

# WILDLIFE HAZARD ASSESSMENT

For

## Grand Junction Regional Airport (June 2007 to May 2008)



Submitted by:

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Animal and Plant Health Inspection Service  
Wildlife Services  
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## ACRONYMS

GJT .....	Grand Junction Regional Airport
WHA .....	Wildlife Hazard Assessment
FAA .....	Federal Aviation Administration
FAR .....	Federal Aviation Regulations
WHMP .....	Wildlife Hazard Management Plan
WS .....	Wildlife Services
MOU .....	Memorandum of Understanding
AOA .....	Air Operations Area
CDOW .....	Colorado Division of Wildlife
USFWS .....	United States Fish and Wildlife Service
CFR .....	Codes of Federal Regulation
AC .....	Advisory Circular
AER .....	Approach End of Runway
MBTA .....	Migratory Bird Treaty Act



## 1.0 INTRODUCTION

Collisions between aircraft and wildlife (wildlife strikes) are a worldwide concern due to the loss in revenue stemming from costly repairs to aircraft (Milsom and Horton 1990, Linnell et al. 1996, Robinson 1997) and the reduction of public confidence in the air transport industry as a whole (Conover et al. 1995). Possibly the most important concern is the threat to passenger safety (Thorpe 1997). No airport or aircraft type are immune to the hazards of wildlife strikes. At Grand Junction Regional Airport (GJT), wildlife strikes are a concern. In the past five years (2005, 2006 and 2007) GJT has had several wildlife strikes, all of which were reported as unknown species and sometimes as vaguely as “bird or bat”. Although these strikes have not been reported as having caused extensive damage to any aircraft, the threat to public safety does exist. Certain factors that contribute to an increase in reported wildlife strikes include: trend toward more efficient and quieter jet aircraft; increased population size and distribution of wildlife species that are hazardous to aircraft; and continued increase in air traffic (Cleary and Dolbeer 2000, Richardson and West 2000, Thorpe 1998 in Cleary et al. 2006).

Wildlife strikes have occurred since the start of aircraft travel. Calbraith Rodgers, the first man to fly across the United States in a plane, was also the first to die as a result of a bird-aircraft collision. On April 3, 1912, Rodgers' Wright Pusher struck a gull, causing the aircraft to crash into the surf at Long Beach, California (Blokpoel 1976). More recently, on September 22, 1995 an Air Force Airborne Warning and Control System (AWACS) aircraft crashed, killing all twenty-four on board, after ingesting four Canada geese into its number one and two engines during takeoff from Elmendorf Air Force Base, Alaska (Gresh 1996, Ohashi et al. 1996). Not all wildlife strikes end up with human mortalities, a 22 year old pilot in Brazil lost an eye after his aircraft struck a flock of ravens and one of the birds came through the windscreen, hit the pilot in the face. The aircraft landed safely, however the pilot lost his eye and the aircraft experienced significant damage. Most wildlife strikes cause expensive damage to aircraft, although, indirect impacts cost substantial amounts of money as well. Indirect impacts include: modified flight schedules; closed runways; passenger delays; fuel dumping; and cost associated with time while plane is out of operation. Based on analysis of eleven years of wildlife strike data (1990-2000), the estimated cost associated with wildlife strikes to the U.S. civil aviation industry is in excess of 580,029 hours/year of aircraft down time, \$399.31 million/year in direct monetary losses and \$157.32 million/year in associated costs (Cleary et al. 2006). One can only expect that cost to be greater in 2008.

It is impossible to predict the reaction of any animal to the factors that are encountered on an airfield due to the differences in innate behavior from species to species and also due to numerous environmental factors constantly affecting any animal's behavior. A Wildlife Hazard Assessment (WHA) makes it possible to gauge a species' potential for a damaging collision with aircraft. By considering factors such as the body mass and density of the animal, its frequency on the airfield, the observed behaviors of the species, and its abundance and tendencies in the area, a prediction can be made concerning the risk species may pose on an airfield. Species discussed during this WHA ranked high in one or more of the above factors and are considered a potential hazard. As the hazards are discussed in this document, the realization that the following discussions of wildlife hazards focus on the *potential* for a damaging wildlife strike, but not necessarily the *probability* of such a strike needs to be taken into consideration. For the purposes of this WHA, a wildlife hazard is defined as: *A potential for a damaging aircraft collision with wildlife on or near an airport [14 CFR Part 139.337(a)(3)].*

The FAA is responsible for setting and enforcing the Federal Aviation Regulations (FAR) and policies to enhance public aviation safety. To ensure compliance with FAR Part 139.337 (Appendix A), the FAA requires certified airports to conduct an ecological study or a wildlife hazard assessment (WHA), and if necessary, establish a Wildlife Hazard Management Plan (WHMP) when any of the following events occur on or near an airport:

1. An aircraft experiences multiple bird strike or engine ingestion.
2. An aircraft experiences a damaging collision with wildlife other than birds.
3. Wildlife of a size or in numbers capable of causing an event described above is observed to have access to any airport flight pattern or movement area.

The FAA required a WHA be completed for GJT based on the third of these conditions.

A WHA is an understanding of potential wildlife hazards on an airport. It may also serve as the foundation for a thorough WHMP. Data for WHA's are recorded over a one-year period as per FAR part 139. This allows the biologists to observe seasonal fluctuations, daily behavior changes (such as feeding and roosting habits as well as attractant areas), as well as the abundance of migratory and resident species, in order to determine what specific attractants and patterns occur at an airport. Upon completion of the study, recommendations designed to reduce site-specific wildlife hazards are developed based on an analysis of the data collected. If it is determined from the WHA that significant wildlife hazards are present, the FAA may require a WHMP be written. Such a plan addresses the responsibilities, policies, and procedures necessary to reduce wildlife hazards. A WHMP is written in accordance with CFR 14, 139.337, subpart (e), and is the responsibility of the airport. The WHA for GJT was initiated June 2007 and ended May 2008.

### **1.1 Legal Authority of Wildlife Services**

The U.S. Department of Agriculture, Wildlife Services (WS) program has a Memorandum of Understanding (MOU) with the FAA that established a cooperative relationship between the FAA and WS for reducing wildlife hazards to aviation in a manner that benefits public safety and the airport (Appendix B). The MOU recognizes that WS has wildlife damage management expertise and therefore, may provide technical and operational assistance to reduce and assist in alleviating wildlife hazards at airports. This program/project must be funded by the airport or another entity. WS may conduct a WHA to serve as a basis for the WHMP, but the responsibility of development, approval, and implementation of the WHMP lies with the airport.

The primary statutory authority by which WS operates is the Animal Damage Control Act of March 2, 1931, as amended (7 U.S.C. 426-426c; 46 Stat. 1468). WS has the authority to cooperate with States, local jurisdictions, individuals, public and private agencies, organizations, and institutions while conducting a program of wildlife services **involving mammal and bird species** that are reservoirs for zoonotic diseases, **or animal species that are injurious** and/or a nuisance to, among other things, agriculture, horticulture, forestry, animal husbandry, wildlife, and **human health and safety**. WS Directive 2.305, *Wildlife Hazards to Aviation*, provides guidance for WS wildlife biologists in providing technical assistance or direct control to airport managers, State aviation agencies, the aviation industry, the FAA, and the Department of Defense regarding hazards caused by wildlife to airport safety.

WS is a non-regulatory, federal cooperative wildlife management program whose mission is to provide leadership in reducing conflicts between people and wildlife. A growing focus of WS is to help promote the safe operation of aircraft by working with airport management to document, assess and manage wildlife hazards at airports throughout the country.

The MOU and legislation allow WS to conduct initial on-site investigations, biological assessments (short-term studies), WHA's (ecological studies), wildlife management operations, and to assist airports with the development of a WHMP.

## **2.0 OBJECTIVES**

The Objectives of this WHA were to:

- Determine wildlife population parameters such as abundance and periods of peak activity, and movements, with a particular emphasis on species most threatening to aircraft and safety.
- Identify wildlife attractants at GJT and surrounding areas.
- Provide management recommendations for reducing wildlife hazards at GJT.
- Review available wildlife strike data records.
- Encourage wildlife strike education, recognition, and reporting.

## **3.0 STATUS OF WILDLIFE SPECIES AT GJT**

Federal, State and Local laws may be in place in order to protect most forms of wildlife and the habitats they occupy. Prior to any control measure taking place (lethal or non-lethal) observations should be conducted in order to identify any and all species that will be affected. Proper permits must be in place prior to conducting certain control activities. GJT is responsible for adhering to all current regulations regarding the species to be managed, control activities and methods to be used, and for obtaining the appropriate permits to take and/or harass the species to be managed. All avian species observed on and around GJT property during the course of this assessment, with the exception of European Starlings, feral pigeons (Rock Dove), and House Sparrows, are protected by either Federal or State regulations.

### **3.1 Federal Regulations**

The Migratory Bird Treaty Act (MBTA), the Lacey Act, the Endangered Species Act, and the Bald and Golden Eagle Protection Act all regulate the control of specific species and their habitats. These are the basis of most wildlife regulations that have been issued in the Codes of Federal Regulations (CFR'S). Several agencies share the responsibility of implementing and enforcing such regulations. U.S. Fish and Wildlife Service (USFWS) primarily enforce that of the MBTA as well as the Endangered Species Act. Permits are issued from the USFWS regional office for control actions involving species covered under the MBTA and must be renewed annually as well as all actions conducted under this act being reported at the expiration of the permit. USFWS also issues ninety-day (90) permits for the harassment of Bald and Golden Eagles which also require that all actions taken under the authority of the permit be reported at the end of the permit period. It should be noted that the term "migratory", as referred to in the Migratory Bird Treaty Act, does not necessarily mean that the species has to migrate. Common

Ravens and Black-billed Magpies which are year-round residents in Colorado are protected as a migratory species under this act.

GJT is currently acting under a USFWS Migratory Bird 'Depredation Permit'. This permit allows for the lethal take as well as hazing/harassment of specific species of migratory birds as well as the destruction of Cliff Swallow nests in order to reduce the chance of a serious threat to aviation at GJT. Throughout the duration of this assessment, lethal and non-lethal techniques were utilized as well as several nests destroyed. It is recommended that GJT obtain a permit annually. GJT must request at least thirty (30) days prior to the expiration of the current permit which expires at the end of each calendar year. This permit also includes conditions (50CFR 21.43 Standard Conditions) which state that GJT is required to document the activities conducted while acting under the authority of the permit to include type of action, species and numbers involved, and the status of the carcass of those lethally taken. These records should remain available in the event of an inspection.

### **3.2 State and local Regulations**

Colorado State Law regulates actions concerning game species including: small game (rabbits, coyotes, fox, raccoon, etc.; furbearers (beaver, skunks, badgers...); game birds (pheasant, quail, chucker, waterfowl...); and big game (deer, elk, pronghorn, bear...) The Colorado Division of Wildlife (CDOW) is responsible for any depredation permits which allow these animals to be taken to protect private property. The Endangered Species Act of 1972 affords protection to wildlife species in danger of becoming extinct. Colorado also maintains an endangered species list and a list of species of special concern, one such species is that of the "state threatened" Burrowing Owl found regularly in the spring, summer, and fall at GJT. GJT is not currently operating under any permits from CDOW. Should game species become an issue, GJT should contact the CDOW North West Regional Office in Grand Junction at (970) 255-6100 or visit the CDOW website at [www.wildlife.state.co.us](http://www.wildlife.state.co.us).

## **4.0 BACKGROUND**

### **4.1 Location of Grand Junction Regional Airport**

Grand Junction Regional Airport (GJT) is located on the North side of Grand Junction, CO. The entire airport property is approximately 2,700 acres. The Air Operations Area, or AOA, is nearly 535 acres. The AOA is fenced by a nine-foot security/perimeter fence made of chain-link and three strands of barbed-wire along the top around approximately 25%-30% of the 9.3 mile perimeter, the remainder of the AOA is fenced by a four-strand barbed-wire fence. There are two runways at GJT. The first is 11/29 which is paved and handles most operations. It is 10,500 feet long by 150 feet wide with 20 foot-wide paved shoulders. The second runway 4/22, which is a cross wind, paved runway, is 5,500 feet long by 75 feet wide. This runway is used only occasionally and mostly by general aviation.

GJT is surrounded on the north, west, and east sides largely by Bureau of Land Management (public) lands and mostly commercial to the south with a small parcel of irrigated agricultural property on the east side and one 35 acre parcel of agriculture to the south. The Highline canal flows along the south perimeter and up along the west end of the property. Interstate 70 provides a dividing line between the AOA and agriculture and residential to the south east, 27¼

road (a county maintained road) runs along the west boundary and merely 1000 feet off the approach end of runway (AER) 11. Several recently constructed storm-water retention ponds, 500 yards west of runway 4/22, were designed to drain within 48 hours when filled completely. Locations of such attractants as stormwater management ponds are mentioned in the Advisory Circular No. 150/5200-33B (Appendix C). These types of areas are known to attract wildlife. Refer to *Recommendations* (section 7.0) to address wildlife attracted to these areas.

GJT experiences approximately 78,000 movements per year. The majority of these flights take place from April through September. GJT contracted with WS, per agreement number 08-73-7308-031, to assist them with their WHA. During the course of this assessment, responsibility for managing airport wildlife hazards remained with the airport manager. Airport management chose to let WS address wildlife issues for the duration of the agreement. WS was present at GJT for a one year period from June 6, 2007 to June 6, 2008. Point-count surveys were conducted from June 6, 2007 to May 30, 2008.

During this assessment, direct control activities took place as necessary to reduce the potential of wildlife hazards. These activities included exclusion, hazing, trapping and shooting of wildlife that posed a direct hazard to aircraft. Also during the assessment, when particular habitats or certain wildlife attractants were identified, adjustments were made to reduce wildlife use. It should be noted when reviewing this WHA that these activities took place simultaneously with the data collection. Data reflects WS direct control. GJT's surroundings contain sufficient water and favorable wildlife habitat, which created a necessity for direct control of wildlife while performing the WHA.

#### **4.2 Habitat Description**

Habitat is known as the area which provides resources needed by a species to survive. The needed resources of any species can be broken down to food, water and cover/shelter. Species found at GJT, receive needed resources on or surrounding GJT property. In order to understand why species are attracted to GJT and analysis of these resources is needed.

#### **FOOD**

A variety of food sources exist at or surrounding GJT. The following is a description of food sources, where the attractant is found, wildlife species attracted, and season the attractant is available:

##### **Seeds**

Seed bearing grasses and forbs attract insects, small (sparrows, larks, European Starlings, etc.), medium (Mourning Doves, Rock Doves or "Pigeons", Loggerhead Shrikes, American Kestrels, etc.), and large-sized (Common Ravens, American Crows, etc.) birds, as well as small rodents (mice, rabbits and prairie dogs) seeking to feed on seeds and insects. Seeds are found spring through winter with the majority in the late summer through late fall. The areas where seeds are most common include the short grass and long grass, native shrubs (Grease-wood, Sage and Rabbit Brush) within the AOA, and surrounding recreational areas. Close by agriculture of corn as well as alfalfa and pasture grass also provide uncontrollable supplies of seed and cover.

### Small Mammals

Small mammals, such as prairie dogs, mice, and rabbits attract predators, such as Red Fox, and Coyote, raptors, vultures, and ravens. Small mammals prefer medium to long length grass and they can be found year-round throughout GJT.

### Fish and Insects

Fish and insects found in and around ponds, ditches, grasses and rivers, attract waterfowl, raptors (Eagles), shorebirds (Great Blue Herons, Belted Kingfishers and Killdeer) and swallows (Cliff, Barn, and Tree Swallows). Insects are most abundant during spring and summer months and into October where they congregate on asphalt to warm themselves. Fish are mainly present spring through fall within the Highline Canal.

### Birds

Sparrows, other small birds and waterfowl are prey species attracting fox, coyotes, raptors and ravens. Birds occupy all habitats at GJT. Songbirds are available mainly during spring, summer, and fall, whereas waterfowl are available year-round, but more abundantly spring through fall.

### Human Hand-outs

Pigeons, Red Fox and corvids (ravens, crows, and magpies) are attracted to and kept around by human hand-outs. Wildlife can become year-round residents as a result of human hand-outs. An example of this is the refuse left along side roads and on the BLM land to the west and north of the AOA, as well as dumpsters left open containing "leftovers" or "people food".

## WATER

Water attracts many species of wildlife. Water sources at GJT are used for drinking, though many wildlife use water for food and cover. The primary sources of water at GJT include retention ponds, irrigation ditches and various low collecting areas. During periods of sustained freezing, the amount of available drinking water is limited. Waterfowl were most commonly observed in "flowing water" and landscaped areas during the irrigation season, with shorebirds, swallows and blackbirds also being prevalent. Some form of water habitat is present near all of the south and west lying boundaries of the AOA while any given point on the AOA may hold water for several days after a storm due to poor drainage. The water here also contributes to the other habitat hazards of food and cover.

## COVER

Cover includes areas used by wildlife for nesting/burrowing, roosting (sleeping), loafing, and/or protection against predators and weather. The following is a description of the types of cover at GJT, the main wildlife species using them, and activity:

### Airport Facilities/Structures

Airport facilities and structures include hangars, the terminal building, lights, signs, fences (chain-link and barbed-wire) and culverts. Airport facilities and structures attract a variety of species including, but not limited to: pigeons; coyote; fox; sparrows; larks; corvids; and raptors. Loafing, roosting, nesting/burrowing and feeding were common activities associated with these types of cover.

### Open Water

Open water is water with an available surface for wildlife use. This would include retention ponds, irrigation reservoirs, irrigation ditches and low-washed out areas. Major species using open water include waterfowl (Canada Geese, Mallards and

American Coots) and shorebirds (Killdeer). These species were observed feeding, loafing, and roosting on the open water.

#### Short Grass and Long Grass

Blackbirds, corvids, doves, finches, larks and sparrows are attracted to short grass (3-7 inches) for feeding and loafing. Long grass (7- 14 inches) is generally found along fences, paved areas and the perimeter roads and buildings. This grass allows for cover for rodents, as well as larger mammals and birds for scavenging food. Long grass along the perimeter fence may also conceal areas where wildlife is gaining access to the AOA.

#### Trees and Shrubs

Trees and shrubs are common around GJT, especially along ditches, fences and the terminal. Raptors, corvids, blackbirds and sparrows utilize trees and shrubs for loafing, nesting and roosting. Rabbits also use the shrub thickets for feeding and cover, in turn attracting predators.

#### Miscellaneous Cover

Miscellaneous cover includes items such as the abandoned tanks, culverts, piles of concrete, gravel piles, asphalt millings, lighting on landside as well as airside, and shade hangars. These items may or may not be being used for everyday operations at the airport, but provide for species such as: fox, raptors, pigeons, swallows, blackbirds and provide corvids with places to loaf, feed, and nest/burrow.

## **5.0 METHODS**

To effectively assess wildlife hazards at GJT three different survey types were used. Each survey type was designed to meet the objective of determining wildlife hazards. The survey types used were standard point counts, spotlight surveys and general observation. All survey observations were recorded on a Standardized Point Count Survey form (Appendix D). A log of general observations was recorded separately.

### **5.1 Standardized Point Count Surveys**

To quantify wildlife abundance and seasonal occurrence point count surveys were conducted an average of 7 times per month. Surveys were conducted mostly during early morning and late afternoon hours, in order to obtain an adequate sample of bird activity/presence throughout a survey day. Wildlife data was collected from established observation points along a survey route covering the majority of the AOA (Figure 1.2, Appendix E). A survey is defined as one visit to all stations along the survey route. Eighteen observation points were established around the airport. Each point was surveyed for a 3-minute period, and all observed wildlife activity within a ¼ mile radius was recorded. Wildlife species, abundance, behavior, cover type, and other pertinent observations were noted. Binoculars were used to identify readily visible species and verify the number of animals. Smaller birds (e.g., songbirds) were normally only detected when seen at close range or when flushed from their cover, therefore the number of smaller solitary birds may be underestimated. A total of 89 Standardized Point Count Surveys were conducted at GJT from June 2007 through June 2008.



Fig. 1.1 Aerial Photo of GJT.jpg

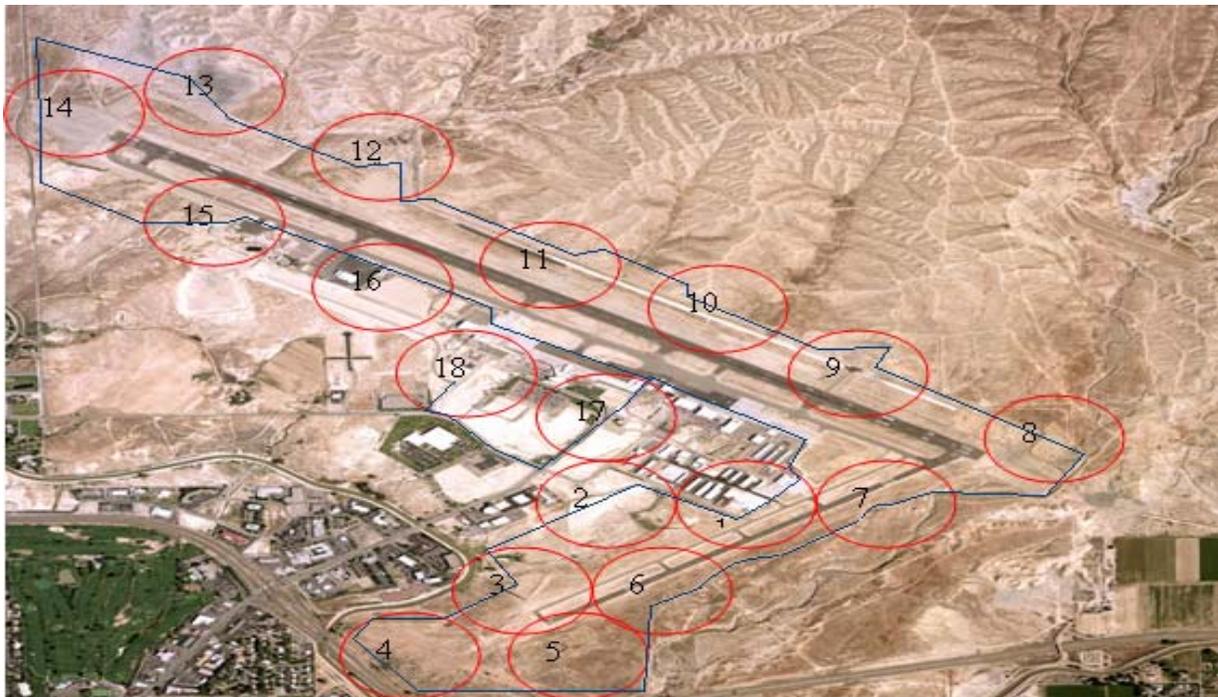


Fig. 1.2 Survey Route Map

## **5.2 Spotlight Surveys**

Spotlight surveys were conducted once per month, surveys consisted of driving a continuous route around the airfield using a spotlight approximately ½ hour after sunset, documenting nocturnal wildlife activity. Animals were viewed using a spotlight, their species, activity, location, and number were recorded.

## **5.3 General Observations**

General observations proved to be helpful in detecting wildlife attractants and reducing certain wildlife hazards within five (5) miles of the airport (Appendix C). General Observations consist of bird use and movements around and within structures and other unique areas of the airport environment that are not covered in the standardized point count survey.

## **5.4 Guild Classifications**

For the purpose of simplification, species observed during standardized surveys were grouped into guilds (Appendix F). Guild classifications were based on observed behaviors of each species during the assessment, as animals with similar behaviors and habitat requirements can generally be managed by similar techniques. It should be noted the following guild classifications may differ from those found in standard wildlife literature regarding animal taxonomy, but tend to loosely correspond with traditional taxonomic categories.

### Ictarids and Starlings

These are small birds such as European Starlings and Red-winged Blackbirds. Members of this guild were often observed loafing, feeding and flying localized in flocks of 5 to 50 individuals around the AOA, pastures, and water ways.

### Doves

Doves are smaller sized birds including Mourning Dove and feral pigeons (Rock Dove). These are common birds that are abundant in cities and farm land. Both are robust flyers and gregarious (flocking) in nature, preferring warm open habitats. Pigeons were most commonly observed around the terminal building, and surrounding businesses (WestStar Hangars, Shwann, and Motel 6) while Mourning Doves were usually seen perching on fences, and loafing on perimeter roads.

### Corvids

These are medium to large sized birds which include American Crows, Blacked-billed Magpies, and Common Ravens. These birds inhabit all cover types at GJT and feed on a wide variety of natural and human-provided food sources. Their primary feeding method involves scavenging. Corvids were generally seen feeding in open grassy areas; the safety areas, the public lands to the north west and drainage area to the west, just south of the runway, they were often observed adjacent to and crossing the runways as well.

### Thrushes and Shrikes

American Robin, Western Meadowlark, Loggerhead Shrikes and Western Kingbird make up the guild. These smaller birds are mainly insectivores but may also eat seeds. Most of these species are found solitary or in pairs, perching on posts, fences or feeding on the ground.

### Larks

Horned Larks are small sparrow like birds that generally feed solitarily or in small groups. Once flushed from a feeding area, flight response will be triggered in several other small groups creating a large group of small birds flying erratically. Horned Larks generally feed on seeds and small insects in short grass and are most often found on the AOA through spring, summer and fall.

### Raptors

This group is comprised of eagles, hawks, falcons, and owls. They are small to large birds that prey on small birds, mammals, insects, and fish. These birds are most often seen perching on structures around the airfield and in trees. Red-tailed hawks and American Kestrels were the most abundant and noticeable members of this group at GJT. Also included in this group are owls (Barn Owl, Great-Horned Owl, and Burrowing Owl) which were only seen before sunrise and during spotlight surveys with the exception of Burrowing Owls. These owls are diurnal (active during the day) and feed mainly on insects, small rodents or ground nesting birds during warmer months of the year.

### Shorebirds

This guild was limited in species, and included Killdeer and Long-billed Curlew. Killdeer can generally be found around open water, generally low areas that collect rain water or irrigation water, where they are attracted to aquatic insects. Long-billed Curlew is a shore bird generally only seen passing through during migration. This observation could be attributed to unusual weather conditions due to the infrequency of this species.

### Sparrows and Finches

This guild consists of House Sparrows, Finches, White-Crowned Sparrows, Western Bluebirds and various other sparrow-like or small passerine (perching) birds. These are all small sized, flocking or semi-solitary birds, and are generally considered hazardous to aircraft due to flocking behaviors at different times of the year.

### Swallows

Swallows are small birds but have the tendency to form large colonies and hunt in groups. The swallows that are most abundant at GJT include Cliff and Barn Swallows. These swallows were found most often around water or marshy areas or near taxiways and runways where they fly erratically feeding on insects. These birds build a 'mud type' nest in rafters, open-beam style buildings, and/or under bridges.

### Waterfowl

This guild includes Mallards, Canada Geese, American Coot, and other ducks and geese. These are medium to large size birds that feed on a variety of aquatic sources including vegetation, insects, and vertebrate species. They are most often associated with water, but some species (e.g., geese) graze in short grass adjacent to runways. Many of the species are migratory and are most abundant during spring and fall migrations. Daily movements between the local water source and food sources results in a relatively low frequency of this guild on and over the airfield at GJT yet flight can be slow, low to the ground and very near to runways or flight paths.

## Mammals

These can be large or small in size. Mammals which are of the most concern for GJT include the Coyote, Cotton-tailed Rabbit, and White-tailed Prairie Dog. Populations can be found around the airfield where they scavenge and graze. Prairie Dogs and rabbits, which eat grasses and forbs, are found in the safety and open areas surrounding the airfield. Ungulates such as Mule Deer and Pronghorn (Antelope) are not usually found within the perimeter fence. Mice and voles are a concern because they attract larger mammals and raptors though their presence was not documented during this assessment. Mice and voles prefer longer grass where they can gather seeds and seek shelter from predators.

## **5.5 Data Analysis**

Standardized point count data was analyzed to determine the Frequency of a guild observed and the average number of individuals during a survey for each observation point. This data was also used to determine the abundance of each guild throughout the course of the WHA. Results of these analyses are intended as an index over time, not an absolute quantification of the populations. Spotlight data was analyzed to determine hazards occurring at night.

The following bar graphs, termed *Species Abundance*, represent the percentage of surveys a given guild was present in, *Percent Occurrence*, and the *Average Number* of individuals at each survey point. The *Percent Occurrence* and *Average Number* per survey point were derived from point counts and spotlight surveys.

*Percent Occurrence* is defined as the percentage of surveys for each location in which a particular species was present. For example, a solitary species may have been observed in 80% of all surveys, but, on average, only 2 birds were observed. Conversely, a flocking species may have been infrequently observed (15% of the time), but in large numbers when present (i.e., 100 individuals).

The *Average Number* represents how many individuals, on average, of a particular guild were present at each survey point.

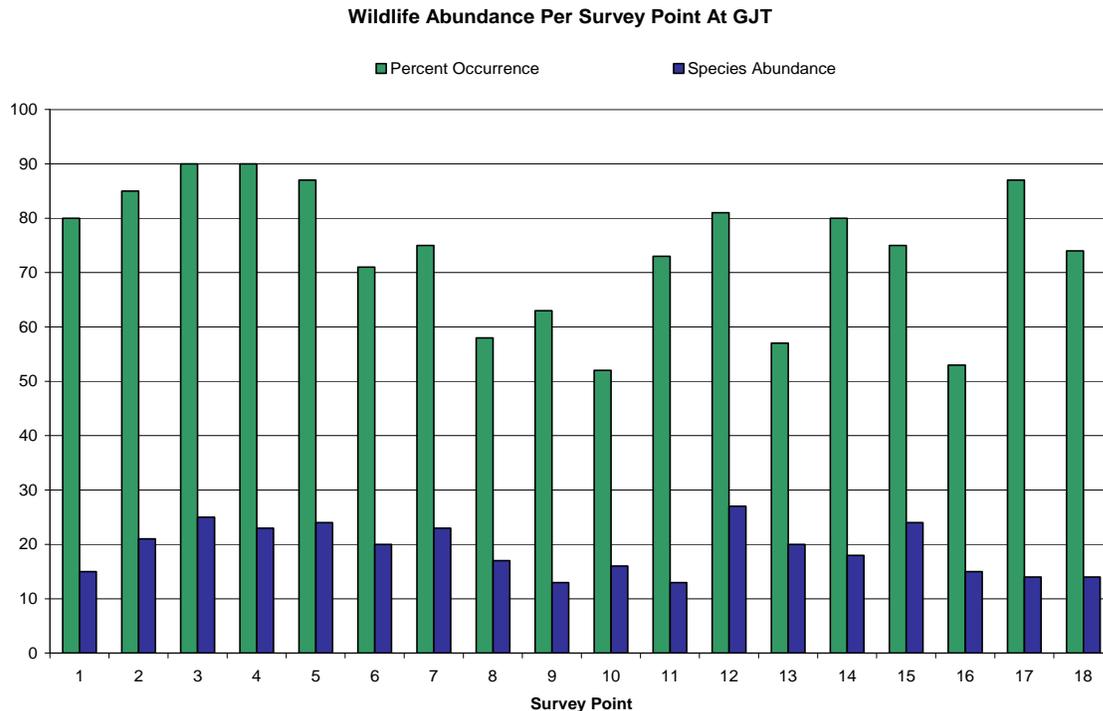
The following line graphs, termed *Seasonal Distribution*, represent the *Average Number* of individuals, within a given guild, and are derived from combining the point count and spotlight surveys. Averages are shown by season so individual guild use can be identified on a seasonal basis. Averages also allow for general predictions to be made on the number of individuals to expect.

Effective wildlife hazard management at airports is dependent on the identification of key species involved. The following tables, figures, and written descriptions focus primarily on key species that may pose the greatest hazard to aircraft at GJT.

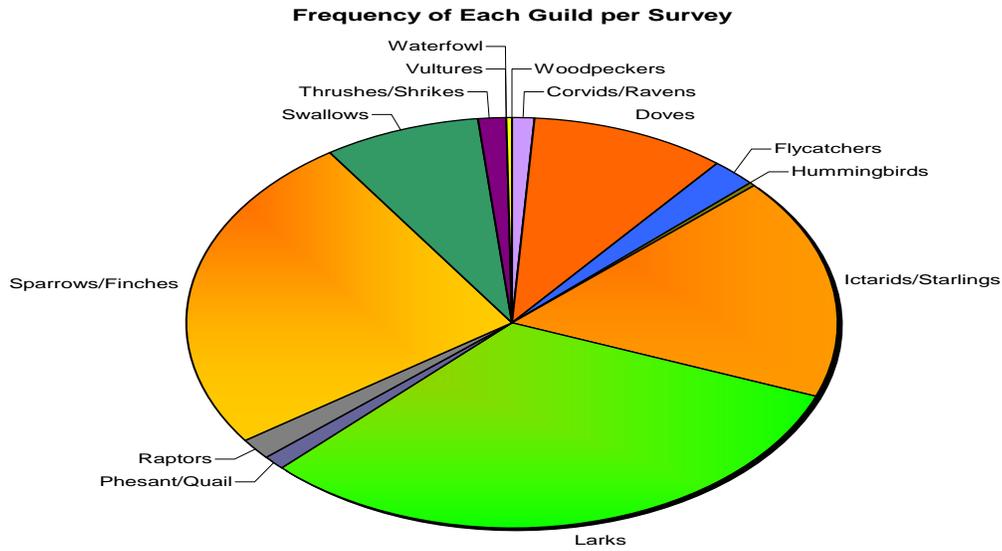
## 6.0 RESULTS AND DISCUSSION

### 6.1 All Species Combined

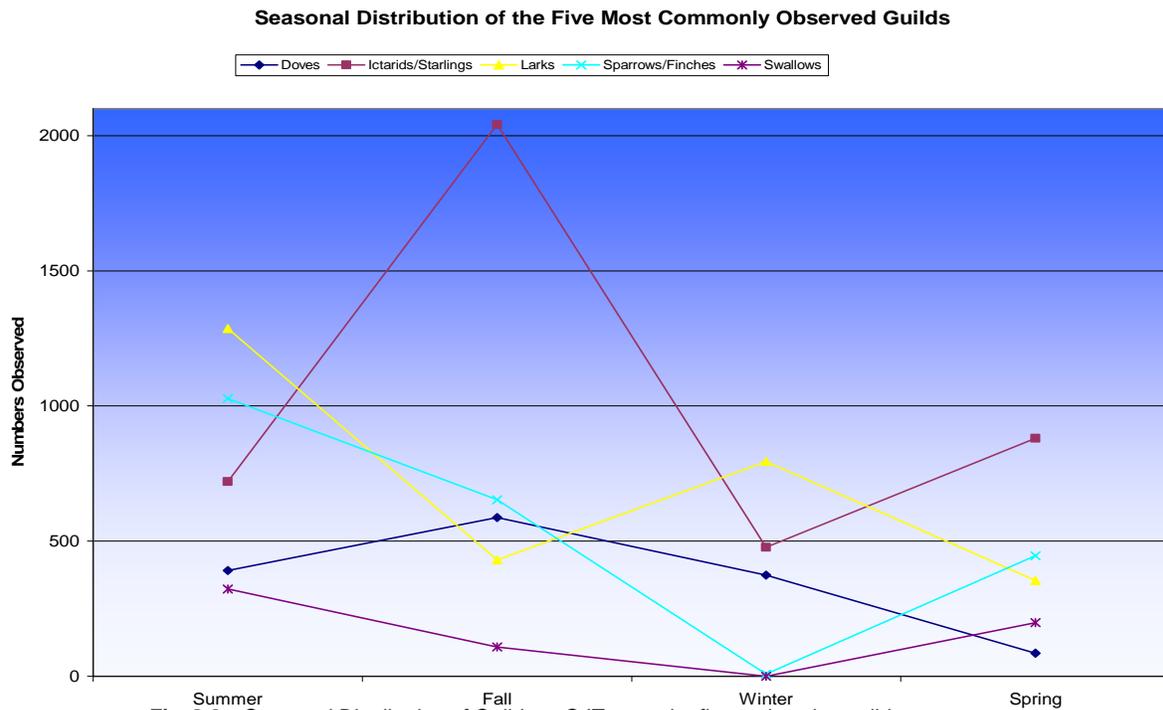
Wildlife that frequent the airport (flying or not) could potentially occur on or above a runway and therefore present a risk to aircraft safety. This information is applicable in determining which areas of the airfield receive the greatest use by wildlife, as well as how often (*Percent Occurrence*) and in what numbers (*Average Number*) wildlife can be expected to use the areas. Survey Points 3 and 4, along the fence near the new storm water retention ponds, were locations with the highest wildlife usage (fig. 2.1). Wildlife species were observed utilizing these areas with a *Percent Occurrence* of 90%; with an *Average Number* of 24 species and 15 and 11 animals present at a time respectively. With 52% as the lowest *Percent Occurrence*, we see that every part of the Air Operations Area (AOA) is utilized by wildlife over half of the time. Another look at the data shows that around the AOA, the percent occurrence is relatively steady with low spots being those with little to no vegetation, namely points 8, 9, 10, 13, and 16. The average *Percent Occurrence* around the AOA is also relatively high with 74% occurrence and 19 different species.



**Fig. 2.1** Species Abundance (all guilds combined) at GJT June 2007 through June 2008, based on 89 point count surveys.



**Fig. 2.2** Distribution of guild frequencies per survey, five guilds of concern include Ictarid/Starlings, Larks, Sparrows/Finches, Swallows, and Doves.



**Fig. 2.3** Seasonal Distribution of Guilds at GJT, note the five main avian guilds (Ictarids/Starlings, Doves, Swallows, Larks, and Sparrows/Finches) of concern as well as the mammal group of concern (rodents).

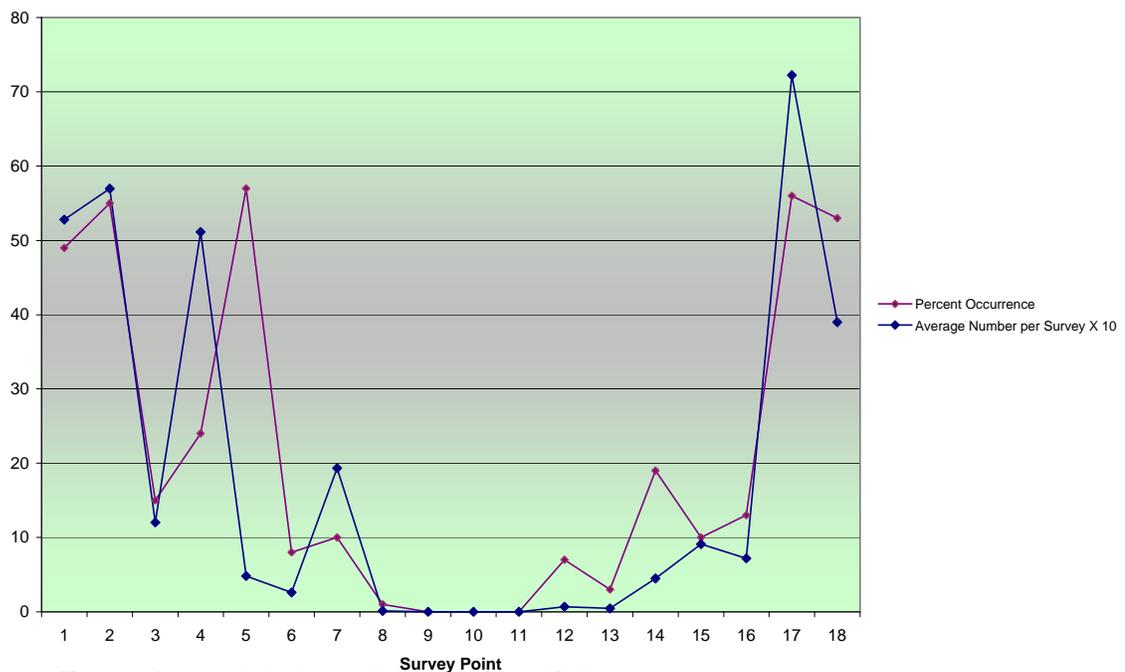
## 6.2 Ictarids and Starlings

All blackbirds which include Red-winged, Yellow-headed, Brewer's, Brown-headed Cowbirds, Meadowlarks, Grackles and European Starlings make up this guild. These are identified as birds with sharp-pointed bills; conical rather than flat in profile. Most have iridescent black feathers and medium length tails. Starlings appear stockier, have speckles during winter and have shorter tails than other blackbirds. Most blackbirds are native but European Starlings were introduced to North America around 1890, and since have



become a very abundant pest. Starlings are cavity nesters and will use any structure with holes for nesting. All members of this guild are gregarious (flock forming), especially in winter when they can form roosts in the thousands, sometimes comprised of mixed species. Blackbirds and starlings are diurnal (active during day light hours), and feed on insects, small fruits, seeds, waste grains, small aquatic insects and other small aquatic life such as tadpoles, insect larvae, and even small minnows.

Ictarids/Starlings Distributions On GJT AOA



**Fig. 3.1** Data analysis shows which areas of the airfield serve as an attractant to different species (Refer to Fig 1.2). Areas may be more of an attractant due to various reasons such as food sources, shelter, water, or roosting areas.

### Seasonal Fluctuations in Ictarids/Starlings

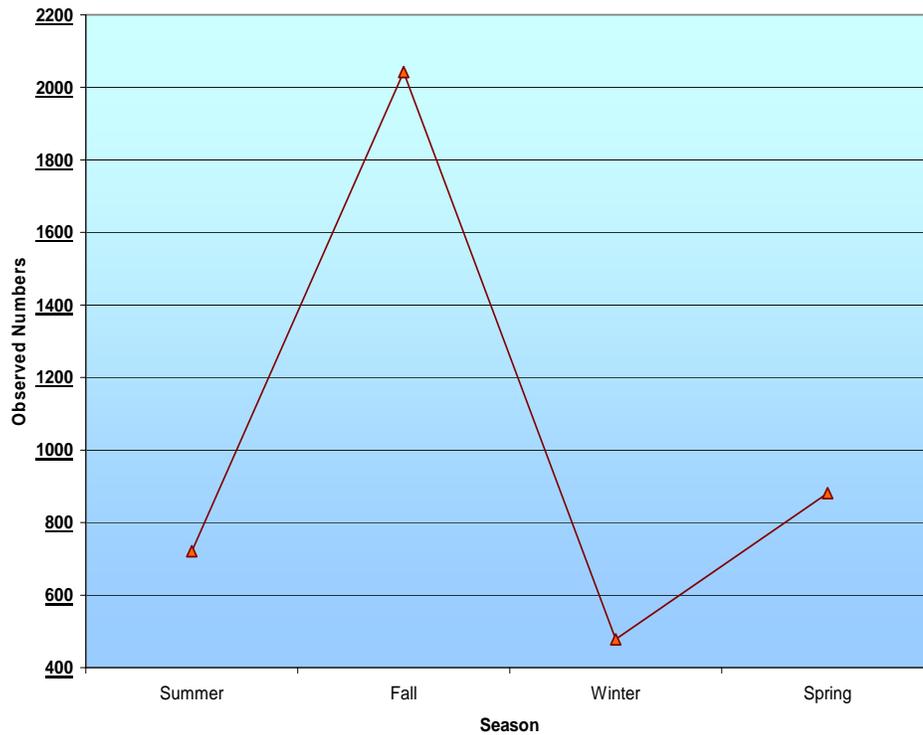


Fig. 3.2 The analysis of seasonal fluctuation in numbers of individuals of a guild, gives a better understanding of when the species is of greatest concern, Y-axis begins at 400 individuals.

### Damage

Due to the number of birds generally associated with this guild, they can be considered extremely hazardous, to aviation. The European Starling has one of the highest density for their size making the bird even more hazardous. In addition, winter roosts and spring breeding areas present a nuisance because of their noise, nesting material, and droppings, which corrode and damage buildings and property. In addition, many infectious diseases can be spread by means of the fecal droppings of these birds. Starlings were responsible for over \$700,000 in damages to civil aircraft in the United States from 1990-2001 (Cleary et al. 2002).

### Legal Status

Being an introduced species, starlings are not protected by state or federal laws and can be taken at any time without a permit. Blackbirds (Yellow-headed, Brewer's, and Red-winged) can be taken without a Federal permit when they are "...concentrated in such numbers and manner as to constitute a health hazard or other nuisance..." (50 CFR Ch. 21.43).

## Control Measures

By managing long grass (7 to 14 inches) at GJT, operations personnel can deter starlings and blackbirds from feeding on the airfield. Removal of marsh and wetland grass areas around ponds, such as the irrigation pond, and low areas near the airfield, along with removing grazing pastures (Colorado has a fence out policy on all 'open range' which includes all of the north, east and west boundaries) and cattle adjacent to the airfield will reduce the feeding habits of blackbirds and starlings on and near the AOA. Removing nesting/roosting areas (trees) and making others unavailable through proper exclusion methods (i.e. "Welcome to Grand Junction" sign) can also deter birds from the use of flyways resulting from movement between feeding, nesting, and roosting sites. The Government Highline Canal, storm water retention ponds, and the irrigation pond cannot feasibly be removed or relocated, though flyways across the runways may be altered by use of pyrotechnics, bioacoustics, and visual repellents. Caution should be taken that birds are not simply chased along or across other flyways/runways or on to other locations of the airfield. Trained wildlife control personnel need to be persistent in their endeavors and concentrate their efforts in the cooler hours of the day, early morning and late afternoon, when the birds are most active. Lethal removal of some individuals using firearms will no doubt become a necessary reinforcement technique when the birds become accustomed to hazing efforts, but it is not an effective method of reducing blackbird populations when flocks are large (i.e., thousands of birds). Registered pesticides (i.e. DRC-1339) may be chosen as a lethal removal technique but must be applied by persons with a Pesticide Applicators License (DRC-1339 is only available to WS agents through its labeling).

### **6.3 Doves**

Mourning doves and Rock Doves (commonly referred to as pigeons) are familiar birds that are abundant in cities and farms throughout Colorado. Mourning doves typically fly low near cover as they travel between feeding and roosting areas, while feral pigeons tend to fly at higher altitudes, descending to their destinations in a rapid circling pattern. Although both species are primarily granivorous (herbivore species that feed primarily on the seeds of the plant), they will occasionally consume protein-



rich animal material such as insect larvae, and both dove species will readily accept handouts from humans. At GJT, Mourning Doves are generally found alongside the runways, perimeter roads, on ant hills, roosting in trees and also perching/feeding along the fences. Survey point 1 and 9 show the highest abundance for pigeons which could be attributed to loafing areas provided by the Weststar Aviation buildings as well as roosting areas provided by the two shade hangars just off of Charlie-1-Alpha. It is not known if these birds are finding food here or if the only attractant is the easily accessible cover. Mourning Doves were observed with the highest

*percent occurrence* at survey points 2 and 4, feeding and loafing near the fence and under the trees. They were very common at survey point 4 where the canal goes under Interstate 70.

### Dove Distribution on GJT AOA

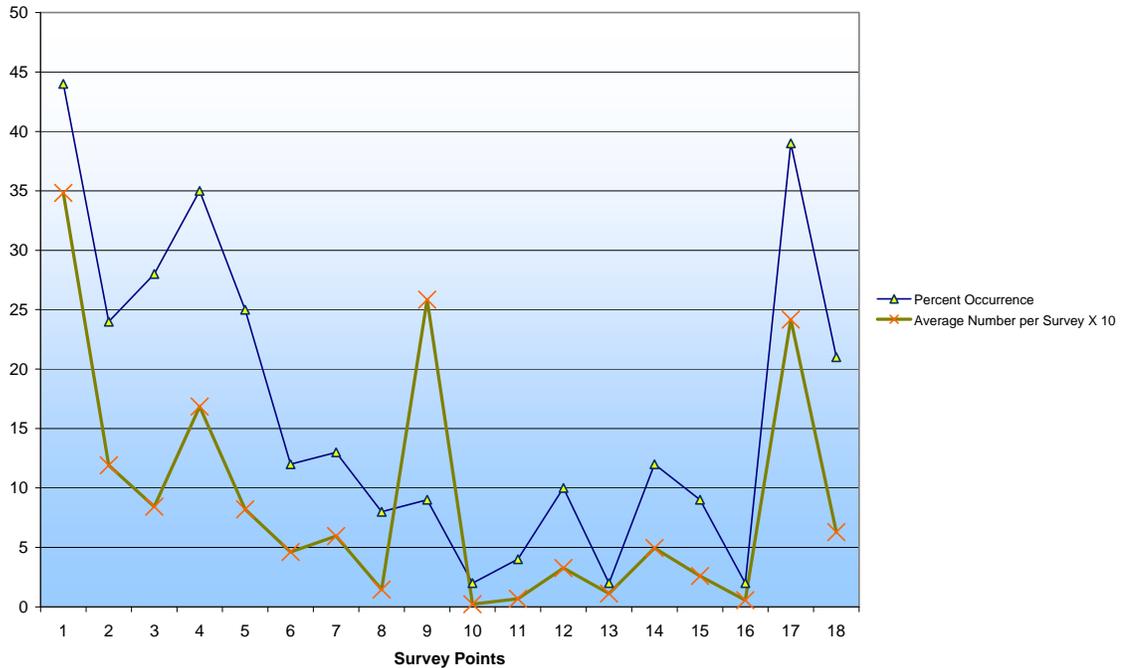


Fig. 4.1 Survey points with higher percent occurrence are areas used for feeding, nesting, or watering. Average numbers are low, yet it is obvious that the guild spends much time at these points on the AOA.

### Damage

Doves and pigeons present a threat to air safety at GJT and merit control measures. Doves and pigeons are a large concern because of their loose flocking behavior, overall abundance, and dense body structure, all of which increases their potential to damage an aircraft. Their relatively slow flight, compared to that of the other guilds of concern, further

increases the threat that they pose. They also damage property such as buildings and airplanes with their droppings, which are corrosive to painted and metal surfaces.

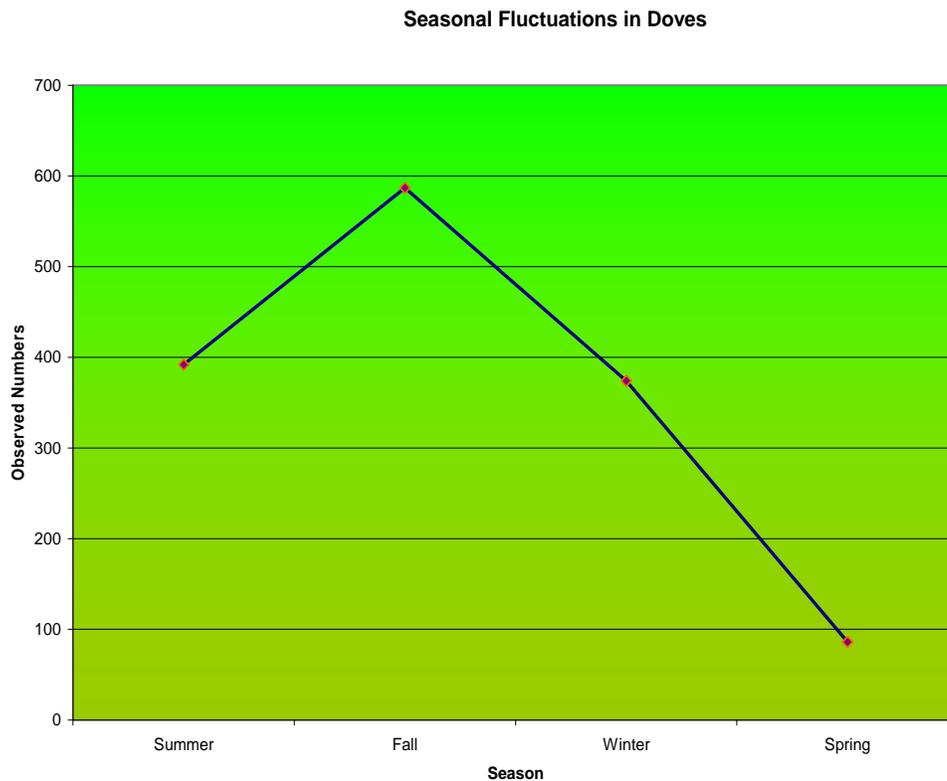
The pigeons which are living in the shade hangars on Charlie-1-Alpha are causing damage to the exclusion structures as well as the aircraft parked beneath them. There were 2,198 reported dove or pigeon strikes to civil aircraft in the United States from 1990-2001 (Cleary et al. 2002). Costs associated with damage from these strikes



exceeded \$5,000,000. The reported strikes of “medium-sized, unknown birds” at GJT could possibly be that of the doves mentioned here. Therefore, populations around the airfield should be kept to a minimum. Pigeons (and their droppings) are also carriers of several infectious diseases such as *psittacosis* and *histoplasmosis*.

### Legal Status

Feral Pigeons are not regulated by Federal or State laws and can be taken at any time. Mourning Doves, however, are migratory game birds and are regulated by Federal and State regulations and permits or hunting licenses are required for lethal control actions. GJT currently holds a permit allowing the take of Mourning Doves.



*Fig 4.2 Seasonally, Mourning Doves tend to leave during the cooler months and return late spring. Rock doves are year long residents, but due to disease or other factors, their population drops in the cooler months as well.*

### Control Measures

Habitat modification is the best solution to control dove and pigeon problems. Weedy fields (especially those containing sunflowers and shrubs) should be eliminated and all grass height kept between 7-14 inches if hazards exist. Areas of bare ground, which is attractive to Mourning Doves, should be replaced with grass according to approved seeding specifications, and kept at the recommended height. New structures



should, when feasible, be designed to preclude nesting by pigeons. Current buildings can be retrofitted with exclusionary netting or types of barriers to block access to eaves and beams. Careful examination of the exclusion methods should be taken into consideration for each situation. Exclusion or trapping may work well in areas such as the tops of hangars (i.e. Weststar Aviation) in removing pigeons. The two shade hangars have been used for nesting in the past and were re-colonized. If possible, exclusion devices should be placed between the ledges of the I-style beams (tightly stretched exclusion netting may be an option) and must be maintained. Non-lethal and lethal reinforcement may be necessary through the use of pyrotechnics and air rifles. Exclusionary techniques are most effective when birds are initially attempting to colonize an area. Lethal removal via shotgun or pellet rifle, nets and traps have been an effective approach for reducing the number of pigeons loafing around runways or terminal buildings. General Aviation tenants as well as public living within close proximity of GJT should be discouraged from feeding feral pigeons and Mourning doves.



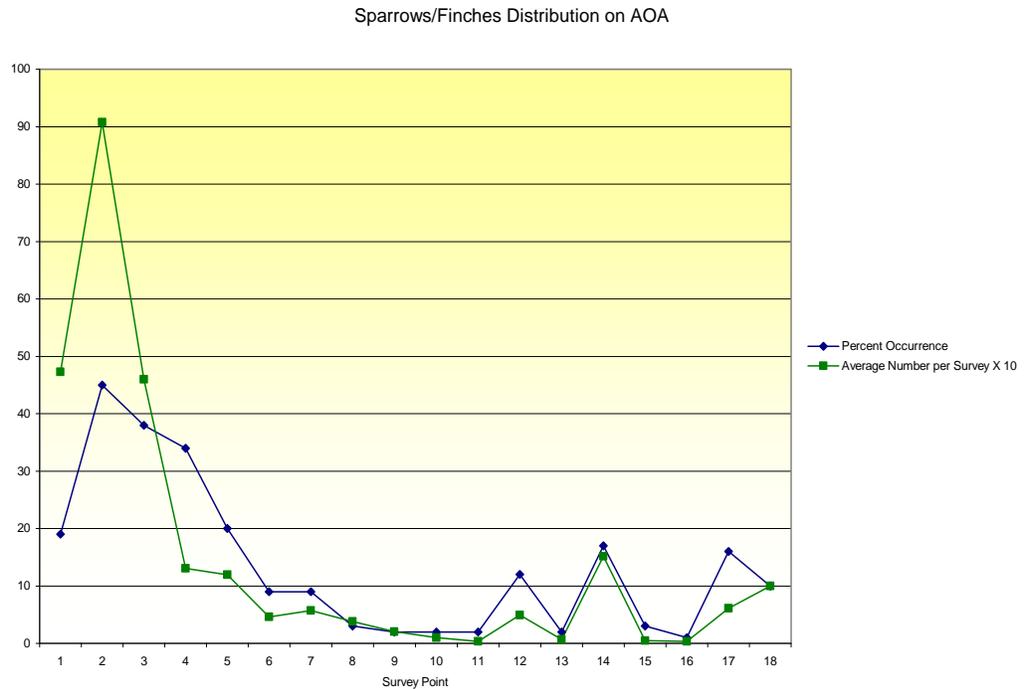
#### 6.4 Sparrows and Finches

Sparrows and finches are some of the smaller birds found on GJT, but because of their large numbers in areas, they become one of the birds of concern on the AOA. Sparrows (House, White-crowned and Dark-eyed Junco) along with the finches (House, Lazuli Bunting) are all granivores that are sometimes found together. House Sparrows are accustomed to perching and nesting in and around buildings and generally use the dense cover of 'ornamental' cedar trees and shrubs during the hotter parts of the days. These sparrows have been found nesting in the ceiling of the terminal parking garage at GJT. House Sparrows generally feed on seeds and small insects, are very common in cities across the continent, and are often found feeding and perching alongside House Finches at GJT. House Finches are



smaller than House sparrows but are usually found in flocks much larger than that of sparrows. House Finches spend much of their time on fences and in the long grass and shrubs foraging for seeds and small insects. White-Crowned Sparrows are generally not found mixed with other sparrows or finches and are more common in the winter even though they are year-around residents to Colorado. These sparrows spend much of their time in shrubs along fence lines and paved areas. These three species are very susceptible to 'human hand-outs' and may frequent areas around dumpsters and parking lots to feed on crumbs and leftovers. Lazuli Buntings are considered a finch because of their feeding habits. These birds are generally solitary or found in pairs, and infrequent visitors to GJT. Lazuli Buntings prefer areas away from towns, they frequent open brush and riparian areas, and are only summer residents of Colorado. Dark-eyed Junco's are sparrow sized birds that prefer

wooded areas until winter when they are found along roadsides and shrubby areas. Juncos are also susceptible to feeding and hand-outs.



*Fig. 5.1 The concentration of Sparrows and finches are of concern at survey points 1-4. They were generally seen perched on fencing or feeding in tall grass and shrubs in this area.*

### Damage

Birds belonging to this guild do become struck by aircraft quite often (generally reported as “small bird or bat”). Due to their small size and lower flocking tendency they rarely result in substantial damage.

### Legal Status

All birds in this guild with the exception of the House Sparrow are protected as migratory non-game birds and require a USFWS permit for lethal take. The House Sparrow (a non-native, introduced specie) can be controlled through lethal means without a permit.

Seasonal Fluctuation in Sparrows/Finches

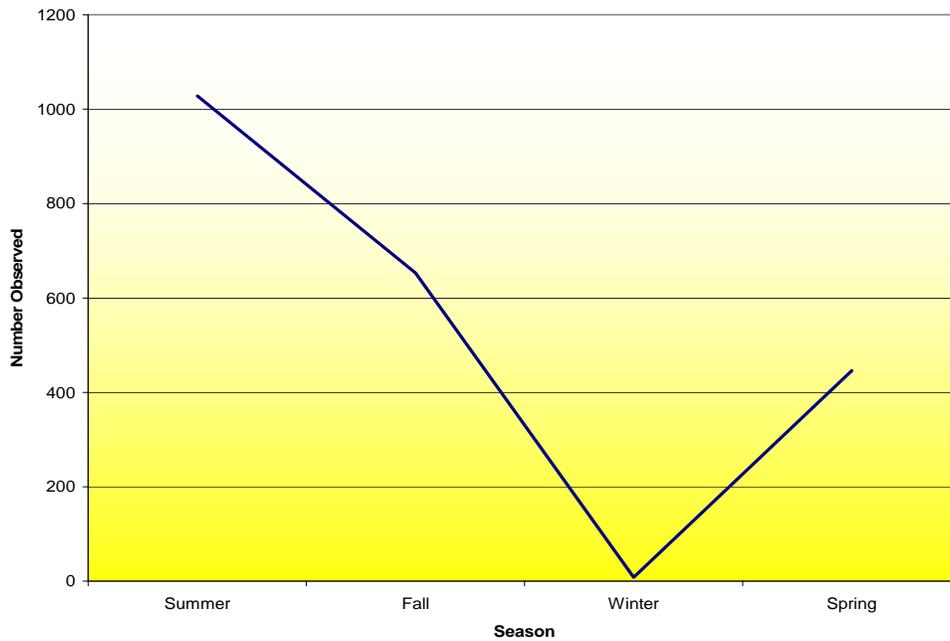


Fig. 5.2 As with most species at GJT, a winter decline in population shows migration with the influx of the adults in the spring and new young in early summer.

### Control Measures

Management of taller (7-14 inches), non-seeding grass and the *removal of weeds and bushes* will reduce these species' abundance around the airfield if hazardous populations exist. Pyrotechnics, combined with lethal control is effective in moving them away from critical areas. Visual repellents, especially raptor kites, helium balloons, and Mylar tape, may augment the effectiveness of hazing. Special measures need to be taken near the terminal building (exclusion at parking area), chain-link fences (shrubs and tall grass), and neighboring businesses (Motel 6 dumpster area and trees); these places are frequently being utilized by sparrows and House Finches.

### 6.5 Larks

The Horned Lark is the only species included in this guild, and was observed at every point around the airfield. Horned larks are small, sparrow-looking birds that feed mostly on seeds and insects, but differing from sparrows and finches in that they spend the majority of their time on the ground seeking cover under the shadow of runway/taxiway signs and short grasses. These birds walk rather than hop and when flushed, one bird will activate the flush response in several other birds. These species prefer bare ground and sparsely vegetated ground. Horned Larks are common in strike records across the western states.

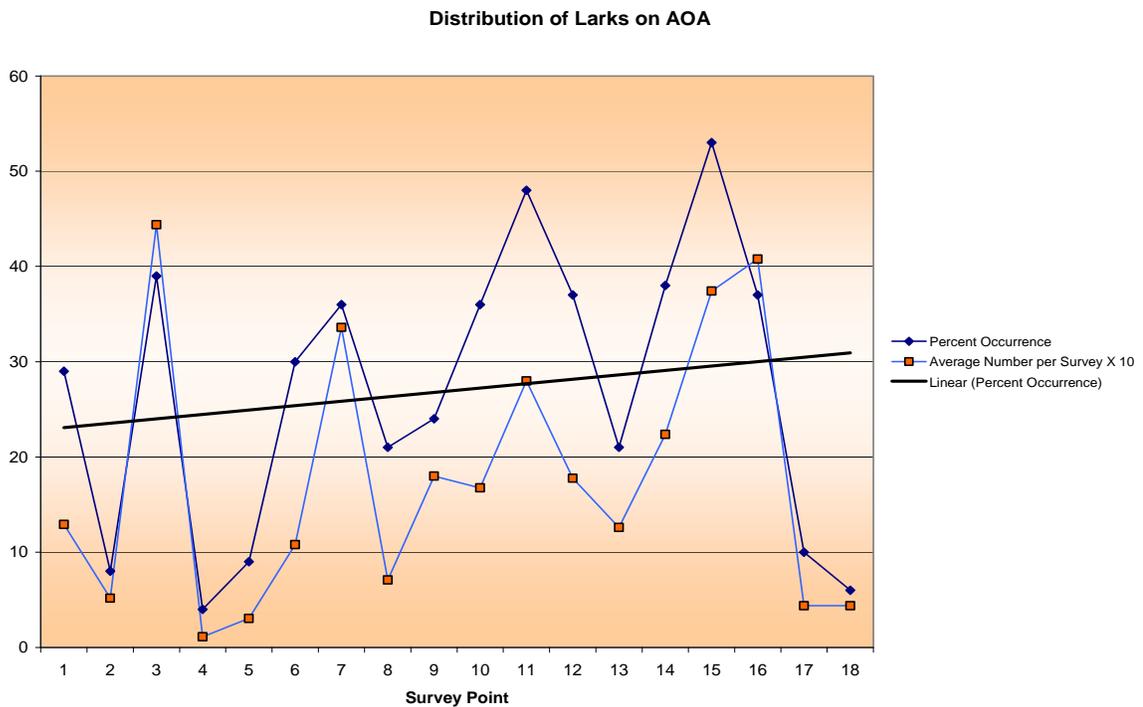


## Damage

Due to the small size of these birds they pose little risk of damage to aircraft during a strike.

## Legal Status

Larks are protected as migratory non-game birds and require a permit from the USFWS in order to lethally control them. GJT currently has a federal permit and is strongly encouraged to renew on an annual basis and amend as needed to add species.



*Fig. 6.1 Horned Larks are one of the few species commonly seen at nearly every point around the airfield, with the exception of points 17 and 18 which have little to no bare ground for habitat, and points 2, 4, and 5 which have an over abundance of tall grass, shrubs and sparrows/finches. Linear (Percent Occurrence) line shows that this species appears with a steady percent occurrence through out the AOA.*

Seasonal Fluctuation in Larks

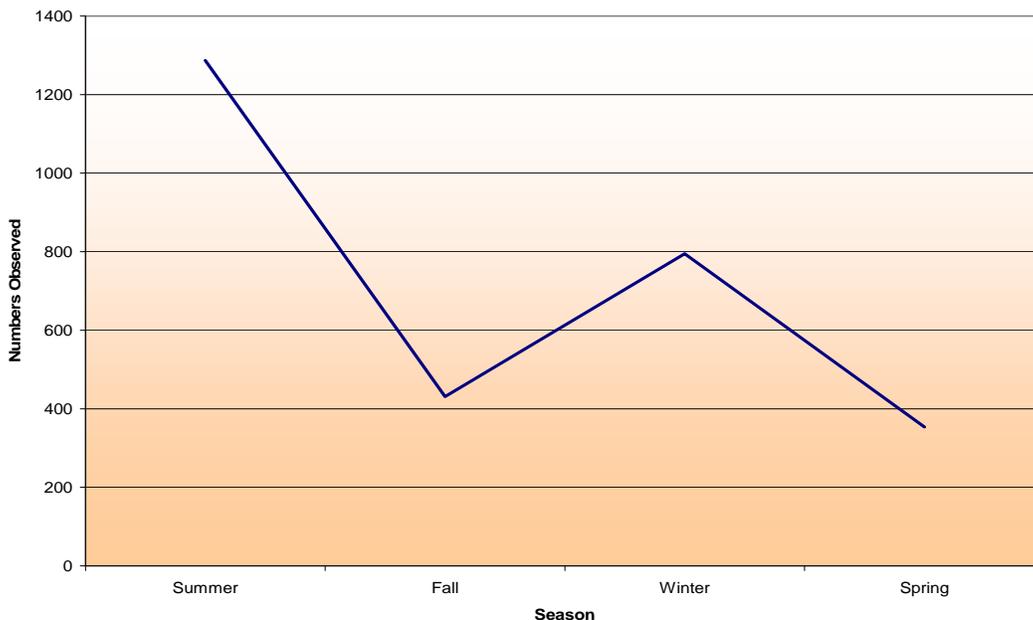


Fig. 6.2 Larks spend much of their time on the ground, preferring bare soil and temperatures that produce seeds and active insects.

### Control Measures

Management of grass between 7-14 inches could hinder the ability of Horned Larks to feed on soil dwelling insects and find preferred bare ground. Continually mowing in order to keep grass this height will also reduce insects that are present on the vegetation. Areas with bare ground should be re-vegetated to decrease habitat appeal. Pyrotechnics, combined with periodic shooting is very effective in moving them away from critical areas, although attempts at this must be constant. Habitat management is the most productive means of reducing the population of this species on and around the AOA. Due to habituation visual repellents should not be the only method utilized to control populations or their activity around the airfield.



### 6.6 Swallows

All swallows found at GJT during this assessment were similar in size and shape. Swallows are about 7 inches long with pointed wings. They are very graceful and acrobatic flyers and are commonly seen flying around ponds and ditches in order to catch insects. They can also be seen in large erratic flying flocks combing through the grass near trees, roads, and fence lines. Barn and Cliff Swallows, the most common seen at GJT, nest under eaves, bridges or culverts where they build mud nests. Swallows were frequently seen around the AOA during summer months. During the hatch of Alfalfa Butterflies (which congregate near pavement where they warm during the morning hours) swallows were seen in large numbers



feeding near taxiways, runways, and ramps. Survey points 3 and 4 had a high number of swallows present. These points have an irrigation pond as well as the Government Highline Canal near the perimeter fence, which provides excellent conditions for insects as well as for nesting under the bridges that cross the canal.

**Damage**

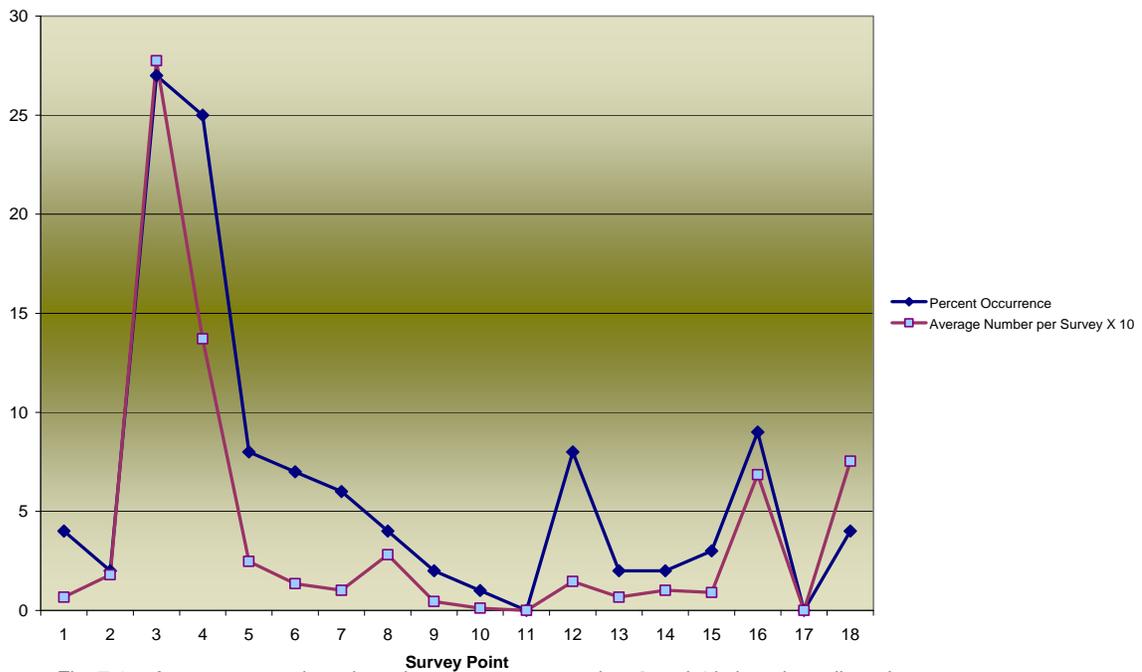
Swallows are commonly involved in strikes with aircraft because of their erratic flight behavior while foraging for insects. Fortunately, these collisions seldom result in damage because they are small and tend to be solitary or in very loose flocks. However, swallows may become a bigger hazard if numbers are allowed to increase. If allowed to nest in the eaves of terminal buildings or hangars, nests that fall, therefore, may become a FOD hazard.



**Legal Status**

Swallows are protected as migratory birds. A depredation permit must be obtained before lethal control can take place.

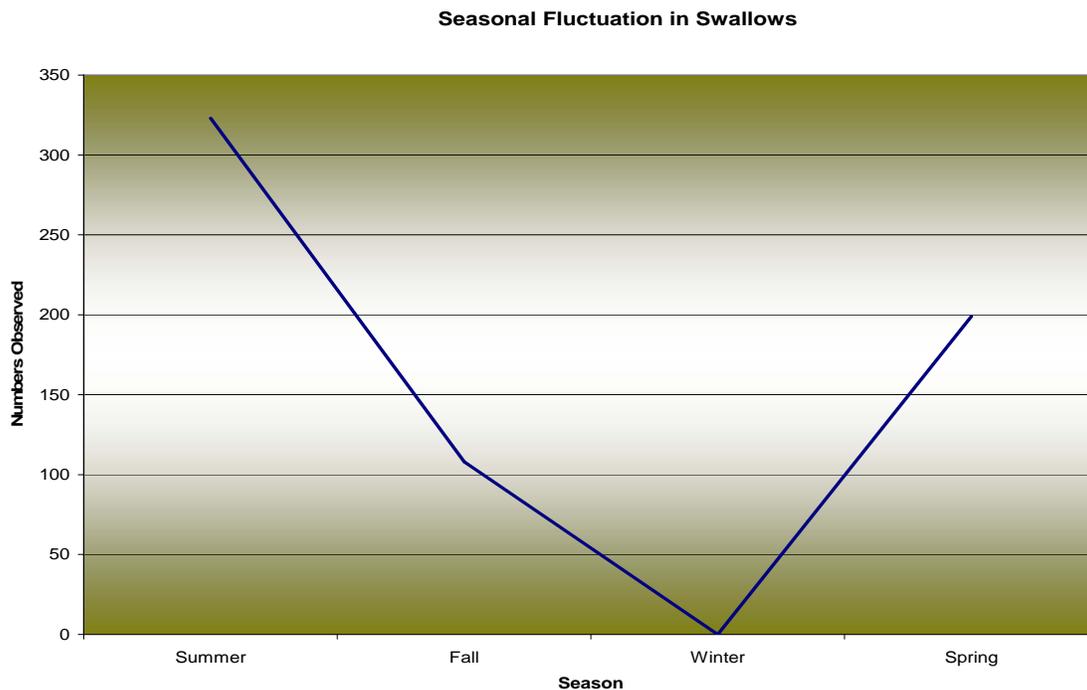
**Distribution of Swallows on AOA**



*Fig. 7.1 An extreme peak such as the one present at points 3 and 4 is largely attributed to several bridges that cross the Government Highline Canal. The canal provides nesting areas, travel corridors, and food and water sources.*

## Control Measures

Elimination of wetland areas, wetland-type vegetation, and water sources will be the best long term solution. By eliminating water, the food base would not be as prevalent due to many insects necessity to use water for breeding purposes. If water elimination is not feasible, insecticides may be applied to remove the food base, in accordance with environmental regulations, in areas with high swallow occupancy. Exclusion from eaves, bridges and culverts where Barn and Cliff Swallows build nests can also reduce their numbers around nesting sites and should be considered during the design phase of new structures.



*Fig. 7.2 Swallows are very much a seasonal species to GJT and as temperatures cool, Swallows leave the area and return with the high temperatures to breed, further increasing the population explosion in the spring.*

## **6.7 Raptors And Vultures**

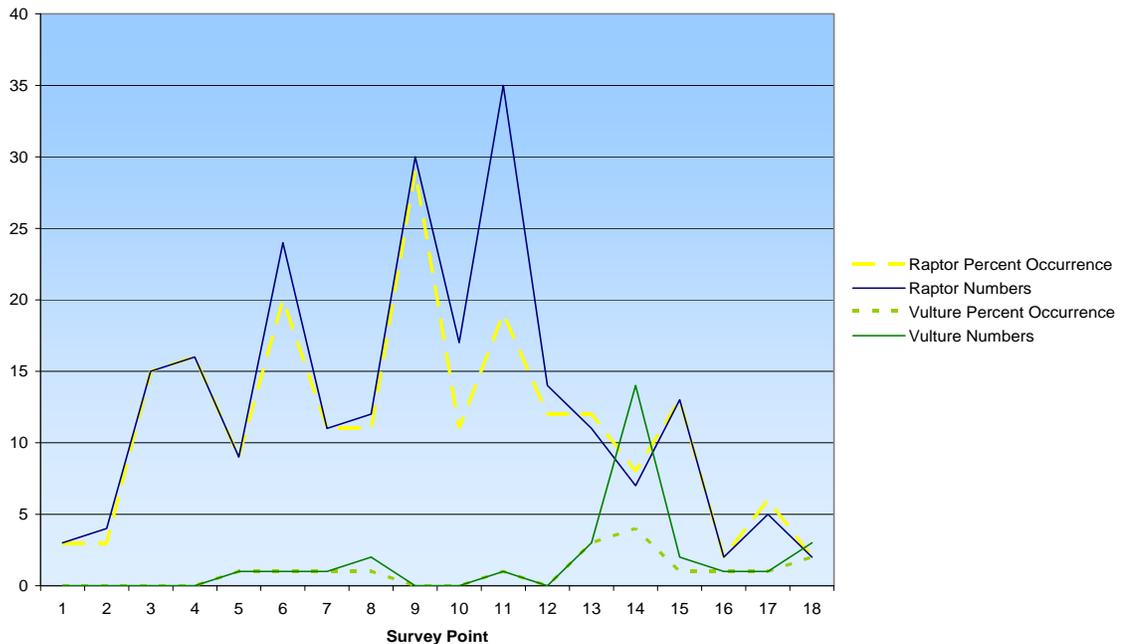
Raptors are predatory birds and scavengers with hooked beaks and talons which are used to capture and feed on prey. Several elements exist on airports that are attractive to raptors. These include; open grasslands, large populations of prey-base species, and numerous perching structures, such as fence posts and taxiway lights. Predominant prey items include small mammals (e.g., prairie dogs, mice, and rabbits) and smaller birds (e.g., finches, larks, doves, and sparrows). Raptors tend



to be solitary individuals or found in mating pairs. The term raptor includes eagles, falcons, hawks, and, owls. Vultures are predominantly scavengers primarily eating carrion (carcasses of dead animals) and can be 32 inches from head to tail. Vultures soar searching for dead and decaying animals, often soaring just off of the approach end of Runway 11 or feeding on road-killed rabbits or prairie dogs on 27 ¼ Road. Raptors range in size from small (8-inch long American Kestrel) to very large (43 inch long Bald Eagle). Most species have characteristic hunting styles such as soaring (vultures, eagles, and hawks), low-flying (harriers), ambushing (Peregrine Falcon), hovering (American kestrel), and watching from perches (hawks and owls). Survey point 9 had the most abundant occurrence of hawks, most likely attributed to the hill on the north side of runway 11/29 with antenna structures allowing for birds of prey to perch and hunt for prairie dogs. Also survey points 6 through 13 had an increased population due to the number of wooden fence posts available for perching over the prairie dog colonies. Wooden posts were used not only for perches, but were also used as a solid platform to eat after a successful hunt. In survey points 4-15 American kestrels were generally observed hunting for food or perching on fences. Points 13-15 were the points where Turkey Vultures were observed due to scavenging road-killed carcasses found on 27 ¼ Road.



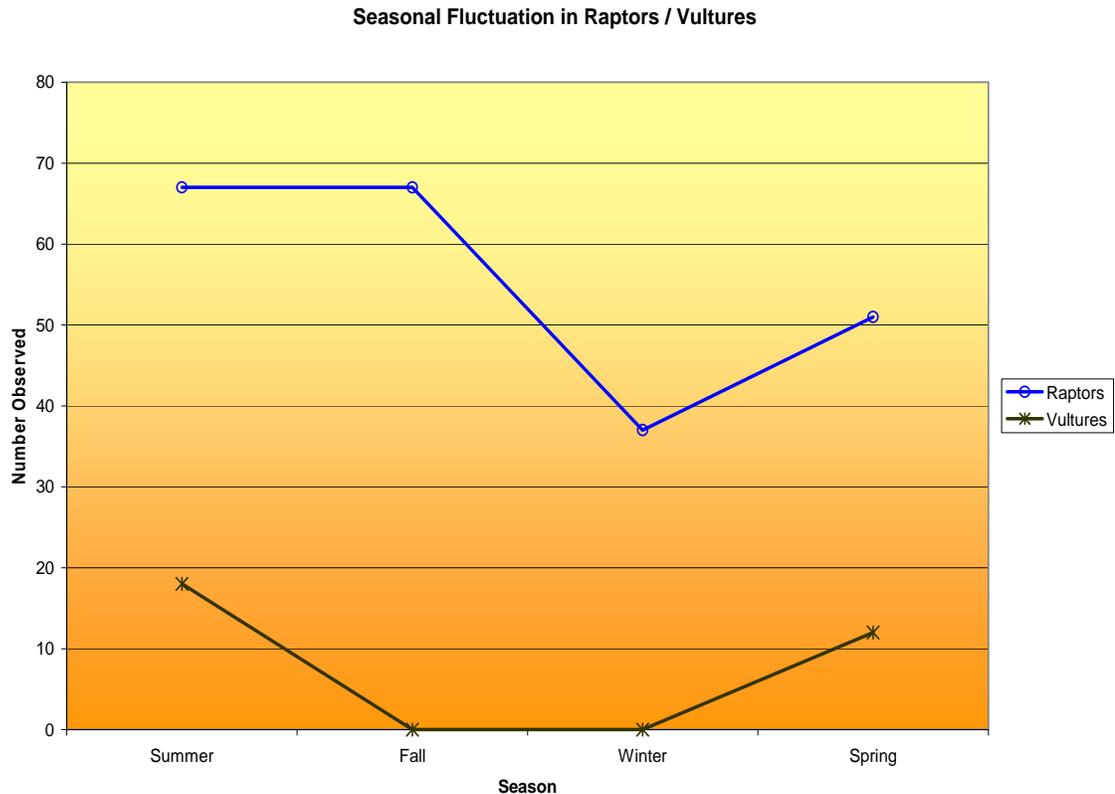
**Raptor/Vulture Distribution and Numbers**



*Fig. 8.1 Due to the prey base and the opportunistic feeding habits of most raptors, vultures and raptors overlap in their occurrences. Vultures are not likely to hunt or kill their own prey but will sometimes share or chase raptors off kills.*

## Damage

Raptors represent a significant hazard to aircraft because they are typically large in size and their hunting and flying behaviors increase the possibility of interaction with aircraft. From 1990 to 2001, 1,200 reported strikes involving raptors caused damages to civil aircraft upwards of \$11,600,000 (Cleary et al. 2002). Raptors are also the third most commonly reported species causing bird strikes.



*Fig. 8.2 Vultures, which leave GJT in the winter, correspond closely with the numbers of raptors present at GJT.*

## Legal Status

Raptors are protected as migratory birds, and eagles are further protected by the Bald and Golden Eagle Act of 1940. Ferruginous Hawks and Peregrine Falcons are afforded varying degrees of protection under Colorado State and/or Federal Threatened and Endangered Species laws. These respective regulating agencies should be consulted prior to implementing any control action that may affect them. The list of protected species should be reviewed and updated at least once per year due to the possibility of a species status changing. An updated listing can be obtained from the USFWS. Trained wildlife control

personnel should have the ability to identify these species and be aware of the presence of these species in order to avoid potential impacts to them.

### Control Measures

Habitat modification, specifically vegetation height and type, perching structure removal, and prey-base management will have profound effects on the number of raptors found at and around GJT. Perch sites have a substantial effect on the ability of a raptor to hunt and



should be in the plans for removal from the airfield. Continual monitoring will help identify perches which should be removed. If raptors remain on the airfield, hazing with pyrotechnics can be used to disperse birds with the proper permits in place (Eagles require a permit to haze/harass). The most non-respondent individuals may have to be trapped or lethally removed after all other methods have been unsuccessful. If stated on federal permit, raptors can be captured using several styles of traps, including bal-chatri, padded-jaw leg hold, and Swedish goshawk. These traps are designed to relocate specific individuals. It may become

necessary to lethally remove certain offending individuals if they pose a significant risk to air traffic. Appropriate permits must be obtained prior to most control operations.

### **6.8 Waterfowl and Shorebirds**

Neither guild has a significant presence at GJT but both guilds were observed on the airfield. Waterfowl are aquatic birds with webbed feet, flattened bills, narrow pointed wings, and short legs. This guild includes ducks and geese. Due to their large size, waterfowl can easily damage or down an aircraft. Waterfowl abundance is high during spring and fall migrations but, during the winter months, the area has a fairly large population that over-winters. Their flocking behavior increases the hazard to aircraft, which could possibly result in multiple engine ingestions and ultimately, failure.

Shorebirds can be small in size (Killdeer) medium (Black-crowned Night Heron) or large (Great Blue Heron). These birds are mostly associated with water or wetland soils. Species included in this guild



forage in or around water (fish, amphibians, and various insects). Although not a constant water source,



survey point 17 holds water from excessive watering with irrigation practices, which in turn attracted killdeer. One observation of a Great Blue Heron and one of a Long-billed Curlew were noted throughout the assessment. Survey points 3 and 4 had the most abundant occurrence of waterfowl.

Distribution of Waterfowl at GJT

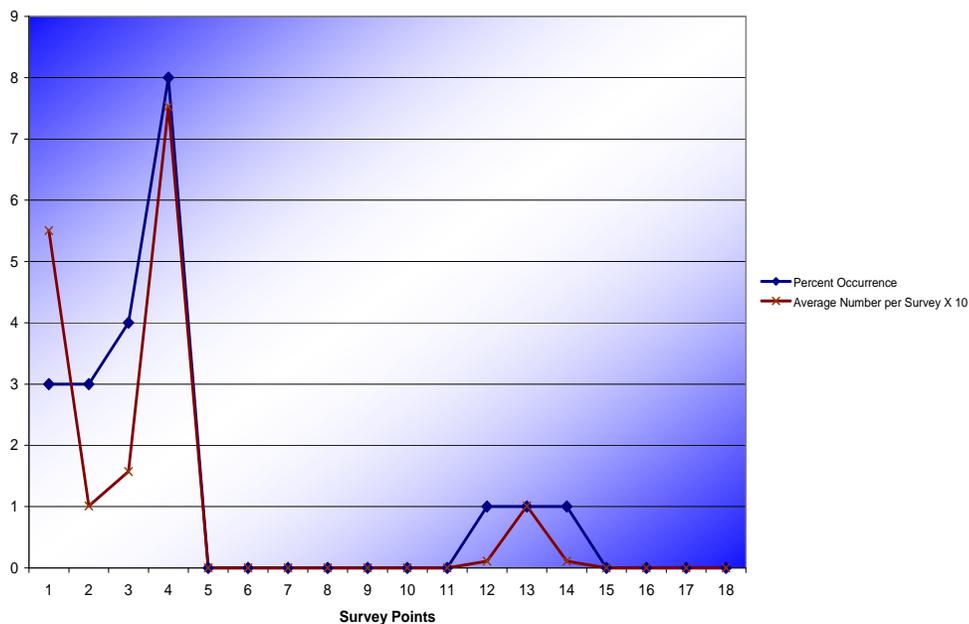


Fig. 9.1 Waterfowl and Shorebirds, when seen, did not share the same areas of the AOA. Waterfowl were generally following waterways and passing by.

Distribution of Shorebirds at GJT

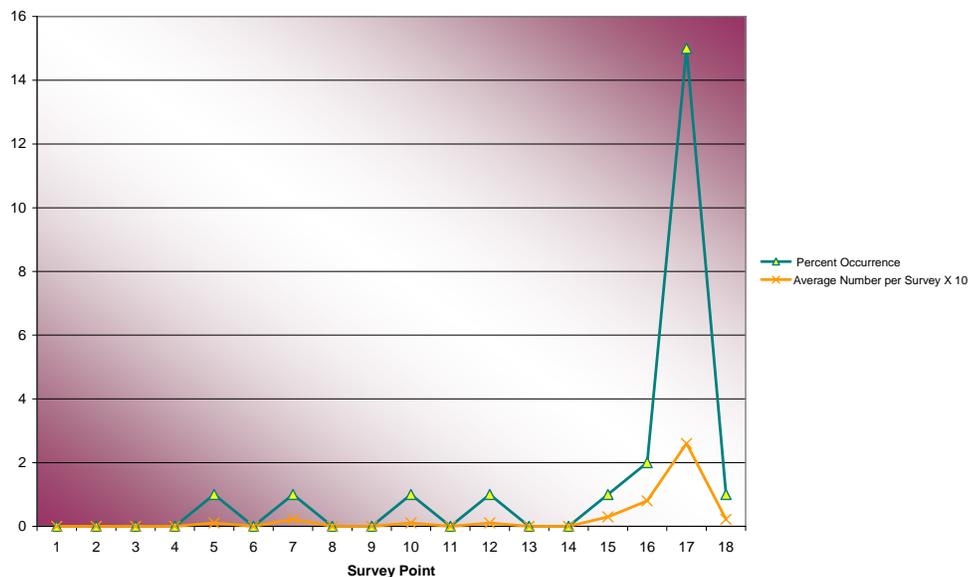
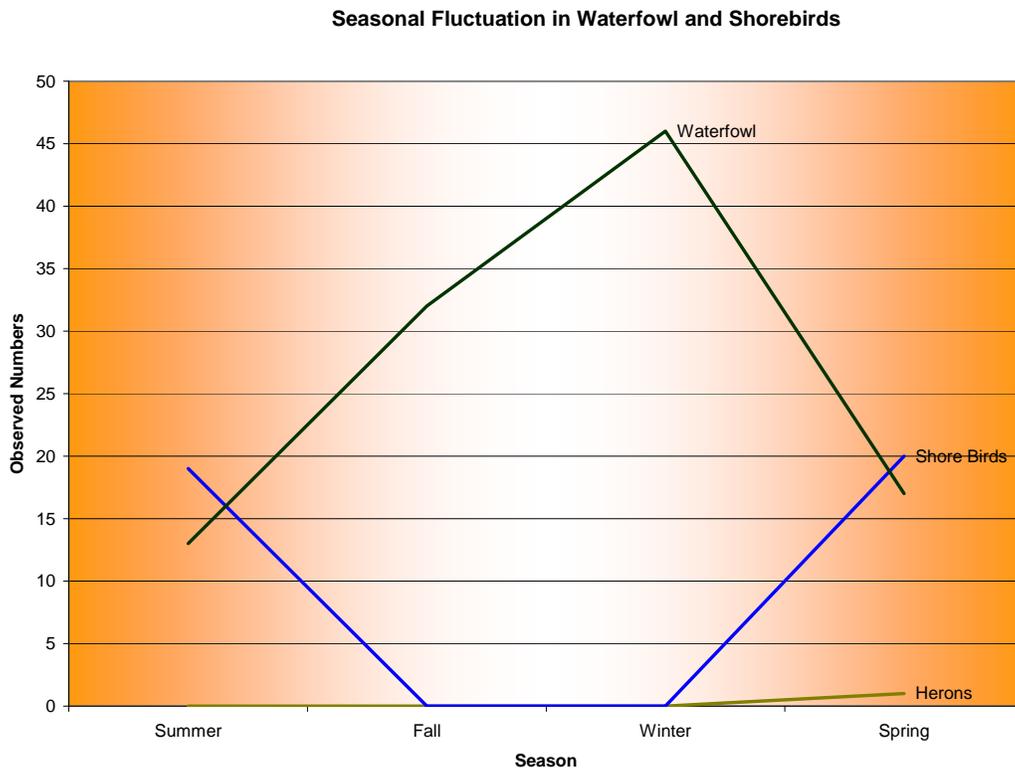


Fig. 9.2 Shorebirds were generally present in graveled or short grass areas where water collected. These low-lying areas collected rainwater or irrigation water and attracted aquatic insects.

## Damage

Waterfowl are particularly hazardous to aircraft due to their size, weight, and flocking behavior. As discussed earlier, the potential for damage by waterfowl was most tragically illustrated in September 1995 when an Air Force jet crashed in Alaska after striking a flock of Canada geese on takeoff, killing all 24 crew members. Waterfowl were responsible for over \$47,000,000 in damages to civil aircraft in the United States from 1990-2001 (Cleary et al. 2002).

Shorebirds are hazardous to aircraft when abundant and in large numbers around the airfield. Most birds of this guild have bodies which are relatively large and can have substantial weight. Shorebirds pose a hazard to aircraft as they travel between feeding grounds due to short, low flight patterns. Fortunately, GJT has little activity from either of these guilds. However, action must be taken *when* hazards do arise.



*Fig. 9.3 Shorebirds found their way to GJT during migration. Resident waterfowl were more commonly observed than transients. Only one heron was observed during the course of the assessment and was therefore separated in order to preserve the integrity of data.*

## Legal Status

Waterfowl are protected as migratory game birds by Federal and State laws, but most can be hunted during fall and winter months. A Federal depredation permit from the USFWS will need to be obtained if waterfowl are to be removed out of season or in excess of the legal bag limit during hunting season.

Also, shorebirds are protected as migratory birds, and permits must be obtained from the USFWS before lethal control can take place. Hazing can take place without permits, although, this type of control must be reinforced by use of lethal means.

### Control Measures

The best method to control waterfowl is the removal or exclusion of ponds, ditches and wetland habitats. If removal of ponds and ditches are not feasible then exclusion may be an alternate choice in areas where frequent activity is observed. Wire grids are effective at 10-20 foot intervals or floating plastic balls (or empty 2-liter soda bottles) for use over pond surfaces. It is recommended that exclusion should be installed to prevent waterfowl, from accessing storm water retention ponds when water is present for long periods after rainfall. Using long grass management (7 - 14 inches) or an unpalatable ground cover can effectively preclude a wide variety of birds (Linnell et al. 1997), including geese, from feeding on airfields. Pyrotechnics work well for most waterfowl, especially during the hunting season. If they become tolerant to hazing efforts, it may become necessary to lethally remove a few individuals to reinforce these methods. Becoming tolerant to hazing techniques is most often noticeable with resident birds, but may also occur in migrants a few weeks after the regular hunting season closes. Waterfowl can also be affected by the use of visual repellents in conjunction with pyrotechnics. An aggressive approach to keeping waterfowl off of the airfield should be taken if they begin to feed or loaf on the property. If management practices are not taken seriously, waterfowl numbers could potentially increase.

The best long term control of shorebirds is to eliminate all water bodies and wetland areas. If elimination of all water is not feasible then reduction of these areas is the next best option. A simple fix to pooling irrigation water is to reduce irrigation time to no more than 10 minutes, then re-water if needed at a later time in the evening or early morning, this allows water to soak into soil and leaves less on the surface to accumulate and attract birds. Exclusion devices will work where single water sources are prevalent. Pyrotechnics work well for shorebirds if occasional lethal control is incorporated. Spring months for pyrotechnics would be the most beneficial as their numbers are at the highest and shorebirds are looking for favorable habitat for nesting. If lethal control is to take place, be sure that the proper species and numbers are included in a permit from USFWS.



### **6.9 Corvids**

American crows, Black-billed Magpies and Common Ravens are well-known, rowdy birds of exceptional intelligence, and are very social. All three species were present at GJT, while ravens and magpies were common. Crows, magpies and ravens are medium to large sized birds that feed on a wide range of food items including carrion, crops, insects, and



refuse. Ravens tend to be more wary of humans than crows and magpies. American Crows were few and far between, where as Common Ravens and Black-billed Magpies were most abundant on the north, south and east perimeters at survey points 5-13.

### Damage

Crows, magpies and ravens can inflict severe damage to aircraft. Fortunately, most corvids are somewhat adept when it comes to avoiding aircraft, and are generally not considered a great threat to aviation. However, this does not mean they can be dismissed as a hazard altogether. Approximately 300 strikes involving corvids caused over \$300,000 in damages to civil aircraft in the United States alone from 1990-2001 (Cleary et al. 2002). Furthermore, corvids tend to form larger flocks during the winter, which increases the likelihood for the entire flock to find food but also increases the potential for damage if struck by an aircraft.

### Legal Status

Corvids are migratory birds and have been afforded federal protection. However, crows and magpies can be taken without a Federal permit when they are "...concentrated in such numbers and manner as to constitute a health hazard or other nuisance..." (50 CFR Ch. 21.43). The population of any avian species at GJT constitutes a hazard to human health and safety. The State of Colorado recognizes Federal regulations and does not require a state permit under the conditions previously mentioned. This depredation order does not apply to ravens, so a Federal Depredation Permit is required if the airport expects to take ravens, thus, it is recommended that American Crows and Black-billed Magpies be added to the permit as well.

Distribution of Corvids / Ravens At GJT

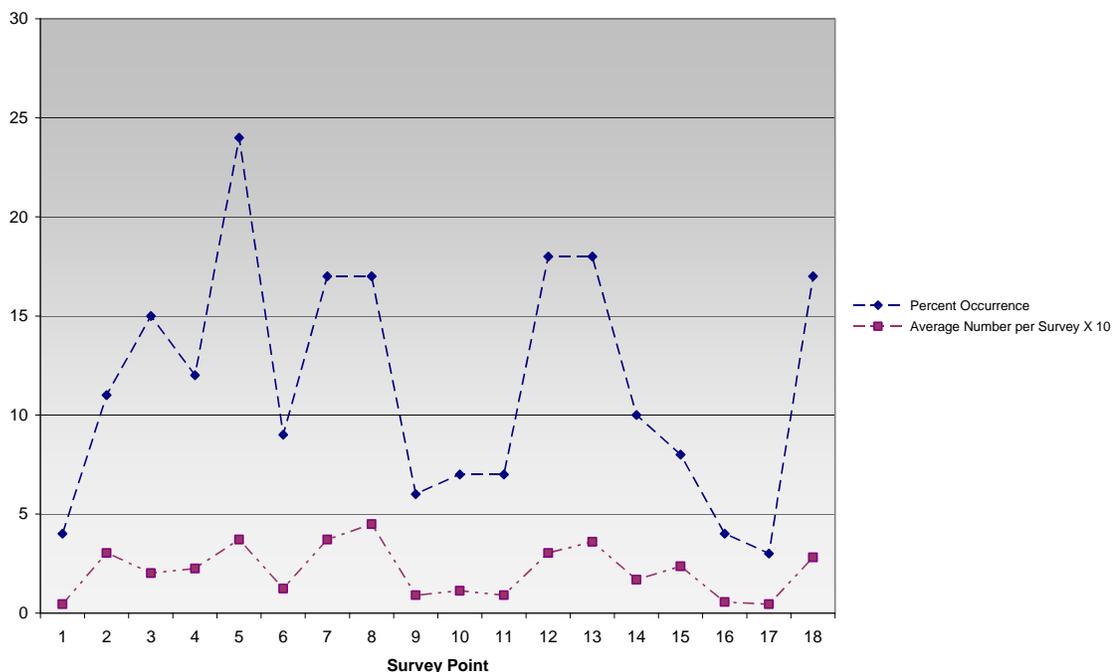
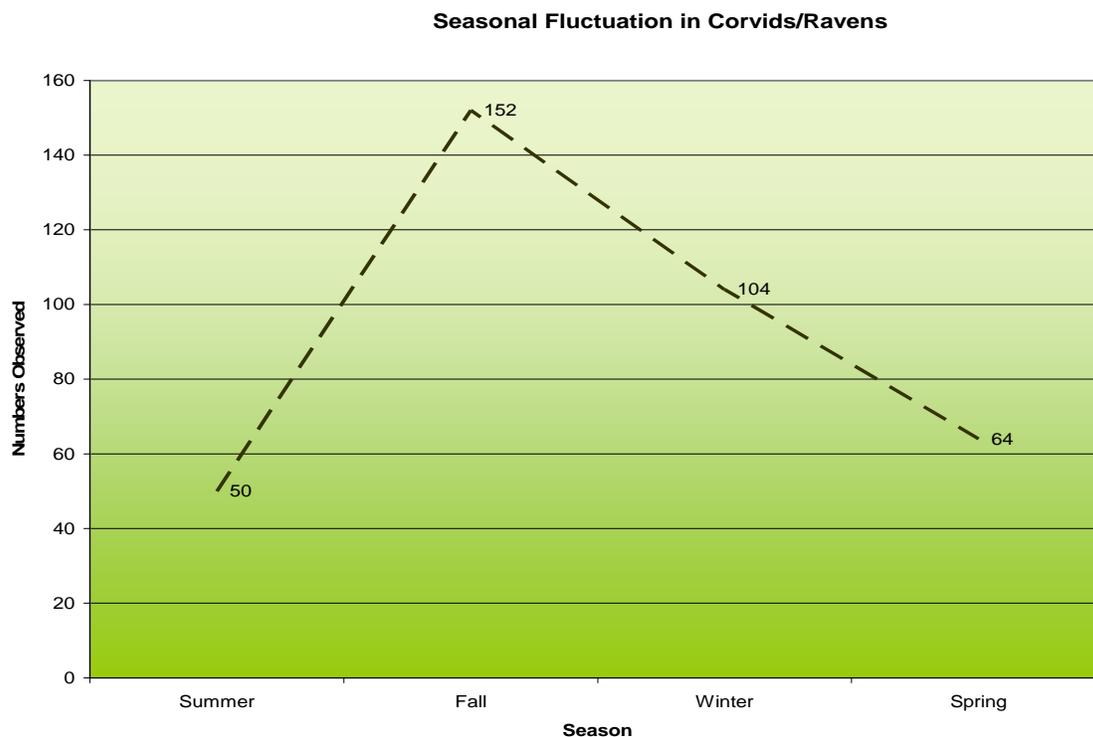


Fig. 10.1 Corvids are a common occurrence at GJT and are found at all points around the AOA. Points 5, 7, 8, 12, 13, and 18 are the most common areas to find a member of this guild.

### Control Measures

Prey-base reduction and the removal of carrion, trees, and refuse from runways is usually most effective. Corvids can easily be hazed using pyrotechnics, bioacoustics, and visual repellents, but they soon habituate to these devices if not enhanced by lethal reinforcement. Use of a pellet gun or shotgun can be useful in removing specific individuals from an airfield.

Currently, GJT has a federal depredation permit to lethally remove ravens and magpies from the airfield because they pose a threat to Human Health and Safety. GJT should continue to remove road-killed carcasses from 27 ¼ road, H road, and also I-70 to help keep excess ravens from sharing the airspace with aircraft.



*Fig. 10.2 Corvids are generally a very common species around GJT year-around. The population does spike shortly before the fall migration begins. This may be migration as well as winter kill off before the spring breeding season.*

### 6.10 Flycatchers, Thrushes and Shrikes

These guilds are composed of small to medium sized birds which possess similar behavior and feeding habits. Birds found in these guilds include, but are not limited to, American Robin, Western Meadowlark, Loggerhead Shrike and Western Kingbird. These birds are mostly insectivores, though they will eat seeds. They are attracted to areas with insects and perches. Areas along 27 ¼ Road on the west border and along I-70 to the south, with short grass, fence posts and areas with bare ground are most suitable for this guild. Survey points 2, 5, 6, 7, 8, 12, and 14 meet many, if not all, of these habitat needs, especially bare ground and short grass.

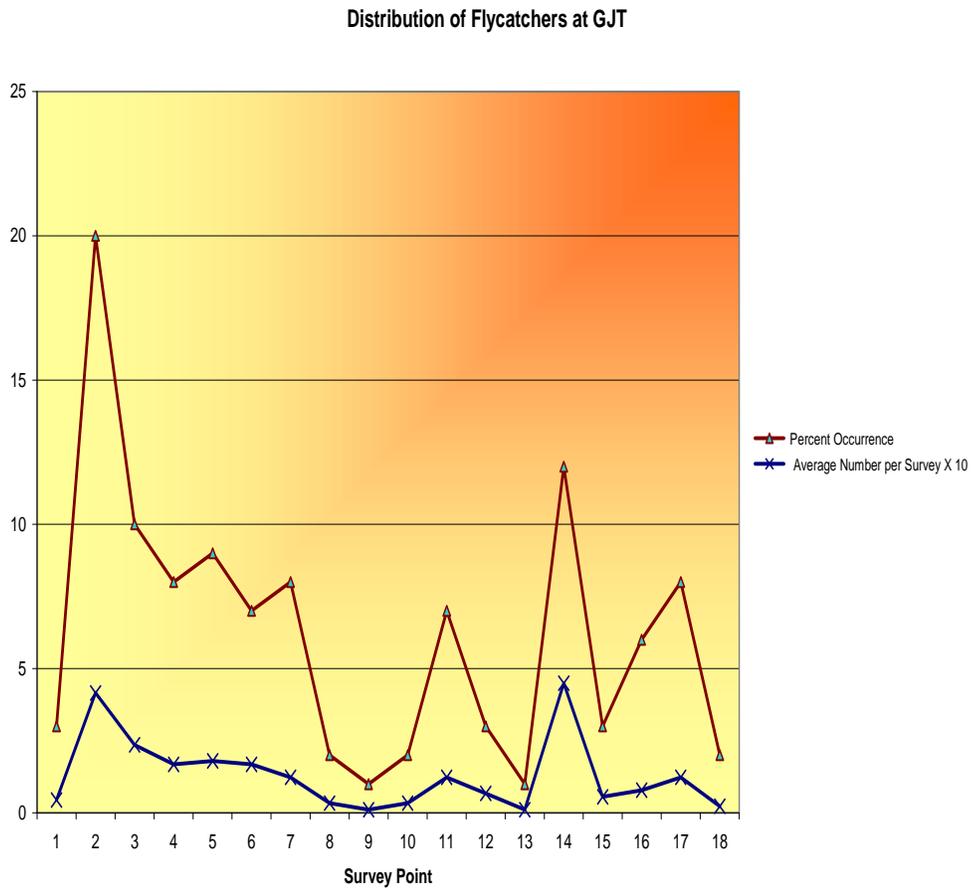


Fig. 11.1 Flycatchers, such as Western Kingbirds, spend their time closer to areas with water like points 2 and 3.

Distribution of Thrushes/Shrikes at GJT

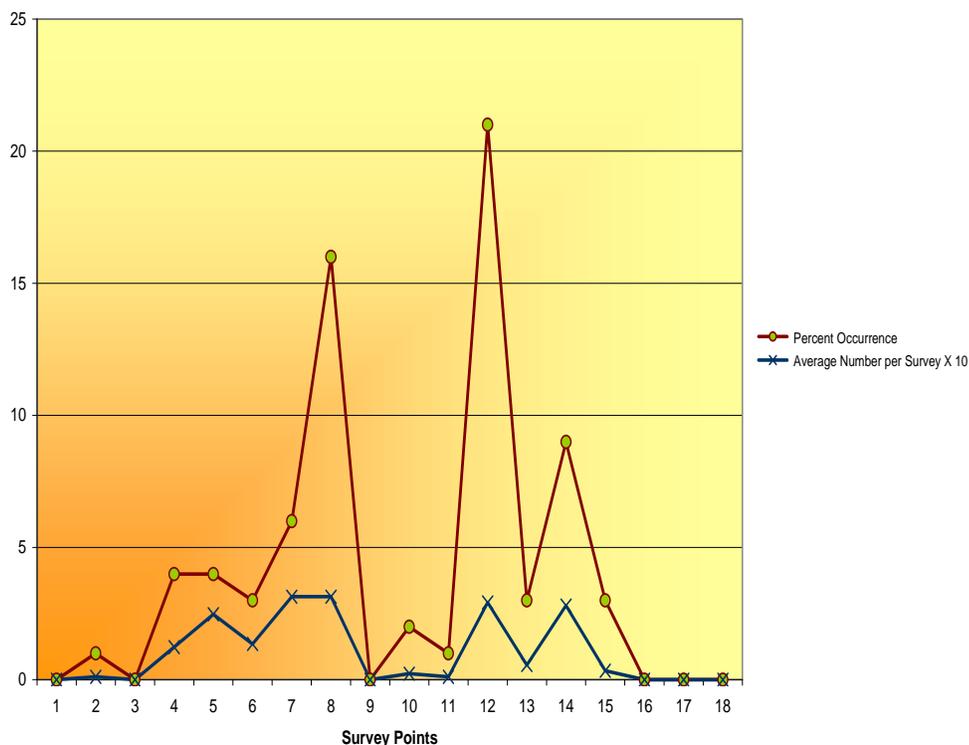


Fig. 11.2 Thrushes (Meadow Larks, Western Bluebirds) are generally found in the dryer areas which have shorter, sparse patches of grass such as points 8, 12, and 14.

Damage

Due to the small sized birds in this guild and the fact that they don't form large flocks, the guild poses a much smaller risk of damage to aircraft during a strike, though their presence on the airfield needs to be addressed.

Legal Status

All species in these guilds are protected as migratory non-game birds and require a permit from the USFWS in order to lethally control them although, non-lethal means require no permit.

### Seasonal Fluctuation in Flycatchers, Thrushes and Shrikes

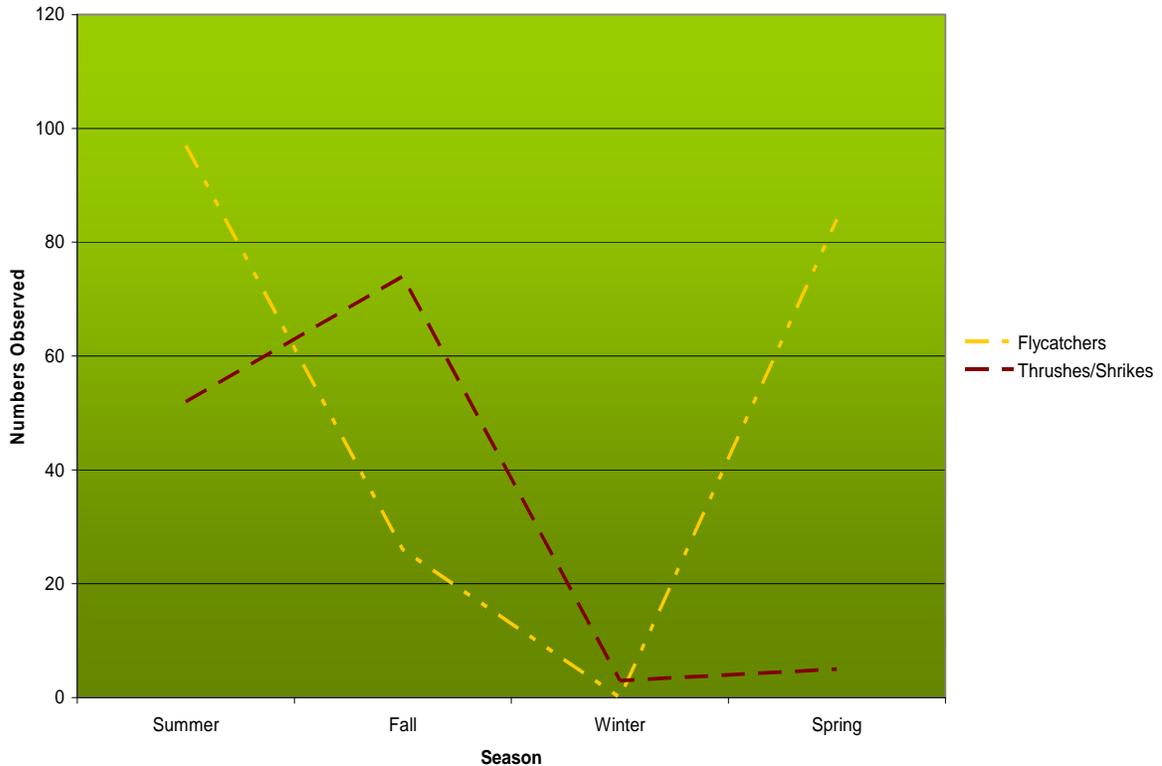


Fig. 11.3 Thrushes, Shrikes and Flycatchers all winter elsewhere, therefore the spring season is the best time to control these, especially Flycatchers like the Western Kingbird.

#### Control Measures

Management of grass between 7-14 inches will hinder the ability of larks and thrushes to feed on soil dwelling insects. Continually mowing in order to keep grass this height will also reduce insects that are present on the vegetation. Areas with bare ground should be re-vegetated to decrease habitat appeal. Pyrotechnics, combined with lethal control when necessary is effective in moving them away from critical areas. Visual repellents, especially raptor kites, helium balloons, and Mylar tape, may augment the effectiveness of hazing.

#### **6.11 Mammals**

Mammals utilized areas near open grassy areas and water, generally on the north and west sides of the airfield along with the area south west of the BLM ramp. The impact of direct control on mammals on the airport showed a need for continued control. It shows the need for proper direct control on a daily basis, mainly for White-tailed Prairie Dogs, and also a need for continued observations of mammalian wildlife on the airport. There is also a need to stress the importance of logging observations and frequent inspection of the property surrounding the airfield.

## Red Fox, Coyotes, and Badgers

Red Foxes are a rusty red color with black legs, and a bushy tail with a white tip. Red Fox diet includes, but is not limited to: birds, insects, small rodents, prairie dogs, fruit, carrion, refuse and human handouts. Red Fox are medium sized mammals weighing up to twenty pounds.



Red Fox at GJT were not extremely common during the assessment (only 2 observations) but can usually be found loafing around ditches, shrubs, and various debris (concrete refuse,



old fuel tanks, culverts, and gravel piles).

Coyotes are larger than foxes, generally 25-35 pounds; grey-brown in color with a medium length tail and smaller erect ears. Coyotes are opportunistic feeders, meaning they will eat a variety of prey including: small rodents, rabbits, prairie dogs, birds,



berries, fruit, carrion, refuse, human handouts, fish, insects and plant material. Coyotes have been observed on numerous occasions at GJT and are common at night although one was



never documented during spotlight surveys. When the animal itself was not observed, tracks and other sign were available to indicate their presence.

Badgers are short-legged, stocky animals weighing 15 to 25 pounds. Badgers feed on small burrowing rodents (prairie dogs, ground squirrels, cottontail rabbits, mice) and also snakes and ground nesting birds. Badgers have been seen on several occasions digging up prairie dogs and hunting near coyotes. Due to their ability to seek shelter in the burrows of prey animals they generally vanish quickly. Evidence also indicates that badgers have been traveling under the fences to hunt in the evening and morning hours.



On several occasions, WS personnel observed places where badgers and coyotes had come under the chain-link fence. Also, coyotes observed crossing the runways and using the property, need to be documented in order to better understand the dynamics of the population at GJT.

## Damage

Because of their moderate size Red Fox, Coyotes and Badgers could easily damage landing gear on an aircraft. Red Fox and Coyotes commonly cross runways and taxiways to new feeding grounds, to and from dens, to watering areas, and/or use these surfaces as travel corridors. These animals will also cause other types of damage such as chewing on runway marker lights and wiring, and digging holes under the perimeter fence. Red Fox, Coyote, and Badgers can also result in delayed

take offs and aborted landings, if a pilot were to see the animal loafing on a runway, resulting in lost revenue.

#### Legal Status

All furbearers require coordination with the CDOW to take lethally. WS coordinated with the CDOW and agreed to report the take of all furbearers from the airport property. GJT staff should continue to communicate and cooperate with CDOW regarding furbearer issues and before any lethal techniques are used.

#### Control Measures

Due to their adaptable behavior, it is nearly impossible to permanently disperse resident fox or coyote from the entire airfield using only habitat modification or hazing procedures. A chain-link skirting attached to the bottom of the entire perimeter fence ran at a 45 degree angle on the outside, then covered with soil; along with a 10 foot "no-climb" 1-inch chain-link fence with 3-strand barbed-wire risers on the top would be the best long term solution. Lethal control is also efficient for reducing numbers. However, these species will continue to migrate into this area unless prey densities are kept low.

#### Prairie Dogs

The species of prairie dog at GJT is the White-tailed Prairie Dog. It is a small golden-brown rodent that forages on grasses and lives in underground burrows. It is one of many prey species found at GJT and the greatest prey-base species observed on the AOA. The highest occupancy of prairie dogs can be found all along the north side of runway 11/29 and also south west of the BLM ramp. These areas should be continually monitored and controlled to keep numbers low. Any control in these areas should be inspected for any carcasses to avoid attracting avian species such as vultures and corvids.



#### Damage

Prairie Dogs have been struck by aircraft before but are usually not a direct threat to aircraft, due to their small size. Their attraction of predators to the airfield creates a hazard. These predators could collide with aircraft or could leave behind pieces of prey further attracting a variety of scavengers. Among these predators are the fox, coyote, corvids, vultures, and raptors.

#### Legal Status

Despite many outside attempts at protecting the White-tailed Prairie Dog, USFWS and the Colorado Wildlife Commission have not placed this species on the endangered/threatened species list. Lethal control continues to be an option for the airport.

#### Control Measures

Prairie dogs can be managed by toxicants and firearms; however, this method will be ineffective if prairie dog burrows are not destroyed. The propane/oxygen concussion systems that are on the market claim to destroy burrows by collapsing

them. Unfortunately, without the proper types of soils and correct conditions, this method will not be effective. Control will be a continuous effort due to other prairie dogs moving onto the airport property from the surrounding areas. Visual barriers are another option for excluding prairie dogs. Visual barriers are also ineffective if members of the same family group are on both sides of the visual barrier. Any light coming through the barrier will cause the rodents to damage the material. It may be more practical and cost effective to seek lethal control of prairie dogs and then destroying burrow systems by use of a furrowing disc or field plow.

### Rabbits

Rabbits, specifically the Desert Cottontail, have a large presence at GJT also. Cottontail rabbits are small rodents with a rusty patch on the nape of the neck. They consume grasses and seeds and are mainly active at night. It is not uncommon to see rabbits at all hours of the day at GJT. Rabbits use longer grasses and shrubs for cover and concealment from predators, yet they generally feed in the short grass.

### Damage

Rabbits are unlikely to cause damage to an aircraft, but may indirectly cause damage by attracting predators and scavengers. Rabbits and prairie dogs can be found road-killed on 27 ¼ road attracting corvids and vultures. They are a regular attractant for raptors such as Golden Eagles and Red-tailed Hawks as well as for mammalian predators such as coyotes and foxes. Rabbits have also been known to chew through wiring at GJT, which would also be an indirect hazard to aviation, and sun themselves early in the morning on the paved surfaces.

### Legal Status

Cottontail Rabbits are a state managed small game species. It is also not advised to relocate rabbits due to the transmission of disease in and out of an area. CDOW should be contacted prior to any control efforts other than habitat management. Lethal control will be at the discretion of CDOW.

### Control Measures

Habitat management for rabbits would include managing grass lengths between 7 - 14 inches and removing shrubs and low-lying brush. With the approval of CDOW lethal control for rabbits would include the use of firearms and air rifles. Barriers are not effective at hazing or excluding rabbits and therefore habitat management and lethal control are the most effective method of population management.

### Other Small Rodents

Voles, mice, and rats fall into this category. GJT sustains a large population of small rodents. This population is dependant on the abundance of water, grass, and grass seeds. No surveys were conducted to quantify rodent abundance so precise data is not available, although, Deer Mice were seen in the spring while conducting spotlight surveys. While small rodents do not pose a direct threat to aviation they do pose an indirect threat. Indirect threats include gnawing on electrical wires and prey base to larger predator species, such as fox, coyotes, and birds of prey.

### Legal Status

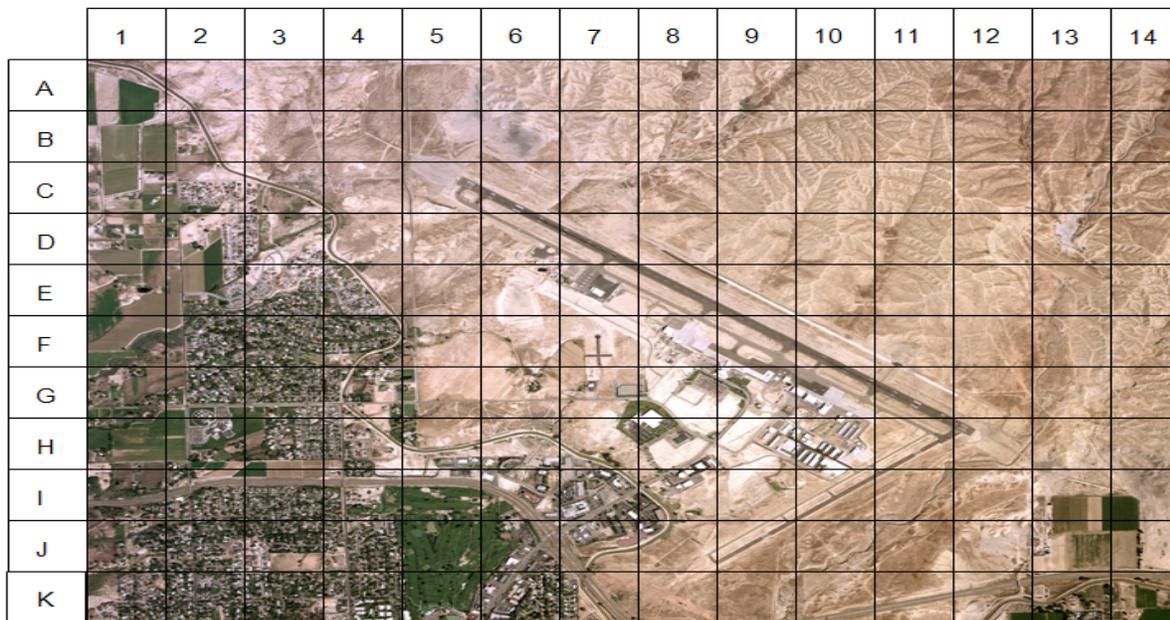
Most small rodents can be controlled without obtaining any permits. If threatened or endangered rodents were to be found on GJT property in the future, then special consideration would need to take place. No threatened or endangered species are known to be present at GJT.

**Control Measures**

Small rodents may be controlled by trapping efforts or by applying pesticides. Both of these options are time consuming and costly. However, keeping grass heights to 7-14 inches may be the best, least costly and also most productive solution depending on problem species. Continual mowing will reduce grass seeds production, thereby decreasing the amount of rodents around the AOA.

**6.12 Spotlight Surveys**

Spotlight surveys were conducted monthly as weather allowed for the twelve months of the assessment and, due to snow, rain, and mud, only nine spotlight surveys were conducted. Animals were spotted, counted, and assigned to a grid on a grid map provided by GJT. The grids are designated a letter or number and thus make up grid points such as H-11.



*Fig. 12.1 Grid Map of GJT used to conduct Spotlight Surveys.*

Overall, Cottontail Rabbits were the most common and highest in population of all of the animals seen during spotlight surveys. Rabbits were available through all seasons and at very high numbers. Locations H9, H12, I10, I11, J8, and K7 were among the highest in rabbit population at night. These locations are along Indian Wash, which borders the east perimeter fence, and along the highline canal on the west side of Runway 4/22.

### Spotlight Surveys

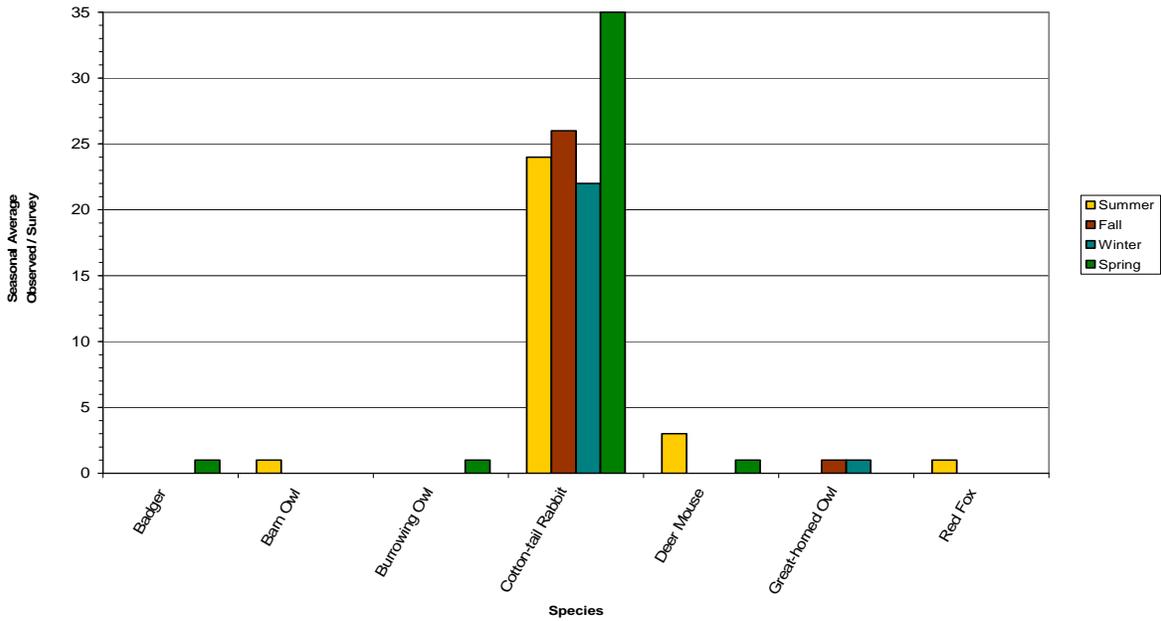


Fig. 12.2 Spotlight surveys were conducted in order to assess the population of nocturnal wildlife activities on the airfield at GJT. Surveys began approximately 30-minutes after sunset. The main species observed was the Desert Cottontail Rabbit.

### Distribution of Species During Spotlight Surveys At GJT

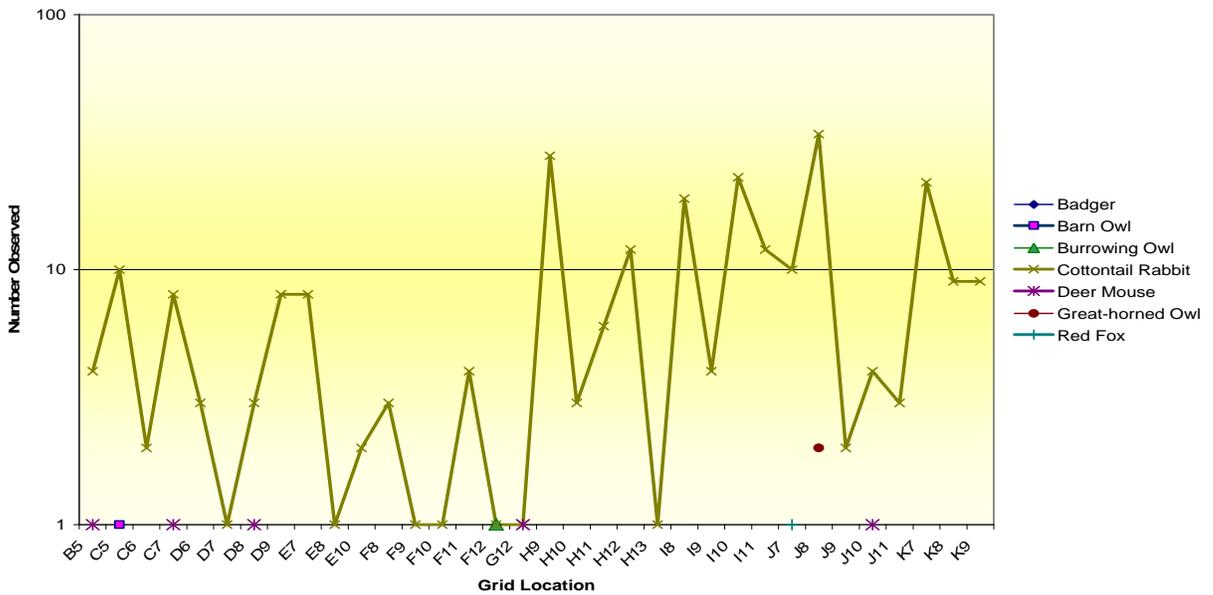


Fig. 12.3 Distribution of species shows where the populations are highest as well as where the attractants are. Cottontail Rabbits were the most abundant species during spotlight surveys at GJT.

### **6.13 General Observation**

There are several issues difficult to show with traditional survey and data results. The General Observation section expands on these issues. General Observations were recorded in a field notebook along with date and time of observation. General Observations encompass wildlife species not generally noted in point count surveys. Wildlife attractants and issues were the focuses of this type of observation.

#### **Man-made Attractants**

One issue is irrigation ponds on the AOA. In order to irrigate landside areas to the south of the terminal, GJT has an irrigation pond that the water is pumped out of. This pond was not seen attracting a large number of species, birds or otherwise, but could easily become a dangerous attractant if grasses and such are not managed properly. The bird species noticed in this area: Red-Winged Blackbirds; Mallards; swallows, finches and sparrows, are attracted to either the water or the insects on and around the water as well as the nesting habitat for the blackbirds.

Other issues of the same type are: the Storm-water retention ponds; Government Highline Canal, which creates a corridor through the AOA for species such as waterfowl, coyotes, and bear; various small low lying areas which could become an attractant. On August 31, 2007 a black bear cub was removed from a culvert and relocated by CDOW after crossing airport property. It is believed that this bear crossed the property after following the highline canal onto the property. Another bear, approximately 2-3 years old, was reported but not confirmed coming off of the same canal and crossing the airfield 2 weeks later on September 12, 2007. Dumpsters may become a concern and may need to be "bear-proofed" in the near future.

Construction materials also increase potential hazards, since these types of materials increase habitat diversity if not properly disposed of after projects are completed. There are several locations of construction residue, such as cement culverts which have been removed from service and stored near the storm water retention ponds, as well as several piles of concrete, fill dirt, and asphalt millings in various places around runway 11/29. The culverts and concrete slabs increase habitat, mainly for Red fox and rabbits. The fill dirt and asphalt milling creates attractants for insects and small birds. These areas also create perches for raptors while hunting or feeding.

The small cattle ranch just south of the west end of 11/29 is an attractant for starlings, blackbirds and magpies. Another cattle ranch out one mile west of the AER 11 is also an attractant for the same species of birds and this ranch turns the cattle out to "free range" in early spring. Frequently, these "free ranging" cattle brake through the outside property fence and the possibility for them to gain access to the airfield exists after such an incident due to weak areas in the barbed wire fence. Cattle could pose a serious hazard if they make it onto the airfield or runways/taxiways.

#### **Naturally Occurring Attractants and Threats**

Indian Wash borders the perimeter fence on the east side of the airfield. This arroyo creates a travel-way, den sites for fox and coyotes, and easy access to hunting grounds on the AOA for predators and Raptors. Indian Wash also has several trees (dead and alive) as well as shrubs and low lying water collection sites. All of these features create ideal conditions for a

variety of species that utilize the habitat. A four-strand barbed wire fence and 400 yards of grass separates the wash from the runway's threshold.

Other naturally occurring attractants or threats include the many arroyos and washes that drain from north of the airfield. These types of landscape features provide corridors used by predators, such as coyotes for hunting purposes, as well as by deer, antelope, and bear while foraging and moving between water feeding areas and cover. Antelope, or pronghorns, were baited away from the airfield in the winter of 2005 and 2006 by using alfalfa hay. Pronghorn activity around GJT will need to be monitored closely and action taken if situations warrant control.

## **7.0 RECOMMENDATIONS**

The recommendations for managing wildlife hazards at GJT are divided into three sections: *General Recommendations*, *Habitat Management Recommendations*, and *Wildlife Deterrence Recommendations*.

While all recommendation sections are important, the management of habitat will have the most lasting effect by reducing the use of the airport by hazardous animals and should be implemented regularly.

### **7.1 General**

#### **Develop a WHMP based on this WHA**

A WHMP is a critical element for determining how wildlife hazards will be managed and who is responsible for their control. A WHMP should be developed using this WHA. It should include sections on habitat management, available resources, training, control methods/techniques, and evaluation. The habitat management section should include a timetable outlining wildlife habitat management goals and expected completion dates. Wildlife control methods/techniques should include species/guild-specific techniques for dispersal or removal. These procedures should set guidelines for the appropriate and most effective use of lethal control methods. The plan must be reviewed annually to determine if revisions are necessary to improve or modify the wildlife control program (Appendix A, Sec. (f)(6)).

#### **Assign Wildlife Control Personnel**

During this assessment wildlife hazards were always imminent. The presence of wildlife habitat surrounding the airport, namely the Indian Wash area, Government Highline Canal and the irrigation/retention ponds, will continue to attract hazardous wildlife to the airfield despite efforts to eliminate wildlife attractants inside the airport property. This will require regular observations and maintenance of habitat by the airport in managing its wildlife hazards. More frequent control efforts, continual habitat modification recommendations, and ongoing documentation of wildlife control efforts and wildlife activity, all necessitate the involvement of personnel. Significant reductions in wildlife hazards should follow if the airport assigns an individual employee who will conduct the following activities:

- Obtain appropriate wildlife control permits and supplies.
- Implement these permits with proper shooting, trapping, and hazing skills.
- Maintaining cooperative relationships with appropriate wildlife resource management agencies (e.g., USFWS, WS, and CDOW). Such relationships will provide the airport with ongoing biological expertise.
- Ensure that GJT personnel and pilots are familiar with the proper procedures for reporting all types of wildlife strikes and making FAA Form 5200-7 (Appendix H) readily available. Whenever possible, wildlife personnel should file wildlife strike reports to ensure accuracy in species identification and other crucial information.
- Create a system of record, such as a database, for reporting wildlife hazard management activities, as well as wildlife strike information collected from pilot reports, mechanical inspections, tower logs, and runway sweeps/inspections.
- Make arrangements for the proper instruction of GJT personnel who will assist in the implementation of wildlife hazard management.
- Carry out daily wildlife hazard deterrent activities which include the hazing of wildlife from the AOA and advising pilots through a NOTAM of recurring wildlife movements that have the potential to result in a strike with operating aircraft.

Efforts *must* be made to improve the reporting of wildlife strikes. Throughout the air transportation industry there has been a tendency to neglect reporting wildlife strikes. Maintenance personnel, operations staff, and pilots should be encouraged to report every strike using the FAA Form 5200-7 (Appendix H). Personnel should also be encouraged to properly identify the wildlife species. If the present personnel are unable to identify the wildlife species then a trained biologist should be notified. Personnel should also strive to make an accurate estimate of damage cost caused by the wildlife and keep this as a record in a database. Daily sweeps of the AOA should be conducted in order to identify wildlife that may have been struck but not reported, any unexplainable carcass, in whole or in part, found within 200 feet of a runway centerline should be recorded and reported as a strike.

Wildlife control personnel should actively participate in land-use projects or changes (on or off airport) property that could increase wildlife hazards at GJT. For example, new buildings or development plans should be reviewed in order to make recommendations in the design to discourage use by wildlife, and also any agricultural and use changes on the property surrounding GJT including the public use areas (Appendix C).

### **Train Personnel in Wildlife Hazing Procedures and Species Identification**

Personnel involved in wildlife hazard management should be trained to recognize and respond to hazardous wildlife and potential wildlife hazards. Field guides are very useful for wildlife identification and should be made readily available. Such guides include *The Sibley Field Guide to Birds of Western North America* (Sibley, 2006), *Field guide to the Birds of North America* (National Geographic Society 1999), and *The Birders Handbook* (Ehrlich et al., 1988). Depending on the situation, responses to wildlife hazards may include active hazing or shooting, trapping, or may require the employee to notify the airport manager and/or tower operator about observed wildlife movements.

All personnel should be trained in the safe handling and most effective use of hazing devices so as to avoid increasing the hazardous situation (e.g., chasing birds into the path of an approaching aircraft). WS offers a formal training course designed to familiarize airport personnel with basic bird identification, dispersal techniques, and safe applications. This 8-hour course involves both classroom instruction and hands-on training in the field and is renewed annually with recurrent training.

#### **Adopt a Policy of ZERO Tolerance Toward Wildlife**

A zero tolerance policy on the airfield should be adopted toward all potentially hazardous wildlife, including ravens, pigeons, starlings, and waterfowl as well as any predator. Any bird observed on the airfield by airport personnel can be considered hazardous because any bird could potentially fly over/along the runway. This does not suggest that every individual of every species must be immediately removed from the airfield, but airport operations must be aware of what is in the area and how frequently before the determination to remove, either lethally or by hazing, can be made appropriately. In any wildlife deterrent operation, common sense must have a bearing as to the proper timing and implementation of deterrent actions. Improper timing could result in an employee hazing an animal into air traffic.

#### **Maintain Necessary Federal and State Wildlife Control Permits**

GJT must continue to maintain such permits a Migratory Bird Depredation Permit (annually) as well as a Depredating Eagle Permit (as needed, expires every 90 days) both available from U.S. Fish and Wildlife Service. These permits create a legal means for lethal control of migratory birds as well as harassment of eagles and a renewal should be applied for one month **prior** to the expiration date on the permit.

#### **Adopt and Enforce a “No Wildlife Feeding” Policy**

The airport should become an institution of education in an effort to alert the public and airport tenants that intentionally or unintentionally feeding wildlife can contribute to hazards at the airport. Hand-fed wildlife commonly becomes acclimated to humans. Wildlife that becomes accustomed to feeding from dumpsters or being hand fed by people is more difficult to disperse from the airport using non-lethal methods. The use of signs in public areas and/or distribution of information via local media sources are ways to increase employee, tenant, and public awareness of this issue. In addition, businesses that use outdoor containers (e.g., dumpsters) for disposal of food waste should be encouraged to keep their containers securely closed at all times to prevent access by scavenging wildlife. A “no tolerance” approach should be strictly enforced at GJT. This should be a policy that is **regularly re-visited** at staff meetings and training.

#### **Encourage adjacent land owners to minimize wildlife activity on their land**

Adjacent land owners may have the means of removing wildlife attractants and if not, they may be willing to cooperate with GJT's attempts at protecting human health and safety. Modification or elimination of the attractants would be the most effective means of reducing wildlife around the airfield. However, since habitat modification is generally inconsistent with the intended use of the land by neighboring owners, wildlife deterrent techniques may be more practical. Some wildlife deterrent measures require a permit from the CDOW and USFWS for use. Land owners should contact the local offices of these agencies to secure permission for techniques prior to use. Two species of concern

are European Starlings and Rock Doves, which are not protected and do not need a permit for lethal removal, hazing or deterrent devices, although CDOW should be contacted with the intent. City and County law enforcement should also be contacted and well informed on these issues and the way GJT plans to alleviate them.

### **Revise Daily Wildlife Control Recording Procedures**

Daily wildlife control record keeping should include the documentation of all efforts made to observe and remove/deter hazardous wildlife. Airfield patrols during which no hazardous wildlife are observed as well as observed wildlife should be noted in daily logs by date and time. It is important to document these efforts to detect wildlife in order to ensure that all possible efforts to alleviate hazards are being taken. The observation of hazardous wildlife which does not result in immediate action should also be recorded. This allows other personnel conducting wildlife control operations to focus their efforts on species and areas of the airfield that may have been missed during previous efforts, as well as to encourage personnel to be cognizant of areas and species that have been observed in the past and may become a hazard. Wildlife control records should also document wildlife attractants such as open trash receptacles, changes in grass length or invasion of new species that attract wildlife (e.g., seasonal production of seeds by certain plants), and temporary standing water. Documentation of wildlife attractants will alert control personnel to areas that need immediate attention and allow more effective revisions to the WHMP.

### **Consider Using a Computer Database for Keeping Records**

If implemented, a database system can be very user friendly and can be operated by personnel with little or no previous computer training. Employees can enter their own hazing data, print reports, and analyze trends. A database is useful for organizing and keeping data on wildlife observations and reviewing management activities and their results.

### **Continue Monitoring Wildlife Activity and Use Patterns on the Airfield**

The intent of this WHA was to document species occurrence, habitat use, and population characteristics of wildlife at GJT. Attempts were also made to identify significant attractants within a 5-mile radius of the airfield that could adversely affect the safety of pilots and passengers. It must be realized that wildlife abundance and use patterns on airfields are affected by a host of variables that are rarely the same from year-to-year. Hence, conclusions based on wildlife activity and patterns during this study are only meant to be a guide and may or may not be consistent with subsequent years. Survey routes and methods were established to facilitate continued monitoring by an individual trained in wildlife species identification. Data from this study will provide a baseline for comparison in subsequent years. GJT should continue to monitor wildlife activity by conducting periodic surveys at the same points used during this assessment. While surveys conducted in subsequent years may not be conducted with the same frequency or intensity as this initial hazard assessment, they would still provide general insights into wildlife species and use patterns over time. In addition, they would enable GJT wildlife control personnel to gauge the effectiveness of their control efforts.

## **7.2 Habitat Management**

Habitat management provides the most effective long term remedial measure for reducing wildlife hazards on or near airports. Habitat management includes the physical removal or manipulation of food, water, and cover that attract wildlife. The ultimate goal is to provide an environment which is unappealing to species posing the greatest hazards to air traffic. This is accomplished by promoting an airport environment that is monotypic (uniform) throughout. The main wildlife attractant at GJT is grass and grass seed which provide food for prairie dogs and rabbits. These species become a large prey base for raptors and predators which in turn become an attractant to corvids searching for the remains of the prey. GJT is located to the north of the city of Grand Junction and within the property are some of the largest storm water retention ponds for the county, which may eventually become one of the airports largest attractants. These ponds are located near points 2 and 3 (Fig. 1.2) and are the storm water drainage for part of the city of Grand Junction. The bank has areas that have been seeded and are currently growing several grasses. This provides habitat for insects, small rodents and their predators. All vegetation on the pond bank should be kept at a length of 7-14 inches to reduce the attractiveness of these ponds depending on problem species and frequency of use. The Government Highline canal and irrigation ponds, on the south side of GJT's property, provide water and tall grasses for waterfowl and blackbirds for most of the warm months of the year. The water and wildlife activity should be monitored daily.

It is generally recommended that all grassy areas near the AOA be paved or filled with gravel. Clearing all grasses near runways and taxiways will be less appealing to many wildlife species. It is also advantageous to grade or smooth out low places that collect water.

## **7.3 Wildlife Deterrence**

A variety of equipment and methods are available for deterring hazardous wildlife (Appendix I). The following wildlife deterrent recommendations represent only possible solutions to the hazards observed at GJT and not the extent of those measures available. WS encourages the trial of other techniques, particularly non-lethal methods, for eliminating wildlife hazards. It is important to remember that a little imagination and persistence greatly augments the efficiency of any wildlife hazard reduction measure. It is also easy to get "stuck" in a pattern when searching for and deterring wildlife. Take a new route daily if possible and try not to look at things in the same order, try to implement various methods in order to be more effective.

*Note: **Remember** that wildlife deterrent measures are designed to deal with hazardous wildlife after they are detected. Such measures will not reduce the attractiveness of a particular area, especially if suitable habitat is allowed to remain. Wildlife deterrent techniques can help reduce wildlife hazards to arriving and departing aircraft for short periods of time. The length of time depends on the diversity of methods being used, the target species ability to adapt, and the persistence of wildlife control personnel. Therefore, wildlife deterrence should not be used as a replacement for habitat modification, habitat modification is the most useful and effective tool available.*

### **Expand wildlife control operations to include all hours of operation**

According to CFR 14, Part 139.337(e)(5)(ii), the airport should provide for physical inspections of the movement area and other areas critical to wildlife hazard management sufficiently in advance of air carrier operations to allow time for wildlife controls to be

effective. Hazardous wildlife detection efforts should be conducted before every air carrier aircraft movement. Hazing efforts should follow if hazardous wildlife is detected.

The exact schedule of wildlife control operations should be formulated by the wildlife control coordinator and also be included in the WHMP. All hazardous wildlife should be hazed from the field whenever observed. This includes hours of operation during which there are no air carrier operations. This will help reinforce the zero-tolerance policy towards wildlife. Birds in particular can habituate to periods of relative safety (hours when they are not hazed), thus becoming more difficult to deter on a long term basis. Again it is important not to fall into a set pattern for several days at a time.

### **Concentrate Hazing Efforts Early in the Morning**

Bird hazing efforts should be heaviest during morning hours. If birds are consistently dispersed each morning before they have a chance to feed, they will find alternative food sources and be less likely to return later in the day. Once birds become established on the airfield, they become increasingly difficult to disperse. Flocking birds such as sparrow-like birds, starlings, pigeons, and waterfowl are readily attracted to individuals or flocks of birds already present, known as a decoy effect. This results in a dramatic increase in the number of birds on the airport throughout the day. To prevent this, all birds must be dispersed from the airfield immediately upon detection and not allowed to forage, loaf, or roost.

When using **lethal** control, follow these guidelines:

Lethal control should be used to control birds that do not respond to non-lethal methods (the exact species that can be controlled lethally should be listed on all Federal and State permits). Lethal control of shorebirds (e.g., plovers and sandpipers) is typically less effective and should be used only in situations where they pose an immediate hazard to aviation safety.

- Use lethal control only as *reinforcement* for non-lethal hazing methods such as pyrotechnics or vehicle hazing, or as a *last* resort for removing persistent *individuals*. Occasionally, the removal of one or two individuals generally has the same negative conditioning effect on remaining individuals as the removal of 10-15 individuals of the same group.
- Lethal control of individuals from migrating flocks (e.g., shorebirds) may not significantly reduce the number of birds landing on the airfield. Negative response conditioning will not affect birds that have never experienced the conditioning technique. During migration, different individuals are likely to be encountered on a day-to-day basis. Birds harassed the day before with a shotgun may not be the same ones observed the next day. Therefore, daily hazing and lethal control may be required several times a day during the migration.
- Non-lethal control methods are most effective when accompanied by lethal shooting of flocking birds. This helps insure that harassment techniques do not lose effectiveness.

*Public sensitivity to lethal control should be considered, and discretion is strongly advised. However, concerns over public sensitivity should not supersede those of public safety, and the airport should not hesitate to implement lethal control when the situation warrants such action.*

**Previous Roosts Need to be Periodically Checked and Removed**

Places where birds have roosted in the past should be checked periodically. New nests should be removed immediately to continue to discourage use of these areas. Several roosting sites were observed in close proximity to critical airspace at GJT and had to be removed by WS during the assessment; however, permanent sites such as the canal bridges, ornamental cedar trees, and the shade hangars on C1A should all be monitored regularly.

## 8.0 LITERATURE CITED

*The following sources of literature were cited either directly or indirectly in this assessment. In addition to these sources of information, WS relied upon knowledge of GJT airfield employees, the knowledge of other WS biologists, and local wildlife professionals with regards to wildlife history and issues.*

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APPENDIX A (2 pages) CRF 139.337

**Title 14, Code of Federal Regulations, Part 139.337 (Wildlife Hazard Management)  
Revised 10 Feb 2004**

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

(b) In a manner authorized by the Administrator, each certificate holder must ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport

(b) (1) An air carrier aircraft experiences multiple wildlife strikes:

(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 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

(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.

(c) The wildlife hazard assessment required in paragraph (b) of this section must be conducted by a wildlife damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual. The wildlife hazard assessment must contain at least the following:

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

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

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

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

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

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

(d) (1) The wildlife hazard assessment;

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

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

(d) (4) The views of the certificate holder;

(d) (5) The views of the airport users; and

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

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

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

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

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

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

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

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

(f) (i) Wildlife population management;

(f) (ii) Habitat modification; and

(f) (iii) Land use changes.

(f) (3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.

(f) (4) Identification of resources that the certificate holder will provide to implement the plan.

- (f) (5) Procedures to be followed during air carrier operations that at a minimum includes—
  - (f) (5) (i) Designation of personnel responsible for implementing the procedures;
  - (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;
  - (f) (5) (iii) Wildlife hazard control measures; and
  - (f) (5) (iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.
- (f) (6) Procedures to review and evaluate the wildlife hazard management plan annually or following an event described in paragraphs (b)(1), (2), and (3) of this section, including:
  - (f) (6) (i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and
  - (f) (6) (ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.
- (f) (7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.
- (g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

**Memorandum of Understanding  
between the  
United States Department of Transportation  
Federal Aviation Administration  
and the  
United States Department of Agriculture  
Animal and Plant Health Inspection Service  
Wildlife Services**

**ARTICLE 1**

This Memorandum of Understanding (MOU) continues the cooperation between the Federal Aviation Administration and Wildlife Services (WS) for mitigating wildlife hazards to aviation.

**ARTICLE 2**

The FAA has the broad authority to regulate and develop civil aviation in the United States<sup>1</sup>. The FAA may issue Airport Operating Certificates to airports serving certain air carrier aircraft. Issuance of an Airport Operating Certificate indicates that the airport meets the requirements of Title 14, Code of Federal Regulations, part 139 (14 CFR 139) for conducting certain air carrier operations.

The WS has the authority to enter agreements with States, local jurisdictions, individuals, public and private agencies, organizations, and institutions for the control of nuisance wildlife<sup>2</sup>. The WS also has the authority to charge for services provided under such agreements and to deposit the funds collected into the accounts that incur the costs<sup>3</sup>.

<sup>1</sup> Federal Aviation Act of 1958, 49 U.S.C. § 40101, et. seq.

<sup>2</sup> The Animal Damage Control Act of March 2, 1931, as amended, 46 Stat. 1468; 7 U.S.C. 426 – 426b.

<sup>3</sup> The Rural Development, Agriculture, and Related Agencies Appropriations Act of 1988, as amended, 426c to U.S.C. 426 – 426b.

14 CFR 139.337 requires the holder of an Airport Operating Certificate (certificate holder) to conduct a wildlife hazard assessment (WHA) when specific events occur on or near the airport. A wildlife management biologist who has professional training and/or experience in wildlife hazard management at airports, or someone working under the direct supervision of such an individual, must conduct the WHA required by 14 CFR 139.337. The FAA reviews all WHAs to determine if the certificate holder must develop and implement a wildlife hazard management plan (WHMP) designed to mitigate wildlife hazards to aviation on or near the airport. These regulations also require airport personnel implementing an FAA-approved WHMP to receive training conducted by a qualified wildlife damage management biologist.

**ARTICLE 3**

The FAA and the WS agree to the following.

- a. The WS has the professional expertise, airport experience, and training to provide support to assess and reduce wildlife hazards to aviation on and near airports. The WS can also provide the necessary training to airport personnel.
- b. Most airports lack the technical expertise to identify underlying causes of wildlife hazard problems. They can control many of their wildlife problems following proper instruction in control techniques and wildlife species identification from qualified wildlife management biologists.
- c. Situations arise where control of hazardous wildlife is necessary on and off airport property (i.e., roost relocations, reductions in nesting populations, and removal of wildlife). This often requires the specialized technical support of WS personnel.
- d. The FAA or the certificate holder may seek technical support from WS to lessen wildlife hazards. This help may include, but is not limited to, conducting site visits and WHAs to identify hazardous wildlife, their daily and seasonal movement patterns and habitat requirements. WS personnel may also provide:
  - i. support with developing WHMPs including recommendations on control and habitat management methods designed to minimize the presence of hazardous wildlife on or near the airport;
  - ii. training in wildlife species identification and the use of control devices;
  - iii. support with managing hazardous wildlife and associated habitats; and
  - iv. recommendations on the scope of further studies necessary to identify and minimize wildlife hazards.
- e. Unless specifically requested by the certificate holder, WS is not liable or responsible for development, approval, or implementation of a WHMP required by 14 CFR 139.337. Development of a WHMP is the responsibility of the certificate holder. The certificate holder will use the information developed by WS from site visits and/or conducting WHA in the preparation of a WHMP.
- f. The FAA and WS agree to meet at least yearly to review this agreement, identify problems, exchange information on new control methods, identify research needs, and prioritize program needs.

#### **ARTICLE 4**

The WS personnel will advise the certificate holder of their responsibilities to secure necessary permits and/or licenses for control of wildlife. This will ensure all wildlife damage control activities are conducted under applicable Federal, State, and local laws and regulations.

#### **ARTICLE 5**

This MOU defines in general terms, the basis on which the parties will cooperate and does not constitute a financial obligation to serve as a basis for expenditures.

Request for technical, operational, or research assistance that requires cooperative or reimbursable funding will be completed under a separate agreement.

**ARTICLE 6**

This MOU will supersede all existing MOUs, supplements, and amendments about the conduct of wildlife hazard control programs between WS and the FAA.

**ARTICLE 7**

Under Section 22, Title 41, U.S.C., no member of or delegate to Congress will be admitted to any share or part of this MOU or to any benefit to arise from it.

**ARTICLE 8**

This MOU will become effective on the date of final signature and will continue indefinitely. This MOU may be amended by agreement of the parties in writing. Either party, on 60 days advance written notice to the other party, may end the agreement.

\_\_\_\_\_ OSB Woodie Woodward \_\_\_\_\_  
Associate Administrator for Airports  
Federal Aviation Administration

Date \_\_\_\_ June 20, 2005 \_\_\_\_\_

\_\_\_\_\_ OSB William H Clay \_\_\_\_\_  
Deputy Administrator for Wildlife Services  
Animal and Plant Health Inspection Service

Date \_\_\_\_ June 27, 2005 \_\_\_\_\_

APPENDIX C

U.S. Department of Transportation

**Federal Aviation  
Administration**



**Advisory  
Circular**

AC 150/5200-33b

**Subject:** HAZARDOUS WILDLIFE ATTRACTANTS ON  
OR NEAR AIRPORTS

(25 PAGES)



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

# Advisory Circular

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**Subject: HAZARDOUS WILDLIFE  
ATTRACTANTS ON OR NEAR  
AIRPORTS**

**Date:** 8/28/2007

**AC No:** 150/5200-  
33B

**Initiated by:** AAS-300

**Change:**

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

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

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

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

- a. Technical changes to paragraph references.
- b. Wording on storm water detention ponds.
- c. Deleted paragraph 4-3.b, *Additional Coordination*.

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

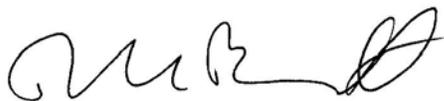
according to their relative hazard to aircraft. The ranking is based on the 47,212 records in the FAA National Wildlife Strike Database for the years 1990 through 2003. These hazard rankings, in conjunction with site-specific Wildlife Hazards Assessments (WHA), will help airport operators determine the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

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

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

#### **6. MEMORANDUM OF AGREEMENT BETWEEN FEDERAL RESOURCE AGENCIES.**

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



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

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

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

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

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

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

<sup>4</sup> Aircraft incurred at least some damage (destroyed, substantial, minor, or unknown) from strike.

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

<sup>6</sup> Aborted takeoff, engine shutdown, precautionary landing, or other.

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## **SECTION 1.**

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

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

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

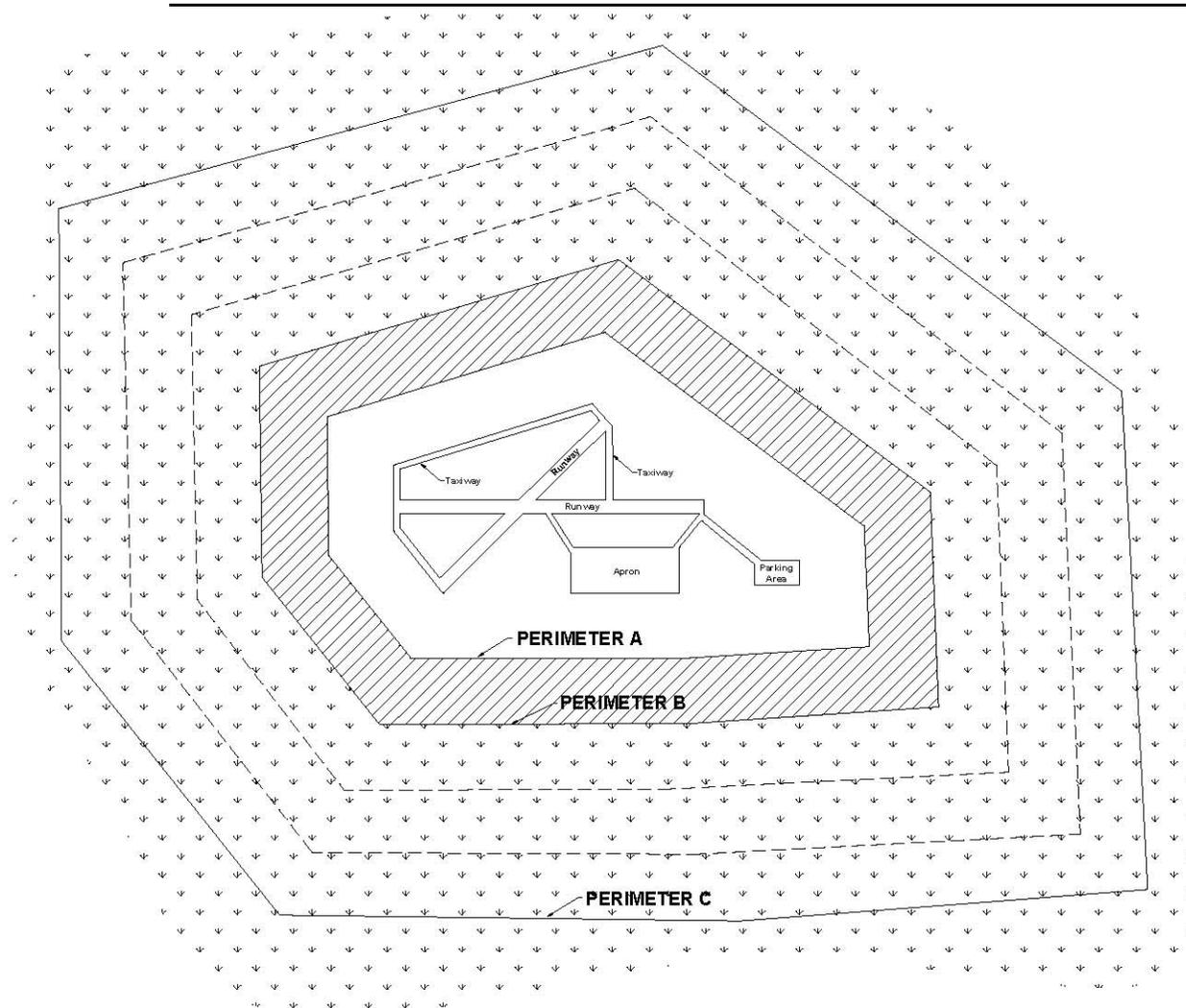
The basis for the separation criteria contained in this section can be found in existing FAA regulations. The separation distances are based on (1) flight patterns of piston-powered aircraft and turbine-powered aircraft, (2) the altitude at which most strikes happen (78 percent occur under 1,000 feet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

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

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

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

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



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

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

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

## SECTION 2.

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

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

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

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

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

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

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

- b. Siting for new MSWLF not subject to AIR 21.** If an airport and MSWLF do not meet the restrictions of Public Law 106-181, the FAA recommends against locating MSWLF within the separation distances identified in Sections 1-2 through 1-4. The separation distances should be measured from the closest point of the airport's AOA to the closest planned MSWLF cell.
- c. Considerations for existing waste disposal facilities within the limits of separation criteria.** The FAA recommends against airport development projects that would increase the number of aircraft operations or accommodate larger or faster aircraft near MSWLF operations located within the separations identified in Sections 1-2 through 1-4. In addition, in accordance with 40 CFR 258.10, owners or operators of existing MSWLF units that are located within the separations listed in Sections 1-2 through 1-4 must demonstrate that the unit is designed and operated so it does not pose a bird hazard to aircraft. (See Section 4-2(b) of this AC for a discussion of this demonstration requirement.)
- d. Enclosed trash transfer stations.** Enclosed waste-handling facilities that receive garbage behind closed doors; process it via compaction, incineration, or similar manner; and remove all residue by enclosed vehicles generally are compatible with safe airport operations, provided they are not located on airport property or within the Runway Protection Zone (RPZ). These facilities should not handle or store putrescible waste outside or in a partially enclosed structure accessible to hazardous wildlife. Trash transfer facilities that are open on one or more sides; that store uncovered quantities of municipal solid waste outside, even if only for a short time; that use semi-trailers that leak or have trash clinging to the outside; or that do not control odors by ventilation and filtration systems (odor masking is not acceptable) do not meet the FAA's definition of fully enclosed trash transfer stations. The FAA considers these facilities incompatible with safe airport operations if they are located closer than the separation distances specified in Sections 1-2 through 1-4.
- e. Composting operations on or near airport property.** Composting operations that accept only yard waste (e.g., leaves, lawn clippings, or branches) generally do not attract hazardous wildlife. Sewage sludge, woodchips, and similar material are not municipal solid wastes and may be used as compost bulking agents. The compost, however, must never include food or other municipal solid waste. Composting operations should not be located on airport property. Off-airport property composting operations should be located no closer than the greater of the following distances: 1,200 feet from any AOA or the distance called for by airport design requirements (see AC 150/5300-13, *Airport Design*). This spacing should prevent material, personnel, or equipment from penetrating any Object Free Area (OFA),

Obstacle Free Zone (OFZ), Threshold Siting Surface (TSS), or Clearway. Airport operators should monitor composting operations located in proximity to the airport to ensure that steam or thermal rise does not adversely affect air traffic. On-airport disposal of compost by-products should not be conducted for the reasons stated in 2-3f.

- f. Underwater waste discharges.** The FAA recommends against the underwater discharge of any food waste (e.g., fish processing offal) within the separations identified in Sections 1-2 through 1-4 because it could attract scavenging hazardous wildlife.
- g. Recycling centers.** Recycling centers that accept previously sorted non-food items, such as glass, newspaper, cardboard, or aluminum, are, in most cases, not attractive to hazardous wildlife and are acceptable.
- h. Construction and demolition (C&D) debris facilities.** C&D landfills do not generally attract hazardous wildlife and are acceptable if maintained in an orderly manner, admit no putrescible waste, and are not co-located with other waste disposal operations. However, C&D landfills have similar visual and operational characteristics to putrescible waste disposal sites. When co-located with putrescible waste disposal operations, C&D landfills are more likely to attract hazardous wildlife because of the similarities between these disposal facilities. Therefore, a C&D landfill co-located with another waste disposal operation should be located outside of the separations identified in Sections 1-2 through 1-4.
- i. Fly ash disposal.** The incinerated residue from resource recovery power/heat-generating facilities that are fired by municipal solid waste, coal, or wood is generally not a wildlife attractant because it no longer contains putrescible matter. Landfills accepting only fly ash are generally not considered to be wildlife attractants and are acceptable as long as they are maintained in an orderly manner, admit no putrescible waste of any kind, and are not co-located with other disposal operations that attract hazardous wildlife.

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

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

support the operation of storm water management facilities on or near all public-use airports to ensure a safe airport environment.

**a. Existing storm water management facilities.** On-airport storm water management facilities allow the quick removal of surface water, including discharges related to aircraft deicing, from impervious surfaces, such as pavement and terminal/hangar building roofs. Existing on-airport detention ponds collect storm water, protect water quality, and control runoff. Because they slowly release water after storms, they create standing bodies of water that can attract hazardous wildlife. Where the airport has developed a Wildlife Hazard Management Plan (WHMP) in accordance with Part 139, the FAA requires immediate correction of any wildlife hazards arising from existing storm water facilities located on or near airports, using appropriate wildlife hazard mitigation techniques. Airport operators should develop measures to minimize hazardous wildlife attraction in consultation with a wildlife damage management biologist.

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

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

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

**b. New storm water management facilities.** The FAA strongly recommends that off-airport storm water management systems located within the separations identified in Sections 1-2 through 1-4 be designed and operated so as not to create above-ground standing water. Stormwater detention ponds should be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and remain

completely dry between storms. To facilitate the control of hazardous wildlife, the FAA recommends the use of steep-sided, rip-rap lined, narrow, linearly shaped water detention basins. When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions. When physical barriers are used, airport operators must evaluate their use and ensure they will not adversely affect water rescue. Before installing any physical barriers over detention ponds on Part 139 airports, airport operators must get approval from the appropriate FAA Regional Airports Division Office. All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated. If soil conditions and other requirements allow, the FAA encourages the use of underground storm water infiltration systems, such as French drains or buried rock fields, because they are less attractive to wildlife.

- c. Existing wastewater treatment facilities.** The FAA strongly recommends that airport operators immediately correct any wildlife hazards arising from existing wastewater treatment facilities located on or near the airport. Where required, a WHMP developed in accordance with Part 139 will outline appropriate wildlife hazard mitigation techniques. Accordingly, airport operators should encourage wastewater treatment facility operators to incorporate measures, developed in consultation with a wildlife damage management biologist, to minimize hazardous wildlife attractants. Airport operators should also encourage those wastewater treatment facility operators to incorporate these mitigation techniques into their standard operating practices. In addition, airport operators should consider the existence of wastewater treatment facilities when evaluating proposed sites for new airport development projects and avoid such sites when practicable.
- d. New wastewater treatment facilities.** The FAA strongly recommends against the construction of new wastewater treatment facilities or associated settling ponds within the separations identified in Sections 1-2 through 1-4. Appendix 1 defines wastewater treatment facility as “any devices and/or systems used to store, treat, recycle, or reclaim municipal sewage or liquid industrial wastes.” The definition includes any pretreatment involving the reduction of the amount of pollutants or the elimination of pollutants prior to introducing such pollutants into a publicly owned treatment works (wastewater treatment facility). During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.
- e. Artificial marshes.** In warmer climates, wastewater treatment facilities sometimes employ artificial marshes and use submergent and emergent aquatic vegetation as natural filters. These artificial marshes may be used by some species of flocking birds, such as blackbirds and waterfowl, for breeding

or roosting activities. The FAA strongly recommends against establishing artificial marshes within the separations identified in Sections 1-2 through 1-4.

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

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

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

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

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

**c. Mitigation for wetland impacts from airport projects.** Wetland mitigation may be necessary when unavoidable wetland disturbances result from new airport development projects or projects required to correct wildlife

hazards from wetlands. Wetland mitigation must be designed so it does not create a wildlife hazard. The FAA recommends that wetland mitigation projects that may attract hazardous wildlife be sited outside of the separations identified in Sections 1-2 through 1-4.

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

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

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

**(3) Mitigation banking.** Wetland mitigation banking is the creation or restoration of wetlands in order to provide mitigation credits that can be used to offset permitted wetland losses. Mitigation banking benefits wetland resources by providing advance replacement for permitted wetland losses; consolidating small projects into larger, better-designed and managed units; and encouraging integration of wetland mitigation projects with watershed planning. This last benefit is most helpful for airport projects, as wetland impacts mitigated outside of the separations identified in Sections 1-2 through 1-4 can still be located within the same watershed. Wetland mitigation banks

meeting the separation criteria offer an ecologically sound approach to mitigation in these situations. Airport operators should work with local watershed management agencies or organizations to develop mitigation banking for wetland impacts on airport property.

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

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

produced by the on-airport crops when deciding whether to allow crops on the airport.

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

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

**c. Alternative uses of agricultural land.** Some airports are surrounded by vast areas of farmed land within the distances specified in Sections 1-2 through 1-4. Seasonal uses of agricultural land for activities such as hunting

can create a hazardous wildlife situation. In some areas, farmers will rent their land for hunting purposes. Rice farmers, for example, flood their land during waterfowl hunting season and obtain additional revenue by renting out duck blinds. The duck hunters then use decoys and call in hundreds, if not thousands, of birds, creating a tremendous threat to aircraft safety. A wildlife damage management biologist should review, in coordination with local farmers and producers, these types of seasonal land uses and incorporate them into the WHMP.

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

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

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

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

Airport operators should ensure that plant varieties attractive to hazardous wildlife are not used on the airport. Disturbed areas or areas in need of re-vegetating should not be planted with seed mixtures containing millet or any other large-seed producing grass. For airport property already planted with seed mixtures containing millet, rye grass, or other large-seed producing grasses, the FAA recommends disking, plowing, or another suitable

agricultural practice to prevent plant maturation and seed head production. Plantings should follow the specific recommendations for grass management and seed and plant selection made by the State University Cooperative Extension Service, the local office of Wildlife Services, or a qualified wildlife damage management biologist. Airport operators should also consider developing and implementing a preferred/prohibited plant species list, reviewed by a wildlife damage management biologist, which has been designed for the geographic location to reduce the attractiveness to hazardous wildlife for landscaping airport property.

- c. Airports surrounded by wildlife habitat.** The FAA recommends that operators of airports surrounded by woodlands, water, or wetlands refer to Section 2.4 of this AC. Operators of such airports should provide for a Wildlife Hazard Assessment (WHA) conducted by a wildlife damage management biologist. This WHA is the first step in preparing a WHMP, where required.
- d. Other hazardous wildlife attractants.** Other specific land uses or activities (e.g., sport or commercial fishing, shellfish harvesting, etc.), perhaps unique to certain regions of the country, have the potential to attract hazardous wildlife. Regardless of the source of the attraction, when hazardous wildlife is noted on a public-use airport, airport operators must take prompt remedial action(s) to protect aviation safety.

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

### **SECTION 3.**

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

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

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

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

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

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

**3-4. WILDLIFE HAZARD ASSESSMENTS, TITLE 14, CODE OF FEDERAL REGULATIONS, PART 139.** Part 139.337(b) requires airport operators to conduct a Wildlife Hazard Assessment (WHA) when certain events occur on or near the airport. Part 139.337 (c) provides specific guidance as to what facts must be addressed in a WHA.

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

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

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

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

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

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

## **SECTION 4.**

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

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

- a.** The FAA discourages the development of waste disposal and other facilities, discussed in Section 2, located within the 5,000/10,000-foot criteria specified in Sections 1-2 through 1-4.
- b.** For projects that are located outside the 5,000/10,000-foot criteria but within 5 statute miles of the airport's AOA, the FAA may review development plans, proposed land-use changes, operational changes, or wetland mitigation plans to determine if such changes present potential wildlife hazards to aircraft operations. The FAA considers sensitive airport areas as those that lie under or next to approach or departure airspace. This brief examination should indicate if further investigation is warranted.
- c.** Where a wildlife damage management biologist has conducted a further study to evaluate a site's compatibility with airport operations, the FAA may use the study results to make a determination.

#### **4-2. WASTE MANAGEMENT FACILITIES.**

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

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

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

- b. Waste handling facilities within separations identified in Sections 1-2 through 1-4.** To claim successfully that a waste-handling facility sited within the separations identified in Sections 1-2 through 1-4 does not attract hazardous wildlife and does not threaten aviation, the developer must establish convincingly that the facility will not handle putrescible material other than that as outlined in 2-2.d. The FAA strongly recommends against any facility other than that as outlined in 2-2.d (enclosed transfer stations). The FAA will use this information to determine if the facility will be a hazard to aviation.
- c. Putrescible-Waste Facilities.** In their effort to satisfy the EPA requirement, some putrescible-waste facility proponents may offer to undertake experimental measures to demonstrate that their proposed facility will not be a hazard to aircraft. To date, no such facility has been able to demonstrate an ability to reduce and sustain hazardous wildlife to levels that existed before the putrescible-waste landfill began operating. For this reason, demonstrations of experimental wildlife control measures may not be conducted within the separation identified in Sections 1-2 through 1-4.

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

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

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

**a. Airports that have received Federal grant-in-aid assistance.** Airports that have received Federal grant-in-aid assistance are required by their grant assurances to take appropriate actions to restrict the use of land next to or near the airport to uses that are compatible with normal airport operations. The FAA recommends that airport operators to the extent practicable oppose off-airport land-use changes or practices within the separations identified in Sections 1-2 through 1-4 that may attract hazardous wildlife. Failure to do so may lead to noncompliance with applicable grant assurances. The FAA will not approve the placement of airport development projects pertaining to aircraft movement in the vicinity of hazardous wildlife attractants without appropriate mitigating measures. Increasing the intensity of wildlife control efforts is not a substitute for eliminating or reducing a proposed wildlife hazard. Airport operators should identify hazardous wildlife attractants and any associated wildlife hazards during any planning process for new airport development projects.

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

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

- 1. Air operations area.** Any area of an airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft. An air operations area includes such paved areas or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiways, or apron.
- 2. Airport operator.** The operator (private or public) or sponsor of a public-use airport.
- 3. Approach or departure airspace.** The airspace, within 5 statute miles of an airport, through which aircraft move during landing or takeoff.
- 4. Bird balls.** High-density plastic floating balls that can be used to cover ponds and prevent birds from using the sites.
- 5. Certificate holder.** The holder of an Airport Operating Certificate issued under Title 14, Code of Federal Regulations, Part 139.
- 6. Construct a new MSWLF.** To begin to excavate, grade land, or raise structures to prepare a municipal solid waste landfill as permitted by the appropriate regulatory or permitting agency.
- 7. Detention ponds.** Storm water management ponds that hold storm water for short periods of time, a few hours to a few days.
- 8. Establish a new MSWLF.** When the first load of putrescible waste is received on-site for placement in a prepared municipal solid waste landfill.
- 9. Fly ash.** The fine, sand-like residue resulting from the complete incineration of an organic fuel source. Fly ash typically results from the combustion of coal or waste used to operate a power generating plant.
- 10. General aviation aircraft.** Any civil aviation aircraft not operating

under 14 CFR Part 119, Certification: Air Carriers and Commercial Operators.

- 11. Hazardous wildlife.** Species of wildlife (birds, mammals, reptiles), including feral animals and domesticated animals not under control, that are associated with aircraft strike problems, are capable of causing structural damage to airport facilities, or act as attractants to other wildlife that pose a strike hazard
- 12. Municipal Solid Waste Landfill (MSWLF).** A publicly or privately owned discrete area of land or an excavation that receives household waste and that is not a land application unit, surface impoundment, injection well, or waste pile, as those terms are defined under 40 CFR § 257.2. An MSWLF may receive other types wastes, such as commercial solid waste, non-hazardous sludge, small-quantity generator waste, and industrial solid waste, as defined under 40 CFR § 258.2. An MSWLF can consist of either a stand alone unit or several cells that receive household waste.
- 13. New MSWLF.** A municipal solid waste landfill that was established or constructed after April 5, 2001.
- 14. Piston-powered aircraft.** Fixed-wing aircraft powered by piston engines.
- 15. Piston-use airport.** Any airport that does not sell Jet-A fuel for fixed-wing turbine-powered aircraft, and primarily serves fixed-wing, piston-powered aircraft. Incidental use of the airport by turbine-powered, fixed-wing aircraft would not affect this designation. However, such aircraft should not be based at the airport.
- 16. Public agency.** A State or political subdivision of a State, a tax-supported organization, or an Indian tribe or pueblo (49 U.S.C. § 47102(19)).
- 17. Public airport.** An airport used or intended to be used for public purposes that is under the control of a public agency; and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft is publicly owned (49 U.S.C. § 47102(20)).
- 18. Public-use airport.** An airport used or intended to be used for public purposes, and of which the area used or intended to be used for landing, taking off, or surface maneuvering of aircraft may be under the control of a public agency or privately owned and used for public purposes (49 U.S.C. § 47102(21)).
- 19. Putrescible waste.** Solid waste that contains organic matter capable of being decomposed by micro-organisms and of such a character and

proportion as to be capable of attracting or providing food for birds (40 CFR §257.3-8).

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

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

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

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

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

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

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

special nuclear, or by product material as defined by the Atomic Energy Act of 1954, as amended, (68 Stat. 923). (40 CFR 257.2)

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

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

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

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

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

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

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

- a. A pilot reports striking 1 or more birds or other wildlife;
- b. Aircraft maintenance personnel identify aircraft damage as having been caused by a wildlife strike;

- c. Personnel on the ground report seeing an aircraft strike 1 or more birds or other wildlife;
- d. Bird or other wildlife remains, whether in whole or in part, are found within 200 feet of a runway centerline, unless another reason for the animal's death is identified;
- e. The animal's presence on the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, aircraft left pavement area to avoid collision with animal) (Transport Canada, Airports Group, *Wildlife Control Procedures Manual*, Technical Publication 11500E, 1994).

## **2. RESERVED.**



APPENDIX E (1 page) **GJT Survey Points and Route Map**



## APPENDIX F (1 page) Grand Junction Regional Airport's Guild Classification List

### Ictarids/Starlings

Red-winged Blackbird (*Agelaius phoeniceus*)  
European Starling (*Sturnus vulgaris*)  
Western Meadowlark (*Sturnella neglecta*)

### Doves

Mourning Dove (*Zenaidura macroura*)  
Rock Dove (*Columba livia*)

### Corvids

American Crow (*Corvus brachyrhynchos*)  
Black-billed Magpie (*Pica pica*)  
Common Raven (*Corvus corax*)

### Thrushes/Shrikes/Flycatchers

American Robin (*Turdus migratorius*)  
Western Kingbird (*Tyrannus verticalis*)  
Western Bluebird (*Sialia mexicana*)  
Loggerhead Shrike (*Lanius ludovicianus*)

### Raptors

American Kestrel (*Falco sparverius*)  
Bald Eagle (*Haliaeetus leucocephalus*)  
Golden Eagle (*Aquila chrysaetos*)  
Swainson's Hawk (*Buteo swainsoni*)  
Northern Harrier (*Circus cyaneus*)  
Coopers Hawk (*Accipiter cooperii*)  
Peregrine Falcon (*Falco peregrinus*)  
Burrowing Owl (*Athene cunicularia*)  
Merlin (*Falco columbarius*)  
Barn Owl (*Tyto alba*)  
Great-horned Owl (*Bubo virginianus*)  
Red-tailed Hawk (*Buteo jamaicensis*)

### Vultures

Turkey Vulture (*Cathartes aura*)

### Larks

Horned Lark (*Eremophila alpestris*)

### Swallows

Barn Swallow (*Hirundo rustica*)  
Cliff Swallow (*Petrochelidon pyrrhonota*)  
Violet-green Swallow (*Tachycineta thalassina*)

### Waterfowl

Mallard (*Anas platyrhynchos*)  
Canada Goose (*Branta canadensis*)

### Shorebirds

Great Blue Heron (*Ardea herodias*)  
Killdeer (*Charadrius vociferus*)  
Long-billed Curlew (*Numenius americanus*)

### Mammals

Red Fox (*Vulpes vulpes*)  
Badger (*Taxidea taxus*)  
Pronghorn Antelope (*Antilocapra americana*)  
Black Bear (*Ursus americanus*)  
Striped Skunk (*Mephitis mephitis*)  
Coyote (*Canis latrans*)  
White-tailed Prairie Dog (*Cynomys leucurus*)  
Desert Cottontail Rabbit (*Sylvilagus audubonii*)

### Sparrows/Finches

House Finch (*Carpodacus mexicanus*)  
House Sparrow (*Passer domesticus*)  
Dark-eyed Junco (*Junco hyemalis*)  
White-crowned Sparrow (*Zonotrichia leucophrys*)

### Woodpeckers

Northern Flicker (*Colaptes auratus*)

### Hummingbirds

Broad-tailed Hummingbird (*Selasphorus platycercus*)  
Black-chinned Hummingbird (*Archilochus alexandri*)

### Pheasant/Quail

Gambel's Quail (*Callipepla gambelii*)

**Migratory Bird Depredation Permit Application  
and  
State Exemption Application**



Department of the Interior  
U.S. Fish and Wildlife Service  
Federal Fish and Wildlife Permit Application Form

Expires 11/30/2010  
OMB No. 1018-0022

[Click here for addresses.](#)

Return to: U.S. Fish and Wildlife Service (USFWS)  
Migratory Bird Regional Permit Office

Type of Activity: Migratory Bird Depredation Permit

--

Complete Sections A or B, and C, D, and E of this application. U.S. address may be required in Section C, see instructions for details. See attached instruction pages for information on how to make your application complete and help avoid unnecessary delays.

A. Complete if applying as an individual			
1.a. Last name	1.b. First name	1.c. Middle name or initial	1.d. Suffix
2. Date of birth (mm/dd/yyyy)	3. Social Security No.	4. Occupation	5. Affiliation/ Doing business as (see instructions)
6.a. Telephone number	6.b. Alternate telephone number	6.c. Fax number	6.d. E-mail address

B. Complete if applying on behalf of a business, corporation, public agency or institution			
1.a. Name of business, agency, or institution		1.b. Doing business as (dba)	
2. Tax identification no.		3. Description of business, agency, or institution	
4.a. Principal officer Last name	4.b. Principal officer First name	4.c. Principal officer Middle name/ initial	4.d. Suffix
5. Principal officer title		6. Primary contact	
7.a. Business telephone number	7.b. Alternate telephone number	7.c. Business fax number	7.d. Business e-mail address

C. All applicants complete address information				
1.a. Physical address (Street address; Apartment #, Suite #, or Room #; no P.O. Boxes)				
1.b. City	1.c. State	1.d. Zip code/Postal code:	1.e. County/Province	1.f. Country
2.a. Mailing Address (include if different than physical address; include name of contact person if applicable)				
2.b. City	2.c. State	2.d. Zip code/Postal code:	2.e. County/Province	2.f. Country

D. All applicants MUST complete	
1. Attach check or money order payable to the U.S. FISH AND WILDLIFE SERVICE in the amount of \$100.00 if you are applying for a new permit or \$50.00 if you are requesting a substantive amendment to your existing permit. If you are a homeowner requesting a permit for damage to your personal residence or property, attach \$50.00. Federal, tribal, State, and local government agencies, and those acting on behalf of such agencies, are exempt from the processing fee – attach documentation of fee exempt status as outlined in instructions. (50 CFR 13.11(d))	
2. Do you currently have or have you ever had any Federal Fish and Wildlife permits? Yes <input type="checkbox"/> No <input type="checkbox"/> If yes, list the number of the most current permit you have held or that you are applying to renew/re-issue: _____ No	
3. Certification: I hereby certify that I have read and am familiar with the regulations contained in Title 50, Part 13 of the Code of Federal Regulations and the other applicable parts in subchapter B of Chapter I of Title 50, and I certify that the information submitted in this application for a permit is complete and accurate to the best of my knowledge and belief. I understand that any false statement herein may subject me to the criminal penalties of 18 U.S.C. 1001.	
Signature (in blue ink) of applicant/person responsible for permit (No photocopied or stamped signatures)	Date of signature

## E. MIGRATORY BIRD DEPREDATION PERMIT

(Migratory Bird Treaty Act, 50 CFR 21.41)

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

*Protected Species: The species listed in the Code of Federal Regulations at 50 CFR 10.13 are protected under the Migratory Bird Treaty Act. A list of species in the U.S. and their status under the MBTA is available at the following website:*

<http://www.fws.gov/migratorybirds/issues/nonnative/MBTA-protected&NonprotectedSpecies.htm>.

*Resident Canada goose nests & eggs: If you are only destroying or adding resident Canada goose eggs and your state is one that accepts Federal registration, you may register for free on-line at <https://epermits.fws.gov/eRCGR> in lieu of obtaining a depredation permit.*

*Your application for a depredation permit must include a recommendation from the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, for addressing your depredation problem. You may contact Wildlife Services at (866) 487-3297. If Wildlife Services recommends that a permit be issued to capture or kill birds, they will complete a Wildlife Services Permit Review Form (Form 37). This form and a copy of any required State permits must accompany your application. (This form is not required for resident Canada goose egg adding/destruction/OvoControl™G.)*

*Be as specific as possible in your responses to the questions below. You should submit your application at least 60 days prior to the date that you need your permit (50 CFR 13.11(c)).*

*Please provide the following information:*

1. List the species of migratory birds causing the depredation problem and estimate the number of each involved.
2. Provide the exact location of the property or properties where the control activity would be conducted (State, county, and physical address of the specific site).
3. Description of damage.
  - (a) Describe the specific migratory bird damage or injury you are experiencing.
  - (b) How long has it been occurring (e.g., the number of years)?
  - (c) What times or seasons of the year does it occur?
  - (d) Describe any human health and safety hazards involved.
  - (e) Provide details such as types of crops destroyed, human injuries sustained, property damage incurred, and health and safety hazards created.
4. Describe the extent of the damage and estimate the economic loss suffered as a result, such as percentage of acres of crop and dollar loss, cost to replace damaged property, or cost of injuries.
5. Describe the nonlethal measures you have taken to control or eliminate the problem, including how long (e.g., a week, month, year(s)) and how often they have been conducted. List the techniques you have tried, such as harassment (e.g., horns, pyrotechnics, propane cannons), habitat management (e.g., vegetative barriers, longer grass management, fencing), cultural practices (e.g., crop selection and placement, management of pets and feeding schedules), or no feeding policies.
6. Proposed actions.
  - (a) What actions are you proposing to take to alleviate the problem (e.g., kill, eliminate nesting, trap and relocate)?
  - (b) Describe the method you propose (e.g., shoot, addle, oil, destroy eggs; trap and relocate; trap and donate birds to a food processing center).
  - (c) If you propose to trap birds, describe the method that will be used and your (or your agent's) experience with the method.
7. What long-term measures do you plan to take to eliminate the problem?

8. If you are applying on behalf of an airport for a permit to control birds in flight zones, indicate whether you are operating under an approved Wildlife Hazard Management Plan.
9. Anyone who will be acting as your agent or assisting you with the activities authorized by your permit must be authorized as a subpermittee under your permit. As the primary permittee, you will be legally responsible for ensuring that your subpermittees comply with the terms of your permit. List the name of anyone who will be directly involved in doing the work to resolve your problems. Include any commercial company that may be contracted to conduct the work.
10. You must retain records relating to the activities conducted under your permit for at least 5 years from the date of expiration of your permit. Is the physical address you provided in Section C on page 1 of this application the address where your records will be kept?  
 Yes  No If "no", provide the physical address:

- 
11. Have you obtained all required State permits or approvals to conduct this activity?  
 Yes If "yes", attach a copy of the approval(s).  Have applied  None required
12. Attach a copy of the completed Wildlife Services Permit Review Form (Form 37) prepared by USDA, APHIS, Wildlife Services providing their recommendation regarding your depredation problem.

## PERMIT APPLICATION FORM INSTRUCTIONS

The following instructions pertain to the standard permit form 3-200 that must be completed as an application for a U.S. Fish and Wildlife Service or CITES permit. The General Permit Procedures in [50 CFR 13](#) address the permitting process. For simplicity, all licenses, permits, registrations, and certificates will be referred to as a permit.

### GENERAL INSTRUCTIONS:

- Complete all blocks/lines/questions in Sections A or B, and C and D. Complete all of Section E.
- An incomplete application may cause delays in processing or may be returned to the applicant. Be sure you are filling in the appropriate application form for the proposed activity.
- Print clearly or type in the information. Illegible applications may cause delays.
- Sign the application in [blue ink](#). Faxes or copies of the original signature will not be accepted.
- Mail the original application to the address at the top of page one of the application or if applicable on the attached address list.
- Keep a copy of your completed application.
- Please plan ahead. Allow at least 60 days for your application to be processed. Some applications may take longer than 90 days to process. (50 CFR 13.11)
- Applications are processed in the order they are received.
- Additional forms and instructions are available from <http://permits.fws.gov/>.

### COMPLETE EITHER SECTION A OR SECTION B:

#### Section A. Complete if applying as an individual:

- Enter the complete name of the responsible individual who will be the permittee if a permit is issued. Enter personal information that identifies the applicant. *Fax and e-mail are not required if not available.*
- If you are applying on behalf of a client, the personal information must pertain to the client, and a document evidencing power of attorney must be included with the application.
- **Affiliation/ Doing business as (dba):** business, agency, organizational, or institutional affiliation *directly* related to the activity requested in the application (e.g., a taxidermist is an individual whose business can *directly* relate to the requested activity). The Division of Management Authority (DMA) will not accept *doing business as* affiliations for individuals.

#### Section B. Complete if applying as a business, corporation, public agency, or institution:

- Enter the complete name of the business, agency or institution that will be the permittee if a permit is issued. Give a brief description of the type of business the applicant is engaged in. Provide contact phone number(s) of the business.
- **Principal Officer** is the person in charge of the listed business, corporation, public agency, or institution. The principal officer is the person responsible for the application and any permitted activities. Often the principal officer is a Director or President. **Primary Contact** is the person at the business, corporation, public agency, or institution who will be available to answer questions about the application or permitted activities. Often this is the preparer of the application.

### ALL APPLICANTS COMPLETE SECTION C:

- For all applications submitted to the Division of Management Authority (DMA) a physical U.S. address is required. Province and Country blocks are provided for those USFWS programs which use foreign addresses and are not required by DMA.
- **Mailing address** is address where communications from USFWS should be mailed if different than applicant's physical address.

### ALL APPLICANTS COMPLETE SECTION D:

#### Section D.1 Application processing fee:

- An application processing fee is required at the time of application; unless exempted under 50 CFR 13.11(d)(3). The application processing fee is assessed to partially cover the cost of processing a request. **The fee does not guarantee the issuance of a permit. Fees will not be refunded for applications that are approved, abandoned, or denied.** We may return fees for withdrawn applications prior to any significant processing occurring.
- **Documentation of fee exempt status is not required for Federal, tribal, State, or local government agencies; but must be supplied by those applicants acting on behalf of such agencies.** Those applicants acting on behalf of such agencies must submit a letter on agency letterhead and signed by the head of the unit of government for which the applicant is acting on behalf, confirming that the applicant will be carrying out the permitted activity for the agency.

#### Section D.2 Federal Fish and Wildlife permits:

- List the number(s) of your most current FWS or CITES permit or the number of the most recent permit if none are currently valid. If applying for re-issuance of a CITES permit, the original permit must be returned with this application.

#### Section D.3 CERTIFICATION:

- **The individual identified in Section A, the principal officer named in Section B, or person with a valid power of attorney (documentation must be included in the application) must sign and date the application in blue ink.** This signature binds the applicant to the statement of certification. This means that you certify that you have read and understand the regulations that apply to the permit. You also certify that everything included in the application is true to the best of your knowledge. Be sure to read the statement and re-read the application and your answers before signing.

**Please continue to next page**

**APPLICATION FOR A FEDERAL FISH AND WILDLIFE PERMIT**  
**Paperwork Reduction Act, Privacy Act, and Freedom of Information Act – Notices**

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501, *et seq.*) and the Privacy Act of 1974 (5 U.S.C. 552a), please be advised:

1. The gathering of information on fish and wildlife is authorized by:  
(Authorizing statutes can be found at: <http://www.gpoaccess.gov/cfr/index.html> and <http://www.fws.gov/permits/ltr/ltr.shtml>)
  - a. Bald and Golden Eagle Protection Act (16 U.S.C. 668), 50 CFR 22;
  - b. Endangered Species Act of 1973 (16 U.S.C. 1531-1544), 50CFR 17;
  - c. Migratory Bird Treaty Act (16 U.S.C. 703-712), 50 CFR 21;
  - d. Marine Mammal Protection Act of 1972 (16 U.S.C. 1361, *et. seq.*), 50 CFR 18;
  - e. Wild Bird Conservation Act (16 U.S.C. 4901-4916), 50 CFR 15;
  - f. Lacey Act: Injurious Wildlife (18 U.S.C. 42), 50 CFR 16;
  - g. Convention on International Trade in Endangered Species of Wild Fauna and Flora (TIAS 8249), <http://www.cites.org/>, 50 CFR 23;
  - h. General Provisions, 50 CFR 10;
  - i. General Permit Procedures, 50 CFR 13; and
  - j. Wildlife Provisions (Import/export/transport), 50 CFR 14.
2. Information requested in this form is purely voluntary. However, submission of requested information is required in order to process applications for permits authorized under the above laws. Failure to provide all requested information may be sufficient cause for the U.S. Fish and Wildlife Service to deny the request. Response is not required unless a currently valid Office of Management and Budget (OMB) control number is displayed on form.
3. Certain applications for permits authorized under the Endangered Species Act of 1973 (16 U.S.C. 1539) and the Marine Mammal Protection Act of 1972 (16 U.S.C. 1374) will be published in the **Federal Register** as required by the two laws.
4. Disclosures outside the Department of the Interior may be made without the consent of an individual under the routine uses listed below, if the disclosure is compatible with the purposes for which the record was collected. (Ref. 68 FR 52611, September 4, 2003)
  - a. Routine disclosure to subject matter experts, and Federal, tribal, State, local, and foreign agencies, for the purpose of obtaining advice relevant to making a decision on an application for a permit or when necessary to accomplish a FWS function related to this system of records.
  - b. Routine disclosure to the public as a result of publishing **Federal Register** notices announcing the receipt of permit applications for public comment or notice of the decision on a permit application.
  - c. Routine disclosure to Federal, tribal, State, local, or foreign wildlife and plant agencies for the exchange of information on permits granted or denied to assure compliance with all applicable permitting requirements.
  - d. Routine disclosure to Captive-bred Wildlife registrants under the Endangered Species Act for the exchange of authorized species, and to share information on the captive breeding of these species.
  - e. Routine disclosure to Federal, tribal, State, and local authorities who need to know who is permitted to receive and rehabilitate sick, orphaned, and injured birds under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act; federally permitted rehabilitators; individuals seeking a permitted rehabilitator with whom to place a bird in need of care; and licensed veterinarians who receive, treat, or diagnose sick, orphaned, and injured birds.
  - f. Routine disclosure to the Department of Justice, or a court, adjudicative, or other administrative body or to a party in litigation before a court or adjudicative or administrative body, under certain circumstances.
  - g. Routine disclosure to the appropriate Federal, tribal, State, local, or foreign governmental agency responsible for investigating, prosecuting, enforcing, or implementing statutes, rules, or licenses, when we become aware of a violation or potential violation of such statutes, rules, or licenses, or when we need to monitor activities associated with a permit or regulated use.
  - h. Routine disclosure to a congressional office in response to an inquiry to the office by the individual to whom the record pertains.
  - i. Routine disclosure to the General Accounting Office or Congress when the information is required for the evaluation of the permit programs.
  - j. Routine disclosure to provide addresses obtained from the Internal Revenue Service to debt collection agencies for purposes of locating a debtor to collect or compromise a Federal claim against the debtor or to consumer reporting agencies to prepare a commercial credit report for use by the FWS.
5. For individuals, personal information such as home address and telephone number, financial data, and personal identifiers (social security number, birth date, etc.) will be removed prior to any release of the application.
6. The public reporting burden on the applicant for information collection varies depending on the activity for which a permit is requested. The relevant burden for a Migratory Bird Depredation permit application varies from 1.5 hours for individuals to 3 hours for businesses. The burden for recordkeeping varies from 15 minutes for individuals to 30 minutes for businesses. This burden estimate includes time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of the form to the Service Information Clearance Officer, U.S. Fish and Wildlife Service, Mail Stop 222, Arlington Square, U.S. Department of the Interior, 1849 C Street, NW, Washington D.C. 20240.

**Freedom of Information Act – Notice**

For organizations, businesses, or individuals operating as a business (i.e., permittees not covered by the Privacy Act), we request that you identify any information that should be considered privileged and confidential business information to allow the Service to meet its responsibilities under FOIA. Confidential business information must be clearly marked "Business Confidential" at the top of the letter or page and each succeeding page and must be accompanied by a non-confidential summary of the confidential information. The non-confidential summary and remaining documents may be made available to the public under FOIA [43 CFR 2.13(c)(4), 43 CFR 2.15(d)(1)(i)].



**U.S. Fish & Wildlife Service**

**Migratory Bird Regional Permit Offices**

<b>FWS REGION</b>	<b>AREA OF RESPONSIBILITY</b>	<b>MAILING ADDRESS</b>	<b>CONTACT INFORMATION</b>
Region 1	California, Hawaii, Idaho, Nevada, Oregon, Washington	911 N.E. 11th Avenue Portland, OR 97232-4181	Tel. (503) 872-2715 Fax (503) 231-2019 Email <a href="mailto:permitsR1MB@fws.gov">permitsR1MB@fws.gov</a>
Region 2	Arizona, New Mexico, Oklahoma, Texas	P.O. Box 709 Albuquerque, NM 87103	Tel. (505) 248-7882 Fax (505) 248-7885 Email <a href="mailto:permitsR2MB@fws.gov">permitsR2MB@fws.gov</a>
Region 3	Iowa, Illinois, Indiana, Minnesota, Missouri, Michigan, Ohio, Wisconsin	One Federal Drive Fort Snelling, MN 55111	Tel. (612) 713-5436 Fax (612) 713-5393 Email <a href="mailto:permitsR3MB@fws.gov">permitsR3MB@fws.gov</a>
Region 4	Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virgin Islands, Puerto Rico	P.O. Box 49208 Atlanta, GA 30359	Tel. (404) 679-7070 Fax (404) 679-4180 Email <a href="mailto:permitsR4MB@fws.gov">permitsR4MB@fws.gov</a>
Region 5	Connecticut, District of Columbia, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Virginia, Vermont, West Virginia	P.O. Box 779 Hadley, MA 01035-0779	Tel. (413) 253-8643 Fax (413) 253-8424 Email <a href="mailto:permitsR5MB@fws.gov">permitsR5MB@fws.gov</a>
Region 6	Colorado, Kansas, Montana, North Dakota, Nebraska, South Dakota, Utah, Wyoming	P.O. Box 25486 DFC(60154) Denver, CO 80225-0486	Tel. (303) 236-8171 Fax (303) 236-8017 Email <a href="mailto:permitsR6MB@fws.gov">permitsR6MB@fws.gov</a>
Region 7	Alaska	1011 E. Tudor Road (MS-201) Anchorage, AK 99503	Tel. (907) 786-3693 Fax (907) 786-3641 Email <a href="mailto:permitsR7MB@fws.gov">permitsR7MB@fws.gov</a>

# STATE OF COLORADO

Bill Owens, Governor  
Dennis E. Ellis, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

4300 Cherry Creek Dr. S.  
Denver, Colorado 80246-1530  
Phone (303) 692-2000  
TDD Line (303) 691-7700  
Located in Glendale, Colorado

Laboratory Services Division  
8100 Lowry Blvd.  
Denver, Colorado 80230-6928  
(303) 692-3090

<http://www.cdphe.state.co.us>



Colorado Department  
of Public Health  
and Environment

## Request for Public Health/Safety Exemption to Use Prohibited Devices for the Taking of Wildlife

Date \_\_\_\_/\_\_\_\_/\_\_\_\_

Agency, group or individual: \_\_\_\_\_

Mailing address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Contact person: \_\_\_\_\_ Title: \_\_\_\_\_ Telephone \_\_\_\_\_

Reason for Request: Public Health  Public Safety

Species to be Controlled: \_\_\_\_\_ Multiple animals  Single Animal

Describe the health/safety issue (be specific) \_\_\_\_\_

Device(s) for which exemption is requested: \_\_\_\_\_

Location where device(s) will be used: \_\_\_\_\_

Time period during which device(s) will be used: \_\_\_\_/\_\_\_\_/\_\_\_\_ to \_\_\_\_/\_\_\_\_/\_\_\_\_

Describe alternative control methods used (include dates, duration of use: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Why were these alternative methods unsuccessful? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

This form is to be used for requests to the Colorado Department of Public Health and Environment (CDPHE), local county Health Officer or organized local health departments for an exemption to use leg-hold traps, body-gripping traps, snares, poisons or other devices prohibited under Amendment 14 of the Colorado Constitution. Authorization for granting an exemption is provided under Title 33, Article 6, Part 2, C.R.S., 1997. Refer to the CDPHE document entitled "Criteria for Granting an Exemption by a Health Department to Permit the Use of Leghold Traps or Other Prohibited Devices" for guidance in completing this request. To insure a prompt response, please be **specific** when describing dates, locations, laboratory data, estimates on wildlife populations, alternative methods used and other requested data.

APPENDIX H (2 pages) **FAA Form 5200-7: Wildlife Strike Reporting Form**

Form Approved OMB NO. 2120-0018

 <b>BIRD/OTHER WILDLIFE STRIKE REPORT</b> U.S. Department of Transportation Federal Aviation Administration																																																					
1. Name of Operator		2. Aircraft Make/Model		3. Engine Make/Model																																																	
4. Aircraft Registration		5. Date of Incident ____/____/____ Month Day Year		6. Local Time of Incident <input type="checkbox"/> Dawn <input type="checkbox"/> Dusk    — HR — MIN <input type="checkbox"/> Day <input type="checkbox"/> Night <input type="checkbox"/> AM <input type="checkbox"/> PM																																																	
7. Airport Name		8. Runway Used		9. Location if En Route (Nearest Town/Reference & State)																																																	
10. Height (AGL)		11. Speed (TAS)																																																			
12. Phase of Flight <input type="checkbox"/> A. Parked <input type="checkbox"/> B. Taxi <input type="checkbox"/> C. Take-off Run <input type="checkbox"/> D. Climb <input type="checkbox"/> E. En Route <input type="checkbox"/> F. Descent <input type="checkbox"/> G. Approach <input type="checkbox"/> H. Landing Roll		13. Part(s) of Aircraft Struck or Damaged																																																			
		<table border="1"> <thead> <tr> <th></th> <th>Struck</th> <th>Damaged</th> </tr> </thead> <tbody> <tr><td>A. Radome</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>B. Windshield</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>C. Nose</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>D. Engine No. 1</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>E. Engine No. 2</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>F. Engine No. 3</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>G. Engine No. 4</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </tbody> </table>			Struck	Damaged	A. Radome	<input type="checkbox"/>	<input type="checkbox"/>	B. Windshield	<input type="checkbox"/>	<input type="checkbox"/>	C. Nose	<input type="checkbox"/>	<input type="checkbox"/>	D. Engine No. 1	<input type="checkbox"/>	<input type="checkbox"/>	E. Engine No. 2	<input type="checkbox"/>	<input type="checkbox"/>	F. Engine No. 3	<input type="checkbox"/>	<input type="checkbox"/>	G. Engine No. 4	<input type="checkbox"/>	<input type="checkbox"/>	<table border="1"> <thead> <tr> <th></th> <th>Struck</th> <th>Damaged</th> </tr> </thead> <tbody> <tr><td>H. Propeller</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>I. Wing/Rotor</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>J. Fuselage</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>K. Landing Gear</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>L. Tail</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>M. Lights</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>N. Other:</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </tbody> </table>			Struck	Damaged	H. Propeller	<input type="checkbox"/>	<input type="checkbox"/>	I. Wing/Rotor	<input type="checkbox"/>	<input type="checkbox"/>	J. Fuselage	<input type="checkbox"/>	<input type="checkbox"/>	K. Landing Gear	<input type="checkbox"/>	<input type="checkbox"/>	L. Tail	<input type="checkbox"/>	<input type="checkbox"/>	M. Lights	<input type="checkbox"/>	<input type="checkbox"/>	N. Other:	<input type="checkbox"/>	<input type="checkbox"/>
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N. Other:	<input type="checkbox"/>	<input type="checkbox"/>																																																			
		<i>(Specify, if "N. Other" is checked)</i>																																																			
14. Effect on Flight <input type="checkbox"/> None <input type="checkbox"/> Aborted Take-Off <input type="checkbox"/> Precautionary Landing <input type="checkbox"/> Engines Shut Down <input type="checkbox"/> Other: <i>(Specify)</i>		15. Sky Condition <input type="checkbox"/> No Cloud <input type="checkbox"/> Some Cloud <input type="checkbox"/> Overcast		16. Precipitation <input type="checkbox"/> Fog <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> None																																																	
17. Bird/Other Wildlife Species		18. Number of birds seen and/or struck		19. Size of Bird(s)																																																	
		<table border="1"> <thead> <tr> <th>Number of Birds</th> <th>Seen</th> <th>Struck</th> </tr> </thead> <tbody> <tr><td>1</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>2-10</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>11-100</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> <tr><td>more than 100</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td></tr> </tbody> </table>		Number of Birds	Seen	Struck	1	<input type="checkbox"/>	<input type="checkbox"/>	2-10	<input type="checkbox"/>	<input type="checkbox"/>	11-100	<input type="checkbox"/>	<input type="checkbox"/>	more than 100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large																																		
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2-10	<input type="checkbox"/>	<input type="checkbox"/>																																																			
11-100	<input type="checkbox"/>	<input type="checkbox"/>																																																			
more than 100	<input type="checkbox"/>	<input type="checkbox"/>																																																			
20. Pilot Warned of Birds <input type="checkbox"/> Yes <input type="checkbox"/> No																																																					
21. Remarks <i>(Describe damage, injuries and other pertinent information)</i>																																																					
<b>DAMAGE / COST INFORMATION</b>																																																					
22. Aircraft time out of service: _____ hours		23. Estimated cost of repairs or replacement (U.S. \$): \$ _____		24. Estimated other cost (U.S. \$) (e.g. loss of revenue, fuel, hotels): \$ _____																																																	
Reported by <i>(Optional)</i>		Title		Date																																																	
<p><b>Paperwork Reduction Act Statement:</b> The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. We estimate that it will take approximately <u>8 minutes</u> to complete the form. If you wish to make any comments concerning the accuracy of this burden estimate and any suggestions for reducing this burden, send those comments to the Federal Aviation Administration, Management Staff, ARP-10, 800 Independence Avenue, SW, Washington, DC 20591. The information collected is voluntary. Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0045.</p>																																																					

FAA Form 5200-7 (3-97) Supersedes Previous Edition

☆ U.S. GPO: 1997-418-084/64203

NSN 0052-00-851-9005

U.S. Department  
of Transportation  
**Federal Aviation  
Administration**  
800 Independence Ave., S.W.  
Washington, D.C. 20591

Official Business  
Penalty for Private Use, \$300



NO POSTAGE  
NECESSARY  
IF MAILED IN  
THE UNITED  
STATES



POSTAGE WILL BE PAID BY THE FEDERAL AVIATION ADMINISTRATION



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

**FOLD AND TAPE HERE**

## APPENDIX I (9 pages)

### ***SOURCES OF WILDLIFE MANAGEMENT SUPPLIES/EQUIPMENT***

The following is a list of wildlife management equipment suppliers and/or manufacturers, compiled by USDA's Wildlife Services Program. This list was assembled to assist others in obtaining wildlife management supplies, equipment, or information, and does not represent Wildlife Services' endorsement of any device type, manufacturer, or distributor.

#### **EXCLUSION**

##### ***Metal Wires or Projections***

Bird-B-Gone  
24362 Via Madrugada  
Mission Viejo, CA 92692  
Phone: 800-392-6915  
Fax: (714) 472-3116

Bird Barrier  
20925 Chico St.  
Carson, CA 90746  
Phone: 800-503-5444  
Fax: (310) 527-8005

Bird Barrier America  
300 Calbert Ave.  
Alexandria, VA 22301  
Phone: 800-662-4737  
Fax: (202) 338-6268

Cat Claw, Inc.  
P.O. Box 3778  
Johnstown, PA 15994  
Phone: (814) 266-5544

Nixalite of America  
417 25th St.  
Moline, IL 61265  
Phone: 800-624-1189  
Fax: (309) 755-0077

Shaw Steeple Jacks, Inc.  
2710 Bedford St.  
Johnstown, PA 15904  
Phone: (814) 269-3885

##### ***Netting***

ADPI Enterprises, Inc.  
3621 B Street  
Philadelphia, PA 19134  
Phone: 800-621-0275  
Fax: (215) 739-8480

Apex Knitting Mills, Inc.  
49 W. 37th St.  
New York, NY 10018  
Phone: (718) 417-3869

Agricultural Supply, Inc.  
1435 Simpson Way  
Escondido, CA 92029  
Phone: 800-527-6699  
Fax: (619) 741-9412

Bird-B-Gone  
24362 Via Madrugada  
Mission Viejo, CA 92692  
Phone: 800-392-6915  
Fax: (714) 472-3116

Bird Barrier  
20925 Chico St.  
Carson, CA 90746  
Phone: 800-503-5444  
Fax: (310) 527-8005

Bird Barrier America  
300 Calbert Ave.  
Alexandria, VA 22301  
Phone: 800-662-4737  
Fax: (202) 338-6268

Bird-X, Inc.  
300 N Elizabeth St.  
Chicago, IL 60607  
Phone: 800-662-5021  
Fax: (312) 648-0319

Conwed Corp.  
Plastics Division  
P.O. Box 43237  
St. Paul, MN 55164-0237  
Phone: (651) 641-8614

Forest Protection Products  
P.O. Box 1047  
Coos Bay, OR 97420  
Phone: 800-289-7659  
Fax: (503) 269-7300

Green Valley Blueberry Farm  
9345 Ross Station Rd.  
Sebastopol, CA 95472  
Phone: (707) 887-7496

Hartman's Plantation, Inc.  
310 60<sup>th</sup> St., P.O. Box 100  
Lacota, MI 49063  
Phone: (616) 253-4281  
Fax: (616) 253-4457

J.A. Cissel Manufacturing Co.  
P.O. Box 2025  
Lakewood, NJ 08701  
Phone: 800-631-2234  
(732) 901-0300  
Fax: (732) 901-1166

Laird Plastics, Inc.  
8991 Yellowbrook Rd.  
Baltimore, MD 21237  
Phone: (410) 780-7100  
Fax: (410) 780-7100

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Miller Net and Twine  
1674 Getwell Rd., P.O. Box 18787  
Memphis, TN 38181-0787  
Phone: 800-423-6603  
Fax: (901) 743-6580

Naltex Plastics, Inc.  
220 East St. Elmo, P.O. Box 40909  
Austin, TX 78704-0909  
Phone: 800-531-5112  
Fax: (512) 447-7444

Nichols Net and Twine Co.  
2200 Highway 111  
Granite City, IL 62040  
Phone: (618) 797-0211  
Fax: (618) 697-0212

Norplex, Inc.  
111 3<sup>rd</sup> St. NW  
Auburn, WA 98002  
Phone: 800-929-2960  
(253) 735-3431  
Fax: (253) 735-5056

Nylon Net Company  
845 N. Main St., P.O. Box 592  
Memphis, TN 38101  
Phone: 800-238-7529  
(901) 526-6500  
Fax: (901) 526 6538

Orchard Equipment & Supply Co.  
P.O. Box 540, Route 116  
Conway, MA 01341  
Phone: 800-634-5557  
Fax: (413) 369-4431

Orchard Supply Co.  
1731 17<sup>th</sup> Street  
Sacramento, CA 95814  
Phone: (916) 446-7821

Prosoco, Inc.  
3741 Greenway Cir.  
Lawrence, KS 66046  
Phone: 800-255-4255  
(785) 865-4200  
Fax: (785) 830-9797

PVE  
Phil Nichols  
P.O. Box 84  
Pennsburg, PA 18073-0084  
Phone: 800-724-9468

Sutton Agricultural Enterprises  
746 Vertin Ave.  
Salinas, CA 93901  
Phone: (408) 422-9693  
(831) 422-9693  
Fax: 800-422-4201

W. Atlee Burpee Seed Co.  
300 Park Ave.  
Warminster, PA 18974  
Phone: 800-333-5808  
Fax: 800-487-5530

### ***Conventional Fencing***

ADPI Enterprises, Inc.  
3621 B Street  
Philadelphia, PA 19134  
Phone: 800-621-0275  
Fax: (215)739-8480

Advanced Farm Systems  
RD 1, Box 364  
Bradford, ME 04410  
Phone: (207) 327-1237

American Feed & Farm  
3310 H Street  
Omaha, NE 68107  
Phone: 800-228-9534

Farm & Industrial Supply Co.  
P.O. Box 31510  
Stockton, CA 95213  
Phone: 800-221-2884  
Fax: (209) 983-8449

Innovative Fence  
640 East Main St.  
Palmyra, NY 14522  
Phone: (315) 597-1111  
Fax: (315) 597-1206

K Fence System  
c/o Hugh Kraemer  
Route 1, Box 195  
Zumbro Falls, MN 55991  
Phone: (507) 753-2943  
Fax: (507) 753-2706

Kencove Fence  
111 Kendall Lane  
Blairsville, PA 15717  
Phone: 800-245-6902  
Fax: (724) 459-9148

Keystone Steel & Wire  
7000 SW Adams St.  
Peoria, IL 61641  
Phone: 800-447-6444  
(309) 697-7422  
Fax: (309) 697-7487

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Qual-Line Fence Corporation  
801 South Division  
Waunakee, WI 53597  
Phone: 800-533-3623  
(608) 849-4654  
Fax: (608) 849-8605

Southwest Power Fence  
26321 Highway 281 North  
San Antonio, TX 78260  
Phone: 800-221-0178  
(830) 438-4600  
Fax: (830) 438-4604

Techfence Advanced Farm Systems  
Route 2 P.O. Box 364  
Bradford, ME 04410  
Phone: (207) 327-1237  
Fax: (207) 327-2076

Tech-Fence Division  
Multi-Tech Industries, Inc.  
64 South Main St., P.O. Box A  
Marlboro, NJ 07746  
Phone: 800-431-3223

Twin Mountain Supply Company  
P.O. Box 2240  
San Angelo, TX 76902  
Phone: 800-527-0990  
(915) 944-8661  
Fax: (915) 949-2047

Waterford Corporation  
404 N. Link Ln., P. O. Box 1513  
Fort Collins, CO 80524  
Phone: 800-525-4952  
(970) 482-0911  
Fax: (970) 482-0934

Wellscroft Farm  
c/o Dave & Deborah Kennard  
167 Sunset Hill - Chesham  
Harrisville, NH 03450  
Phone: (603) 827-3464  
Fax: (603) 827-2999

West Virginia Fence Corporation  
U.S. Route 219  
Lindside, WV 24951  
Phone: 800-356-5458  
(304) 753-4387  
Fax: (304) 753-4827

### ***Electric Fencing***

Avi-Away Division  
Monard Molding, Inc.  
P.O. Box 279  
Council Grove, KS 66846  
Phone: (316) 767-7525

Farm & Industrial Supply Co.  
P.O. Box 31510  
Stockton, CA 95213  
Phone: 800-221-2884  
Fax: (209) 983-8449

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Parker McCory Manufacturing  
2000 Forest Ave.  
Kansas City, MO 64108  
Phone: 800-662-1038  
Fax: (816) 221-9879

Premier Fence Systems  
2031 300<sup>th</sup> St.  
Washington, IA 52353  
Phone: 800-282-6631  
Fax: (319) 653-6304

Shock Tactics Electric Fence Sys.  
Waterford Corporation  
216 Commerce Dr., P.O. Box 1513  
Fort Collins, CO 80524  
Phone: 800-525-4952

Speedrite Service  
P.O. Box 424  
McPherson, KS 67460  
Phone: 800-527-5487  
Fax: (316) 241-4266

West Virginia Electric Fencing  
Rt. 81, Box 47  
Greenville, WV 24945  
Phone: (304) 753-4387

## **REPELLENTS**

### ***Noise Repellents/Attractants-Predator calls and recordings***

Hoosier Trapper Supply, Inc.  
1155 N. Matthews Rd.  
Greenwood, IN 46143  
Phone: (317) 881-3075

Hunter Specialities  
6000 Huntington Court NE  
Cedar Rapids, IA 52402  
Phone: 800-728-0321  
(319) 395-0321

Nite Lite Retail Store  
Dennis Kirk Game Calls  
P.O. Box 777  
Clarksville, AR 72830  
Phone: 800-332-6968

Rocky Mountain Wildlife  
Enterprises  
(Crit'R-Call)  
P.O. Box 999  
Laporte, Colorado 80535  
Phone: (970) 484-2768

Sceery Game Calls  
P.O. Box 6520  
Santa Fe, NM 87502  
Phone: 800-327-4322

R-P Outdoors  
505 Polk St., P.O. Box 1170  
Mansfield, LA 71052  
Phone: 800-762-2706  
Fax: (318) 872-8824

### ***Noise Repellents - Electronic Alarm and Recorded Sounds***

AMTEK  
11025 Sorrento Valley Ct  
San Diego, CA 92121  
Phone: 800-762-7618  
Fax: 800-762-7613  
(Critter Gitter-motion sensor)

Bird-X, Inc.  
300 N Elizabeth St.  
Chicago, IL 60607  
Phone: 800-662-5021  
Fax: (312) 226-2480

FLR, Inc.  
P.O. Box 108  
Midnight, MS 39115  
Phone: (662) 247-4409  
Fax: (662) 247-1715  
(electronic scarecrow)

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Orchard Equipment & Supply Co.  
P.O. Box 540, Route 116  
Conway, MA 01341  
Phone: 800-634-5557  
Fax: (413) 369-4431

Oregon Vineyard Supply  
2700 Saint Joseph Rd.  
McMinnville, OR 97128  
Phone: 800-653-2216

Peregrine Systems, LLC  
2166 South 900 East  
Salt Lake City, UT 84106  
Phone: (801) 486-8731  
Fax: (801) 484-2737

Pocatello Supply Depot  
238 E. Dillon St.  
Pocatello, ID 83201-6623  
Phone: (208) 236-6920  
Fax: (208) 236-6922

Reed-Joseph International Co.  
800 Main Street, P.O. Box 894  
Greenville, MS 38702  
Phone: 800-647-5554  
Fax: (601) 335-8850

Sutton Agricultural Enterprises  
746 Vertin Ave.  
Salinas, CA 93901  
Phone: (408) 422-9693  
(831) 422-9693  
Fax: 800-422-4201

Weitech, Inc.  
601 N. Larch St., P.O. Box 1659  
Sisters, OR 97759  
Phone: 800-343-2659  
Fax: (541) 549-8154

W. Atlee Burpee Seed Co.  
300 Park Ave.  
Warminster, PA 18974  
Phone: 800-333-5808  
Fax: 800-487-5530

**Noise Repellents - Propane Exploders**

Agricultural Supply, Inc.  
1435 Simpson Way  
Escondido, CA 92029  
Phone: 800-527-6699  
Fax: (619) 741-9412

Farm & Industrial Supply Co.  
P.O. Box 31510  
Stockton, CA 95213  
Phone: 800-221-2884  
Fax: (209) 983-8449

H. C. Shaw Company  
4554 Quantas Ln, Suite 1  
Stockton, CA 95206  
Phone: 800-221-2884  
Fax: (209) 983-8449

Margo Supplies Ltd.  
P.O. Box 5400 High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Orchard Equipment & Supply Co.  
P.O. Box 540, Route 116  
Conway, MA 01341  
Phone: 800-634-5557  
Fax: (413) 369-4431

Reed-Joseph International Co.  
800 Main Street, P.O. Box 894  
Greenville, MS 38702  
Phone: 800-647-5554  
Fax: (601) 335-8850

Sutton Agricultural Enterprises  
746 Vertin Ave.  
Salinas, CA 93901  
Phone: (408) 422-9693  
(831) 422-9693  
Fax: 800-422-4201

Wildlife Control Technology  
2501 North Sunnyside, #103  
Fresno, CA 93727  
Phone: 800-235-0262  
Fax: (209) 294-0632

**Noise Repellents - Pyrotechnic Devices**

Agricultural Supply, Inc.  
1435 Simpson Way  
Escondido, CA 92029  
Phone: 800-527-6699  
Fax: (619) 741-9412

Alaska Generator  
7140 Crawford Dr.  
Anchorage, AK 99502  
Phone: (907) 562-2505

All Purpose Ammo  
517 Concord Ind. Drive  
Seneca, SC 29672  
Phone: 800-870-2666  
Fax: (864) 882-5239

APGAR, Inc.  
Mill River Supply  
375 Adams  
Bedford Hills, NY 10507  
Phone: (914) 666-5774  
Fax: (914) 666-9183

Great Guns, Inc.  
7550 Old Seward Hwy.  
Anchorage, AK 99518  
Phone: (907) 522-3775

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511

Northern Security Supply, Inc.  
360 E International Airport Rd.,  
Suite 8  
Anchorage, AK 99518  
Phone: (907) 561-5602

Pocatello Supply Dept.  
238 E. Dillon  
Pocatello, ID 83201-6623  
Phone: (208) 236-6920  
Fax: (208) 236-6922

Reed-Joseph International Co.  
800 Main Street, P.O. Box 894  
Greenville, MS 38702  
Phone: 800-647-5554  
Fax: (601) 335-8850

Stoneco., Inc.  
P.O. Box 765  
Trinidad, CO 81082  
Phone: 800-833-2264

Sutton Agricultural Enterprises  
746 Vertin Ave.  
Salinas, CA 93901  
Phone: (408) 422-9693  
(831) 422-9693  
Fax: 800-422-4201

Western Fireworks  
P.O. Box 426  
Aurora, OR 97002  
Phone: (503) 678-2378

*Taste or Olfactory Repellents*

Avitrol Corp.  
320 S. Boston Ave., Suite 514  
Tulsa, OK 74103  
Phone: (918) 622-7763

Bird-X, Inc.  
300 N Elizabeth St.  
Chicago, IL 60607  
Phone: 800-662-5021  
(Goose Chase)

Becker Underwood  
801 Dayton Ave.  
Ames, IA 50010  
Phone: 800-232-5907  
800)-323-3396  
Fax: (515) 232-5961  
(ReJeX-iT)

Bonide Chemical Co.  
2 Wurz Avenue  
Yorkville, NY 13495  
Phone: (315) 736-8231  
(Thiram)

Earl May Seed & Nursery Co.  
208 N. Elm  
Sheanandoah, IA 51603  
Phone: (712) 246-1020  
(Ziram)

Faesy & Besthoff, Inc.  
143 River Rd.  
Edgewater, NJ 07020  
Phone: (201) 945-6200  
Fax: (201) 945-6145

(Tobacco Dust)Farnam Company,  
Inc.  
Sudbury Consumer Products Div.  
P.O. Box 34820  
Phoenix, AZ 85067-4820  
Phone: 800-825-2555  
Fax: (602) 285-1803  
(Rabbit, Deer, Squirrel & Bat  
Repellent)

Forestry Suppliers, Inc.  
205 West Rankin Street  
P.O. Box 8397  
Jackson, MS 39284  
Phone: 800-360-7788  
(Deer Away)

Gustafson, Inc.  
P.O. Box 220065  
Dallas, TX 75222  
Phone: 800-527-4781  
Fax: (214) 985-1696  
(Thiram)

IntAgra, Inc.  
8500 Pillsbury Ave., South  
Minneapolis, MN 55420  
Phone: (612) 881-5535  
Fax: (612) 881-7002  
(Putrescent whole egg solids)

J.T. Eaton & Company, Inc.  
1393 East Highland Rd.  
Twinsburg, OH 44087  
Phone: 800-321-3421  
(330) 425-7801  
Fax: (330) 425-8353

LESCO, Inc.  
20005 Lake Road  
Rocky River, OH 44116  
Phone: 800-321-5325  
Fax: 800-673-3030  
(Flight Control)

Miller Chemical & Fertilizer Corp.  
Box 333  
Hanover, PA 17331  
Phone: (717) 632-8921  
Fax: (717) 632-4581  
(Capsaicin)

Monterey Chemical Company  
3654 S. Willow Ave.  
P.O. Box 35000  
Fresno, CA 93745  
Phone: (559) 499-2100  
Fax: (559)499-1015

Nortech Forest Products, Inc.  
801 Dayton Ave.  
Aimes, IA 50010  
Phone: 800-323-3396  
(515) 232-5907  
Fax: (515) 232-5961

Nott Manufacturing  
Pleasant Valley, NY 12569  
Phone: (914) 635-3243  
(Thiram)

Orchard Equipment & Supply Co.  
P.O. Box 540, Route 116  
Conway, MA 01341  
Phone: 800-634-5557  
Fax: (413) 369-4431

PVE  
Phil Nichols  
P.O. Box 84  
Pennsburg, PA 18073-0084  
Phone: 800-724-9468  
(Ropel, Tanglefoot, Snake Away)

Smith & Hawken  
35 Corte Madera  
Mill Valley, CA 94941  
Phone: (415) 381-1800  
(Organic Deer Repellent)

Washington Forest Protection  
711 Capitol Way, Evergreen Plaza  
Olympia, WA 98501  
Phone: (360) 352-1500  
Fax: (360) 352-4621  
(Bear Damage Prevention Info.)

### ***Tactile Repellents***

Bird Control International  
J.T. Eaton & Co.  
1393 E. Highland Rd.  
Twinsburg, OH 44087  
Phone: 800-321-3421

J.C. Ehrlich Chemical Company  
2293 Amber Dr.  
Hatfield, PA 19440  
Phone: 800-488-9495  
Fax: (215) 822-2616

The Tanglefoot Company  
314 Straight Ave. SW  
Grand Rapids, MI 49504  
Phone: (616) 459-4130

### ***Visual Repellents***

Aerostar International  
1814 F Ave.  
Sioux Falls, SD 57104  
Phone: (605) 331-3500  
Fax: (605) 331-3520

B & G Company  
10539 Maybank St.,  
P.O. Box 20372  
Dallas, TX 75220  
Phone: (214) 357-5741  
Fax: (214) 357-4514

Behrens Enterprises Inc.  
P.O. Box 398  
Spring Valley, WI 54767  
Phone: 800-729-8056  
(Bird/Mammal Repellents)

Bird-B-Gone  
24362 Via Madrugada  
Mission Viejo, CA 92692  
Phone: 800-392-6915  
Fax: (714) 472-3116  
(rotating propeller)

Bird-X, Inc.  
300 N Elizabeth St.  
Chicago, IL 60607  
Phone: 800-662-5021  
(Raptor Effigies, Lights)

Bleyhl Farm Service, Inc.  
119 East Main, P.O. Box 100  
Grandview, WA 98930  
Phone: 800-645-4416  
Fax: (509) 882-3681

Flambeau Products Corp.  
15981 Balplast Rd.  
Middlefield, OH 44062  
Phone: 800-457-5252  
Fax: (440) 632-1581  
(wildlife effigies & decoys)

Jackite, Inc.  
2868 West Landing Rd.  
Virginia Beach, VA 23456-3822  
Phone: (757) 426-5359  
Fax: (877) 522-5483

Kite City  
1201 Front St.  
Old Sacramento, CA 95814  
(Hawk Kite)

Mellingers  
2310 W. South Range Rd.  
N. Lima, OH 44452  
Phone: 800-321-7444  
Fax: (330) 549-3716  
(Repellents, Effigies)

Modern Agricultural Products Co.  
410 1<sup>st</sup> St.  
Lynden, WA 98264  
Phone: 800-352-7496  
Fax: (360) 354-8885

Nishizawa (U.S.A.) Limited  
19301 Pacific Gate Way Dr.  
Torrence, CA 90502  
Phone: (310) 532-7407  
Fax: (310) 532-7408  
(Mylar Balloons, Flash Tape)

Orchard Equipment & Supply Co.  
P.O. Box 540, Route 116  
Conway, MA 01341  
Phone: 800-634-5557  
Fax: (413) 369-4431  
(Balloons, Mylar Flash Tap)

Peregrine Systems, LLC  
2166 South 900 East  
Salt Lake City, UT 84106  
Phone: (801) 486-8731  
Fax: (801) 484-2737

Qualimetrics, Inc.  
1165 National Dr.  
Sacramento, CA 95834  
Phone: 800-824-5873  
Fax: (916) 928-1165

Reed-Joseph International Co.  
800 Main Street, P.O. Box 894  
Greenville, MS 38702  
Phone: 800-647-5554  
Fax: (601) 335-8850

Sutton Agricultural Enterprises  
746 Vertin Ave.  
Salinas, CA 93901  
Phone: (408) 422-9693  
(831) 422-9693  
Fax: 800-422-4201

Tripp-Lite Manufacturing Co.  
111 W. 35<sup>th</sup> St.  
Chicago, IL 60609  
Phone: (773) 869-1111  
Fax: (773) 869-1329

## **WILDLIFE CAPTURE/REMOVAL**

### ***Traps and Trapping Supplies***

Alaska Range Trapping Supply Inc.  
951 Bunker Hill  
Wasilla, Alaska 99654  
Phone: (907) 376-2621  
(Footholds, Body Grip, Snares,  
Lures)

Animal Care Equipment & Services  
340 S. Hwy 138, P.O. Box 3275  
Crestline, CA 92325  
Phone: 800-338-2237  
Fax: (909) 338-2799  
(Catch Plole, Cage Traps, Net Gun)  
B & G Company  
10539 Maybank St.  
P.O. Box 20372 Dallas, TX 75220  
Phone: (214) 357-5741  
Fax: (214) 357-4514  
(Cage Traps)

Bell Laboratories, Inc.  
3699 Kinsman Blvd.  
Madison, WI 53704  
Phone: (608) 241-0202  
Fax: (608) 241-9631  
(Mice and Rat Traps)

Coon Getter  
19750-356th Ave.  
Miller, SD 57362  
Phone: (605) 853-2545  
Fax: (605) 853-2243  
(Cage Traps & Lures)

DWL Brand  
P.O. Box 174  
Galway, NY 12074  
Phone: (518) 882-9145  
Fax: (518) 882-5212  
(Bat Traps)

Flambeau Products Corp.  
15981 Balplast Rd.  
Middlefield, OH 44062  
Phone: 800-457-5252  
Fax: (440) 632-1581  
(wildlife decoys)

Gremar Co.  
4719 Cody Dr., P.O. Box 65003  
West Des Moines, IA 50265  
Phone: (515) 263-3007  
Fax: (515) 221-9243  
(Mouse Cage Traps)

Aldrich Snares  
P.O. Box 158  
Sekiu, WA 98381-0158  
Phone: (360) 963-2519  
(360) 297-8332  
(Bear Foot Snares)

APGAR, Inc.  
Mill River Supply  
375 Adams  
Bedford Hills, NY 10507  
Phone: (914) 666-5774  
Fax: (914) 666-9183  
B-Kind Animal Control Equipment  
Southeastern Metal Products, Inc.  
1200 Foster St. NW, PO Box 93038  
Atlanta, GA 30377  
Phone: (404) 351-6686  
(Cage Traps)

Bob Jameson=s Professional  
Nuisance Control Scents  
P.O. Box 579  
Brownsville, PA 15417-0579  
Phone: (724) 938-2002  
(Lures)

Cumberland=s  
Northwest Trappers Supply, Inc.  
P.O. Box 408  
Owatonna, Minnesota 55060  
Phone: (507) 451-7607  
Fax: (507) 451-5869  
(All Types, Lures)

Eckroat Seed Co.  
1106 M. L. King Ave.  
P.O. Box 17610  
Oklahoma City, OK 73136  
Phone: 800-331-7333  
Fax: (405) 427-7174  
(Lures)

Ferrel & Co  
P.O. Box 92  
Union, MS 39365  
Phone: (601) 774-8983  
(Lures, Cage & Foothold Traps,  
etc.)

Hancock Trap Company  
P.O. Box 268  
Custer, SD 57730  
Phone: (605) 673-4128  
(Beaver and otter live trap)

American Feed & Farm  
3310 H Street  
Omaha, NE 68107  
Phone: 800-228-9534

B & B Wildlife Service Inc.  
748 Vinemont Rd.  
Reinholds, PA 17569  
Phone: (610) 775-2876  
(Cage Traps)

Batrap  
2823 Estey Rd.  
Manlius, NY 13104  
Phone: (315) 682-2050  
(Bat Traps)

Chagnon=s Trapping & Hunting  
Supply  
Route 2, P.O. Box 2638B  
Manistique, MI 49854  
Phone: (906) 341-2030  
Fax: (906) 341-1604  
(All Types, Lures)

Duke Company  
508 Brame Ave.  
P.O. Box 555  
West Point, MS 39773  
Phone: (662) 494-6767  
Fax: (662) 494-5360  
(Footholds, Body Grip)

Farm & Industrial Supply Co.  
P.O. Box 31510  
Stockton, CA 95213  
Phone: 800-221-2884  
Fax: (209) 983-8449  
(Squirrel and Gopher Traps)

Grawes Animal Lures  
P.O. Box 306  
Wahpeton, ND 58074-0306  
Phone: (218) 643-3292  
Fax: (701) 642-3240  
(lures, snares)

J.T. Eaton & Company, Inc.  
1393 East Highland Rd.  
Twinsburg, OH 44087  
Phone: 800-321-3421  
(330) 425-7801  
Fax: (330) 425-8353  
(glue traps)

Ketch-All Company  
4149 Santa Fe Road, #2  
San Luis Obispo, CA 93401  
Phone: (805) 543-7223  
Fax: (805) 543-7154  
(Cage Traps, Ketch Poles)

Leggett's Supplies  
7308 Monroe Rd.  
Boonsboro, MD 21713  
Phone: (301) 432-6210 Fax: (301)  
432-8715  
(lures, traps)

Manufacturing Systems, Inc.  
Tru-Catch Traps  
300 Industrial St., P.O. Box 816  
Belle Fourche, SD 57717-0816  
Phone: 800-247-6132  
(605) 892-2717  
Fax: (605) 892-6327  
(live catch traps, restraints)

Minnesota Trapline Products  
6699 156th Ave. NW  
Pennock, MN 56279  
Phone: (320) 599-4176  
Fax: (320) 599-4314  
(All Types, Lures)

National Live Trap Corporation  
P.O. Box 302  
Tomahawk, WI 54487  
Phone: (715) 453-2249  
Fax: (715) 453-4705  
(traps, cages)

Pest Control Supplies  
1700 Liberty St., P.O. Box 025665  
Kansas City, MO 64102  
Phone: 800-821-5689  
(816) 421-4696  
Fax: (816) 472-0966

Pocatello Supply Depot  
238 E. Dillon St.  
Pocatello, ID 83201-6623  
Phone: (208) 236-6920  
Fax: (208) 236-6922  
(Breakaway Snare Locks, Trap  
Drags and Parts)

Rob Erickson's  
On-Target A.D.C.  
P.O. Box 469  
Cortland, IL 60112-0469  
Phone: (815) 286-3039  
(Lures)

Kness Manufacturing Company,  
Inc.  
Highway 5 South, P.O. Box 70  
Albia, IA 52351-0070  
Phone: 800-247-5062  
(641) 932-7846  
Fax: (641) 932-2456  
(live animal traps)  
M & M Fur Company  
P.O. Box 15  
Bridgewater, SD 57319-0015  
Phone: (605) 729-2535  
Fax: (605) 729-2536  
(Break-way snares & lures)

Margo Supplies Ltd.  
P.O. Box 5400  
High River, Alberta,  
Canada T1V 1M5  
Phone: (403) 652-1932  
Fax: (403) 652-3511  
(Cage Traps, Net Guns)

Montgomery Fur  
1539 West 3375 South  
Ogden, UT 84401  
Phone: (801) 394-4686  
Fax: (801) 394-9828  
(Footholds, Body Grip, Cage Traps)

O'Gorman Enterprises, Inc.  
Box 419  
Broadus, MT 59317  
Phone: (406) 436-2234  
(Snares, Lures)

P-W Manufacturing Co.  
610 High Street  
Henryetta, OK 74437  
Phone: (918) 652-4981  
Fax: (918) 652-9770  
(Death-Klutch Gopher/Mole Trap)

PVE  
Phil Nichols  
P.O. Box 84  
Pennsburg, PA 18073-0084  
Phone: 800-724-9468  
(Footholds, Body Grips, Cage Traps  
and Lures)

R-P Outdoors  
505 Polk St., P.O. Box 1170  
Mansfield, LA 71052  
Phone: 800-762-2706  
Fax: (318) 872-8824  
(All Types)

Last Perch  
P.O. Box 426  
Mitchellville, IA 50169  
Phone: (515) 967-2853  
(Cage Traps)

Macabee Gopher Trap Company  
110 Loma Altaa Avenue  
Los Gatos, CA 95030  
Phone: (408) 354-4158  
Fax: (408) 354-2958  
(Gopher Traps)

Micro-Gen Equipment Corporation  
3568 Tree Court Industrial Blvd.  
St. Louis, MO 63122  
Phone: 800-777-8570  
(636) 225-5371  
Fax: 800-977-1087  
(traps)

Nash Mole Trap Co.  
5716 East "S" Avenue  
Vicksburg, MI 49097-9990  
Phone: (616) 323-2980  
(Mole Traps)

Oneida-Victor Co.  
1685 E. 301  
Eastlake, OH 44095  
Phone: (216) 761-9010  
(Footholds)

Paws-I-Trip  
M-Y Enterprises  
220 Lincoln St.  
Homer City, PA 15748-1545  
Phone: (724) 479-9442  
Fax: (724) 479-9275  
(Footholds, Snares, Misc.)

R. C. Best Traps  
P.O. Box 103  
Knox, PA 16232-0103  
Phone: (814) 797-1546  
(Body Grip Traps)

Safe-N-Sound Live Traps  
P.O. Box 573  
Hutchinson, MN 55350  
Phone: 800-795-8093  
(Cage Traps)

Safeguard Products, Inc.  
P.O. Box 8  
New Holland, PA 17557  
Phone: 800-433-1819  
(717) 354-4586  
Fax: (717) 355-2505  
(live animal traps)

Sheda's  
Ludy & Mary's Trap Co. Inc.  
202 Irish St.  
Chelsea, IA 52215  
Phone: (515) 489-2155  
(All Traps, Lures)

Sterling Fur Co.  
11268 Frick Road  
Sterling, OH 44276  
Phone: (330) 939-3763  
Fax: (330) 939-5135

(Footholds, etc.) Sullivan's  
Sure-Catch Traps  
Box 1241  
2324 S. Patterson  
Valdosta, GA 31601  
Phone: (912) 242-1677

The Snare Shop  
13191 Phoenix Ave.  
Carrol, IA 51401  
Phone: (712) 822-5318  
Fax: (712) 822-5319  
(Snares, Footholds, Cage Traps)

Tomahawk Live Trap Co.  
P.O. Box 323  
Tomahawk, WI 54487  
Phone: 800-272-8727  
Fax: (715) 453-4326

Triple S Outdoor Supply  
2179 Highway 35 South  
Foxworth, MS 39483  
Phone: (601) 763-1789  
(All Types)

Tru-Catch Traps  
P.O. Box 816  
Belle Fourche, SD 57717  
Phone: (605) 892-4797  
Fax: (605) 892-6327

Wildlife Control Products  
P.O. Box 330568  
West Hartford, CT 06133-0568  
Phone: (860) 236-2683  
(Chimney Traps)

W.C.T.  
Wildlife Control Supply, Inc.  
P.O. Box 6951  
Villa Park, IL 60181-6951  
Phone: (815) 286-9251  
Fax: (630) 833-8058

Wickenkamp Live Trap  
Manufacturing  
Route 2, 129 Buckeye  
Hedrick, IA 52563  
Phone: (515) 661-2700  
(Cage Traps)

William's Trapping Supply  
4587 E. Station Rd.  
Roanoke, IN 46783  
Phone: (219) 672-3721  
(Cage Traps)

Woodstream Corp.  
69 N. Locust St.  
Lititz, PA 17543  
Phone: (717) 626-2125  
Fax: (717) 626-1912  
(Cage Traps)

### ***Firearms and Ammunition***

Beeman Precision Airguns  
5454 Argosy Drive  
Huntington Beach, CA 92649  
Phone: 800-227-2744  
Fax: (714) 890-4808  
(Airguns)

Beretta USA Corp.  
17601 Beretta Drive  
Accokeek, MD 20607  
Phone: (301) 283-2191  
Fax: (301) 283-0435  
(Firearms)

Browning  
1 Browning Place  
Morgan, UT 84050  
Phone: 800-234-2067  
Fax: 800-234-4155  
(Firearms)

Federal Cartridge Corp.  
900 Ehlen Drive  
Anoka, MN 55303  
Phone: (612) 421-7100  
Fax: (612) 323-3800  
(Ammunition)

Harrington & Richardson  
Industrial Rowe  
Gardner, MA 01440  
Phone: (508) 632-9393  
Fax: (508) 632-2300  
(Break-action Shotgun)

Heckler & Koch, Inc.  
ATTN: Government Sales  
17603 Indian Head Highway  
Accokeek, MD 20607-2501  
Phone: (301) 283-6981  
Fax: (301) 283-6988

Marlin Firearms Co.  
100 Kenna Drive, Box 248  
North Haven, CT 06473  
Phone: (203) 239-5621  
Fax: (203) 985-3349

Mossburg Arms  
7 Grasso Ave.  
North Haven, CT 06473  
Phone: 800-989-4867  
Contact: David Horn ext. 430

Remington Arms Co. Inc.  
P.O. Box 700  
Madison, NC 27025  
Phone: 800-852-7634  
(336) 548-8796

Smith & Wesson  
ATTN: Government Sales  
1117 North 19th Street  
Arlington, VA 22209  
Phone: (703) 522-4486

Sturm Ruger  
ATTN: Government Sales  
Lacey Place  
Southport, CT 96490  
Phone: (203) 259-7843

Tippmann Pneumatics, Inc.  
3518 Adams Center Road  
Fort Wayne, IN 46806  
Phone: (219) 749-6022  
(Paint Ball Guns)

Olin Winchester Division  
Law Enforcement Marketing  
ATTN: Government Sales, Beth  
427 N. Shamrock St.  
E. Alton IL 62024  
Phone: (618) 258-2897  
Fax: (618) 258-3446  
(Ammunition)

Olin Winchester Division  
US Repeating Arms  
USRAC 344 Winchester Ave.  
New Haven, CT 06511  
Phone: 800-945-1392  
Fax: (203)-789-5890  
(Firearms)

### Optics

Beeman Precision Airguns  
5454 Argosy Drive  
Huntington Beach, CA 92649  
Phone: 800-227-2744  
Fax: (714) 890-4808

Cabela's  
1 Cabela Drive  
Sidney, NE 69160  
Phone: 800-237-4444  
(Binoculars & Scopes)

Leupold & Stevens, Inc.  
P.O. Box 688  
Beaverton, OR 97075-0688  
Phone: 800-929-4949  
(Binoculars & Scopes)

Redfield  
5800 E. Jewell Avenue  
Denver, CO 80224  
Phone: (303) 757-6411  
Fax: (303) 756-2338  
(Scopes)

The Brunton Company  
620 East Monroe  
Riverton, WY 82501  
Phone: (307) 856-6559  
Fax: (307) 856-1840  
(Binoculars)



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

# Advisory Circular

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**Subject:** Qualifications for Wildlife  
Biologist Conducting Wildlife Hazard  
Assessments and Training Curricula for  
Airport Personnel Involved in Controlling  
Wildlife Hazards on Airports

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**Date:** June 28, 2006      **AC No:** 150/5200-36  
**Initiated by:** AAS-300

## 1. Purpose.

This Advisory Circular (AC) describes the qualifications for wildlife biologists who conduct Wildlife Hazard Assessments for airports certificated under Title 14, Code of Federal Regulations, Part 139 (14 CFR, Part 139). In addition, it addresses the minimum wildlife hazard management curriculum for the initial and recurrent training of airport personnel involved in implementing a Federal Aviation Administration (FAA) approved Wildlife Hazard Management Plan.

## 2. Background.

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

## 3. Applicability.

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

#### 4. Related Reading Material.

Please review the most recent versions of the following documents:

- a. FAA AC 150/5200-18C, *Airport Safety Self-Inspection*.
- b. FAA AC 150/5200-32A, *Reporting Wildlife Aircraft Strikes*.
- c. FAA AC 150/5200-33A, *Hazardous Wildlife Attractions on or Near Airports*.
- d. FAA AC 150/5200-34A, *Construction or Establishment of Landfills Near Public Airports*.
- e. FAA Office of Safety and Standards, Certalert no. 98-05. *Grasses Attractive to Hazardous Wildlife*.
- f. FAA Office of Safety and Standards, Certalert no. 04-09, *Relationship Between FAA and WS*.
- g. FAA Office of Safety and Standards, Certalert no. 04-16, *Deer Hazard to Aircraft and Deer Fencing*.
- h. Cleary, E. C., R. A. Dolbeer, and S. E. Wright. *Wildlife Strikes to Civil Aircraft in the United States*. FAA National Wildlife Aircraft Strike Database Serial Reports.
- i. Cleary, E. C. and R. A. Dolbeer. 2005. *Wildlife Hazard Management at Airports: A Manual for Airport Operators*. 2<sup>nd</sup> Ed. FAA, Office of Airport Safety and Standards, Washington, DC. 347 pages.
- j. Report to Congress: *Potential Hazards to Aircraft by Locating Waste Disposal Sites in the Vicinity of Airports*, April 1996, DOT/FAA/AS/96-1.
- k. Title 14, Code of Federal Regulation, Part 139, Certification of Airports.
- l. Title 40, Code of Federal Regulation, Part 258, Criteria for Municipal Solid Waste Landfills.

Some of these documents and other information on wildlife management, including FAA Certalerts and guidance on siting hazardous wildlife attractants such as landfills, are available on the FAA website at [http://www.faa.gov/airports\\_airtraffic/airports/](http://www.faa.gov/airports_airtraffic/airports/) or <http://wildlife-mitigation.tc.faa.gov/>.

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

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

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

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

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

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

- a. Have the necessary academic coursework from accredited institutions and work experience to meet the qualifications of a GS-0486 series wildlife biologist as defined by the U.S. Office of Personnel Management classification standards (Appendix A); **or** be designated as a Certified Wildlife Biologist by The Wildlife Society (<http://www.wildlife.org>) **and**,
- b. Have taken and passed an airport wildlife hazard management training course acceptable to the FAA Administrator (Appendix B<sup>1</sup>) **and**,
- c. While working under the direct supervision of a qualified airport wildlife biologist, have conducted at least one Wildlife Hazard Assessment acceptable to the FAA Administrator (as described in §139.337(c)). **and**,
- d. Have successfully complete at least one of the following within the past 3 years:
  - (1) An airport wildlife hazard management training course that is acceptable to the FAA Administrator (Appendix B) **or**,
  - (2) Attendance, as a registered participant, at a joint Bird Strike Committee–USA/Bird Strike Committee–Canada annual meeting, **or**,
  - (3) Other training acceptable to the FAA Administrator.

Persons wishing to conduct Wildlife Hazard Assessments or provide the requisite training should provide the Certificate Holder documentation verifying they meet the requirements outlined in 5 a – d above.

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

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

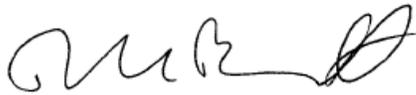
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<sup>1</sup> Appendix B also contains instruction for those wishing to establish a training program to train wildlife biologist for designation as “qualified airport wildlife biologist” by the FAA Administrator.

§139.303(c) and (e) describe the minimum areas covered during initial and recurrent airport wildlife hazard management training. Depending on local wildlife and environmental issues, additional topics or more in-depth coverage of listed topics, might be needed. Appendix C outlines the training requirements for airport personnel who carry out an airport's Wildlife Hazard Management Plan. Initial and recurrent training must be at least 8 hours in length.

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

Remember, holders of Airport Operating Certificates issued under Part 139 are required to make and keep records of all training for airport personnel involved in controlling wildlife hazards [§139.303(d)].



David L. Bennett  
Director, Office of Airport Safety and Standards

### Appendix A.

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

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

1. A degree in biological science that includes—
  - a. At least 9 semester hours in such wildlife subjects as mammalogy, ornithology, animal ecology, and wildlife management or research courses in the field of wildlife biology; **and**
  - b. At least 12 semester hours in zoology in such subjects as general zoology, invertebrate zoology, vertebrate zoology, comparative anatomy, physiology, genetics, ecology, cellular biology, parasitology, and entomology or research courses in these subjects (excess courses in wildlife biology may be used to meet the zoology requirements where appropriate); **and**
  - c. At least 9 semester hours in botany or the related plant sciences; **or**
2. A combination of education and experience equivalent to a major in biological science (i.e., at least 30 semester hours), with at least 9 semester hours in wildlife subjects, 12 semester hours in zoology, and 9 semester hours in botany or related plant science, as shown in “a” above, plus appropriate experience or additional education.

## Appendix B.

### 1. Curriculum Outline for an Airport Wildlife Hazard Management Course, Acceptable to the FAA Administrator, for Personnel Conducting Wildlife Hazard Assessments, or Providing Training to Personnel Actively Involved in Implementing FAA Approved Wildlife Hazard Management Plans.

A list of training program providers acceptable to the FAA Administrator can be found at the FAA's wildlife strike web page: <http://wildlife-mitigation.tc.faa.gov>.

Links to the most recent versions of FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues can be found at [http://www.faa.gov/airports\\_airtraffic/airports/](http://www.faa.gov/airports_airtraffic/airports/) and <http://wildlife-mitigation.tc.faa.gov/>.

Those proposing to establish a program to train qualified airport wildlife biologist to meet the requirements of Title 14, Code of Federal Regulations, §139.337 must submit a complete training syllabus and instructor vita to the FAA. The syllabus must include all lesson plans, student handouts, and graphic presentations. Submit the material to:

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

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

### 2. Instructor Qualifications.

The lead instructor for the training should have the following qualifications:

- a. Be a qualified airport wildlife biologist
- b. Academic credits in education or instructor/teaching experience
- c. A minimum of 2 years experience in all aspects of managing hazardous wildlife on or near airports

### 3. Training Curriculum Outline.

- a. Training goals and process
- b. Airport familiarization
  - (1) Introduction to the National Plan of Integrated Airport Systems
  - (2) Airport design and layout
  - (3) Navigation aids and Air Traffic Control
  - (4) Airport operations and safety
  - (5) Signs, marking, and lighting

- (6) Ground vehicle operator communication
- c. Aircraft familiarization
  - (1) Physics of a strike
  - (2) Aircraft nomenclature
  - (3) Civil aviation aircraft categories
  - (4) Aircraft engines
    - (a) Reciprocating
    - (b) Turbo
  - (5) Aircraft certification standards
- d. Preview of wildlife hazards to aviation
  - (1) History of major strikes
  - (2) Aviation losses
    - (a) Worldwide
    - (b) United States
- e. Controlling laws, regulations and policies
  - (1) Migratory Bird Treaty Act of 1918, as amended
  - (2) Animal Damage Control Act of 1931, as amended
  - (3) Bald Eagle Protection Act of 1940, as amended
  - (4) Federal Insecticide, Fungicide, and Rodenticide Act of 1948, as amended
  - (5) National Environmental Policy Act of 1969, as amended
  - (6) Endangered Species Act of 1973, as amended
  - (7) Title 14, Code of Federal Regulation, Part 139, Certification of Airports
  - (8) Title 40, Code of Federal Regulations, Part 258, Criteria for Municipal Solid Waste Landfills
  - (9) Title 50, Code of Federal Regulations, Parts 1–199, Wildlife Management
  - (10) Wendell H. Ford Aviation Investment and Reform Act for the 21st Century, Pub. L. No. 106–181 (April 5, 2000), "Structures Interfering with Air Commerce," section 503
  - (11) Applicable FAA ACs in the 150/5200 series about Airport Wildlife Hazard Management
  - (12) Applicable FAA Office of Airports Certalerts
  - (13) Applicable state and local laws, regulations, and ordinances
- f. Department of Defense requirements and perspective on military/civilian joint-use airports

- g. Other Federal and State agency roles and responsibilities
  - (1) U.S. Department of Interior, Fish and Wildlife Service
    - (a) Role and responsibilities related to managing problem wildlife
    - (b) Migratory Bird Depredation Permits
    - (c) Salvage Permits
  - (2) U.S. Department of Agriculture, Wildlife Services
    - (a) Role and responsibilities related to managing problem wildlife
  - (3) Other agencies
    - (a) U.S. Environmental Protection Agency
      - i. Siting landfills
      - ii. Pesticide registration and use
    - (b) U.S. Army Corps of Engineers
      - i. Wetlands mitigation
  - (4) Multi-Federal Agency Memorandum of Agreement
  - (5) Applicable state wildlife regulations
- h. FAA National Wildlife Aircraft Strike Database
  - (1) Strike reporting
  - (2) Species identification and feather identification
  - (3) Database access
- i. Environmental issues—working with Federal and State agencies
  - (1) National Environmental Policy Act
  - (2) U.S. Army Corps of Engineers (wetland loss and mitigation issues)
- j. Initial consultations and Wildlife Hazard Assessments (WHA)
  - (1) Triggering events for WHA
  - (2) Duration and contents of WHA
  - (3) Wildlife surveys at airports to assess wildlife hazards
  - (4) Data analysis and presentation of results
  - (5) Writing a WHA
- k. FAA review of WHA and determination of need for Wildlife Hazard Management Plan (WHMP)
- l. Drafting and carrying out integrated WHMP
  - (1) Contents of WHMP
  - (2) FAA review of WHMP

- (3) Endangered Species Act compliance
  - (4) National Environmental Policy Act review
  - m. Integrated wildlife hazard management for airports; survey of basic control strategies and tactics
    - (1) Flight schedule modification
    - (2) Habitat modification and exclusion
    - (3) Wildlife dispersal techniques
    - (4) Wildlife population management
  - n. Addressing off-airport attractants and community planning and involvement
  - o. Outline of field trip (to conduct a “mini” WHA)
  - p. Field trip/site visit
  - q. Final exam
  - r. Post exam review
  - s. Course evaluation
  - t. Presentation of certificates
- 4. Recommendations.**
- a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.
  - b. Passing grade/evaluation should be recorded and retained as instructor’s records.
  - c. Instructors should retain course attendance records for a period of three years.

### Appendix C.

#### 1. Training curriculum outline for airport personnel actively involved in implementing FAA approved Wildlife Hazard Management Plans.

The goal of the training course must be to provide the knowledge, skills, and abilities needed by airport personnel to safely and accurately implement relevant portions of an FAA approved Wildlife Hazard Management Plan. To be acceptable to the FAA, initial and recurrent training must be at least 8 hours in length and include the agenda items:

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

- e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern.
  - f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual<sup>2</sup>:
    - (1) Safety, parts, and operation of firearms and pyrotechnic launchers.
    - (2) Fundamentals of using ammunition and pyrotechnics.
    - (3) Personnel protective equipment.
    - (4) Cleaning, storage, and transport of firearms and pyrotechnic launchers.
    - (5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics.
    - (6) Live fire training with firearms and pyrotechnic launchers.
  - g. Any other training required by local, State, or Federal regulations.
- 2. Recommendations.**
- a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.
  - b. The Trainer should retain passing grades/evaluations records.
  - c. The Trainer should retain course attendance records for a period of three years.
  - d. Airport personnel charged with responsibility for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employee conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

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<sup>2</sup> State Certificated Hunter Safety Instructors, police officers, and firearms instructors should be qualified to teach firearms safety and possibly the safe use of pyrotechnic launchers. Pyrotechnics are classified as high explosives by the Bureau of Alcohol Tobacco and Firearms (ATF) and as Division 1.4 explosives by the U.S. Department of Transportation. There are numerous regulations, security considerations, and ATF licensing requirements that apply to pyrotechnics.