



U.S. Department
of Transportation
**Federal Aviation
Administration**

Advisory Circular

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

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Change:

1 **Purpose.**

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

2 **Applicability.**

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

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 That term is outdated, and “qualified airport wildlife biologist,” which is used in this AC, has the same meaning for purposes of complying with part 139.

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

3 **Background.**

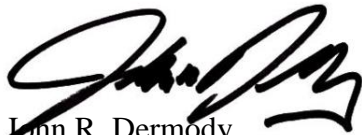
1. 14 CFR § 139.337, *Wildlife Hazard Management*, prescribes the specific reasons why an Assessment must be conducted and what subject matter is minimally required. While minimum standards for Assessments and Plans have existed in the past, there have not previously been standards on preferred methodologies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

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

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

4 **Feedback on this AC.**

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



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

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

1.1 Introduction.

- 1.1.1 Wildlife Hazard Site Visits can be beneficial for any airport. A Site Visit has three parts: (1) gathering airport information; (2) field observations; and (3) a final report with recommendations. Airports can use a Site Visit to quickly evaluate and mitigate potential hazards on and near airports. An airport can also use a Site Visit to determine whether an Assessment is necessary. An exception to this occurs if the airport is certificated and has had one of the events listed in § 139.337(b). Then the airport must conduct an Assessment⁴.
- 1.1.2 If an airport already has a Plan, airport management can use a Site Visit to investigate wildlife strikes to aircraft or see if the Plan needs to be updated. Airports can also use a Site Visit to decide if a proposed land use in the vicinity of an airport will increase the potential for wildlife hazards at the airport. For non-certificated airports that do not have a Plan, a Site Visit can provide a suitable basis to develop a basic Plan.
- 1.1.3 During the Site Visit, the QAWB collects and compiles information on the airport's wildlife hazard history, documented and suspected wildlife hazards, habitat attractants, control activities, airport operations and maintenance procedures, communications of hazards through ATC and pilots, aircraft operations and scheduling. A Site Visit is typically conducted over a period of one to three days. A QAWB evaluates the habitat on and surrounding the airport, and records direct or indirect wildlife observations. The QAWB also reviews the current Plan, current wildlife management activities, and airport wildlife strike data. Appendix B has a checklist that airports can use to ensure a complete and detailed Site Visit. The checklist can also be used to review the Site Visit protocol and report.
- 1.1.4 It is recommended that a QAWB conduct Site Visits. Standards for becoming a QAWB are found in AC 150/5200-36, *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculum for Airport Personnel Involved in Controlling Wildlife Hazards on Airports*.

1.2 Applicable Airport Information.

- 1.2.1 A QAWB may request the following information, if available, from the airport operator to prepare for a site visit:
1. Personnel and departments responsible for airport operations
 2. Number of aircraft operations per year

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

3. Type of operations (i.e., % private, civil, and military)
4. Recent airport construction or airfield changes
5. Past and present land management practices
6. Records of strikes and damage, flight delays, injuries, and fatalities due to strikes. Wildlife strike data may help determine hazardous species on an airport. Data on reported wildlife strikes are available through the FAA National Wildlife Strike Database (available at <http://wildlife.faa.gov>). Airports may maintain their own local database which can be compared with the National Database. It is recommended that a Site Visit include an analysis of wildlife strike records. If possible, include summaries of strike data by species, time of day, on and off-site airport locations, and weather conditions. At minimum, it is recommended that a wildlife strike analysis include, if available:
 - a. Bird and mammal species involved
 - b. Frequency distribution by month and year
 - c. Number per 10,000 aircraft movements
 - d. Location on the airfield
7. Any existing wildlife hazard management efforts and related maintenance procedures, if applicable – Records of past management efforts may be helpful during this initial consultation. It is recommended that attempts to exclude, deter, or remove wildlife from the airport be noted. If not already in place, it is recommended that a wildlife log be created and maintained by airport operations to document all wildlife activity observed on the airport.
8. Description of current wildlife hazard threats or concerns
9. Presence / absence of perimeter fence, condition of fence and its effectiveness⁵
10. Any current Federal and State depredation/ wildlife control permits and annual permit reports
11. Current U.S. Geological Survey (USGS) topographic maps, airport maps, and/ or aerial photographs
12. Other pertinent information present in airport records

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

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

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

1.3 **Observations.**

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

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

1.4 **Site Visit Report.**

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

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

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

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

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

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

2.1 Introduction.

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

2.1.2 The objective of an Assessment is to provide a baseline of data and understanding of wildlife species considered hazardous on or near an airport, and of attractants that provide food, water, and shelter⁸. An Assessment typically takes a year to complete. FAA recommends that assessment methodologies be reproducible. It is also recommended that data collection procedures such as point counts, trapping indices and vehicle routes be set up and used to allow future repetition for consistent, continued monitoring or comparison to previous findings. The Assessment identifies wildlife populations and trends at the airport, such as the location and seasonality of wildlife hazards. It also identifies how these fluctuations in behavior and abundance may affect aviation safety, with particular emphasis on wildlife strikes to aircraft. Assessments promote an integrated approach for wildlife mitigation to effectively:

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

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

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

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

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

2.2 **Requirements for Wildlife Hazard Assessments.**

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

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

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

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

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

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

2.3 Necessary Elements of a Wildlife Hazard Assessment.

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

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

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

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

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

2.4 Necessary Elements of a Wildlife Hazard Assessment Report.

- 2.4.1 The final Assessment report must discuss elements within § 139.337(c). If there was no triggering event or circumstance that prompted the Assessment, then the discussion of triggering event (required under § 139.337(c)(1)) may be omitted. Although there are many acceptable formats to present the findings of an Assessment, it must include those key components listed in § 139.337(c). The required components include sections summarizing methodologies, results, and any recommendations. The report should be submitted to the FAA regional office within 90 days following completion of field work and must contain the name of the QAWB who conducted the Assessment.
- 2.4.2 It is recommended that Assessment procedures such as point counts, trapping indices, vehicle routes, and avian radar be described to allow duplication of procedures for consistent, continued monitoring or comparison to previous findings. FAA recommends that the report include any maps, imagery and/or detailed descriptions whenever location information is necessary, such as assessment techniques, wildlife hazard attractants, or airport layout. **It is recommended the report cite the presence or absence of Federal or State listed species identified during the Assessment.** If enough data is available, it is recommended that the discussion include whether the species is resident on or near the airport or is considered transient to the location observed. The FAA recommends the report contain an evaluation of all available wildlife strike data for the airport. The National Wildlife Strike Database (<http://wildlife.faa.gov>) is available to the public and is the primary repository for wildlife strikes to civil aircraft in the U.S., although strike records may be available from other sources such as the airport, airlines and engine manufacturers. FAA

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

- 2.4.3 The analysis of strike data may include different methodologies that can provide a key component for a comprehensive risk analysis and assessment. Beyond descriptive statistics that summarize strike characteristics at an airport it is recommended that a QAWB determine the number of overall strikes and damaging strikes per number of operations.⁹ Another useful alternative for analysis may include determining the amount of biomass struck equated to number of operations or strikes. These analyses can provide a better understanding of risk and as a metric to evaluate the effectiveness of an airport's wildlife program.
- 2.4.4 Recommended actions for reducing identified wildlife hazards may include detailed, task-specific objectives or general measures. Pay attention to both proactive mitigation such as habitat modification and exclusion techniques, and reactive measures that involve harassment, dispersal and removal procedures. When applicable, airports are encouraged to maintain Federal and State depredation permits. Guidance for acquiring these permits is provided in FAA Certalert No. 13-01, *Federal and State Depredation Permit Assistance* (January 30, 2013).
- 2.5 **Minimum Number of Wildlife Surveys Required and Duration of Wildlife Hazard Assessment.**
- 2.5.1 Conducting an Assessment under § 139.337(c)(2) requires the “*identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences.*” The following protocols meet the requirements of § 139.337(c)(2). Alternative protocols may be proposed to the FAA and accepted if they are comparable.
- 2.5.2 In most cases, conducting a 12-month Assessment would meet this requirement so the seasonal patterns of birds and other wildlife using the airport and surrounding area can be documented. Most regions of the USA have dramatic seasonal differences in numbers and species of migratory birds. Even for non-migratory wildlife, such as deer and resident Canada geese, behavior and movement patterns can change significantly throughout the seasons.
- 2.5.3 To adequately identify wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences, the QAWB may choose from several objective standardized procedures. These standardized survey procedures ensure that QAWBs consistently collect quality, representative data for hazardous wildlife species in the airport environment. These procedures can then be repeated in future years for comparison. Appendix D is an example of a Wildlife Survey Data Sheet.

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

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

2.5.4.1 **Avian Surveys.**

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

2.5.4.2 **Mammalian Surveys.**

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

2.5.4.3 **Data from Other Sources.**

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

2.6 **Basic Wildlife Survey Techniques for Wildlife Hazard Assessments.**

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

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

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

2.6.1 Avian Survey.

- 2.6.1.1 Any standardized survey may be used provided it is designed to comprehensively identify wildlife on or near the airport. One objective procedure for assessing bird populations, based on the North American Breeding Bird Survey (BBS) methodology, is creating standardized survey points about half a mile apart throughout the airport. The number of observation points required to obtain adequate coverage of the sample area will depend on the size, complexity, and physical features of the airport. This is one example of a specific type of survey, however, and this particular survey is not required.
- 2.6.1.2 Using a standardized survey methodology gives a baseline estimate of bird species and numbers on the airport that can be compared with other airports and the same airport in the future. Data on species and numbers are collected from established observation points along a survey route. A survey is defined as one visit to all observation points along a survey route. A survey-day consists of one or more independent surveys conducted during one day (i.e., morning, midday, evening).
- 2.6.1.3 Although forested areas can provide attractive perching or roosting locations for hazardous avian species such as raptors and blackbirds, woodland interior birds are usually of limited concern unless they frequent open habitats which will be surveyed. In many cases, observation points in forested areas are more important for the systematic or ancillary identification of animals and less critical for identifying hazardous avian species. Data relating to forested areas may also be collected by general observations.
- 2.6.1.4 In addition, it is recommended that observation points also be considered at selected areas within five miles of the airport's AOA if the attractant could cause hazardous wildlife movement into or across the approach or departure airspace. Examples of such attractants include, but are not limited to large water impoundments, reservoirs, roosting sites, feedlots, landfills, and agriculture such as sunflowers. The observation points at these areas within the five miles do not need to be surveyed during every data collection trip, but it is recommended that they be surveyed at least quarterly.
- 2.6.1.5 One method used to conduct a survey would be to start at one end of the survey route and stop the vehicle at each observation point. Record the numbers and species of all birds heard at any distance and all birds detected visually (with or without binoculars) within a quarter-mile radius for 3-5 minutes. During the survey, significant birds (e.g., a flock of

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

- 2.6.1.6 QAWBs may choose to develop a coding procedure to record birds observed actually on or over a runway during the 3-5 minute observation periods. By knowing the percent of total airport runway area covered by the observation points, you can estimate the number of birds on or crossing the runways per hour. For example, if ten observation points on an airport survey route cover 25% of the runway area, and you recorded an average of 1.5 birds per 3-5 minute observation on or over a runway, then you would estimate that the airport averaged 120 birds on or crossing runways per hour. Assigning each bird or bird flock observed during a point count to a grid location can be useful in further refining spatial distributions of birds on the airport.
- 2.6.1.7 For the area within a ¼ mi. radius of each avian observation point, make a visual estimate of the proportion of each major habitat type [e.g., pavement, short (< 8 in.) grass, tall grass (>8 in.), water, shrub]. It may be useful to analyze data for certain species by observation point to associate that species with a certain habitat type or location on the airport. For example, if waterfowl are consistently observed at one observation point that has aquatic habitat, this should be stated in the analysis and presentation of results.
- 2.6.1.8 Ultimately, the overall survey design (i.e., number and location of survey points, frequency of survey counts per month, time between visits to airport) and analysis of data will vary between airports and depend on the individual airport's wishes. The focus of this AC is to provide minimum standards for data collection and identify limited examples of acceptable data collection techniques. Airports and QAWBs may choose to collect additional data or use more rigorous data collection techniques.¹¹

2.6.2 General Observations.

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

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

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

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

2.6.3 Data Recording.

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

2.6.4 Data Analysis and Descriptive Statistics.

- 2.6.4.1 Appropriate data analysis and interpretation helps accurately assess hazards and make management recommendations. Data also serves as a baseline from which the effectiveness of management actions can be measured.
- 2.6.4.2 For each survey, calculate the total and average number of birds observed per species and the number of observation points recording the species (frequency of sightings on the airport). The number of birds observed gives a measure of species density on the airport. The frequency of sightings at each location shows the distribution of the species on the airport. Surveys can then be grouped to calculate mean number and frequency of birds by species seen per survey by time of day, month, and season.
- 2.6.4.3 If desired, statistical tests used to identify significant differences among months or seasons can be conducted using analysis of variance (ANOVA) and chi-square calculations.

2.6.5 Seasonal Patterns.

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

2.6.6 Mammal Surveys.

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

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

2.6.6.3 **Vehicle Surveys.**

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

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

- 2.6.6.3.2 Observations may be performed starting one half hour after sunset and ending after two to three hours, or delayed, dependent on times of limited scheduled aircraft operations. In general, the survey route(s) should be run once per night, but multiple runs may be made if time permits. All mammals and birds observed should be recorded by species and location. It is recommended that the start and end time of each survey and total distance driven be recorded so that numbers seen per hour and distance can be calculated. FAA recommends that wildlife surveys be conducted in most types of weather according to schedule, but it may sometimes be necessary to postpone survey periods during severe weather. FAA further recommends that surveys not be conducted in excessive wind or heavy rain as mammal activity may be significantly affected by weather.
- 2.6.6.4 **Catch-Per-Unit-Effort (small mammals).**
- 2.6.6.4.1 Small mammal populations may be measured if birds of prey or mammalian predators occur in the strike record or if direct observations or alternative data suggest high predator densities. The number of transects and traps will depend on the size of the habitat being surveyed. Traps are generally set in daylight hours and checked within 24 hours. FAA recommends that transects be run for two to four consecutive nights in spring and again in autumn.
- 2.6.6.4.2 When checking traps, it is recommended that the following data be collected for each trap: status of trap (sprung or unsprung) and species, if any, captured. Trapping results are recorded, by species, as the number of animals caught per 100 adjusted trap nights. Small mammal trapping is not required. It is optional depending on the hazardous wildlife present at the airport.
- 2.6.6.5 **Spot Mapping.**
- Spot mapping consists of plotting on a grid map the location, date, and time of mammal observations and provides a general overview of mammal activity on the airport. Often airport operations officers, who are required to perform runway sweeps, can assist in collection of this data, as can

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

2.7 **Basic Habitat Surveys for Wildlife Hazard Assessments.**

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

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

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

2.7.3.1 **Pre-existing Habitat Data.**

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

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

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

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

2.7.3.2 **Descriptive Habitat Data.**

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

2.7.3.2.1 Natural Habitat Data.¹³

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

2.7.3.2.2 Artificial Environment Data.¹⁴

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

2.7.3.3 **Food.**

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

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

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

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

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

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

2.7.3.4 **Vegetation.**

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

2.7.3.5 **Water.**

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

2.7.3.6 **Structures.**

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

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

2.7.3.7 **Soil.**

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

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

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

2.7.3.8 **Spot Mapping.**

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

2.8 **Evaluation of Airport and Aircraft Operations.**

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

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

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

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

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

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

3.1 Introduction.

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

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

3.2 Wildlife Hazard Management Plan Regulatory Requirements and Methodology.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. Vegetative/prey food items for hazardous species

- a. Prey items (rodents, earthworms, insects)
 - b. Vegetative food items (grain/seeds, fruit, desirable grasses)
 - c. Garbage (handling, storage)
 - d. Handouts (feeding wildlife)
2. Vegetation management may include:
 - a. AOA vegetation
 - b. Drainage ditch vegetation
 - c. Landscaping
 - d. Agriculture
 3. Water management may include:
 - a. Permanent Water
 - b. Wetlands
 - c. Canals / ditches / streams
 - d. Holding ponds
 - e. Sewage (glycol) treatment ponds
 - f. Ephemeral water
 - g. Runways, taxiways, aprons
 - h. Other wet areas
 4. Airport buildings may include:
 - a. Airfield structures
 - b. Abandoned structures
 - c. Terminal
 - d. Airport construction
 - e. Leased facilities

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

This section provides a description of regulated and site-specific protocols for the communication and/or notification of wildlife control activities, identified and current wildlife hazards on or near the airport environment or imminent wildlife threats to aircraft operations on or near the airport. Protocols may include training in airport communication and the development of notification procedures for airport personnel and Air Traffic Control when wildlife control procedures are implemented or in response to immediate wildlife threats to safe air operations to ensure dispersal activities do not inadvertently increase wildlife hazards.

Communication and/or notification procedures within the Plan should recognize pilot reports, ATC advisories and NOTAMS and establish responsibilities for reporting wildlife strikes. This section may also provide equipment requirements that include radios, cellular phones, and lights and an official call list with numbers.

3.2.6 14 CFR 139.337(f)(6). “Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:”

At a minimum, the Plan must be fully reviewed once annually. This review must be documented and may be accomplished as a routinely scheduled event or following a triggering incident as defined in § 139.337(b)(1)-(3). The airport should maintain documentation of all triggering incidents and corresponding reviews of the Plan to ensure its effectiveness mitigating the hazardous species involved in the triggering incident. It is often helpful for the airport manager to appoint a Wildlife Hazards Working Group to periodically review the Plan and the Plan’s implementation to recommend further refinements or modifications. Appendix F is an example of a Plan review form.

3.2.6.1 **14 CFR 139.337(f)(6)(i). “The plans effectiveness in dealing with known wildlife hazards on and in the airport’s vicinity and:”**

Input should be provided from all airport departments, Air Traffic Control, and the QAWB as to the effectiveness of the Plan. Good records are necessary to properly evaluate the effectiveness of a program.

3.2.6.2 **14 CFR 139.337(f)(6)(ii). “Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.”**

3.2.6.2.1 The reevaluation, for example, should consider:

1. Number of times wildlife is seen on the AOA
2. Requests for wildlife dispersal from air traffic control, pilots, or others
3. Increased number of strikes

3.2.6.2.2 Section 139.337(f)(6) cannot be effectively implemented or evaluated without documentation of wildlife strikes. The effectiveness of a Plan to reduce wildlife hazards both on and near an airport and the reevaluation of all facets of damaging/nondamaging strikes from year to year require accurate and consistent reporting. Therefore, every Plan should include a commitment to document all wildlife strikes that occur within the separation distances described in sections 1-2 and 1-3 of Advisory Circular 150/5200-33 to better identify, understand and reduce threats to safe aviation.

- 3.2.7 14 CFR 139.337(f)(7) “A training program conducted by a wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.”

Initial and recurrent training conducted by a QAWB required under § 139.303 and described in AC 150/5200-36 should equip personnel actively involved in an airport’s wildlife hazard management program with sufficient resources needed to comply with the requirements in the Airport Certification Manual and the requirements of § 139.337. Personnel identified in § 139.337(f)(5)(i) should be considered for inclusion within this recurrent training. Pesticide user training and certification requires its own regulated training and certification schedule and should be monitored.

3.3 **Pertinent Laws and Regulations.**

Under § 139.337(e), the FAA may direct an airport operator to develop a Plan or to update an existing Plan. The FAA’s action in approving a Wildlife Hazard Management Plan submitted by an airport operator under part 139 is considered a Federal action, as defined in the Order 5050.4B, National Environmental Policy Act (NEPA) Implementing Instructions for Airport Actions, and Order 1050.1F, Environmental Impacts: Policies and Procedures. However, that Order also stipulates that “A grant to fund the preparation of a WHMP or the approval of that plan normally qualifies for categorical exclusion...”. The FAA may also have to delineate which specific measures within the plan may be implemented without further review, versus other measures that may require further interagency coordination and permitting. Such delineation would normally involve measures that have independent utility from one another. Below are some of the more common laws that may require coordination and/or consultation. Note that violations of some of these laws can result in significant fines and/or imprisonment, even for a first offense. Penalties increase substantially for additional offenses, and in some cases violations will be classified as felony criminal offenses.

3.3.1 The Endangered Species Act (Federal and similar State laws).

- 3.3.1.1 This paragraph generally outlines procedures for complying with Section 7 of the ESA, the Magnuson-Stevens Act, and state laws protecting wildlife. It also describes procedures for responding to requests by state wildlife agencies to facilitate and encourage habitats for State-listed threatened and endangered species or species of special concern that may occur on airports and pose a threat to aviation safety. It is the FAA’s responsibility as the action agency to determine whether the proposed Plan may affect federally protected species or habitat for such species on or near the airport. To make this determination, the FAA should first consult the USFWS Information for Planning and Consultation (IPAC) website (<https://ecos.fws.gov/ipac/>). This webpage will help FAA determine if a particular measure within a Plan may affect any federally listed species or critical habitat. If the FAA cannot determine the presence of federally listed or proposed species or designated or proposed critical habitat

occurring on or near the airport, the FAA representative may contact the local USFWS Ecological Services Field Office for additional assistance. In cases of doubt, contact APP-400 and the FAA Environmental Protection Specialists for further guidance about whether to seek assistance from the USFWS, National Marine Fisheries Service (NMFS), or relevant state and local wildlife agencies.

- 3.3.1.2 However, the airport's AOA is an artificial environment that has been created and maintained for aircraft operations. Because an AOA can be markedly different from the surrounding native landscapes, it may attract wildlife species that do not normally occur, or that occur only in low numbers in the area. Some of the grassland species attracted to an airport's AOA are at the edge of their natural ranges, but are attracted to habitat features found in the airport environment. Also, some wildlife species may occur on the airport in higher numbers than occur naturally in the region because the airport offers habitat features the species prefer. Some of these wildlife species may be Federal or State-listed threatened and endangered species or have been designated by State resource agencies as species of special concern.
- 3.3.1.3 Many agencies have requested that airport operators facilitate and encourage habitat on airports for state-listed threatened and endangered species or species of special concern. State-Listed threatened and endangered species and species of special interest are not afforded the level of protection of federally listed species. These species, or the habitat needed to support them should not be allowed on airport property if direct or associated hazards are caused by their promotion in the airfield environment. Managing the on-airport environment to facilitate or encourage the presence of hazardous wildlife species can create conditions that are incompatible with, or pose a threat to, aviation safety.
- 3.3.1.4 Airport sponsors should reevaluate existing and evaluate future agreements with Federal, State, or local wildlife agencies where the terms of the agreements are or may be contrary to federal obligations concerning hazardous wildlife on or near public-use airports and aviation safety. Whenever practicable, wetland mitigation for Federal or State-listed threatened and endangered species or species of special concern should be sited off-airport and outside separation distances recommended in AC 150/5200-33, *Hazardous Wildlife Attractants On or Near Airports*, Section 1.
- 3.3.1.4.1 Procedures for Federal Threatened and Endangered Species on Airports.
1. The ESA directs all Federal agencies to work to conserve endangered and threatened species, and to use their authorities to further the purposes of the Act. Section 7 of the Act, called "Interagency Cooperation," is the mechanism by which Federal agencies ensure the actions they take, including those they fund or authorize, do not

jeopardize the continued existence of any listed species. Section 7 of the ESA, as amended, sets forth requirements for consultation that a federal agency shall use if that agency believes a listed species or critical habitat for such a species may be in the area affected by the project. If the FAA determines that an action “may affect” a threatened or endangered species, then Section 7(a)(2) requires the FAA to consult with the USFWS or the NMFS, as appropriate, to ensure that any action the agency authorizes, funds, or carries out is not likely to jeopardize the continued existence of any Federally listed endangered or threatened species or result in the destruction or adverse modification of critical habitat. (The effects on fish, wildlife, and plants include the destruction or alteration of habitat and the disturbance or elimination of fish, wildlife, or plant populations). If the Secretary of the Interior has developed a recovery plan for an affected species pursuant to section 4(f) of the ESA, that plan should be reviewed by FAA environmental protection specialists to ensure that assessments of impacts from FAA actions consider the management actions and criteria for measuring recovery identified in the plan. If a species has been proposed for Federal listing as threatened or endangered, or a critical habitat has been proposed, section 7(a)(4) states that each agency shall confer with the Services. Refer to the FWS and NMFS *“Endangered Species Consultation Handbook: Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act,”* March 1998.

2. Section 9 of the ESA prohibits a Federal agency from taking, without an incidental take permit, any listed species. Where a conservation plan has been developed pursuant to a permit under ESA section 10 (incidental take permit), the FAA environmental protection specialists should ensure that the impact analysis for the affected species contained in the NEPA document is consistent with the predicted impacts described in the conservation plan. Under the Magnuson-Stevens Act, Federal agencies must consult with the NMFS with regard to any action authorized, funded, or undertaken that may adversely affect any essential fish habitat identified under the Act. The consultation procedures are generally similar to ESA consultation requirements.
 - a. **No Consultation Required.** If there are no federally listed or proposed species or designated or proposed critical habitat occurring on or near the airport and the FAA has determined there is no effect to a listed species, no further action is required to fulfill the ESA.
 - b. **Consultation May Be Required.** If federally listed or proposed species or designated or proposed critical habitat occur on or near the airport, the following additional actions may need to be taken.

- i. If the FAA determines that a particular measure proposed within the Plan may affect Federally listed or proposed species or designated or proposed critical habitat, then the FAA Regional Coordinator must contact the local USFWS Ecological Services Field Office/and or the NMFS Office responsible for section 7 consultations and coordinate to determine next steps. Depending on the nature of the effects, the FAA may informally or formally consult with the Services. Formal consultation occurs when the Federal agency makes a determination of “may affect, likely to adversely affect” a species. Informal consultation occurs if a Federal agency determines, and the service supports, a determination of “may affect, not likely to adversely affect.”
 - 1. The airport operator may need to prepare a Biological Assessment (50 CFR 402.13) assessing the effects of the particular measure in the Plan on the federally listed or proposed species or designated or proposed critical habitat. The airport operator would submit the Biological Assessment to the FAA along with the draft Plan. Under the ESA, it is FAA’s obligation to consult with the USFWS or NMFS. Therefore, the FAA must review the Biological Assessment and determine if it is accurate and adequate for use in Section 7 consultation with the appropriate Service.
- ii. FAA must complete the Section 7 consultation before the FAA tells the airport sponsor they may implement the particular measure(s) and the sponsor implements any actions in the Plan that may affect federally listed or proposed species or designated or proposed critical habitat.

3.3.1.4.2 Procedures for State Listed Species and Species of Special Concern on Airports.

If State-listed or proposed species or designated or proposed critical habitat occur on or near the airport, the airport operator shall take this information into consideration when developing its Plan. Because each State maintains requirements specific to its natural resources, it is recommended the airport operator: (1) coordinate with the State Department of Natural Resources to determine whether a Biological Assessment or monitoring program is required; (2) determine whether special permits are required to allow routine maintenance operations, harassment or other management alternatives involving the species.

3.3.2 The Bald and Golden Eagle Protection Act.

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), is another law that must be considered when evaluating the potential impacts of a proposed Plan. This law was enacted in 1940, and amended several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." For purposes of these guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

3.3.2.1 **50 CFR § 22.26.**

The regulation set forth in 50 CFR § 22.26 provides for issuance of permits to take bald eagles and golden eagles where the taking is associated with but not the purpose of the activity and cannot practicably be avoided. Most take authorized under this section will be in the form of disturbance; however, permits may authorize non-purposeful take that may result in mortality.

3.3.2.2 **50 CFR § 22.27.**

The regulation at 50 CFR § 22.27 establishes permits for removing eagle nests where: (1) necessary to alleviate a safety emergency to people or eagles; (2) necessary to ensure public health and safety; (3) the nest prevents the use of a human-engineered structure; or (4) the activity or mitigation for the activity will provide a net benefit to eagles. Only inactive nests may be taken, except in the case of safety emergencies. Inactive nests are defined by the continuous absence of any adult, egg, or dependent young at the nest for at least 10 consecutive days leading up to the time of take.

3.3.3 The Migratory Bird Treaty Act of 1918 (MBTA).

3.3.3.1 The MBTA (16 U.S.C. §§ 703–712) implements the convention for the protection of migratory birds between the United States and Great Britain (acting on behalf of Canada). The statute makes it unlawful without a waiver to pursue, hunt, take, capture, kill or sell birds listed therein

("migratory birds"). The statute does not discriminate between live or dead birds and also grants full protection to any bird parts including feathers, eggs and nests.

- 3.3.3.2 The USFWS issues permits for otherwise prohibited activities under the MBTA. These include permits for taxidermy, falconry, propagation, scientific and educational use, and depredation¹⁵, an example of the latter being the killing of geese near an airport, where they pose a danger to aircraft.

3.3.4 National Environmental Policy Act (NEPA) Review.

- 3.3.4.1 The FAA's approval of a Plan normally falls within the scope of a categorical exclusion under NEPA, as implemented by FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures* (July 16, 2015), paragraph 5-6.2.e, and FAA Order 5050.4B, *National Environmental Policy Act (NEPA) Implementing Instructions for Airport Projects* (April 28, 2006), paragraph 209b. To determine whether approval of the Plan qualifies for categorical exclusion, the FAA must determine whether the measures in the Plan involve extraordinary circumstances (see FAA Order 1050.1F, paragraphs 5-2 a and b, and FAA Order 5050.4B, paragraph 209b). Extraordinary circumstances include significant impacts on federally protected species, species of state concern, or habitat for such species.

1. The FAA may categorically exclude approval of the Plan itself under FAA Order 1050.1F.
2. In addition, however, the specific measures within the Plan must be examined for extraordinary circumstances.
3. If specific measures within the Plan involve extraordinary circumstances, the FAA may still approve the Plan as a whole, but must clearly delineate which specific measures may be implemented without further coordination or permitting from those that may need additional review.

- 3.3.4.2 Once a draft Plan is approved, the Plan is returned to the airport sponsor for inclusion in the airport's Airport Certification Manual and is enforceable. Appendix G is a template for a Letter of Approval. Appendix H is a template for a Letter of Mixed Approval.

¹⁵ For further information, see CertAlert No. 13-01, *Federal and State Depredation Permit Assistance* (01/30/2013). This CertAlert assists airport operators with the acquisition of Federal or State depredation permits.

CHAPTER 4. PROTOCOL FOR CONTINUAL MONITORING

4.1 Introduction.

4.1.1 When an airport completes an Assessment and Plan, it should consider implementing a continual monitoring program for wildlife hazards. A continual monitoring program is a best management practice and not a requirement. Recurrent wildlife monitoring would be outlined in the Plan. The goal of systematic, long-term wildlife hazard monitoring in an airport environment is to identify changes to wildlife composition, numbers, attractants, travel corridors and the general airport environment in a timely manner that can affect the presence or behavior of wildlife. Continual monitoring enhances safety because it allows the airport operator to regularly determine trends in wildlife, and target mitigation practices to reduce the possibility of strikes. The airport can use this information to quickly and efficiently implement mitigation techniques and evaluate the efficacy of its mitigation program. Ultimately, the frequent hazard identification and adaptable mitigation will reduce the likelihood of wildlife strikes. Additionally, continual monitoring should decrease the time, effort, personnel hours, and money spent on mitigation because hazards will be identified before they pose a high risk.

4.1.2 In contrast to an assessment or inventory of wildlife hazards in an airport environment, a monitoring program over time assesses changes and trends of the resources. It is recommended that consideration be given to data points and techniques tested and incorporated into an airport's Assessment for use in its long term monitoring protocol. Ultimately, the techniques used for long term monitoring may change over time dependent on the airports goals or management objectives, personnel changes, availability of improved methodologies or equipment, and recommendations based on systematic evaluation of the monitoring program.

4.2 Continual Monitoring Protocol.

It is recommended that the monitoring consist of monthly wildlife surveys and identification of significant changes to natural/ artificial habitats and other attractants.

4.2.1 Avian Surveys.

1. Twelve months data collection
2. Minimum one survey per month for each of the survey points during the diurnal periods of morning, midday and evening; unless the Assessment, strike records or monitoring data justifies the elimination of a survey time period (e.g., elimination of midday surveys).

4.2.2 Mammalian Surveys.

1. It is recommended that airports that have documented hazardous terrestrial mammals (e.g., deer or canids) conduct a minimum of one survey per quarter, and that airports without recognized terrestrial mammal hazards consider a minimum of 2 to 4 surveys throughout the year.

4.2.3 Monitoring of Airport Procedures.

It is recommended that monitoring airport procedures include:

1. ATC and airport “event logs” or wildlife management, patrol, monitoring logs
2. Wildlife/aircraft strike reports
3. Federal/State Depredation Permit use or Special Permit use (e.g., Eagle Disturbance or Nest Removal Permits)

4.3 **Continual Monitoring Annual Report.**

As part of a continual monitoring program, an airport should consider preparing an annual report to best evaluate the efficacy of its wildlife mitigation program summarizing:

1. Identification of the wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences
2. Identification and location of features on and near the airport that attract wildlife
3. Description of wildlife hazards to air carrier operations
4. Description of wildlife strikes during the year
5. Discussion of any significant modifications on or near the airport property
6. Summary of ATC and airport “event logs” or wildlife management, patrol, monitoring logs
7. Summary of Federal/State Depredation Permit use; Special Permit use (e.g., Eagle Disturbance or Nest Removal Permits)

APPENDIX A. COMPOSITE RANKING OF HAZARDOUS WILDLIFE SPECIES

Composite ranking (1 = most hazardous, 50 = least hazardous) and relative hazard score of 50 wildlife species with at least 100 reported strikes with civil aircraft based on three criteria (damage, major damage, and effect-on-flight). Data were derived from the FAA National Wildlife Strike Database, 1990–2012.¹

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

Wildlife species	% of strikes with:			Mean hazard level ⁵	Composite ranking	Relative hazard score ⁶
	Damage ²	Major damage ³	Effect on flight ⁴			
Peregrine falcon	8	2	5	5	20	9
Laughing gull	5	2	7	5	21	8
American robin	7	1	4	4	22	7
Snow bunting	1	1	9	4	23	7
Red fox	3	0	8	4	23	7
European starling	4	1	5	3	25	6
Amer. golden-plover	4	2	4	3	26	6
Barn owl	4	2	3	3	27	5
Upland sandpiper	4	1	4	3	27	5
Purple martin	5	1	2	3	29	5
Mourning dove	3	1	4	3	30	5
Red-winged blackbird	3	0	5	3	31	5
Woodchuck	2	0	4	2	32	4
Northern harrier	2	1	2	2	33	3
Chimney swift	2	0	2	1	34	2
Killdeer	1	0	2	1	35	2
House sparrow	2	0	1	1	35	2
Black-tailed jackrabbit	1	1	1	1	37	2
American kestrel	1	<1	2	1	38	2
Eastern meadowlark	1	<1	2	1	38	2
S.-tailed flycatcher	0	0	2	1	40	1
Horned lark	1	<1	1	1	41	1
Pacific golden-plover	1	0	1	1	41	1

Wildlife species	% of strikes with:			Mean hazard level ⁵	Composite ranking	Relative hazard score ⁶
	Damage ²	Major damage ³	Effect on flight ⁴			
Barn swallow	1	0	1	1	43	1
Savannah sparrow	1	0	<1	1	43	1
Common nighthawk	1	0	1	1	45	1
Tree swallow	0	0	1	<1	46	1
Burrowing owl	1	0	0	<1	46	1
Western kingbird	0	0	1	<1	48	0
Virginia opossum	1	0	0	<1	48	0
Striped skunk	0	0	0	0	50	0

Notes:

¹ Excerpted from Table 19 of Serial Report No. 19, "Wildlife strikes to civil aircraft in the United States, 1990-2012. U.S. Department of Transportation, Federal Aviation Administration, Office of Airport Safety and Standards, Washington, DC., USA. Refer to this report for additional explanations of criteria and method of ranking.

² Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

³ Aircraft incurred damage or structural failure, which adversely affected the structure strength, performance, or flight characteristics, and which would normally require major repair or replacement of the affected component, or the damage sustained made it inadvisable to restore aircraft to airworthy condition.

⁴ Aborted takeoff, engine shutdown, precautionary landing, or other negative effect on flight.

⁵ Based on the mean value for percent of strikes with damage, major damage (substantial damage or destroyed), and negative effect-on-flight.

⁶ Mean hazard level (see footnote 5) was scaled down from 100, with 100 as the score for the species with the maximum mean hazard level and thus the greatest potential hazard to aircraft.

APPENDIX B. AIRPORT WILDLIFE HAZARD SITE VISIT AND REPORT CHECKLISTS**Airport Wildlife Hazard Site Visit Checklist**

Airport Name:		
Date of Site Visit:		Time:
Airport Representative:		
Qualified Airport Wildlife Biologist:		
FAA Reviewer:		
	Y or NA	Comments
1.2 Applicable Airport Information		
Personnel and departments responsible for airport ops		
Type of airport/annual operations		
Recent construction or upgrades		
Strike records (in database and/or airport records)		
Wildlife hazard management efforts		
Description of current wildlife concerns		
Depredation permits		
Airport maps/aerial photographs		
1.3 Observations		
Birds (species, activity, location, type of habitat used, time and date of observations, status if listed species, and evidence of activity, i.e., fecal material, nests, tracks, etc.)		
Mammals (species, activity, location, type of habitat used, time and date of observations, status if listed species, and evidence of activity, i.e., scat, tracks, burrows, etc.)		
Habitat attractants on movement and non-movement areas (assess both natural and man-made attractants)		
Habitat attractants within the separation distances 5,000ft, 10,000 ft., 5 miles as described in AC 33 (assess both natural and man-made attractants)		

Airport Wildlife Hazard Site Visit Report Checklist

1.4 Site Visit Report	Y or NA	Comments
General airport information		
Strike data analysis		
List of bird/mammal species observed and times of observations		
State and federal status of species		
Description of habitat features (natural and man-made) that may attract wildlife within movement and non-movement areas		
Description of habitat features (natural and man-made) that may attract wildlife within the separation distances 5,000ft, 10,000ft and 5 miles		
Map of airport with location of wildlife attractants within the movement and non-movement areas		
Map of airport with location of wildlife attractants within the separation distances 5,000ft, 10,000ft. and 5 miles with the separation distances depicted		
Recommended actions for reducing identified wildlife hazards to air carrier operations		
Recommendation regarding whether a 12-month wildlife hazards assessment should be conducted or if an existing Wildlife Hazard Management Plan should be modified		

APPENDIX C. AIRPORT WILDLIFE HAZARD ASSESSMENT AND REPORT CHECKLISTS

Airport Wildlife Hazard Assessment Checklist

Airport Name:
Airport Representative:
Qualified Airport Wildlife Biologist:
Assessment Dates (Initiation/Completion):
Assessment Report – Date Completed:
Assessment Report – Date Approved by FAA:
FAA-Reviewer:

	Y or NA	Comments
Analysis of the event or circumstances that prompted the assessment		
Personnel and departments responsible for airport ops		
Type of airport/annual operations		
Recent construction or upgrades		
Strike data analysis (in database and/or airport records)		
Depredation permits		
Wildlife hazard management plan (if applicable)		
Review of current habitat management activities		
Review of current wildlife management activities		
Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences		
Assessment = Minimum of 12 consecutive months		
Locate standardized observation points on airport (observation points off airport are optional) to adequately observe wildlife and their movements		

	Y or NA	Comments
Point count surveys conducted morning, midday and evening		
Avian surveys conducted a minimum of twice monthly		
Mammal surveys conducted a minimum of once per quarter (4 total)		
Record results of point count surveys and all general wildlife observations. Include species, number of individuals, specific location, activity, direction of movement.		
Record presence of state and/or federally listed species		
Small mammal trapping (optional)		
Identification and location of features on airport that attract wildlife		
Identification and location of features near airport (within 5 miles) that attract wildlife		

Airport Wildlife Hazard Assessment Report Checklist

	Y or NA	Comments
Description and qualifications of biologist(s) who conducted the WHA.		
Analysis of the event or circumstances that prompted the study		
Personnel and departments responsible for airport operations		
Type of airport/annual operations		
Description of recent construction or upgrades, if any		
Strike data analysis (in database and/or airport records)		
Depredation permits (do they have valid permit)		
Wildlife hazard management plan (if applicable)		
Description of current habitat management activities		
Description of current wildlife management activities		
Identification of wildlife species observed and their numbers, locations, local movements, and daily and seasonal occurrences: <ul style="list-style-type: none"> • Description of methodologies used to collect data • Results of point count surveys and all general wildlife observations. Include species, number of individuals, specific location, activity, direction of movement and discuss the presence / absence of Federal or State listed species identified during Assessment • Results of mammal surveys. Include species, number of individuals, specific location, activity, direction of movement • Map of airport with location and description of observation points 		
Identification and location of features on and near the airport that attract wildlife: <ul style="list-style-type: none"> • Description of habitat features (natural and man-made) that may attract wildlife on the movement and non-movement areas 		

	Y or NA	Comments
<ul style="list-style-type: none"> • Description of habitat features (natural and man-made) that may attract wildlife within the 5,000ft, 10,000ft, and 5mile separation distances as described in AC 33 • Map of airport with location of wildlife attractants on movement and non-movement areas • Map of airport with location of wildlife attractants near airport within 5,000 ft, 10,000 ft, and 5mile separation distances (include the location of the separation distances relative to the airport) 		
<p>Description of the wildlife hazards to air carrier operations at the subject airport</p>		
<p>Recommended actions for reducing identified wildlife hazards to air carrier operations:</p> <ul style="list-style-type: none"> • List of prioritized recommendations that are unique to this airport (is a Section 7 Consultation required based on these recommendations?) 		

APPENDIX E. AIRPORT WILDLIFE HAZARD MANAGEMENT PLAN CHECKLIST

Airport Name:
Airport Representative:
Plan Preparation Date:
Plan FAA Review Date:
FAA Reviewer:

	Y or NA	Comments/Observations
BRIEF introduction describing hazards identified in the Assessment and the wildlife attractants on and near the airport		
<p>A list of individuals having authority and responsibility for implementing each aspect of the plan:</p> <ul style="list-style-type: none"> • Decision making roles and responsibilities including: Airport Director, Wildlife Coordinator, Operations Supervisor, Maintenance Supervisor, Security Dept., Planning Dept., Finance Dept., Wildlife Hazard Working Group • Other 		
<p>A list prioritizing the following actions identified in the Assessment and target dates for their initiation and completion:</p> <ul style="list-style-type: none"> • (i) Wildlife population management (list of problem wildlife populations and mitigation actions/target dates) • (ii) Habitat modification (list of wildlife attractants and mitigation actions/target dates) • (iii) Land use changes (list of land use on and near airport that attract wildlife and mitigation actions/target dates) • Ongoing data collection and analysis • Recordkeeping • Do any proposed activities require NEPA review or Section 7 Consultation with USFWS? 		

	Y or NA	Comments/Observations
Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits (Copies of all valid permits must be included in Plan)		
Identification of resources that the certificate holder will provide to implement the plan <ul style="list-style-type: none"> • Personnel • Field identification guides • Pyrotechnics • Vehicles • Pesticide and application equipment • Other (binoculars, traps, guns, radios, etc.) • Sources of supplies 		
Procedures to be followed during air carrier operations that at a minimum includes:		
(i) Designation of personnel responsible for implementing the procedures (Wildlife patrol staffing and primary responsibilities, hours of availability, etc.)		
(ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin <ul style="list-style-type: none"> • Routine inspection procedures, • Documentation of inspections and observations • Runway/taxiway sweeps, perimeter fence inspections 		
(iii) Wildlife hazard control measures <ul style="list-style-type: none"> • Monitoring • Recordkeeping • Dispersal/harassment procedures • Procedures for wildlife control during different seasons and heavy air traffic times 		
(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower		

	Y or NA	Comments/Observations
<ul style="list-style-type: none"> • Training in communication procedures • Procedures for immediate coordination and response to pilot-reported wildlife strikes or observations 		
Other		
Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following a triggering event		
Include a log at the beginning of the plan to record dates plan is reviewed and reason for review		
(i) The plan’s effectiveness in dealing with known wildlife hazards on and in the airport’s vicinity and (ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated <ul style="list-style-type: none"> • One or more meetings with Wildlife Hazard Working Group to review Plan • Procedures for documentation of wildlife observations and wildlife control activities • Protocol to meet training requirements 		
A training program conducted by a qualified airport wildlife biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan <ul style="list-style-type: none"> • Certification that training meets requirements in AC 150/5200-36 • Training participation documentation 		

APPENDIX F. AIRPORT WILDLIFE HAZARD MANAGEMENT PLAN REVIEW

Once a Wildlife Hazard Management Plan is in place, it must be evaluated every 12 consecutive months or following a triggering event as per 14 CFR part 139.337(f)(6). Those triggering events are:

- An air carrier aircraft experiences multiple wildlife strikes
- An air carrier aircraft experiences substantial damage from striking wildlife
- An air carrier aircraft experiences an engine ingestion of wildlife

The foundation for these evaluations is not only the documentation of wildlife strikes but the maintenance of consistent records of wildlife surveys and wildlife control activities. Based on the annual evaluation the WHMP should be updated as needed to ensure the information adequately addresses known wildlife hazards. As these changes are adopted, approved, and implemented at the airport, it is of the utmost importance that all documentation is well prepared and available during FAA inspections.

To assist airport operators in documenting this review, the following sample review forms are provided. One form is for the “annual” review (every 12 consecutive months), and one for a review following a triggering event. These forms represent examples and may be used as provided or modified to suit specific needs to review a Wildlife Hazard Management Plan.

Subject: Wildlife Hazard Management Plan Annual Review

Date: _____

Airport: _____

Airport ID: _____

On _____ we conducted the annual review of the Wildlife Hazard Management Plan, as per the requirements of 139.337(f) (6). General Information/ Significant findings:

- **Name of review coordinator-** (Person facilitating discussions and writing plan updates; usually the Wildlife Coordinator, Wildlife Biologist, or Airport Manager) & **participating airport personnel and representatives of other organizations** (As listed in 139.337(f)(1); may include members of airport management, the wildlife coordinator, airport operations/ wildlife staff, wildlife Biologist who conducted Wildlife Hazard Assessment, members of the wildlife hazard working group*). Attach a sign-in sheet.
- **Summary of results of annual data analysis-** Example: ranking of highest priority species based on the analysis. (Per standardized continual monitoring procedures of 139.337(f)(6); data for analysis may include logs of wildlife strikes, wildlife observations and control measures, standardized wildlife monitoring surveys, and wildlife data from off-airport sites of concern.)
- **Summary of progress and challenges in management of the most significant wildlife attractants and/or habitats on or near the airport -** (Review of habitat management priorities listed in 139.337(f)(2))
- **Summary of progress and challenges in direct wildlife hazard management (i.e., dispersals, strike response) on the airfield -** (Review of procedures to be followed during air carrier operations as listed in 139.337(f)(5))
- **Changes to management strategies identified**
- **Changes to documentation identified**
- **Changes to Wildlife Hazard Working Group membership or objectives identified**
- **Changes to airport training program identified**
- **Changes/ updates to Wildlife Hazard Management Plan identified**
(Submit any changes to the WHMP to the assigned FAA Airport Certification Safety Inspector)

 Airport Manager/Director

*The wildlife hazard working group is made up of representatives that own and/or manage properties, attractants, and habitats for wildlife (both on- and off-airport property) that impact airport safety. The function of the wildlife hazard working group, or the airport's relationships with such representatives, is to cooperatively address the airport's specific wildlife hazard issues. During the annual review of the Plan, the effectiveness in addressing the issues should be evaluated, with any needed changes documented.

Subject: Wildlife Hazard Management Plan Review Following a Triggering Event

Date: _____ Airport: _____ Airport ID: _____

On _____ we conducted a review of the Wildlife Hazard Management Plan, as per the requirements of 139.337(f) (6).

Description of Triggering Event:

- **Date/Time** - Provide details of the event which triggered the review. Attach strike report, if available and any pertinent information; runway used, airline, take-off, landing, species, damage, etc.

General Information/ Significant findings:

- **Name of review coordinator-** (Person facilitating discussions and writing plan updates; usually the Wildlife Coordinator, Wildlife Biologist, or Airport Manager) & **participating airport personnel and representatives of other organizations** (As listed in 139.337(f)(1); may include members of airport management, the wildlife coordinator, airport operations/ wildlife staff, wildlife Biologist who conducted Wildlife Hazard Assessment, members of the wildlife hazard working group*). Attach a sign-in sheet.
- **The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity-** Example: Review the current wildlife control log and evaluate recent strike reports or events. Make a determination as to whether the current program is working and what can be improved.
- **Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated** – Review assessment to determine if everything is being addressed that was previously identified as a hazard or if other species are now present. Note: If other/additional new species are now present on or in the vicinity of the airport, another Wildlife Hazard Assessment may be needed.
- **Summary of progress and challenges in direct wildlife hazard management (i.e., dispersals, strike response) on the airfield** - (Review of procedures to be followed during air carrier operations as listed in 139.337(f)(5))
- **Changes to management strategies identified**
- **Changes to airport training program identified**
- **Changes/ updates to Wildlife Hazard Management Plan identified**
(Submit any changes to the WHMP to the assigned FAA Airport Certification Safety Inspector)

Airport Manager/Director

The wildlife hazard working group is made up of representatives that own and/or manage properties, attractants, and habitats for wildlife (both on-and off- airport property) that impact airport safety. The function of the wildlife hazard working group, or of the airport's relationships with such representatives, is to cooperatively address the airport's specific wildlife hazard issues. During the annual review of the Plan, the effectiveness in addressing the issues should be evaluated, with any needed changes documented.

**APPENDIX G. LETTER OF APPROVAL OF WILDLIFE HAZARD MANAGEMENT PLAN
(WHMP) FOR AIRPORTS**



U.S. Department of Transportation
Federal Aviation Administration

Federal Aviation Administration
Regional Office

Address _____
City, State, Zip _____

Date

Name
Title
Airport
Address
City/State/Zip

Subject: Approval of Wildlife Hazard Management Plan (WHMP) for [Insert name of airport]

Dear _____:

The Federal Aviation Administration (FAA) has completed its review and approved the above-referenced Wildlife Hazard Management Plan (WHMP), as submitted to the FAA on [insert date]. The FAA based this approval on the adequacy of the WHMP to comply with the requirements of 14 CFR §139.337(f). The WHMP is a required element of the Airport Certification Manual (ACM) for your airport. Please insert this letter of approval and the attached plan to the ACM. We will retain one copy of this plan for our official file copy of your ACM.

The specific actions identified in the WHMP are categorically excluded from further National Environmental Policy Act (NEPA) review in accordance with FAA Order 1050.1F ("Environmental Impacts: Policies and Procedures"). The FAA's review included verification that there was no evidence of extraordinary circumstances in connection with any of the specific measures.

The FAA may have to reevaluate this environmental determination if environmental circumstances change or if new information becomes available that could bear upon particular actions. It is also important to note that the FAA has not evaluated the WHMP (or the specific actions it identifies) with respect to state, county or local requirements.

Any additions or modifications to the WHMP may require additional documentation and interagency coordination, particularly if resource categories of special concern (such as wetlands, floodplains, threatened/endangered species, cultural resources, etc.) are likely to be impacted. Such resources usually require permits or approvals from a Federal or State environmental resource agency.

It is the airport’s responsibility to initiate and complete required environmental coordination with the appropriate FAA Airports District Office (or Regional Office), as well as any other relevant Federal and State agencies prior to implementation of these actions.

However, nothing in this letter shall limit the legal authority or responsibility of the certificate holder to undertake operational safety measures that would not, on their own, trigger a Federal action for review and approval.

Approval of the WHMP does not constitute a commitment of Federal funds from the Airport Improvement Program (AIP) for any capital development projects. AIP funding requires evidence of eligibility and justification when a funding request is ripe for consideration. Please identify any such requests well in advance, typically as part of the periodic Capital Improvement Plan process, in order to ensure that you address all statutory and regulatory requirements, and technical and operational issues, in a timely manner.

Please include a copy of this letter when coordinating with FAA on any ALP changes or funding requests.

If you have questions or need more information, please contact me at (____) ____-____.

Sincerely,

Airport Certification/Safety Inspector

Enclosures

cc: _____, Manager, [insert] Airports District Office
_____, Environmental Protection Specialist
_____, Planning/Programming Specialist

**APPENDIX H. LETTER OF MIXED APPROVAL OF WILDLIFE HAZARD MANAGEMENT
PLAN (WHMP) FOR AIRPORTS**



U.S. Department
of Transportation
**Federal Aviation
Administration**

Federal Aviation Administration
Regional Office

Address _____
City, State, Zip _____

Date

Name

Title

Airport

Address

City/State/Zip

Subject: Mixed Approval of Wildlife Hazard Management Plan (WHMP) for [insert name of airport]

Dear _____:

The Federal Aviation Administration (FAA) has completed its review and approved the above-referenced Wildlife Hazard Management Plan (WHMP), as submitted to the FAA on [insert date]. The FAA based this approval on the adequacy of the WHMP to comply with the requirements of 14 CFR §139.337(f). The WHMP is a required element of the Airport Certification Manual (ACM) for your airport. Please insert this letter of approval and the attached plan to the ACM. We will retain one copy of this plan for our official file copy of your ACM.

Please note, however, that not all of the specific actions identified in the WHMP have full clearance to proceed into implementation. Certain action items and components (identified below) may require further review under the National Environmental Policy Act (NEPA) and/or other special purpose environmental laws or regulations. Future consideration of these action items and components, and any additions or modifications to the WHMP, may require additional documentation and interagency coordination, particularly if resource categories of special concern (such as wetlands, floodplains, threatened/endangered species, cultural resources, etc.) are likely to be impacted. Such resources usually require permits or approvals from a Federal or State environmental resource agency.

The following items and components are categorically excluded from further NEPA review in accordance with FAA Order 1050.1F (“Environmental Impacts: Policies and Procedures”). The actions that may proceed to implementation without further environmental review are:

1. [insert]
2. [insert]
3. [insert]

The FAA may have to reevaluate this environmental determination if environmental circumstances change or if new information becomes available that could bear upon particular actions. It is also important to note that the FAA has not evaluated the WHMP (or the specific actions it identifies) with respect to state, county or local requirements.

Although the following actions are included in the approved WHMP, they may require further review under NEPA and/or other special purpose environmental laws or regulations as discussed above:

- 1. [insert]
- 2. [insert]
- 3. [insert]

It is the airport’s responsibility to initiate and complete required environmental coordination with the appropriate FAA Airports District Office (or Regional Office), as well as any other relevant Federal and State agencies prior to implementation of these actions.

However, nothing in this letter shall limit the legal authority or responsibility of the certificate holder to undertake operational safety measures that would not, on their own, trigger a Federal action for review and approval.

Approval of the WHMP does not constitute a commitment of Federal funds from the Airport Improvement Program (AIP) for any capital development projects. AIP funding requires evidence of eligibility and justification when a funding request is ripe for consideration. Please identify any such requests well in advance, typically as part of the periodic Capital Improvement Plan process, in order to ensure that you address all statutory and regulatory requirements, and technical and operational issues, in a timely manner.

Please include a copy of this letter when coordinating with FAA on any ALP changes or funding requests.

If you have questions or need more information, please contact me at (____) ____-____.

Sincerely,

Airport Certification/Safety Inspector

Enclosures

cc: _____, Manager, [insert] Airports District Office
_____, Environmental Protection Specialist
_____, Planner

Advisory Circular Feedback

If you find an error in this AC, have recommendations for improving it, or have suggestions for new items/subjects to be added, you may let us know by (1) mailing this form to Manager, Airport Safety and Operations Division, Federal Aviation Administration ATTN: AAS-300, 800 Independence Avenue SW, Washington DC 20591 or (2) faxing it to the attention of AAS-300 at (202) 267-8663.

Subject: AC 150/5200-38

Date: _____

Please check all appropriate line items:

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows:

In a future change to this AC, please cover the following subject:
(Briefly describe what you want added.)

Other comments:

I would like to discuss the above. Please contact me at (phone number, email address).

Submitted by: _____

Date: _____