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March 12, 2015

Mr. Brian Picken
Airport Manager
Mammoth Yosemite Airport
1200 Airport Road
Mammoth Lakes, California 93546

RE: Mammoth Yosemite Airport – Wildlife Hazard Assessment

Dear Mr. Picken:

We want to thank you for all your cooperation during the year-long wildlife assessment at the Mammoth Yosemite Airport. Dr. Ann Hodgson and I have revised the Wildlife Hazard Assessment report to include review comments from you and Mr. Reinard Brandley, P. E.

The report should now be submitted to the FAA Cert. Inspector - Ms. Charlotte Jones. We anticipate a quick FAA approval of this document, and the FAA's recommendation to prepare the Wildlife Hazard Management Plan.

Respectfully,

Ann Hodgson, Ph.D. and Gary Exner
Advantage Consulting LLC

cc: Mr. Reinard Brandley, P.E.

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Mammoth Lakes
CALIFORNIA

**MAMMOTH YOSEMITE AIRPORT (KMMH)
WILDLIFE HAZARD ASSESSMENT
MAMMOTH LAKES, MONO COUNTY, CALIFORNIA**



PRESENTED TO:
Mr. Brian Picken, Airport Manager
Mammoth Yosemite Airport
1200 Airport Road, Mammoth Lakes, California 93546

and

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PREPARED BY:
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Gary Exner, FAA Qualified Airport Wildlife Biologist
Advantage Consulting, LLC

January 12, 2015

ACKNOWLEDGMENTS

Special thanks to Mr. Brian Picken, Airport Manager, Mr. Vince Maniaci, Operations/ARFF Manager, and the Hot Creek Aviation staff for the cooperation and information they provided to help us prepare the most accurate and comprehensive assessment of wildlife conditions at the Airport.

LIST OF PREPARERS

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CITATION

Exner, G. and A. B. Hodgson. 2015. Mammoth Yosemite Airport Wildlife Hazard Assessment. Prepared for Reinard W. Brandley, P.E., Consulting Airport Engineer, Loomis, California and Mammoth Yosemite Airport, Mammoth Lakes, California. Prepared by Advantage Consulting LLC, Chuluota, Florida.

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Acronyms and Abbreviations

Abbreviation	Description
AC	Advisory Circular
AIP	Airport Improvement Program
AOA	Airport Operations Area; for this report, the area within the security fence
ATCT	Air Traffic Control Tower
AWOS	Automated Weather Observation System
BGEPA	Bald and Golden Eagle Protection Act
CATEX	Categorical Exclusion
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CTAF/UNICOM	Common Traffic Advisory Frequency/Universal Communications
CWA	Clean Water Act
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FBO	Fixed-base Operator
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FOD	Foreign Object Debris
FR	Federal Register
GA	General Aviation
KMMH	Mammoth Yosemite Airport
LDA/DME	Localizer Directional Aid/Distance Measuring Equipment
MBTA	Migratory Bird Treaty Act
NEPA	National Environmental Policy Act
NOTAMS	Notices to Airmen
NTSB	National Transportation Safety Board
PAPI	Precision Approach Path Indicator
PIREPS	Pilot Reports
REILS	Runway End Identifier Lights
RSA	Runway Safety Area
RW	Runway
USDA-WS	United States Department of Agriculture – Wildlife Services
USACE	United States Army Corps of Engineers
VOR/DME	Visual Observation Radio/Distance Measuring Equipment
WHA	Wildlife Hazard Assessment
WHMP	Wildlife Hazard Management Plan
WHWG	Wildlife Hazard Working Group

1 EXECUTIVE SUMMARY

The purpose of this Wildlife Hazard Assessment (WHA) is to identify potential hazards to aircraft and human safety associated with wildlife populations and movements at and/or near Mammoth Yosemite Airport (KMMH or Airport) in Mammoth Lakes, Mono County, California. This WHA was conducted following Federal Aviation Administration (FAA) guidance and at the request of Mammoth Yosemite Airport (KMMH). KMMH retained the Advantage Consulting, LLC Team (Team) to conduct a WHA according to FAA standards and guidelines outlined in 14 CFR § 139.337. The Team biologists, Dr. Ann Hodgson and Mr. Gary Exner, who are FAA Qualified Airport Wildlife Biologists as defined in Advisory Circular (AC) 150/5200-36A, prepared this document.

The FAA has made it a primary initiative for all Part 139 Certificated airports to have a WHA and Wildlife Hazard Management Plan (WHMP) completed for Part 139 airports. The FAA's goal, as described by the FAA Western-Pacific Region, is to "assess potential hazards of wildlife at specified general aviation (GA) and Part 139 Certificated airports, and develop WHMPs where required." Although no wildlife strikes were documented at KMMH, and there were no reported triggering events according to the FAA Wildlife Strike Database, KMMH is a Part 139 airport, and the FAA funded a WHA for KMMH in 2013 as part of the Airport's Master Plan Update.

A WHA is a tool to help airport operators determine the abundance and use patterns of wildlife around the airport. The WHA was designed to identify wildlife attractants of hazardous wildlife species as defined in AC 150/5200-33B. This WHA includes a discussion of historic and recent conditions at KMMH, the status and attraction characteristics of adjoining land uses, results of the wildlife surveys, a hazard risk analysis, and recommendations. If the FAA deems a WHMP necessary, the data and information gained through a WHA is used to prepare a WHMP. The WHA is used to support the preparation of a WHMP, and the WHMP outlines the wildlife management responsibilities of the airport staff and other stakeholders.

To ascertain seasonal and daily patterns and movements, the Team Biologist conducted point-count wildlife surveys for 12 consecutive months from October 2013 through September 2014, during two days per month. Point-count surveys were conducted three times a day in dawn, mid-day, and evening/night survey events during each visit, for a total of 72 survey events in the 12-month period. Five observation points were established within the Airport Operations Area (AOA). For this WHA, the AOA was defined as property within the Airport security fence. Six other observation points located outside the AOA within a 5-mile separation distance were surveyed. Avian observations comprised 96.9% of all wildlife observations during the WHA study period. Of the total avian observations, 5.8% occurred on the Airport, and 94.2% occurred off the Airport. During each monthly survey event, an average of 19 birds was seen at the five combined AOA sites, and an average of 303 birds was seen at the six combined off-AOA sites, with the majority of these avian observations occurring at the Alkali Lakes complex about 5 miles northeast of the Airport. Because the point-counts were repeated three times each day at each station on two successive days each month, it is probable that the same individuals were counted repeatedly at each station on each count. The assessment included investigating areas for concentrations of wildlife attracted to specific features. Nighttime spotlight surveys were conducted each season, and small mammal trapping surveys were completed in the spring and fall. The Team concluded that migratory birds, corvids, raptors, and medium and large-sized mammals foraging in the AOA posed the primary wildlife hazards at the Airport.

The number of birds was greatest during the fall migration period in October 2013, and declined during the winter months. Avian activity increased in the spring 2014, with the arrival of migrating flocks and seasonally nesting species. Observation counts declined after the nesting season, and increased during fall migration in September 2014. The most abundant guilds were waterfowl (79.3%), passerines (5.9%), corvids (5.4%), and icterids/starlings (4.5%). Waterfowl were attracted to the Alkali Lakes complex northeast of the Airport and rarely were observed flying over the Airport during migration and the nesting season. Passerines, corvids, and icterids/starlings guilds were observed foraging, perching/nesting, and loafing in varying numbers at various locations and throughout the year. Total annual avian populations cannot be estimated accurately due to variations in climate from year to year.

Of the 736 total mammal/other wildlife observations (3.1% of all wildlife observations), 15.8% occurred on the Airport, and 84.2% occurred off the Airport. Mule deer were the dominant mammal, accounting for 82.3% of the observations in the mammal/other wildlife guild. Resident coyotes were the dominant large mammal and were observed hunting

regularly on the AOA. Mountain cottontails and Panamint chipmunks were the most frequently observed mammalian prey-base species.

The wildlife species that were potentially the most hazardous at KMMH were corvids, raptors, ground foraging passerine species, deer, and coyotes. Monthly observation point counts indicated that the risk of avian wildlife strikes at KMMH would be greatest during spring migration and the nesting season (March through May), and during fall migration (September through November). The risk of mule deer strikes was greatest when the deer migrated from higher elevations into the valleys in the fall and they were intrusive residents until migrating back to higher elevations in the spring. Not all deer migrated, so the Airport was subject to a constant hazardous risk from these large mammals.

The primary wildlife attractants identified in this study were the dense shrub cover attracting foraging and roosting birds and browsing mule deer to the AOA, and the several water bodies within five miles of the Airport attracting birds through the air traffic patterns.

The WHA process requires listing various recommendations that may ultimately be selected for management tasks in the WHMP. Modifying the vegetative composition within the AOA, and closely monitoring migration activities at attractant areas outside the AOA are two recommended tasks. Various water bodies around KMMH are recognized avian attractants, and avian movements between these attractants may involve birds crossing KMMH airspace. Mitigation for these attractants may be considered in the WHMP.

The recommendations in this WHA listed below are prioritized based on feasibility with respect to cost, availability of FAA grant funding, equipment, and/or personnel availability, while considering the potential risk of hazards to aircraft safety.

- Install a deer-deterrent fence around the AOA (CertAlert #04-16).
- Repair /secure gate and fence gaps (CertAlert #04-16).
- Modify habitat to reduce shrub cover in the AOA and adjacent to the Airport perimeter areas.
- Formalize/implement a wildlife observation reporting and communication plan.
- Continue routine inspections of the AOA perimeter to monitor wildlife intrusion.
- Assess and implement timely wildlife hazing and harassment as necessary.
- Encourage continued and enhanced wildlife observation notification and communications from Airport Operations, pilots, and tenants.
- Develop a Wildlife Hazard Working Group (WHWG) and implement an active community involvement program.



MAMMOTH YOSEMITE AIRPORT

2 AIRPORT OVERVIEW

The Mammoth Yosemite Airport (KMMH or Airport) is a 260-acre city-owned public-use airport located 6 miles east of the central business district of the Town of Mammoth Lakes, Mono County, California (Figure 1). The Airport is situated at an elevation of 7,135 feet and has one active asphalt paved runway; Runway 9/27 that is 7,000 feet long by 100 feet wide (Figure 2). The general setting of Airport facilities is shown in Figure 3.

Regularly scheduled passenger service is provided by two airlines and varies seasonally. The Airport had two scheduled airlines operating in 2013-2014, with one flight per day during the summer months and up to seven flights per day in the winter. Alaska Airlines operates Q400 aircraft and United Airlines operates CRJ 700 aircraft, both of which have about 70 seats. The Airport requires 24-hour notice to the Airport Manager, (760) 934-3813, for non-commercial aircraft operations with more than 30 passenger seats. There is no FAA Air Traffic Control Tower (ATCT) at the Airport. Operational statistics for KMMH as reported by Airport IQ 5010, Airport Master Record, are shown in Table 1.

TABLE 1. AIRPORT OPERATIONAL STATISTICS

	No. of Aircraft	No. of Aircraft	
Aircraft based on the field:	7	4,178	Transient general aviation
Single engine airplanes:	6	1,725	Air taxi
Multi engine airplanes:	1	620	Local general aviation
Jet airplanes:	0	1,565	Commercial
Helicopters:	0	100	Military / law enforcement
Total	14	8,188	

(Note: statistics verified by Airport Engineer, 3/10/2015)

Aeronautical services are available locally at the Airport through Hot Creek Aviation, a Fixed-Base Operator (FBO) whose services include fueling, hangar rental, and aircraft maintenance to provide the needs of the aviation community. Some of the services offered at KMMH include aviation fueling (100LL, Jet-A), aircraft storage, flight planning, flight school/flight instruction, catering, car rental, and on-call charter service. Aircraft range in size from small general aviation aircraft to large corporate jets. An on-site Aircraft Rescue and Fire Fighting (ARFF) Station is readily accessible to attend to aviation related emergencies at the Airport. The emergency personnel have FAR Part 139, Index B Aircraft Rescue and Fire Fighting capability. The FAA has provided funding for various airport improvements.



FIGURE 1. LOCATION OF MAMMOTH YOSEMITE AIRPORT

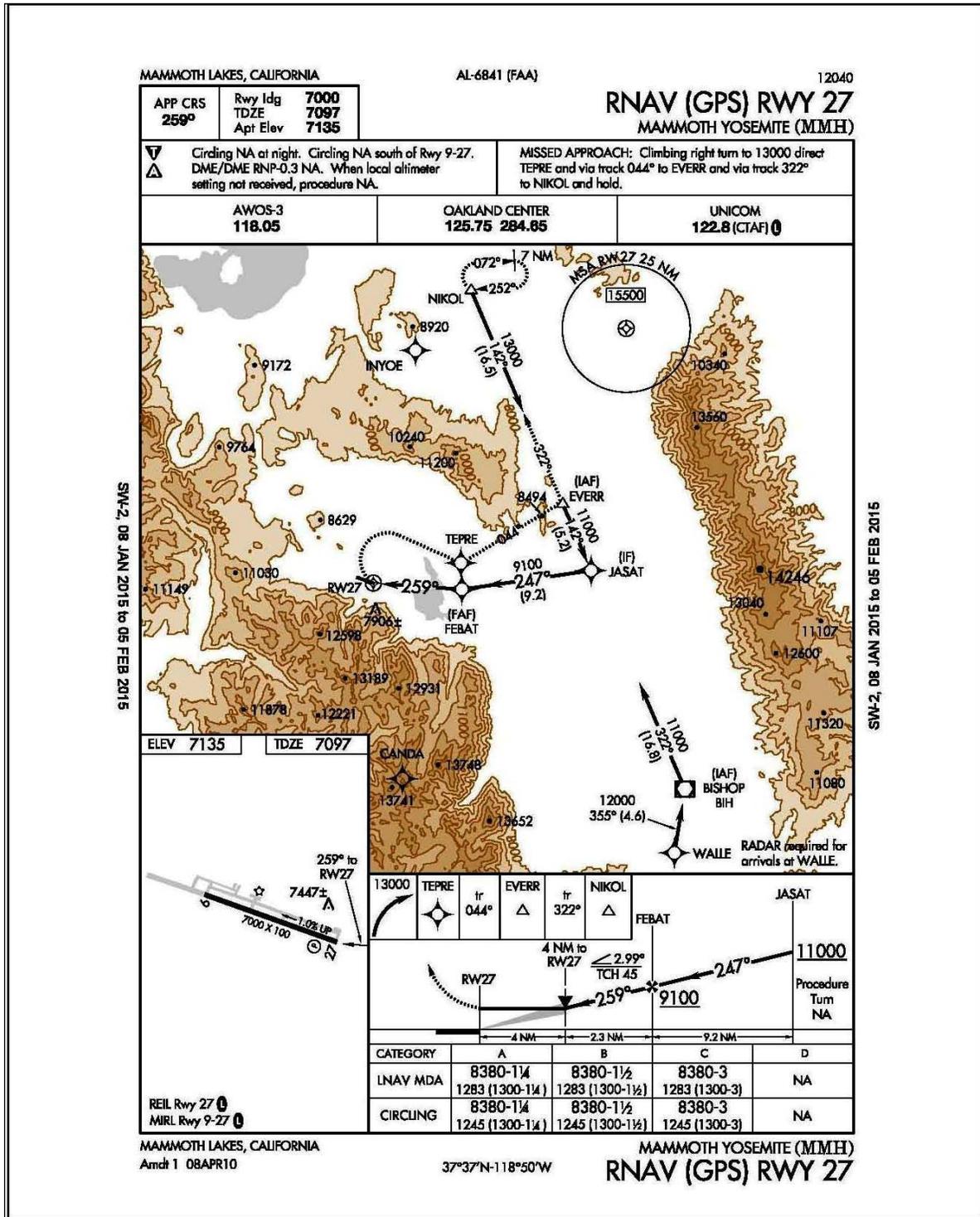


FIGURE 2. KMMH DIAGRAM



AIRPORT OPERATIONS OFFICES



THE TERMINAL BUILDING



EXECUTIVE HANGARS AT THE WEST END OF AOA



MULE DEER STANDING NEAR HANGARS



AIRPORT WATER TANK



AUTOMATED WEATHER OBSERVATION SYSTEM

FIGURE 3. GENERAL SETTING OF KMMH FACILITIES

3 WILDLIFE HAZARD ASSESSMENT – TRIGGERING EVENT REQUIREMENTS

The Federal Aviation Administration (FAA) issued a Certification Alert (CertAlert) to airport operators on June 11, 2009, reminding them of their obligation under 14 CFR Part 139 to conduct WHAs, if they experience or have previously experienced, a “triggering event” as outlined in Part 139.337(b):

- 1) An air carrier experiences multiple wildlife strikes;
- 2) An air carrier aircraft experiences substantial damage from striking wildlife;
- 3) An air carrier aircraft experiences an engine ingestion of wildlife; or
- 4) Wildlife of a size, or in numbers, capable of causing any of the items described above.

Airport sponsors and managers have a legal responsibility under federal regulations (Title 14 Code of Federal Regulations, Part 139) to ensure the airport maintains a safe operating environment. As part of this responsibility, they must assess the risk and magnitude of the wildlife strike problems for their airport should one of the four conditions occur [14 CFR, Part 139.337(b)(1)-(4)].

While KMMH has not had a recent triggering event, FAA funded this WHA to identify the risk and magnitude of potential wildlife strike problems at the Airport. The findings of the WHA indicate that a WHMP is recommended, due to multiple wildlife hazard incursions that were observed in the AOA. The data collected during the WHA will be used to develop the WHMP, which will serve as a guiding document of procedures that the Airport will follow to mitigate wildlife hazards.

3.1 STRIKE DATA ANALYSIS

No wildlife strikes have been reported to date to the FAA Strike Database for KMMH. Mule deer, however, are regular intruders on the AOA because the existing fence is inadequate to limit ingress. These deer pose a potential hazard to aircraft safety at KMMH (Figure 4).



FIGURE 4. MULE DEER BROWSING BY THE KMMH RUNWAY

4 METHODOLOGY

The Advantage Consulting LLC Team (Team) was selected to conduct the year-long WHA. The Team includes: Gary Exner, FAA Qualified Airport Wildlife Biologist, and Ann B. Hodgson, Ph.D., CWB®, FAA Qualified Airport Wildlife Biologist. The preliminary assessment tour and kick-off meeting for the WHA was conducted on October 24, 2013. Attendees at the kick-off meeting included the Team, the Airport Manager, and Airport staff responsible for general operations at the Airport.

The WHA is defined as a 12-month assessment to establish background information that addresses the collection of monthly and seasonal data specific to the observation frequency and types of wildlife that are regularly and/or occasionally observed at attractant areas inside and outside the AOA. Particular attention is paid to wildlife that may pose medium to high-risk threats to aircraft during approach, climb, departure, and circling procedures. Twelve monthly survey events were conducted. Each event had three surveys per day (AM, Mid-day, and PM surveys), on two consecutive days, for a total of six surveys/event and 72 survey events in 12 months. Spotlight surveys were

conducted to assess the wildlife activities in and around the Airport during each season of the assessment. Small mammals were trapped in spring and fall.

4.1 Study Area Description

Mammoth Yosemite Airport lies north of Highway 395, surrounded by the U. S. Forest Service Inyo National Forest (Figure 5). Local elevations range from 4,000' in the Owens Valley to 14,494' at Mt. Whitney, the highest peak in the contiguous United States. U. S. Highway 395 runs north/south along the east side of the Sierra Nevada Mountains. This highway effectively splits the mountain range from the lower valley to the east.

The local vegetative community is described as:

“The Basin Sagebrush community generally occurs on dry slopes and plains at low elevations within the (Mammoth) Planning Area. The community is dominated by soft woody shrubs; basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*); low sagebrush (*Artemisia arbuscula* spp. *arbuscula*); Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*); silver sagebrush (*Artemisia cana* spp. *viscidula*); mountain big sagebrush (*Artemisia tridentata* spp. *vaseyana*); antelope bitterbrush (*Purshia tridentata*); and snowberry (*Symphoricarpos vacciniodes*). Other associated species include annuals and perennial bunchgrasses that are sparsely distributed between shrubs (Town of Mammoth Lakes 2007).



FIGURE 5. VIEW OF THE AIRPORT FROM AIRPORT ROAD

The study area was defined with reference to Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5200-33B (*Hazardous Wildlife Attractants on or Near Airports*). Airport operations include both piston-powered and turbine-powered aircraft. For the purpose of this WHA, the 10,000-foot separation distance and 5-mile separation distance from the active Airport surface were used for the project study area (Figure 6). The 10,000 foot separation distance is defined as the focus area for wildlife observation data collection during the WHA, and is also reviewed for compatible land use in the areas near the Airport. The focus of the assessment in the 5-mile separation distance was to assess compatible land use changes or developments in these areas.

The existing FAA regulations specify the separation distances based on aircraft type and flight patterns. The separation distances are determined by: (1) flight patterns of piston-powered aircraft and turbine-powered aircraft;

(2) the altitude at which most strikes, or 78%, occur at or less than 1,000 feet above ground level, and 90% occur at or less than 3,000 feet above ground level; and (3) National Transportation Safety Board (NTSB) recommendations.

Airports selling Jet-A fuel normally serve turbine-powered aircraft. In this case, the FAA recommends a separation distance of 10,000 feet at these airports for any of the hazardous wildlife attractant areas, or for new airport development projects meant to accommodate aircraft movement. This is the ideal separation distance to be maintained between an airport's AOA and the hazardous wildlife attractant areas.

When considering proposed land use changes, airport operators, local planners, and developers must take into account whether the proposed land use changes, including new development projects, will increase wildlife attractants and consequently increase wildlife hazard potentials to aircraft. Some land use practices may attract or sustain hazardous wildlife populations on or near airports, which in turn can significantly increase the potential for wildlife strikes in those areas.

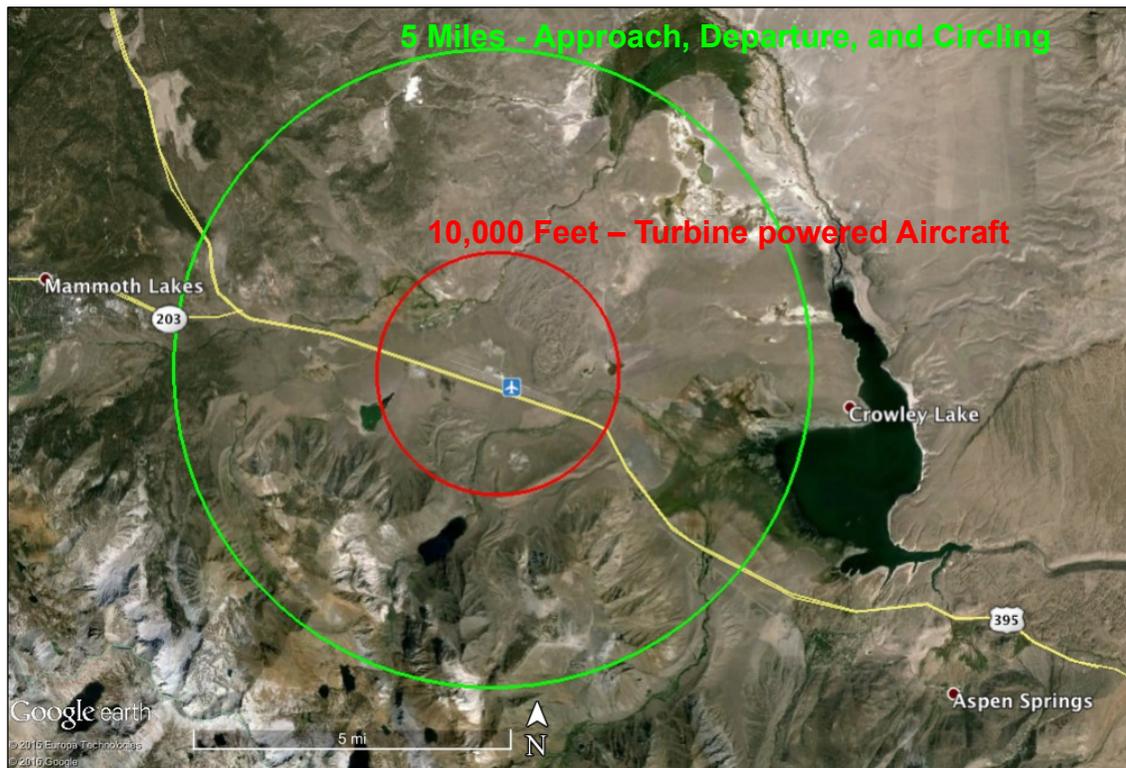


FIGURE 6. KMMH 5-MILE AND 10,000 FEET SEPARATION DISTANCES

4.2 Observation Points Inside the AOA

Observation points within the AOA are identified as OP-1 through OP-5 (Figure 7). These observation points were selected in locations that provide wildlife information specific to potential incursion areas at or near runways and taxiways. OP-1 includes the terminal, general aviation (GA) apron, and hangars; OP-2 overlooks the AOA from the west end of the executive hangars; OP-3 provides a view of the AOA from the west end of the AOA at approach Runway 27; OP-4 provides a similar view of the east side of the AOA and approach Runway 9; and OP-5 provides a panoramic view of the central AOA and “Doe Ridge”, a low hill overlooking the Airport, on the north side of the AOA. These observation points allowed for a complete and generally panoramic coverage of wildlife activities inside the AOA.

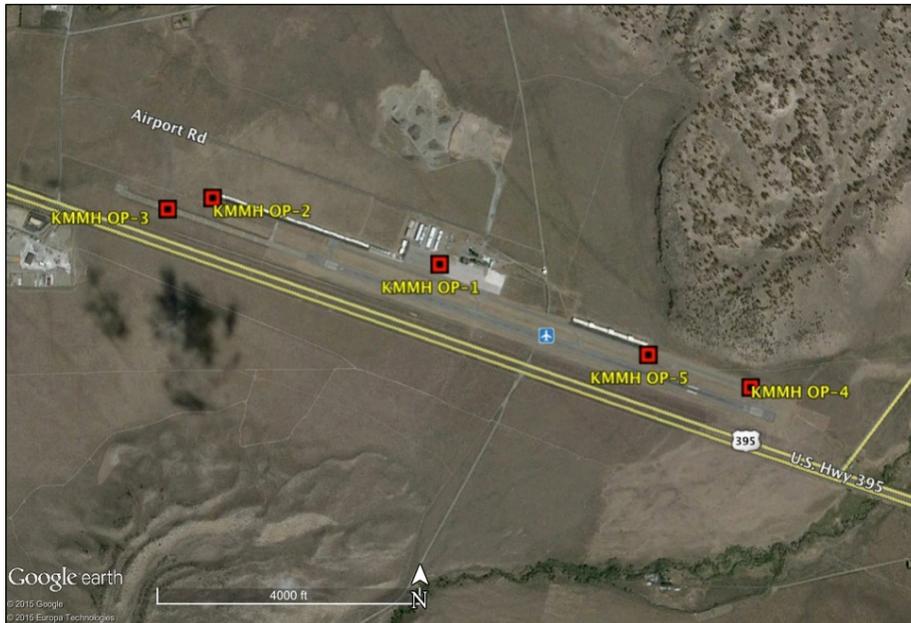


FIGURE 7. OBSERVATION POINTS INSIDE THE AOA

4.3 Observation Points Outside the AOA

Observation points outside the AOA are identified as XP-1 through XP-6 (Figure 8). These observation points were selected to monitor wildlife activities particularly along the approaches to the runway and at identified attractant habitats at varying distances within the 5-mile separation distance from the Airport. XP-1 is located on Hot Creek Hatchery Road by the viewing kiosk; XP-2 is located at the intersection of Hot Creek Hatchery Road and Airport Road at the west end of the AOA; XP-3 is located at the intersection of Highway 395 and Benton Crossing Road at the east end of the AOA; XP-4 is located at the dog kennel/park on Benton Crossing Road; XP-5 is located at the Alkali Lakes complex south of the Benton Crossing Landfill; and XP-6 is located on the south boundary of the AOA north of Highway 395.



FIGURE 8. OBSERVATION POINTS OUTSIDE THE AOA

4.4 Waste Management & Landfills

The Town of Mammoth Lakes operates Benton Crossing Landfill (899 Pit Road, Crowley Lake, CA) the closest landfill to the Town of Mammoth Lakes, located on Benton Crossing Road approximately 5 miles northeast east of Highway 395 and the AOA. The operations of the site are performed by Mono County staff, including gatehouse operations, household hazardous waste processing, used oil processing, appliance processing and recycling, as well as the burial of Construction and Demolition Waste as well as Municipal Solid Waste (Figure 9). The Town of Mammoth Lakes plans to close the landfill and other associated facilities within the 5-mile separation distance of the Airport within the next five years.

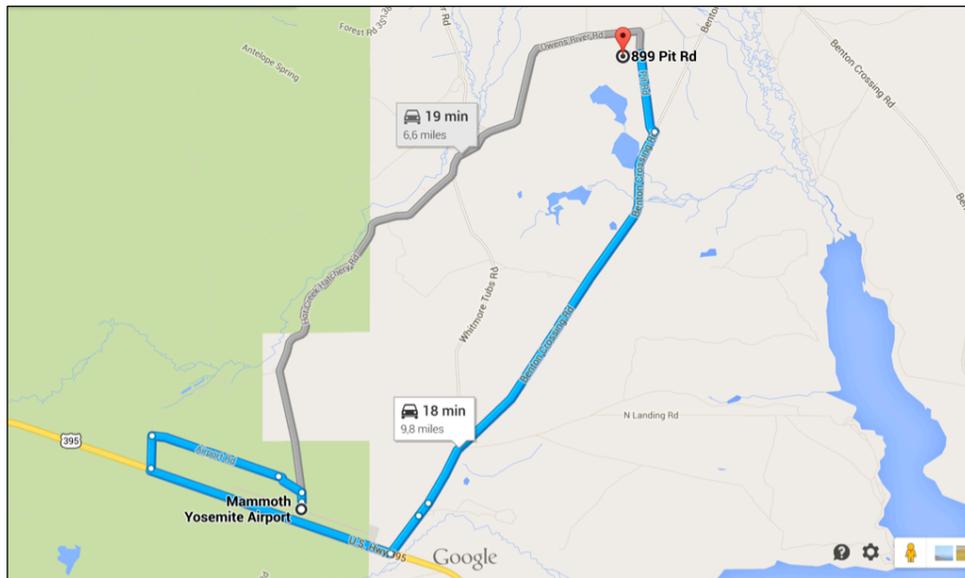


FIGURE 9. LOCATION OF BENTON CROSSING LANDFILL, CROWLEY LAKE, CALIFORNIA

FAA Advisory Circular No. 150/5200-34A entitled “Construction or Establishment of Landfills near Public Airports (January 26, 2006)”, describes the required separation distance prescribed by federal law between a new municipal solid waste landfill and a public airport. Landfills that were constructed before April 5, 2000 are exempt from this statute. Existing landfills that began modifications before this date are also exempt. Future landfills should comply with FAA guidelines.

4.5 Regional Wetlands

The Airport is situated in a “xeric” (dry) valley with numerous natural wetlands and water bodies occurring within a two-mile (10,000 feet) radius around the Airport, and other water features that are within the 5-mile separation distance. These water bodies were primarily lakes (Convict Lake, Crowley Lake, the Alkali Lakes complex), stream channels (Hot Creek), and riparian wetlands associated the drainages in the Hot Creek watershed and Crowley Lake (Figure 10). Convict Lake, at 7,850’ elevation, lies about three miles west of the Airport on the west side of Highway 395. It rarely hosted waterfowl (ducks or gulls). Crowley Lake, about 5 miles southeast of the Airport, supports migrating and breeding waterfowl. The Alkali Lake complex, just south of the Benton Crossing Landfill, had most of the waterfowl, shorebirds, and swallows migrating through or nesting in the area. The Hot Creek drainage, lying north-northeast of the Airport, is a complex of geothermal hot springs, vents, stretches of surface creek, and expanses of emergent sedges, rushes, and grasses surrounding Whitmore Hot Springs and adjoining water features. These areas attracted scattered flocks of passerines and shorebirds.

Because wildlife frequently congregate at water attractants, daily monitoring events at the inside and outside observation points around KMMH were focused on wildlife observations at aquatic-related attractants in the vicinity of the Airport.

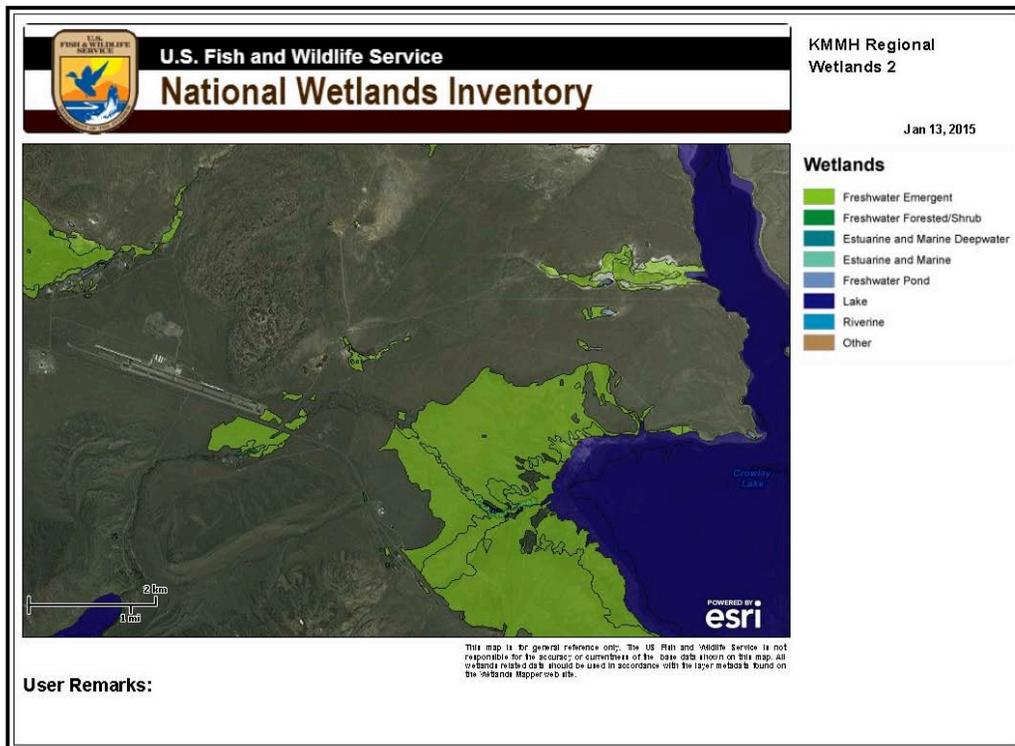
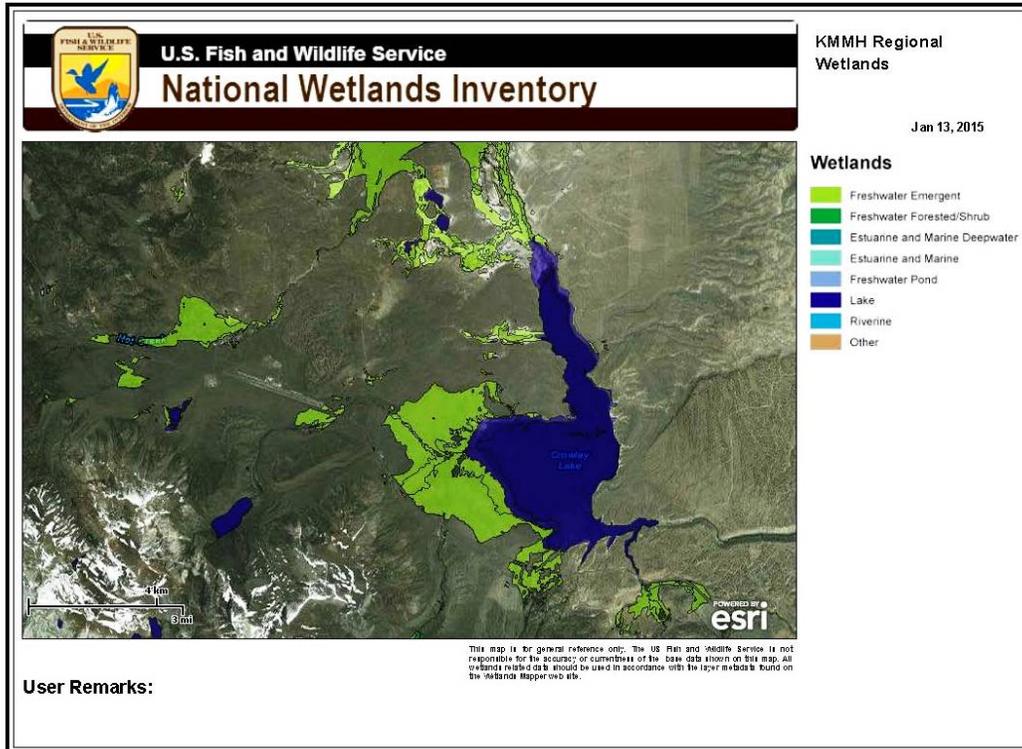


FIGURE 10. WATER BODIES, CREEKS, RETENTION BASINS, AND WETLANDS NEAR KMMH

5 RESULTS

The study results include an analysis of day and night wildlife survey observations at the Airport, and at off-site observation points and incidental observation points. Relevant airport operations information gathered for a 12-month assessment period beginning with the initial kick-off meeting and inspections in October 2013 is included. Monthly assessment monitoring reports were provided to the Airport Manager and Airport Engineer. These reports detailed the number of wildlife observations of each species of wildlife, and relevant notes about attractants and habitat use.

The first six monthly inspections at KMMH and surrounding areas included observation data from October 2013 through March 2014, provided as the Mid-Term Progress Assessment. The Mid-Term Progress Assessment reported three key findings:

1. The AOA is fenced with barbed wire only and wildlife incursions by mule deer, coyotes, and other smaller mammals occurred regularly. A deer deterrent fence (CertAlert #04-16) should be installed. Following installation of a deterrent fence, regular inspections along the AOA perimeter would be critical in maintaining a secured AOA.
2. Existing gates had gaps that should be remediated to FAA standards;
3. Tree and shrub cover was present on the AOA that should be removed to minimize habitat attraction and cover.

The twelve monthly inspections at KMMH and surrounding areas included observation data from October 2013 through September 2014, provided as the WHA. The key findings of the WHA included the findings from the progress assessment (items 1-3, above) and additional findings summarized in the following list:

1. A total of 23,167 bird observations (96.9% of wildlife observations) and 736 mammal/other wildlife observations (3.1% of wildlife observations) for a total of 23,903 total wildlife observations were documented during the year-long survey period.
2. Of the total bird observations, 5.8% occurred on the Airport, and 94.2% occurred off the Airport. (Figure 11).

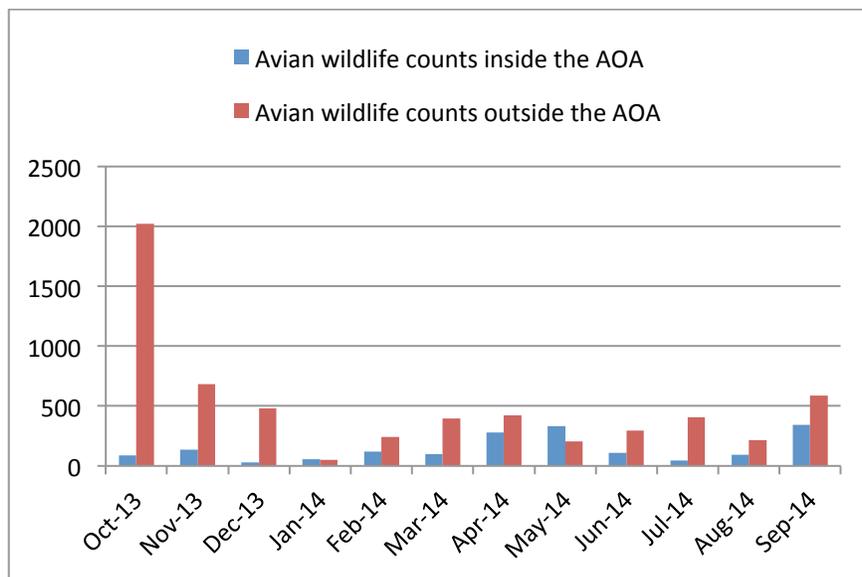


FIGURE 11. TOTAL AVIAN WILDLIFE COUNTS INSIDE AND OUTSIDE THE AOA

3. During each monthly survey event, an average of 112 birds (4 birds at each of the 5 survey points) was seen during each of three daily surveys on the AOA. An average of 303 birds (51 birds at each of the 6 survey points) was seen during each of three daily surveys off the AOA, with the majority of avian observations occurring at the Alkali Lakes complex.

4. Airport operations staff used vehicles as necessary to haze mule deer off the AOA, but the occasional hazing did not significantly reduce the number of mule deer wildlife observations inside the AOA.
5. Winter wildlife activity was greatly dependent on the frequency and intensity of significant winter storm events. Snowstorms occurred regularly in the vicinity of the Mammoth Yosemite Airport through March 2014. Wildlife activity decreased until the storms abated and wildlife emerged to resume foraging.
6. Wildlife observations were most numerous during the spring, and fall migration periods when migratory waterfowl are moving along the eastern slope of the Sierra Nevada Mountains, and during the summer when wildlife were most active in the Hot Creek and Owens Valleys surrounding the Airport.
7. During the summer (July-September 2014), the public parking area at the Airport entrance was being re-paved, however, construction-related activities did not cause an increase or decrease in the concentration of wildlife or number of wildlife observations around the construction site.

5.1 Wildlife Habitat On The Airport

The Airport lies in a valley on the east side of the Sierra Nevada Mountain range. The Basin Sagebrush vegetative community is a moderate patchy cover of woody shrubs dominated by sagebrush and rabbitbrush, with various grasses and wildflowers such as sulfur flower (sulfur flower buckwheat) mixed among the shrubs as the dominant habitat (Figure 12).



VIEW OF THE AOA LOOKING NORTHWEST



VIEW OF THE AOA LOOKING NORTHEAST



TYPICAL GROUND COVER IS SPARSE BUNCH GRASS AND WILDFLOWERS, MIXED WITH LOW SHRUBS



TYPICAL RUNWAY AREA

FIGURE 12. TYPICAL VIEWS OF THE GROUND COVER ON THE AOA

Areas within the AOA and adjacent to the runways and taxiways were mowed seasonally to control vegetation height and/or density, or remove undesirable plants. Operations staff brush-hogged about 5 acres of sagebrush from the west end of the runway, and between the Terminal and water tank, after the 2014 nesting season was completed. In 2015, the Airport plans to cut 10 acres between the runway and Highway 395 before or after the passerine nesting season.

'Soft' ground cover of bunch grass and wildflowers is maintained so that vegetation is controlled while not causing excessive dust. Periodically, KMMH experiences southerly winds with velocities up to 120 mph that blow significant amounts of sand across the AOA. This causes destructive sandblasting of airplanes and vehicles. To minimize potential erosion, a non-woody, low-growing plant cover in the open areas is cultivated. Maintaining ground cover is challenging because the site is extremely dry grassland, and there are few native or adapted grass species (perennial bunch or sod grasses) that can be used effectively to establish ground cover without also being a wildlife attractant through seed production.

Guidance on mowing heights for airfield areas is directed primarily at grass management, and is presented in the FAA and US Department of Agriculture (USDA) document entitled "Wildlife Hazard Management at Airports: A Manual for Airport Personnel" (Cleary and Dolbeer 2005), and in FAA Certalert No. 98-05 "Grasses Attractive to Hazardous Wildlife" (FAA 1998), which specifies that airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport. This Certalert refers particularly to brown millet, which is not used at KMMH. Wildlife activity on airports varies depending upon the available forage base, which includes seeds, berries, invertebrate and vertebrate species. The shrubs, grasses, and wildflowers produce various forage sources that are recognized as attractants to wildlife. Small grass-nesting birds were prevalent along the northwestern and western sides of the AOA. These birds were observed transitioning through the grass and shrub areas within the AOA. Raptors were frequently observed hunting for small birds and mammals on the AOA. Small rodents and mountain cottontail rabbits were the most common small mammal prey-base species observed on the AOA.

Spotlight surveys. The spotlight surveys regularly identified mule deer, coyotes, rabbits, and owls transitioning onto the AOA, taxiway, and runway median to forage. Medium to large-sized mammal hunting/foraging was the most hazardous wildlife activity observed on the AOA. A few roosting passerines (mostly mountain bluebirds) flushed from the edges of the taxiways as the survey vehicle passed during the spotlight surveys.

Storm water. The Airport lies in a very dry basin where little precipitation is received annually. The soils on the AOA are highly porous and storm water percolates rapidly and does not pond. West of the town hangars, a small ditch line drains excess runoff from the asphalt parking area and around the hangars into the fields to percolate. No wetlands were associated with this ditch line.

Hangars. Several hangars were inspected during monitoring events to identify any nesting areas for wildlife within the structures (Figure 13). Internal portions of the hangars were essentially free from nests or dens. Hangar doors were typically closed except when aircraft were being taken from, or returned to those areas (Figure 14). At the start of the study period, a leased town hangar had a gap in the soffit and starlings nested in the hangar. The Town adopted an ordinance requiring wildlife-accessible breaches to be repaired, and the lessee repaired the damaged soffit, which excluded the starlings from the hangar.



FIGURE 13. TYPICAL VIEW OF EXECUTIVE HANGARS



FIGURE 14. WELL-MAINTAINED HANGAR

5.2 Wildlife Habitat Off The Airport

U.S. Highway 395, the main route going north-south on the east side of the Sierra Nevada mountains, borders the south side of KMMH. A small, low-density industrial and commercial development and the Convict Lake campground lie on the south side of Highway 395 across from the Airport. The Airport is surrounded by expansive rangeland, and overall development will likely remain unchanged given the U. S. Forest Service development guidelines for this Ranger District. Doe Ridge, a low hill northeast of the Airport, shelters a local mule deer herd (Figure 15).



FIGURE 15. MULE DEER BROWSING ON DOE RIDGE NORTHEAST OF KMMH

Water features within 2 to 3 miles of the Airport may serve as wildlife attractants (Figure 16). Convict Lake lies two miles south of the Airport, however, very few waterfowl were observed there during the assessment. On the north side of the highway, Hot Creek borders the northwest side of the Airport, and flows northeast into the Owens Valley (Figure 17). Northeast of the Airport, the Alkali Lakes complex lies along the migration route for many of the waterfowl migrating on the Pacific Flyway. This area attracted hundreds of mixed waterfowl where they staged during migration (Figure 18). Most birds were migratory, and few pairs of ducks or shorebirds nested around the lakes.

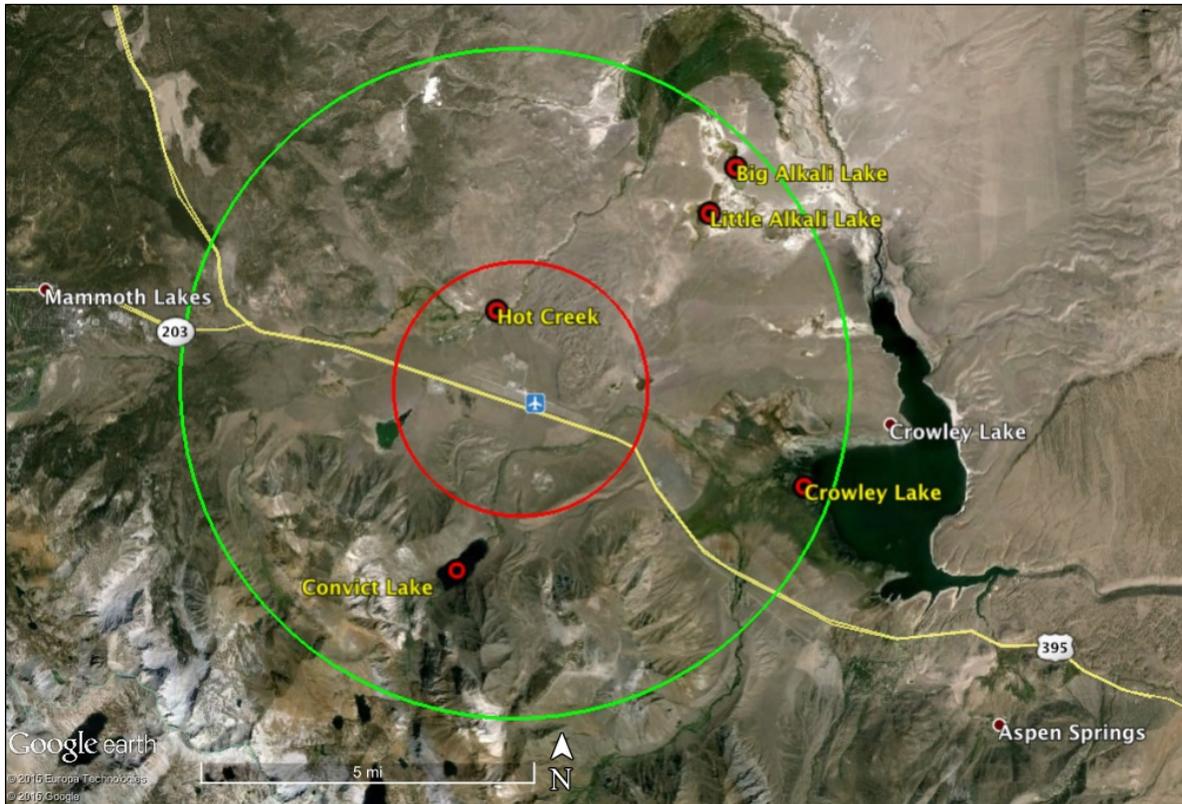


FIGURE 16. WATER BODIES IN THE 2-MILE AND 5-MILE SEPARATION DISTANCES OF KMMH



FIGURE 17. HOT CREEK FLOODPLAIN



FIGURE 18. MIGRATORY BIRDS AT ALKALI LAKES

5.3 Wildlife Species Listed/Observed During the Assessment – Birds

A total of 82 avian species were observed inside and outside KMMH during the 12-month wildlife assessment period (Table 2). The Avian Abundance Wildlife Table shows the number of avian wildlife abundance observations and the average size of each species in relation to the typical categories of small, medium, and large birds.

Title 40, Code of Federal Regulations, Part 33.76 classifies birds according to weight:

- Small birds weigh less than 3 ounces (oz.).
- Medium birds weigh more than 3 ounces and less than 2.5 pounds (lbs.).
- Large birds weigh greater than 2.5 lbs.

TABLE 2. AVIAN WILDLIFE ABUNDANCE TABLE

Species	Scientific Name	Abundance	Average size (S, M, L)
American avocet	<i>Recurvirostra americana</i>	147	M
American coot	<i>Fulica americana</i>	7680	M
American kestrel	<i>Falco sparverius</i>	17	M
American robin	<i>Turdus migratorius</i>	10	S
American white pelican	<i>Pelecanus erythrorhynchos</i>	30	L
American wigeon	<i>Anas americana</i>	22	M
ash-throated flycatcher	<i>Myiarchus cinerascens</i>	1	S
bald eagle	<i>Haliaeetus leucocephalus</i>	4	L
barn swallow	<i>Hirundo rustica</i>	1	S
Bewick's wren	<i>Thryomanes bewickii</i>	1	S
black-billed magpie	<i>Pica pica hudsonica</i>	93	S
black-necked_stilt	<i>Himantopus mexicanus</i>	1	M
blue-winged teal	<i>Anas discors</i>	100	M
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	377	S
bufflehead duck	<i>Bucephala albeola</i>	135	M
cackling goose	<i>Branta hutchinsii</i>	200	M
California gull	<i>Larus californicus</i>	6439	M
Canada goose	<i>Branta canadensis</i>	160	M
canvasback duck	<i>Athya valisneria</i>	32	M
cave swallow	<i>Petrochelidon fulva</i>	46	S
cinnamon teal	<i>Anas cyanoptera</i>	9	M
cliff swallow	<i>Petrochelidon pyrrhonota</i>	449	S
common goldeneye	<i>Bucephala clangula</i>	4	M
common merganser	<i>Mergus merganser</i>	3	M
common raven	<i>Corvus corax</i>	1152	M
dark-eyed junco (Oregon)	<i>Junco hyemalis</i>	33	S
double-crested cormorant	<i>Phalacrocorax auritus</i>	50	M
eared grebe	<i>Podiceps nigricollis</i>	328	S
gadwall duck	<i>Anas strepera</i>	22	M
golden eagle	<i>Aquila chrysaetos</i>	1	L
great blue heron	<i>Ardea herodias</i>	7	L
great egret	<i>Ardea alba</i>	3	L
great-tailed grackle	<i>Quiscalus mexicanus</i>	14	S
green-tailed towhee	<i>Pipilo chlorurus</i>	1	S
hairy woodpecker	<i>Picoides villosus</i>	1	S
horned grebe	<i>Podiceps auritus</i>	50	M
horned lark	<i>Eremophila alpestris</i>	677	S
house finch	<i>Carpodacus mexicanus</i>	206	S
house sparrow	<i>Passer domesticus</i>	6	S
least grebe	<i>Tachybaptus dominicus</i>	6	S
lesser scaup	<i>Athya affinis</i>	13	S
loggerhead shrike	<i>Lanius ludovicianus</i>	137	S
mallard duck	<i>Anas platyrhynchos</i>	1181	M
merlin	<i>Falco columbarius</i>	2	M
mountain bluebird	<i>Sialia currucoides</i>	26	S
mourning dove	<i>Zenaida macroura</i>	7	S
northern flicker	<i>Colaptes auratus</i>	2	S
northern harrier	<i>Circus cyaneus</i>	5	M
northern pintail	<i>Anas acuta</i>	24	M
northern shoveler	<i>Anas clypeata</i>	204	M
pied-billed grebe	<i>Podilymbus podiceps</i>	57	S
purple martin	<i>Progne subis</i>	50	S

Species	Scientific Name	Abundance	Average size (S, M, L)
red-shouldered hawk	<i>Buteo lineatus</i>	1	M
red-tailed hawk	<i>Buteo jamaicensis</i>	16	M
red-winged blackbird	<i>Agelaius phoeniceus</i>	50	S
redbreasted merganser	<i>Mergus serrator</i>	1	M
redhead duck	<i>Athya americana</i>	31	M
ring-billed gull	<i>Larus delawarensis</i>	508	M
ruddy duck	<i>Oxyura jamaicensis</i>	1066	M
sage grouse	<i>Centrocercus urophasianus</i>	30	M
sage sparrow	<i>Amphispiza belli</i>	27	S
sage thrasher	<i>Oreoscoptes montanus</i>	22	S
sharp-shinned hawk	<i>Accipiter striatus</i>	1	M
short-eared owl	<i>Asio flammeus</i>	1	M
snowy egret	<i>Egretta thula</i>	1	M
spotted towhee	<i>Pipilo maculatus</i>	1	S
starling	<i>Sturnella neglecta</i>	595	S
tree swallow	<i>Tachycineta bicolor</i>	51	S
tundra swan	<i>Cygnus columbianus</i>	10	L
turkey vulture	<i>Cathartes aura</i>	75	L
vesper sparrow	<i>Pooecetes gramineus</i>	165	S
violet green swallow	<i>Tachycineta thalassina</i>	15	S
western bluebird	<i>Sialia mexicana</i>	1	S
western grebe	<i>Aechmophorus occidentalis</i>	10	M
western kingbird	<i>Tyrannus verticalis</i>	3	S
western meadowlark	<i>Sturnella neglecta</i>	14	S
western sandpiper	<i>Calidris mauri</i>	10	S
white-crowned sparrow	<i>Zonotrichia leucophrys</i>	29	S
white-faced ibis	<i>Plegadis chihi</i>	55	M
white-throated sparrow	<i>Zonotrichia albicollis</i>	4	S
Wilson's phalarope	<i>Phalaropus tricolor</i>	145	S
yellow-rumped warbler	<i>Dendroica coronata</i>	3	S
Total avian observations		23,167	

Note: The average size designations correlate to the three basic size groups of small, medium, and large-sized birds. The majority of the point counts were related to waterfowl (Canada geese, duck species, California and ring-billed gulls) during the spring and fall. Other large counts were related to seasonal passerine migrations, and resident or nesting icterids, corvids, and passerines. The table does not include reptile or mammal counts.

5.3.1 Guilds

Animals with similar habitat requirements and behaviors can often be managed by similar techniques, which allow grouping them into guilds: “a group of species that exploit the same class of environmental resources in a similar way”. Bird species observed during surveys were grouped into guilds and classified based on observed behaviors for each species during the assessment. The guilds described below generally correspond to traditional taxonomic categories, except where noted otherwise. Habitat use by birds overlaps among guilds.

Doves/Pigeons (Columbids). Mourning doves, Eurasian collared doves, and rock doves (also known as feral pigeons) are common smaller-sized birds, usually well established in urban areas and grasslands where they forage on seeds and insects. They are robust fliers and are often gregarious, grouping together in flocks. A few solitary mourning doves occurred on the Airport.

Ravens, Jays, and Magpies (Corvids). Common ravens, Steller's Jay, and black-billed magpies are medium to large-sized birds inhabiting many cover types and are generally scavengers of natural forage and human garbage and/or predatory on small birds and mammals. Ravens, which regularly exceed 3 lbs. and 26 inches, are the largest species in the family Corvidae. Ravens were common around the Airport, where they roosted on power poles and streamed to and from the Airport from a night roost west of the Airport. Black-billed magpies were common in the rangeland and around the Hot Creek Hatchery north of the Airport, and Steller's jays were ubiquitous in town but not occurring around the Airport.

Blackbirds/Starlings/Grackles (Icterids). Brewer's blackbirds, red-winged blackbirds, and starlings are small to medium-sized birds that are insectivorous and seedeaters or can be attracted to human garbage. They occurred in small groups (1-50 individuals) inside and outside the AOA. The Brewer's blackbirds and red-winged blackbirds nested in the heavy cover of the drainage ditches along Benton Crossing Road and by the Hot Creek Hatchery. A few pairs nested in the cottonwoods and willows of the Terminal parking lot. Starlings were numerous initially, but occurred in reduced numbers after a hangar with a breached soffit was repaired.

Grouse and Quail (Phasianids). Greater sage grouse are insectivorous and granivorous grouse that were observed foraging along Hot Creek Hatchery Road, near the Whitman Hot Springs, on the north side of Airport Road, and about 100 yards east of the approach to Runway 27. None of the smaller quail species were seen during the surveys.

Swallows. Barn, cliff, and tree swallows are small birds that typically form nesting colonies and fly erratically in fast-moving groups foraging on insects. They tend to concentrate foraging where flying insects are attracted to the lights illuminating the park's ball field. Ten pairs of cliff swallows arrived in late spring and nested under the eaves of the utility building at the park. The cliff swallows migrated in late summer, and other migrating swallow species also moved through the area in early fall.

Sparrows/Larks/Flycatchers/Thrushes/Woodpeckers (Passerines). This guild includes sparrows and other sparrow-like or small passerine (perching) birds (western meadowlark, mountain bluebird, flycatchers, sage thrasher, sage sparrow, dark-eyed junco, horned lark, and northern flicker) that are primarily insectivores but also eat worms and invertebrates. Most of these birds are found as single individuals or in pairs, perching on fences, posts or foraging on the ground.

Passerines include several small-sized species that may be semi-solitary or flocking. Sparrows are not usually associated with flocking except during migration periods. Because of their small size, these birds are generally not considered to be a serious hazard to aircraft unless they are moving in large groups/flocks. Although they do not flock traditionally, the birds form small groups that often moved together, and occasionally fly directly over or onto the main runway or taxiways. Sparrows were observed inside the AOA throughout the grass, wildflower, and shrub cover. Meadowlarks, horned larks, and bluebirds are small, sparrow-like birds that generally feed solitarily or in small groups and leave the area in winter. They feed primarily on seeds and small insects in short grasses. Upon being flushed from an area, these birds often initiate a triggering response that alerts other birds to combine in a larger erratically flying group. This reaction can pose a problem if it occurs near the Runway Safety Area (RSA). Included in this group, though not truly passerines, are the tree-climbing birds, e.g. woodpeckers. For the purposes of this assessment, the species in this group are categorized generally as small-sized birds.

Raptors/Vultures. This group comprises eagles, hawks, falcons, owls, and vultures. Raptors range in size from small to large birds and prey on small birds, insects, mammals, reptiles, amphibians, and fish. These birds were most often seen on structures and trees that offer the greatest visibility to the surrounding area. A few Red-tailed hawks, northern harriers, and American kestrels were regularly observed flying over the Airport. Red-tailed hawks perched in the trees on Doe Ridge, on the north side of the AOA and foraged over the AOA; northern harriers flew at very low elevations upwind and/or downwind on the AOA foraging for small rodents; and American kestrels made short foraging sorties across the airfield and perched on the runway and taxiway signage between hovering/foraging flights.

Turkey vultures were seen occasionally soaring on thermals over Highway 395, where they scavenged for road killed animals. Their large size (4+ lbs.) and soaring flight characteristics (high and slow) are recognized as very hazardous to

most aircraft, but they were rarely seen soaring over the Airport. These birds were, however, present in the traffic patterns and thus pose a significant hazard to aircraft.

Shorebirds/Wading Birds. Because the Airport is very dry, shorebirds occurred very rarely near the AOA. A few killdeer, sandpipers that are common on many airports, nested in the moist field east of the RSA near Benton Crossing Road. They are usually solitary or in small groups and forage in moist soil, feeding on invertebrates in wet ground ponds and low areas that collect rainwater or irrigation water. Numerous large and small species of shorebirds were seen at the Alkali Lake complex, but did not transition to the Airport.

Geese and Ducks (Waterfowl)/Gulls (Larids) - Canada geese, cackling geese, mallards, American coots, other ducks, California and ring-billed gulls (family Laridae) are medium to large birds that feed on aquatic vegetation, insects, amphibians, fish, and other aquatic organisms. Canada and cackling geese are migratory in spring and fall, and several large flocks migrated through the flyway. They fly regularly in formations, generally in pairs or medium to large flocks. One group of eight Canada geese was seen circling over the Airport from the east at an elevation of 200 feet AGL (above ground level). These large birds may present hazards to aircraft in the vicinity of KMMH. They may also fly at extremely high altitudes during migrations, and pilots should use caution when flying near these large birds. Groups of mallards and other ducks (10-500 birds) were observed aggregated at the Alkali Lake complex. Mallards and most ducks fly at speeds between 40 to 60 mph. They usually migrate between altitudes of 200 to 4,000 feet, but are capable of flying much higher. Ring-billed gulls and California gulls regularly roosted at the Alkali Lake complex and Crowley Lake, and foraged at the Benton Crossing Landfill. Small groups of gulls were seen flying occasionally over the Airport.

5.4 Wildlife Species Common to the Mono County Region – Mammals

A total of 11 mammal species were observed, or their presence was identified through tracks, scat, dens or burrows, trapping events, or identification of remains during the 12-month assessment period (Table 3). Mule deer were very common and presented a hazardous condition almost daily. Coyotes were the most frequently occurring predator and were seen regularly on the AOA. Several small mammal species (rabbits, mice, chipmunks, and ground squirrels) that are prey-base species for coyotes and various raptors were common in the vicinity of the AOA. A small, unidentified bat was observed foraging in the illumination of the lights at the terminal. This could have been one of several species of bats that occur regionally; they are a nighttime hazard to aircraft safety and are similar to swallows with erratic flight tendencies.

TABLE 3. MAMMALS OBSERVED DURING MAMMOTH YOSEMITE AIRPORT WILDLIFE HAZARD ASSESSMENT

Common Name	Scientific Name	Occurrence	Abundance
bat species	<i>Chiroptera</i> spp.	Migrant, Summer	Moderate
black bear	<i>Ursus americanus</i>	Resident	Low
black-tailed hare	<i>Lepus californicus</i>	Resident	Moderate
Belding’s ground squirrel	<i>Urocyon beldingi</i>	Resident	Moderate
coyote	<i>Canis latrans</i>	Resident	Moderate
deer mouse	<i>Peromyscus maniculatus</i>	Resident	Common
mule deer	<i>Odocoileus hemionus</i>	Resident	Moderate
long-tailed weasel	<i>Mustela frenata</i>	Resident	Moderate
Panamint chipmunk	<i>Tamias panamintinus</i>	Resident	Common
mountain (Nuttall’s) cottontail	<i>Sylvilagus nuttallii</i>	Resident	Common
wood rat	<i>Neotoma cinerea</i>	Resident	Moderate

NOTE: A road-killed black bear was seen on Highway 395, and black bears were seen regularly in the mountains around the town, but none were seen on the Airport property or AOA.

5.5 Wildlife Species Common to Mono County – Herpetofauna

The California Natural Diversity Data Base lists eight species of reptiles and amphibians common to Mono County, and possibly occurring in the area around the Airport (Table 4). These species were not confirmed during the assessment period but, where present, may be a forage source for raptors, corvids, and other birds.

TABLE 4. CALIFORNIA NATURAL DIVERSITY DATA BASE, MONO COUNTY, REPTILES AND AMPHIBIANS

Common Name	Scientific Name	Federal Status	State Status	CDFW Status
California tiger salamander	<i>Ambystoma californiense</i>	Threatened	Threatened	SSC
Yosemite toad	<i>Anaxyrus canorus</i>	Threatened	None	SSC
Mount Lyell salamander	<i>Hydromantes platycephalus</i>	None	None	SSC
northern leopard frog	<i>Lithobates pipiens</i>	None	None	SSC
foothill yellow-legged frog	<i>Rana boylei</i>	None	None	SSC
Sierra Nevada yellow-legged frog	<i>Rana sierrae</i>	Endangered	Threatened	SSC
western spadefoot	<i>Spea hammondi</i>	None	None	SSC
Panamint alligator lizard	<i>Elgaria panamintina</i>	None	None	SSC

5.6 Plant Species Common to Mono County

The California Natural Diversity Data Base includes an inventory of plants present in Mono County, and many species, where present, may provide a forage source for birds or mammals. One plant species, Fish Slough milk-vetch (*Astragalus lentiginosus* var. *piscinensis*), is listed as federally threatened in Mono County (US Fish and Wildlife Service 1998). Based on the mapped occurrence of the plant, it occurs to the southeast of the Airport near Crowley Lake and is not a management concern for the Airport.

5.7 Daytime Wildlife Observations

Daytime (morning and mid-day), evening, and night monitoring was included as part of the overall assessment at observation points on the Airport and at offsite locations. Approximately 75 percent of the total counts occurred during the day, and 25 percent of the total counts occurred during evening and night time monitoring (Figure 19).

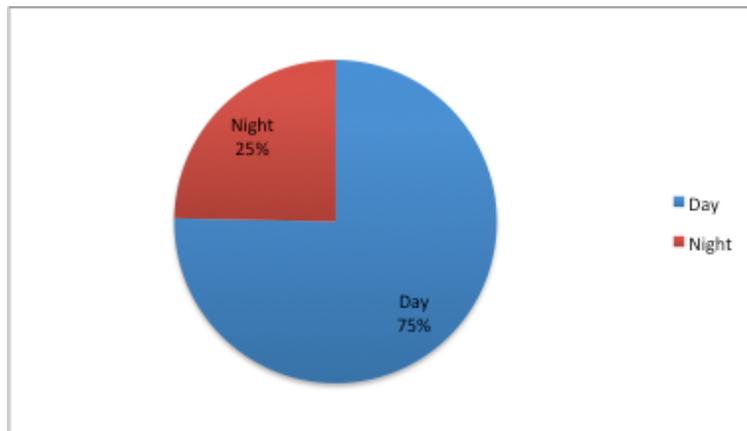


FIGURE 19. PERCENT WILDLIFE OBSERVATIONS IN DAYTIME AND NIGHTTIME

Daytime wildlife observations were conducted during dawn, midday, and late afternoon periods. Daytime surveys included visual observations and the use of wildlife cameras capable of capturing digital images of wildlife activity during the day. Wildlife activity levels were highest from early morning until midday. Activity was usually low during midday then increased near sunset, except when harsh weather conditions caused activity levels to decrease.

5.8 Night Wildlife Observations

Night wildlife observations, which included visual observations, night spotlight surveys that were randomly used throughout the study, and infrared wildlife cameras capable of capturing digital images of wildlife activity at night, were conducted after sunset and in the late evening or pre-dawn periods. Mule deer (Figure 20), coyotes (Figure 21), a short-eared owl, and other species were photographed by the deployed wildlife cameras.



FIGURE 20. MULE DEER ON THE AOA



FIGURE 21. COYOTE HUNTING ON THE AOA

5.9 Wildlife of Most Hazardous Concern to Airport Operations at KMMH

The FAA developed a database of hazardous wildlife strikes and the relationship to a prioritized risk assessment with respect to aircraft safety. The FAA's risk-based analysis evaluated all reported wildlife strikes to civil aircraft in the United States from 1990 through 2013. From this analysis, the mean hazard level and hazard level rankings of the 30 species of birds most frequently struck by civil aircraft from 1990 through 2013, and for 2013 only, were established (Table 5). Note the footnote on the table that indicates more birds of each species were struck, because only 38% of strikes were reported to species between 1990-2013 and, despite improved reporting, only 60% of strikes were reported to species in 2013.

The Wildlife Hazard Assessment field observations showed that mule deer and coyotes, both hazardous large mammals, were the most frequent intruders on the AOA. Of the avian species observed, large (turkey vulture, golden eagle), medium-sized (red-tailed hawk, common raven), and smaller (American kestrel, mountain bluebird, Brewer's blackbird, red-winged blackbird, starling, horned lark, and various sparrows) birds in the various avian guilds occurred most frequently and potentially could cause hazardous and damaging conflicts with aircraft at the Airport.

From the data in Table 5 (2013 only), the 10 avian species with the highest strike risk observed at KMMH were, in descending order: mourning dove; horned lark; American kestrel; European starling; red-tailed hawk; American robin; western meadowlark; turkey vulture, short-eared owl; and red-winged blackbird. Based on the total number of observations of each of these species, the cumulative total of 1,462 observations equates to 6.3% of the total observations of all recorded avian species during the assessment period.

TABLE 5. TOP 30 AVIAN WILDLIFE SPECIES STRUCK BY AIRCRAFT

Wildlife Strikes to Civil Aircraft in the United States, 1990–2013

The 30 species of birds identified most frequently as struck by civil aircraft in USA, 1990-2013 and 2013 only. See Figure 13 for relation between mean body mass and percent of strikes causing damage.

Rank	Bird species	Strikes (1990-2013) ¹		Strikes (2013 only) ¹		
		Num-ber	% causing damage	Bird species	Num-ber	% causing damage
1	Mourning dove	6,124	3	Mourning dove	752	1
2	American kestrel	3,593	1	Barn swallow	504	<1
3	Killdeer	3,369	1	Horned lark	479	<1
4	European starling	3,348	3	Killdeer	442	<1
5	Barn swallow	2,863	<1	American kestrel	352	0
6	Horned lark	2,669	1	European starling	281	2
7	Rock pigeon	2,514	9	Eastern meadowlark	228	1
8	Red-tailed hawk	1,874	15	Red-tailed hawk	215	15
9	Canada goose	1,470	50	Rock pigeon	179	4
10	Ring-billed gull	1,296	8	Cliff swallow	165	0
11	Eastern meadowlark	1,182	1	American robin	107	7
12	Herring gull	1,065	10	Ring-billed gull	101	8
13	Barn owl	959	4	Western meadowlark	91	0
14	Cliff swallow	941	<1	Common nighthawk	84	0
15	Pacific golden-plover	805	1	Savannah sparrow	76	1
16	W. meadowlark	778	1	Barn owl	72	1
17	Mallard	749	23	Canada goose	68	44
18	American robin	689	7	Herring gull	67	10
19	Turkey vulture	537	52	Tree swallow	62	2
20	Tree swallow	474	<1	Chimney swift	62	0
21	Short-eared owl	408	2	Mallard	59	20
22	Common nighthawk	404	1	Pacific golden-plover	52	4
23	American crow	395	8	Turkey vulture	49	55
24	Laughing gull	364	5	Short-eared owl	49	0
25	Chimney swift	328	2	Bank swallow	44	0
26	Great blue heron	326	21	Red-winged blackbird	43	0
27	Savannah sparrow	314	1	Snowy owl	38	11
28	Cattle egret	290	9	Yellow-rumped warbler	35	0
29	Zebra dove	274	1	Snow bunting	34	3
30	Bank swallow	271	1	Western kingbird	31	6

¹ Actual number struck was higher for each species because only 38% and 60% of the bird strike reports from 1990-2013 and in 2013, respectively, identified the bird to species.

Very few columbids were present on the AOA. Corvids (common ravens) were present all year and scavenged the Airport for food. Icterids and starlings nested in spring and had a migratory passage in September. Peak passerine migrations occurred in March-April and September, and some nested during spring and summer. Phasianids (grouse) did not occur on the AOA. Raptors (red-tailed hawks and kestrels) and turkey vultures foraged regularly. Shorebirds were absent from the AOA. Swallows did not nest on site. Waterfowl (a small flock of Canada geese) circled the Airport in transition to the Alkali Lakes complex. The chart below shows avian population activity levels for observation points inside the AOA over the 12-month assessment period (Figure 22).

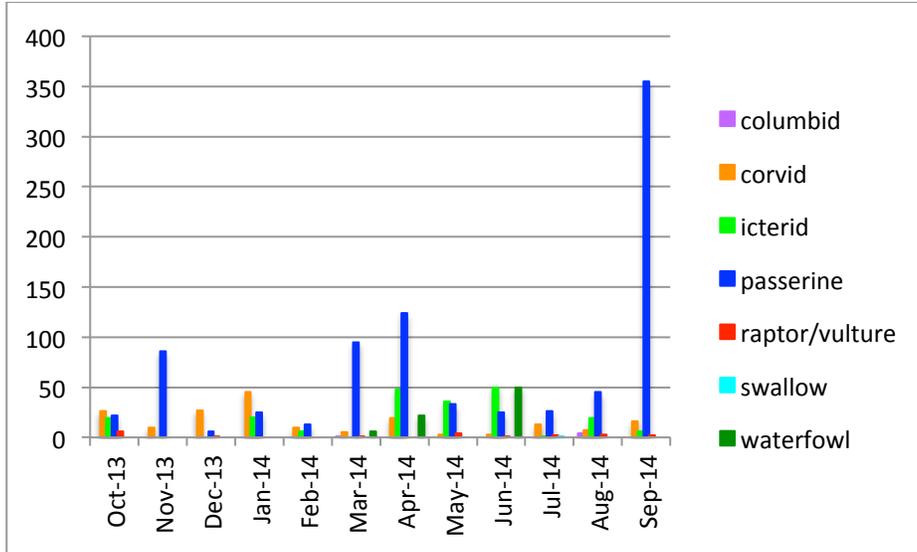


FIGURE 22. MONTHLY AVIAN WILDLIFE OBSERVATIONS INSIDE THE AOA

Avian activity observations outside the AOA were dominated by waterfowl and swallow migrations (Figure 23). Notably, Canada and cackling geese, California and ring-billed gulls, and groups of migrating American white pelicans and several tundra swans, all of which are large, hazardous waterfowl species, were seen on the Alkali Lakes complex during migration. Ducks (many species) were numerous in migration. Corvids (common ravens and black-billed magpies) were numerous around the Hot Creek Hatchery. Common ravens maintained a night roost just west of the Airport. Icterids and starlings were active during spring, summer, and early fall, particularly around the hatchery. Raptors were observed rarely. The few shorebirds (avocets and sandpipers) were concentrated along the shoreline at the Alkali Lakes complex. Swallows nested at the Animal Services/park center and foraged over the Alkali Lakes area.

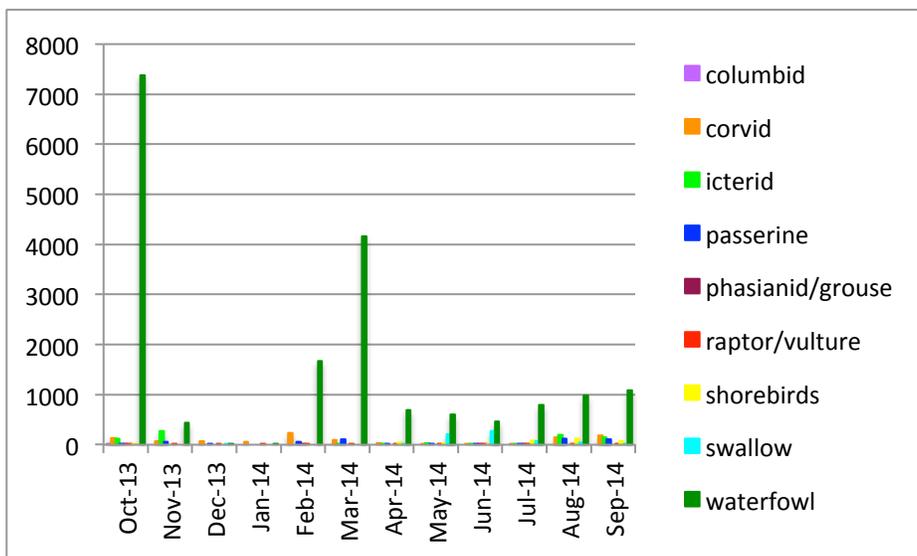


FIGURE 23. MONTHLY AVIAN WILDLIFE OBSERVATIONS OUTSIDE THE AOA

The relationship between wildlife size and loss records of civilian aircraft as a result of a wildlife strike relative to aircraft mass where the aircraft was damaged beyond repair or destroyed as reported in the FAA database from 1990 through 2013 is shown in Table 5. With respect to damaging strikes on civilian aircraft, mule deer ranked first, Canada geese were fifth, turkey vultures were sixth, followed by eagles, hawks, rabbits, coyotes, red-tailed hawks and other species seen at KMMH, or were reported nationally. Each of the above species was observed and reported on or

around KMMH during the assessment. Mule deer were the most hazardous wildlife species on or around KMMH at any time during the assessment period and, because of animal size, they can cause significant aircraft losses.

TABLE 5. RANKING OF THE TOP 28 OF 77 AVIAN AND MAMMAL WILDLIFE SPECIES STRUCK BY AIRCRAFT

Ranking of 77 bird and mammal species or groups (1 = most hazardous) as to relative hazard to aircraft in airport environments (i.e., ≤500 ft [152 m] above ground level), based on a composite rank. The composite rank reflects 3 variables: the percentage of total strikes (for that species–group) that caused any level of damage to the aircraft, the percentage of total strikes that caused substantial damage to the aircraft, and the percentage of total strikes that caused an effect on flight (EOF). Strike data are from the Federal Aviation Administration National Wildlife Strike Database, for strikes that occurred in the United States from 1990 to 2009¹.

Species ²	Total strikes reported	% with damage	% with substantial damage	% with EOF	Damage rank	Substantial damage rank	EOF rank	Composite rank	Relative hazard score
Mule deer (<i>Odocoileus hemionus</i>)	47	96	38	83	1	1	1	1	100
White-tailed deer (<i>Odocoileus virginianus</i>)	814	87	36	68	2	2	3	2	88
Domestic dog	21	53	26	75	4	4	2	3	71
Other geese	20	68	32	32	3	3	8	4	61
Canada goose (<i>Branta canadensis</i>)	776	51	16	34	7	9	7	5	46
Turkey vulture (<i>Cathartes aura</i>)	159	46	16	34	10	7	6	5	44
Other ducks	77	49	24	30	8	5	11	7	48
Great horned owl (<i>Bubo virginianus</i>)	29	52	16	27	6	8	17	8	44
Double-crested cormorant (<i>Phalacrocorax auritus</i>)	24	52	13	29	5	13	13	8	43
Brown pelican (<i>Pelecanus occidentalis</i>)	31	35	13	38	14	14	5	10	40
Wild turkey (<i>Meleagris gallopavo</i>)	38	37	6	43	13	28	4	11	40
Sandhill crane (<i>Grus canadensis</i>)	66	43	10	28	11	19	15	11	37
Glaucous-winged gull (<i>Larus glaucescens</i>)	27	48	9	28	9	21	16	13	39
Bald eagle (<i>Haliaeetus leucocephalus</i>)	74	40	7	30	12	25	10	14	36
Great black-backed gull (<i>Larus marinus</i>)	20	26	21	22	18	6	23	14	32
Osprey (<i>Pandion haliaetus</i>)	77	32	12	26	16	15	19	16	32
Great blue heron (<i>Ardea herodias</i>)	132	32	8	28	15	23	14	17	31
Ring-necked pheasant (<i>Phasianus colchicus</i>)	45	26	14	22	20	10	26	18	29
Herring gull (<i>Larus argentatus</i>)	291	25	13	24	23	12	21	18	29
Snowy owl (<i>Bubo scandiacus</i>)	28	23	12	26	24	17	20	20	28
Mallard (<i>Anas platyrhynchos</i>)	221	31	11	21	17	18	28	21	29
Great egret (<i>Ardea alba</i>)	24	26	4	29	21	32	12	22	28
Red-tailed hawk (<i>Buteo jamaicensis</i>)	534	26	8	21	19	24	27	23	25
California gull (<i>Larus californicus</i>)	23	14	14	20	33	11	30	24	22
Cattle egret (<i>Bubulcus ibis</i>)	112	17	6	27	32	27	18	25	23
Ring-billed gull (<i>Larus delawarensis</i>)	362	21	8	20	26	22	33	26	23
Franklin's gull (<i>Larus pipixcan</i>)	26	9	9	23	41	20	22	27	19
Raccoon (<i>Procyon lotor</i>)	23	18	12	14	28	16	40	28	20
Species ²	Total strikes reported	% with damage	% with substantial damage	% with EOF	Damage rank	Substantial damage rank	EOF rank	Composite rank	Relative hazard score

Note: Table 5 was excerpted from AC 150/5200-38 (Draft document, the watermark could not be removed).

5.10 AOA Observation Points

Avian guilds and mammal counts were analyzed for each of the six primary observation points (OP-1 through OP-6) inside the AOA. Each observation point had slight differences in dominant wildlife activity, although many species were ubiquitous in the AOA.

Observation point OP-1 was located at the terminal and hangars (Figure 24). This area includes the terminal parking lot, the entrance road to the Airport, and the FBO. Starlings, Brewer’s and a few red-winged blackbirds, ravens, and passerines were common.

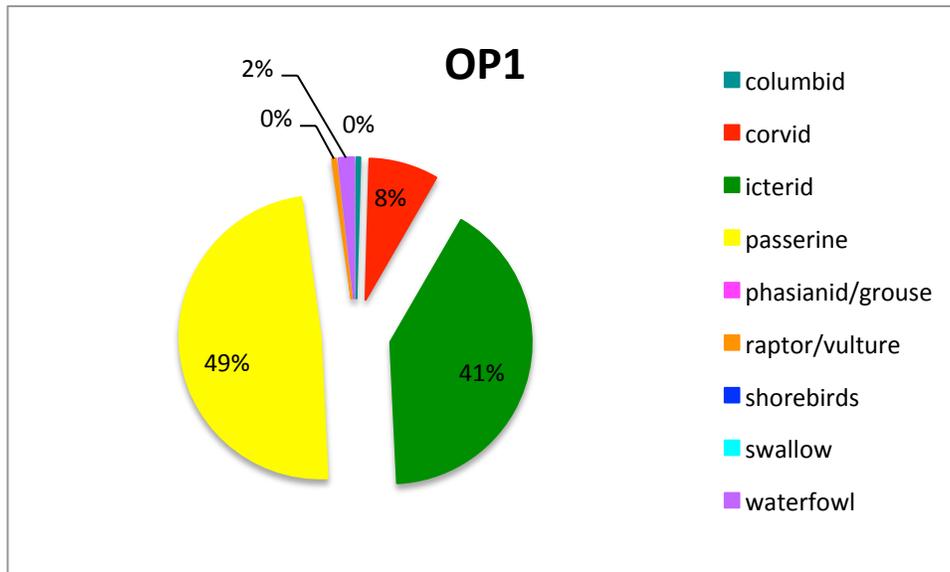


FIGURE 24. OBSERVATION POINT OP-1

Observation point OP-2 was located at the west end of the executive hangars overlooking the west approach (Figures 25). Wildlife observations were primarily mule deer and passerines. Dense sagebrush and rabbitbrush dominate this area of the AOA.

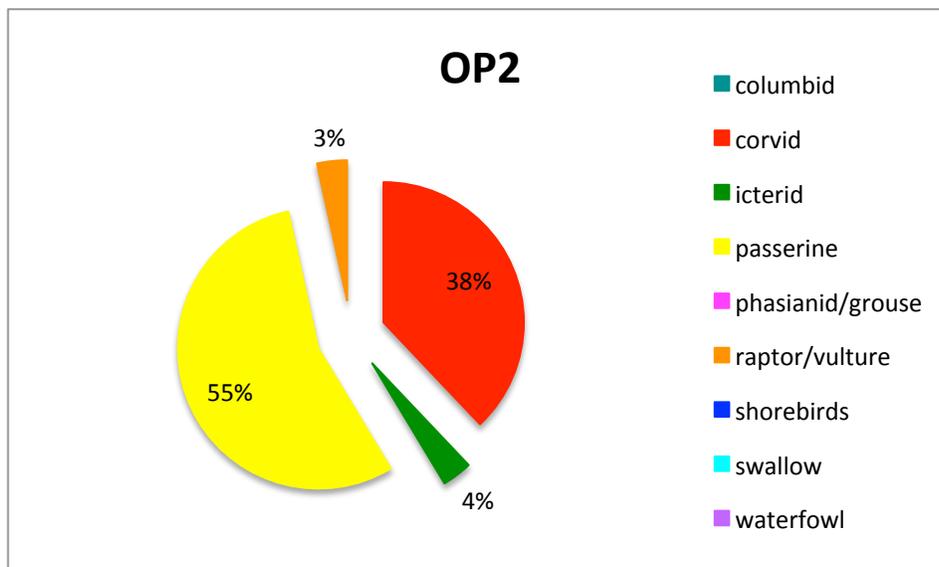


FIGURE 25. OBSERVATION POINT OP-2

Observation point OP-3 was located at the west end of the abandoned runway (Figure 26). The bird guilds were dominated by passerines (sparrows, horned lark, dark-eyed junco, and sage thrashers).

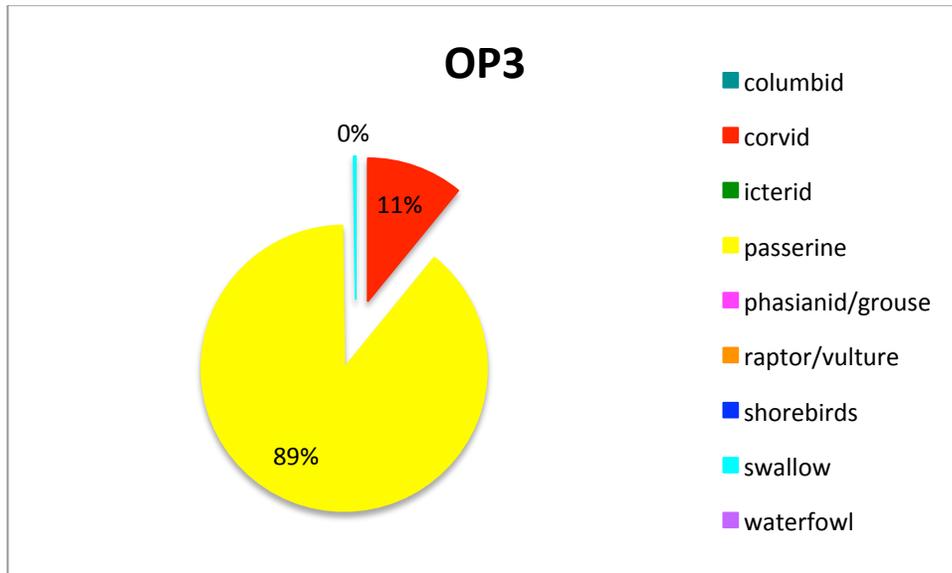


FIGURE 26. OBSERVATION POINT OP-3

Observation point OP-4, at the approach of Runway 9 on the east side of the AOA, had bunch grass, wildflower, and shrub cover. Coyotes hunted through the area, and mule deer regularly transitioned into the AOA from Doe Ridge to browse (Figure 27). Raptors regularly hunted the area.

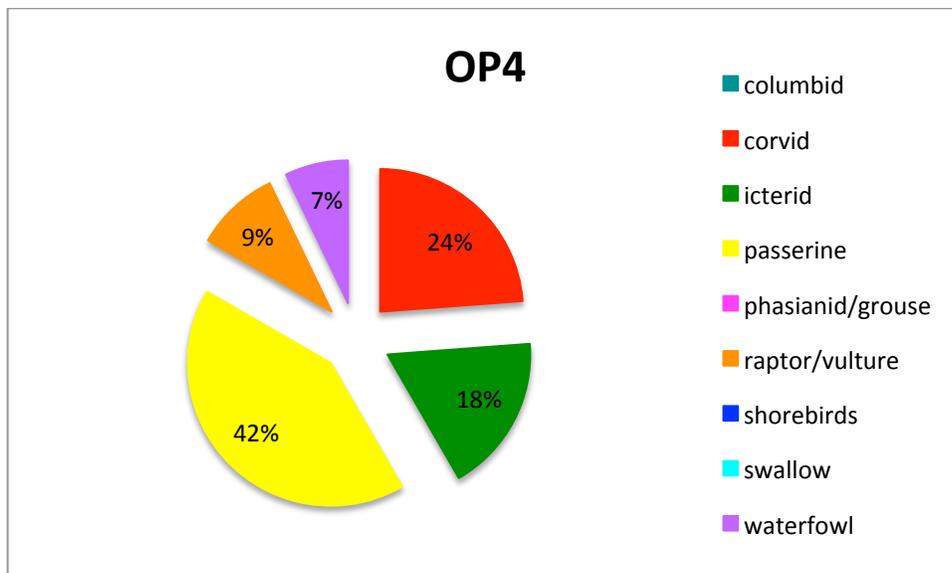


FIGURE 27. OBSERVATION POINT OP-4

Observation point OP-5 was located at the mid-point of Runway 9 adjacent to the hangars. The ground cover was bunch grass and wildflowers. Sagebrush grew outside the AOA fence. A few sparrows and juncos foraged in the low cover. American kestrels and red-tailed hawks hunted the area. Mule deer and coyotes frequently transitioned into the AOA from the surrounding range (Figure 28).

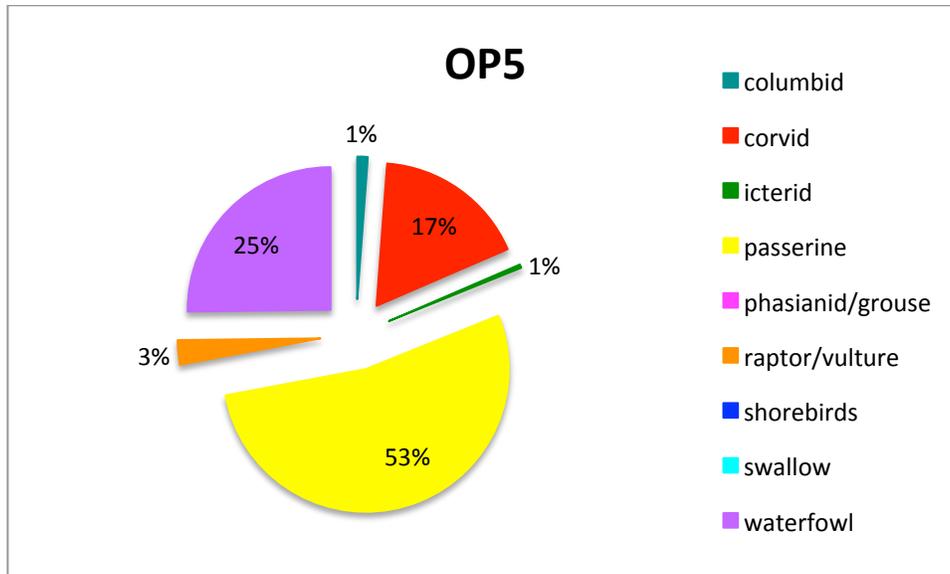


FIGURE 28. OBSERVATION POINT OP-5

5.11 Description of Wildlife Hazards Inside the AOA

Raptors. Red-tailed hawks, northern harriers, and American kestrels hunted commonly on the AOA (Figure 29). The red-tailed hawks were present in all seasons and but were less active when snow cover was present, because prey was less active and available. Northern harriers were seen occasionally hunting over the low grass on the median. One to two pairs of American kestrels nested locally. Turkey vultures soared through the airspace periodically but were not resident on the airport. A short-eared owl was observed at night.



FIGURE 29. RAPTOR FORAGING AREAS ENCOMPASSED THE AIRPORT

Passerines. Sparrows (vesper, white-crowned, white-throated, etc.), sage thrashers, western meadowlarks, horned larks, and mountain bluebirds were commonly distributed across the AOA and roosted or nested in the shrubs across the AOA (Figure 30). The small passerines generally did not congregate into groups or flocks and were a minimal hazard. Occasional small groups of Brewer's blackbirds (<50 birds) and starlings (20 birds) were present by the hangars, but were never a significant hazard. When flushed by a vehicle or aircraft they flew in small, scattered groups in low, erratic patterns, generally towards the perimeter areas, which could result in an aircraft strike or engine ingestion. They are poorly visible until a vehicle or aircraft is very close to them.



FIGURE 30. SAGE THRASHER NESTING DISPLAY ON SAGE BRUSH

Waterfowl. Waterfowl (ducks, Canada geese, or gulls) rarely flew over the Airport but were drawn instead to the Alkali Lakes complex five miles to the northeast, where large groups of gulls and ducks rested on migration (Figure 31).



FIGURE 31. WATERFOWL AT THE ALKALI LAKES

Mammals. Mule deer and coyotes are the large mammals commonly seen on the Airport. Mule deer were frequently observed on the AOA and Operations staff reported that they regularly intrude from the north and south. Coyotes were actively hunting during all seasons on the AOA. Coyote scat was observed regularly at several locations along

paved areas in the AOA, and their tracks were followed after snowstorms. Coyotes commonly have a relatively high ranking with respect to Effect On Flight (EOF), because pilots often see these animals and may abort landing or take off. When coyotes are struck, they often result in expensive damage to aircraft.

Trapping for large mammals (snares or large live traps) was not conducted because large mammal (mule deer and coyote) ingress/egress to the AOA was obvious. Several other species of mid-sized mammals occur such as mountain cottontails, deer mice, and Panamint chipmunks that are hunted by coyotes. Very few mountain cottontails were observed, perhaps as a result of drought conditions and lack of forage on the Airport.

Small Mammal Trapping Summary

Approximately ten species of “small mammals” (mice, shrews, voles, chipmunks, pocket gophers, etc.) that are important raptor and carnivorous mammal prey items occur in the Owens valley. Small mammals were sampled by trapping (100 trap-nights at five representative locations where small mammals were likely to be attracted to cover or foraging areas) during the summer (June) and fall (September). Trap areas were designated as SMTA1 through SMTA4 (Figure 32).

Eight small mammals, deer mice (*Peromyscus maniculatus*), were caught in the traps (8% catch-per-trap night) combined in both seasons. The catch-per-unit effort by season was 3 mice captured in June, and 5 mice captured in September. Other small mammals were identified but were not trapped during the trapping events.

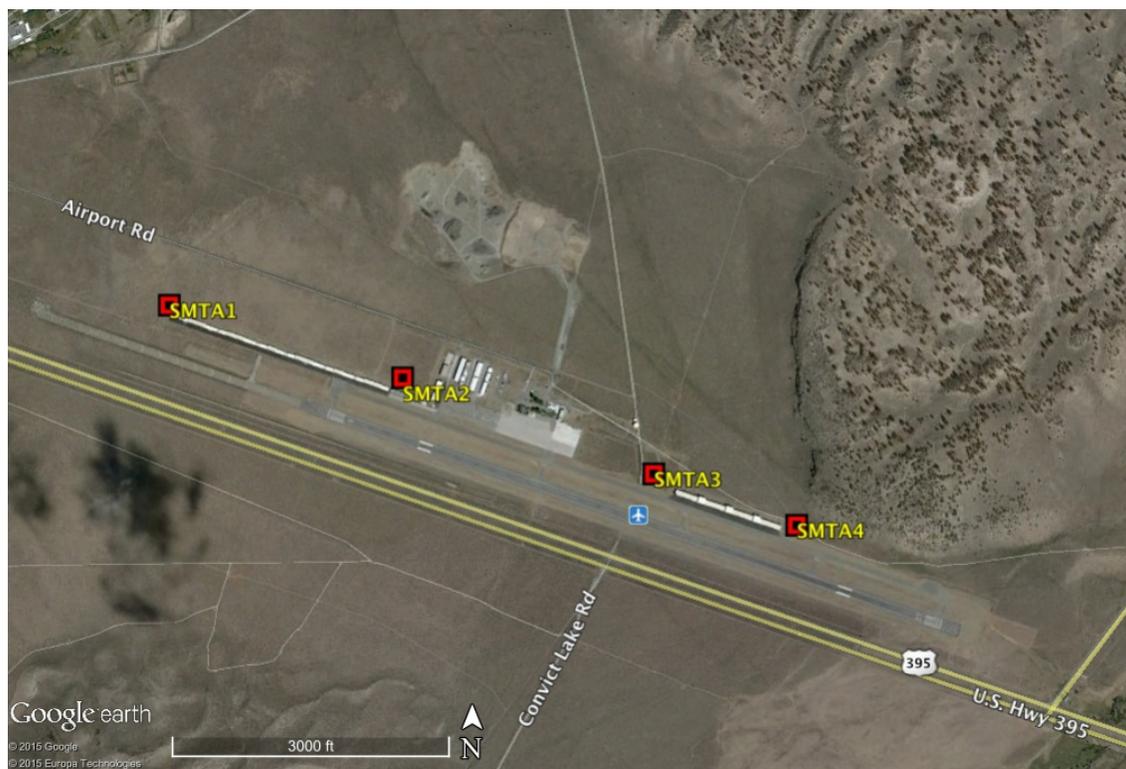


FIGURE 32. SMALL MAMMAL TRAP AREAS ON THE AOA

5.12 External Observation Points

Seasonal wildlife activity varies from year to year and may result in avian and mammalian concentration shifts from outside to inside the AOA. Avian guilds and mammal counts were also analyzed for each of the six observation points (XP-1 through XP-6) outside the AOA. The external observation points were specifically selected as different potential wildlife attractant areas.

Observation point XP-1 was in the Hot Creek floodplain on the south side of the creek, with a panoramic view of the floodplain. The most numerous birds were passerines (white-crowned and song sparrows, dark-eyed juncos), ravens, black-billed magpies, and waterfowl (mallards) in the creek (Figure 33). Mammals observed were mule deer, Panamint chipmunks, mountain cottontails, and black-tailed hares.

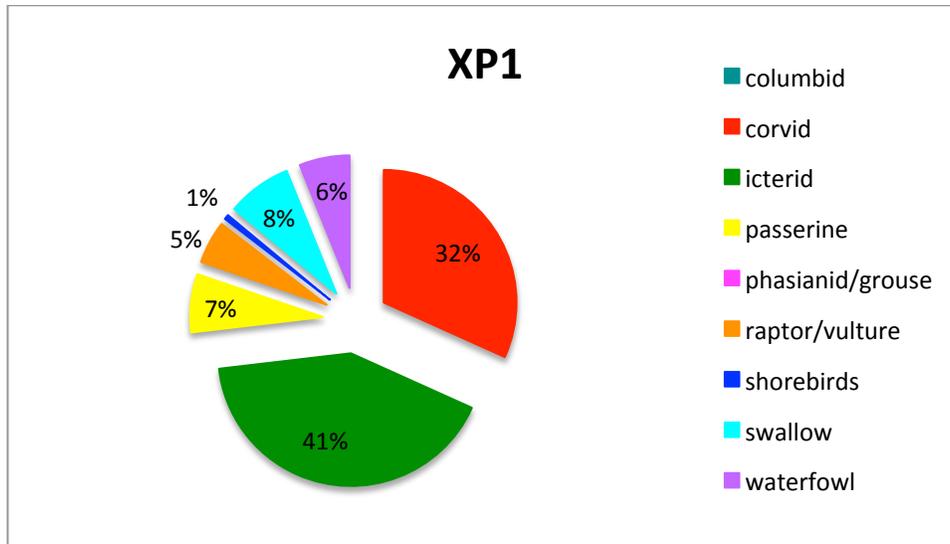


FIGURE 33. OBSERVATION POINT XP-1

Observation point XP-2 was at the intersection of Hot Creek Hatchery Road and Airport Road. Wildlife observations along Airport Road were aggregated to this site. The range was dense sagebrush and scattered bunch grass. The most numerous birds were passerines (white-crowned and song sparrows, horned lark), and ravens. Sage grouse were observed on the north side of Airport Road. Mule deer were numerous (Figure 34).

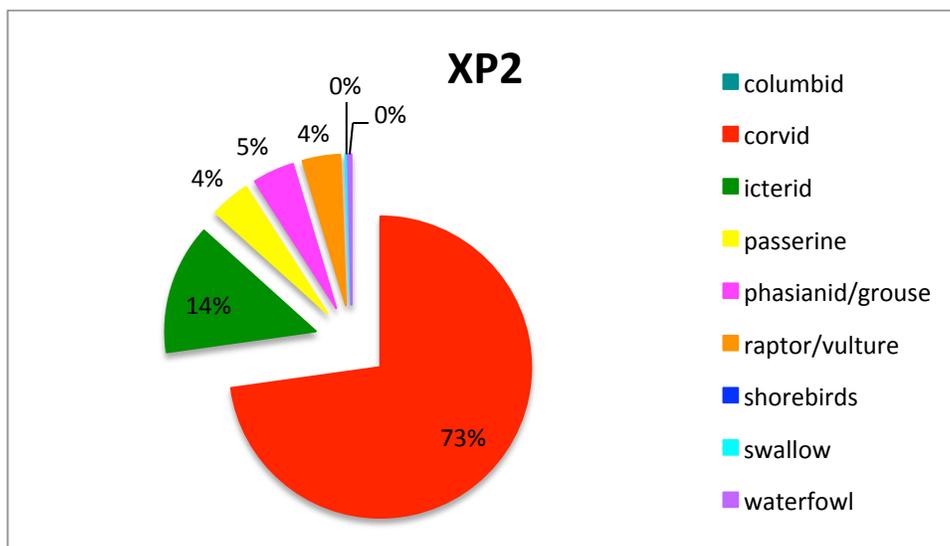


FIGURE 34. OBSERVATION POINT XP-2

Observation point XP-3 was at the intersection of Highway 395 and Benton Crossing Road, adjacent to the Green Church, approximately 1/2 mile east of the approach to Runway 9. This area had moderate disturbance from daily recreational activity and parking at the Green Church. The dominant guilds were passerines (dark-eyed juncos, sparrows), Brewer’s and red-winged blackbirds, and ravens (Figure 35).

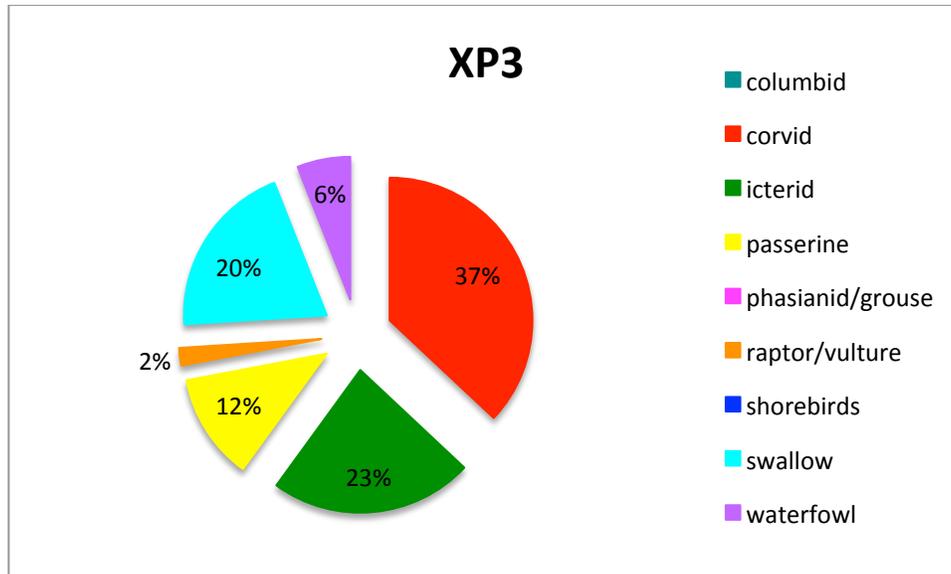


FIGURE 35. OBSERVATION POINT XP-3

Observation point XP-4 was at the dog kennel and park on the west side of Benton Crossing Road, approximately 1 mile north of Highway 395 on the east side of Doe Ridge. Very little wildlife activity occurred here. The dominant guilds were passerines (sparrows, dark-eyed juncos, and ash-throated flycatcher), Brewer’s blackbirds, and cliff swallows that nested on the utility building (Figure 36).

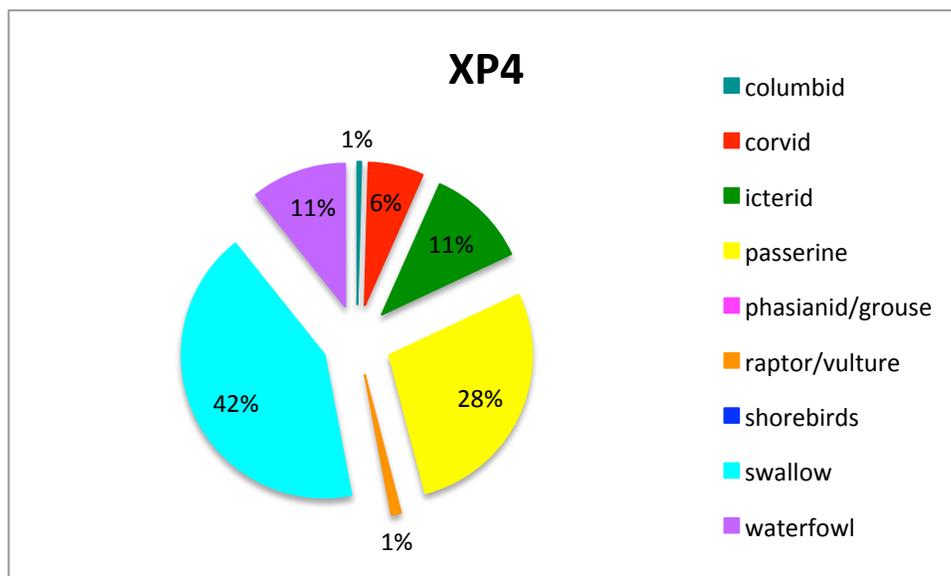


FIGURE 36. OBSERVATION POINT XP-4

Observation point XP-5 was at the Alkali Lakes complex adjacent to the Benton Crossing Landfill, approximately 5 miles northeast of the Airport. These lakes attracted the majority of aquatic birds passing through the Owens valley. Passerines (dark-eyed juncos, and sparrows), and swallows occurred seasonally. On the shoreline and open water waterfowl (Canada geese, American coots, ducks, coots), shorebirds including large herons, egrets, and white-faced

ibis) and larids (ring-billed gulls, California gulls) were numerous. American white pelicans and tundra swan were seen on migration (Figure 37).

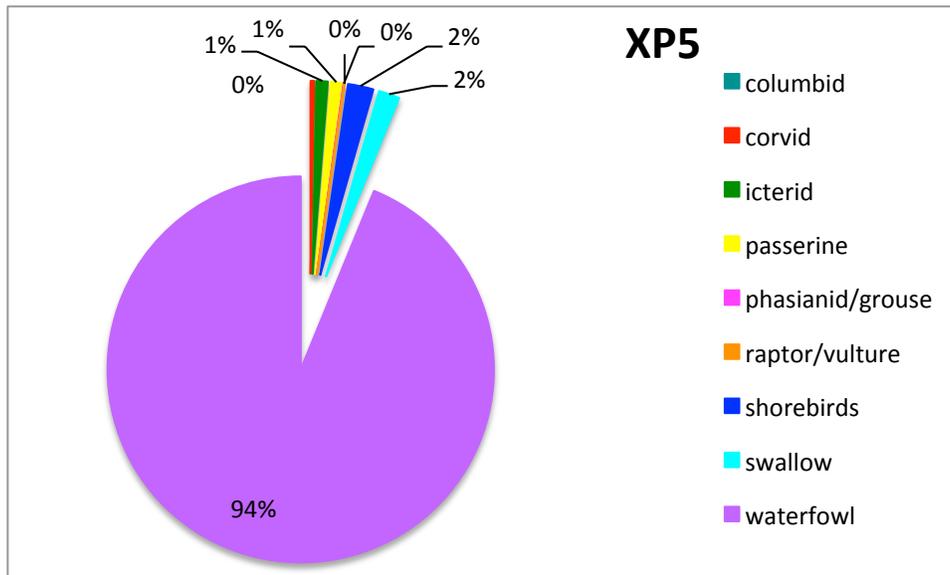


FIGURE 37. OBSERVATION POINT XP-5

Observation point XP-6 was at the mid-field windsock on the south side of the AOA perimeter fence, north of Highway 395. This area had passerines (dark-eyed juncos, sparrows, and sage thrashers), and occasional icterids (Figure 38).

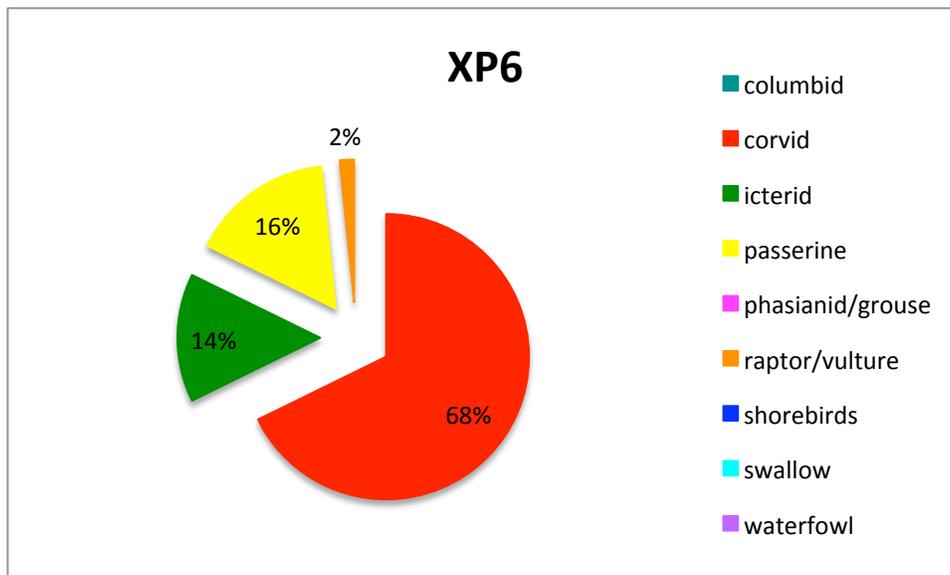


FIGURE 38. OBSERVATION POINT XP-6

5.13 Description of Wildlife Hazards Outside the Airport

Columbids. Very few mourning doves were seen at the dog kennel and park.

Corvids. Large groups of common ravens aggregated around the highway to scavenge for food, and flew west towards the mountains at night going to a night roost. Black-billed magpies were common around the Hot Creek Hatchery.

Icterids. Small groups of starlings, Brewer’s blackbirds, and red-winged blackbirds were common around the Hot Creek Hatchery and Alkali Lakes/landfill areas.

Passerines. Migratory and resident passerines were widely distributed outside the Airport.

Phasianids/Grouse. Sage grouse were seen along Airport Road, northeast of the Airport by the Whitmore Hot Springs, and on Pit Road by the landfill.

Raptors/Vultures. Raptors (primarily red-tailed hawks, northern harriers, and American kestrels) and turkey vultures were present in low numbers hunting over the range and highway. They are potential hazards to aircraft while soaring, hunting, or transitioning and can climb to high altitudes where they are virtually invisible to pilots.

Shorebirds. Small groups and solitary individuals of large and small shorebirds were seen around the Alkali Lakes complex.

Swallows. Cliff swallows were seen in low numbers nesting at the dog kennel/park, and foraging over the Crowley Lake basin; they were a low threat because they were present in such low numbers.

Waterfowl. Canada geese, mallards, and other ducks were present in large numbers during migration. A few American white pelicans and tundra swans were seen at the Alkali Lakes complex as they migrated. Only rarely were geese and gulls observed flying over the Airport.

Mammals. Mule deer and coyotes are free ranging outside the AOA and transition easily onto the AOA to forage. Scattered populations of rabbits, rodents, etc. provide forage for raptors, vultures, and carnivorous mammals.

6 MANAGEMENT RECOMMENDATIONS

Food, water, and cover are basic wildlife attractants. Management of these resources at KMMH can minimize wildlife attraction to the airfield. The WHA provides background information describing the wildlife species that are attracted typically to various areas on and around an airport. The categories discussed in this section describe the basic areas for wildlife management. Although some airports immediately employ lethal control management practices on wildlife, particularly on airport property, depredation should be used only after applying non-lethal management techniques. The FAA recommends a basic hierarchy of wildlife management techniques before resorting to depredation (Figure 39).

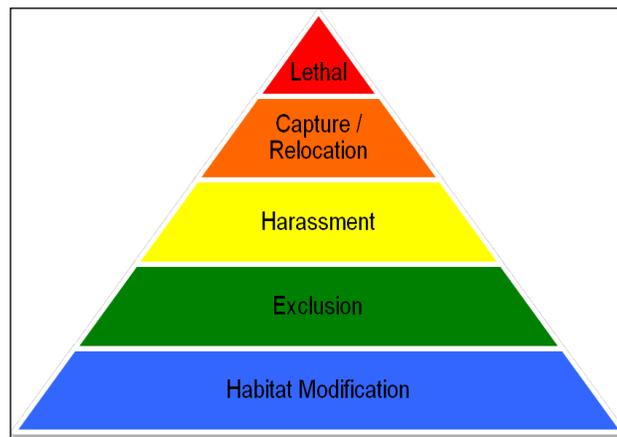


FIGURE 39. HIERARCHY OF WILDLIFE MANAGEMENT TECHNIQUES

6.1 Habitat Modification

Habitat modification generally refers to evaluating and potentially modifying any existing wildlife attractant areas that currently exist on an airport. Fencing is the most frequently used modification followed by vegetation and turf management.

6.1.1 AOA Vegetation

The Airport has heavy shrub cover, except in areas that were brush-hogged in fall 2014. Reducing the height of the sagebrush and other shrubs will reduce mule deer attraction to the AOA to forage, and reduce numbers of small passerines relying on the bushes as holding cover. Shrubs should be removed following FAA guidelines.

6.1.2 Grass/Turf Management

KMMH lies in at foothills elevation where turf grasses are not grown typically. Instead, both native and non-native bunch grasses are used as the ground cover for erosion and dust control on the AOA. Only a small patch of turf grass is planted near the Terminal building entry, and this small area of turf is not a wildlife attractant. The general management concern in managing grass growth on the AOA is that un-mowed grass provides cover for rodents, reptiles, and larger mammals, and serves as a raptor hunting attractant area.

Guidance on mowing heights for airfield areas is in the FAA and US Department of Agriculture (USDA) document entitled, "Wildlife Hazard Management at Airports: A Manual for Airport Personnel (2005)." The FAA recommends maintaining grass heights between 6 to 12 inches; however, grass areas in the AOA may occasionally be lower or higher than the guidance heights due to wet and/or dry season weather patterns that may preclude mowing during certain times of the year. When airports are unable to conduct mowing operations due to variability in seasonal growth conditions, taller grasses are generally considered preferable to shorter grasses.

At KMMH, the ground cover is composed of sparse grass and wildflower species adapted to grow in xeric conditions. The grass species are "bunch grasses" not "turf grasses". Bunch grasses reach their maximum annual height as inflorescence development starts and maintain that height through seed maturation and seed dispersal. Common grasses within the AOA include species planted when the runway was re-paved (various wheatgrasses, fescues, and bromes) with mature heights ranging from 6 to 15 inches. While the mixed bunch grasses and wildflowers attract low numbers of birds (icterids, corvids, doves, larks, and sparrows) for foraging and loafing, to achieve the goal of expanding the percent cover and control dust on the AOA, it is important that these grasses re-seed the "grass" areas annually, so the grass should not be mowed before the mature seeds have dispersed.

Shrubs (sagebrush) should be removed from the AOA because they are a wildlife habitat. The maintenance staff cut about 5 acres of shrubs at the approach of runway 9 in 2014, and has scheduled cutting 10 acres in 2015. Maintaining the shrubs at a low height will reduce wildlife cover and perching sites.

6.2 Exclusion – Fences and Gates

The existing AOA fence is a three or four-strand barbed wire, except where chain-link is installed in a short area by the town lease hangars and FBO (Figure 40 shows representative fence and gate conditions). A deer fence is urgently needed to reduce the continuous mule deer incursions on the AOA. At KMMH, exclusion of smaller mammals is also necessary. Some manual and electric gates may have horizontal or vertical gaps greater than the recommended maximum of four inches (preferred) to six inches (maximum) inches above the paved base surface. While a deterrent perimeter fence must be installed before being concerned about gate breaches, these gaps allow small to medium-sized mobile terrestrial wildlife to enter the AOA. Modifications to gates may require future adjustments, or the addition of vertical pipes between the upright closures. Any gates with gaps larger than the recommended widths should be remediated by re-hanging or adjusting the base closing distance.



TYPICAL AOA CHAIN-LINK ENTRY GATE



ENTRANCE GATE WITH GAP BELOW GATE



TYPICAL BARBED WIRE AOA PERIMETER FENCE



TYPICAL BARBED WIRE AOA PERIMETER FENCE

FIGURE 40. FENCE AND GATE CONDITIONS

The FAA Deer Fencing Cert Alert 04-16 identifies and recommends the ideal installation of a wildlife fence to exclude deer and other large mammals (applicable to coyotes and black bears as well as deer). KMMH proposes to install a black 8-foot chain link fence, as used by the California Department of Transportation, Alturas Municipal Airport, Cedarville Municipal Airport, Lake Tahoe Airport, Georgetown Airport, and Placerville Airport (Figure 41).



FIGURE 41. PROPOSED 8-FOOT CHAIN LINK FENCE TO EXCLUDE DEER FROM AOA

6.3 Trash Management.

Exclusion also requires developing a secure system to minimize other potential forage attractants on airport property. Dumpster and waste container maintenance is crucial in reducing the numbers of scavenger birds and animals that frequent anywhere that food wastes may be disposed. Dumpsters and waste containers should be placed and secured so they are always inaccessible to wildlife.

Terminal Parking Lot Litter. Items such as food wrapper litter and cigarette butts are wildlife attractants for birds and mammals. Littering and disposal of cigarette butts on the ground should be prevented at the Terminal entry, “Hangar” waiting area, and parking lot.

Terminal Litter. The Terminal area was maintained satisfactorily, although airline management staff reported some mice were present in baggage and storage areas. Mice can be excluded through focused control of small trash items and trapping as necessary by the contract pest control firm.

AOA Entry Gate Dumpsters. All trash should be placed in bear/wildlife-proof containers and the dumpster should be locked with a mechanical lock.

6.4 Exclusion – Pesticide/Herbicide Management

Passerines are attracted to forage on the grass and wildflower seeds produced by the plants on the AOA, and they are attracted to the terrestrial insects that live on those grasses, and the invertebrates (worms, larval grubs) that live in the soil. After AOA fence installation, herbicide treatment or mechanical removal of vegetation along AOA fences will help maintenance and operations staff in identifying ingress locations of mobile terrestrial wildlife that provide a prey-base for other wildlife species. Fence maintenance and diligent attention to the eradication of weeds that normally grow and accumulate near fences should aid in controlling wildlife intrusions at the Airport.

6.5 Exclusion – Storm water Drainage and Wetland Features

Most wildlife require water resources for survival. Wildlife are attracted to flowing water or wetland areas. The KMMH AOA does not retain water. There are no storm water ponds or drainage ditches on the AOA.

Should future construction necessitate installation of a retention pond, it should be noted that FAA describes specific conditions in which retention ponds may exist around the Airport. Dry retention areas must be able to fully drain within 48 hours following a rainfall event. These restrictions are described in AC 150/5200-33B.

6.6 Harassment

Successful harassment procedures require persistence and regularity, and include the use of a variety of techniques to modify wildlife behavior. When wildlife individuals experience consistent harassment, they usually will leave the AOA as the continued harassment causes them to exert too much energy for the forage benefit they could possibly gain. Lights, horns, and pyrotechnics are generally useful harassment practices.

Mule deer are the most problematic species at KMMH. In addition to resident deer around the Airport, many deer migrate in spring and fall through the Airport area, so the groupings of individual deer needing behavior-modification changes constantly, and both migratory and resident deer may be nomadic and infrequently exposed to harassment so their behavior could be unpredictable. Typical incursions are in dawn and dusk or nocturnal periods.

Airport Operations staff has been effective hazing deer off the runway with an Operations vehicle before commercial flight arrivals or departures; however, most of the incursions occur at times when staff are not present.

Pyrotechnics are the most effective technique used for hazing and harassment of birds, but birds on the runway is a minor problem at KMMH. The most effective pyrotechnics include the use of 15 mm launchers with screamers and bangers used sequentially and persistently until the wildlife leave the area. Though screamers and bangers are very cost-effective, there are several other pyrotechnics that can also prove successful in keeping wildlife away from active areas on the Airport. Other devices may include mobile Propane Air Cannons that can be remotely fired to keep wildlife away. The use of these devices requires specific training for safe handling and storage. Appendix C lists sources of supply for these devices.

Some bird species are attracted to freshly mowed grasses. Mowing tends to activate insect movement and consequently excites bird foraging in those areas. Should aggregations of birds foraging behind mowers become problematic, and if standard harassment techniques fail to move the birds off the AOA, the next most commonly used tactic is depredation. Depredation should only be used after all other non-lethal techniques have been employed, and only if the activity is problematic to the safe operation to aircraft using the airport.

6.7 Capture and Relocation

Capture through the use of snares, traps, manual collection, and relocation away from the airport is another method for wildlife management. The FAA does not recommend deer relocation, and relocation of other wildlife species is not supported generally by various technical assessments; however, bears and coyotes are sometimes captured and relocated using snares or live traps. Bear were not sighted during the WHA study, and bear incursions were not a problem at KMMH. Coyotes access the AOA randomly, and have been minimally problematic at KMMH. Improving the fencing will likely reduce coyote incursions at KMMH.

Relocation of some species is difficult and may not be allowed by regulatory agencies. The Airport should consult with the local wildlife authorities before attempting any offsite relocations. Non-regulated predator species are generally depredated, as it is typically difficult to find acceptable relocation sites.

6.8 Lethal/Depredation

Lethal or depredation practices are usually considered as a last resort for most native wildlife species. Currently, the Airport does not hold state and federal depredation permits to control hazardous wildlife on the AOA. The Airport should obtain and annually renew a Migratory Bird Treaty Act (MBTA) Depredation Permit from the USFWS and other permits as necessary. Management actions such as migratory bird nest removal may only be allowed under special permit conditions of the MTBA. KMMH should keep an active depredation permit at all times to avoid delays if a “take” action is necessary for migratory birds. The Airport staff has not needed to use lethal control to date and lethal removal of migratory birds should only be used as a last resort to reinforce other non-lethal techniques. The Depredation Permit should be specific as to the problem species that may need to be controlled by lethal methods. Some of these species may include geese and other waterfowl, gulls, crows/ravens, swallows, and blackbirds. At KMMH, ravens were the problematic species.

Several avian species (house sparrows, rock pigeons, and European starlings) not covered under the MBTA often nest in structures around airports and, therefore, their nests can be removed and individuals can be taken without a Depredation Permit.

Lethal control of coyotes may be occasionally necessary. Coyote incursions on the AOA are likely to be reduced significantly as a result of future fence installation, corrective gate adjustments, and the installation of breach blocks along fences where gaps exceed four inches in height or width. Coyotes are a nongame species regulated by the California Department of Fish and Game in California, and the Airport could use lethal control for depredation of coyotes if necessary.

6.9 Communications

Wildlife strike reports should be generated voluntarily and communicated to the Airport Operations staff using FAA form 150/5200-7. Periodic staff interviews are part of the overall communications program for wildlife hazard management. KMMH does not have an ATCT. In the absence of an ATCT, the Airport Operations staff and FBO representatives should regularly alert pilots when wildlife are observed, or are located in potentially hazardous areas with respect to approaching or departing aircraft. FAA Order 7110.65 describes specific requirements for advisories through regularly updated pilot reports (PIREPS), and notices to airmen (NOTAMS). KMMH does not issue automatic terminal information service (ATIS) reports. These above-required advisories should be regularly updated and appropriate alerts should be communicated as necessary.

Communication with tenants is important. Overall, hangar maintenance was found to be very good. Hangars were kept closed routinely, with some of the overhead doors open occasionally during daytime activities.

7 LIMITATIONS

KMMH does not have a permit for “depredation by firearms”. The Airport should apply for and obtain depredation permits approved by state and federal regulatory agencies for use by Airport Operations staff. The staff should use depredation when necessary to manage persistent species (primarily corvids) that may not leave the AOA, and if non-lethal harassment techniques fail to be successful.

After the airfield is secured through perimeter fence replacement, gate adjustment, and shrub removal, the presence of coyotes should be re-assessed. The installation of exclusion fencing and gates may prevent them from coming onto the AOA. If necessary, the Airport should contract with a wildlife trapper licensed to trap coyotes, or train Airport staff on methods to remove them safely.

8 PRIORITIZED RECOMMENDATIONS

This section summarizes the prioritized recommendations and conclusions of the WHA and establishes priorities for implementation. The administrative and operational actions include the following recommendations:

8.1 Airport Wildlife Coordinator

Identify and designate an Airport Wildlife Coordinator (AWC) for KMMH. The AWC is responsible for managing wildlife management activities and assuring that the recommendations of the WHA are implemented, as appropriate. The AWC is responsible for the following activities.

- Conducting or coordinating all wildlife management activities.
- Maintaining personnel training standards and commitment to the wildlife hazard management activities.
- Ensuring that all individuals responsible for wildlife hazard management are properly trained.
- Ensuring that all KMMH personnel, pilots, and lessees are familiar with the requirements and procedure for reporting wildlife strikes.
- Ensuring that all KMMH staff with access to the AOA routinely inspect the AOA for wildlife hazards and report all identified wildlife hazards to the AWC.
- Obtaining appropriate wildlife control permits and supplies, as necessary.
- Continued wildlife monitoring.
- Recording wildlife management activities. Use of a Wildlife Management Database is highly recommended.

8.2 Inform KMMH Users of Potential Hazards

To reduce the potential for a strike, KMMH should implement procedures for communication between the FBO and pilots, in accordance with FAA Order 7110.65. For avian hazards, because there is no ATCT, if Airport Operations, the Fixed-Base Operator (FBO), or pilots see a potential wildlife hazard, such as a large flock of birds entering into the approach, departure, and circling airspace, they should communicate the situation to pilots and alter operations if necessary to avoid potential strikes. To facilitate wildlife hazard communications, KMMH and the FBO should develop a Bird Watch Condition protocol that categorizes bird activity into low, moderate, and severe conditions. Bird Watch Condition codes can be posted in the pilots’ lounge to increase awareness and promote reporting of hazards among aircrews. The categories should be determined based on the risk of bird strike and can be described as follows:

- **LOW** – Normal bird activity on and above the airfield with a low probability of a strike.
- **MODERATE** – Increased bird activity in locations that heighten the potential for strikes. This condition should alert operations staff to consider hazing the problem wildlife. This condition would require heightened awareness by all KMMH staff and aircrews.
- **SEVERE** – High bird activity on or immediately above the active runway or other specific location that represents a high potential for strike. Examples of this would be groups of ravens or Brewer’s blackbirds or other species

foraging on, adjacent to, or over the runways. Supervisors and aircrews must thoroughly consider rescheduling flights until the bird watch condition is decreased.

All KMMH operations and maintenance personnel should be trained to identify the birds, watch conditions, and effectively communicate these conditions between pilots and Fixed-Base Operator (FBO). The training is usually performed by an FAA qualified airport wildlife biologist trainer at the conclusion of the FAA and Airport staff approval of the WHMP. Pilots should be encouraged to submit a PIREP if large flocks of birds or other wildlife hazards have been observed during their approach or departure from KMMH. The PIREP will advise other pilots of potential wildlife hazards in the area.

Avian movements in the AOA were most abundant in the early and mid-morning hours. Activity levels tended to diminish later in midday, and decline in the early evening hours, except for ravens flying to a night roost. Most of these movements were associated with groups of western meadowlarks, mountain bluebirds, common ravens, and horned larks flying across the AOA to access foraging sites. Raptors/vultures (primarily red-tailed hawks) and corvids (common ravens and black-billed magpies) were also common during this period, and all actions should be in place to alert pilots of wildlife activities. Similar precautions should be enacted when waterfowl of any species are observed. The NOTAM system should be used for wildlife warnings. Since pilots are often de-sensitized to common or repeated warnings on the NOTAM system, NOTAM warnings should be regularly updated. While it is recognized that commercial airlines have little flexibility in scheduling to avoid known periods of high bird activity and concentrations, IFTA, general aviation pilots, FBOs, and business traffic may have more flexibility in scheduling flights. Information regarding historical trends in bird activity should be made available to all airport users so they consider the wildlife activity when scheduling flights.

8.3 Community Outreach and Wildlife Hazard Working Group

Periodic inspections with formalized record-keeping will be very important in observing wildlife activities around the Airport, and will continue to be necessary to improve on the management techniques used to control wildlife. Coordination between the Airport, the FBO, commercial carriers, and general aviation pilots should be enhanced.

Dumpsters and trash are well managed at the Airport. Litter occurs usually only around the Terminal area. KMMH can reduce the potential for these garbage cans to become attractants by developing a tenant and community outreach program to ensure lessees' and the public's support in reducing wildlife attraction. KMMH lessees and the FBO should participate in identifying and reporting potential hazards or strikes as they observe them. The AWC should develop a Wildlife Hazard Working Group (WHWG) that focuses on public outreach and wildlife management on the airfield. The Wildlife Hazard Working Group would implement the following steps in this outreach program.

- Coordinate with all airfield lessees to eliminate leaving any food wastes available for wildlife on the Airport property.
- Use written letters, signs, and other communication methods (mailings, radio announcements, web-based messaging) to inform transient passengers about the need to minimize litter and avoid attracting wildlife around the Airport. The information materials should stress the need to control all litter and avoid feeding wildlife. The Town of Mammoth Lakes program for co-existing with bears provides community guidance that can be amplified at the Airport.
- Communicate with other local stakeholders (resource agencies, town departments, Mono County staff, and neighboring communities) to discuss controlling wildlife attractants.

8.4 Maintain Appropriate Permits to Control Wildlife

KMMH should obtain and annually renew a Migratory Bird Treaty Act (MBTA) Depredation Permit from the USFWS. Although unlikely, KMMH may need to implement lethal removal of MBTA-protected birds such as hawks or other species, and would need a MBTA Depredation Permit to conduct these management actions. KMMH should maintain an active depredation permit at all times so that delays can be avoided if take of a migratory bird is necessary. House sparrows, rock pigeons, European starlings, and Eurasian collared doves often nest in structures. These species are not covered under the MBTA, therefore, their nests can be removed and individuals taken without a Depredation Permit.

Lethal removal of these species should only be used as a last resort to reinforce other non-lethal techniques. The KMMH surroundings support healthy bird populations; therefore, lethal removal would likely result in only a temporary reduction of birds in the AOA. Typically, lethal removal would be supplemental to other management techniques and implemented in particularly problematic situations. Problematic situations that may warrant lethal removal include an immediate threat to life or property, excessively territorial raptors diving on aircraft, or groups of birds nesting on structures.

8.5 Train Personnel in Wildlife Identification and Hazing Techniques

All personnel who have access to the AOA should be trained to recognize and respond to potential wildlife hazards. Personnel on the AOA will need to make rapid decisions about the appropriate actions to address a potential wildlife hazard immediately after the hazard is identified. Good decisions cannot be made without adequate training. Personnel need to know when a potential hazard warrants hazing the problem individuals or just notifying the AWC. If hazing is necessary (e.g., common ravens or horned larks foraging on the runway), personnel must know not to haze the wildlife when aircraft are on approach, landing roll, or takeoff.

Personnel should be trained to identify hazardous wildlife and hazardous threat conditions as per FAA requirements detailed in AC 150/5200-36A. Readily available field guides should be made available to personnel to facilitate species identification. The AWC should assemble a flow chart that identifies the appropriate actions to take when certain conditions or wildlife occurs. In addition, personnel should be trained in the safe handling and use of hazing devices. Wildlife Services and consultants offer training courses and periodic training updates to familiarize airport staff on wildlife identification, and the most current dispersal technology and safety procedures.

8.6 Improve Wildlife Strike Reporting

KMMH personnel who conduct runway and airfield inspections should be informed of the importance of collecting and reporting wildlife remains. All wildlife remains found within the AOA should be identified to the species level, and the observation must be reported to the AWC for inclusion in the strike log. FAA AC 150/5200-32B clearly states that a wildlife strike has occurred if “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.”

Proper identification of the species will allow the AWC to adapt management actions as necessary. If KMMH staff or a local biologist is not able to identify remains to the species level, the AWC can send portions of the remains to the Feather Laboratory at the Smithsonian Institute for identification. This is a free service funded at the national level by the FAA. KMMH staff would need to complete FAA Form 5200-7 and mail the form and remains to the feather identification lab. FAA AC 150/5200-32B contains detailed instructions on processing and submitting wildlife remains.

Feather and DNA remains can be sent to:

**Feather Laboratory
Smithsonian Institute
NHB, E610, MRC 116
10th & Constitution Avenue NW
Washington DC 20560-0116**

8.7 Continue Wildlife Monitoring

The AWC or a contractor should continue to monitor wildlife activity at KMMH on a regular basis. This WHA provides a baseline for wildlife occurrences and uses in and around KMMH; however, wildlife uses and movements in the area will change as environmental conditions change. KMMH should track the changes in wildlife movements by conducting regular surveys of the airfield and surrounding areas of influence in order to implement management techniques. The survey methodology should be similar to the methods used for this WHA. Surveys should be conducted at least once during each season of the year. The survey data should be managed in a database that is accessible to the AWC. The AWC should review the data regularly to identify changes in the wildlife uses and adapt management actions as necessary.

8.8 Runway and Airfield Inspections

Routine runway inspections are an excellent opportunity to identify potential wildlife attractants in the movement areas. During runway inspections, KMMH staff should be looking for any items that may attract opportunistic feeders such as common ravens. Opportunistic eaters can be attracted to carcasses, cyclical insect infestations, wildlife scat, discarded food products, wrappers, and even small, colored objects. When identified, these items should be removed from the movement areas.

8.9 Hangar Maintenance

Few problems were observed with birds entering the hangars to roost. Birds typically start looking for protected places to roost just before sunset. One way to discourage roosting in hangars is to close the hangar doors one hour before sunset. By closing the hangar doors the option is removed for birds to access and roost in the hangar. Typically, birds have located their night roost within one hour after nightfall. If desired, the hangar doors can be opened one hour after nightfall with little potential for birds to enter. Another option for deterring roosting is to install netting on the hangar ceiling. Installing netting can be very expensive and it must be done properly to be effective. Netting must cover all corners, beams, pipes, tracks, and infrastructure to be effective. Effigies have also been used but are generally ineffective and they may not deter birds that are intent of roosting inside the hangars.

Scavenger birds and bears can get into dumpsters and pull out discarded food, which may then blow around the airfield. All dumpsters located on the AOA that receive discarded food products should have functional latching mechanisms on the lids or be replaced with latching dumpsters. If replacing the dumpsters is not feasible, the existing dumpsters should be retrofitted to include a functional latching mechanism on the lids.

Dumpster placement is also critical. Lids must be able to be closed after they are emptied. Stenciled lettering on the outside face of the dumpster can be painted easily to state "Dumpster Lids Must Be Closed At All Times".

8.10 Habitat or Facilities Modifications

Habitat and facilities modifications are effective techniques for reducing wildlife attraction to airfields. At KMMH, habitat and facility modifications should include implementing an infield management program, landscape management, installing a deer-deterrent perimeter fence, adjusting gate gaps, and removing unnecessary perches. These recommendations are discussed below.

8.11 Infield Management

The FAA (CertAlert 98-05) generally recommends maintaining the grass height at 6 to 12 inches throughout the Airport property. Vegetation within the AOA is recommended to be the same height because birds are attracted to shorter grass (less than 6 inches) for foraging and un-mowed grasses (greater than 12 inches) have increased small mammal populations during different seasons (Barras et al. 2000). KMMH is situated at a foothills elevation where the ground vegetation is dominated by sparse bunch grasses and clumps of flowering forbs growing typically at a density of 40-60% cover. Because the area is so xeric, ground cover rarely grows at higher density, and the sparse cover is attractive to many ground foraging birds. Low numbers of horned larks, western meadowlarks, mountain bluebirds, sparrows, blackbirds, starlings, ravens, and other migratory passerines were observed foraging in the bunch grasses. Several passerine species (sage thrasher, sage sparrow, other sparrows, mountain bluebirds) nested in undisturbed remote areas of the AOA. Mule deer also commonly transitioned onto the AOA to forage and were the most problematic

The current mowing regime at KMMH mows the airfield only as needed and dependent on actual conditions to maintain the grass height in the RSA at approximately 6-18 inches in the Object Free Areas, and greater than 15 inches in most of the outer airfield. This mowing regime effectively reduces the number of ground nesting birds or small mammal populations within the AOA. Installing 20 foot wide paved shoulders along the runway and taxiways would reduce the number of birds foraging adjacent to them and also reduce or eliminate erosion.

Unmowed areas of the AOA with sagebrush and rabbitbrush habitat provided cover for small mammals such as mice, rabbits, and ground squirrels, which then attracted predators – primarily coyotes and red-tailed hawks. The shrub cover should be brush-hogged to a low height to reduce the amount of cover for wildlife, perching sites, and deter passerine nesting. Tall vegetation provides excellent perching opportunities and should be eliminated. The removal

of vegetation from these areas should help in reducing the prey base and the populations of raptors and ravens that frequent the AOA.

8.12 Landscape Management

The terminal entrance area and parking lot were landscaped with sparse landscape plants, wildflowers, and a few small irrigated turf areas by the FBO office. Several dense willow bushes by the FBO provided cover for a few pairs of nesting Brewer's blackbirds. These shrubs should be trimmed to minimize nesting.

8.13 Perimeter Fence

The highest wildlife hazard management priority at KMMH is to install a wildlife-deterrent fence. The existing perimeter fence is three- or four-strand barbed wire, with a short stretch of chain-link fence paralleling Airport Road adjacent to the town hangars; consequently, the AOA is completely porous and incursions by mule deer, coyote, and other small animal occur constantly. The perimeter fence should be modified to install a wildlife deterrent fence (FAA Cert Alert 04-16), as funding becomes available. Vegetation should be regularly mowed or cleared from the base of the fence line to allow inspection. KMMH staff should conduct daily visual inspections of the entire perimeter fence. The inspections should focus on identifying and repairing new breaches in the fence and ensuring that all the gates along the perimeter fence are free of gaps. Any washouts, breaks, or other holes in the fence should be repaired as soon as they are discovered.

In areas where a fence segment terminates at the corner of a structure, KMMH should ensure that the gap between the structure and the fence does not exceed 4 inches. If the gap exceeds 2 inches, the fence should be extended to close the gap.

Vertical and horizontal gate gaps greater than 4 inches should be repaired. If necessary, a concrete or asphalt threshold (or speed bump) could be installed under each gate to minimize gaps under the gates. If installing a concrete threshold at each gate is cost prohibitive, KMMH should consider installing gate-brooms. Gate brooms attach to the bottom of the gate, look like broom bristles, and give the gate a solid appearance to the ground.

8.14 Avian Perch Modifications

Birds routinely perch on structures for hunting and resting, and common perches at KMMH include fences, runway markers, and power poles. Starlings were problematic at a gap in a hangar soffit, but after the hangar was repaired very few starlings were seen perching on the hangar and nearby light poles. Aerial insectivores (western meadowlarks, mountain bluebirds, red-winged and Brewer's blackbirds, American kestrels, and ravens) were occasionally observed perching on the runway markers while foraging for insects. Most of these structures are essential for the operation of the airfield. Bird barrier spike strips can be installed on the runway markers to deter perching birds. KMMH should consider removing any unnecessary structures to minimize the number of available perches in the AOA.

9 WILDLIFE CONTROL

This section outlines the various types of wildlife control and their respective applications.

9.1 Harassment and Deterrence Hazing

Bird species from different guilds use the airfield for nesting, foraging, roosting, and loafing. The recommended infield management program will help decrease this activity over time but will not be an immediate solution for many species. All KMMH personnel who have access to the airfield should be capable of hazing birds in the AOA, primarily through the use of hand-launched pyrotechnics. Repeated hazing is very important with flocking birds. When one or two individuals land in the airfield, it attracts more individuals of the same species, resulting in a rapid increase in birds in the airfield. To avoid the rapid congregation of birds, birds should be hazed as soon as they land. Hazing will need to be increased during the spring, summer, and fall months when the breeding and migratory bird population in the area increases.

Hazing should also be implemented to deter raptor foraging in the airfield. Raptors were observed foraging in the airfield on numerous occasions. Raptors often soar above the foraging grounds to spot potential prey. Soaring raptors pose a threat to KMMH aircraft; therefore, soaring raptors should be hazed to deter this behavior.

The Airport is effectively hazing mule deer from the AOA when they are sighted during daytime operating hours, but many of the habitual incursions occur in dawn, dusk, or nocturnal hours when Operations staff is not at the Airport to haze the animals, so they continue to be attracted to the AOA. Deer incursions would be minimized with a deer-deterrent perimeter fence.

9.2 Pyrotechnics and Bioacoustics

The use of pyrotechnics or other audible deterrents (bioacoustics) is recommended. Because of regional fire hazards, KMMH would be required to obtain a permit from the U. S. Forest Service and/or other agencies before using pyrotechnics. The KMMH ARFF personnel would be required to be standing by during pyrotechnic use due to the area's high fire hazard potential. Individuals utilizing pyrotechnics on the airfield should maintain open and continuous communications with the KMMH ARFF Department. Pyrotechnic users must communicate on the Unicom channel to avoid dispersing birds when aircraft are on approach or takeoff.

Bioacoustic devices use the recorded distress or alarm calls of the species to be dispersed projected over any suitable speaker system and may be used in conjunction with a diversity of pyrotechnics for best results.

KMMH has not needed to use handheld pyrotechnics for hazing birds to date. Considering the species using the airfield, the use of bangers and/or screamers would be recommended, if necessary. The Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATF) regulates the use of explosive pest control devices (EPCDs). The Bureau of Alcohol, Tobacco, and Firearms (ATF) recently clarified to the FAA that the distribution to, receipt of, and use of explosives by municipal airports, or their explosives contractors and subcontractors, are exempt from explosives licensing requirements. Since KMMH is a local government-owned agency, the Airport would not be required to obtain licensing from the BATF to purchase and use EPCDs.

9.3 Bureau of Alcohol, Tobacco, Firearms, and Explosives Permitting

Information on obtaining a permit can be found at www.atf.gov/explosives/how-to/become-an-fel.html. KMMH should obtain a permit using BATF Form 5400.13. Permitted EPCD users must store the EPCDs in BATF-approved storage devices. Depending on the EPCD being stored, either Type 1, Type 2, or Type 4 storage magazines are required for storing EPCDs. In addition, EPCD users are required to maintain and submit reports that detail the daily uses and storage procedures being employed. Appendix B includes a summary sheet that describes the specific requirements for obtaining and using EPCDs. All parties involved with the use of pyrotechnics on an airfield should attend annual safety training. Annual training should be included in the FAA required wildlife hazard training course, as described in AC 15/5200-36A and should include safe handling, storage, and use of EPCDs.

10 REGULATORY IMPLICATIONS

This section evaluates the regulatory implications of the recommended management actions. These discussions provide brief overviews of the various federal, state, and local regulations that most airports must consider when implementing projects.

10.1 Federal Endangered Species Act

Section 9 of the Endangered Species Act (ESA) prohibits the "take" of any federally listed endangered species (16 United States Code [USC] 1538(a)). The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct" (16 USC 1532(19)). If it is not possible to design an otherwise lawful land use activity in a manner that avoids take of a listed species, either directly or through habitat modification. Section 10(a)(1)(B) of the ESA (16 USC 1539(a)(1)(B)) authorizes the USFWS to issue a permit allowing take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Although no federally listed species were considered problematic at KMMH, the AWC must periodically check the list published by

the USFWS to learn if any species might be impacted by wildlife management actions. Federally listed threatened and endangered species in Mono County include plants, invertebrates, fish, amphibians and reptiles, and birds (Table 7).

TABLE 7
U S FISH & WILDLIFE SERVICE - THREATENED AND ENDANGERED SPECIES – MONO COUNTY

Group	Name	Status	Recovery Plan Name	Recovery Plan Stage
Amphibians	Mountain yellow-legged frog (<i>Rana muscosa</i>)	Endangered		
Amphibians	Yosemite toad (<i>Anaxyrus canorus</i>)	Threatened		
Birds	California condor (<i>Gymnogyps californianus</i>)	Endangered	California Condor Recovery Plan, Third Revision	Final Revision 3
Birds	Least Bell's vireo (<i>Vireo bellii pusillus</i>)	Endangered	Draft Recovery Plan for the Least Bell's Vireo	Draft
Birds	Greater sage-grouse (<i>Centrocercus urophasianus</i>)	Proposed Threatened		
Birds	Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	Endangered	Final Recovery Plan for the Southwestern Willow Flycatcher	Final
Conifers and Cycads	Whitebark pine (<i>Pinus albicaulis</i>)	Candidate		
Fishes	Owens pupfish (<i>Cyprinodon radiosus</i>)	Endangered	Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California	Final
Fishes	Lahontan cutthroat trout (<i>Oncorhynchus clarkii henshawi</i>)	Threatened	Lahontan Cutthroat Trout (<i>Oncorhynchus clarkii henshawi</i>) Recovery Plan	Final
Fishes	Owens tui chub (<i>Gila bicolor ssp. snyderi</i>)	Endangered	Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California	Final
Flowering Plants	Fish Slough milk-vetch (<i>Astragalus lentiginosus var. piscinensis</i>)	Threatened	Owens Basin Wetland and Aquatic Species Recovery Plan, Inyo and Mono Counties, California	Final
Mammals	Sierra Nevada bighorn sheep (<i>Ovis canadensis sierrae</i>)	Endangered	Final Recovery Plan for the Sierra Nevada Bighorn Sheep (<i>Ovis canadensis californiana</i>)	Final

10.2 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) of 1940 (16 USC 668) prohibits taking, possession, and commerce of bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) or any part, nest, or eggs without a permit issued by the Secretary of the Interior. "Take" is defined as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. "Disturb" is defined in 50 CFR 22.3 as the act of agitating or bothering a bald or golden eagle to a degree that, based on the best scientific information available, causes, or is likely to cause one or more of the following conditions: 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or shelter behavior.

Furthermore, "disturb" also includes the impacts of human-induced alterations occurring near a nest site during a time when eagles are absent from the area if, when the eagle returns, those alterations would agitate or bother an eagle to the extent that it interferes with or interrupts normal breeding, feeding, or sheltering habits, and cause injury, death, or nest abandonment.

In limited situations, the USFWS does have a mechanism available to authorize take of bald and golden eagles pursuant to the BGEPA (*Federal Register* 74:46836). On November 10, 2009, the USFWS authorized limited take of bald and golden eagles under the BGEPA (*Federal Register* 74:46836). Rule 50 CFR 22.26 authorizes the issuance of permits to take bald and golden eagles where take is incidental to otherwise lawful activities. Permit provisions under 50 CFR 22.27 allow for intentional take of eagle nests under particular, limited circumstances. The WHA biologists observed bald eagles and golden eagles near KMMH during the assessment period. Recommended coordination with the USFWS and management actions will be necessary prior to any anticipated take or harassment actions of either of

these species. No lethal take of these species is anticipated to be necessary, but the Airport should pursue a permit to haze these species whenever they pose hazards to aviation.

10.3 Migratory Bird Treaty Act

The MBTA of 1918 (16 USC 703–712) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the USFWS. Even though the MBTA does not have provisions for allowing unauthorized take, the MBTA recognizes that aircraft despite implementing measures to avoid “take” of birds may kill some migratory birds.

Acknowledging that large populations of certain bird species can cause damage to aircraft and threaten human safety, the USFWS by regulation and permit has provided for controlled take of certain species in specific areas at specified times. Before KMMH conducts any management activities that would result in “take” of birds protected by the MBTA, KMMH should obtain an MBTA “take permit” from USFWS. The Airport must also first contact the US Department of Agriculture APHIS Wildlife Services to provide a Form 37 consultation to the USFWS in order for the USFWS to issue depredation permits.

10.4 Section 404 of the Clean Water Act

The U.S. Army Corps of Engineers (USACE) is responsible for the issuance of permits for the placement of dredged or fill material into “waters of the United States” pursuant to Section 404 of the Clean Water Act (CWA) (33 USC 1344). As defined by USACE in 33 CFR 328.3(a)(parts 1–6), “waters of the United States” are defined as:

Those waters that are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; tributaries and impoundments to such waters; all interstate waters including interstate wetlands; and territorial seas.

If a project would result in dredge or fill of “waters of the United States,” the project would be subject to Section 404 of the CWA, based on review by the USACE. The KMMH airfield has areas that *may be considered* jurisdictional wetlands or other waters that would be subject to the CWA. Therefore, implementation of the recommended management actions *may require* coordination with or authorization from USACE.

10.5 Animal Control Act of 1931

Under this act, the U.S. Department of Agriculture (USDA) can manage wildlife injurious to agricultural interests, other wildlife, or human health and safety, including wildlife hazards to aircraft. This act permits USDA to manage wildlife at KMMH, on an as-needed basis, if KMMH retains USDA to perform these services.

10.6 Federal Insecticide, Fungicide, and Rodenticide Act

The U.S. Environmental Protection Agency oversees the registration, labeling, classification, and use of pesticides, as stated in this act. Persons using restricted-use pesticides, applying any pesticides to the land of another, or applying any pesticides for hire, must be a Certified Applicator, or working under the direct supervision of a Certified Applicator, and then may only use pesticides covered by the Certified Applicator’s certification. If KMMH, for example, uses a rodenticide to eradicate ground squirrels or an herbicide to manage infield vegetation, then KMMH and their contractor must comply with the Federal Insecticide, Fungicide, and Rodenticide Act. Permits and licenses are issued by the state in compliance with federal requirements.

10.7 National Environmental Protection Agency

A CATEX was required by paragraph 307 of FAA order 1050.1F for the issuance of this planning grant and this WHA will not require additional NEPA documentation; however, some actions that result from future airport modification or wildlife management recommendations might require NEPA analysis. As an example, actions that would require filling in wetlands or impacting wildlife listed in the Endangered Species Act may require NEPA documentation.

10.8 State-Listed Threatened and Endangered Species

FAA Cert Alert 06-07 describes procedures for responding to requests for state wildlife agencies to facilitate and encourage habitat for state-listed threatened and endangered species of species of special concern that occur on airports and may pose a threat to aviation safety. State listed threatened and endangered species in Mono County include plants, invertebrates, fish, amphibians and reptiles, and birds (Table 8).

TABLE 8
CALIFORNIA DEPARTMENT OF FISH AND GAME - THREATENED AND ENDANGERED SPECIES –
9 QUADS CENTERED ON KMMH IN MONO COUNTY

Element Type	Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals - Amphibians	Ambystoma californiense	California tiger salamander	Threatened	Threatened	SSC	-
Animals - Amphibians	Anaxyrus canorus	Yosemite toad	Threatened	None	SSC	-
Animals - Amphibians	Hydromantes platycephalus	Mount Lyell salamander	None	None	SSC	-
Animals - Amphibians	Rana sierrae	Sierra Nevada yellow-legged frog	Endangered	Threatened	SSC	-
Animals - Birds	Accipiter gentilis	northern goshawk	None	None	SSC	-
Animals - Birds	Aquila chrysaetos	golden eagle	None	None	FP ; WL	-
Animals - Birds	Buteo swainsoni	Swainson's hawk	None	Threatened	-	-
Animals - Birds	Calypte costae	Costa's hummingbird	None	None	-	-
Animals - Birds	Centrocercus urophasianus	greater sage-grouse	Proposed Threatened	None	SSC	-
Animals - Birds	Charadrius montanus	mountain plover	None	None	SSC	-
Animals - Birds	Circus cyaneus	northern harrier	None	None	SSC	-
Animals - Birds	Contopus cooperi	olive-sided flycatcher	None	None	SSC	-
Animals - Birds	Empidonax traillii	willow flycatcher	None	Endangered	-	-
Animals - Birds	Falco mexicanus	prairie falcon	None	None	WL	-
Animals - Birds	Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	FP	-
Animals - Birds	Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	-
Animals - Birds	Icteria virens	yellow-breasted chat	None	None	SSC	-
Animals - Birds	Lanius ludovicianus	loggerhead shrike	None	None	SSC	-
Animals - Birds	Melanerpes lewis	Lewis' woodpecker	None	None	-	-
Animals - Birds	Pandion haliaetus	osprey	None	None	WL	-
Animals - Birds	Piranga rubra	summer tanager	None	None	SSC	-
Animals - Birds	Riparia riparia	bank swallow	None	Threatened	-	-
Animals - Birds	Setophaga petechia	yellow warbler	None	None	SSC	-
Animals - Birds	Sphyrapicus ruber	red-breasted sapsucker	None	None	-	-
Animals - Birds	Spizella breweri	Brewer's sparrow	None	None	-	-
Animals - Birds	Strix nebulosa	great gray owl	None	Endangered	-	-
Animals - Birds	Strix occidentalis occidentalis	California spotted owl	None	None	SSC	-
Animals - Fish	Catostomus fumeiventris	Owens sucker	None	None	SSC	-
Animals - Fish	Oncorhynchus clarkii henshawi	Lahontan cutthroat trout	Threatened	None	-	-
Animals - Fish	Oncorhynchus mykiss aguabonita	Volcano Creek golden trout	None	None	SSC	-

Mammoth Yosemite Airport
Wildlife Hazard Assessment

Element Type	Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals - Fish	Rhinichthys osculus ssp. 2	Owens speckled dace	None	None	SSC	-
Animals - Fish	Rhinichthys osculus ssp. 5	Long Valley speckled dace	None	None	-	-
Animals - Fish	Siphateles bicolor snyderi	Owens tui chub	Endangered	Endangered	-	-
Animals - Insects	Hygrotylus fontinalis	travertine band-thigh diving beetle	None	None	-	-
Animals - Mammals	Apodontia rufa californica	Sierra Nevada mountain beaver	None	None	SSC	-
Animals - Mammals	Euderma maculatum	spotted bat	None	None	SSC	-
Animals - Mammals	Gulo gulo	California wolverine	None	Threatened	FP	-
Animals - Mammals	Lepus townsendii townsendii	western white-tailed jackrabbit	None	None	SSC	-
Animals - Mammals	Martes caurina	Pacific marten	None	None	-	-
Animals - Mammals	Martes caurina sierrae	Sierra marten	None	None	-	-
Animals - Mammals	Ochotona princeps schisticeps	gray-headed pika	None	None	-	-
Animals - Mammals	Ovis canadensis sierrae	Sierra Nevada bighorn sheep	Endangered	Endangered	FP	-
Animals - Mammals	Pekania pennanti	fisher - West Coast DPS	Proposed Threatened	Candidate Threatened	SSC	-
Animals - Mammals	Sorex lyelli	Mount Lyell shrew	None	None	SSC	-
Animals - Mammals	Vulpes vulpes necator	Sierra Nevada red fox	None	Threatened	-	-
Animals - Mollusks	Pyrgulopsis wongi	Wong's springsnail	None	None	-	-
Plants - Bryophytes	Helodium blandowii	Blandow's bog moss	None	None	-	2B.3
Plants - Vascular	Antennaria pulchella	beautiful pussy-toes	None	None	-	4.3
Plants - Vascular	Arabis repanda var. greenei	Greene's rockcress	None	None	-	3.3
Plants - Vascular	Astragalus johannis-howellii	Long Valley milk-vetch	None	Rare	-	1B.2
Plants - Vascular	Astragalus kentrophyta var. danaus	Sweetwater Mountains milk-vetch	None	None	-	4.3
Plants - Vascular	Astragalus lemmonii	Lemmon's milk-vetch	None	None	-	1B.2
Plants - Vascular	Astragalus monoensis	Mono milk-vetch	None	Rare	-	1B.2
Plants - Vascular	Astragalus oophorus var. oophorus	egg milk-vetch	None	None	-	4.3
Plants - Vascular	Astragalus ravenii	Raven's milk-vetch	None	None	-	1B.3
Plants - Vascular	Atriplex pusilla	smooth saltbush	None	None	-	2B.1
Plants - Vascular	Boechea bodiensis	Bodie Hills rockcress	None	None	-	1B.3
Plants - Vascular	Boechea cobrensis	Masonic rockcress	None	None	-	2B.3
Plants - Vascular	Boechea dispar	pinyon rockcress	None	None	-	2B.3
Plants - Vascular	Boechea tularensis	Tulare rockcress	None	None	-	1B.3
Plants - Vascular	Botrychium ascendens	upswept moonwort	None	None	-	2B.3
Plants - Vascular	Botrychium crenulatum	scalloped moonwort	None	None	-	2B.2
Plants - Vascular	Calochortus excavatus	Inyo County star-tulip	None	None	-	1B.1
Plants - Vascular	Calyptridium pygmaeum	pygmy pussypaws	None	None	-	1B.2

Mammoth Yosemite Airport
Wildlife Hazard Assessment

Element Type	Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Plants - Vascular	<i>Camissonia sierrae</i> ssp. <i>alticola</i>	Mono Hot Springs evening-primrose	None	None	-	1B.2
Plants - Vascular	<i>Carex buxbaumii</i>	Buxbaum's sedge	None	None	-	4.2
Plants - Vascular	<i>Carex congdonii</i>	Congdon's sedge	None	None	-	4.3
Plants - Vascular	<i>Carex incurviformis</i>	Mt. Dana sedge	None	None	-	4.3
Plants - Vascular	<i>Carex scirpoidea</i> ssp. <i>pseudoscirpoidea</i>	western single-spiked sedge	None	None	-	2B.2
Plants - Vascular	<i>Claytonia megarhiza</i>	fell-fields claytonia	None	None	-	2B.3
Plants - Vascular	<i>Cleomella brevipes</i>	short-pedicelled cleomella	None	None	-	4.2
Plants - Vascular	<i>Crepis runcinata</i> ssp. <i>hallii</i>	Hall's meadow hawkbeard	None	None	-	2B.1
Plants - Vascular	<i>Cryptantha glomeriflora</i>	clustered-flower cryptantha	None	None	-	4.3
Plants - Vascular	<i>Draba cana</i>	canescent draba	None	None	-	2B.3
Plants - Vascular	<i>Draba incrassata</i>	Sweetwater Mountains draba	None	None	-	1B.3
Plants - Vascular	<i>Draba lonchocarpa</i>	spear-fruited draba	None	None	-	2B.3
Plants - Vascular	<i>Draba praealta</i>	tall draba	None	None	-	2B.3
Plants - Vascular	<i>Draba sierrae</i>	Sierra draba	None	None	-	1B.3
Plants - Vascular	<i>Elymus scribneri</i>	Scribner's wheat grass	None	None	-	2B.3
Plants - Vascular	<i>Epilobium howellii</i>	subalpine fireweed	None	None	-	4.3
Plants - Vascular	<i>Eremothera boothii</i> ssp. <i>boothii</i>	Booth's evening-primrose	None	None	-	2B.3
Plants - Vascular	<i>Eremothera boothii</i> ssp. <i>intermedia</i>	Booth's hairy evening-primrose	None	None	-	2B.3
Plants - Vascular	<i>Eriastrum sparsiflorum</i>	few-flowered eriastrum	None	None	-	4.3
Plants - Vascular	<i>Ericameria nana</i>	dwarf goldenbush	None	None	-	4.3
Plants - Vascular	<i>Eriogonum microthecum</i> var. <i>alpinum</i>	northern limestone buckwheat	None	None	-	4.3
Plants - Vascular	<i>Eriophyllum lanatum</i> var. <i>obovatum</i>	southern Sierra woolly sunflower	None	None	-	4.3
Plants - Vascular	<i>Fritillaria pinetorum</i>	pine fritillary	None	None	-	4.3
Plants - Vascular	<i>Goodmania luteola</i>	golden goodmania	None	None	-	4.2
Plants - Vascular	<i>Hulsea vestita</i> ssp. <i>inyoensis</i>	Inyo hulsea	None	None	-	2B.2
Plants - Vascular	<i>Ivesia kingii</i> var. <i>kingii</i>	alkali ivesia	None	None	-	2B.2
Plants - Vascular	<i>Ivesia unguiculata</i>	Yosemite ivesia	None	None	-	4.2
Plants - Vascular	<i>Jamesia americana</i> var. <i>rosea</i>	rosy-petalled cliffbush	None	None	-	4.3
Plants - Vascular	<i>Kobresia myosuroides</i>	seep kobresia	None	None	-	2B.3
Plants - Vascular	<i>Lupinus duranii</i>	Mono Lake lupine	None	None	-	1B.2
Plants - Vascular	<i>Lupinus gracilentus</i>	slender lupine	None	None	-	1B.3
Plants - Vascular	<i>Lupinus nevadensis</i>	Nevada lupine	None	None	-	4.3
Plants - Vascular	<i>Lupinus padre-crowleyi</i>	Father Crowley's lupine	None	Rare	-	1B.2
Plants - Vascular	<i>Micromonolepis pusilla</i>	dwarf monolepis	None	None	-	2B.3
Plants - Vascular	<i>Minuartia stricta</i>	bog sandwort	None	None	-	2B.3
Plants - Vascular	<i>Parnassia parviflora</i>	small-flowered grass-of-Parnassus	None	None	-	2B.2
Plants - Vascular	<i>Pedicularis crenulata</i>	scalloped-leaved lousewort	None	None	-	2B.2

Element Type	Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Plants - Vascular	<i>Penstemon papillatus</i>	Inyo beardtongue	None	None	-	4.3
Plants - Vascular	<i>Phacelia gymnoclada</i>	naked-stemmed phacelia	None	None	-	2B.3
Plants - Vascular	<i>Phacelia inyoensis</i>	Inyo phacelia	None	None	-	1B.2
Plants - Vascular	<i>Primula pauciflora</i>	beautiful shootingstar	None	None	-	4.2
Plants - Vascular	<i>Salix brachycarpa</i> var. <i>brachycarpa</i>	short-fruited willow	None	None	-	2B.3
Plants - Vascular	<i>Salix nivalis</i>	snow willow	None	None	-	2B.3
Plants - Vascular	<i>Spartina gracilis</i>	alkali cord grass	None	None	-	4.2
Plants - Vascular	<i>Sphaeromeria potentilloides</i> var. <i>nitrophila</i>	alkali tansy-sage	None	None	-	2B.2
Plants - Vascular	<i>Stuckenia filiformis</i> ssp. <i>alpina</i>	slender-leaved pondweed	None	None	-	2B.2
Plants - Vascular	<i>Thelypodium integrifolium</i> ssp. <i>complanatum</i>	foxtail thelypodium	None	None	-	2B.2
Plants - Vascular	<i>Trichophorum pumilum</i>	little bulrush	None	None	-	2B.2
Plants - Vascular	<i>Triglochin palustris</i>	marsh arrow-grass	None	None	-	2B.3
Plants - Vascular	<i>Utricularia minor</i>	lesser bladderwort	None	None	-	4.2
Plants - Vascular	<i>Viola purpurea</i> ssp. <i>aurea</i>	golden violet	None	None	-	2B.2

Note: This list includes unprocessed records California Natural Diversity Data Base that may result in a change to the listing status of a species after the records are processed.

10.9 Local Ordinances

The Mammoth Lakes City Code is current through Ordinance 1081, passed October 21, 2014. No sections were identified pertaining to listed wildlife or wildlife control permits for activities around the Airport. Feral animal control is managed by Mono County Animal Services.

11 ASSESSMENT CONCLUSION

In recent decades, there has been an increase in the number of aircraft wildlife strikes nationwide, which has caused millions of dollars in damage and also poses a serious threat to human safety. KMMH has never filed a strike report. While no recent triggering events have occurred, the bird and mammal species present in the area surrounding the Airport present multiple risks to aviation safety. KMMH practices some conventional measures to mitigate wildlife hazards, but the Airport is positioned in a mule deer migration path and general site conditions are highly attractive to foraging mule deer. It is urgent to install a wildlife deterrence fence to eliminate mule deer incursions. Undertaking this WHA is the first step in addressing the wildlife conditions at the Airport. The completion and approval of this WHA will satisfy the requirements of Title 14 CFR Part 139, Section 139.337. Following the review and approval of this document, the FAA will determine the need for a WHMP. The results of the WHA show that safety and operations at KMMH would benefit from the preparation and implementation of a WHMP.

The WHMP should, at a minimum, include provisions for implementing the recommendations outlined in this WHA. These recommendations are designed to reduce wildlife attraction to KMMH and provide a basic structure for managing wildlife at Mammoth Yosemite Airport. In the interim, the recommendations contained in this WHA can be implemented while waiting for FAA's review of the WHA.

KMMH is commended for initiating this process and addressing many of the recommendations contained in this report through the course of the Wildlife Hazard Assessment. Implementing the recommendations fully will further diminish the potential wildlife hazard potential and ensure that public safety is not compromised.



1/12/2015

Revised

/ / 2015

Gary Exner, FAA Qualified Airport Wildlife Biologist



1/12/2015

Revised

/ / 2015

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APPENDIX A

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- Federal Aviation Administration (FAA) Registry.
Available at: http://registry.faa.gov/aircraftinquiry/NNum_Inquiry.aspx.
- Federal Aviation Administration (FAA) Wildlife Strike Database.
Available at: <http://wildlife-mitigation.tc.faa.gov/wildlife/default.aspx>.
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APPENDIX B

SUPPLEMENTAL DOCUMENTS

Advisory Circulars and Regulations

FAA Certalerts and Advisory Circulars regarding Wildlife Strikes

[Certalert No. 09-10](#)

Wildlife Hazard Assessments in Accordance with Part 139 Requirements

[Certalert No.98-05](#)

Grasses Attractive To Hazardous Wildlife

[Certalert No. 04-09](#)

Relationship Between FAA And Wildlife Services

[Certalert No. 04-16](#)

Deer Hazard to Aircraft and Deer Fencing

[Certalert No. 06-07](#)

Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports

[AC 150/5200-32B](#)

Reporting Wildlife Aircraft Strikes

[AC 150/5200-33B](#)

Hazardous Wildlife Attractants On Or Near Airports

[AC 150/5200-34A](#)

Construction or Establishment of Landfills Near Public Airports

[AC 150/5200-36A](#)

Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports

Lasers- We have received a lot of questions concerning FAA guidance on the use of lasers on airports to harass hazardous wildlife. There are 2 documents that provide FAA guidance on outdoor laser use around airports.

[FAA Advisory Circular 70-1 Outdoor Laser Operations](#)

(12-30-04) provides information for those proponents planning to conduct outdoor laser operations that may affect aircraft operations in the National Airspace System (NAS). Also, the AC explains why notification to the Federal Aviation Administration (FAA) is necessary, how to notify the FAA of the planned laser operation, and what action the FAA will take to respond to such notifications.

[FAA Order 7400.2F- Procedures for Handling Airspace Matters](#)

[Effective Date: February 16, 2006 Includes Change 1, Effective August 3, 2006]. Part 6, Chapter 29 prescribes policy, responsibilities, and guidelines for processing a Notice of Proposed Outdoor Laser Operations and determining the potential effect of outdoor laser activities on users of the National Airspace System.

14 CFR 139.337 - Wildlife Hazard Management.

Code of Federal Regulations - Title 14: Aeronautics and Space

Updated to: January 01, 2011

Title 14: Aeronautics and Space

CHAPTER I: FEDERAL AVIATION ADMINISTRATION, DEPARTMENT OF TRANSPORTATION (CONTINUED)

SUBCHAPTER G: AIR CARRIERS AND OPERATORS FOR COMPENSATION OR HIRE: CERTIFICATION AND OPERATIONS

PART 139: CERTIFICATION OF AIRPORTS

Subpart D: Operations

139.337 - Wildlife hazard management.

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

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

(1) An air carrier aircraft experiences multiple wildlife strikes;

(2) An air carrier aircraft experiences substantial damage from striking wildlife. As used in this paragraph,

substantial damage means damage or structural failure incurred by an aircraft that adversely affects the structural strength, performance, or flight characteristics of the aircraft and that would normally require major repair or replacement of the affected component;

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

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

(c) The wildlife hazard assessment required in paragraph (b) of this section must be conducted by a wildlife

damage management biologist who has professional training and/or experience in wildlife hazard management at airports or an individual working under direct supervision of such an individual. The wildlife hazard assessment must contain at least the following:

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

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

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

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

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

(d) The wildlife hazard assessment required under paragraph (b) of this section must be submitted to the

Administrator for approval and determination of the need for a wildlife hazard management plan. In reaching this determination, the Administrator will consider:

(1) The wildlife hazard assessment;

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

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

- (4) The views of the certificate holder;
 - (5) The views of the airport users; and
 - (6) Any other known factors relating to the wildlife hazard of which the Administrator is aware.
- (e) When the Administrator determines that a wildlife hazard management plan is needed, the certificate holder must formulate and implement a plan using the wildlife hazard assessment as a basis. The plan must?
- (1) Provide measures to alleviate or eliminate wildlife hazards to air carrier operations;
 - (2) Be submitted to, and approved by, the Administrator prior to implementation; and
 - (3) As authorized by the Administrator, become a part of the Airport Certification Manual.
- (f) The plan must include at least the following:
- (1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.
 - (2) A list prioritizing the following actions identified in the wildlife hazard assessment and target dates for their initiation and completion:
 - (i) Wildlife population management;
 - (ii) Habitat modification; and
 - (iii) Land use changes.

- (3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.
- (4) Identification of resources that the certificate holder will provide to implement the plan.
- (5) Procedures to be followed during air carrier operations that at a minimum includes?
 - (i) Designation of personnel responsible for implementing the procedures;
 - (ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin;
 - (iii) Wildlife hazard control measures; and
 - (iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and air traffic using the airport.
- (6) Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in paragraphs (b)(1), (b)(2), and (b)(3) of this section, including:
 - (i) The plan's effectiveness in dealing with known wildlife hazards on and in the airport's vicinity and
 - (ii) Aspects of the wildlife hazards described in the wildlife hazard assessment that should be reevaluated.
- (7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.
- (g) FAA Advisory Circulars contain methods and procedures for wildlife hazard management at airports that are acceptable to the Administrator.

Federal Environmental Pesticide Control Act of 1972

Federal Environmental Pesticide Control Act of 1972 (7 USC 136-136y, P.L. 92-516, October 21, 1972, 86 Stat. 973) as amended by: P.L. 93-205, December 28, 1973, 87 Stat. 903; P.L. 94-140, November 28, 1975, 89 Stat. 751; P.L. 95-396, September 30, 1978, 92 Stat. 819; P.L. 98-201, December 2, 1983, 97 Stat. 1379; and P.L. 100-202, December 22, 1987, 101 Stat. 1329.

The Federal Environmental Pesticide Control Act of 1972, enacted as P.L. 92-516, amended the 1947 Federal Insecticide, Fungicide, and Rodenticide Act (P.L. 80-102, June 25, 1947, 61 Stat. 163).

The 1947 statute (FIFRA) prohibited the sale or distribution of "economic poisons," provided for the registration of such materials, and authorized penalties for violation of the Act. The 1972 amendments established, under the Administrator of EPA, a program for controlling the sale, distribution, and application of pesticides through an administrative registration process. The amendments provided for classifying pesticides for "general" or "restricted" use. "Restricted" pesticides may only be applied by or under the direct supervision of a certified applicator.

The amendments also authorized experimental use permits and provided for administrative review of registered pesticides and for penalties for violations of the statute. States were authorized to regulate the sale or use of any pesticide within a state, provided that such regulation does not permit any sale or use prohibited by the Act.

The Endangered Species Act of 1972 amended FIFRA to define imminent hazard to include situations involving unreasonable hazard to the survival of a species declared by the Secretary of the Interior to be endangered or threatened (P.L. 93-205, December 28, 1973, 87 Stat. 903).

The 1975 amendments to FIFRA (P.L. 94-140, November 28, 1975, 89 Stat. 751) required that the EPA Administrator consider the impacts of regulatory actions on production and prices of agricultural commodities and to notify the Secretary of Agriculture in advance of related rulemaking. Experimental use permits were also authorized for agricultural research activities.

The 1978 amendments to FIFRA (P.L. 95-396, September 30, 1978, 92 Stat. 819) reauthorized appropriations and stipulated the authorized uses of data supplied by an applicant seeking to register pesticides, as well as procedures to be followed by EPA if additional data is needed to support an existing pesticide registration. In addition, the amendments provided clarification of State authority to regulate the sale or use of pesticides and stipulated that States have primary responsibility for pesticide use violations, provided that they have adopted adequate pesticide use laws and regulations.

Amendments enacted in 1983 (P.L. 98-201, December 2, 1983, 97 Stat. 1379) authorized appropriations through FY 1984. The 1987 amendments to FIFRA (P.L. 100-202, December 22, 1987, 101 Stat. 1329) prohibited EPA from canceling any pesticide registrations prior to September 15, 1988, for failure to comply with EPA's endangered species-related labeling regulations.

Amendments were again made on October 25, 1988, P.L. 100-532, The Federal Insecticide, Fungicide, and Rodenticide Act Amendments (102 Stat. 2655, 2677, 2679). Substantive changes which impact the Fish and Wildlife Service were not made.

As part of amendments passed on November 28, 1990 (P.L. 101-624, 104 Stat. 3628), a Biological Pesticide Handling Study was mandated. The study was to review the biological control programs and registration procedures utilized by the Food and Drug Administration, the Animal and Plant Health Inspection Service, and the Environmental Protection Agency. Upon completion of the study, the Secretary of the Interior, in cooperation with the Administrator of the EPA and the Secretary of Agriculture were to begin an educational outreach program to inform persons engaged in agricultural commodity production of any proposed pesticide labeling programs or requirements which may be imposed in compliance with the Endangered Species Act. A study to identify reasonable and prudent means available to implement the endangered species labeling program in compliance with the Endangered Species Act was also mandated.

Amendments were again made on December 13, 1991 (P.L. 102-237, 105 Stat. 1894-1896) which changed registration and re-registration requirements for pesticides. The last legislative action taken on this act was in the August 3, 1996 amendments (P.L. 104-170, 110 Stat. 1492). As with the 1991 amendments, changes were made to pesticide registration and re-registration procedures. Finally, the 1996 amendments also extended the authorization of appropriations.

Title 27: Alcohol, Tobacco Products, and Firearms

CHAPTER II: BUREAU OF ALCOHOL, TOBACCO, FIREARMS, AND EXPLOSIVES, DEPARTMENT OF JUSTICE

SUBCHAPTER C: EXPLOSIVES

PART 555: COMMERCE IN EXPLOSIVES

Subpart K: Storage

555.201 - General.

(a) Section 842(j) of the Act and Sec. 555.29 of this part require that the storage of explosive materials by any person must be in accordance with the regulations in this part. Further, section 846 of this Act authorizes regulations to prevent the recurrence of accidental explosions in which explosive materials were involved. The storage standards prescribed by this subpart confer no right or privileges to store explosive materials in a manner contrary to State or local law.

(b) The Director may authorize alternate construction for explosives storage magazines when it is shown that the alternate magazine construction is substantially equivalent to the standards of safety and security contained in this subpart. Any alternate explosive magazine construction approved by the Director prior to August 9, 1982, will continue as approved unless notified in writing by the Director. Any person intending to use alternate magazine construction shall submit a letter application to the regional director (compliance) for transmittal to the Director, specifically describing the proposed magazine. Explosive materials may not be stored in alternate magazines before the applicant has been notified that the application has been approved.

(c) A licensee or permittee who intends to make changes in his magazines, or who intends to construct or acquire additional magazines, shall comply with Sec. 555.63.

(d) The regulations set forth in Sec. 555.221 through 555.224 pertain to the storage of display fireworks, pyrotechnic compositions, and explosive materials used in assembling fireworks and articles pyrotechnic.

(e) The provisions of Sec. 555.202(a) classifying flash powder and bulk salutes as high explosives are mandatory after March 7, 1990: Provided, that those persons who hold licenses or permits under this part on that date shall, with respect to the premises covered by such licenses or permits, comply with the high explosives storage requirements for flash powder and bulk salutes by March 7, 1991.

(f) Any person who stores explosive materials shall notify the authority having jurisdiction for fire safety in the

locality in which the explosive materials are being stored of the type, magazine capacity, and location of each site where such explosive materials are stored. Such notification shall be made orally before the end of the day on which storage of the explosive materials commenced and in writing within 48 hours from the time such storage commenced.

(Paragraph (f) approved by the Office of Management and Budget under control number 1140-0071)

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981, as amended by T.D. ATF-293, 55 FR 3722, Feb. 5, 1990; T.D. ATF-400, 63 FR 45003, Aug. 24, 1998; ATF-11F, 73 FR 57242, Oct. 2, 2008]

27 CFR Part 555.106 Certain prohibited distributions.

(a) A licensee or permittee may not distribute explosive materials to any person except—

(1) A licensee;

(2) A holder of a user permit; or

(3) A holder of a limited permit who is a resident of the State where distribution is made and in which the premises of the transferor are located.

(b) A licensee shall not distribute any explosive materials to any person:

(1) Who the licensee knows is less than 21 years of age;

(2) In any State where the purchase, possession, or use by a person of explosive materials would be in violation of any State law or any published ordinance applicable at the place of distribution;

(3) Who the licensee has reason to believe intends to transport the explosive materials into a State where the purchase, possession, or use of explosive materials is prohibited or which does not permit its residents to transport or ship explosive materials into the State or to receive explosive materials in the State; or

(4) Who the licensee has reasonable cause to believe intends to use the explosive materials for other than a lawful purpose.

(c) A licensee shall not distribute any explosive materials to any person knowing or having reason to believe that the person:

(1) Is, except as provided under

§ 555.142 (d) and (e), under indictment or information for, or was convicted in any court of, a crime punishable by imprisonment for a term exceeding 1 year;

(2) Is a fugitive from justice;

(3) Is an unlawful user of marijuana, or any depressant or stimulant drug, or narcotic drug (as these terms are defined in the Controlled Substances Act, 21 U.S.C. 802);

(4) Was adjudicated as a mental defective or was committed to a mental institution;

(5) Is an alien, other than an alien who—

(i) Is lawfully admitted for permanent residence (as that term is defined in section 101(a)(20) of the Immigration and Nationality Act (8 U.S.C. 1101));

(ii) Is in lawful nonimmigrant status, is a refugee admitted under section 207 of the Immigration and Nationality Act (8 U.S.C. 1157), or is in asylum status under section 208 of the Immigration and Nationality Act (8 U.S.C. 1158), and—

(A) Is a foreign law enforcement officer of a friendly foreign government, as determined by the Attorney General in consultation with the Secretary of State, entering the United States on official law enforcement business, and the shipping, transporting, possession, or receipt of explosive materials is in furtherance of this official law enforcement business;

(B) Is a person having the power to direct or cause the direction of the management and policies of a corporation, partnership, or association licensed pursuant to section 843(a), and the shipping, transporting, possession, or receipt of explosive materials is in furtherance of such power;

(C) Is a member of a North Atlantic Treaty Organization (NATO) or other friendly foreign military force, as determined by the Attorney General in consultation with the Secretary of Defense, (whether or not admitted in a nonimmigrant status) who is present in the United States under military orders for training or other military purpose authorized by the United States, and the shipping, transporting, possession, or receipt of explosive materials is in furtherance of the military purpose; or

(D) Is lawfully present in the United States in cooperation with the Director of Central Intelligence, and the shipment, transportation, receipt, or possession of the explosive materials is in furtherance of such cooperation;

(6) Has been discharged from the armed forces under dishonorable conditions; or

(7) Having been a citizen of the United States, has renounced citizenship.

(d) The provisions of this section do not apply to the purchase of commercially manufactured black powder in quantities not to exceed 50 pounds, intended to be used solely for sporting, recreational, or cultural purposes in antique firearms or in antique devices, if the requirements of § 555.105(a)(7) or (b)(7) are fully met.

[T.D. ATF-87, 46 FR 40384, Aug. 7, 1981. Redesignated by T.D. ATF-487, 68 FR 3748, Jan.24, 2003. ATF No. 1, 68 FR 13790, Mar. 20, 2003]



**FAA
Airports
Airport Safety and Operations Division**

Calendar Year 2013 Part 139 CertAlert Log

NUMBER	DATE	TOPIC	CONTACT
13-06	21 Nov 2013	Field Condition Reporting (FICON) Limitations When Using the NOTAM Manager System Drop-Down List	Phillip Davenport (202) 267-7072
13-05	25 Sep 2013	Publication Announcement: JO 7930.2N, Notices to Airmen (NOTAM)	Phillip Davenport (202) 267-7072
13-04	29 July 2013	Additional Precautions for Approaching Aircraft with Ballistic Parachutes, Ejection Seats, and Airbags	Marc Tonnacliff (202) 267-8732 Randy Moseng (404) 474-5114
13-03	7 May 2013	Coordination of High Risk Flight Test Activities at Airports	Randy Moseng (404) 474-5114
13-02	15 Mar 2013	Final Rule: Safety Enhancements, Certification of Airports (78 FR 3311)	Ken Langert (202) 493-4529
13-01	30 Jan 2013	Federal and State Depredation Permit Assistance	John R. Weller (202) 267-3778
11-04	40 Nov 2011	Announcement of Order JO-7930.2M, Notices to Airmen (NOTAM), Change 2; Notice JO-7930.93, Reporting of Field Conditions (FICON); and Notice JO-7930.94, Use of 'Work in Progress' in Notices to Airmen	Phillip Davenport
04-13	28 Oct 2004	Rocket-Deployed Emergency Parachute Systems—Cancelled	K. Gilliam



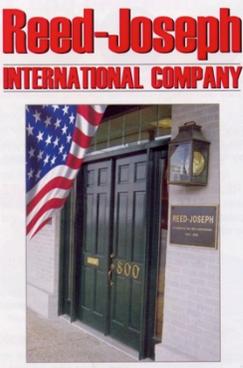
FAA
Airports
Airport Safety and Operations Division

Calendar Year 2014 Part 139 CertAlert Log

NUMBER	DATE	TOPIC	CONTACT
14-03	25 June 2014	Preventive Maintenance of In-Pavement Lighting Systems	Randy Moseng (404) 474-5114 Alvin Logan (202) 267-8743
14-02	2 Apr 2014	Increase in the Numbers of Vehicles and/or Equipment Inadvertently Hitting and Damaging Airplanes in the Ramp/Gate Areas	Brian Rushforth (202) 267-9617
14-01	26 Feb 2014	Seasonal Mitigation of Hazardous Species at Airports: Attention to Snowy Owls	John Weller (202) 267-3778 Amy Anderson (202) 267-7205

APPENDIX C

Deterrent Equipment Product Data



**Reed-Joseph
INTERNATIONAL COMPANY**

800 MAIN STREET, 38701
or
P.O. BOX 894, 38702
GREENVILLE, MS
1.800.647.5554
Tel: 662.335.5822
Fax: 662.335.8850
sales@reedjoseph.com


SAME DAY SHIPPING



**Reed-Joseph
INTERNATIONAL COMPANY**

OVER 55 YEARS

ESTABLISHED IN 1953
**OVER 55 YEARS OF EXCELLENCE
IN BIRD AND WILDLIFE CONTROL**

www.reedjoseph.com

PYROTECHNICS

SCREAMER SIREN
Launched from a single or double shot launcher with the aid of a 6mm blank primer, the 15mm Screamer Siren travels 250 to 300 feet, making a siren-like sound as it flies.

BIRD BANGER
Launched in the same manner as the Screamer Siren, the loud 15mm Bird Banger travels 100 to 150 feet down range before exploding with a very loud report.

SCREAMER BANGER ROCKET
Triples the range of our Bird Banger. Simply slide a Bird Banger into the attached collar, load the Rocket into the launcher muzzle, as you would load a Screamer Siren, and fire. The cartridge travels approximately 300 to 350 feet down range making a screaming noise followed by the loud report from the attached Bird Banger.

6mm BLANK PRIMERS
These are provided at no charge, with all our 15mm pyrotechnic orders.

EYE & EAR PROTECTORS
Eye and Ear Protectors are recommended with all our SCARE-AWAY products.

SINGLE SHOT LAUNCHER
Our Single Shot Launcher offers rugged dependability and low price. It launches our 15mm cartridges.

DOUBLE SHOT LAUNCHER
Automatically re-cocks after the first 15mm cartridge is fired, allowing a second cartridge to be quickly fired.

SEVEN SHOT LAUNCHER
The RG-46 is the best of its kind. It fires more rapidly and with much more ease than the RJ-1 Single Shot Launcher or the RJ-2 Double Shot Launcher.
Available to Government Agencies only.

CAPA & LAUNCHER
For high soaring raptors or birds in hard-to-reach places. Using a 4 caliber Very-type launcher, CAPA carries the cartridge 1,000 feet down range, before making a loud 150 decibel report.

TYPE IV STORAGE MAGAZINE
Our ATF&E approved, prefabricated and portable, indoor, storage magazine features an 8 gauge steel exterior, a half inch plywood interior and 2 hasps & hoods.
Available in two sizes:
30" x 16" x 14.5" Weight 90 lbs.
22.5" x 11.5" x 14.5" Weight 64 lbs.
ATF&E approved Heavy Duty Lock and Key Set.
- Two locks, keyed alike, with two identical keys.

SCAREY MAN®



This human-sized inflatable scarecrow combines sudden movement as it inflates with a siren-like noise, a bird-phobic color, and illumination at night. Frightens away animal pests as it inflates and deflates on a controlled time basis.

REFLECTIVE TAPE
Hang in strips or suspend between poles. The slightest breeze causes the Mylar® to flash and crackle, irritating and confusing birds.
Available in two sizes:
0.5" x 250' and 1.25" x 250'.

BIRD GARD®
Features solid-state electronics mounted inside a NEMA-type control box for weather protection. Covers up to 6 acres. 4 built-in amplifiers and 4 external speakers provide high-volume, crystal-clear digital sound. Mounts easily to a post or pole.

EVIL EYE BALLOONS



These 16 inch diameter, heavy-duty, vinyl balloons discourage birds from roosting around gardens, boats, marinas, buildings, airplane hangars, fruit and berry crops, livestock pens and other problem areas.

REJEX-IT® MIGRATE™ FOR AGRICULTURE
Makes treated cherries, grapes and blueberries unpalatable to birds. It causes them no harm, and they will avoid feeding where it is present.

REJEX-IT® MIGRATE™ FOR TURF
When you spray this food grade biodegradable repellent on turf, watch the unwanted geese and ducks disappear!
One gallon covers 16,000 square feet.

MOBILE BIRD GARD®



Target your bird dispersal program more accurately with our Mobile Bird Gard®. Installation is a snap! Simply plug the sound generator into your vehicle's cigarette lighter and place the magnet-based speaker on the roof.

LP GAS CANNONS AND ACCESSORIES

SCARE-AWAY LP Gas Cannons can protect your investment from bird and wildlife infestation. They automatically produce harmless thunderclap bangs to disperse birds and wildlife from areas such as crops, orchards, vineyards, campuses, golf courses, fish ponds, parks, airfields, and landfills. **SCARE-AWAY LP Gas Cannons** are powered by the same 5 gallon LP gas cylinders used for outdoor grills. The cost for this valuable protection – pennies a day!

OUR SCARE-AWAY LP GAS CANNONS are available in three models. Choose the model which best suits your needs.

M3 produces single bangs which can be regulated from one bang every 30 seconds to one bang every 20 minutes. The M3 utilizes flint ignition. Each flint produces up to 1,000 ignitions.

M4 produces single bangs identical to the M3, and uses a piezo ignition system, which operates without batteries or electricity and produces up to 200,000 ignitions.

M8 Multi-Bang produces random series of single, double, and triple-shot clusters. Time between series may be adjusted from every 30 seconds to every 20 minutes.

MULTIPLE SHOTS AT IRREGULAR INTERVALS DURING A SHORT PERIOD OF TIME HAVE PROVEN TO BE EXTREMELY EFFECTIVE IN DISPERSING BIRD AND WILDLIFE PESTS.

ROTOMAT
The **SCARE-AWAY LP Gas Cannon** can also be mounted on a **ROTOMAT** revolving platform, as shown here, that allows the cannon to change direction each time it fires, enhancing the effectiveness.

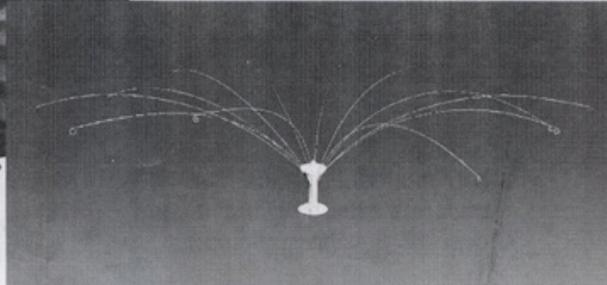
CLOCK TIMER
Our battery operated Clock Timer does a superb job of activating and deactivating the **SCARE-AWAY LP Gas Cannon** automatically. No winding is necessary. It will operate for an entire season on just one AA battery.

AVIAN DISSUADE™
Point the hand-held laser in the direction of the birds. The laser beam will startle, frighten, and drive them away.
Range is at least half a mile.
There are 2 versions - 650nm Red and 532nm Green:
● **Red Laser** is most effective in low light conditions.
● **Green Laser** remains effective in higher ambient light conditions than the Red Laser.

SAME DAY SHIPPING

BIRD SPIDER™ from **BIRD•B•GONE, INC**

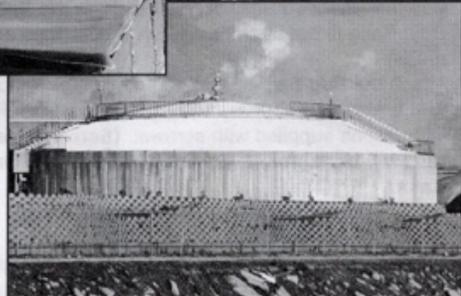
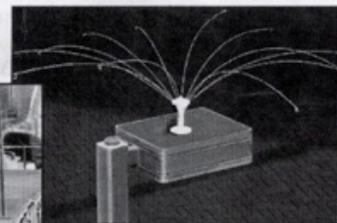
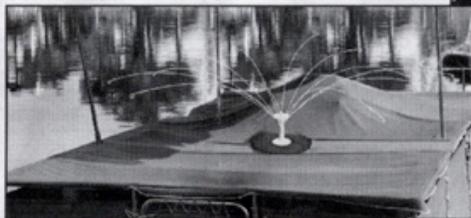
Installation Instructions



- Stainless Steel "Arms" move with the breeze, which deters birds from landing and causing damage.
- Bird•B•Gone Bird Spider has no moving parts in the base unit, which makes it extra sturdy and stable. **NO ASSEMBLY REQUIRED!**
- Convenient / FREE attachments make Bird Spider Adaptable!
- Available in Four Widths! 2', 4', 6' and 8' Diameters.
- Super Easy to Install...and Maintenance Free!

The Bird Spider is Ideal For:

- Signs
- Parking Lot Lights
- Street Lights
- A.C. Units
- Rooftops
- Boats
- Building Maintenance
- AND MORE!



BIRD•B•GONE™ INC.

PH: 949-472-3122 • FAX: 949-472-3116

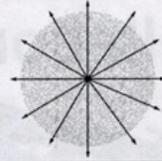
E-mail: nobirds@birdbgone.com

www.birdbgone.com

For Customer Support,
Call **1-800-392-6915**

INSTALLATION INSTRUCTIONS FOR BIRD•B•GONE BIRD SPIDER

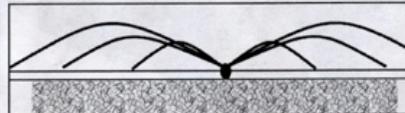
1. Ensure mounting surface is clean of bird feces and debris before installing any bird deterrent, including the Bird Spider.
 - Use Bird-B-Gone Disinfectant or appropriate disinfectant to prepare the surface.



Bird Spider Arm "tips" should overhang mounting surface by at least 2".

2. Select the appropriate Bird Spider (4' or 8') depending on the surface of coverage.
 - It is important that the "tips" of the arms extend several inches over the outside surface(s).

4. Bird Spider Arm Tips Should be no more than 2-3" above mounting surface.



3. Stainless Steel arms must have room to move with the air.
 - Do not mount Bird Spider in an area where the arms will be suppressed from movement or blocked by walls.

5. If the Bird Spider requires gluing for the installation, the PVC adapter must be used.
 - **DO NOT GLUE THE BOTTOM OF THE BASE UNIT WITHOUT INSTALLING THE PVC BASE.**
 - Use Bird-B-Gone Adhesives, available direct from Bird-B-Gone

BOAT ADAPTATION:

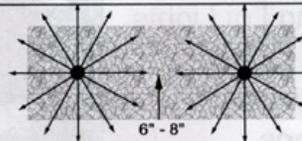
Bird Spider Boat Base:

- Attach the Bird Spider Base directly to the Boat Base with the screws supplied.
 - **Do not mount onto the PVC supplied attachment first.**
- Each of the four "corners" of the Bird Spider Boat Base has holes.
- This makes it easy to "bungee" or tie down the base to the canopy top, cover, etc. ... and also allows for easy removal of this ideal boat protective device!

Bird Spider Sandbag Base:

- Use the Sandbag Base on Boats where the Bird Spider Boat Base is not appropriate (i.e. Bimini Tops and larger areas).
- Attach the Bird Spider Base directly to the Sandbag Base with the screws supplied with Sandbag Base. Follow instructions supplied with screws. **(Screws used for the PVC attachment will not work with the Sandbag Base.)**
 - Do not mount onto the PVC supplied attachment first
- Although the Bird Spider Sandbag Base is weighted, it should always be secured to the boat.
- High winds or extreme shifts in weather could remove the Sand Bag Base and cause damage if it is not properly secured.

6. If installing more than one Bird Spider in a row, be sure that they are installed 6-8" from arm tip-to-arm tip (not base-to-base).



Any Questions Regarding
Bird Spider Installation:
Call **1-800-392-6915**

Bird•B•Gone, Inc.
Ph. 949-472-3122
FAX: 949-472-3116
Email: nobirds@birdbgone.com
www.birdbgone.com

