federal grants for the purpose of mitigating wildlife hazards.

3.5 Wildlife Hazard Management Plan.

3.5.1 The FAA will consider the results of the assessment, along with the aeronautical activity at the airport and the views of the airport operator and airport users, in determining whether a wildlife management plan is needed for certificated airports, or recommended for non-certificated airports.

3.5.2 If the FAA determines that a wildlife management plan is needed for a certificated airport, the airport operator must formulate a plan, using the assessment as its basis and submit to the FAA for approval. If the FAA recommends that a non-certificated airport develop a plan, either an assessment or a site visit can be used as the basis for the wildlife management plan. Airports should consult AC 150/5200-38, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans,* for further information on preparation and implementation requirements for their wildlife management plan.

3.5.3 The goal of an airport's wildlife 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. For wildlife management plans to effectively reduce wildlife hazards on and near airports, accurate and consistent wildlife strike reporting is essential. Airports should consult AC 150/5200-32, *Reporting Wildlife Aircraft Strikes,* for further information on responsibilities and recommendations concerning wildlife strikes.

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

3.6 Local Coordination.

The FAA recommends establishing a Wildlife Hazards Working Group to facilitate the communication, cooperation, and coordination of the airport and its surrounding community necessary to ensure the effectiveness of the wildlife management plan. The cooperation of the airport community is essential to prevent incompatible development in the airport vicinity. Whether on or off the airport, input from all involved parties must be considered when a potentially hazardous wildlife attractant is being proposed. Based on available resources, airport operators should undertake public education activities with the local planning agencies because some activities in the vicinity of an airport, while harmless under normal conditions, can attract wildlife and present a danger to aircraft (see Paragraphs 4.5 to 4.8). 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.

3.7 Operational Notifications of Wildlife Hazards.

3.7.1 Operational notifications include active correspondence addressing wildlife issues on or near an airport, notifications and alerts. 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. Permanent attractions that cannot be eliminated or mitigated may be noted in the Airport/Facility Directory. NOTAMS and Airport/Facility Directory notifications are not appropriate for short-term or immediate advisories that can be relayed via Pilot Reports, direct air traffic control voice communications, or temporary Automated Terminal Advisory System alerts. Care should be given to avoid the continual broadcast of general warnings for extended periods of time. General warnings such as "birds in the vicinity of the aerodrome" offer little timely information to aid pilots and eventually may be ignored if not updated.

3.7.2 The Automated Terminal Advisory System (ATIS) is a continuous broadcast of recorded aeronautical information for aerodromes and their immediate surroundings. ATIS broadcasts contain essential information, such as current weather information,

active runways, available approaches, wildlife hazards and any other information required by the pilots. They indicate significant (moderate or severe) wildlife activity, as reported by an approved agency that presents temporary hazards on the ATIS broadcast. Pilots take notice of available ATIS broadcasts before contacting the local control unit, which reduces the controllers' workload and relieves frequency congestion. The recording is updated in fixed intervals or when there is a significant change in the information. Although ATIS broadcasts involving wildlife should be timely and specific, pilots do not need to know species-specific information. General descriptive information detailing size and number of animals, locations and timing of occurrence provides useful, actionable information for pilots.

3.7.3 A pilot report (PIREP) is reported by a pilot to indicate encounters of hazardous weather (e.g., icing or turbulence) and hazardous wildlife. Pilot reports are short-lived warnings providing immediate information on pilot observations that are transmitted in real-time to air traffic control. Large animals near active surfaces, soaring vultures and raptors within approach/ departure corridors and waterfowl such as geese feeding in grassy areas next to runways are all examples of pilot reports generated by pilots.

3.8 Federal and State Depredation Permits.

The FAA recommends that airports maintain federal and state depredation permits to allow mitigation and/ or removal of hazardous species. All protected species require special permits for lethal mitigation or capture and relocation procedures. Similarly, endangered or threatened species mitigation also requires special permits. The FAA recommends that airports work closely with a Qualified Airport Wildlife Biologist during the U.S. Fish and Wildlife Service consultation and permitting process. The following Orders can help airports reduce risks from hazardous species by allowing private citizens to control hazardous species off airport properties without the need for a Federal depredation permit.

3.8.1 Standing Depredation Orders.

3.8.1.1 Federal law allows people to protect themselves and their property from damage caused by migratory birds. Provided no effort is made to kill or capture the birds, a depredation permit is not required to merely scare or herd depredating migratory birds other than endangered or threatened species or bald or golden eagles (50 CFR 21.41).

3.8.1.2 In addition, certain species of migratory birds may be mitigated without a federal permit under specific circumstances, many of which relate to agricultural situations. The following Standing Depredation Orders have applicability near airports:

- 50 CFR § 21.49- Control Order for Resident Canada Geese at Airports and Military Airfields.
- 50 CFR § 21.50- Depredation Order for Resident Canada Geese Nests and Eggs.

- 50 CFR § 21.43 - Depredation Order for Blackbirds, Cowbirds, Crows, Grackles, and Magpies.
- 50 CFR § 21.54 - Control Order for Muscovy Ducks in the United States.
- 50 CFR § 21.55 - Control Order for Invasive Migratory Birds in Hawaii.

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CHAPTER 4. RECOMMENDED PROCEDURES FOR THE FAA, AIRPORT OPERATORS AND OTHER GOVERNMENT ENTITIES REGARDING OFF-AIRPORT ATTRACTANTS

4.1 FAA Notification and Review of Proposed Land-Use Practice Changes in the Vicinity of Public-Use Airports.

4.1.1 For projects that are located within 5 miles of the airport's aircraft operations area, the FAA may review development plans, proposed land-use changes, operational changes, major federal actions or wetland mitigation plans to determine if such changes increase risk to airport safety by attracting hazardous wildlife on and around airports. The FAA is not a permitting agency for land use modifications that occur off airport properties, therefore, such reviews are typically initiated by state or federal permitting agencies seeking FAA input on new or revised permits. Each of the land uses listed in Chapter 2 of this AC has the potential to pose a risk to airport operations when they are located within the separation distances provided in Paragraphs 1.2 through 1.4.

4.1.2 Off-site land use modifications near airports may include an assessment of risk for facilities and land-use changes and, if necessary, mitigation strategies that may reduce risk to an acceptable level. However, the FAA recognizes that individual facilities or land-use modifications may present a range of attractants to different species, resulting in varying levels of risk. Therefore, the FAA considers each proposal on a case-by-case basis.

4.1.3 The FAA analyzes each land-use modification or new facility proposal prior to its establishment or any significant planned changes to design or operations that may increase the risk level. As part of a review, the FAA considers several factors that include, but are not limited to:

1. Type of attractant;
2. Size of attractant;
3. Location/distance of attractant from airport;
4. Design (e.g., construction, material, mitigation techniques employed into design);
5. Operation (e.g., cleanliness, constancy/ volume of use, seasonality, time of day);
6. Monitoring protocols (e.g., frequency, documentation, evaluation, species identification and number thresholds that trigger actions of communication or mitigation, baseline wildlife data);
7. Mitigation protocols (e.g., responsibilities, methods, intensity, pre-determined objectives, documentation, evaluation); and
8. Communication protocols to airport and/ or air traffic control tower;

4.1.4 The review of these factors may result in FAA recommended additions or modifications to a conditional use permit that allows the permitting agency to track compliance with the permittee obligations. Such conditions placed within a permit

may involve a comprehensive outline and recognition of individuals responsible for monitoring, communication, and mitigation measures if certain action thresholds are met. Action thresholds are defined in this instance as those pre-determined parameters (e.g., number, location, behavior, time of day) of specific hazardous species that would trigger a mitigation response. Additionally, baseline data should be used to determine the effect, if any, on wildlife populations at the proposed off-site location and/or at the airport.

4.1.5 Baseline data may need to be collected, depending on the existence of useful data and timeline for site modification. If, after taking into account the factors above, FAA determines that a facility poses a significant risk to airport safety, FAA will object to its establishment or renewal.

4.1.6 For projects that are located within 5 miles of the airport's aircraft operations area, the FAA Airport District Office may review development plans, proposed land-use changes, operational changes, major federal actions 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.

4.1.7 Where a Qualified Airport Wildlife 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.

4.2.1 Notification of New/Expanded Project Proposal.

4.2.1.1 49 U.S.C. § 44718(d), prohibits the construction or establishment of new municipal landfills within 6 miles of certain public-use airports, when both the airport and the landfill meet specific conditions. See Paragraph 2.2 of this guidance for a more detailed discussion of these restrictions.

4.2.1.2 The Environmental Protection Agency (EPA) requires any landfill operator proposing a new or expanded waste disposal operation within 5 miles of a runway end to notify the appropriate FAA Regional Airports Division Office and the airport operator of the proposal. See 40 CFR § 258, *Criteria for Municipal Solid Waste Landfills,* Section 258.10, *Airport Safety*. The EPA also requires owners or operators of new landfill units, or lateral expansions of existing MSWLF landfill units, that are located within 10,000 feet of any airport runway end used by turbine-powered 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 4.3.2 below.)

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

4.2.1.4 The FAA discourages the development of waste disposal and other facilities, discussed in Chapter 2, located within the separation criteria specified in Paragraphs 1.2 through 1.4. To show that a waste-handling facility sited within the separations identified in Paragraphs 1.2 through 1.4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish the facility will not handle putrescible material other than that as outlined in 2.2.4. The FAA recommends against any facility other than those outlined in 2.2.4 (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.

4.3 Other Land-Use Practice Changes.

4.3.1 The FAA encourages operators of public-use airports who become aware of proposed land use practice changes that may attract hazardous wildlife within 5 miles of their airports to notify their assigned Airport Certification Safety Inspector or Airports District Office Program Manager. 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.

4.3.2 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 prior to submitting Form 7460-1.

4.3.3 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.

4.3.4 Airports that have Received Federal Assistance.

Airports that have received Federal assistance are required under 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. See Grant Assurance 21. The FAA recommends that airport operators oppose off-airport land-use changes or practices, to

the extent practicable, within the separations identified in Paragraphs 1.2 through 1.4, which 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 preventing, eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for airport development projects.

4.4 Coordination to Prevent Creation of New Off-Airport Hazardous Wildlife Attractants.

Airport operators should work with local and regional planning and zoning boards 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 Paragraphs 1.2 through 1.4. Pay particular attention to proposed land uses involving creation or expansion of wastewater treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, it is recommended that airport operators 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. This may be accomplished through one or more of the following:

4.4.1 Site-specific Criteria.

The airport should establish site-specific criteria for assessment of land uses attractive to hazardous wildlife and locations that would be of concern based on wildlife strikes and on wildlife abundance and activity at the airport and in the local area. These criteria may be more selective, but should not be less restrictive than this guidance.

4.4.2 Outreach.

Airports should actively seek to provide educational information and/ or provide input regarding local development, natural resource modification or wildlife-related concerns that affect wildlife hazards and safe air travel.

4.4.2.1 **External Outreach.**

Airport operators and a Qualified Airport Wildlife Biologist should consider outreach to local planning and zoning organizations on land uses of concern or to local organizations responsible for natural resource management (including wildlife, wetlands, and parks.) Airports should also consider developing and distributing position letters and educational materials on airport-specific concerns regarding wildlife hazards, wildlife activity and attraction. Finally, airports should provide formal comments on local procedures, laws, ordinances, plans, and regulatory actions such as permits related to land uses of concern.

4.4.2.2 **Internal Outreach.**

Airports should consider developing and distributing position letters and educational materials on airport-specific concerns regarding species identification and mitigation procedures, wildlife hazards, wildlife activity and attraction to employees and personnel with access to the aircraft operations area.

4.5 Coordination on Existing Off-Airport Hazardous Wildlife Attractants.

Airports are encouraged to work with landowners and managers to cooperatively develop procedures to monitor and manage hazardous wildlife attraction. If applicable, these procedures may include:

1. Conducting a wildlife hazard site visit by a wildlife biologist meeting the qualification requirements of Advisory Circular 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports*
2. Conducting regular, standardized, wildlife monitoring surveys;[4]
3. Establishing threshold numbers of wildlife which would trigger certain actions and/or communications;
4. Establishment of procedures to deter or remove hazardous wildlife.

4.6 Prompt Remedial Action.

For attractants found on and off airport property, and with landowner or manager cooperation, Part 139 certificated airports must take immediate action in accordance with their Airport Certification Manual and the requirements of Part 139.337, to alleviate wildlife hazards whenever they are detected. It is also recommended that non-certificated airports take immediate action to alleviate wildlife hazards whenever they are detected. In addition, airports should take prompt action to identify the source of attraction and cooperatively develop procedures to mitigate and monitor the attractant. **For Part 139 Certificated airports, immediate actions are required in accordance with 139.337(a).**

4.7 FAA Assistance.

If there is a question on the implementation of any of the guidance in this section, contact the FAA Regional Airports Division for assistance.

[4] Recommended survey protocols can be found in AC 150/5200-38, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans,* and DeVault, T.L., B.F. Blackwell, and J.L. Belant, eds. 2013. *Wildlife in Airport Environments: Preventing Animal–Aircraft Collisions through Science-Based Management.* Johns Hopkins University Press, Baltimore, MD, USA. 181 pp.

4.7.1 Airport Documentation Procedures.

Airports should document on-site and off-site wildlife attractants as part of their "Wildlife Hazard Management Plan Annual Review," "Wildlife Hazard Management Plan Review Following a Triggering Event," and the airport's Continual Monitoring Annual Report (as outlined in FAA Advisory Circular 150/5200-38). As a best management practice, airports may choose to keep a log to track contacts from landowners or managers, permitting agencies, or other entities concerning land uses near the airport.

APPENDIX A. DEFINITIONS OF TERMS USED IN THIS ADVISORY CIRCULAR

A.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 14 C.F.R. Part 139.
6. **Construct a new municipal landfill.** 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 municipal landfill.** 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 operating under 14 CFR Part 91.
11. **Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral and domesticated animals, not under control that may pose a direct hazard to aviation (i.e., strike risk to aircraft) or an indirect hazard such as an attractant to other wildlife that pose a strike hazard or are causing structural damage to airport facilities (e.g., burrowing, nesting, perching).
12. **Municipal Landfill.** 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. A municipal landfill 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. A municipal landfill can consist of either a stand-alone unit or several cells that receive household waste.

13. **New municipal landfill.** 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 where 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 more than 48 hours.
22. **Risk**. Risk is the relationship between the severity and probability of a threat. It is the product of hazard level and abundance in the critical airspace, and is thus defined as the probability of a damaging strike with a given species.
23. **Runway protection zone.** 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.
24. **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).

25. **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)
26. **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).
27. **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 Clean Water Act, or source, special nuclear, or by product material as defined by the Atomic Energy Act of 1954.(40 CFR § 257.2).
28. **Turbine-powered aircraft.** Aircraft powered by turbine engines including turbojets and turboprops but excluding turbo-shaft rotary-wing aircraft.
29. **Turbine-use airport.** Any airport that sells fuel for fixed-wing turbine-powered aircraft.
30. **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, as defined by Section 212 of the Clean Water Act. 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 publicly owned treatment system. (See 40 CFR § 403.3 (q), (r), & (s)).
31. **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. 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).
32. **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 aircraft operations area. These attractants can include architectural features, landscaping, waste disposal sites, wastewater treatment facilities, agricultural or aquaculture activities, surface mining, or wetlands.

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

34. **Wildlife strike.** A wildlife strike is deemed to have 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:

        i. 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, unless another reason for the animal's death is identified or;

        ii. On a taxiway or anywhere else on or off airport that there is reason to believe was the result of a strike with an aircraft.

    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, aircraft left pavement area to avoid collision with animal).

APPENDIX B. ADDITIONAL RESOURCES

B.1 Regulations

- 14 CFR § 139.337, *Wildlife Hazard Management*
- 40 CFR § 258, *Criteria for Municipal Solid Waste Landfills*

B.2 Advisory Circulars

- AC 150/5200-32, *Reporting Wildlife Aircraft Strikes*
- AC 150/5200-33, *Hazard Wildlife Attractants on or Near Airports*
- AC 150/5200-34, *Construction or Establishment of New Landfills Near Public Airports*
- 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*
- AC 150/5200-38, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans*
- AC 150/5220-25, *Airport Avian Radar Systems*
- AC 150/5210-24, *Airport Foreign Object Debris (FOD) Management*

B.3 Certification Alerts

- Certalert No. 97-09, *Wildlife Hazard Management Plan Outline* (11/17/1997)
- Certalert No. 98-05, *Grasses Attractive To Hazardous Wildlife* (9/21/1998)
- 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* (11/21/2006)
- Certalert No. 13-01, *Federal and State Depredation Permit Assistance* (1/30/2013)
- Certalert No.14-01, *Seasonal Mitigation of Hazardous Species at Airports: Attention to Snowy Owls* (2/26/2014)
- Certalert No. 16-03, *Recommended Wildlife Exclusion Fencing* (8/2016)

B.4 Airport Cooperative Research Program Reports

These, and other wildlife / aviation reports, are available from the Transportation Research Board of the National Academies (TRB) at http://www.trb.org/Publications/Publications.aspx.

- ACRP Research Report 198: Wetland Mitigation, Volume 2, A Guidebook for Airports (2019)
- ACRP Synthesis 92: Airport Waste Management and Recycling Practices (2018)
- ACRP Research Report 174: Guidebook and Primer (2018)
- ACRP Report 122: Innovative Airport Responses to Threatened / Endangered Species (2015)
- ACRP Report 125: Balancing Airport Stormwater and Bird Hazard Management (2015)
- ACRP Report 145: Applying an SMS Approach to Wildlife Hazard Management (2015)
- ACRP Synthesis 39 Report: Airport Wildlife Population Management (2013)
- ACRP Synthesis 52 Report: Habitat Management to Deter Wildlife at Airports (2014)
- ACRP Synthesis 23 Report: Bird Harassment, Repellent, and Deterrent Techniques for Use on and Near Airports (2011)
- ACRP Report 32: Guidebook for Addressing Aircraft/Wildlife Hazards at General Aviation Airports (2010)

B.5 Manuals

- Wildlife Hazard Management at Airports - A Manual for Airport Personnel (2005)

B.6 Orders

- 50 CFR § 21.49, Control Order for Resident Canada Geese at Airports and Military Airfields
- 50 CFR § 21.50, Depredation Order for Resident Canada Geese Nests and Eggs
- 50 CFR § 21.43, Depredation Order for Blackbirds, Cowbirds, Crows, Grackles, and Magpies
- 50 CFR § 21.54, Control Order for Muscovy Ducks in the United States
- 50 CFR § 21.55, Control Order for Invasive Migratory Birds in Hawaii

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) 267-5257.

Subject: AC 150/5200-33C 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: _____

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.

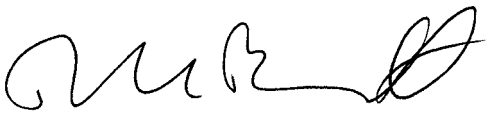
Under § 44718(d), as amended, the FAA Administrator may approve an exemption from the statute's landfill location limitations. Section 44718(d), as amended, permits the aviation agency of the state in which the airport is located to request such an exemption from the FAA Administrator. Any person desiring 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: 01/24/2019 **AC No:** 150/5200-36B
Initiated By: AAS-300

1 PURPOSE.

1. This Advisory Circular (AC) has two purposes. First, this AC describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments (WHA) for airports.
2. Second, this AC addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel who implement Wildlife Hazard Management Plans (WHMPs).

2 APPLICABILITY.

The Federal Aviation Administration (FAA) recommends that public-use airport operators fulfill the standards and practices contained in this AC. The holders of Airport Operating Certificates issued under Part 139, Subpart D, may use the standards, practices, and recommendations contained in this AC to comply with the wildlife hazard management requirements of Part 139. The FAA also recommends the guidance in this AC for persons wishing to conduct Wildlife Hazard Assessments and for those who help prepare Wildlife Hazard Management Plans or conduct the requisite training.

3 CANCELLATION.

This AC cancels AC 150/5200-36A, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports,* dated January 31, 2012.

4 PRINCIPAL CHANGES.

The following changes have been incorporated:

1. Paragraph 2, Applicability–Language changed back to original language in AC 150/5200-36 in order to be consistent with current recommended language.
2. Paragraph 7.3 (3)–Revised the following requirement to be a qualified airport wildlife biologist: While working under the direct supervision of a qualified wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)).
3. The revision of this requirement is necessary following the completion of all initial Wildlife Hazard Assessments at Part 139 certificated airports as per §139.337(b). The FAA recognizes that the opportunities to meet this requirement are now limited. The FAA is providing additional options to meet this requirement.

5 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)].

6 RELATED READING MATERIAL.

6.1 Please review the most recent versions of the following documents:

1. FAA AC 150/5200-18, *Airport Safety Self-Inspection.*
2. FAA AC 150/5200-32, *Reporting Wildlife Aircraft Strikes.*
3. FAA AC 150/5200-33, *Hazardous Wildlife Attractions On or Near Airports.*
4. FAA AC 150/5200-34, *Construction or Establishment of Landfills Near Public Airports.*
5. FAA AC 150/5200-38, *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments and Wildlife Hazard Management Plans*.
6. FAA AC 150/5210-20, *Ground Vehicle Operations on Airports.*
7. FAA AC 150/5220-25, *Airport Avian Radar Systems.*
8. FAA AC 150/5300-13, *Airport Design.*
9. FAA AC 150/5340-1, *Standards for Airport Markings.*
10. FAA AC 150/5340-18, *Standards for Airport Sign Systems.*

11. FAA Office of Safety and Standards, CertAlert 98-05, *Grasses Attractive to Hazardous Wildlife.*

12. FAA Office of Safety and Standards, CertAlert 16-03, *Recommended Wildlife Exclusion Fencing.*

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

14. 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.

15. Dolbeer, R. A., J.R. Weller, A.A. Anderson and M.J. Begier. 2016. W*ildlife Strikes to Civil Aircraft in the United States, 1990 – 2015.* FAA National Wildlife Aircraft Strike Database Serial Report #22.

16. 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.

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

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

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

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

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

22. Aeronautical Information Manual (AIM).

6.2 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/airport_safety/wildlife/resources/.

7 PROFESSIONAL QUALIFICATIONS OF WILDLIFE BIOLOGISTS CONDUCTING WILDLIFE HAZARD ASSESSMENTS AND WILDLIFE HAZARD MANAGEMENT TRAINING AT FAA CERTIFICATED AIRPORTS.

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

> Section 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.

7.2 Airports with a FAA-approved Wildlife Hazard Management Plan must provide employees the training needed to carry out 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.

7.3 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:
   a. Have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in Section 139.337) or,
   b. Conducted at least one year of continual wildlife hazard monitoring at a certificated airport using FAA-approved methodology (FAA AC 150/5200-38, Ch. 4).
4. Have successfully completed at least one of the following within 5 years of their initial FAA approved airport wildlife hazard management training course, and every 5 years thereafter:
   a. An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix C), or
   b. Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting, or
   c. Other training acceptable to the FAA Administrator.

7.4 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.

7.5 Certificate Holders or Airport Sponsors must obtain documentation verifying the qualifications outlined in paragraph 7.3 (1) – (4) above of any person(s) conducting wildlife hazard assessments or providing requisite training. Documents such as training certificates, transcripts, diplomas, letters from employers, etc. are acceptable to verify professional qualifications.

7.6 Holders of Airport Operating Certificates issued under Part 139 must retain records documenting the airport wildlife biologist(s) qualifications to conduct Wildlife Hazard Assessments. These records must be retained for 2 years.

8 INITIAL AND RECURRENT TRAINING FOR AIRPORT PERSONNEL ACTIVELY INVOLVED IN MANAGING HAZARDOUS WILDLIFE ON OR NEAR AIRPORTS.

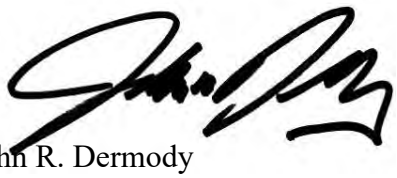
8.1 Personnel actively involved in implementing FAA-approved Wildlife Hazard Management Plans are subject to the requirements of 14 CFR Part 139.303. Section 139.303 requires a specific training regimen for all airport personnel. Section 139.303(c) and (e) require the holder of an Airport Operating Certificate 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)].

8.2 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.

8.3 Section 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 by title or position who must complete the required training.

8.4 Section 139.337(f) does not prohibit holders of Airport Operating Certificates from using a "train-the-trainer" approach when providing the requisite training. The trainers must receive and successfully complete initial and recurrent training every 12 consecutive months, which includes a discussion of the trainer's airport wildlife hazard assessment and wildlife hazard management plan, from a qualified airport wildlife biologist. Trainers who are not qualified airport wildlife biologists are limited to providing training to their airport employees.

8.5 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)].



John R. Dermody
Director, Office of Airport Safety and Standards

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

A.1 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 9 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 9 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 9 semester hours in wildlife subjects, 12 semester hours in zoology, and 9 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

B.1 The following training resource requirements and instructor qualifications are for individuals 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.

B.2 Training Resources and Requirements.

B.2.1 A list of training program providers acceptable to the FAA Administrator can be found on the FAA's wildlife strike website: https://www.faa.gov/airports/airport_safety/wildlife/resources/#training.

B.2.2 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/airport_safety/wildlife/resources/.

B.2.3 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 at a minimum all curriculum items 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

B.2.4 The goal of the training must be to provide the knowledge, skills, and abilities needed by a 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.

B.3 Instructor Qualifications.

The lead instructor for the training should:

1. Be a qualified airport wildlife biologist.
2. Have a minimum of 2 years' experience in all aspects of managing hazardous wildlife on or near airports.

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

C.1 Training Curriculum Outline.

The goal of the training must be to provide the knowledge, skills, and abilities needed by a 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.

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

b. Animal Damage Control Act of 1931, as amended

c. Bald Eagle Protection Act of 1940, as amended

d. Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended

e. National Environmental Policy Act of 1969, as amended

f. Endangered Species Act of 1973, as amended

g. Title 14, Code of Federal Regulations, Part 139, Certification of Airports

h. Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills

i. Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management

j. 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

k. Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management

l. Applicable FAA Airport CertAlerts

m. Applicable state and local laws, regulations, and ordinances

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

7. Other Federal and State agency roles and responsibilities

   a. U.S. Department of Interior, Fish and Wildlife Service

      i. Role and responsibilities related to managing problem wildlife

      ii. Migratory Bird Depredation Permits

      iii. Salvage Permits

      iv. Bald and Golden Eagle Protection Act Permits: 50 CFR§ 22.26 *(Permits for eagle take that is associated with, but not the purpose of, the activity)* and 50 CFR § 22.27 *(Removal of Eagle Nests)*

   b. U.S. Department of Agriculture, Wildlife Services

      i. Role and responsibilities related to managing problem wildlife

   c. Other agencies

      i. U.S. Environmental Protection Agency

         (1) Siting landfills

         (2) Pesticide registration and use

      ii. U.S. Army Corps of Engineers

         (1) Wetlands mitigation

   d. Multi-Federal Agency Memorandum of Agreement

e. Applicable State wildlife regulations

8. FAA National Wildlife Strike Database
   a. Strike reporting
   b. Species identification and feather identification
   c. Database access
9. Environmental issues—working with Federal and State agencies
   a. National Environmental Policy Act
   b. Endangered Species Act (threatened and endangered species consultation)
   c. U.S. Army Corps of Engineers (wetland loss and wetland mitigation)
10. Initial consultations and Wildlife Hazard Assessments (WHAs)
   a. Triggering events for WHAs
   b. Duration and contents of WHAs
   c. Wildlife surveys at airports to assess wildlife hazards
   d. Data analysis and presentation of results
   e. Writing a WHA
11. FAA review of a WHA and determination of need for a Wildlife Hazard Management Plan (WHMP)
12. Drafting and carrying out integrated WHMPs
   a. Contents of WHMPs
   b. FAA review of WHMPs
   c. National Environmental Policy Act review
   d. Compliance with the Endangered Species Act, and other special purpose environmental laws and regulations
13. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics
   a. Flight schedule modification
   b. Habitat modification and exclusion
   c. Wildlife dispersal techniques
   d. Wildlife population management
14. Addressing off-airport attractants and community planning and involvement
15. Outline of field trip (to conduct a “mini” WHA)
16. Field trip/site visit
17. Final exam

18. Post exam review
19. Course evaluation
20. Presentation of certificates

C.2 **Recommendations.**

1. Exams or tests may be oral, written, practical demonstrations, or a combination of each.
2. Passing grade/evaluation should be recorded and retained as instructor's records.
3. Instructors should retain course attendance records for a period of 2 years.

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

D.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:

1. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report.
2. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months.
3. Review of the airport's Wildlife Hazard Assessment is to include—
   a. Existing wildlife hazards and trends in wildlife abundance.
   b. Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months.
4. Review of the airport's Wildlife Hazard Management Plan, to include the following:
   a. Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.
   b. Review of the airport's wildlife permits (local, State, and Federal).
   c. Review of other airport-specific items:
      i. Wildlife hazard management strategies, techniques, and tools:
         (1) Flight schedule modification
         (2) Habitat modification, exclusion
         (3) Repelling methods
         (4) Wildlife population management
      ii. Responsibilities of airport personnel for—
         (1) Reporting wildlife strikes, control actions, and wildlife observations
         (2) 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
         (3) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts
         (4) Documenting and reporting when no hazards are seen during patrols and inspections

5. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern.
6. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual[1]:
   a. Safety, parts, and operation of pyrotechnic launchers.
   b. Fundamentals of using pyrotechnics to safely and effectively disperse wildlife.
   c. Personnel protective equipment.
   d. Cleaning, storage, and transport of firearms and pyrotechnic launchers.
   e. Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics.[2]
   f. Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors.
   g. 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.[3]
7. Any other training required by local, State, or Federal regulations.

D.2 **Recommendations.**

1. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.
2. The Trainer should retain passing grades/evaluations records.
3. The Trainer should retain course attendance records for a period of 2 years.
4. 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 6 months after termination of employment.

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[1] 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] Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: https://www.atf.gov/explosives/explosives-pest-control-device-requirements.

[3] 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 Certified National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

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 Engineering Division, Federal Aviation Administration ATTN: AAS-300, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of the Office of Airport Safety and Standards at (202) 267-5257.

Subject: AC 150/5200-36B 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: _____

Appendix C WILDLIFE STRIKE REPORTING MATERIALS

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

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-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.

General Information for Collecting Birdstrike Material

Feather Identification Lab, Smithsonian Institution

COLLECTING REMAINS

Feathers:

Whole Bird: Pluck a variety of feathers (breast, back, wing, tail)
Partial Bird: Collect a variety of feathers with color or pattern
Feathers only: Send all materials
Do not cut feathers from the bird (we need the down at the base)
Do not use any sticky substance (no tape or glue)
Place remains in a re-closeable bag
Allow remains to dry before sealing bag.

Blood / Tissue ("Snarge"):

Place dry snarge in a re-closeable bag
If need, wipe off with alcohol wipe or paper towel sprayed with 70% alcohol
Please do not use water or bleach – it is not compatible with our dna analysis

- Include copy of FAA 5200-7 report
- Include contact information

SHIPPING

Routine / Non-Damaging Cases: *US Postal Service*

Feather Identification Lab
Smithsonian Institution
NHB E600, MRC 116
P.O. Box 37012
Washington, DC 20013-7012

Priority / Damaging Cases: *Overnight Shipping*

Feather Identification Lab
Smithsonian Institution
NHB, E600, MRC 116
10th & Constitution Ave., NW
Washington, DC 20560-0116

WEBSITES

Civil Aviation:	http://wildlife-mitigation.tc.faa.gov
Birdstrike Committee:	www.birdstrike.org

Feather Lab Contact Information

202-633-0801
dovec@si.edu
heackerm@si.edu

* Basic safety measures and good hygiene when collecting material is encouraged. Use latex gloves, face mask and eye protection; always thoroughly wash hands after handling remains.

HOW TO COLLECT BIRDSTRIKE EVIDENCE

BIRDSTRIKE SAMPLE

Whole Feathers

If both whole feathers & "snarge" are available, collect both types of evidence. *"The more the merrier"*

Tissue / Blood "Snarge"

Whole Carcass

Feather Fragments

Pull (don't cut) variety of feathers: breast, back, wing, tail.

Collect as much material as possible.

Wipe/scrape off all material. If need, spray area with alcohol to loosen material then wipe off. Do not use water or bleach.

- **Allow samples to dry**
- **Include FAA form 5200-7**
- **Include contact info**

REGULAR SHIPMENT:

Smithsonian Institution
Feather Identification Lab
E600, MRC 116
P.O. Box 37012
Washington, DC 20013-7012

OVERNIGHT SHIPMENT:

Smithsonian Institution
Feather Identification Lab
E600, MRC 116
10th & Constitution Ave, NW
Washington, DC 20560

"MAKE-YOUR-OWN" - BIRDSTRIKE COLLECTING KITS

Birdstrike Collecting Kits are cheap to make and easy to assemble. Having pre-made kits available improves birdstrike reporting and encourages the sampling of birdstrike remains. Most folks assemble the contents into individual bags or envelopes and keep a supply in field vehicles or office supply cabinets for quick access. Below is a list of recommended items to include in your birdstrike collecting kits; mix and match as budgets permit:

Re-sealable Plastic Bags

A variety of sizes; Re-sealable bags help contain liquids and keeps odors to a minimum.

Sharpie Markers

Permanent markers are water resistant and used for writing data (date, time, aircraft, etc) directly on the bag of remains.

Alcohol Wipes

Pre-packaged alcohol hand-wipes can be used to wipe "snarge" off aircraft. Alcohol is better than water at preserving DNA, preventing mold growth, and is more sanitary for humans. Alternatively, use a spray bottle with 70% alcohol to spray the area before wiping with paper towels. Do not use bleach wipes, it destroys DNA. .

Miscellaneous Items for Birdstrike Collecting

Kitchen shears – good for cutting feet, wings, bills

Tongue depressors, tweezers, cotton swabs/cotton-tipped applicators

Hand cleaners, or other alcohol based gel hand sanitizers.

FTA® DNA collecting cards: If you send a lot of blood/tissue ("snarge") samples for DNA identification, you may want to look into 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 on ordering these items contact the Feather Lab.

Note: If you only occasionally send blood/tissue samples - a paper towel with alcohol, or alcohol wipe is still a good option for blood/tissue samples.

(collecting kit cont.)

Extra Safety Items

Latex Gloves

Protective Eyewear

Face masks: If avian flu is a concern, the Center for Disease Control recommends NIOSH rated N95 face masks. (These may be referred to as respirators.) There is a disposable version of these masks by 3M that looks similar to the regular "cup" style face masks.

Reminders

Always encourage proper hygiene & provide personnel easy access to cleaning/hygiene supplies

Do not cut off the fluffy down at the bottom of feathers

Do not use bleach on samples

Be sure personnel are briefed on proper carcass disposal protocols

Stay informed to the status of HPAI H5N1 avian flu virus. The following website has excellent coverage:

The American Ornithologists' Union Ornithological Council
http://www.nmnh.si.edu/BIRDNET/OC/avianinfluenza.html

Contact Information

Feather Identification Lab	202-633-0801
Carla Dove	dovec@si.edu
Marcy Heacker	heackerm@si.edu

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

Federal Aviation Administration

National Part 139 CertAlert

AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

Date: **01/30/2013** **No. 13-01**

To: **Part 139 Airport Operators**

Subject: **Federal and State Depredation Permit Assistance**

Point of Contact: John R Weller, AAS-300, 202-267-3778
Email: john.weller@faa.gov

1. Purpose. This CertAlert provides assistance to airport operators with the acquisition of Federal or State depredation permits.

2. Background. Airports should maintain Federal and State depredation permits when lethal or other permitted techniques to reduce wildlife threats are necessary. Most wildlife under the purview of Federal or State agencies require special permits if an airport operator has decided to lethally control, take, possess, or transport the hazardous wildlife for depredation control. Nonlethal, non-injurious methods of exclusion, harassment, or dispersal may be used without a depredation permit to reduce or eliminate threats from wildlife[1].

To aid airport operators in the acquisition of depredation permits, the FAA has provided contact information for each State wildlife or natural resource agency web site (Attachment 1) and applicable information to acquire Federal depredation permits (Attachments 2, 3, and 4). Requirements for a State depredation permit vary from state to state. Some states may require fees or the acquisition of other permits or licenses (i.e., hunting licenses) when procuring a depredation permit.

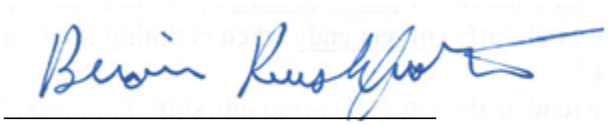
Federally protected species require consultation and permitting through the U.S. Fish and Wildlife Service (USFWS). The regulations governing migratory bird permits can be found in 50 CFR part 13 (General Permit Procedures) and 50 CFR part 21 (Migratory Bird Permits). Generally, no permit is required to harass or disperse depredating migratory birds other than endangered or threatened species, species of special concern, and bald or golden eagles. Also, the USFWS requires a Migratory Bird Damage Project Report (WS Form 37) prepared by the

[1] The taking (the definition of which includes harassment and lethal removal) of game (including birds) in Alaska is regulated by Alaska Statute 16.05.920 *Prohibited Conduct Generally* and Title 5 Alaska Administrative Code 92.033 *Permit For Scientific, Educational, Propagative, Or Public Safety Purposes.*

U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services. Wildlife Services provides their recommendation for depredation problems on WS Form 37. Separately, endangered or threatened species, species of special concern, and bald or golden eagle mitigation also requires special permits.

The amount of time necessary to acquire a depredation permit depends on several factors. These may include the type of permit (Federal or State), time of year the permit application is submitted, and proper completion of the application forms (i.e., inclusion of WS Form 37 for Migratory Bird Permits). Associated requirements of certain State wildlife permit offices may involve prior acquisition of a Migratory Bird Permit, hunting license, Federal Duck Stamp, and Upland Gamebird, Migratory Gamebird, and Sandhill Crane permits. Airports that have an urgent need to expedite the procurement of a depredation permit should communicate this to the permitting office(s). If it is necessary in the interim, airports should maintain mitigation techniques that do not require a permit and/or acquire assistance from professionals who have the proper authority.

3. Actions. If an airport experiences delays or requires assistance to expedite the permitting process, they are advised to notify their regional FAA office. FAA Airport Certification Safety Inspectors will verify, when applicable, that airports have obtained proper local, State, and Federal wildlife control permits.



January 30, 2013

Brian Rushforth, Manager
Airport Safety and Operations Division, AAS-300

DATE

ATTACHMENT 1 - STATE FISH, WILDLIFE AND NATURAL RESOURCE AGENCY WEB SITES

Alabama – http://www.dcnr.state.al.us/agfd	Alaska – http://www.state.ak.us/adfg
Arizona – http://www.gf.state.az.us/	Arkansas – http://www.agfc.com/
California – http://www.dfg.ca.gov/	Colorado – http://wildlife.state.co.us/
Connecticut – http://www.ct.gov/dep/site/	Delaware – http://www.dnrec.delaware.gov/fw/
Florida – http://myfwc.com/	Georgia – http://www.gadnr.org/
Hawaii – http://www.hawaii.gov/dlnr/	Idaho – http://fishandgame.idaho.gov/
Illinois – http://www.dnr.illinois.gov	Indiana – http://www.in.gov/dnr/fishwild/
Iowa – http://www.iowadnr.com/index.html	Kansas – http://www.kdwpt.state.ks.us/
Kentucky – http://www.kdfwr.state.ky.us/	Louisiana – http://www.wlf.louisiana.gov/
Maine – http://www.maine.gov/ifw/	Maryland – http://www.dnr.state.md.us/
Massachusetts – http://www.mass.gov/dfwele/dfw/	Michigan – http://www.michigan.gov/dnr
Minnesota – http://www.dnr.state.mn.us/index.html	Mississippi – http://mdwfp.com/
Missouri – http://mdc.mo.gov/	Montana – http://fwp.mt.gov/
Nebraska – http://outdoornebraska.ne.gov/	Nevada – http://ndow.org/
New Hampshire – http://www.wildlife.state.nh.us/	New Jersey – http://www.state.nj.us/dep/fgw
New Mexico – http://www.wildlife.state.nm.us/	New York – http://www.dec.ny.gov/
North Carolina – http://www.ncwildlife.org/	North Dakota – http://gf.nd.gov/
Ohio – http://www.dnr.state.oh.us/wildlife/	Oklahoma – http://www.wildlifedepartment.com/
Oregon – http://www.dfw.state.or.us/	Pennsylvania - http://www.pgc.state.pa.us/portal/server.pt/community/pgc/9106
Rhode Island - http://www.dem.ri.gov/	South Carolina – http://www.dnr.sc.gov/
South Dakota – http://gfp.sd.gov/	Tennessee – http://www.state.tn.us/twra/
Texas – http://www.tpwd.state.tx.us/	Utah – http://wildlife.utah.gov/dwr/
Vermont – http://www.anr.state.vt.us/	Virginia – http://www.dgif.state.va.us/
Washington – http://wdfw.wa.gov/	West Virginia – http://www.wvdnr.gov/
Wisconsin – http://www.dnr.state.wi.us/	Wyoming – http://wgfd.wyo.gov/web2011/home.aspx

ATTACHMENT 2 - UNITED STATES FISH AND WILDLIFE SERVICE MIGRATORY BIRD PERMITS REGULATION 50 CFR § 21.41

Title 50: Wildlife and Fisheries

CHAPTER I: UNITED STATES FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

SUBCHAPTER B: TAKING, POSSESSION, TRANSPORTATION, SALE, PURCHASE, BARTER, EXPORTATION, AND IMPORTATION OF WILDLIFE AND PLANTS

PART 21: MIGRATORY BIRD PERMITS

Subpart D: Control of Depredating and Otherwise Injurious Birds

21.41 - Depredation permits.

(a) Permit requirement. Except as provided in §§ 21.42 through 21.46, a depredation permit is required before any person may take, possess, or transport migratory birds for depredation control purposes. No permit is required merely to scare or herd depredating migratory birds other than endangered or threatened species or bald or golden eagles.

(b) Application procedures. Submit application for depredation permits to the appropriate Regional Director (Attention: Migratory bird permit office). You can find addresses for the Regional Directors in 50 CFR 2.2. Each application must contain the general information and certification required in § 13.12(a) of this subchapter, and the following additional information:

(1) A description of the area where depredations are occurring;

(2) The nature of the crops or other interests being injured;

(3) The extent of such injury; and

(4) The particular species of migratory birds committing the injury.

(c) Additional permit conditions. In addition to the general conditions set forth in part 13 of this subchapter B, depredation permits shall be subject to requires, in this section:

(1) Permittees may not kill migratory birds unless specifically authorized on the permit.

(2) Unless otherwise specifically authorized, when permittees are authorized to kill migratory birds they may do so only with a shotgun not larger than No. 10 gauge fired from the shoulder, and only on or over the threatened area or area described on the permit.

(3) Permittees may not use blinds, pits, or other means of concealment, decoys, duck calls, or other devices to lure or entice birds within gun range.

(4) All migratory birds killed shall be retrieved by the permittee and turned over to a Bureau representative or his designee for disposition to charitable or other worthy institutions for use as food, or otherwise disposed of as provided by law.

(5) Only persons named on the permit are authorized to act as agents of the permittee under authority of the permit.

(d) Tenure of permits. The tenure of depredation permits shall be limited to the dates which appear on its face, but in no case shall be longer than one year.

[39 FR 1178, Jan. 4, 1974, as amended at 42 FR 17122, Mar. 31, 1977; 63 FR 52637, Oct. 1, 1998]

ATTACHMENT 3 – APPLICATION FOR USFWS MIGRATORY BIRD DEPREDATION PERMIT

Department of the Interior
U.S. Fish and Wildlife Service

OMB Control No. 1018 - 0022
Expires 02/28/2014

Federal Fish and Wildlife Permit Application Form

Click here for addresses.

Return to: U.S. Fish and Wildlife Service (USFWS)

Type of Activity: **Migratory Bird Depredation Permit**

_____ 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. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)
6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.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		
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 if you are applying for a new permit or $50.00 if you are requesting a substantaive amendment to your existing permit. If you are a homeowner requesting a permit for damage to your personal residence or property, attach $50.00.** 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 (**in blue ink**) of applicant/person responsible for permit (No photocopied or stamped signatures) Date of signature (mm/dd/yyyy)

Please continue to next page

E. MIGRATORY BIRD DEPREDATION PERMIT
(Migratory Bird Treaty Act, 50 CFR 21.41)

A Federal Migratory Bird Depredation Permit is required to capture or kill migratory birds for depredation control purposes. The permit authorizes certain management and control activities necessary to provide for human health and safety, protect personal property, or allow resolution of other injury to people or property. No permit is required merely to scare or herd depredating migratory birds other than endangered or threatened species and bald or golden eagles. You should apply for a depredation permit only after non-lethal management proves unsuccessful. If a permit is issued, you will be expected to continue to integrate non-lethal techniques when implementing any lethal measures. You must be at least 18 years of age to apply.

Protected Species: The species listed in the Code of Federal Regulations at 50 CFR 10.13 are protected under the Migratory Bird Treaty Act. A list of species in the U.S. and their status under the MBTA is available at the following website: http://www.fws.gov/migratorybirds/issues/nonnative/MBTA-protected&NonprotectedSpecies.htm.

Resident Canada goose nests & 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 on-line at https://epermits.fws.gov/eRCGR in lieu of obtaining a depredation permit.

Note: 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. You may 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). This form and a copy of any required State permits must accompany your application. (This form is not required for resident Canada goose egg addling/destruction/OvoControl™G.)

Please provide the following information numbered according to the questions below on a separate sheet of paper. You should be as specific as possible in your responses. You should submit your application at least 60 days prior to the date that you need your permit (50 CFR 13.11(c)).

1. List the species of migratory birds causing the depredation problem and estimate the number of each involved.

2. Provide the exact location of the property or properties where the control activity would be conducted (State, county, and physical address of the specific site).

3. Description of damage.
   (a) Describe the specific migratory bird damage or injury you are experiencing.
   (b) How long has it been occurring (e.g., the number of years)?
   (c) What times or seasons of the year does it occur?
   (d) Describe any human health and safety hazards involved.
   (e) Provide details such as types of crops destroyed, human injuries sustained, property damage incurred, and health and safety hazards created.

4. 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.

5. Describe the nonlethal measures you have taken to control or eliminate the problem, including how long (e.g., a week, month, year(s)) and how often they have been conducted. List the techniques you have tried, such as harassment (e.g., horns, pyrotechnics, propane cannons), habitat management (e.g., vegetative barriers, longer grass management, fencing), cultural practices (e.g., crop selection and placement, management of pets and feeding schedules), or no feeding policies.

6. Proposed actions.
   (a) What actions are you proposing to take to alleviate the problem (e.g., kill, eliminate nesting, trap and relocate)?
   (b) Describe the method you propose (e.g., shoot; addle, oil, destroy eggs; trap and relocate; trap and donate birds to a food processing center).
   (c) If you propose to trap birds, describe the method that will be used and your (or your agent's) experience with the method.

7. What long-term measures do you plan to take to eliminate the problem?

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 an approved Wildlife Hazard Management Plan.

9. Anyone who will be acting as your agent or assisting you with the activities authorized by your permit must be authorized as a subpermittee under your permit. As the primary permittee, you will be legally responsible for ensuring that your subpermittees comply with the terms of your permit. List the name of anyone who will be directly involved in doing the work to resolve your problems. Include any commercial company that may be contracted to conduct the work.

10. You must retain records 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:

_____

11. 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

12. Attach a copy of the completed Wildlife Services Permit Review Form (Form 37) prepared by USDA, APHIS, Wildlife Services providing their recommendation regarding your depredation problem.

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, and in 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 in blue ink. 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 in blue ink.** 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 E.

Please continue to next page

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.gpoaccess.gov/cfr/index.html and http://www.fws.gov/permits/ltr/ltr.html.)

   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), 50CFR 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 a 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 General Accounting 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. The burden for recordkeeping varies from 15 minutes for individuals to 30 minutes for businesses. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the 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, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

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 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].

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 Fax (503) 231-2019 Email *permitsR1MB@fws.gov*
Region 2	**Arizona, New Mexico, Oklahoma, Texas**	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email *permitsR2MB@fws.gov*
Region 3	**Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin**	5600 America Blvd. West Suite 990 Bloomington, MN 55437-1458 (Effective 5/31/2011)	Tel. (612) 713-5436 Fax (612) 713-5393 Email *permitsR3MB@fws.gov*
Region 4	**Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico**	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 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 Fax (413) 253-8424 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 Fax (303) 236-8017 Email *permitsR6MB@fws.gov*
Region 7	**Alaska**	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email *permitsR7MB@fws.gov*
Region 8	**California, Nevada**	2800 Cottage Way Sacramento, CA 95825	Tel. (916) 978-6183 Fax (916) 414-6486 Email*permitsR8MB@fws.gov*

ATTACHMENT 4 – USDA / APHIS / WILDLIFE SERVICES CONTACT INFORMATION FOR WS FORM 37 *MIGRATORY BIRD DAMAGE PROJECT REPORT* (REQUIRED FOR COMPLETION OF USFWS MIGRATORY BIRD DEPREDATION PERMIT SECTION D-10)

Office	Director	Phone
Alabama, Virgin Islands, Puerto Rico	Frank Boyd	(334) 844-5670
Arkansas	Thurman Booth	(501) 835-2318
Florida	Edwin Hartin	(352) 377-5556
Georgia	Steve Smith	(706) 546-5637
Illinois	Scott Beckerman	(217) 241-6700
Indiana	Judy Loven	(765) 494-6229
Louisiana	Dwight LeBlanc	(225) 389-0229
Maine	John Forbes	(207) 629-5181
Maryland, Delaware, D.C.	Kevin Sullivan	(410) 349-8055
Massachusetts, Connecticut, Rhode Island	Monte Chandler	(413) 253-2403
Michigan	Peter Butchko	(517) 336-1928
Minnesota	Gary Nohrenberg	(651) 224-6027
Mississippi	Kris Godwin	(662) 325-3014
Missouri, Iowa	Seth Swafford	(573) 449-3033
New Hampshire, Vermont	Parker Hall	(603) 223-6832
New Jersey	Wendy Anderson	(908) 735-5654
New York	Martin Lowney	(518) 477-4837
North Carolina	Jon Heisterberg	(919) 786-4480
Ohio	Andy Montoney	(614) 861-6087
Pennsylvania	Harris Glass	(717) 236-9451
South Carolina	Noel Myers	(803) 786-9455
Tennessee, Kentucky	Brett Dunlap	(615) 736-5506
Virginia	Scott Barras	(804) 739-7739
West Virginia	Chris Croson	(304) 636-1785
Wisconsin	Jason Suckow	(608) 837-2727
Arizona	David Bergman	(602) 870-2081
California	Dennis Orthmeyer	(916) 979-2675
Colorado	Mike Yeary	(303) 236-5810
Hawaii, Pacfic Islands	Mike Pitzler	(808) 838-2840
Idaho	Todd Grimm	(208) 378-5077
Kansas	Tom Halstead	(785) 537-6855
Montana	John Steuber	(406) 657-6464
Nebraska	Tim Veenendaal	(402) 434-2340
Nevada	Mark Jensen	(775) 851-4848
New Mexico	Alan May	(505) 346-2640
North Dakota, South Dakota	Phil Mastrangelo	(701) 250-4405
Oklahoma	Kevin Grant	(405) 521-4039
Oregon	Dave Williams	(503) 326-2346
South Dakota	N/A	(605) 224-8692
Texas	Mike Bodenchuk	(210) 472-5451
Utah	Mike Linnell	(801) 975-3315
Washington, Alaska	Roger Woodruff	(360) 753-9884
Wyoming	Rod Krischke	(307) 261-5336

Federal Aviation Administration

National Part 139 CertAlert

AdvisoryCautionary**Non-Directive**Advisory**Cautionary**Non-Directive**Advisory**Cautionary**Non-Directive**

Date:	**February 26, 2014**	**No. 14-01**
To:	**Airport Operators, FAA Airport Certification Safety Inspectors**	
Subject:	**Seasonal Mitigation of Hazardous Species at Airports: Attention to Snowy Owls**	
Points of Contact:	John Weller, AAS-300, (202) 267-3778, John.Weller@FAA.gov Amy Anderson, AAS-300, (202) 267-7205, Amy.Anderson@FAA.gov	

1. **Purpose.** This CertAlert aims to heighten awareness of transient hazardous wildlife such as snowy owls (Bubo scandiacus). Although snowy owls at an airport may be a unique event, they should be prevented or discouraged from using airport environments because they pose a serious risk to aviation.

2. **Background.** Seasonal changes in wildlife populations directly impact safety at airports. These changes can include seasonal migrations, brood rearing and fledging, fawning, calving, and other cyclical events. These variations in wildlife populations often require airports to look for and potentially alter how they mitigate hazardous species to reduce the risk of strikes.

   Snowy owls periodically leave their northern breeding grounds en masse in movements called *irruptions* or *invasions*. These movements differ from seasonal migrations because they are unpredictable and not repeated annually. These irruptive migrations can greatly expand the winter distribution of the species. They represent a serious strike risk due to their size, flight characteristics, and behavior.

   Snowy owls are rarely observed in the contiguous United States and attract exceptional attention when they arrive. They are large, slow-flying birds that hunt close to the ground. They prefer open, expansive habitats. Snowy owls easily tolerate human activities. Many of their daily movements occur in the same airspace as an aircraft's take-offs and landings.

3. **Description.** The snowy owl stands almost 2 feet tall. Its wingspan exceeds 5 feet, and it weighs between 3 and 4 pounds. It is North America's heaviest owl and is commonly spotted during daylight hours. The plumage is largely white, with variable amounts of brown barring and spots.

Their diet is predominantly lemmings, when available. In the contiguous United States, their diet includes other small mammals and birds, including rodents, rabbits, squirrels, songbirds, waterfowl, and wading birds.

Snowy Owl (*Bubo scandiacus*). Photo credit: Christopher Castillo.

4. Actions. The snowy owl is protected by the Migratory Bird Treaty Act (MBTA) and as such may be harassed or dispersed from airport environments using non-injurious methods. If federally permitted actions are necessary, such as capture and relocation, then airports must apply for a U.S. Fish and Wildlife Service Depredation Permit. If possible, the snowy owls should be released far from any airport.

Airports should not support the presence of snowy owls even though it may be an uncommon, short-lived event. Airports should not encourage snowy owls to remain on-site through purposeful inaction, or create attractive habitats or feeding opportunities. At no time should anyone feed snowy owls in an airport environment. Such actions can result in hazards to aviation.

Brian Rushforth, Manager
Airport Safety and Operations Division, AAS-300

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 D TURNERS FALLS MUNICIPAL AIRPORT WILDLIFE HAZARD CONTROL REPORT FORMS

WILDLIFE REPORT

FOR DESIGNATED SURVEYS, SWEEPS, AND SIGNIFICANT EVENTS

Date	**Ground Conditions**	**Air Traffic Flow** (circle one)
Observer		East to West / West to East

Weather (precip., temp., cloud cover %, wind speed/dir., atm. press.)

Survey or Event:

Time	Animal	Number	Main Behavior	Main Attractant			Control Actions
Observer	Beaver		Resting	Runway/Taxiway			Lethal
Location	Deer		Feeding	Grass	<8"	>8"	Horn
(use diagram)	Turkey		Flyover (pass)		Mowed	Unmowed	Banger
	Coyote		Flyover (local)	Building			Screamer
	Fox		Hunting	Wetland			Cracker
	Duck		Moving	Woods/Shrubs			Shotgun
	Goose		Standing	Other			Vehicle
Wildlife Location	Eagle		Swimming				Other
(use diagram)	Hawk		Flyover Notes				**Action Result**
	Blackbird		Flight Height				Good
	Vulture		Flight Direction				Fair
	Killdeer		**Comments**				Poor
	Starling						None
	Other						Mortality
							Number Killed

Survey or Event:

Time	Animal	Number	Main Behavior	Main Attractant			Control Action
Observer	Beaver		Resting	Runway/Taxiway			Lethal
Location	Deer		Feeding	Grass	<8"	>8"	Horn
(use diagram)	Turkey		Flyover (pass)		Mowed	Unmowed	Banger
	Coyote		Flyover (local)	Building			Screamer
	Fox		Hunting	Wetland			Cracker
	Duck		Moving	Woods/Shrubs			Shotgun
	Goose		Standing	Other			Vehicle
Wildlife Location	Eagle		Swimming				Other
(use diagram)	Hawk		Flyover Notes				**Action Result**
	Blackbird		Flight Height				Good
	Vulture		Flight Direction				Fair
	Killdeer		**Comments**				Poor
	Starling						None
	Other						Mortality
							Number Killed

Significant Event Description (strike, near miss, or high numbers)

Animal	Aircraft			Airline Contact Info	Estimated Cost
Dead	Airline	Type	Flight #	Name	Estimated Downtime
Not Found				Phone	
Other	Parts Struck			Email	
Snarge					

Event	Effect on Ops	Runway	Taxiway	First Reported		Strike Area
Strike/Poss. Strike	Aborted takeoff	13-31	A	KCRA		AOA
Near Miss	Precautionary landing	3-21	B	Airline		<10,000'
Effect on Ops.	Engine malfunction		C	Other		>10,000'
Other	Other		D			

Important Telephone Numbers:

Appendix E SUPPLIERS FOR MATERIALS FOR MANAGING HAZARDOUS WILDLIFE

Provided below are resources for obtaining wildlife management equipment and supplies. This list was assembled based on an Internet search conducted by wildlife biologists at Stantec Consulting Services Inc. (Stantec). This list does not represent any endorsement of these suppliers by Stantec biologists.

Commercial Fencing (Local)

New England Fence Inc.
965 South St.
Pittsfield, MA
Phone: 413-442-8081
http://newenglandfencesite.com/index.html

River Valley Fencing
Deerfield, MA
Phone: 413-348-4071
https://rivervalleyfencing.com/

S & S Fence
Bennington, VT
802-688-5817
http://vtfence.com/index.html

Deterrents (Alarm, Exploders, Pyrotechnics, Chemical Repellants)

BirdBusters
Toll Free: (866) 915-8225
https://www.birdbusters.com/

Reed-Joseph International Company
800 Main Street
Greenville, MS 38701
Toll Free: (800) 647-5554
https://reedjoseph.com/

Bird-X, Inc.
845 N Larch Ave.
Elmhurst, IL 60126
Toll Free: 800.662.5021
https://bird-x.com/

Wildlife Control Supplies, Inc.
P.O. Box 538
East Granby, CT 06026
Toll Free: (877) 684-7262
https://www.wildlifecontrolsupplies.com/

Forestry Suppliers, Inc.
Toll Free: (800) 647-5368
https://www.forestry-suppliers.com/index1.php

Margo Supplies Ltd.
2727 N Lake Valley Rd.
Prescott Valley, AZ 86314
Toll Free: (888) 652-1199
Email: info@margosupplies.com
https://www.margosupplies.com/us-en/home/

Bird B Gone
15375 Barranca Pkwy # D
Irvine, CA 92618
Toll Free: (800) 392-6915
https://www.birdbgone.com/

BASF Corporation Pest Control Solutions
Product Directory Service:
Toll Free: (800) 669-2273
https://pestcontrol.basf.us/