

Wildlife Aircraft Strike Hazard (WASH) Plan
for Yuma Proving Ground Laguna Army
Airfield in Yuma, Arizona



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Table of Contents

1.0 Introduction.....	5
1.1 Purpose.....	5
1.2 Applicability.....	5
1.3 Conditions of Execution.....	5
2.0 Background.....	5
2.1 General	5
2.2 Airfield Description.....	5
2.3 General Flight Operations at LAAF.....	6
2.4 Current Wildlife Hazard Monitoring and Management Activities at LAAF	7
3.0 Wildlife Hazard Assessment 2017-2018 Summary.....	8
3.1 Attractants	8
3.1.1 On LAAF	8
3.1.2 Within 8 km of LAAF	8
3.2 Hazards.....	10
3.2.1 Mule Deer	11
3.2.2 Vultures and Ravens.....	11
3.2.3 Coyotes and Foxes.....	12
3.2.4 Birds of Prey (Hawks, Falcons).....	13
3.2.5 Rabbits (Black-tailed Jackrabbit, Desert Cottontail).....	14
3.2.6 Waterbirds (Ducks, Grebes, Coots).....	14
3.3 Recommendations	16
4.0 Reporting Wildlife Aircraft Strikes	19
5.0 Legal Status.....	20
5.1 General	20
5.2 Federal Regulations – FAA Safety	20
5.3 Federal Regulations – Natural Resources/Wildlife Protection	20
5.4 State Regulations – Natural Resources/Wildlife Protection	21
6.0 Organizational Tasks and Responsibilities.....	21
6.1 General	21
6.2 Tasks & Responsibilities Assigned.....	21
7.0 BASH/WASH Wildlife Management Resources	25
APPENDICES	27
APPENDIX A. The Wildlife Hazard Management Plan (WHMP) Checklist, 14 CFR 139.337 (f)	27
APPENDIX B. Laguna Army Airfield Project Area	34
APPENDIX C. Wildlife attractants (wildlife activity hotspots) identified directly on the Laguna Army Airfield at YPG, 2017.	35
APPENDIX D. Wildlife attractants documented within an 8 km radius of the Laguna Army Airfield at YPG, 2017.	36

APPENDIX E. Hazardous Wildlife Control and Avoidance Techniques	37
APPENDIX F. Wildlife Watch Warning System	41
APPENDIX G. Wildlife Detection Dispersal Team (WDDT) Procedures.....	43
APPENDIX H. BASH/WASH Self-inspection Checklist	45
APPENDIX I. Authorized BASH/WASH Equipment List	47
AUTHORIZED BASH EQUIPMENT LIST.....	47
NOTE:	47
Munitions	47
APPENDIX J. BASH/WASH Deployment Kit	52
APPENDIX K. Wildlife Strike Reporting Instructions <i>for Aircraft Personnel</i>	53
Federal Aviation Administration	56
APPENDIX L. Wildlife Strike Reporting Instructions <i>for YPG Wildlife Biologist</i>	3
APPENDIX M. Guidelines for Assembling BASH/WASH Collection Kits.....	5
APPENDIX N. BASH/WASH Video List.....	7
ATTACHMENTS.....	8
ATTACHMENT 1. Guidelines for Using Effigies	8
ATTACHMENT 2. FAA Recommended Wildlife Exclusion Fencing	11
Date: 08/03/2016 No. 16-03	11
1. Purpose.	11
2. Cancellation.	11
3. Background.....	11
4. Recommendations.	11
ATTACHMENT 3. Low-level Flight BASH/WASH Considerations.....	14

1.0 Introduction

1.1 Purpose

This Wildlife Hazard Management Plan (WHMP) provides a base program designed to minimize the potential risk of a wildlife strike to aircraft, airport structures and equipment and human health posed by populations of hazardous wildlife on and around Laguna Army Airfield (LAAF) at Yuma Proving Ground (YPG). This WHMP provides procedures, guidance and defines responsibilities for proper execution of wildlife management at LAAF. The WHMP identifies hazardous wildlife attractants on or near the airport and the appropriate wildlife damage management measures to minimize the wildlife hazard. In addition, the WHMP prioritizes these management measures. This plan was developed from data collected and analyzed in the Wildlife Hazard Assessment titled, “Wildlife Aircraft Strike Hazard (WASH) Assessment 2017-2018 for Yuma Proving Ground Laguna Army Airfield in Yuma, Arizona” (Clark and Ingraldi 2018). The assessment summarizes wildlife data collected within an 8 km radius of LAAF for a 12-month period during 2017-2018. This WHMP is designed to:

1. Establish a Wildlife Hazard Working Group (WHWG) and designate responsibilities to its members. The group’s meetings may be combined with airfield operations board or airfield safety council.
2. Establish procedures for reporting wildlife aircraft strikes.
3. Develop procedures for monitoring and recording wildlife hazards.
4. Establish procedures for reporting wildlife hazards and altering or discontinuing flying operations.
5. Establish management techniques to decrease airfield attractiveness to wildlife, and eliminate or reduce environmental conditions that attract wildlife to the airfield.

1.2 Applicability

This plan applies to personnel assigned to or associated with airfield operations, including personnel involved in maintenance of the airfield and flying operations at LAAF.

1.3 Conditions of Execution

This plan is based on hazards posed by both resident and seasonal wildlife populations. Portions of this plan must be implemented on a continuous basis, while others will only require implementation in the event of increased wildlife activity. Increased wildlife activity is usually associated with the arrival of migratory and/or wintering species at LAAF. *The Wildlife Hazard Management Plan (WHMP) Checklist, 14 CFR 139.337 (f)* was used as a guiding document when preparing this plan ([APPENDIX A](#)).

2.0 Background

2.1 General

The WASH program management is an ongoing process, which includes both information dissemination and active/passive wildlife control techniques and tactics.

2.2 Airfield Description

Name of Airfield: Laguna Army Airfield (LAAF)

Name of Army Installation: Yuma Proving Ground

Name of Runways: 06/24 and 18/36

Location: Yuma County; Yuma, AZ ([APPENDIX B](#))

Airfield/Heliport Size: 11 acres

Airfield/Heliport Elevation: 433 feet above sea level

General Topography: The airfield is located within the Lower Colorado River Valley subdivision of the Sonoran Desert scrub biotic community. The airfield is located in a low lying flat creosote-dominated expanse bordered by the following land features: to the west, the Imperial Hills and the more distant Colorado River riparian corridor; to the south, an open expanse of creosote-dominated flats, sand-dunes, the Laguna Mountains, Muggins Mesa, and privately owned agriculture lands; to the east, the Kofa Firing Range, and an open expanse of creosote-dominated flats; and to the north open expanse of creosote-dominated flats on BLM lands and YPG testing sites.

Significant Terrain Features: A dry wash/drainage with a culvert under taxiway E is present on east-southeast side of airfield; a shallow, dry wash/drainage borders the south edge of Laguna Lagoon just off the southwest corner of the airfield.

Lagoons/Sewage Ponds: Laguna Lagoon is located west-southwest side of the airfield among airport buildings; Kofa Lagoon is located at 3 km east of the airfield; Walker Lagoon is located 4 km south of the airfield; Howard Lagoon is located 3.5 km southwest of the airfield; Walker Brine Pond is located 2 km south of the airfield.

Developed Areas: Howard Cantonment is located 3 km from the airfield; Walker Cantonment is located 2 km from the airfield; Kofa Cantonment is located 4 km from the airfield.

Vegetation Across YPG: The vegetation across YPG is characteristic of the Lower Colorado River Valley subdivision of the Sonoran Desert biotic community. This vegetative community is characterized by drought-tolerant plant species such as creosote (*Larrea tridentata*), bursage (*Ambrosia* sp.), paloverde (*Cercidium* sp.) and several cactus species (e.g., *Opuntia* sp. and *Carnegiea gigantea*). The broad, flat and sparsely vegetated desert plains of the YPG region are dissected by numerous incised washes that additionally harbor ironwood (*Olneya tesota*), smoketree (*Psoralea arguta*), acacia (*Acacia greggii*), mesquite (*Prosopis* sp.) and numerous shrub species. More elevated hills and mountain slopes contain vegetation similar to the Arizona Upland Subdivision of the Sonoran Desert with beargrass, cacti and agave species.

Airport Vegetation: Included within the 8 km radius, are scattered occurrences of ocotillo (*Fouquieria splendens*), mesquite (*Prosopis* sp.) in drainages, saltcedar (*Tamarix* sp.) and other tall and short ornamentals among cantonment, residential and commercial areas.

Landfill: YPG Landfill located 3.5 km northeast of the airfield.

Golf Course: Privately owned golf course is located 6 km west of the airfield.

Other Potential Wildlife Attractions: Colorado River riparian corridor is located a minimum of 4.5 km from the airfield.

2.3 General Flight Operations at LAAF

LAAF is the primary airfield of the Yuma Proving Ground. The airfield's mission is to provide test support and administrative aviation resources for the accomplishment of Research, Development, Test and Evaluation (RDTE) programs assigned to the Army Test and Evaluation Command (ATEC). The bulk of the airfield functions (flight operations, air traffic control tower, aircraft maintenance and servicing) are contracted. Other staff include 10 DOD personnel (pilots, airfield manager, quality control specialist and electronic technician) and fall under the ATEC TDA.

Laguna AAF also provides aviation support to tenant and transient training activities. Laguna AAF consists of a north-south (18/36) runway which is 6,118 feet long by 150 feet wide; an east-west (06/24) runway which is 6,000 feet long by 100 feet wide; connecting taxiways; parking aprons; a cargo loading apron; three

maintenance hangars; shade structures; aircraft services (LOX, JP-8 and 100LL); various ground support equipment; and limited transient aircraft maintenance. All runways and most taxiways are of asphalt construction.

The airfield is classified Restricted – Official Business Only. The airfield is closed to all transient aircraft that do not have official business at or near the Yuma Proving Ground installation.

Aircraft organic to the airfield include four UH-60, Blackhawk, helicopters; three C-27, Spartan, airplanes; three CASA 212 airplanes; and one Cessna Caravan 208B airplane. Visiting aircraft include, but are not limited to, C-130, Hercules and C-17, Globemaster III cargo airplanes; V-22, Ospreys; several types of unmanned aerial systems (UAS); and various U.S. Marines Corps helicopters and airplanes.

2.4 Current Wildlife Hazard Monitoring and Management Activities at LAAF

Monitoring

Airfield personnel are trained to continuously monitor the airfield for potential hazards to flight. Potential hazards are noted in the daily logs maintained by the Tower and Flight Operations.

Flight Operations performs a runway check every day for foreign object debris (FOD) on or near aircraft movement areas prior to commencing flight operations for the day. This check includes, but is not limited to, checking for wildlife hazards on the airfield and residuals from wildlife strikes.

A wildlife hazard warning is included in the FAA Flight Information Publications on LAAF. It states “Wildlife hazard, wild horses and burros may be on airfield, use extreme caution during flight operations.” Hazard reports should contain the five W’s, including who, what, when, where and why.

The Tower or Flight Operations makes the final call that the runways and taxiways are clear for the Division Chief and Airfield Manager.

Management

Vegetation management is scheduled quarterly with the garrison Directorate of Public Works (DPW) to remove any vegetation on runways, taxiways, ramps and shoulders or around lighting. Vegetation within 50 feet of runways, taxiways and ramps is removed if deemed a hazard by flight operations. Managing height of vegetation varies depending on the vegetation’s distance from the runways and taxiways and whether the vegetation is located in flight paths or adjacent to flight paths. Flight operations determines what vegetation is considered a hazard per FAA and Army guidance and schedules the appropriate action. In the past, DPW Environmental has recommended thinning vegetation near the airfield to avoid providing shelters for wildlife and flight operations acts on those recommendations.

Aside from scheduled vegetation management, ad hoc management actions are taken as needed. For example, periodic storm damage that produces FOD on or near aircraft movement areas is promptly removed.

DPW Operations and Management maintains all lagoons on YPG. LAAF personnel has no role in the management of the lagoons on YPG, however, if a perceived threat from birds or other wildlife from activity near the lagoons, flight operations will inform DPW Environmental of the situation.

DPW Operations and Management Operations and Maintenance maintains LAAF’s perimeter fence and security personnel inspect the perimeter fences periodically. Breaches in the perimeter fence are reported through a service order through DPW for repairs.

The YPG Landfill is managed by DPW Operations and Maintenance.

3.0 Wildlife Hazard Assessment 2017-2018 Summary

3.1 Attractants

Wildlife attracts located directly on LAAF ([APPENDIX C](#)) and within 8 km of LAAF ([APPENDIX D](#)) were identified and mapped when conducting the 2017-2018 WHA.

3.1.1 On LAAF

1. Laguna Lagoon

Laguna Lagoon regularly attracts the highest diversity and abundance of birds in the immediate vicinity of LAAF. In particular, this lagoon attracts some of the highest concentrations of waterbirds and shore/wading birds in the immediate vicinity of LAAF. The open bodies of water provide ideal habitat for birds (particularly waterbirds, shore/wading, nighthawks, doves and swallows) to feed, loaf and shelter. The largest concentration of bird use was observed during fall and winter. And similar to the Howard and Walker lagoons, this lagoon provides one of the few permanent water sources where birds can drink in an otherwise arid desert landscape. In addition, the highest number of mammal species were detected on camera H adjacent to the Laguna lagoon.

The southwest corner of the LAAF, including the approach end of runways 06 and 36, receives the most bird activity relative to the other runways (approach end 24 and 18) on LAAF. This higher bird activity is most likely the result of its closer proximity to Laguna Lagoon. Occasionally, birds fly across the runways on the southwest corner of LAAF from Laguna Airfield toward Walker Cantonment, Walker Lagoon and/or Howard Lagoon to the south, and vice versa.

Laguna Lagoon attracts fewer birds than Walker and Howard lagoons, especially fewer large-bodied waterbirds and shore/wading birds. There were likely fewer birds at Laguna Lagoon than the Walker and Howard lagoons due to its smaller surface area of perennial water and the higher amount of human activity in the vicinity of Laguna Lagoon. The smaller amounts of water, smaller pond size, and the higher number of people present near Laguna Lagoon make Laguna Lagoon less attractive to birds than other sources of perennial water within the project area.

2. Human-made Airport Infrastructure

Birds were most frequently detected on and among human-made airport infrastructure (e.g., buildings, lagoons, electrical poles, electrical wires, fences, signs, airport displays, water tower and hangars) on the west and east sides of LAAF, versus in the more open vegetated areas of the airfield proper dominated by semi-open creosote, ocotillo, mesquite and palo verde. Small bodied birds (particularly various songbirds) most often were observed perching on electrical lines, on airport displays, building tops, electrical poles and the lagoon fence among the building, particularly on the southwest and west side of LAAF.

3. Isolated Perches immediately on or adjacent to LAAF

Birds of Prey (American Kestrels and Red-tailed Hawks) were occasionally observed perching on electrical poles and airport signs in the mid-field. Red-tailed Hawks were also observed infrequent but on more than one occasion perching on natural features including robust ocotillo in the mid-field and on the ground on a hillside just northeast of approach end of runway 24.

Birds of Prey (Red-tailed Hawk) were regularly observed perching on electrical poles in the flat lands located outside of the LAAF perimeter fence yet in view of the LAAF. This species was also regularly observed perching on two water-towers in view of the LAAF airfield including the LAAF water-tower and the Walker water-tower. A pair of Red-tailed Hawks have been known to build a nest nearly every year on the LAAF water-tower.

3.1.2 Within 8 km of LAAF

1. Walker Lagoon and Howard Lagoon

Various guilds and sometimes large numbers of birds (>50) were documented regularly at the Walker and Howard lagoons. These lagoons attract the highest occurrences of waterbirds and shore/wading birds in the vicinity of LAAF. These large, open bodies of water provide ideal habitat for birds (particularly waterbirds, shore/wading, nighthawks, doves and swallows) to feed, loaf and shelter. The largest concentration of bird use was observed during fall and winter, with notably large concentrations northern shovelers using these lagoons in winter. In general, these lagoons provide one of the few permanent water sources where birds can drink in an otherwise arid desert landscape. No mammals were detected inside the perimeter fences of these facilities, indicating that the construction features and maintenance on the perimeter fences surrounding these lagoons are satisfactory for excluding mammals.

2. YPG Landfill

Turkey Vultures, Common Ravens and coyotes were regularly observed and documented congregating at the YPG Landfill. The YPG Landfill was identified as an attractant that regularly attracts a notable amount of wildlife.

3. Hwy 95, Martinez Lake Road, Laguna-Imperial Dam Road

Hwy 95, Martinez Lake Road and Laguna-Imperial Dam Road encircle LAAF. These three roads are heavily traveled (especially Hwy 95), primarily by local YPG workers and seasonal tourists, and have the potential to attract and concentrate scavengers (especially coyotes, Common Ravens and Turkey Vultures) to the vicinity of LAAF when wildlife are struck on the roads. During 2017, wild burro scat was occasionally detected on these three roadways indicating that burros cross these roads on occasion. Only one vehicle collision with a burro was reported during 2017; however, other collisions may have occurred but were not reported to YPG personnel. A herd of burros were observed on two incidental occasions on the east side of Hwy 95 but they were well away from the road right-of-way (greater than 100 m from the road). These roadways may naturally attract Turkey Vulture and Common Raven as they opportunistically search for carcass along these roads. Overall, the low frequency and number of roadkill detected along these three roads within 8 km of LAAF indicated that these roadways do not pose a regular threat for attracting hazardous wildlife. However, two areas located just outside of the 8 km area may be at increased risk of attracting wildlife. These areas are located at within 9 km of LAAF and include the following:

a. *Martinez Lake Road Drainage*

A notably dense concentration of burro scat were regularly observed on the northwest end of the Martinez Lake Road route immediately just outside of the 8 km radius of LAAF, where a major wash crosses Martinez Lake Road, indicating that wild burros frequently cross this road in this particular area (Figure 19). Due to this potential high activity area, burros and vehicles using this particular area on Martinez Road are at increased risk of colliding and thus attracting wildlife scavengers.

b. *Hwy 95 – Southeast of LAAF*

A notably high number of roadkills were detected just immediately outside of the 8 km radius of LAAF on the southern end of Hwy 95 (Figure 19). The undulating topography in this area likely serves as a wildlife corridor that concentrates wildlife on this section of road. Due to this high activity observed, this particular area on Hwy 95 is at increased risk of attracting wildlife scavengers.

4. Hwy 95 – East and Northeast of LAAF

While conducting bird point count surveys on LAAF, occasionally Turkey Vultures and Common Ravens were observed soaring in the vicinity of Hwy 95 due east and northeast of LAAF. It is likely that Hwy 95 naturally attracts these species as they opportunistically search for carcasses along the road.

5. Howard Cantonment Tree Patch

A small group of Turkey Vulture were documented roosting in a tall, relatively dense stand of Tamarisk trees located at the entrance of Howard Cantonment. However, their roosting behavior was documented on only one occasion through an incidental observation; no standardized surveys were conducted in this area. This dense stand of tall trees has the potential to supporting small and large flocks of roosting birds such as Vultures, Ravens, Grackles, Starlings and Blackbirds.

6. Walker Brine Pond

Only pair of Black-necked Stilts were detected using this pond during the summer. No other notable wildlife activity was noted at this pond. It is likely that the brine conditions make this feature unattractive to wildlife.

7. Kofa Lagoon

This site has the potential to attract wildlife given it is a lagoon providing an open water source for waterbirds and other wildlife. However, surveys were not conducted at this lagoon due to limited access and time, and the low potential to detect wildlife in notable numbers. In the future, this site should be evaluated for its wildlife use given it is located within 8 km of LAAF.

8. Colorado River Riparian Corridor

The majority of the Colorado River riparian corridor lies outside of the 8 km area except for a small portion on the southeastern extent of this corridor falls within the 8 km radius of LAAF. In general, this corridor regularly attracts a diverse assemblage and large number of birds (waterbirds, shorebirds/wading birds and various other bird guilds). Only a small number of roadkill were detected here and they involved small bodied wildlife. No standardized bird surveys were conducted in this corridor during 2017 because of it was identified as low priority relative to other potential wildlife attractants located closer to LAAF. One Least Bittern was observed on the LAAF proper during summer 2017. It is believed that this individual incidentally landed on the LAAF tarmac, possibly mistaking the tarmac as an open water source. LAAF is susceptible to attracting various waterbirds incidentally into its air space on the occasion, because of its proximity to the Colorado River riparian corridor and the innate nature of the tarmac structure typical of airfields that may be incidentally perceived by waterbirds and waterfowl as open water on occasion.

9. Distant Mountains Surrounding LAAF

During winter, large kettles of Turkey Vulture were observed along two particular mountains more distant from LAAF: west-southwest of LAAF among the Imperial Hills, and far south of LAAF among the Laguna Mountains. Thermals along these mountain ridges provide thermals that sometimes supported large concentrations of Turkey Vultures. During January and February, large concentrations of Turkey Vulture (typically around 50 individuals) were observed more frequently soaring over and in the immediate vicinity of LAAF. Between 30 January and 6 February, Turkey Vultures were in such high densities that this bird species posed a threat to air flight; pilots actively using the airfield were alerted about high bird presence within the airfield space by LAAF Field Operation Flight Tower personnel. Turkey Vulture concentrations during winter are at an increased risk of entering the airspace of LAAF.

3.2 Hazards

The following is a summary of the bird/wildlife strike hazards identified from the WASH assessment (Clark and Ingraldi 2018). Associated with each hazard (individual species or a group of species) are general behavioral characteristics of the species/group, recommendations for avoiding and/or controlling the species/group, the legal status of the species/group, and the threat level assigned to each species/group at this time. The hazard level assigned to each group at LAAF was based on a combination of factors including overall size of the animal, behavior in response to aircraft, numbers detected, frequency of detection, occurrence directly on LAAF and/or within the 8 km radius of LAAF and the relative hazard that each group poses to

aircraft as identified by the FAA 2013 list *2013 Federal Aviation Administration (FAA) Advisory Circular 150/5200-32B Reporting Wildlife Aircraft Strikes*. See table listing top 50 wildlife hazards Online at: https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1021289 Below is a list of the few wildlife species detected directly on LAAF that pose a direct risk threat:

3.2.1 Mule Deer

General Behavior – Mule deer are generally browsers, preferring to feed on tender twigs, bark buds, leaves and nuts of shrubs and trees of mostly broad-leaved shrubs and trees, rather than on grasses and forbs. Most often they feed on mountain-mahogany, buckbrush, cliffrose, sagebrush, buckthorn, juniper and oak. They are most active at dawn and dusk, although human activity may cause them to shift to feeding more at night. The primary predators of deer are coyotes, bobcats and mountain lion in Arizona. Deer can occur single, or in small or large groups, depending on the time of year.

Avoidance & Control – A chain-linked perimeter fence should be erected around the airfield to exclude coyotes and foxes. The fence should have the following specs: 8-10 feet tall, buried 4-ft skirt and consist of 3-strand barbed-wire outriggers. Regularly maintain the perimeter fence around the airfield. Install cattle guards at gate entrances in the airport perimeter fence in instances where gates will remain open to readily allow traffic to move freely between the inside and outside of the perimeter fence daily. Control growth of broad-leaf weeds, shrubs and trees. The presence of these plants well outside of the airport perimeter fence will serve to draw these animals from the airfield. Use flashing lights, sirens, pyrotechnics or propane cannons to frighten these animals. Reduce denser stands of brush or trees on airfields that deer can hide among. Trapping of deer to remove them from the airfield can be effective. If trapping is to be used, coordinate with base natural resources personnel on permit requirements.

Legal Status – Deer are protected in all states. In Arizona, persons wishing to take deer outside of the normal hunting season must have an Arizona depredation permit. Depredation permits are issued by the Arizona Game and Fish Department.

Threat Level – Mule deer are very large bodied and are largely crepuscular, and therefore pose a high threat to aircraft at LAAF. Although mule deer were only detected in low numbers (approximately two individuals total) and for a short period of time during January directly on LAAF, they can access the airfield again at any time given the infrastructure in place is not sufficient for keeping them off of LAAF.

3.2.2 Vultures and Ravens

General Behavior – The Turkey Vulture is a scavengers that specialize in feeding on carrion and frequently use thermals to search for prey and are attracted to landfills. Vultures become active during mid-morning and remain aloft until late afternoon. Vultures can occur single, in small groups or in very large groups; both low numbers and high numbers pose a threat.

The Common Raven is an opportunistic generalist eating a variety of live prey, carrion and garbage. Ravens are common in open areas and around landfills, and will frequently use thermals and loaf around human infrastructure. These birds typically occur single or with a mated pair and rarely occur in larger groups unless a food source or limited roosting location attracts them.

Avoidance & Control – Aircraft should use caution in areas with thermal generating terrain such as ridgelines, rolling hills and large bodies of water. Extra precaution should be taken when flying during mid-morning through late afternoon to avoid soaring birds and around sunset when these birds return to roost sites. Reference the online BAM and AHAS for bird hazard information associated with waterfowl migration and low-level routes when planning aircraft flight schedules. Landfills and trash receptacles should be properly managed to reduce available feeding, loafing and roosting sites for ravens and vultures. Eliminate roosting sites for these species by managing tall, dense tree patches. Pro-actively removing dead animals within at least an 8 km radius of the airfield will help control numbers of these birds. Reduce perching sites around the airfield by removing

snags (dead standing trees) and restrict access to other perching such as signs, poles, roof tops, etc. through removal of this infrastructure (if no longer in use) and use anti-perching devices. For example, cap utility poles with sheet metal cones or porcupine wire. Use pyrotechnics (primarily shell crackers, bird bangers and screamers) to frighten vultures and ravens from the airfield. Vulture effigies can be used to disperse roosts and loafing sites of vultures and ravens.

Legal Status – All vultures are protected by the Migratory Bird Treaty Act. These laws strictly prohibit the capture, killing, or possession of hawks, owls, or eagles without a special permit. No permits are required to scare migrating birds that are causing damage except for endangered or threatened species (50 CFR 21.41).

Threat Level – High for vultures at YPG; Medium for ravens at YPG. Thermals generated from the adjacent mountain ridgelines surrounding the LAAF naturally attract vultures and ravens. Turkey Vultures pose a high threat to aircraft because of their large body size, soaring behavior and the high altitudes at which they can fly. Especially, during winter (particularly January and February), larger concentrations of vultures pose a threat at YPG. The largest concentrations of vultures (range=50-190 individuals per survey day) occurs during the winter (particularly during January and February) at YPG. However, most kettles of this size were observed greater than 800 m from LAAF. Only on a few occasions were kettles containing up to 50 individuals documented within the more immediate airspace of LAAF during the winter. On one occasion, while conducting standardized surveys, a kettle with at least 50 individuals was detected within 175 m of LAAF during February. And, on occasion, the densities of vultures between 30 January and 6 February were in such high densities that pilots actively using the airfield were alerted about high bird presence within the airfield space by flight tower personnel. Vulture numbers are relatively low (range=0-6 individuals; average=1 individual/day) during the spring/summer and fall seasons at YPG based on standardized survey counts located on the LAAF. Note, both ravens and vultures are attracted to the YPG landfill which is located 3.5 km northeast of the LAAF. YPG landfill personnel reported that approximately 10-12 individual vultures use the landfill daily from approximately February through October. Both species were reported to loaf on edges of the landfill opening and feed on the food scrapes in the landfill and soar around the landfill. The Common Raven poses a moderate threat at LAAF because of their large body size and numbers are of only moderate concern. Numbers of individual raven detected in the vicinity of LAAF were low (range=1-9 individuals on three occasions total) during standardized bird surveys across all seasons. However, YPG Landfill personnel report that approximately 30 individual ravens use the landfill daily during all seasons.

3.2.3 Coyotes and Foxes

General Behavior – Coyotes are opportunistic, omnivores that often eat a variety of rodents (e.g., rabbits, mice, voles, kangaroo rats, squirrels) as well as young deer, birds, snakes, lizards, fish, insects, fruit, berries mesquite beans and acorns. Coyotes are most active at night and during early morning hours but can be active at any time of the day. Coyotes are notorious for digging under fences and entering airfield through culverts, gates and gaps in gates.

Kit foxes are primarily carnivores that mainly eat rodents and rabbits. Kit foxes will also eat birds, snakes, lizards, insects and cactus fruit. Kit fox prefer sandy areas and are almost exclusively nocturnal and burrow underground during the day. Both coyotes and foxes will scavenge on carrion. Dens may be found in banks, culverts or other suitable areas.

Avoidance & Control – A chain-linked perimeter fence should be erected around the airfield to exclude coyotes and foxes that have the specifications: 8-10 feet tall, buried 4-ft skirt and consist of 3-strand barbed-wire outriggers. Regularly maintain the perimeter fence around the airfield. Maintain vegetation at short heights to reduce rabbit and other rodent populations. Remove carcasses within an 8 km radius of the airfield in a time sensitive manner to avoid attracting these carrion feeders to the carcass. Use pyrotechnics to frighten these species. In the desert Southwest, removing denser concentrations of vegetation, in the vicinity of the airfield which provide traveling corridors or loafing areas, will deter coyotes from concentrating in or traveling through particular areas. Reducing the number of culverts and hillsides on or near the airfield may reduce suitable den

sites. Use of gas cartridges for den fumigation can be effective. Occasional shooting of individual animals will also reduce their numbers. If fumigation or shooting is to be used, coordinate with base natural resources personnel on permit requirements.

Legal Status - Both the coyote and kit fox are listed as fur-bearing mammals by the Arizona Game and Fish Department. Both species can be controlled as nuisance and depredating species given they are listed as fur-bearing animals. In Arizona, persons wishing to take coyote or kit fox outside of the normal hunting season must have an Arizona depredation permit. Depredation permits are issued by the Arizona Game and Fish Department.

Threat Level – High for coyotes at YPG; Moderate for foxes at YPG. Coyotes are large bodied and frequently detected on the LAAF while conducting standardized surveys, and therefore pose a notable threat to aircraft. Coyotes are regularly attracted to the YPG Landfill. YPG landfill personnel reported observing 10-12 individual coyotes daily throughout the year at the YPG Landfill. Foxes are medium sized animals and numbers were determined to be relatively low while conducting standardized surveys, and therefore they only pose a moderate threat to aircraft at this time.

3.2.4 Birds of Prey (Hawks, Falcons)

General Behavior – Most birds of prey can be particularly hazardous to aircraft because of its large body size and variable flight behavior at different heights above ground frequently soaring at very high altitudes. Red-tailed Hawks frequently use thermals to travel to hunting sites. These birds become active at least by mid-morning when thermals are available. They typically occur single, in pairs, or with fledging young of the year. Red-tailed Hawks are opportunistic generalist but most often prey on small mammals (e.g., ground squirrels and rabbits), birds and reptiles. They spend most of their time perched (i.e., hunting or loafing) from a few select perches but can vary their hunting techniques depending on local food resource availability.

The American Kestrel is the smallest and most common falcon in North America. This species hunts by perching for long periods of time and scanning the ground for prey to ambush. However, this species also hunts from the air by hovering in the air with rapid wing beats while homing in on prey. The kestrel's diet typically consists of grasshoppers, other insects, lizards, mice and small birds (notably, sparrows). It nests in cavities in trees, cliffs, buildings and other structures.

Avoidance & Control – Aircraft should use caution in areas with thermal generating terrain such as ridgelines, rolling hills and large bodies of water. Aircraft personnel should watch for soaring hawks, particularly from mid-morning into the afternoon when thermals are well developed. Also, in the fall and spring, birds of prey migrate by day to areas of heavy winter concentrations in the southern states. Landfills and trash receptacles should be properly managed to help reduce rodent populations which will attract birds of prey to hunt in the area. Controlling rodent and insect numbers on the airfield and among the human infrastructure (e.g., buildings) surrounding the airfield will reduce hunting opportunities in the vicinity of the airfield for these birds of prey. Removing dead animals within at least an 8 km radius of the airfield in a time sensitive manner will help control numbers of some birds of prey; some species will feed on carcasses. Reduce perching sites in the vicinity of the airfield by removing snags (dead standing trees) and restrict access to other perching structures such as signs, poles, roof tops, etc. through removal of this infrastructure (if no longer in use) and use anti-perching devices. For instance, utility poles can be capped with sheet metal cones or porcupine wire. When particular nesting pairs become a concern and the location of the nest structure is known, the nest can legally be disassembled prior to the first egg being laid. Once the first egg is laid, the nest cannot be removed without lawful permission. Birds of Prey can be trapped and removed from the area; however, coordinate with base natural resources personnel on permit requirements. Note, for some territorial birds of prey, such as Red-tailed Hawks, removing an active nesting pair from a site will likely be ineffective for the long-term given other birds of prey (e.g., another nesting pair) will likely fill the emptied niche shortly thereafter. Use pyrotechnics (primarily shell crackers, bird bangers and screamers) to frighten these birds of prey from the airfield.

Legal Status - All birds of prey are protected by the Migratory Bird Treaty Act. These laws strictly prohibit the capture, killing, or possession of hawks, owls, or eagles without a special permit. No permits are required to scare migrating birds that are causing damage except for endangered or threatened species (50 CFR 21.41). State and local laws should be consulted, however, before any control measures are taken. State and federal permits are required to trap and relocate and/or shoot offending birds of prey. Trapping, relocating and shooting should be done by authorized personnel only.

Threat Level – High for the Red-tailed Hawk at YPG. Low for the American Kestrel at YPG. Red-tailed Hawks can be particularly hazardous to aircraft because of their large body size and variable flight behavior at different heights above ground frequently soaring at very high altitudes. A resident, year-around, pair of Red-tailed Hawks attempt to nest almost every year on LAAF water tower. This pair of hawks was observed hunting, roosting and loafing on and adjacent to the LAAF during almost every survey day. They were most frequently observed perched on the LAAF water tower where they nest during the spring/summer, the Walker Cantonment water tower, soaring or flapping immediately outside the airport perimeter fence and perched on electrical poles outside of the airport perimeter fence. On a few occasions these birds were observed flying over the airfield space proper, perched on the Air Delivery Building, perched on ocotillo in the mid-field and perched on the ground on the hillside on the east side of the airfield. This pair of birds spent most of their time perched when present in the immediate airfield space of LAAF, based on data collected during standardized surveys. These particular birds and airport personnel seem to be aware and acclimated to one another. It is unknown how offspring of this pair interact with aircraft, given these interactions were not observed during the 2017 survey efforts (i.e., active nesting was not observed). Red-tailed Hawks have occasionally been observed soaring over the YPG Landfill. The American Kestrel poses a low threat to aircraft at LAAF because their numbers are low at LAAF at this time. The American Kestrel was detected only two times on LAAF during standardized surveys.

3.2.5 Rabbits (Black-tailed Jackrabbit, Desert Cottontail)

General Behavior – Rabbits can be a direct threat to aircraft on the runway, and in addition often attract other large bodied predators, including hawks, falcons, owls, snakes, bobcats and coyotes. Rabbits are herbivores that mainly live underground. The black-tailed jackrabbit diet is composed of shrubs, small trees, grasses, forbs and cacti. The desert cottontail diet primarily consists of forbs and grasses; however, they will also eat cacti and feed on the leaves and peas of mesquite, fallen fruit, pads of prickly pear, various cacti and twigs of shrubs. Cottontails rarely drink and free water does not appear to be required for their survival.

Avoidance & Control – Proper grass management (maintaining short vegetation and minimizing weed seed management) will reduce the numbers of these animals on airfields. Adequate fencing will help keep them off of runways. Shooting rabbits with a .22 rifle can reduce populations for several subsequent years. Trapping can also be effective for reduction of populations. If shooting or trapping is implemented, coordinate with base natural resources personnel on permit requirements.

Legal Status – Rabbits are classified as small game animals by the Arizona Game and Fish Department. If shooting is the method employed, consult appropriate authorities and permits before using this method. An AGFD hunting license may be required and an exemption from the ¼-mile firearm discharge rule may be needed.

Threat Level – Moderate for jackrabbit and cottontail at YPG. Both jackrabbit and cottontails were frequently observed while conducting standardized surveys on LAAF and infrequently encountered during roadkill surveys. The regular presence of rabbits are likely attracting coyotes and kit foxes onto the LAAF.

3.2.6 Waterbirds (Ducks, Grebes, Coots)

General Behavior – These species are attracted to water, particularly if these areas contain emergent or submerged vegetation for feeding, nesting and/or shelter. Dabblers feed in shallow water and their diet primarily consist mostly of aquatic plants and insects. Divers feed in deeper water and typically eat more fish, aquatic insects and crustaceans. Coots are omnivores that feed on a variety of foods including aquatic plants,

arthropods, tadpoles, fish and aquatic insects; however, their principal source of food is aquatic vegetation, especially algae.

Avoidance & Control – Control is best accomplished by removing fish-producing ponds near the airfield. However removal of fish food sources are not always possible especially when particular fish species are needed to manage mosquito populations. When possible, drain water sources after ensuring compliance with wetlands laws and regulations. Sewage treatment lagoons should be located as far from the runways and traffic patterns as possible. Steepening ditch and pond banks and removing vegetation will reduce dabbler and coot numbers. Grain fields may also attract waterfowl in large numbers and should be eliminated when possible. Use of live ammunition to frighten waterfowl can be effective. Use of pyrotechnics (e.g., shell crackers, screamers, and bangers), gas cannons, propane exploders, trained dogs and scarecrows can be effective control techniques for waterfowl. Waterbirds can be hazed using red or green laser lights. Install overhead wires (grid-wire system) and/or bird balls (floating balls) across lagoons pond may also be effective in reducing bird numbers. A distinction must be made between resident and migrating populations. Resident waterfowl are attracted to waterways for breeding and feeding. Resident birds are most active at dawn and dusk, moving at low altitudes to and from feeding areas, thus avoid flying near water sources with known waterfowl concentrations during these periods of the day. Resident waterfowl act as live decoys for migrating waterfowl and should not be allowed to linger on or near the airfield waterways during the peak waterfowl migration season. Migrating waterfowl are particularly dangerous to aviation due to the large numbers and generally higher altitude of the birds. Large flocks of waterfowl travel along traditional flyways to their breeding and wintering grounds during spring and fall; October and November are typically most hazardous. Huge flocks may stop along the route awaiting favorable weather conditions to continue. Migrating birds are most active from sunset through midnight, with numbers decreasing in the early morning hours. Avoid flying during the evening hours and limit flying during the peak of the migration season when possible. Wintering concentrations of waterfowl should be avoided by aircraft. Reference the online BAM and AHAS for bird hazard information associated with waterfowl migration and low-level routes when planning aircraft flight schedules. Because the Colorado River corridor is located within approximately 9 km of LAAF and supports a large riparian bird population, aircraft operators and field operations should remain alert and regularly be reminded of the potential for various species of waterbirds to occasionally present in the airspace on and adjacent to LAAF.

Legal Status - All waterbirds are protected by the Migratory Bird Treaty Act. These laws strictly prohibit the capture, killing, or possession of hawks, owls, or eagles without a special permit. No permits are required to scare migrating birds that are causing damage except for endangered or threatened species (50 CFR 21.41). State and local laws should be consulted, however, before any control measures are taken.

Threat Level – Moderate for waterbirds at YPG. These waterbirds can pose a high threat to aircraft because of their large body size, gregarious behavior and the high altitudes at which they can fly, especially during fall and winter at YPG. However, no waterbirds were detected directly on or crossing the LAAF. A relatively small number of waterbirds regularly used the Laguna Lagoon including Northern Shoveler, Ring-necked Duck, Ruddy Duck and Green-winged Teal. Total numbers during a given survey never exceeded six individuals. Most waterbirds were observed on the Howard Lagoon and Walker Lagoon, and numbers of shovelers occurred in the 100's during fall and winter. For instance, the high count for Northern Shoveler during one survey was 470 individuals at the Howard Lagoon and 301 individuals at the Walker Lagoon. However, total numbers of other waterbird species never exceeded 24 individuals at the Walker Lagoon and Howard Lagoon. In summary, low numbers of waterbirds were observed during all seasons on the Laguna Lagoon located adjacent to the airfield, and high numbers of waterbirds were regularly observed during fall and winter (October through February) at both Walker Lagoon and Howard Lagoon, which are located 3.5 km southeast and southwest of LAAF. It is likely that waterbirds fly among the Laguna Lagoon, Howard Lagoon and Walker Lagoon. And it is likely that waterbirds fly between the greater Colorado riparian corridor and these three lagoons. Aircraft personnel should be made aware of the potentially high numbers of waterbirds in the vicinity of these three lagoons during fall and winter.

3.3 Recommendations

The following is a summary of the WASH recommendations identified during the implementation of the 2017-2018 WHA.

1. Priorities should be given to the following actions, listed from the highest to least threatening

- Exclude large-bodied mammals including mule deer, coyotes and burros from entering the LAAF.
- Exclude/Reduce numbers of waterbirds and wading/shorebirds from Laguna Lagoon.
- Exclude/Reduce numbers of large-bodied wildlife such as Turkey Vultures, Common Ravens and coyotes from the YPG Landfill.
- Incorporate a time-sensitive communication warning system to alert pilots to threats posed by small and large numbers of large-bodied soaring birds including Turkey Vultures, Birds of Prey (especially Red-Tailed Hawks), Common Ravens and also large flocks of Swallows species when detected within the vicinity of LAAF.

2. Make repairs and renovations on the entire length of the LAAF perimeter fence

Purpose: Exclude large-bodied mammals such as coyotes, mule deer and burros in particular which currently pose a high risk hazard to aircraft

- Make basic fence repairs.
 - Mend existing holes, closing any gaps greater than 6 inches between adjoining fences and/or gates and fences.
- Renovate the fence to meet FAA airport specifications, particularly where it encircles LAAF.
 - Bury the fence 4 feet below the surface.
 - Install 3-strand barbed-wire outriggers.
 - See [APPENDIX E - Hazardous Wildlife Control and Avoidance Techniques](#) for FAA recommended wildlife exclusion fencing.
- Support the efforts underway to install a perimeter fence directly adjacent to and completely encircling LAAF.
 - Currently the perimeter fence surrounding LAAF is contiguous with the Walker Cantonement.
- Install a cattle guard designed for excluding deer at the intersection of Campo Avion Road and Barranca Road, given this intersection is used regularly by YPG personnel and thus needs to remain open on a regular basis.
- Implement regular (annual or bi-annual) maintenance on the fence.

3. Reduce bird perching opportunities on LAAF

Purpose: Deter birds from perching, nesting, roosting and loafing

- Install anti-perching devices on the Laguna Lagoon fence.
- Install anti-perching devices on sign posts, light poles and electrical poles in the infield.
- Remove any unused man-made structures from the infield (e.g., electrical and light poles, lights, signs).
- Continue to remove dense vegetation stands, and taller vegetation such as palo verdes, ocotillos, junipers, and mesquite.

4. Reduce wildlife corridors on and immediately adjacent to LAAF

Purpose: Remove vegetation corridors that enhance mammal movement or provide cover especially along the southeast corner of airfield in the vicinity of approach ends of runways 06 and 36

- Continue to remove dense vegetation stands.
 - Continue to balance the amount of vegetation removal with erosion control needed in the existing desert environment.

5. Create less attractive conditions at the Laguna, Walker and Howard sewage treatment lagoons

Purpose: Reduce the number of birds using these open water sources

- Continue to use and maintain pond liners in lagoons to minimize vegetation growth which would attract wildlife and lower long-term maintenance costs.
- Manage lagoons so that the surface of the water is less attractive or made unavailable for target birds (e.g., waterbirds and shorebirds/wading for loafing, feeding and nesting; perching birds looking for a

drinkable water source; swallows looking for feeding and drinkable water source, hunting hawks; scavenging vultures; and loafing ravens).

- If evapotranspiration rates are not impaired for treatment purposes, place bird balls (floating balls) on ponds in high densities. This will serve to reduce the number birds settling on the surface of the water.
 - Consider placing and testing floating balls on the Laguna Lagoon before placing balls on other lagoons (Walker, Howard and Kofa lagoons) to determine effectiveness and potentially avoid incidentally pushing birds from surrounding lagoons onto the Laguna Lagoon.
- If using floating balls, then continue to use overhead wires (grid-wire system) which typically have proven to be highly effective.
 - If overhead wires (grid-wire system) are to be retained, then make needed repairs (e.g., missing wires and poles), to deter target birds.
 - Consider raising the existing bird wires higher to (1) reduce tension and thus reduce chances of wires snapping and (2) allow for easier maintenance by increasing accessibility.
 - Consider spacing wires closer together in comparison to their current spacing, in an effort to deter target birds.
 - Consider hanging mylar flags/tape (reflective material) at high densities from the wires in an effort to deter target birds. The effectiveness reflective flags/tape at deterring wildlife tends to vary depending on the site conditions and the bird species; therefore, it is worth looking into this relatively low cost option and modifying the technique (changing types of reflective materials and spacing of materials) as needed.
- Reduce the size and/or shape of individual holding ponds at the Howard Lagoon and the Walker Lagoon to make them less attractive to waterbirds (e.g. ducks and grebes).
- Reducing the size and shape of ponds should be effective at decreasing the number of waterbirds at the lagoon given smaller bodies of water and linear bodies of water are less desirable to most waterbirds. Waterbirds feel more exposed to predators on smaller and linear bodies of water verses larger, nonlinear bodies of water, and the reduction in surface area will reduce the amount of space for loafing and amount of food resources available.
- Survey Kofa Lagoon to understand the level of wildlife use (particularly bird use) at this particular site and how it might affect wildlife use in the airspace around LAAF.

6. Create less attractive conditions at the YPG Landfill

Purpose: Reduce the number of vultures, ravens, coyotes and rodents currently using this area

- Work with YPG Landfill personnel to have food items shipped to an off-site landfill.
 - Up to this time, all types of trash including food items are received at the YPG Landfill. Consider using effigies at the YPG Landfill to deter Turkey Vultures. See [APPENDIX E - Hazardous Wildlife Control and Avoidance Techniques](#) for guidelines using vulture effigies.
- For more details on properly managing landfills near airports, see [APPENDIX E - Hazardous Wildlife Control and Avoidance Techniques](#).

7. Remove roadkill in a time sensitive manner

Purpose: Avoid attracting scavengers to carcasses in vicinity of airfield

- Once roadkill is detected or reported, remove large-bodied (e.g., wild burros, mule deer or bighorn sheep) roadkill within an 8 km radius from LAAF to remove carcasses in a time-sensitive manner.

8. Implement emergency communications and subsequent on-the-ground hazing/harassment when needed

Purpose: Disperse notable wildlife hazards that pose an immediate high threat (e.g., large numbers of individuals and/or hazard persists for notable periods of time) and/or interfere with time-sensitive aircraft operations

- Continue to implement a time-sensitive communication warning system protocol between LAAF Field Operations Flight Tower and pilots to alert pilots to immediate emergency wildlife hazards detected at LAAF.

- See [APPENDIX F – Wildlife Watch Warning System](#) for further guidance on establishing formal procedures to communicate Wildlife Watch Conditions (WWC), should they be needed in the future.
- Consider designing and implementing an on-the-ground hazing/harassment protocol when hazardous wildlife pose a high risk threat for sustained periods of time which warrant intervention.
 - Note, wildlife hazards observed during 2017, did not occur frequently nor pose a sustained threat for notably long periods of time and therefore regular hazing is not warranted at this time.
 - See [APPENDIX G – Wildlife Detection Dispersal Team Procedures](#) for further guidance on establishing procedures for establishing a Wildlife Detection Dispersal Team (WDDT) and guidance on procedures for dispersing known hazardous wildlife from the airfield.
 - See [APPENDIX H – BASH/WASH Self-inspection Checklist](#), [APPENDIX I – Authorized BASH/WASH Equipment List](#), and [APPENDIX J – BASH/WASH Deployment Kit](#) for more details on identifying components of a BASH/WASH reduction plan and authorized dispersal equipment lists.

9. Report wildlife strikes and document wildlife strike hazards

Purpose: Increase communication and awareness, provide formal procedure for reporting wildlife strikes, continue to assess hazards, and subsequently employ adaptive management

- Wildlife hazard issues should be a topic at all operational safety meetings.
 - Information sharing and communication between all vested parties (e.g., installations wildlife biologist, airport management, maintenance, ATC personnel, civilian and military pilots and ground operations) should be encouraged.
 - Encourage all vested parties to submit wildlife strike hazard reports.
- Establish a WASH/BASH Strike Reporting Station, making strike reporting kits available and any pertinent educational materials (e.g., bird strike posters).
 - Consult the DPW Environmental Office to determine where the WASH/BASH Strike Reporting Station will be located.
 - Reporting can help document the presence of wildlife strike hazards, wildlife hazard trends over time and ultimately help guide the wildlife strike hazard management to reduce potential hazards through increased awareness.
 - See chapter 4 Aircraft Strikes herein for more details.

10. Continue monitoring wildlife activity and use patterns on the airfield

Purpose: Increase communication and awareness, provide formal procedure for reporting wildlife strikes, continue to assess hazards, and subsequently employ adaptive management

- Airfield personnel should continue to monitor the airfield for potential hazards to flight and record hazards in the daily logs maintained by the Tower and Flight Operations.
- No full-time BASH/WASH team is warranted given the relatively low wildlife use (low diversity and density) observed on and adjacent to LAAF.
- In 10 years, re-survey bird and mammal activity patterns within 8-km of the LAAF.

11. Comply with INRMP, state and federal and local laws

- Any wildlife control and management measures should ensure compliance with other applicable state and federal laws and regulations. There are sensitive species that should be given lawful protection when they do occur.
- Prior to any control measure taking place (lethal or non-lethal), proper permits must be in place prior to conducting certain control activities. LAAF is responsible for adhering to all current regulations regarding the species to be managed, control activities and methods to be used, and for obtaining the appropriate permits to take and/or harass the species to be managed. All avian species observed on and around LAAF property during the course of this assessment, with the exception of the European Starling, Rock Pigeon and House Sparrow, are protected by either Federal or State regulations.

- See chapter 5.0 Legal Status herein for more details.

12. Keep hazard mitigation planning adaptable

- Wildlife control and management measures should be adaptive and may require implementing various techniques and changes to those techniques over time depending upon individual species, time of year and habitat utilization.
- See [APPENDIX E - Hazardous Wildlife Control and Avoidance Techniques](#) for a more complete list of various wildlife control and avoidance techniques that are currently applicable to LAAF.

13. Plan in advance for capital improvement needs

- Various management recommendations may require funding beyond what is currently available to the airfield. Thus, it is important to include activities in the airfield's Capital Improvement Program.
 - Look into AIP funding if applicable to Department of Defense lands to make capital improvements.

14. Consult important guidance resources

- See chapter 7 BASH/WASH Wildlife Management Resources herein for a list of these resources.

4.0 Reporting Wildlife Aircraft Strikes

The following steps should be followed if an aircraft strikes or aircraft is presumed to have struck wildlife.

1. The pilot should inform the Flight Control Tower and Base Operations of any wildlife strike.
2. If the pilot is airborne, he/she should land to assess the damage.
3. If the strike occurs on the ground, the pilot should stop the aircraft to assess the damage.
4. If an aircraft is damaged or an accident has occurred, consult reporting procedures outlined in the following Army Regulations (AR): AR 385-40, Army Accident Reporting; AR 385-10, The Army Safety Program; AR 95-1, Flight Regulations. All reportable aircraft damage is reported to the U.S. Army Combat Readiness Center at Fort Rucker with courtesy copies furnished through LAAF's chain of command to the U.S. Army Test and Evaluation Command.
5. Pilots should report wildlife strikes, both damaging and non-damaging.
6. Report all known or suspected strikes, even if no wildlife remains are found on the aircraft.
7. The pilot should try to retrieve and preserve the wildlife strike remains (including feather, hair, tissue, and/or blood) from the airfield or aircraft.
8. Any unpreserved wildlife remains should be removed from the airfield.
9. Aircraft personnel will report wildlife strikes using the [Wildlife Strike Reporting Instructions for Aircraft Personnel](#) provided in [APPENDIX K](#), which includes filling out the FAA Form 5200-7 Wildlife Strike Report Form therein.
10. Aircraft personnel will submit the 5200-7 Wildlife Strike Report Form to the YPG Environmental Sciences Division Wildlife Biologist. The YPG Wildlife Biologist is responsible for reviewing the strike report, mailing remains, and updating the FAA's NWSD. See [APPENDIX L](#) for the [Wildlife Strike Reporting Instructions for YPG Wildlife Biologist](#).
11. When strike reports are filed, it is important that all relevant information be provided on strike datasheets whenever possible. The YPG Wildlife Biologist should follow-up immediately with the recording when information is found to be incomplete.
12. Guidance for assembling a [BASH/WASH Collecting Kit](#) and instruction on procedures to safely collect wildlife remains can be found in [Appendix M](#).

5.0 Legal Status

5.1 General

Federal, State and Local laws are in place in order to protect most forms of wildlife and the habitats they occupy. Prior to any control measure taking place (lethal or non-lethal), proper permits must be in place prior to conducting certain control activities. LAAF is responsible for adhering to all current regulations regarding the species to be managed, control activities and methods to be used, and for obtaining the appropriate permits to take and/or harass the species to be managed. All avian species observed on and around LAAF property during the course of this assessment, with the exception of European Starlings, Rock Dove, and House Sparrows, are protected by either Federal or State regulations. All state and federal permits needed to disperse and/or lethally remove wildlife on airport property should be obtained and kept current. Several agencies share the responsibility of implementing and enforcing such regulations.

5.2 Federal Regulations – FAA Safety

The Federal Aviation Administration's (FAA) Title 14, CFR, Part 139.337 states that airports experiencing one or more of the following events involving wildlife must conduct a Wildlife Hazard Assessment: 1) Multiple wildlife strike or engine ingestion, or 2) damaging collision with wildlife other than birds, or 3) hazardous wildlife have access to the aircraft movement area.

5.3 Federal Regulations – Natural Resources/Wildlife Protection

Six Acts

Six acts provide wildlife protection at the federal level including the Migratory Bird Treaty Act (MBTA; 1918), Lacey Act (1900), Endangered Species Act (ESA; 1972), Eagle Protection Act (1962), National Environmental Policy Act (1970) and Federal Insecticide, Fungicide, and Rodenticide Act (1974).

The ESA of 1972 affords protection to wildlife species in danger of becoming extinct. Section 7(a)(2) of the ESA of 1973, as amended, (16 U.S.C. 1531 et seq.) states, in part, that each Federal agency shall, in consultation with and with the assistance of the Secretary of Interior, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any Federally-listed or proposed endangered or threatened species, or result in the destruction or adverse modification of designated or proposed critical habitat.

U.S. Fish and Wildlife Service (USFWS) Permits

The USFWS primarily enforces the MBTA and ESA.

- Migratory birds can be harassed without a federal permit but not taken.
- A depredation permit is not required for non-lethal harassment of migratory birds on the airfield. A Federal Migratory Bird Depredation Permit (USFWS Form 3-200-13) is required for taking migratory birds. USFWS Federal Migratory Bird Depredation Permit Application & Instructions can be found Online at: <https://www.fws.gov/permits/applicationforms/ApplicationLM.html#MBTA>. This permit allows for the lethal take as well as hazing/harassment of specific species of migratory birds. This permit must be renewed annually. NOTE: All actions conducted under this act, to include type of action, species and numbers involved, and the status of the carcass of those lethally taken, must be reported at the expiration of the permit. These records should remain available in the event of an inspection.
- Harassment of eagles and threatened and endangered species require additional permits to carry out dispersals or removals. Because harassment constitutes a "taking" for purposes of the Endangered Species Act, the USFWS must be consulted prior to the use of pyrotechnics if their use will affect any Federal threatened/endangered species. USFWS issues ninety-day (90) permits for the harassment of Bald and Golden Eagles. NOTE: Under this permit, all actions taken under the authority of the permit be reported at the end of the permit period.
- Copies of permits must be carried whenever exercising its authority.
- It should be noted that the term "migratory", as referred to in the MBTA, does not necessarily mean

that the species has to migrate.

- European Starlings (*Sturnus vulgaris*), House Sparrows (*Passer domesticus*), and Rock Doves/domestic pigeons (*Columba livia*) are not federally protected in the United States and require no federal depredation permit.

5.4 State Regulations – Natural Resources/Wildlife Protection

State of Arizona Wildlife Codes

Arizona State Law regulates actions concerning game species including the following: small game (rabbits, coyotes, fox, raccoon, etc.; furbearers (beaver, skunks, badgers...); game birds (pheasant, quail, chucker, waterfowl...); and big game (deer, elk, pronghorn, bear...). The AGFD is responsible for Wildlife Services License which allow these animals to be taken to protect private property. Arizona also maintains an endangered species list and a list of species of special concern. Should game species become an issue, the YPG Wildlife Biologist should contact the AGFD Regional Office in Yuma, Arizona at (928) 342-0091 or visit the AGFD website at www.azgfd.gov for AGFD State Permit Application & Instructions.

6.0 Organizational Tasks and Responsibilities

6.1 General

The installation is responsible for ensuring that airfield vegetation, fencing, and water drainage are managed to minimize wildlife attractants. An excellent cooperative relationship must exist between all installation agencies to ensure the proper environment exists around the airfield that minimizes wildlife attractiveness.

6.2 Tasks & Responsibilities Assigned

6.2.1 Garrison Commander (GC) or Deputy (DGC)

1. Chairs the Wildlife Hazard Working Group (WHWG) meetings.
2. Approves/Disapproves recommendations of the WHWG.
3. Appoints the Wildlife Detection and Dispersal Team (WDDT).

6.2.2 Director Public Works Operations and Maintenance Division

1. Advises WHWG of physical modifications to the airfield and surrounding environment.
2. Corrects or coordinates the corrections of all physical conditions that increase WASH potential.
3. Maintains physical conditions based on the recommendations of the WHWG.

6.2.3 Environmental Sciences Division Wildlife Biologist

1. Advises Airfield Manager or WHWG on wildlife biology and behavior, habitat requirements or modifications, or management schemes to make informed decisions and minimize aircraft-wildlife strikes.
2. Conducts lethal control and advises WDDT on all lethal taking of wildlife pursuant to WASH activities.
3. Helps acquire all necessary state/federal permits for harassment/depredation of nuisance wildlife, and maintains permits as required for Fish & Wildlife control efforts.
4. Helps identify wildlife remains after a strike if needed.

6.2.4 Public Affairs Office

1. Upon request will provide a public information program designed to inform garrison personnel, dependents, and the general public on the hazards and cost of uncontrolled wildlife activity, including feral animals, and the measures being taken to minimize them.

6.2.5 Directorate of Plans Training, Mobilization and Security (DPTMS)

1. The DPTMS should support and promote the implementation of the airfield WASH plan.

6.2.6 Airfield Division Chief/Manager

1. Oversees the operation and execution of the WASH plan on the airfield. He/She is also an integral part of the WHWG to ensure effectiveness of the WASH plan.
2. The Airfield Manager should conduct the following:
 - a. Declare a wildlife watch condition (WWC) based on WWC criteria in accordance with this plan and recommendations from base operations /flight dispatch or air traffic control (ATC). Note: If the Airfield Manager is absent, the designated representatives will declare an appropriate WWC.
 - b. Disseminates wildlife hazard warnings on the airfield in accordance with this plan.
 - c. Provide guidance to airfield personnel on the reporting of WWC and wildlife strikes to aircraft.
 - d. Issue specific guidance to base operations/flight dispatch personnel on procedures to be followed under each WWC.
 - e. Determine when and where WDDT members can respond.
 - f. Coordinate with DPW Pest Control and Fish & Wildlife on actions to modify habitat and trap/remove wildlife.
 - g. Coordinate with Environmental Sciences Division for lethal taking of wildlife.
 - h. As funding permits, work with an outside authorized agency (such as Arizona Game and Fish Department or Wildlife Services) to manage nuisance birds on LAAF.

6.2.7 Airfield Operations Manager

1. The airfield operations manager can be responsible for portions of the WASH plan delegated by the airfield manager. He or she is also an integral part of the WHWG.
2. Acquire, maintain and coordinate with Environmental Sciences Division Wildlife Biologist all dispersal equipment.
3. Ensure all members of the WDDT are trained on all dispersal equipment.
4. Submit service orders for the trapping or removal of hazardous wildlife through the appropriate pest/wildlife management process.

6.2.8 Airfield Safety Program Manager (ASPM)

1. The airfield safety program manager can be responsible for portions of the plan delegated to the ASPM by the airfield manager. ASPM is also a part of the WHWG as the recorder for the WHWG meetings.
2. Monitor compliance with the WASH Plan.
3. Assemble and disseminate wildlife data to WHWG and aviation units to include information on how each unit may obtain predictive wildlife hazard information using the USAF Bird Activity Model (BAM).
4. Monitor wildlife activity and strike statistics and advises the WHWG chairperson when additional meetings are deemed necessary.
5. Establishes a WASH hazard education program which may include films, posters and information on local wildlife hazards and reporting procedures in coordination with Environmental Sciences Division Wildlife Biologist.
6. Coordinate with aircrew's ASO (Aviation Safety Officers) and maintenance personnel for collecting of non-fleshy remains after strikes.
7. Establish and maintains a continuity folder with trend data and other pertinent wildlife data and information to assure continuity of knowledge with personnel turnover.
8. Create a WASH Bulletin Board in the Base Operations Flight Planning Room and develops an airfield wildlife activity map tailored to local wildlife hazards. Post, disseminate and update map, as appropriate. At a minimum, map will be reviewed annually and include the date of publication/review.

6.2.9 Air Traffic Control

1. Reports observed wildlife activity to Base Operations/Flight Dispatch and pilots.
2. Issues WWC advisories to aircrews.

3. Identifies radar targets as possible bird activity, when appropriate provide warnings to pilots.
4. Recommends missed approaches or delayed takeoffs when possible wildlife hazards appear on ATC radar.
5. Under WWC SEVERE, ensures that pilots understand the condition and are provided the option to delay, divert, or continue the proposed operation into the hazardous area.
6. Recommends appropriate operational changes or options to pilots/aviation units to avoid areas of known hazardous wildlife concentrations, mission permitting.
7. Upon request from pilot in command, considers the following during periods of increased wildlife activity:
 - a. Raise pattern altitude.
 - b. Change pattern direction to avoid bird concentrations.

6.2.10 Base Operations/Flight Dispatch

1. During daily airfield inspections and checks, observes, reports and disperses wildlife on or near the airfield as necessary.
2. Based on observation or reports of wildlife activity, declares/recommends a WWC condition to the airfield manager or designated representative.
3. Posts the current WWC on the WASH/bulletin board in the flight planning room for aircrews and transient personnel to see. Note: A NOTAM (Notice to Airmen) will be posted if the BWC warrants one.
4. Reports wildlife strike incidents to airfield manager and airfield safety program manager.
5. Maintains wildlife dispersal equipment.
6. Recovers wildlife remains after a strike for identification. If needed contact DPW Fish & Wildlife personnel for assistance.
7. Maintains daily records of wildlife activity and harassment (responses of birds/wildlife to control activities, and number of birds/wildlife dispersed).
8. Ensures wildlife hazard warnings on the airfield are disseminated to local and transient aircrews and ATC.

6.2.11 Wildlife Hazard Working Group (WHWG)

The Wildlife Hazard Working Group is organized to implement and monitor the WASH Program.

Authority: The GC or Deputy should be the WHWG chairman, responsible for the WASH program and is the approval authority for all WHWG recommendations. The WASH plan is a part of the airfield safety and accident prevention program, and as such, the airfield safety program managers should act as the WHWG recorder and monitors the effectiveness of the plan. The WASH plan should also be included in the integrated natural resource management plan with Environmental Sciences Division Wildlife Biologist involvement.

1. At minimum, the WHWG should consist of the following personnel:
 - a. Chairman: GC or Deputy GC
 - b. Directorate of Plans, Training, Mobilization and Security
 - c. Airfield division chief/manager
 - d. Recorder: airfield safety program manager
 - e. Airfield operations manager
 - f. Base operations representative
 - g. Air traffic control representative
 - h. Public works operations and maintenance representative
 - i. Public works Fish & Wildlife division representative
 - j. Air Force weather representative (if available)
 - k. Flying organization aviation safety representatives
 - l. Aircraft maintenance (as applicable)

2. WHWG meetings should be scheduled semi-annually or more frequently as required. Meeting minutes should be recorded, maintained and distributed by the ASPM to all members for the WHWG.
3. WHWG Functions:
 - a. Execute and update the WASH program.
 - b. Monitor compliance with the WASH plan.
 - c. Collect, compile and review trend data on wildlife strikes, wildlife watch condition changes and wildlife dispersal activities on or near the airfield.
 - d. Identify and recommend actions to reduce the wildlife hazards.
 - e. Recommended changes in operational procedures and airfield environment.
 - f. Prepare informational programs and safety briefings for aircrews.
 - g. Recommend modifications to the program to improve effectiveness.

6.2.12 Flying Organization

1. Each flying organization (attached, tenant, or transient to LAAF) on the airfield should assign a WASH POC and an alternate to represent the organization during the Garrison WHWG and to retrieve/disseminate WASH information when needed.
2. At a minimum, annually briefs aircrews to promptly report all wildlife strikes and hazardous conditions per this directive.
3. Should obtain and post current wildlife activity data from Airfield Management and ensure it is readily available for briefing aircrews. Each unit will post the wildlife condition on a status board and inform all aircrews of any change in status.
4. Ensures current wildlife activity data is available and briefed for each planned phase of flight.
5. Ensures that an adequate supply of WASH report forms and wildlife activity maps are readily available for aircrews.
6. Briefs aircrews on seasonal wildlife hazards. Movies, articles, and other information will be used, as appropriate, to maintain awareness.
7. Should make operational changes to avoid areas and times of known hazardous wildlife concentrations, mission permitting.
 - a. Should consider the following during periods of increased wildlife activity:
 - b. Avoid takeoffs/landings at dawn/dusk \pm 1 hour.
 - c. Limit or prohibit formation takeoffs and landings.
 - d. Depart pattern in trail; rejoin 3000' AGL.
 - e. Reschedule local training or transition elsewhere.
 - f. Limit time on low level routes to minimum for training requirements.
 - g. Select low level routes or training areas based on bird hazard data.
 - h. Split formation during recovery.
 - i. Discontinue formation instrument approaches.
 - j. Make full stop landings.

6.2.13 Aircrews

1. Should consider and incorporate wildlife hazards into the mission planning and briefing process. This would include applicable bird advisories and hazard information, available through Internet sources, Automated Terminal Information System, (ATIS), or as disseminated locally. Internet sources include predictive bird hazard information using the USAF BAM.
2. Notifies other aircrews and the controlling agency, when they sight birds/wildlife. Aircrews are essential to detecting wildlife hazards on the airfield and in the local flying area.
3. Reports bird/wildlife strikes to owning unit and airfield management.

6.2.14 Outside Agencies

Departments outside the authority of YPG that assist in the WHMP include the following:

1. Contracting Agency is responsible for:
 - a. assists in monitoring wildlife use patterns

- b. identifies aircraft hazards on the airport and surrounding property
 - c. coordinate needed insect and rodent control
 - d. provides supplemental hazing or coordinated population reduction
 - e. provides regular wildlife and firearms training
 - f. provides expert legal testimony
 - g. advises on future expansion concerning wildlife
 - h. assist in removal of deer and other wildlife from airport property
 - i. providing bird counts and estimated waterfowl numbers in wetlands surrounding the airport
 - j. providing advice on various wildlife issues
2. Arizona Game and Fish Department is responsible for:
 - a. issuing state wildlife depredation permits
 3. U.S. Fish and Wildlife Service is responsible for:
 - a. issuing depredation and salvage permits to the Airport to control federal migratory birds listed in the permit

7.0 BASH/WASH Wildlife Management Resources

1. A [BASH/WASH Self-Inspection Checklist](#) is a useful tool in identifying deficiencies in BASH/WASH reduction plans. The checklist should be used to help guide wildlife strike hazard management planning. See [APPENDIX I](#).
2. A list of [BASH/WASH video resources](#) provide information on general wildlife aircraft strike hazards, dangerous wildlife hazard encounters, BASH low level flight considerations, hazing techniques and an Alaska legacy airstrike event. See [APPENDIX N](#).
3. Consult the *Wildlife Hazard Management at Airports: A Manual for Airport Personnel* for more information on wildlife hazard planning and management at airports. This manual was prepared by FAA and USDA Wildlife Services staff, and contains information to assist airport personnel in the development, implementation, and evaluation of WHMPs at airports. This document includes information on the nature of wildlife strikes, legal authority, regulations, wildlife management techniques, WHAs, WHMPs, and sources of help and information. There are many other resources listed in the manual's bibliography. This document can be found Online at: https://www.faa.gov/airports/airport_safety/wildlife/.
4. FAA regulations, FAA Advisory Circulars, Certalerts, and other documents relevant to wildlife hazard management issues are located at <http://www.faa.gov/airports/> and <http://wildlife.faa.gov/>. Some informative documents therein include:
 - a. FAA Advisory Circular 150/5200-32B 2013 Reporting Wildlife Aircraft Strikes
 - b. FAA Advisory Circular 150/5200-33B 2007 Hazardous Wildlife Attractants on or Near Airports
 - c. FAA Advisory Circular 150/5200-34A 2006 Construction or Establishment of Landfills near Public Airports
 - d. FAA Advisory Circular 150/5200-36A 2012 Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculum for Airport Personnel Involved in Controlling Wildlife Hazards on Airports
 - e. FAA Certalert No. 06-07 2006 Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species of Special Concern on Airports
 - f. FAA Certalert No. 16-03 2016 Recommend Wildlife Exclusion Fencing
 - g. FAA Certalert No. 13-01 2013 Federal and State Depredation Permit Assistance
 - h. FAA Certalert No. 97-09 1997 Wildlife Hazard Management Plan Outline
 - i. FAA Certalert No. 09-10 Wildlife Hazard Assessments in Accordance with Part 139 Requirements
 - j. FAA Certalert No. 04-16 Deer Hazard to Aircraft and Deer Fencing
5. *Air Force Pamphlet 91-212 2004 Bird/Wildlife Aircraft Strike Hazard (BASH) Management Techniques* provides guidance for implementing an effective bird/wildlife aircraft strike hazard reduction program. See <http://www.e-publishing.af.mil>.

6. Avian Hazard Advisory System (AHAS): <http://www.usahas.com/>
7. Bird Strike Committee USA website: <http://www.birdstrike.org/>
8. Air Force BASH/Wildlife website:
<http://www.safety.af.mil/Divisions/Aviation-Safety-Division/BASH/>
9. FAA Wildlife Strike Database website:
<https://wildlife.faa.gov/database.aspx>
10. Smithsonian Feather and DNA Lab website:
<http://www.birdstrike.org/wildlife-strikes-mitigation/smithsonian-feather-dna-lab/>
11. *Wildlife Hazard Management, Title 14, Code of Federal Regulations, PART 139, Part 139.337(b)* requires airport operators to conduct a Wildlife Hazard Assessment when certain events occur on or near the airport. *Part 139.337(c)* provides specific guidance as to what facts must be addressed in a WHA.
See <https://www.gpo.gov/fdsys/granule/CFR-2011-title14-vol3/CFR-2011-title14-vol3-sec139-337>.
12. Federal Migratory Bird Depredation Permit (USFWS Form 3-200-13):
<https://www.fws.gov/permits/applicationforms/ApplicationLM.html#MBTA>
13. Low-Level Bird Avoidance Model (BAM):
https://www.faa.gov/airports/airport_safety/wildlife/current/

APPENDICES

APPENDIX A. The Wildlife Hazard Management Plan (WHMP) Checklist, 14 CFR 139.337 (f)

Wildlife Hazard Management Plan (WHMP) Checklist

14 CFR 139.337 (f) The plan must include at least the following:

Airport Name:	Inspection/ Review Date:	Inspector/ Reviewer Name:
Requirement	✓	Comments to meet requirement
WHMP Contents		
Brief introduction describes the greatest hazards identified in the Wildlife Hazard Assessment (WHA; ie, the most hazardous species and/or the highest priority attractants/ habitats); See footnote 1 for more info.		
Plan follows the order of the 139 regulation, with section headings include the regulation language as provided on this checklist		
Procedures in the Plan are concise and specific including who, what, when, and why, etc		
“(1) A list of the individuals having authority and responsibility for implementing each aspect of the plan.” Decision-making roles and responsibilities for implementing the wildlife hazard management plan including: Airport Director, Wildlife Biologist and/or Wildlife Coordinator, Operations Dept., Maintenance Dept., Security Dept., Planning Dept., Finance Dept., ,		
Designation of responsibility for determining and responding to wildlife hazard conditions, for all hours of airport operation. [Ref 139.337 (a), immediate actions, and 139.339c 7, condition reporting, and see 139.337 (f)(5)(iii)]		
Reference to any mutual agreements on hazardous wildlife attractant coordination such as Wildlife Hazard Working Group membership and mission, agreements with planning and zoning organizations and/or cooperating organizations, cooperative programs with public agencies.		

Airport Name:	Inspection/ Review Date:		Inspector/ Reviewer Name:
Requirement	✓	Comments to meet requirement	
<p><i>“(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.”</i></p> <p>As prioritized in the Wildlife Hazard Assessment or based on ongoing data collection and analysis, long-term species-specific or attractant-specific measures with target dates for completion. <u>Examples:</u> installation of deer-proof fence, grass management strategy, removal of specific attractants, trapping or other population control programs, off-airport cooperative management programs; See footnote 2 for more info</p> <p><u>Note:</u> direct wildlife management (ie, hazing programs) should be listed in (5)iii</p>			
<p><i>“(3) Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.”</i></p> <p>If lethal control or use of pesticides is part of this Plan, appropriate permits are needed and applicable regulations must be cited.</p> <p><u>Note:</u> Citation of applicable regulations only; transcript of regulations is not necessary</p>			
<p>If wildlife control permits are in place, copies of all permits must be included in ACM and must be current.</p>			
<p><i>“(4) Identification of resources that the certificate holder will provide to implement the plan.”</i></p> <p>Lists identifying what the airport will supply in terms of: personnel; time; equipment (i.e. radios, vehicle(s), guns, traps); supplies (i.e. shellcrackers, mylar tape);; vehicle(s); sources of supply</p>			
<p><i>“(5) Procedures to be followed during air carrier operations that at a minimum includes—(i) Designation of personnel responsible for implementing the procedures;”</i></p> <p>Wildlife patrol staffing, position titles, hours of availability, hours of airport operation.</p>			

Airport Name:	Inspection/ Review Date:	Inspector/ Reviewer Name:
Requirement	✓	Comments to meet requirement
<p><i>“(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;”</i></p> <p>Routine inspection procedures including documentation of wildlife inspections and observations. These should include daily runway sweeps sufficient to detect and retrieve carcasses (requires several minutes of runway access)[Ref 139.327 (a) 1-3, Self-Inspection Program, if applicable.]</p>		
<p><i>“(iii) Wildlife hazard control measures”</i></p> <p>Procedures for continuous monitoring of wildlife conditions on the airfield during times, seasons, and conditions with potential for wildlife activity as identified in the WHA.</p>		
Wildlife dispersal procedures including species- or guild-specific procedures for hazardous species identified in the WHA.		
Specific actions and/or criteria for alternate courses of action for unusually heavy wildlife activity, such as due to weather or migration, and for at-large animals such as loose dogs, livestock, or deer on AOA) [Ref 139.337 (a), immediate actions.”]		
Any special procedures for wildlife control during periods of heavy air traffic.		
<p><i>“(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower.”</i></p> <p>Training in communication procedures and airfield familiarization [Ref 139.303]</p>		
Equipment needed, such as radios, cellular phones, lights		
Reference to mutually agreed-upon procedures for wildlife dispersal that may require runway access or may impact air traffic.		
Procedures for immediate coordination and response to pilot-reported wildlife strikes or observations		
Procedures for short-term heavy wildlife activity requiring air carrier notification. [Ref 139.339c 7, condition reporting]		

Airport Name:	Inspection/ Review Date:		Inspector/ Reviewer Name:
Requirement	✓	Comments to meet requirement	
<p><i>“(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.”</i></p> <p>One or more meetings to formally review progress and challenges in implementing the Plan, as documented on the attached worksheet or similar documentation</p>			
Any standardized monitoring procedures (ie, wildlife surveys)			
Procedures for documenting communication, coordination, and prevention of off-airport attractants.			
Procedures for reviewing and analyzing data (strikes, observations and control actions, and standardized surveys) frequently and long-term, such as for annual review.			
<p><i>“(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.”</i></p> <p>Certification that the training curriculum and instructor meet the requirements of Advisory Circular 150/5200-36, Appendix C</p>			
Procedures to document training participation [Ref 139.303 (c)]			
Training and documentation procedures to meet any additional training requirements, listed in (f)(3), such as species identification, firearms safety, or pesticide application			

Airport Name:	Inspection/ Review Date:		Inspector/ Reviewer Name:
Requirement		✓	Comments to meet requirement
Annual 139 inspection items			Items on this page to be verified during the annual Part 139 Airport Certification Safety Inspection [Ref 139.301, Records]
WHMP includes items listed in WHMP Contents below			
Documentation of coordination off-airport land uses			
Wildlife control permits			
Wildlife control permit annual reports			
Documentation of wildlife patrols and control measures (ie, Wildlife Observation and Control Log, airport self-inspection datasheets, perimeter fence patrol records)			
Wildlife control supplies and equipment pr 139.337 (f) (4)			
Wildlife strike reports and recordkeeping			
Documentation of ATCT and/or mutual procedures for implementing 139.337 (a), immediate actions; 139.337 (f)(5)(iii), wildlife hazard control measures; and 139.339 (c)(7), communication of wildlife hazard conditions to air carriers			
Continued monitoring survey data sheets if included in 139.337(f)(6) review and evaluation of the WHMP			
Documentation of WHMP annual review per attached worksheet or comparable			
Documentation of annual wildlife hazard management training dates and attendees dates [Ref 139.301, Records, and 139.303(c), Personnel training, and 139.337 (f)(7), training]			
Certification of instructor qualifications and curriculum requirements per Advisory Circular 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports.			
Documentation of additional training required by 139.337 (f) (3) legal requirements, if applicable, such as wildlife species identification, firearms safety, pesticide application.			

Footnotes

1: A wildlife hazard assessment, defined in part 139.337 (c), conducted by a wildlife damage management biologist, provides the scientific basis for the development, implementation, and refinement of a wildlife hazard management plan. Though parts of the wildlife hazard assessment may be incorporated directly in the wildlife hazard management plan, they are two separate documents. Part of the wildlife hazard management plan can be prepared by the biologist(s) who conducts the wildlife hazard assessment. However, some parts can be prepared only by the airport. For example, airport management assigns airport personnel responsibilities, commits airport funds, and purchases equipment and supplies. Airport management may request the wildlife biologist to review the finished plan.

The wildlife damage management biologist's primary responsibilities are:

- to provide information on the wildlife attractants that have been identified on or near the airport,
- to identify wildlife management techniques,
- to prioritize appropriate mitigation measures,
- to recommend necessary equipment and supplies, and
- to identify training requirements for the airport personnel who will implement the wildlife hazard management plan.

It is often helpful for the airport manager to appoint a Wildlife Hazard Management Group that has responsibility for the airport's wildlife management program. The biologist should assist the Wildlife Hazard Management Group with periodic evaluations of the plan and make recommendations for further refinements or modifications.

2: The FAA/USDA Manual Wildlife Hazard Management at Airports, available at http://wildlife.pr.erau.edu/EnglishManual/2005_FAA_Manual_complete.pdf, provides additional information on the types of wildlife hazard management measures that may be included in a WHMP. Chapters 6 and 9 contain information about long term and short term, species-specific control measures to be implemented on and off of airport property. Examples of such measures include habitat modification, resource protection, repelling/exclusion, and removal. Specific measures discussed include:

Food/prey management:

- Rodents
- Earthworms
- Insects
- Grain/seeds
- Garbage—handling, storage
- Handouts (feeding wildlife)

Vegetation management:

- AOA vegetation
- Drainage ditch vegetation
- Landscaping
- Agriculture

Water management:

- Permanent Water
- Wetlands
- Canals/ditches/streams
- Holding ponds
- Sewage (glycol) treatment ponds
- Other water areas
- Ephemeral water
 - o Runways, taxiways, aprons
 - o Other wet areas

Airport buildings:

- Airfield structures
- Abandoned structures
- Terminal
- Airport construction

References

Advisory Circular 150/5200-33B, Hazardous Wildlife Attractants on or Near Airports

http://www.faa.gov/airports/resources/advisory_circulars/media/150-5200-33B/150_5200_33B.pdf

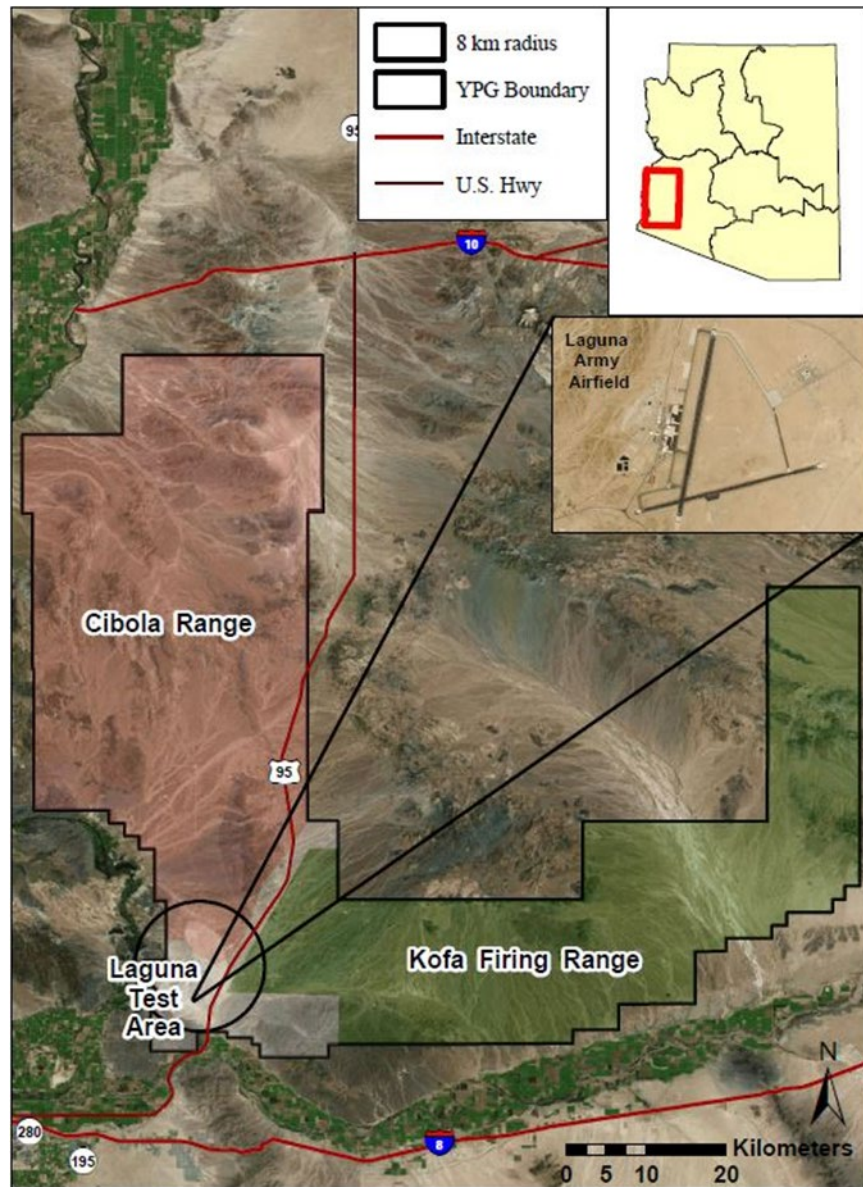
Advisory Circular 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculum for Airport Personnel Involved in Controlling Wildlife Hazards on Airports

http://www.faa.gov/airports/resources/advisory_circulars/media/150-5200-36/150_5200_36.pdf

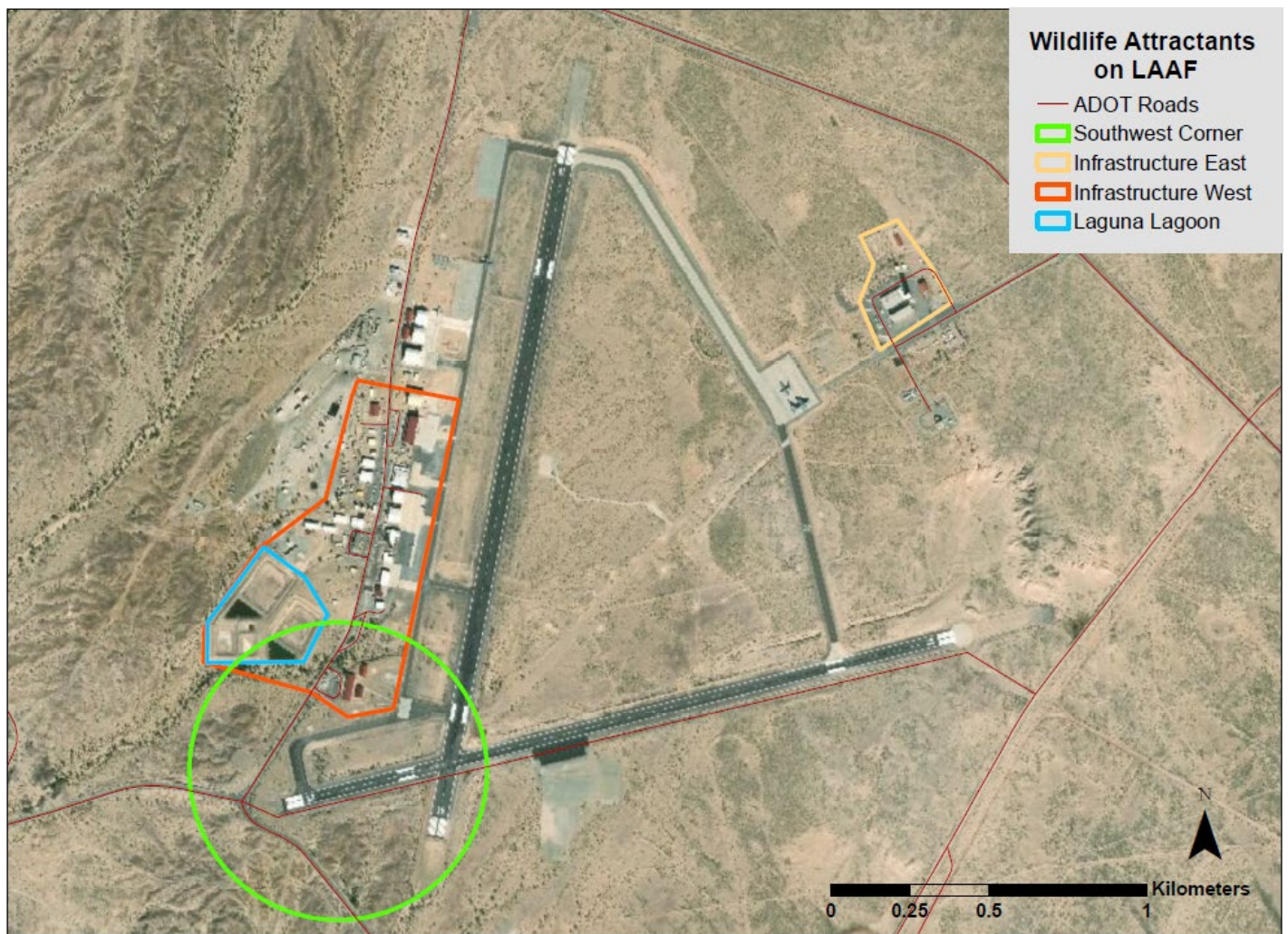
FAA/ USDA Manual: Wildlife Hazard Management at Airports, Chapter 6, Developing Control Programs

http://wildlife.pr.erau.edu/EnglishManual/2005_FAA_Manual_complete.pdf

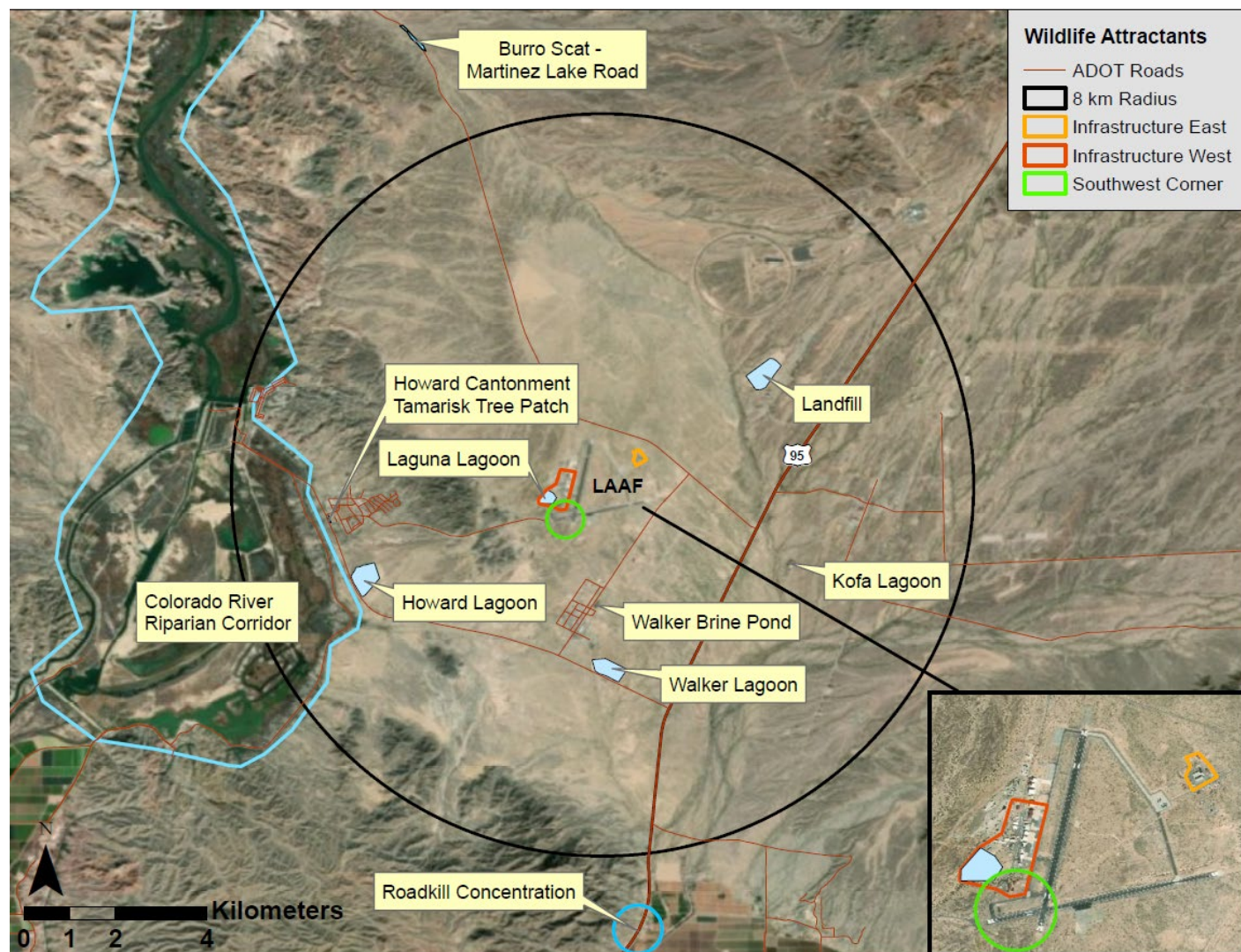
APPENDIX B. Laguna Army Airfield Project Area



APPENDIX C. Wildlife attractants (wildlife activity hotspots) identified directly on the Laguna Army Airfield at YPG, 2017.



APPENDIX D. Wildlife attractants documented within an 8 km radius of the Laguna Army Airfield at YPG, 2017.



APPENDIX E. Hazardous Wildlife Control and Avoidance Techniques

Overview: Airfield Wildlife Control

Active and passive techniques can reduce threats from hazardous wildlife populations. Active control involves implementing actions that disperse wildlife from an airfield giving short-term relief from an immediate safety hazard. Passive techniques are more long-term in nature. They involve managing the airdrome to eliminate or reduce those conditions birds and other wildlife find attractive.

I. Active Controls

Birds and other hazardous wildlife on runways, taxiways, or infields create a potential safety hazard and should be dispersed before flying operations can safely continue. No single method of dispersal works for all problems. A combination of different dispersal tools and using the different tools together or in an alternating manner will be more effective for the long-term. The key to active wildlife dispersal is perseverance. Pyrotechnics, depredation, gas cannons, vehicles and effigies may be effective in dispersing wildlife from LAAF.

Pyrotechnics - Pyrotechnics are noise-producing devices, which are effective in bird dispersal. Scare cartridges, a commercially available pyrotechnic, fired from a 12-gauge shotgun or an NJ-8 Very Pistol [with a locally manufactured steel sleeve insert (technical order (TO) 11W2-9-2-31)], are authorized. The 12-ga scare cartridge is an explosive charge fired 50 to 100 meters. At this distance, it detonates producing a loud noise. Two types of 15mm scare cartridges are also authorized, bangers and screamers. The bangers do not have the range of the 12-ga cartridges but it and the screamer are fired from a 15mm launcher, which is not considered a weapon. The 15mm banger provides a loud report, whereas the screamer makes a shrill whistle. Both are effective and inexpensive bird dispersal tools at moderate distances. Pyrotechnics can be used to flush and direct flocks of birds in a desired direction. For example, if a flock of gulls is feeding near an active runway, a scare cartridge exploded between the birds and the runway will usually cause the birds to fly away from the source of the noise and not pass over the runway. Close coordination with the control tower is essential so birds are not directed into the path of arriving or departing aircraft. Always advise base security forces before pyrotechnics are used. The base agency storing and using pyrotechnics must follow appropriate storage guidelines.

Depredation – As last resort, depredation (take by lethal means) of select individuals may be warranted. Some species may grow accustomed to these techniques, and a few individuals may have to be taken via lethal means. A federal depredation permit, available from the U.S. Fish and Wildlife Service (USFWS), is required before killing any protected birds. Some states may require additional permits for the take of State protected species. *See Legal Status chapter herein.* Anyone participating in the base depredation program should attend and receive certification through a hunter's safety or gun handling safety course.

Propane Gas Cannons - Cannons should be operated at dawn and dusk as birds come in to feed or roost. Cannons must be relocated frequently to avoid habituation issues. These devices may be effective on gulls, blackbirds, waterfowl, pheasants, and other game birds when used in conjunction with other harassment techniques or depredation.

Vehicles - Use of standard vehicles or all terrain vehicles (ATV) in the airfield environment has proven useful in dispersing birds and other wildlife from the aircraft operating area. The vehicle should be used to scare birds in the air or wildlife off of runways, taxiways or the infield. Vehicle dispersal techniques can be supplemented with pyrotechnics.

Effigies - Effigies can be used to disperse nuisance vultures, particularly at roost sites. Effigies resemble a dead vulture and consist of a fresh carcass, a taxidermic preparation, or an artificial decoy painted to resemble a vulture. Both Black Vultures and Turkey Vultures respond similarly to effigies of either species. See guidelines for using effigies in [ATTACHMENT 1](#).

II. Passive Controls

The most permanent methods of discouraging hazardous wildlife from using airfields involve removing attractive habitat features on the airfield and excluding wildlife from the airfield. Methods to reduce bird attractants include managing vegetation, properly managing landfills and water treatment facilities, proactively planning landscape and surrounding land use management, and installing infrastructure to exclude and/or reduce hazardous wildlife at LAAF.

Native Vegetation – At LAAF, environmental conditions do not support turf growth, therefore it is advisable to allow native vegetation to remain in a natural state (above or below the prescribed height of 7–14 inches) as disturbance may provide exotic conditions attractive to some forms of wildlife. The natural state must not supply attractive habitat for wildlife or obstruct views of the airfield from the tower. Another consideration for airfields in low-moisture environments is to consider de-vegetation as an option.

Landscaping – Airport operators should approach landscaping with caution and confine it to airport areas not associated with aircraft movements. The base Wildlife Biologist should review all landscaping plans. When birds or wildlife are observed to be congregating among select vegetation, assess the area for food, water, and shelter that it may provide for wildlife. Birds and other wildlife (e.g., coyotes) can usually be stimulated to move by pruning and thinning trees and shrubs to open the canopy or remove heavy fruit producing species. Dense patches of trees or shrubs within the infield or immediately adjacent to the airport that would provide cover for movement, nesting or loafing by wildlife should be thinned. Tall, solo trees that would serve as a hunting perches for birds of prey should not be allowed to grow in the infield or immediately adjacent to the airfield.

Wastewater Treatment Facilities – Wastewater treatment facilities are particularly attractive to waterbirds and wading/shorebirds for feeding, shelter, and/or nesting.

- Ponds designed with steep sides, lined with rip-rap, little surface area, and no vegetation reduces the attraction to birds. When possible build narrow, linearly shaped detention ponds.
- All vegetation in or around detention basins that provide food or cover for hazardous wildlife should be eliminated.
- Retention basins should be designed, engineered, constructed, and maintained for a maximum 48-hour detention period after the design storm and remain completely dry between storms.
- Ponds should be located as far as possible (greater than 5 miles recommended) from airports.
- When it is not possible to place these ponds away from an airport's AOA, airport operators should use physical barriers, such as bird balls, wires grids, pillows, or netting, to prevent access of hazardous wildlife to open water and minimize aircraft-wildlife interactions.
- If soil conditions and other environmental requirements allow, use of underground storm water infiltration systems, such as French drains or buried rock fields, should be built given these designs are less attractive to wildlife.
- When building new ponds, locate ponds as far from the runway and associated traffic patterns as possible and place them so birds moving from off-base areas to the ponds do not cross the runways.
- During the site-location analysis for wastewater treatment facilities, developers should consider the potential to attract hazardous wildlife if an airport is in the vicinity of the proposed site, and airport operators should voice their opposition to such facilities if they are in proximity to the airport.

Managing Sanitary Landfills – Municipal solid waste landfills (MSWLF) are known to attract large numbers of hazardous wildlife, particularly birds. On-base Municipal solid waste landfills are the most significant attractant to hazardous bird species. Operate disposal sites according to state and federal laws. Move the landfill off-base, if possible. If landfill relocation is not feasible, make the site as unattractive to birds as possible. At a minimum, determine if the putrescible wastes (i.e., food products) components of on-base landfills can be deposited to off-base landfills to help deter vultures, ravens and coyotes from regularly scavenging for food scrapes at the on-base landfill. If solid wastes cannot be moved off-base, consider implementing the following

sanitary methods: maintain a small working face on the landfill to minimize exposed wastes; incinerate waste; operate the landfill as a pit or trench to limit access to birds; dump waste at night or during non-flying periods; cover waste material immediately; discourage birds by limiting perching structures on the upper edges of the pit or trench; and use effigies and/or pyrotechnics to frighten birds away. Section 503 of the Wendell H. Ford Aviation Investment and Reform Act for the 21st Century (Public Law 106-181) (AIR 21) prohibits the construction or establishment of a new MSWLF within 6 statute miles of certain public-use airports.

Planning for the Effects of Surrounding Land Uses - Airport operators should work with local and regional planning and zoning boards so as to be aware of proposed land-use changes, or modification of existing land uses that could create hazardous wildlife attractants. Pay particular attention to proposed land uses involving creation or expansion of waste water treatment facilities, development of wetland mitigation sites, or development or expansion of dredge spoil containment areas. At the very least, airport operators should ensure they are on the notification list of the local planning board or equivalent review entity for all communities located within 5 miles (8 km) of the airport, so they will receive notification of any proposed project and have the opportunity to review it for attractiveness to hazardous wildlife.

Fencing - Installing and regularly maintaining proper fencing is the best way of keeping deer and coyotes off aircraft movement areas. See recommended wildlife exclusion fencing specifications in [ATTACHMENT 2](#). Herein is a summary of important fencing specifications and animal behaviors that should be anticipated:

- The FAA recommends a 10-foot fence with 3-strand barbed wire outriggers as maximum precaution against deer and coyotes. At a minimum, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers depending on the amount of deer activity in a local area.
- A 4- to 5-foot skirt of fencing material, attached to the bottom of the fence and buried at a 45-degree angle on the outside of the fence, is ideal to prevent animals from digging under the fence and reduce the chance of washouts. If the fence skirting cannot be installed at a 45-degree angle, then it is acceptable to install it horizontally underground several inches beneath the surface.
- Gaps in fencing and gates should close with less than 6-inch gaps to prevent entry by deer or coyotes.
 - Deer have been observed jumping over 8-foot fencing and coyotes have been observed scaling 6-foot fencing. Deer have been observed squeezing through a 7.5-inch gap at the bottom of a fence.
 - Coyotes can fit through 6 inch x 4 inch gaps under a fence and they will also dig under the fence to access the airfield.
 - If the gates have gaps along the bottom, installation of concrete “speed bumps” under the gate can be a solution.
 - If the gaps are between the gates or the poles, a heavy brush material or interlocking metal bars can also be installed to preclude entry by deer or coyote. In some cases, a single strand of barbed wire strung between the bottom of the fence and the ground where there are gaps will minimize the potential for wildlife access.
- Ensure that all fences are properly closed when not in use.

III. Ineffective Methods of Control

Methods that have shown to be ineffective including:

- Stuffed owls and rubber snakes have been advertised to rid hangars and buildings of birds. They are usually a waste of money and effort.
- Rotating lights have brought conflicting results; but are generally considered ineffective. Birds quickly habituate to these devices, and the problem remains unsolved.
- Eyespots on aircraft components are being studied in the United States and other countries. Early results suggest the addition of eyespots does not significantly reduce the BASH potential.
- Ultra-sonic devices have thus far proven unsuccessful in deterring wildlife from colliding with aircraft. Very few bird species can hear ultra-sonic sound. Of the bird species most often struck on airfields,

most cannot detect the presence of ultra-sonic sound, therefore rendering these devices useless for dispersing birds on an airfield.

IV. Avoidance - Flight Operation Considerations

When environmental modifications and active control measures do not satisfactorily reduce wildlife hazards on the airfield, flying operations may have to be altered to reduce the risk of bird strikes. Some recommended alterations to flight operations are summarized below.

Time of Day - Flying one hour before and after dawn and dusk should be avoided unless absolutely necessary. The highest levels of bird activity normally occur during these hours as birds leave and return to their roosts. Coyotes, deer, and other mammals are most active at this time. Also reduced visibility makes it harder to see hazards.

Takeoff and Departure - Aircraft making formation departures increase the risk of damaging bird strikes when birds are feeding or loafing on or near the runway.

- Formation and single-ship interval takeoffs often result in birds being scared up by the lead aircraft, causing the wingman to hit the birds.
- When the lead aircraft scares up large flocks of birds, the wingman should delay departure until the birds are clear of the runway. Pilots of lead aircraft must be alert to warn the wingman of bird hazards during takeoff.
- When flocks of migratory birds are a problem, formation takeoffs and single-ship interval takeoffs with minimum spacing involving rejoins, increase the risk of serious bird strikes.

Low-Level Flight Operations - When flying low-level routes or operating in special use airspace, higher aircraft speeds and greater exposure within bird flight environments lead to many damaging bird strikes. During these flights, aircrews are involved in cockpit duties, allowing little time to monitor bird activity. "Heads-up" flying should be stressed as much as possible during these critical operations. The Low-level Flight BASH/WASH Considerations provides guidance for bird avoidance during low-level flight operations / identifies the best times to fly to decrease chances of wildlife strikes ([ATTACHMENT 3](#)).

Low-Level Bird Avoidance Model (BAM) – The BAM is a predictive model using Geographic Information System (GIS) technology and historical data to provide a depiction of what one might expect as a key tool for analysis and correlation of bird habitat, migration, and breeding characteristics, combined with key environmental, and man-made geospatial data. The BAM is internet accessible at <http://usahas.com/bam/>.

Avian Hazard Advisory System (AHAS) – Similar to the Bird Avoidance Model (BAM), AHAS provides information on bird activity through the flight route. The distinction between the two is that on the planned flight route, BAM uses historical data to provide a depiction of what one might expect, whereas AHAS uses the BAM as a foundation and NEXRAD weather radar to provide a near real-time description of bird activity. AHAS is internet accessible at <http://www.ahas.com>.

Existing Wetlands - If wetlands are located on or near airport property, airport operators should be alert to any wildlife use or habitat changes in these areas that could affect safe aircraft operations. If questions exist as to whether an area qualifies as a wetland and mitigation may be required, contact the local division of the U.S. Army Corps of Engineers, the Natural Resources Conservation Service, state wildlife management agency or a wetland consultant qualified to delineate wetlands.

En route Bird Strikes - Aircrews experiencing en route bird strikes should abort the mission when practicable. While some engine ingestions or a windscreen strike may be readily apparent from the flight deck, the damage from many engine, fuselage, wing, tail, or random strikes cannot be adequately assessed. Continuing a mission may cause greater structural damage and lead to a serious in-flight emergency later.

APPENDIX F. Wildlife Watch Warning System

General

The Wildlife Watch Warning System is one of the most critical WASH procedures as it is an immediate exchange of information between ground agencies and aircrews concerning the existence and location of wildlife that pose a hazard to flight safety.

Authority

The Airfield Manager or his designated representative(s) has the authority to declare a WWC during normal flight operations.

The Airfield Manager or his designated representative(s) will implement the following:

- Make the final determination for declaring and increasing/decreasing wildlife watch conditions (WWC).
- May lower the WWC for the runway while keeping the higher WWC for the other area.
- Provide hazardous wildlife locations with WWC code(s).

Declaration of a WWC will be made by the Airfield Manager or designated representative(s) based on the following:

- Visual observation of wildlife activity on or near the airfield by any airfield personnel.
- Information relayed by ATC radar, pilots/airborne and taxiing aircraft.
- Observations relayed to the Tower.
- Observed NEXRAD Radar movements.

Wildlife Watch Conditions Defined

The following WWCs will be used to warn aircrew and support personnel of the current wildlife threat to operations:

- WWC SEVERE: Generally defined as a heavy concentration of birds and wildlife on or immediately adjacent to the active runway or other specific locations that present an immediate hazard to flying operations. Aircrews must thoroughly evaluate mission need before operating in areas under condition SEVERE.
 - WARNING: Landing or departing in condition SEVERE may result in aircraft damage from a bird/wildlife strike.
 - SEVERE may also be declared when birds/wildlife of any size or quantity present an immediate hazard.
- WWC MODERATE: Wildlife activity near the active runway or other specific locations representing increased potential for strikes. WWC MODERATE requires increased vigilance by all agencies and supervisors and caution by aircrews.
- WWC LOW: Wildlife activity on and around the airfield representing low potential for strikes.

Wildlife Hazard Communication Procedures

Once the Airfield Manager or his designated representative(s) has declared a WWC during normal flight operations, Air Traffic Control Tower will disseminate WWC by the following means:

- Include WWC on ATIS Broadcasts.
- Notify inbound/departing aircraft of WWC if aircraft has received ATIS and WWC has changes.
- Provide additional wildlife advisories.
- Airfield Management or the Control Tower will direct the WDDT to the location where the wildlife is posing a problem.
- Pass WWC to Base Operations/Flight Dispatch if notified by some other entity.
- For rapidly changing WWC place a statement on ATIS advising aircrew to contact Base Operations/Flight Dispatch, Air Traffic Control Tower, or Approach Control for the latest WWC.

- Under wildlife watch condition SEVERE, ATC tower should ensure that the pilot understands the condition and is provided the option to delay, divert, or continue the proposed operation into the hazardous area.
- A log will be kept detailing the WWC activities implemented.
- Downgrading WWC - When a WWC has been declared MODERATE or SEVERE, once the hazard no longer exist or has been lowered the WWC shall be downgraded commensurate with updated information.

APPENDIX G. Wildlife Detection Dispersal Team (WDDT) Procedures

Part 1. Wildlife Detection and Dispersal Team (WDDT)

A Wildlife Detection and Dispersal Team (WDDT) should be selected by the GC or DGC and include personnel authorized to employ non-lethal and lethal control techniques in accordance with federal and state depredation permits.

- WDDT should survey LAAF on an as-needed basis and use appropriate active deterrence methods. WASH dispersal/depredation equipment should be made available to WDDT
 - For a list of authorized WASH equipment for wildlife dispersal, see APPENDIX X.
 - For WASH deployment kit, see APPENDIX X.
- WDDT will have documented appropriate training on the following (initial and recurring every year) training:
 - Species identification
 - Wildlife exclusion
 - Horns, launcher, pyrotechnics and other dispersal equipment
 - WWC reporting and downgrading
 - Safe handling and disposal of wildlife
- WDDT will be activated when wildlife on the airfield create hazardous conditions.
- WDDT must have immediate access to binoculars and wildlife dispersal equipment.
- Airfield Safety Program Manager should summarize quarterly the dispersal, data collected by the WDDT and share information during the quarterly Flight Safety Council meetings.

Part 2. General Dispersal Guidelines

- Prior to initiation of dispersal actions, the WDDT team leader will coordinate the location and methods with Airfield Management and the Control Tower personnel to ensure the appropriate WWC has been declared prior to dispersal activities on the active runway.
- Vehicle horns and sirens can be used to initially harass birds/wildlife; however, this method is the least effective method of moving the birds/wildlife off the airfield. Normally, once the birds are airborne or wildlife is running from the sound of the horn, the use of pyrotechnics will move the birds/wildlife a further/safer distance from the airfield.
- Horns and sirens should be used before pyrotechnics are used.
- Pyrotechnics can be used in conjunction with vehicle harassment. These consist of screamer, whistler and banger.
- If portable propane sound cannons are used on the airfield, they should be relocated periodically to prevent habituation.
- All non-lethal deterrents must be attempted first before lethal methods can be employed. If, however, the methods above do not work or the wildlife become accustomed to the hazing, it may become necessary to remove wildlife by trapping, or as last resort use lethal methods to reinforce the dispersal methods.
- When implementing lethal methods be aware of the following -
- Lethal methods for depredation should be implemented according to IAW local, state and federal laws.
- Lethal taking of wildlife will be carried out by authorized personnel, and will occur only after coordination with DPW Fish & Wildlife.
- Personnel conducting lethal control will collect all wildlife for identification, disposal, and reporting requirements.
- The Garrison Commander is the approval authority for the use of lethal methods to remove wildlife from the airfield with guidance from the YPG Wildlife Biologist.
- When using firearms to manage wildlife -
 - Do not use lead ammunition, particularly in areas within the historical range of the California Condor.
 - Check local ordinances and coordinate with YPG police department before using firearms.

- When the target hazardous wildlife are dispersed, Base Operations shall be notified so the WWC can be lowered.
- Base Operations/Flight Dispatch will maintain a daily activity log to include wildlife sightings.
- Base Operations/Flight Dispatch will fill out a log detailing the wildlife dispersal activities implemented include date, time, species, location, number of individuals dispersed and dispersion methods used.

Part 3. Procedures for the Use of Pyrotechnics

- The pyrotechnics may only be used by those individuals who have been trained and authorized by the Airfield Manager or designated representative.
- The fire danger risk will be checked before using pyrotechnics. Pyrotechnics will not be used if the fire danger risk is high or extremely high. The fire department will be notified before discharging pyrotechnics.
- Contact ATC Tower to receive clearance and coordinate location prior to discharging pyrotechnics. If aircraft operations are imminent, ensure the WWC is raised prior to initiating dispersal operations.
- Inform ASPM prior to discharging pyrotechnics on the flight line.
- Use ear and eye protection, and gloves.
- The launcher can only be transported empty.
- Do not load the launcher in the vehicle or fire launcher while in vehicle. Step outside the vehicle, cock the launcher, load the cap and then load the explosive in the launcher.
- Point the launcher at 45 degrees or higher into the air, preferably toward the flock of birds. Face away from the launcher and pull the trigger.
- Any mishap involving the launcher and/or the pyrotechnics cartridge shall be reported immediately.
- Document pyrotechnic activities implemented in a database, in prep to reporting to USFWS when required.

APPENDIX H. BASH/WASH Self-inspection Checklist

The following are suggestions for building effective BASH self-inspection checklists.

- Are all BASH related regulations current and readily available?
- Has a BASH reduction program been implemented?
- Has a BASH plan been written?
- Is the BASH plan reviewed annually?
- Are changes and annual reviews posted to the plan?
- Does the program establish a Bird Hazard Working Group (BHWG)?
- Are base agencies such as Safety, CE or EM (Environmental Management) and Ops assigned responsibilities for the BASH program?
- Is the wing vice commander (or equivalent) the BHWG chairman?
- Is there an assigned OPR of the BHWG?
- Does the BHWG meet at least semiannually, are minutes being recorded and filed?
- Are BASH topics included in flight safety briefings?
- Are BASH related materials posted in aircrew briefing areas, on safety bulletin boards or base operations flight planning areas?
- Are local bird problems documented?
- Are both damaging and non-damaging bird strikes recorded?
- Are all damaging and non-damaging bird strikes reported IAW AFI 91-204?
- Are all bird strike remains being collected and sent to the Smithsonian Institution IAW 91-204?
- Is the bird strike information tracked to facilitate the identification of trends?
- Is a bird identification book readily available?
- Are daily surveys taken of the airfield and surrounding area to observe potential and actual bird hazards?
- Are records of daily observations kept in order to establish trends?
- During the surveys, are areas of standing water, food sources or areas birds use for protection noted?
- Is the vegetation on the airfield particularly attractive to birds?
- Does the mowing or guideline contract specify the grass be maintained at a height of 7-14 inches?
- Does the base practice controlled burning?
- Are birds attracted to the taxiways or runways?
- Have the birds utilizing taxiways and runways been identified?
- Are birds attracted to areas of water on the airfield?
- Are the birds feeding in these wet areas?
- Are the birds attracted to these wet areas identified?
- Do the wet areas contain vegetation along their perimeters?
- Do the wet areas contain fish and/or amphibians?
- Are the wet areas permanent?
- Are there other areas near the runways that attract birds (horse stables, recreation areas, golf courses, etc.)?
- Can it be determined what is attracting the birds?
- Have the birds been identified?
- Do agricultural practices around the area attract birds?
- Is the base notified of the plowing times in order to alter operations?
- Does the base outlease cropland on adjacent areas?
- Does the lease provide for restrictions concerning BASH?
- Are landfills or sewage lagoons located near the base?
- Are these sites covered daily with dirt, wire or netting to discourage birds?
- Do these sites attract birds?
- Are other areas near the base attractive to birds (i.e. lakes, ponds, swamps, cemeteries or wildlife areas)?

- Are game birds and deer controlled so as not to interfere with flying operations?
- Does the control tower warn operations and pilots of birds in the airdrome?
- Is there a designated bird dispersal team?
- What is the average time between upgrade to Bird Watch Condition SEVERE and down-grade back to MODERATE?
- Is bird harassment equipment on hand and readily available?
- Are members of the bird dispersal team trained on dispersal techniques?
- Is a depredation permit on hand and current?
- Are the BAM and/or AHAS being used during flight scheduling and mission planning?

APPENDIX I. Authorized BASH/WASH Equipment List

AUTHORIZED BASH EQUIPMENT LIST

(Information adopted from Air Force Pamphlet 91-212)

Consult with your MAJCOM/SEF or HQ AFSC/ SEFW for up-to-date equipment authorization information due to frequent changes in wildlife control products.

NATIONAL STOCK NUMBER NOMENCLATURE PART NUMBER

NSN 665001108 Binoculars, prism type PN 6702513

NSN 5835010533152 Cassette Tape Recorder PN Model AP 30

NSN 5965010536210 Speaker, High Power PN Model AP 30

NSN 3740000763541 Gas Exploding Cannon BB 101

Pyrotechnics

Launchers

NSN 1095014377478 15mm single shot

NSN 1095014377479 15mm double shot

Cartridges

NOTE:

Do not use semi-automatic shotguns to launch scare cartridges because they will jam the action.

NSN 1370012041525 12 ga, Bird Scare (Shell Cracker)

- 12 ga, Bird Scare (Shot Tell) manufactured by Stoneco, Inc. and marketed by Reed-Joseph International is suitable substitute (AAC/SES ltr, 10 Dec 99)

NSN 1370014549861 15mm Screamer & 6mm blank (hazard classification HD 1.4G)

NSN 1370014552640 15mm Bird Banger (hazard classification HD 1.4G)

NSN 1305014562560 6mm blank (hazard classification HD 1.4S)

Munitions

Shotgun

NSN 1005009735645 12ga, pump, PN Model 870 (old NSN)

NSN 1005010658989 12ga, pump, PN Model 870 (new NSN)

NSN 1005009341404 12ga, automatic, PN Model 1100-12

NSN 1005010732368 12ga, single barrel, PN Model 162

Shot Shells – Stock Listed

NSN 1305012327415 12ga, #9 Lead

NSN 1305012328338 12ga, #00 Buckshot Lead

NSN 1305012328339 12ga, #7 ½ Lead, Federal

NSN 1305013865604 12ga, Slug
NSN 1305013865605 12ga, #7 ½ Lead, trap load
NSN 1305013862028 12ga, #9 Lead, trap load

Shot Shells – Approved by OO-ALC/LIWC for local purchase IAW 21-201

Federal – 12ga, 2 ¾ in, #2 Steel Shot

Olin/Winchester –12ga, Non-Toxic Loads

Super-X Drylok Super Steel Non-Toxic Waterfowl Loads

XSD122 2 ¾ in, #2
XSD124 2 ¾ in, #4
XSD126 2 ¾ in, #6
XS122 2 ¾ in, #2
XS124 2 ¾ in, #4
XS126 2 ¾ in, #6

Super-X Drylok Super Steel Non-Toxic Magnum Waterfowl Loads

XSM123BB 3 in, #BB
XSM1231 3 in, #1
XSM1232 3 in, #2
XSM1233 3 in, #3
XSM1234 3 in, #4
XSV123BB 3 in, #BB
XSV1231 3 in, #1
XSV1232 3 in, #2
XSV1233 3 in, #3
XSV1234 3 in, #4
XSM12BB 2 ¾ in, #BB
XSM121 2 ¾ in, #1
XSM122 2 ¾ in, #2
XSM123 2 ¾ in, #3
XSM124 2 ¾ in, #4
XSM126 2 ¾ in, #6

Super-X Drylok Super Steel Non-Toxic Copperplated Magnum Goose Loads

XSC123T 3 in, #T

XSC123BB 3 in, #BBB

XSC12T 2 ¾ in, #T

XSC12BBB 2 ¾ in, #BBB

Double A Steel Target Load

AAST127 2 ¾ in, #7

Olin/Winchester – 12ga

Supreme Double-X Magnum Game Loads – Copper-plated, Buffered Shot

X123XC4 3 inch 1 7/8 oz shot #4

X123XC6 3 inch 1 7/8 oz #6

X123MT4 3 inch 1 7/8 oz #4

X123MT6 3 inch 1 7/8 oz #6

X12MXC4 3 inch 1 5/8 oz #4

X12MXC6 3 inch 1 5/8 oz #6

X12XC4 2 ¾ in 1 ½ oz #4

X12XC5 2 ¾ in 1 ½ oz #5

X12XC6 2 ¾ in 1 ½ oz #6

X12MT4 2 ¾ in 1 ½ oz #4

X12MT6 2 ¾ in 1 ½ oz #6

Supreme High Velocity Turkey Loads, Copper-plated, Buffered Shot

STH12354 3 ½ in 2 oz #4

STH12355 3 ½ in 2 oz #5

STH12356 3 ½ in 2 oz #6

STH1234 3 inch 1 ¾ oz #4

STH1235 3 inch 1 ¾ oz #5

STH1236 3 inch 1 ¾ oz #6

Supreme Double-X Magnum Turkey Loads, Copper-plated, Buffered Shot

XXT12L4	3 ½ in	2 ¼ oz	#4
XXT12L5	3 ½ in	2 ¼ oz	#5
XXT12L6	3 ½ in	2 ¼ oz	#6

X123MXCT4	3 inch	2 oz	#4
X123MXCT5	3 inch	2 oz	#5
X123MXCT6	3 inch	2 oz	#6

X12HXCT4	2 ¾ in	1 5/8 oz	#4
X12HXCT5	2 ¾ in	1 5/8 oz	#5
X12HXCT6	2 ¾ in	1 5/8 oz	#6

Super-X High Brass Game Loads

X124	2 ¾ in	1 ¼ oz	#4
X125	2 ¾ in	1 ¼ oz	#5
X126	2 ¾ in	1 ¼ oz	#6
X127	2 ¾ in	1 ¼ oz	#7 ½
X128	2 ¾ in	1 ¼ oz	#8

AA Target Loads – Super Pigeon

AA12SP6	2 ¾ in	1 ¼ oz	#6
AA12SP7	2 ¾ in	1 ¼ oz	#7 ½
AA12SP8	2 ¾ in	1 ¼ oz	#8

AA Target Loads – Super Handicap

AAH127	2 ¾ in	1 1/8 oz	#7 ½
AAH128	2 ¾ in	1 1/8 oz	#8

AA Target Loads – Heavy Target Load

AAM127	2 ¾ in	1 1/8 oz	#7 ½
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AAM128	2 ¾ in	1 1/8 oz	#8
AAM129	2 ¾ in	1 1/8 oz	#9

AA Target Loads – Target Load

AA127	2 ¾ in	1 1/8 oz	#7 ½
AA128	2 ¾ in	1 1/8 oz	#8
AA129	2 ¾ in	1 1/8 oz	#9
AAHL127	2 ¾ in	1 oz	#7 ½
AAHL128	2 ¾ in	1 oz	#8

AA Target Loads – Xtra-Lite

AAL127	2 ¾ in	1 oz shot	#7 ½
AAL128	2 ¾ in	1 oz	#8
AAL129	2 ¾ in	1 oz	#9

Upland Game Loads

WU126	2 ¾ in	1 oz shot	#6
WU127	2 ¾ in	1 oz	#7 ½
WU128	2 ¾ in	1 oz	#8

Upland Heavy Game Loads

WU12H4	2 ¾ in	1 1/8 oz	#4
WU12H6	2 ¾ in	1 1/8 oz	#6
WU12H7	2 ¾ in	1 1/8 oz	#7 ½
WU12H8	2 ¾ in	1 1/8 oz	#8
WU12SP77	2 ¾ in	1 ¼ oz	#7 ½
WU12SP78	2 ¾ in	1 ¼ oz	#8

Upland Heavy Field Loads

WU12P4	2 ¾ in	1 ¼ oz	#4
WU12P6	2 ¾ in	1 ¼ oz	#6
WU12P7	2 ¾ in	1 ¼ oz	#7 ½

APPENDIX J. BASH/WASH Deployment Kit

(Information adopted from Air Force Pamphlet 91-212)

This is a list of suggested items for a BASH deployment kit. Items and quantities may be adjusted to meet deployment needs.

QTY	Object
5	15 mm launchers
2	Model 870 12 Gauge Shotguns
2	Very Pistols with sleeves for Shell Crackers
500	Rounds Shell Crackers
1000	Rounds 15 mm Screammers with 6 mm blanks
1000	Rounds 15 mm Bangers with 6 mm blanks
Case	12 Gauge #6 Shot
TBD	Propane Cannons with Gas Bottles
2	Hand Held Distress Call Systems (Bull Horns)
TBD	Hand-Held Radios For Tower Communication
2	Pairs of Binoculars
2	Bird Identification Books for the Area
2	Hand-Held Spotlights with Car Adapter for Power
2	Shovels
2	Potato Rakes
1	Tractor and Mowing Machine (Bush Hog)

Several Note Pads, Pencils, Pens, Plastic Bags, Water Spray Bottles, Paper Towels, old newspaper for wrapping bird strike remains for shipping.

APPENDIX K. Wildlife Strike Reporting Instructions *for Aircraft Personnel*

Instructions for Collecting & Reporting Wildlife Strike Material from Aircraft *for Airport Personnel*

What to Collect? All animals hit in sky or on runway - birds, bats, mammals, lizards and snakes

Who is to Collect? All aviation industry personnel – pilots, Air Traffic Control, aircraft maintenance

Step 1. Obtain a Wildlife Strike Sampling Kit from the BASH/WASH Strike Reporting Station

Step 2. Collect animal remains and place remains in plastic bag (designated Ziploc bag or trash bag)

For whole or partial animal:

If Whole Large Animal (e.g., mammal): Collect enough remains (hair, portion of body is easily attainable) or take pictures to aid in species identification

If Whole Small Animal (e.g., mammal, bat, lizard, snake): Collect whole animal if species identification is unknown

If Partial Bird: Collect a variety of feathers with color or pattern, feet, bill and bones

If Feathers Only: Collect all feathers

- Do not cut feathers from birds (we need the down at the base of feathers)
- Do not use any sticky substances such as tape or glue to collect remains

For Snarge Only:

If Snarge (smug of blood and/or tissue):

- Collect snarge by wetting paper towel with 70% alcohol and then wipe across surface where snarge is located
 - Do not use water or bleach nor anything other than alcohol, given these materials will destroy DNA
 - Let snarge dry on paper towel

For both whole or partial animals and snarge:

Collect remains from each impact location and place them in separate, labeled plastic bags indicating the location on the aircraft from which each sample was collected

Step 3. Label the plastic bag using a permanent marker

- Write the following information on the bag – Date, Collector's Name and Type of Aircraft

Step 4. Complete FAA 5200-7 form and place form with the wildlife remains

- See form attached below and appending directions
- Complete form to the best of your ability; if questions, contact your installation biologist (see below).
- Place form back into its original bag to keep it separate and clean from wildlife remains

Step 5. Immediately report the wildlife strike to your installation's wildlife biologist by phone or email

Current YPG Wildlife Biologist:

Daniel Steward; Environmental Sciences Division; U.S. Army Garrison Yuma Proving Ground;
(928) 328-2125; daniel.m.steward.civ@mail.mil

Purpose:

YPG Wildlife Biologist will know to retrieve the packet of remains in very near future, identify remains to species, submit remains to the Smithsonian Lab if needed, and report strikes to the FAA National Wildlife Strike Database

Step 6. Either place plastic bag with remains into the freezer or Wildlife Strike Remains tote

For whole or partial animal:

- Place remains into the freezer or Wildlife Strike Remains tote
 - *If remains are large and notably wet (susceptible to decay prior to pick up):* Place in the freezer located at the DPW Environmental Office.
 - *If remains are relatively dry:* Place in Wildlife Strike Remains tote
 - Plastic bag should remain open to air dry if needed

For Snarge Only:

- Place dry snarge into Wildlife Strike Remains tote

*Use safety measures and good hygiene when collecting material. Use latex gloves, in addition to face mask and eye protection when needed. Always thoroughly wash hands after handling remains.

U.S. Department of Transportation
Federal Aviation Administration

BIRD / OTHER WILDLIFE STRIKE REPORT

1. Name of Operator		2. Aircraft Make/Model		3. Engine Make/Model																																																	
4. Aircraft Registration		5. Date of Incident ____/____/____ Month Day Year		6. Local Time of Incident <input type="checkbox"/> Dawn <input type="checkbox"/> Dusk ____ HR ____ MIN <input type="checkbox"/> Day <input type="checkbox"/> Night <input type="checkbox"/> AM <input type="checkbox"/> PM																																																	
7. Airport Name		8. Runway Used		9. Location if En Route (Nearest Town/Reference & State)																																																	
10. Height (AGL)		11. Speed (IAS)																																																			
12. Phase of Flight <input type="checkbox"/> A. Parked <input type="checkbox"/> B. Taxi <input type="checkbox"/> C. Take-off Run <input type="checkbox"/> D. Climb <input type="checkbox"/> E. En Route <input type="checkbox"/> F. Descent <input type="checkbox"/> G. Approach <input type="checkbox"/> H. Landing Roll <input type="checkbox"/> I. Unknown		13. Part(s) of Aircraft Struck or Damaged <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;"></th> <th style="width: 10%;">Struck</th> <th style="width: 10%;">Damaged</th> <th style="width: 30%;"></th> <th style="width: 10%;">Struck</th> <th style="width: 10%;">Damaged</th> </tr> </thead> <tbody> <tr> <td>A. Radome</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>H. Propeller</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>B. Windshield</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>I. Wing/Rotor</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>C. Nose</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>J. Fuselage</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>D. Engine No. 1</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>K. Landing Gear</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>E. Engine No. 2</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>L. Tail</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>F. Engine No. 3</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>M. Lights</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>G. Engine No. 4</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>N. Other: (Specify)</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>					Struck	Damaged		Struck	Damaged	A. Radome	<input type="checkbox"/>	<input type="checkbox"/>	H. Propeller	<input type="checkbox"/>	<input type="checkbox"/>	B. Windshield	<input type="checkbox"/>	<input type="checkbox"/>	I. Wing/Rotor	<input type="checkbox"/>	<input type="checkbox"/>	C. Nose	<input type="checkbox"/>	<input type="checkbox"/>	J. Fuselage	<input type="checkbox"/>	<input type="checkbox"/>	D. Engine No. 1	<input type="checkbox"/>	<input type="checkbox"/>	K. Landing Gear	<input type="checkbox"/>	<input type="checkbox"/>	E. Engine No. 2	<input type="checkbox"/>	<input type="checkbox"/>	L. Tail	<input type="checkbox"/>	<input type="checkbox"/>	F. Engine No. 3	<input type="checkbox"/>	<input type="checkbox"/>	M. Lights	<input type="checkbox"/>	<input type="checkbox"/>	G. Engine No. 4	<input type="checkbox"/>	<input type="checkbox"/>	N. Other: (Specify)	<input type="checkbox"/>	<input type="checkbox"/>
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14. Effect on Flight None <input type="checkbox"/> Aborted Take-Off <input type="checkbox"/> Precautionary Landing <input type="checkbox"/> Engines Shut Down <input type="checkbox"/> Other: (Specify)		15. Sky Condition No Cloud Some Cloud <input type="checkbox"/> Overcast <input type="checkbox"/> <input type="checkbox"/>		16. Precipitation Fog Rain <input type="checkbox"/> Snow <input type="checkbox"/> None <input type="checkbox"/>																																																	
17. Bird/Other Wildlife Species <div style="text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> </div>		18. Number of birds seen and/or struck <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 30%;">Number of Birds</th> <th style="width: 10%;">Seen</th> <th style="width: 10%;">Struck</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>2-10</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>11-100</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>more than 100</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Number of Birds	Seen	Struck	1	<input type="checkbox"/>	<input type="checkbox"/>	2-10	<input type="checkbox"/>	<input type="checkbox"/>	11-100	<input type="checkbox"/>	<input type="checkbox"/>	more than 100	<input type="checkbox"/>	<input type="checkbox"/>	19. Size of Bird(s) <input type="checkbox"/> Small <input type="checkbox"/> Medium <input type="checkbox"/> Large																																		
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21. Remarks (Describe damage, injuries and other pertinent information)																																																					
DAMAGE / COST INFORMATION																																																					
22. Aircraft time out of service: _____ hours		23. Estimated cost of repairs or replacement (U.S. \$): \$ _____		24. Estimated other Cost (U.S. \$) (e.g. loss of revenue, fuel, hotels): \$ _____																																																	
Reported by (Optional)			Title		Date																																																
Paperwork Reduction Act Statement: The information collected on this form is necessary to allow the Federal Aviation Administration to assess the magnitude and severity of the wildlife-aircraft strike problem in the U.S. The information is used in determining the best management practices for reducing the hazard to aviation safety caused by wildlife-aircraft strikes. We estimate that it will take approximately 6 minutes to complete the form. The information collected is voluntary. Please note that an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. The OMB control number associated with this collection is 2120-0045. Comments concerning the accuracy of this burden and suggestions for reducing the burden should be directed to the FAA at: 800 Independence Ave SW, Washington, DC 20591, Attn: Information Collection Clearance Officer, ABA-20																																																					

U.S. Department
of Transportation

**Federal Aviation
Administration**

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

Official Business
Penalty for Private Use, \$300

BUSINESS REPLY MAIL

FIRST CLASS PERMIT NO. 12438 WASHINGTON D.C.

POSTAGE WILL BE PAID BY FEDERAL AVIATION ADMINISTRATION

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

NO
POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

FOLD AND TAPE HERE

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

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

APPENDIX L. Wildlife Strike Reporting Instructions *for YPG Wildlife Biologist*

Summary Instructions for Collecting & Reporting Wildlife Strike Material from Aircraft *for YPG Wildlife Biologist*

Applicability: For use by YPG Wildlife Biologist once wildlife remains have been collected by pilots

When to Report a Strike: Report all animal strikes, rather damaging or non-damaging.

Step 1. Collect wildlife strike materials (i.e., animal remains and FAA 5200-7 form) from pilots or other airfield personnel

Review form for completeness. Follow-up with the collector when there is missing or incomplete information to ensure quality of the data.

Step 2. For remains that are identified on-site to species by YPG Wildlife Biologist, submit information on the FAA 5200-7 form to the FAA National Wildlife Strike Database (NWSD)

Either mail a hardcopy of the form using the pre-paid and pre-addressed label at the FAA Form 5200-7 Bird/Other Wildlife Strike Report Document Information website

<http://www.faa.gov/forms/index.cfm/go/document.information/documentID/185872>

or fill out the form Online at Airport Wildlife Hazard Mitigation web site <http://www.faa.gov/go/wildlife>

Step 3. For unidentified remains, prep remains for shipping to the Smithsonian

Do not ship whole animal. Instead, send remains such as wings, breast feathers, tail feathers, beaks, feet, bones, talons, feathers with distinct colors or patterns, any downy “fluff”, and snarge. Include whole feathers (tip and base). Send pictures if pertinent and available, notably for whole carcass.

Step 4. For unidentified remains, ship remains with completed FAA 5200-7 form in a sealed plastic bag to one of two locations

If Routine / Non-Damaging Cases:

Ship via standard US Postal Service

Ship to – Feather Identification Lab

Smithsonian Institution

NHB E600, MRC 116

P.O. Box 37012

Washington, DC 20560-0116

If Priority / Damaging Cases:

Ship via Overnight Shipping

Ship to - Feather Identification Lab

Smithsonian Institution

NHB E600, MRC 116

10th & Constitution Ave., NW

Washington, DC 20560-0116

Provide your contact information if you wish to be informed of the species identification

Step 5. If a comprehensive set of wildlife strike collection and reporting instructions are needed, see AC 150/5200-32B “Reporting Wildlife Aircraft Strikes”:

https://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/1021289

Smithsonian Institute Feather Identification Lab Contact Information:

202-633-0801

dovec@si.edu

heackerm@si.edu

Useful Websites:

Civil Aviation:

Submit electronic version of FAA 5200-7 form: <http://wildlife.faa.gov>

Birdstrike Committee:

Various bird strike resources: www.birdstrike.org

FAA Birdstrike Record Mailing Address:

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

APPENDIX M. Guidelines for Assembling BASH/WASH Collection Kits

"MAKE-YOUR-OWN" - BIRDSTRIKE COLLECTING KITS

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

Re-sealable Plastic Bags

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

Sharpie Markers

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

Alcohol Wipes

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

Miscellaneous Items for Birdstrike Collecting

Kitchen shears - good for cutting feet, wings, bills

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

Hand cleaners, or other alcohol based gel hand sanitizers.

FTA® DNA collecting cards: If you send a lot of blood/tissue ("snarge")

samples for DNA identification, you may want to look into getting Whatman FTA® DNA cards.

The material is sampled with a sterile applicator and placed onto the surface of the card that "fixes" the dna in the sample. For more information on ordering these items contact the Feather Lab.

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

(collecting kit cont.)

Extra Safety Items

Latex Gloves

Protective Eyewear

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

Reminders

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

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

Do not use bleach on samples

Be sure personnel are briefed on proper carcass disposal protocols

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

The American Ornithologists' Union Ornithological Council

<http://www.nmnh.si.edu/BIRDNET/OC/avianinfluenza.html>

Contact Information

Feather Identification Lab 202-633-0801

Carla Dove dovec@si.edu

Marcy Heacker heackerm@si.edu

APPENDIX N. BASH/WASH Video List

(Information adopted from Air Force Pamphlet 91-212)

Please contact the Joint Visual Information Services Distribution Activity Customer Service Representative at the following numbers to order any of the listed videos.

Phone: (570) 895-6543

DSN: 795-6543

Fax: DSN 795-6106

- | | |
|---|---------|
| • BASH-Bird/Wildlife Aircraft Strike Hazard | #609163 |
| • Dangerous Encounters - BASH | #602702 |
| • BASH Low Level | #609164 |
| • Frightening Techniques | #604805 |
| • Legacies – There Is A Choice (Alaska AWACS video) | #613359 |

ATTACHMENTS

ATTACHMENT 1. Guidelines for Using Effigies

Guidelines for Using Effigies to Disperse Nuisance Vulture Roosts

John S. Humphrey, Eric A. Tillman, Michael L Avery

USDA-APHIS-Wildlife Services-National Wildlife Research Center, Florida Field Station, 2820 East University Avenue, Gainesville, FL 32641

WHAT IS AN EFFIGY?

An effigy as defined in Webster's dictionary is a "full or partial representation likeness" of a person or object. Effigies used for dispersing vultures include a fresh carcass, a taxidermic preparation, or real artificial likeness such as a goose decoy painted to resemble a vulture. Both black and turkey vultures respond similarly to effigies of either species.

OVERVIEW

Vulture night roosts consist of single or mixed species. These guidelines were developed principally for wooded roosts, but the same principles apply for roosts in towers and other sites. Furthermore, these procedures might also be applicable to nuisance situations caused by daytime vulture activity. Regardless of the situation or roost habitat, proper placement is the single most important aspect in successfully using an effigy to disperse vultures.

To place the effigy properly, one must fully evaluate the roost site for optimal effigy attachment points. Important factors to consider when deciding where to hang an effigy include:

- locations with the highest bird activity or use, often indicated by an accumulation of feces and feather;
- visibility of the effigy to birds coming into the roost;
- prominent branches or support structures; and
- accessibility by the biologist to the site.

Optimal effigy attachment points are:

- high and prominent;
- relatively free from entanglement (branches or support structures); and
- inaccessible to perching vultures.

THE EFFIGY

Once a bird has been acquired under a legal permit, it should be determined whether a long term or temporary placement is needed. If long term placement or multiple usage is required, it is advised that the bird be prepared by a taxidermist and then treated with a spray on preservative such as Scotch Guard for leather. The posture of the prepared bird should resemble that of a dead bird hung by its feet with one or both wings hanging down in an outstretched manner. For short term placement (up to 3 months, depending on weather conditions) and if odor is not a concern, then an intact carcass can be used.

MATERIALS

The materials that are needed for hanging effigies in the roost could be found at most outdoor or general merchandise stores such as Wal-Mart or K-Mart. These include:

- a bow and fishing arrow (fiberglass or other heavy arrow with line attachment point and field point);
- archery fishing set-up with rod, reel, and 20-40# line;
- spool of 1/8" - 1/4" effigy attachment line (nylon or other synthetic weather resistant);
- heavy duty fishing type snap swivels; and

- a small smooth weight (e.g. sinker) or sand bag that can be used to adjust the line.

PLACING THE EFFIGY ATTACHMENT LINE

Vulture effigies can readily be placed in wooded roosts using a compound bow fitted with a commercially available fishing set-up (Zebco 808 reel mounted on a small rod attached to the stabilizer hole and a fishing arrow). Alternatively, it is possible to use a standard fishing rod with fishing arrow (fiberglass field point arrow with a small hole near the nock for line attachment), however this requires a second person to hold the rod and ensure that the line does not get hung up. It is recommended that 20-lb monofilament line be used due to its strength and flexibility.

Choose a branch or attachment point that is in an area of high use, as evidenced by an accumulation of feces and/or feathers or pellets, and with the high visibility to birds entering the roost. The space below should also be free from branches or structures that could entangle the effigy during heavy winds. **Optimally, the bird should not hang farther than the distance from the attachment point to any other branch or structure to the side** (i.e. from an attachment point 5 ft out on a branch the effigy should hang no more than 5 ft down to prevent it becoming tangled in the trunk of the tree).

Shoot the arrow over the attachment branch. Attempt to limit the number of branches the line goes over by putting tension on the line following release, but not before reaching the branch. This will reduce the friction on the line when raising the effigy and reduce branch or line breakage. Allow the arrow to drop to the ground and then remove it from the line. Secure the attachment line to the fishing line. Reel or wind the fishing line, pulling the effigy attachment line over the branch. After removing the fishing line, attach a heavy duty snap swivel to the effigy attachment line. If this line has gone over multiple branches, it may be necessary to pull back the line from all but the main attachment branch. This can be done by attaching a smooth-edged weight to the end of the line closest to the excess branches, pulling the weight over the branch until it reaches the effigy attachment branch, and then lowering the weight down.

For lower attachment point, it may be possible to use a throwing bag slung over the branch or attachment point. For towers or other structures, a professional climber or other authorized maintenance person should ascend the tower and hang the effigy from a prominent point.

ATTACHING THE EFFIGY

To attach the effigy, take a 2 - 3 ft length of the same material as the attachment line, fold it in half and tie a small loop at the midpoint. This is the point at which the attachment line and snap swivel are connected. Next, tie the ends of the looped line to the legs of the effigy just above the feet, making sure to wrap the line twice around the leg before tying to secure knot. The knotted loop ensures that in the event one of the leg knots comes loose, the effigy will remain in place. If the leg joints have been damaged or otherwise had their strength compromised, a length of line should be tied from the foot knot to the neck in case the leg separates from the effigy.

PUTTING THE EFFIGY TO WORK

Raising the effigy into place may require two people depending on the weight of the bird, the height of the attachment point, and the number of branches the line contacts. It often helps to get the effigy moving by having one person push up on it while a second person pulls on the other end of the line.

Raise the effigy as high as possible while evaluating the factors of visibility, entanglement, and accessibility to perching vultures. It is advisable to back away from the roost and look at it from different angles to determine if it is at a height to satisfy the above concerns. Finally,

tie the trailing end of the attachment line to a secure location that minimizes potential interference by pedestrian, wildlife, or other traffic. Wrap and secure the excess line so that it will be available at a later time should the effigy need to be lowered for maintenance or replacement. Avoid tying to places (such as along a fence top, horizontal branch, or other movement corridor) where chewing damage by rodents is likely. The effigy should now be visible to incoming bird, hanging upside down with its wings outstretched, and ready to disperse the roost.

ATTACHMENT 2. FAA Recommended Wildlife Exclusion Fencing



Federal Aviation Administration

National Part 139 CertAlert

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

Date: 08/03/2016 **No. 16-03**
To: Airport Operators and FAA Airport Certification Safety Inspectors (ACSIIs)
Subject: Recommended Wildlife Exclusion Fencing Point of
Contact: Amy Anderson, AAS-300, (202) 267-7205
 Email: amy.anderson@faa.gov

1. Purpose.

This CertAlert contains airfield exclusion methods for deer and other large mammals.

2. Cancellation.

This CertAlert cancels CertAlert 01-01, Deer Aircraft Hazard, dated February 1, 2001; CertAlert 02-09, Alternative Deer Fencing, dated December 12, 2002; and CertAlert 04-16, Deer Hazard to Aircraft and Deer Fencing, dated December 13, 2004.

3. Background.

Elevated deer and coyote populations in the United States represent an increasingly serious threat to both Commercial and General Aviation Aircraft. According to the National Wildlife Strike Database, deer and coyote are the most frequently struck terrestrial mammals (37 and 34 percent, respectively). Deer are responsible for 92 percent of the mammal strikes that resulted in damage. From 1990 to 2015, over 1,107 deer-aircraft collisions and 487 coyote-aircraft collisions were reported to the Federal Aviation Administration (FAA). Of these reports, 932 of the deer strikes (84%) and 43 of the coyote strikes (9%) indicated the aircraft was damaged as a result of the collision.

The FAA reminds airport operators that controlling deer and other medium to large terrestrial mammals on and around airfields is very important. Two recent incidents include a Cessna 195B sustaining significant damage on landing as a result of veering off the runway to avoid striking white-tailed deer in Virginia and a Cessna 310 that was destroyed on approach to an airport in Michigan when it collided with a white-tailed deer.

4. Recommendations.

Proper fencing is the best way of keeping deer and coyotes off aircraft movement areas. In some cases, deer have been observed jumping over 8-foot fencing and coyotes have been observed scaling 6-foot fencing. Deer and coyotes can fit through very small gaps between

gates and under fencing. Deer have been observed squeezing through a 7.5-inch gap at the bottom of a fence. Coyotes can fit through 6 inch x 4 inch gaps under a fence and they will also dig under the fence to access the airfield.

The FAA recommends a 10-foot fence¹ with 3-strand barbed wire outriggers. In some cases, an airport may be able to use an 8-foot fence with 3-strand barbed-wire outriggers, depending on the amount of deer activity in a local area.

A 4- to 5-foot skirt of fencing material, attached to the bottom of the fence and buried at a 45-degree angle on the outside of the fence, is ideal to prevent animals from digging under the fence and reduce the chance of washouts. If the fence skirting cannot be installed at a 45-degree angle, then it is acceptable to install it horizontally underground several inches beneath the surface. This type of fencing also greatly increases airport security and safety. A concrete base² along the bottom of the fence is also an option to prevent burrowing or digging under the fence. Airport Operators should keep the fence line right-of-way free of excess vegetation. The fence line should be inspected daily, and a fence inspection schedule should be included in an airport's Wildlife Hazard Management Plan (WHMP). If the proposed inspection schedule is less than daily, it should be approved by an ACSI for Part 139 certificated airports. Washouts, breaks, or other holes in the fence need to be repaired as soon as they are discovered.

Gates should close with less than 6-inch gaps to prevent entry by deer or coyotes. If the gates have gaps along the bottom, installation of concrete "speed bumps" under the gate can be a solution. If the gaps are between the gates or the poles, a heavy brush material or interlocking metal bars can also be installed to preclude entry by deer or coyote. In some cases, a single strand of barbed wire strung between the bottom of the fence and the ground where there are gaps will minimize the potential for wildlife access.

Chain link fencing is a type of wire-mesh fencing. Other types of wire-mesh fencing that are suitable for exclusion of wildlife at airports include woven-wire and v-mesh fencing. Also, high tensile welded-wire fencing has been used successfully at different airports to exclude deer and coyotes. However, these types of fencing must be researched thoroughly when choosing an adequate fencing material for an airport due to the variability in durability, life span, and the spacing of mesh and welded wire.

In some cases, electric fencing or matting may offer a suitable alternative. Recent improvements in fencing components and design have greatly increased the effectiveness and ease of installation of electric fences. Tests by the U.S. Department of Agriculture (USDA), National Wildlife Research Center, have shown that some 4- to 6-foot, 5- to 9- strand electric fences designs can be 99% effective at stopping deer. Installation of some of the newer electric fences requires neither specialized equipment nor training; however, they may require more maintenance than other types of fence and must be consistently electrified. Airport sponsors must contact their local Airport District Office (ADO) to

¹ AC No: 150/5370-10G, *Standards for Specifying Construction of Airports* (Part 8 – Fencing), provides details on different fencing and post materials (e.g., chain link, welded and woven wire mesh, galvanized or pvc coating, etc.).

² Additional information regarding underground skirting, fence base materials, vegetation clearance recommendations, and installation procedures can be found in AC 150/5370-10G.

discuss eligibility for AIP funding or requirements for a Modification to Standards (MOS).

In limited situations, the use of non-conductive, composite, frangible electric fence posts and fence conductors may allow the installation of electric fence closer to the aircraft movement area than would normally be allowed with standard link fencing material.

Please note that electric fencing may produce radio frequency interference that could be disruptive to NAVAIDS and airport communications and should be considered when determining types of fencing.

The key for excluding deer and coyotes is the proper installation and maintenance of a fence that is:

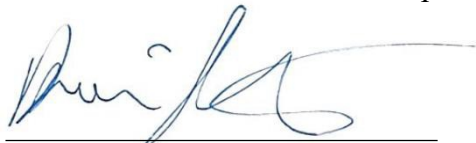
- Of sufficient height to deter jumping and scaling
- Constructed of a material that is difficult to penetrate
- Constructed fully around the airfield without gaps below the fence or at the gates or that mitigates the gaps with other exclusionary materials
- Constructed to deter digging or burrowing under the fence

The most suitable fence for an airport depends on many factors, including the observed wildlife hazards, the potential impacts of certain types of fencing, seasonality of hazards, costs (both for construction and maintenance), and adjacent habitat types. Airport sponsors must contact their local ADO to discuss what types of fencing are eligible for AIP funding.

For proposed fencing that will intersect wetlands or surface waters (streams, rivers, etc.), the airport sponsor should determine what state and federal permits will be required prior to installation. Fencing that is located in wetlands or over surface waters typically requires additional maintenance and/or cleaning due to debris getting caught and potentially damaging the fence. If a culvert is located along the perimeter fence, grates or some other barrier should be placed over the culvert to ensure wildlife cannot access the airfield through the culvert. The barrier should allow for water movement and should be inspected and cleared of debris regularly to ensure water is flowing efficiently.

Airport sponsors should include new and/or improved wildlife fencing in their WHMP as a prioritized action item. If deer are observed on or near the aircraft movement area, immediate action must be taken to remove them.

Airport operators can contact the State Wildlife Management Agency or the nearest USDA, Wildlife Services Office for assistance with deer problems.



Brian Rushforth, Manager
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ATTACHMENT 3. Low-level Flight BASH/WASH Considerations

(Information adopted from Air Force Pamphlet 91-212)

Low-level Flight BASH/WASH Considerations

- Flying routes under the following conditions should be avoided:
 - Areas with known raptor (birds of prey) concentrations during summer, especially during 1000-1700 hours, due to increased thermals. Generally, a maximum altitude of 3,000-4,000' AGL is reached by all raptor species, though soaring can occur at considerably higher altitudes.
 - Areas with ideal terrain for creating thermals during summer months, such as ridgelines, rolling hills and areas near large bodies of water. This applies to southern Florida and Texas during winter.
- Should avoid flying one hour before and after sunrise/sunset when there is a known increase in bird activity to reduce potential hazards, or when in the following areas: All coastal areas, Great Lakes region, and Great Salt Lake to avoid gulls and shorebirds; areas of known blackbird and starling roosts. Information is available from the USFWS and local experts; and Known local concentrations of waterfowl (ducks, geese, pelicans and swans).
- Potential bird strike hazards increase at altitudes with most favorable wind speed and direction for migrating birds (particularly near shear altitudes) up to 48 hours prior to and 24 hours after frontal passage; especially during October and November. Weather is a prime stimulus for migratory bird movements.
- Flying near wildlife refuges, landfills, stockyards, and food processing plants should be avoided, as these all attract birds.
- The following should be obtained from the Internet to best assess low-level and special use airspace bird hazards:
 - Bird Avoidance Model (BAM) bird hazard risk predictions. The BAM may be accessed at www.usahas.com or through the USAF BASH web page (safety.Kirtland.af.mil/AFSC/Bash/home.html).
 - Avian Hazard Advisory System (AHAS) near real time bird risk predictions. AHAS can be accessed at www.usahas.com or through a link from the USAF BASH web page (safety.Kirtland.af.mil/AFSC/Bash/home.html).
- The following may be obtained from HQ AFSC/SEFW, Kirtland AFB to best assess low-level route hazards: Specific guidance when unusual bird movements are noted and guidance in specific geographical areas.
- Consider the following operational changes to reduce threats from bird strikes, mission requirements permitting: Reduce low-level flight time; reduce formation flying; reduce airspeed at low-levels; and increase altitudes during low-level flights.