

Wildlife Hazard Management Plan

Juneau International Airport



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List of Acronyms

AAC	Alaska Administrative Code
AC	Advisory Circular
ACOE	Army Corps of Engineers
ADF&G	Alaska Department of Fish and Game
AS	Alaska Statute
ATCT	Air Traffic Control Tower
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
DEC	Alaska Department of Environmental Conservation
EIS	Environmental Impact Statement
EVAR	Emergency Vehicle Access Road
FAA	Federal Aviation Administration
FSS	Flight Services Station
FAR	Federal Aviation Regulations
JNU	Juneau International Airport
MWSGR	Mendenhall Wetlands State Game Refuge
NOTAM	Notice to Airmen
RSA	Runway Safety Area
USFWS	United States Fish and Wildlife Service
WHA	Wildlife Hazard Assessment
WHAG	Wildlife Hazards Advisory Group
WHWG	Wildlife Hazard Working Group
WHMIS	Wildlife Hazard Management Information System
WHMP	Wildlife Hazard Management Plan
WS	USDA, Wildlife Services program

1.0 INTRODUCTION

1.1 OVERVIEW

The Juneau International Airport (JNU) has contended with wildlife hazards for many years. Its location along the rocky shores of southeast Alaska presents challenges for airport management charged with maintaining a safe aircraft operating environment in the face of dynamic populations of resident and migratory wildlife. A wildlife hazard is defined as: *The potential for a damaging collision between wildlife and aircraft on or near an airport.* Over the years, aircraft operating at JNU have experienced collisions with wildlife. None of these wildlife strikes resulted in injury or loss of life, but substantial damage to aircraft has incurred. As a result of wildlife strikes at JNU, the Federal Aviation Administration (FAA) required the airport to conduct a formal Wildlife Hazard Assessment (WHA). The original WHA was completed in April of 1999 and served as the basis for this Wildlife Hazard Management Plan (WHMP). The WHA identified wildlife species (birds and mammals) which pose a regular hazard to aircraft and the habitat components on and surrounding the airport which attract these species. After the WHA, a WHMP was written and used as the staple for the Wildlife Damage Management at JNU. The WHMP will be reviewed and revised annually.

JNU has long maintained a program for the regular dispersal of birds prior to air carrier aircraft movements. The objective of this WHMP is to set forth a well-defined set of policies, goals, and standards by which wildlife hazards can be effectively reduced. Data collected and documented on the Wildlife Log by documenting observations and daily wildlife dispersal is regularly analyzed and used to continually assess the wildlife hazards at JNU.

This WHMP sets forth the policies and procedures regarding wildlife hazard management at JNU, and fulfills the legal requirements of 14 CFR Part 139.337 (e). The WHMP defines habitat management objectives and wildlife control procedures which will help to reduce the potential for a damaging collision between wildlife and aircraft operating at JNU. The WHMP must include 7 required components according to 14 CFR Part 139.337 (f) and are as follows:

- (1) *A list of the individuals having authority and responsibility for implementing each aspect of the plan.*
- (2) *A list prioritizing the following actions identified in the Wildlife Hazard Assessment (WHA) and target dates for their initiation and completion:*
 - (i) *Wildlife population management;*
 - (ii) *Habitat modification; and*
 - (iii) *Land use changes.*
- (3) *Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.*
- (4) *Identification of resources that the certificate holder will provide to implement the plan.*
- (5) *Procedures to be followed during air carrier operations that at a minimum includes—*

- (i) Designation of personnel responsible for implementing the procedures;*
 - (ii) Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier operations begin;*
 - (iii) Wildlife hazard control measures; and*
 - (iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the Air Traffic Control Tower (ATCT).*
- (6) Procedures to review and evaluate the wildlife hazard management plan every 12 consecutive months or following an event described in FAR 139.337 paragraphs (b)(1), (b)(2), and (b)(3), 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 WHA that should be reevaluated.**
- (7) A training program conducted by a qualified wildlife damage management biologist to provide airport personnel with the knowledge and skills needed to successfully carry out the wildlife hazard management plan required by paragraph (d) of this section.*

In addition, 14 CFR Part 139.337(a) states that “each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected”. Section (a) is extremely important because it allows the airport flexibility in the implementation of its WHMP. The airport, therefore, has discretion in the use of procedures and/or techniques that have not yet been incorporated into the WHMP, but are necessary for the immediate alleviation of wildlife hazards. It is the intent of the airport to incorporate such rapid response procedures and/or techniques into the WHMP during future revisions. To augment compliance with Part 139.337(f), the FAA issued a CertAlert (No. 97-09) to provide guidance to airports in developing their plans. This CertAlert contains a sample outline that was used for guidance in the development of this plan.

1.2 WILDLIFE STRIKE HISTORY

A record of wildlife strikes provides a starting point for understanding wildlife hazards at an airport. While some strikes may have gone unreported over the years, those reported provide valuable information to help resolve current wildlife hazards. Wildlife strike records yield crucial pieces of information, such as the species involved and times of year when wildlife hazards are most prevalent.

The airport recognizes the need for diligence in reporting all wildlife strikes, damaging or not. Wildlife strike reporting is voluntary and places no requirement on aircraft operators or others to report wildlife strikes. However, JNU will, in a timely and accurate manner, report every wildlife strike it becomes aware of. Further guidance for airport personnel regarding wildlife strike reporting is provided under Section 5 of this plan. The JNU wildlife strike record can be found by accessing the FAA’s Wildlife Strike Database at <http://wildlife.faa.gov>.

1.3 HAZARDOUS WILDLIFE AND ASSOCIATED ATTRACTANTS

Hazardous wildlife considered to present the greatest threats to aircraft at JNU is that with flocking tendencies (e.g., gulls, ducks, and shorebirds) or of relatively large size (e.g., Canada geese, eagles, herons, and deer). Mammals such as deer, bear and otter may also present an extreme hazard, but are not as common at JNU as birds. Juvenile animals and migratory species may also pose higher risks for aircraft collisions because of their general unfamiliarity with the airport environment. Wildlife hazard management will focus on the groups previously mentioned, but may include other species as needed. The need to target other hazardous wildlife species will be identified during daily wildlife hazard monitoring efforts and will be included in periodic updates of the WHMP.

JNU is surrounded on three sides by the Mendenhall Wetlands State game Refuge (MWSGR), a well-known staging and wintering area for migratory waterfowl and shorebirds. The MWSGR is a mixture of intertidal wetlands and open marine waters. The habitats present on the MWSGR are the primary attractant for most species of hazardous wildlife common at JNU. The MWSGR is owned by the State of Alaska and managed by the Alaska Department of Fish and Game (ADF&G), and does not fall under the authority of airport management. JNU has both natural and artificial habitats on the airport that contribute to the presence of hazardous wildlife on the airfield. The most attractive of these areas include intertidal wetlands, a brackish water pond, stands of spruce-hemlock woodlands, and 2 freshwater salmon streams, which empty into the intertidal wetlands. In addition, grassy areas bordering aircraft movement areas (the runway and taxiways) support earthworms, which at times attract large numbers of gulls, crows, and shorebirds.

2.0 AUTHORITY AND RESPONSIBILITY FOR IMPLEMENTATION

The WHMP will be executed through the authority of the JNU Airport Manager who bears the responsibility according to 14 CFR Part 139.337. This regulation asserts that the certificate holder is the party responsible for wildlife hazard management at the airport. The City and Borough of Juneau (CBJ) designates the JNU Airport Manager as the person responsible for daily maintenance and safe operating conditions at JNU. Safety is the primary concern driving wildlife hazard management operations. The goal of all authority derived from this WHMP is to enhance the safety of passengers and reduce the damage threat to aircraft operating at JNU.

PERSONS RESPONSIBLE FOR IMPLEMENTING THE PLAN

1. Airport Manager
2. Superintendent of Airfield Operations
3. Wildlife Coordinator (USDA-Wildlife Biologist)
4. Wildlife Patrol (Trained JNU Airfield Maintenance Personnel and Wildlife Services Personnel, from the list in Appendix F)

AIRPORT MANAGER

- Provide oversight and final management decisions on procedures and WHMP implementation in relation to ACs, Certalerts, and other CBJ policies.
- Communicate to the Wildlife Coordinator the report of a wildlife strike.
- Implement habitat management goals according to the timetable in Section 4.
- Review the WHMP annually and update as necessary through coordination with the WHAG.
- Coordinate the annual meeting for review of this WHMP with the Wildlife Coordinator, Superintendent, and other members of the WHAG (Section 8).
- Secure state and federal wildlife control permits for wildlife control operations.
- Submit annual reports of wildlife management activities to ADF&G and United States Fish and Wildlife Service (USFWS).

SUPERINTENDENT OF AIRFIELD OPERATIONS

- In the absence of the Wildlife Coordinator, the Superintendent assumes the duties of the Wildlife Coordinator that are listed below.

- Conduct wildlife control activities as needed.
- Review the WHMP annually and update as necessary through coordination with the WHAG (Section 8).
- Implement habitat management goals according to the timetable in Section 4.
- Communicate to the Wildlife Coordinator the report of a wildlife strike
- Maintain an adequate supply of pyrotechnics, ammunition, firearms, propane tanks, and other equipment necessary to conduct daily wildlife control operations.

WILDLIFE COORDINATOR (USDA - Wildlife Services Project Leader)

- Supervise, coordinate, and monitor wildlife control activities as outlined in the WHMP (Section 5).
- Conduct wildlife control activities listed under Wildlife Patrol as needed.
- Document and maintain written records of all wildlife control activities and strikes and keep the Airport Manager updated as to the status of wildlife hazards.
- Report all wildlife strikes to the FAA using Form 5200-7 or online via the wildlife strike reporting website.
- Coordinate with Superintendent to maintain an adequate supply of pyrotechnics, ammunition, firearms, propane tanks, and other equipment necessary to conduct daily wildlife control operations.
- Provide recommendations to the Superintendent and Airport Manager on possible new habitat management projects.
- Stay informed on upcoming airport construction projects and attend planning/progress meetings to ensure that construction will not create wildlife attractants.
- Continually update the list of personnel trained in wildlife control procedures (Appendix F).
- Review the WHMP annually and update as necessary through coordination with the WHAG (Section 8).
- Train airport personnel to conduct wildlife control per AC 150/5200-36A

WILDLIFE PATROL (Trained JNU Airfield Maintenance Personnel and Wildlife Services Personnel, from the list in Appendix F)

- Carry out daily airfield sweeps and wildlife control actions according Section 5.
- Record all wildlife control actions daily on the Wildlife Log sheet, with emphasis on filling out all information thoroughly including species identification.
- Report the observation of new hazardous wildlife species not currently listed on state and federal wildlife control permits.
- Report any change in airfield conditions resulting in a sudden increase in wildlife numbers on the airport (this includes weather conditions, herring spawn, fish carcasses on shore, etc.).
- Report all wildlife strikes to the Wildlife Coordinator.
- Implement habitat management projects under the direction of the Wildlife Coordinator and/or Airport Manager.
- Remove carcasses, food debris, or refuse that may attract wildlife.
- Report sudden increases in wildlife numbers to the Wildlife Coordinator or designee. Issue an Advisory to ATCT of unusual wildlife activity if warranted.

3.0 PERMITS AND REGULATIONS

3.1 PERMITS REQUIRED BY USFWS AND ADF&G

14 CFR 139.337 sets forth the federal requirements for wildlife hazard management at airports. Compliance with 14 CFR Part 139.337 is required by the FAA for continued certification of JNU's Airport Operating Certificate. Subpart (a) states that "*in accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected*".

Because wildlife in Alaska are protected by state and federal law, a series of permits from USFWS and ADF&G are necessary to legally harass or lethally remove wildlife to reduce the threat to human health and safety. Updated copies of these permits are located in Appendix A of this WHMP. At a minimum, the three permits under which the JNU Wildlife Hazard Management Program is conducted include the following:

1. **Depredation at Airports**, issued by USFWS
2. **Purposeful Eagle Take for Safety/Eagle Nest Take**, issued by USFWS
3. **Public Safety Permit**, issued by ADF&G

Section 5 of this plan describes the annual reporting procedures for permit renewal. As the "permittee", the Airport Manager is responsible for maintaining all federal and state wildlife control permits and for submitting annual reports to applicable agencies. A copy of all permits will be carried by "subpermittees" (in the vehicle or on their person) conducting wildlife control actions.

3.1.1 Depredation At Airports Permit

50 CFR 13 gives the USFWS the authority to issue a permit to JNU to lethally remove migratory birds from the airport to alleviate wildlife hazards (lethal reinforcement). The Depredation at Airports Permit issued by the USFWS is required before birds, protected by the Migratory Bird Treaty Act (Section 3 of this WHMP), can be lethally removed. Section E of the Depredation Permit describes the limits to which birds may be lethally taken. It authorizes that the "**Minimum number and species**" be lethally taken, live-trapped and relocated, or active nests (including eggs) be destroyed. Section F of the Depredation Permit prevents the lethal take of Bald/Golden Eagles and Threatened and Endangered Species. Appendix B provides a list of Threatened and Endangered Species for Alaska.

The Depredation Permit requires that an integrated wildlife damage management program, that emphasizes that non-lethal concepts such as habitat management, exclusion, and deterrence techniques be used prior to using lethal reinforcement. These techniques are addressed in Section 4 (Habitat Management) and Section 5 (Wildlife Management).

3.1.2 Purposeful Eagle Take For Safety/Eagle Nest Take Permit

The Purposeful Eagle Take for Safety/Eagle Nest Take permit (formerly called Eagle Depredation) authorizes Wildlife Patrol personnel at JNU to “*use non-lethal scare devices and scare tactics to move or disperse bald eagles endangering human safety due to high potential of a serious bird strike to aircraft including the use of airhorns, pyrotechnics, and vehicle horns*”. This permit also allowed for the removal of one eagle nests (see permit) in the woodland area south of the Float Pond, and the removal of any new partially constructed nests located on airport property to discourage eagles from re-nesting. For specific conditions to comply with all avoidance, minimization, or other mitigation measures prescribed by the permit issuing office refer to Section F of the Purposeful Eagle Nest Take Permit found in Appendix A of this WHMP.

In order to execute the Purposeful Eagle Nest Take Permit, a letter of concurrence is also required from ADF&G. A letter of concurrence was provided by ADF&G acknowledging that the nests, and eagles associated with the nests, represent a significant hazard to the safety of the public and aircraft landing and departing from the Juneau International Airport, and authorizes removal of these nests consistent with the terms of JNU’s Purposeful Eagle Nest Take Permit.

3.1.3 Public Safety Permit

The Public Safety Permit issued by ADF&G is in accordance with AS 16.05.930. This permit grants “*the permittee and subpermittees to haze all birds to alleviate hazards to arriving and departing aircraft on state-operated property.... Authority is also granted to take (i.e. kill) ...the species and numbers of birds specified on the federal permits....*”

The Public Safety Permit also grants *permittee and subpermittee the authority to haze all mammals from state operated airport property to alleviate hazards to arriving and departing aircraft....*” Prior authorization must be obtained from the local ADF&G Area Biologist prior to lethally removing most mammals. In 2014, an addendum was added to the permit to allow JNU personnel to capture and relocate porcupine.

For specific conditions, exceptions, and restrictions refer to the current copy of the Public Safety Permit located in Appendix A of this WHMP.

3.2 FAA ADVISORY CIRCULARS & CERTALERTS FOR WILDLIFE HAZARD MANAGEMENT

The FAA issued a group of Advisory Circulars (ACs) and Certalerts pertaining to wildlife hazards. These documents are often used by the FAA and airport management to provide specific guidance regarding local land uses. While these documents do not carry the full effect of law, they are used by the FAA and airports as policy guides. JNU will comply with these ACs and Certalerts to the fullest extent possible. These documents are frequently changed or updated, and their current status will be verified on a regular basis. This will be accomplished by

contacting the FAA directly or by visiting their website at <http://wildlife.faa.gov>.

3.2.1 Advisory Circulars

150/5200-32B: *Wildlife Strike Reporting*

This AC discussed the importance of reporting ALL wildlife strikes, how the Feather Identification Lab at the Smithsonian Institute assists with bird identification, and ways to report wildlife strikes.

150/5200-33B: *Hazardous Wildlife Attractants On or Near Airports*

This AC provides guidance on land uses that may attract hazardous wildlife onto or near airports.

150/5200-34A: *Construction or Establishment of Landfills near Public Airports*

This AC contains guidance on complying with Federal requirements regarding the construction or establishment of landfills near public airports.

150/5200-36A: *Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports*

This AC discusses the qualifications and training programs for those personnel conducting wildlife management per the WHMP.

150/5200-38A: *Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans*

This AC defines the minimum acceptable standards for the conduct and preparation of Wildlife Hazard Site Visits (Site Visit), Wildlife Hazard Assessments (Assessments) and Wildlife Hazard Management Plans (Plans).

3.2.2 CertAlerts

04-16: *Deer Hazard to Aircraft and Deer Fencing*

This reminds airport operators of the importance of controlling deer on and around airfields.

06-07: *Concerns Regarding Habitat Projects for Threatened and Endangered Species*

Airport operators must decline to adopt habitat management techniques that jeopardize aviation safety. Adopting such techniques could place them in violation of their obligations and subject to an FAA enforcement action and possible civil penalties under 49 U.S.C. 44706, as implemented by 14 CFR 139.337.

97-09: *Wildlife Hazard Management Plan Outline*

A wildlife hazard assessment, defined as an ecological study in part 139.337 (a), conducted by a wildlife damage management biologist, provides the scientific basis for the development implementation, and refinement of a wildlife hazard management plan.

98-05: Grasses Attractive To Hazardous Wildlife

Airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport.

3.3 FEDERAL LAWS PROTECTING WILDLIFE

The following federal laws provide protection to certain birds. State laws may impose additional restrictions and requirements for these same groups of bird species.

3.3.1 Migratory Bird Treaty Act of 1918 (50 CFR, Part 21.41)

The Migratory Bird Treaty Act is an agreement between the U.S., Great Britain, Canada, Japan, Mexico and the Former Soviet Union for the protection of migratory birds. The MBTA states that ...

it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, ... any migratory bird, any part, nest, or egg of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest or egg thereof, ... or any part, nest, or egg of any such bird. The entire act can be viewed at <http://www.fws.gov/laws/lawsdigest/migtrea.html>.

This law is administered by the USFWS, who also issues Depredation at Airports Permit that authorize activities that are otherwise illegal under the MBTA. The Depredation at Airports Permit gives JNU the authority to lethally remove migratory birds, eggs, and nests for human health and safety purposes.

3.3.2 Bald and Golden Eagle Protection Act (50 CFR, Part 22.23)

This law prohibits “*take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or in any manner any bald eagle commonly known as the American eagle or any golden eagle, alive or dead, or any part, nest, or egg thereof of the foregoing eagles....*” An electronic version of the act can be found at the following web address: <http://www.fws.gov/le/pdf/BEPA.pdf>.

3.3.3 Endangered Species Act (50 CFR, Part 17)

The Endangered Species Act prohibits the harassment, trapping, and killing of wildlife species listed as threatened or endangered (T&E). The Endangered Species Act also affords protection to the habitat of listed species. The harassment and killing of listed species may be allowed under certain circumstances. However, a special permit for such actions must be issued by the appropriate agencies prior to any actions involving listed species. If a wildlife hazard should arise involving a federal or state listed wildlife species, the Wildlife Coordinator will alert the proper agencies as soon as possible to coordinate the best course of action to alleviate such hazard while minimizing impacts to the listed species.

3.4 STATE REGULATIONS (AS 16.05.920 and AAC 92.033)

The taking (the definition of which includes harassment and lethal removal) of game at JNU is regulated by Alaska Statute 16.05.920 PROHIBITED CONDUCT GENERALLY and Title 5 Alaska Administrative Code 92.033 PERMIT FOR SCIENTIFIC, EDUCATIONAL, PROPAGATIVE, OR PUBLIC SAFETY PURPOSES. The state list of endangered species is maintained under Title 5 Alaska Administrative Code 93.020, and can be found in Appendix B.

3.5 LAWS REGARDING HABITAT MODIFICATION

The following laws pertain to wildlife control activities that call for a modification of some aspect of the legally protected environment at JNU. Specifically, water bodies, including ponds and creeks, and wetlands are the two habitats which may require permits from a governing agency before modification can take place. Since this WHMP identifies several wetland areas as the target of habitat modification objectives, the following laws will be adhered to by the airport to ensure legal compliance with local, state, and federal requirements. The Wildlife Coordinator and/or the Airport Manager will coordinate with the Airport Engineer if permits are needed.

3.5.1 Clean Water Act (Section 404)

Section 404 of the Clean Water Act regulates the placement of dredged or fill materials in the waters of the U.S., including wetlands. The U.S. Army Corps of Engineers (ACOE) is responsible for enforcing this regulation and has established a permitting process for activities which may affect wetlands. Generally, the filling of wetlands or alteration of wetlands falls under the protection of this regulation. It has been determined that the hand clearing of surface vegetation from wetlands does not require a permit, whereas grubbing (mechanical land clearing) would require a permit. The loss of wetlands due to habitat modification activities may require mitigation measures. Any such mitigation measures will be consistent with the airport's policy regarding wetlands stated in Section 4.4.4 of this plan. General guidance for obtaining necessary permits and consultation on wetlands designation will be obtained through coordination with JNU's airport engineer.

3.5.2 Clean Water Act (Section 401)

Section 401 of the Clean Water Act requires certification that the proposed project will meet state water quality standards before federal permits are approved. This regulation covers projects affecting waters of the U.S., including wetlands. The Alaska Department of Environmental Conservation (DEC) is responsible for enforcing this regulation.

3.5.3 Fish Habitat Permit [AS 16.05.840 (Fishway Act) & AS 16.05.870 (Anadromous Fish Act)]

These two Alaska statutes require that prior authorization be obtained from ADF&G for activities that could affect fish habitat and fish passage in freshwater streams. The Anadromous Fish Act covers catalogued anadromous fish habitat and the Fishway Act covers areas with resident fish passage. None of the habitat management projects at JNU should require permits under this legislation.

4.0 HABITAT MANAGEMENT

4.1 OVERVIEW

Habitat management is one of the most effective long-term measures for reducing wildlife hazards on or near airports. Habitat management is the alteration of habitat features, natural (food, water, and cover) and artificial (buildings, NAVAIDs, and other structures) that support and attract wildlife. Wildlife habitat exerts different levels of an attractive influence over a given species' behavior. This influence is dependent upon the type of habitat being provided and whether the attractant is one of food, water, cover, or a combination of the three. The strength of any given attractant can be described in terms of its ability to sustain wildlife activity in the face of increasing levels of disturbance (e.g., noise, development, competition from other species). Food sources generally cause wildlife to repeatedly return to a given area in the face of active disturbance. As a result, disturbances such as auditory harassment have less long-term effect on animals that are feeding than those that are loafing. Therefore, reducing the amount or type of food attractant is very important. Habitat management objectives involving food source reduction will be given the highest priority. Habitat modifications will be monitored carefully to ensure the changes reduce wildlife hazards and do not create new attractions for different wildlife. A number of habitat management actions or guidelines are described in this section. However, wildlife populations, vegetative succession, and airport development are dynamic in nature and require routine monitoring and re-evaluation.

4.2 HABITAT MANAGEMENT and EXCLUSION PROJECT TABLES

The goal in managing habitat is to make the airport landscape unattractive to wildlife. Generally, this is accomplished by modifying habitat components, making the environment fairly uniform and unattractive to the species that are considered the greatest hazard to aviation, or by utilizing mechanical exclusion techniques on buildings, NAVAIDs, and other structures. Table 1 lists a series of habitat-based and Table 2 lists exclusion-based action items, including target dates for completion for JNU.

Table 1. Habitat management projects at JNU, listed in order of priority, or chronologically based on completion.

Item No.	JNU HABITAT MANAGEMENT PROJECTS	TARGET DATE	DATE COMPLETED
1	Ensure proper refuse containment on airport.	Ongoing	Ongoing
2	Eliminate small standing and temporary standing water.	Ongoing	Ongoing
3	Eliminate shrub cover to the ditch areas around the runway and taxiways.	Ongoing	Ongoing
4	Use a pickup truck and "drag" (if necessary) to discourage shorebird nesting in gravel areas, especially the RSA.	April - May	Annually

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5	Grade or Fill ruts/depressions that are caused by construction/snow removal equipment.	Ongoing	Ongoing
6	Manage infield grass to deter wildlife in summer months.	Ongoing	Ongoing
7	Dispose of all animal carcasses washed up on the shore or found on-site.	Ongoing	Ongoing
8	Remove driftwood that floats in on the tide around the safety area.	Ongoing	Ongoing
9	Remove vegetation around the pond next to gate X	Ongoing	Ongoing
10	Reduced the angle of the drainage ditch by block O hangers to increase accessibility of mowing equipment	2016	Completed
11	Removed fruit bearing bushes along the S float pond road	2016	Completed
12	Removed cotton wood trees that are a known Eagle attractant SE of runway	2016	Completed
13	Remove Spruce Trees East of 26 MALS	2018	Ongoing
14	Remove brush/vegetation along the float pond and the float pond island as well as the safety areas.	Ongoing	Ongoing
15	Install two eagle perches in the channel to attract the eagles that perch in the safety area. Replace lost perch and add two new perches.	2016	Ongoing
16	Install a culvert from drainage ditch in "Block O" under the runway to the float pond to allow drainage into the pond instead of Jordan Creek. That drainage culvert will reduce the SWPPP requirements, which will reduce the standing water in the ditch south of Alpha.	2020	Completed
17	Extend the EVAR to the east from the current end south of the east finger to gate Victor.	2022	2024
18	Monitor new drainage ditches in the infield for water retention issues.	2020	Ongoing
19	Continual checks for and removal of beaver dams and lodges in Jordan Creek and float pond.	2020	Ongoing
20	Form an agreement with CBJ Public Works streets department to mow the drainage ditches along taxiway A twice a summer or as needed.	2016	Ongoing
21	Formerly requested arm mower but instead purchased a Bobcat T550 Track Skidster which provides maneuverability and mowing capabilities in previously non-mowable locations.	2015	Completed
22	Had the additions to the 08 and 26 ends of the runway filled in and paved as part of RSA Expansion Project.	2013	Completed
23	Added 2" minus rock to the RSA on east, south, west sides as an alternative to pavement, or topsoil and grass.	2012	Completed
24	Installed a culvert at the mouth of Jordan Creek to account for the new south safety area and removed the "rock dam" as identified in the WHA.	2012	Completed
25	Covered the exposed portion of Jordan Creek between the runway and Taxiway A.	2012	Completed
26	Dredged the Float Pond and excavated the shore and added rock to the shore to steepen the slopes and deepen the pond to minimize and/or eliminate pond weed.	2012	Completed

27	Extended tidal area trench along the south RSA to the east and around the approach to Runway 26 to allow for a fish movement corridor, so that adult salmon do not "hold" during summer migration to spawning areas per EIS design.	2011	Completed
28	Installed an underground drain water storage tank on west end of Taxiway A instead of creating a pond of storm water on the approach to Runway 8.	2011	Completed
29	Relocated Duck Creek to the North per recommendation of the WHA and EIS design requirements.	2011	Completed
30	Filled in the wetland area between Temsco and the Wings of Alaska hangar called the Northeast Development area.	2011	Completed
31	Filled in slough on East End of Runway 26 as part of the RSA Expansion Project.	2011	Completed
32	Removed bald eagle nest from the woodlands south of the float pond in accordance with the Purposeful Eagle Take for Safety/Eagle Nest Take permit.	2010	Completed
33	Constructed a road on the south side of the float pond to allow for vehicular travel (wildlife patrol) completely around the float pond.	2010	Completed
34	Filled wetlands at west end of runway (at approach to Runway 08) as part of Runway Safety Area Expansion Project.	2010	Completed

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Table 2. Exclusion projects at JNU, listed in order of priority, or chronologically based on completion.

	JNU PROJECTS USING EXCLUSION DEVICES	TARGET DATE	DATE COMPLETED
1	Maintain the Security Fence so that there are no holes in the fence or breaches at the bottom.	Ongoing	Ongoing
2	Installed 3-D cable grid over centerfield FAA JAWS Control Panel	2018	2018
3	Install grates over culverts to reduce the access river otters have to the float pond	2017	2017
4	Install Anti-perching device on the FAA MALS building	2017	2017
5	Install anti-perching cable on approach lights across Mendenhall River	2017	2017
6	Had AEL&P Install anti-perching triangles on telephone polls that overlooked duck creek	2017	2017
7	Installed anti-perching device on ASOS Anemometer as well as the visibility sensor	2016	Completed
8	Installed anti-perching cable on west runway approach light structure	2016	Completed
9	Install new fencing to complete the security fence south of the airfield so that the entire border of the EVAR is also fenced.	2022	2024
10	Place anti-perching devices on mid-field FAA RVR tower, to prevent Eagles from using structure.	2014	2015
11	Place bird spikes on mid-field JAWS by east end of float pond.	2014	2015
12	Had cellular phone company place bird spikes on 2 nd cell tower North of airfield maintenance building.	2014	2014
13	Had the contracted construction company place anti-perching cables on runway approach lighting.	2013	2013
14	Placed bird spikes on East end JAWS.	2013	2013
15	Had cell company place bird spikes on cell tower North of airfield maintenance building.	2012	2012
16	Any and all new NAVAIDs or devices that are installed at JNU will be required to have anti-perching devices installed.	Ongoing	Ongoing
17	Placed bird spikes on most JNU airport boundary signposts and will continue as posts are replaced or existing areas are identified as perches.	Ongoing	Ongoing
18	Use spikes/cables/mylar tape as a temporary exclusion from ditches or infield grass areas during times of increased wildlife activity.	Ongoing	Ongoing
19	Installed eagle perches in the marsh to the south to provide alternate perch areas away from the airport.	2019	Completed
20	Install anti-perching wire along the rails of the FAA approach lights bridge on the East side of the Mendenhall River.	2020	Completed

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4.3 FOOD/PREY BASE MANAGEMENT

Food attracts and sustains wildlife and is the strongest attractant for hazardous wildlife. Management of the available food sources is an important objective in habitat management strategy. When food is available, many species will persist on the airfield despite repeated control efforts. The removal and/or reduction of food sources is a top priority for habitat management at JNU.

4.3.1 Invertebrates

Insects and earthworms are a substantial attractant for gulls, corvids, shorebirds, and some species of waterfowl. Primary areas that harbor insects and earthworms at JNU are the areas immediately adjacent to the Runway and Taxiway A, the infield grass between the two, and the ditches north of Alpha Taxiway. Periods of heavy rain may contribute to increased earthworm availability, as worms come to the ground surface throughout the year. However, data analysis of the Wildlife Hazard Log entries shows that there is a significant increase in worm activity the last few weeks of October and first few weeks of November depending on whether there is rain or snow during that time of year. Marine and intertidal invertebrates wash up on the shores along the south edges of the RSA, and the grass slopes of both approaches of the runway.

The Wildlife Coordinator and Airport Superintendent will work together to oversee airfield maintenance operations in a manner that minimizes invertebrate availability. A vacuum truck has been found to be the most effective method for removing worms from the taxiways and runway. The truck can be driven outside, around, and between the lights of the taxiways and runway, which makes it ideal for quickly sucking up all the worms that frequent the pavement during periods of rain in the Fall/early winter.

Insects in the grassy areas of the airport are a significant food source during the summer months for insect eating birds like swallows. JNU will keep the grass height during the summer to a short height to minimize insect hatches. Geese have not been observed on-site with enough frequency during the summer months that grass height needs to be maintained at the FAA recommended 7"-14" to deter geese. Therefore, JNU will cut the grass lower in the summer months so that other birds like insect eaters (swallows) will not be attracted to the infield grass.

4.3.2 Vertebrates

Vertebrates such as voles, mice, rats, some birds, and fish (alive and dead) are a food source for many predator species. When vertebrate prey species occur on or around the airport, the attraction of predatory birds and mammals may pose hazards to aircraft and human safety. Small mammals are attracted to weeds, tall grass, fruit-producing plants, brush, and human waste/refuse. Voles have been documented as an attractant for gulls, ravens, and raptors in the marsh/wetland area around TEMSCO (grid C6). Primarily, voles become more of an attractant

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at extreme high tides when the area is flooded. As the area affected by the tides is wetlands, no habitat management is proposed at this time. JNU feels that wildlife control efforts will suffice as the high costs of wetland mitigation are not feasible to accomplish the desired habitat management goals that would reduce the voles at high tide.

4.3.3 Fish/animal carcasses

Any animal carcass, whether naturally occurring or resulting from wildlife control operations, is considered a hazardous wildlife attractant. All carcasses found on airport property that can be safely reached will be retrieved and disposed of immediately. Carcasses will be placed in a plastic trash bag and discarded in a waste receptacle with a tight fitting lid. All bird carcasses generated by wildlife control actions will be processed immediately, following the conditions outlined in the USFWS and ADF&G permits. JNU understands that it is counterproductive to kill birds on the airport to alleviate a hazard, only to leave the carcasses lying to attract other wildlife.

All five species of salmon can be found around JNU. Duck Creek is a spawning area for Chum Salmon and Humpy Salmon in July/August. Chum, Humpy, and Coho Salmon travel up Jordan Creek to spawn. The carcasses after spawning line the creek bottoms all along the creek's presence on airport property. There have also been numerous carcasses observed in the intertidal areas along the south RSA. All carcasses can become a food source for gulls, crows, ravens, and eagles. As with animal carcasses, fish carcasses found on airport property that can be safely reached will be retrieved and disposed of immediately.

4.3.4 Terrestrial Vegetation

Seeds and fruits are high energy food items consumed by many wildlife species. JNU will strive to eliminate or remove existing fruit bearing plants (like mountain ash), and ensure that future landscaping projects on and around the airport will use plants that are less attractive to wildlife. JNU will consult with the on-site Certified Airport Wildlife Biologist for landscaping alternatives.

The infield areas between the runway and Taxiway A, the vegetated areas west of the field (between the EVAR and the Mendenhall River), and the northeast development area have at times attracted various wildlife. Flocks of ducks and geese have been observed foraging in these areas. When that grass was planted during the RSA expansion project, JNU attempted to adhere to the latest scientific publications and plant non-palatable vegetation. JNU will attempt to discourage wildlife from the grassy areas by mowing to short lengths in the summer and allowing grass heights to be between 7" and 14" during the rest of the year.

The east, south, and west Runway Safety Areas were not planted with grass after the RSA construction process. Over time JNU expects the area to have grass and other plants grow in patches. The Wildlife Coordinator will work with the Superintendent and Airfield Maintenance to have a grader dig up the grass and replace it with other rock.

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4.3.5 Trash/Food Refuse

Food refuse in open dumpsters, or in the back of pickup trucks around JNU can attract eagles, ravens, crows, and gulls to the airfield. The Wildlife Patrol will reinforce the proper containment of all trash and food refuse on airport property by ensuring that all airport tenants are aware of the need for complete closure of all dumpsters at all times. In addition, the Wildlife Patrol will remove all trash/debris from the airfield as it is detected. This will usually be accomplished during the course of normal wildlife patrols. If necessary, the Wildlife Patrol can contact airport police to enforce litter ordinances and institute citations for those airport tenants who do not keep refuse contained.

Feeding wildlife on or around the airport contributes to the presence of scavenging birds and increases the potential for wildlife strikes. The Wildlife Coordinator and Wildlife Patrol are responsible for discouraging persons from feeding wildlife on airport property whenever observed.

4.4 WATER MANAGEMENT

Areas of standing and flowing water on and surrounding the airfield contribute to the presence of numerous species of hazardous wildlife. Water is a strong attractant to wildlife for drinking, bathing, feeding, loafing, roosting, and/or protection. While the surrounding marine waters, Mendenhall River, and Miller/Honsinger pond constitute the most significant water attractant for hazardous wildlife, it is not practical or under the authority of JNU to alter this habitat. Water management at JNU focuses primarily on the Sea Plane Base Float Pond, drainage ditches and several areas of temporary standing water scattered around the airfield.

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4.4.1 Sea Plane Base/Float Pond

The aquatic vegetation in the float pond had been determined as one of the primary attractants for waterfowl at JNU during the WHA. Sago pondweed (*Potamogeton pectinatus*) and wigeon-grass (*Ruppia maritima*) are the two species of aquatic vegetation in the float pond that were determined to be most heavily consumed by ducks, geese, and swans. For years JNU attempted to reduce that attractant with herbicide applications and by "mowing" with a pond weed harvester. In 2010/2011, as part of the Runway Safety Area Expansion Project, the float pond was dredged and the sides were sloped with an excavator. The dredge operations took fill dirt out of the float pond and had it placed elsewhere on the airport. The dredge operations have allowed the float pond to have a fairly consistent flat bottom with an average water depth of approximately 20 feet deep. The shoreline slope that was designed to have float plane docks was dug to a 2/1 ratio and the slope on the south shore that does not have float plane dock pilings is 3/1. The 2/1 slope was then stabilized with rip rap and other large rock to prevent sloughing. The east and west fingers were also excavated and dredged, and the west finger shoreline was stabilized with rip rap. The pond work has significantly reduced the amount of aquatic vegetation in the float pond, which has also reduced the attractiveness of the float pond. Aquatic vegetation currently is present on the southeast shore, the east finger, and the east finger slough (east of the east finger within the woods).

At this time JNU feels that wildlife attracted to the float pond because of the pond weed can be dispersed with regular airfield sweeps (Section 5). However, if the pond weed seems to have grown back excessively, JNU understands it can reduce the weed using the weed harvester that was used in the past, or if necessary, JNU can lower the pond water level in December/January when the pond is generally closed, by opening the outflow gate and reduce the level of water to below the pond weed depth. The exposure to cold air temperature will kill the weed and reduce its presence for a few years. JNU recognizes that using the weed harvester or reducing the pond level for a few months is not likely going to eliminate the pond weed, but is a stop gap measure designed to further reduce the pond weed attraction to wildlife. At this time it is not financially feasible to excavate the rest of the perimeter of the float pond to a 2/1 slope and reinforce the area with rip rap and other large expensive rock.

In 2010, a road on the south shore of the float pond was created as part of the dredge operation during Phase 1 of the RSA Expansion project. The road was installed by the construction company with the intent to remove after the dredging operations were completed. JNU adopted the road, understanding the importance from an operations standpoint, and has since added recycled asphalt product (RAP) to the surface. Prior to the road, waterfowl and other birds that were attracted to the float pond could line the south shore of the float pond as they escaped pyrotechnics and other deterrent techniques that were performed from the north road. The road connects the east finger with the west finger along the south shore. The connection allows a vehicle to tour the complete perimeter of the Sea Plane Base/Float Pond. The addition of the road, coupled with the modified shore of the float pond, and the deepening of the pond has significantly reduced the attractiveness of the float pond to hazardous wildlife.

4.4.2 Drainage Ditches

The airfield drainage ditches that carry runoff from the main ramp and Taxiway A holds water for varying lengths of time. These areas of standing water attract hazardous wildlife. Ducks are attracted to these ditches primarily when water flow is restricted for a length of time and begins to pool. It is the intent of JNU to keep all drainage ditches free of debris or materials that would hinder drainage. Culverts and ditches will be maintained to expedite water flow.

The water that is held in the ditch north of Taxiway A and east of Taxiway D1 near Taxiway E1, at the area called Block O, currently flows into Jordan Creek. JNU intends to install a culvert under Taxiway A and the runway to allow the water from Block O to drain into the float pond. The installed culvert will prevent the need for the water to drain into Jordan Creek. There is currently a SWPPP requirement to allow for vegetation to filter the water and collect sediments so that the water flowing into Jordan Creek is clean. The SWPPP requirement creates a wildlife hazard as the standing water attracts ducks and other wildlife. JNU recognizes that the installation of the culvert at Block O will reduce the need for the SWPPP requirements, which will in turn reduce the amount of vegetation in the ditch and further reduce the amount of standing water. By reducing the water and vegetation, the ditch area will be less attractive to shorebirds and waterfowl.

4.4.3 Temporary Standing Water

Low-lying areas that regularly collect rainwater are monitored by the Wildlife Coordinator who recommends strategies for mitigating wildlife hazards associated with temporary standing water (TSW). Most of the areas that had been previously identified as holding TSW were eliminated during the RSA construction process. It is the responsibility of the Wildlife Coordinator and the Wildlife Patrol to document any other temporary standing water locations used by wildlife and work to eliminate them.

4.4.4 On-Site Wetlands Management

Wetlands are attractive to a variety of wildlife species that pose a hazard to aircraft. Waterfowl, wading birds, shorebirds, and raptors are the species associated with wetlands that are most often involved in damaging strikes. Wetlands, whether naturally occurring or man-made, provide a unique combination of food, water, and cover that attract species seasonally and year-round. Because of their unique qualities, wetlands provide a stronger attractant for hazardous species than other land forms and are a priority for modification.

JNU acknowledges that areas that have been delineated as wetlands are nationally recognized as habitats requiring special conservation. However, in FAA Advisory Circular (AC) 150/5200-33B (*Hazardous Wildlife Attractants On Or Near Airports*), the FAA declared that wetlands should be sited outside an airport's operating environment, and that airports should correct wildlife hazards arising from them. At JNU, much of the lands surrounding the runway system are part of the Mendenhall Wetlands State Game Refuge (MWSGR), managed by ADF&G. Several

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areas on airport property have also been identified as wetlands. These areas were also identified in the original WHA (conducted in 1999 - 2000) as hazardous wildlife attractants. The RSA Expansion construction program eliminated or modified most of the areas identified as wetlands located on-site.

The key wetland areas that regularly attract hazardous species such as waterfowl, gulls, and eagles are the intertidal wetlands, which are contiguous to the adjacent wetlands that make up the MWSGR, Duck Creek, and Jordan Creek. As part of the RSA Expansion construction project, many of the on-site wetlands that had been identified have been mitigated. The wetlands west of the approach to Runway 08 were filled in. The area between Wings of Alaska and Temsco were filled in, and is now the Northeast Development Area. The East slough was moved to the east and modified.

4.4.4.1 Intertidal Wetlands

The intertidal wetlands that are located along the east and south border of the RSA, and north and east of Taxiway A are located on airport property, and are recognized as the most attractive habitat type at JNU. Their location adjacent to the RSA makes these intertidal areas especially hazardous at JNU. The attraction changes with the changing tide. High tide and low tide bring different attractants and therefore bring different species of birds. JNU recognizes that any habitat modifications to the intertidal wetlands will involve significant costs due to wetlands mitigation, but will also involve significant costs in a project that will be able to withstand the drastic tide changes. At this time JNU has determined that the costs associated with habitat modifications to the intertidal wetlands will not guarantee results. Instead, JNU will allow for regular airfield sweeps by the Wildlife Patrol to deter wildlife from the intertidal wetlands.

4.4.4.2 Duck Creek

As part of the RSA Expansion construction project, JNU relocated the Duck Creek Corridor and the mouth of Duck Creek where it spilled into the Mendenhall River. JNU worked with a variety of organizations during the EIS process for a design that put the new location of the mouth of Duck Creek to the North of the approach to Runway 08. The design of the new Duck Creek was outlined in the EIS and followed. The work was completed in 2012 and a five year monitoring program by ADF&G commenced.

During parts of the year there is no water flowing in Duck Creek, but areas of shallow standing water pools exist that are from the tide or remaining from rainfall. During July and August, Chum and humpy salmon utilize the portion of Duck Creek located on airport property as a spawning area. The lack of consistent flowing water and the overabundance of riparian vegetation located off airport property (up-stream from the tank farm) make spawning fish migration beyond airport property nearly impossible. That means that all of the adult salmon utilizing Duck Creek to spawn are spawning on airport property. Once the adult salmon have spawned on-site their carcasses line the streambed both upstream and downstream of the pedestrian bridge. Wildlife Patrol personnel will remove the salmon carcasses if they are

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determined to be an attractant, and if it is safe to do so.

On the southern border of the Duck Creek Corridor is the Northwest Development Area that was created as part of the RSA expansion project. The northern edge of the Northwest Development area currently contains an unpaved road that parallels the Duck Creek corridor. On the slope from the road to the corridor, are a variety of willow and other shrubs that were planted as part of the landscaping requirements. As those shrubs grow, they'll become perching areas for songbirds, corvids, and other hazardous wildlife. The growth of the shrubs will create a visual barrier during airfield sweeps when the Wildlife Patrol drive along the road that parallels Duck Creek corridor. It is JNU's intent to cut the willows and shrubs to maintain a height below 3'. The "open" look of the new Duck Creek corridor with uneven vegetation tends to discourage foraging by waterfowl. The Wildlife Coordinator will continue to monitor the Duck Creek corridor for how the habitat modifications required by the EIS affect the attractiveness of the area.

4.4.4.3 Jordan Creek

The Jordan Creek corridor and mouth where the creek empties into the intertidal area have historically attracted hazardous wildlife at JNU. Three of the five species of salmon utilize Jordan Creek as a spawning and rearing area. Herons, eagles, gulls, and ravens all feed on fish in the entire corridor. During the construction program, the exposed area of Jordan Creek between Taxiway A and the runway was covered. The Culvert south of the runway was lengthened and the mouth of Jordan Creek was modified to direct the flow to the south and east in a more direct route to reduce the ponding affect in the intertidal area east of the float pond. Current wildlife damage management of Jordan Creek involves wildlife sweeps to remove waterfowl, corvids, eagles and herons that frequent the area. Salmon carcasses that are detected are removed to reduce the attraction.

Further habitat management of the portion of Jordan Creek corridor on airport property would be to narrow the stream, steepen the sides of the stream bed, straighten the channel, remove the oxbow turn located west of the fire hall, and add a rock substrate to increase the velocity of the water flow. The increased water velocity would decrease the time that fish spent in that area on both the upstream and downstream movements, and would also make the area unattractive to waterfowl. At this time, it is not in JNU's interest to pursue further habitat management for the Jordan Creek Corridor as the cost of wetlands mitigation far exceeds the desired results. JNU will continue to maintain active deterrent techniques by the Wildlife Patrol during daily airfield sweeps.

4.4.4.4 East Finger Slough

Within the wooded area to the east of the east finger and south of the south float pond road is a wetland area that is being called the east finger slough for the purposes of this document. The east finger slough has water in it year round that is usually not deeper than 18 inches. The previously mentioned wigeon grass and sago pondweed that have been identified as attractants in

the float pond, are abundant in the east finger slough. Ducks, geese, swans, and other birds have been identified as utilizing that area for loafing and foraging. Ducks with young have been observed in the summer months. Eagles have been observed loafing in the woods overlooking the slough.

During the RSA expansion project, JNU placed large rock between the east finger and the east finger slough to install a road between the east finger and the slough. That barrier is porous enough to still allow water to flow between the two. The road that was installed also has direct access to the EVAR through a gate. In the future, JNU would like to fill in the east finger slough and eliminate the standing water. The presence of the pond weed in the east finger slough as become a large waterfowl attractant and eliminating filling in the area to eliminate the water would eliminate the attraction. As the east finger slough is delineated as a wetland, JNU is currently not pursuing the option to fill the slough. The cost of mitigation exceeds the desired results.

4.4.4.5 Wetlands portion of the South Woodlands

The woodlands to the south of the float pond have areas that have been designated as uplands and delineated as wetlands within. The low lying areas that have water, soil, and vegetation were delineated as wetlands during the EIS process. From 2007 when the EIS was completed to the RSA Expansion project, JNU mitigated many of the wetland areas surrounding the float pond, the east finger, and the west finger horseshoe. At this time, it is not in JNU's best interest to mitigate more of the delineated wetlands within the woodlands south of the float pond. The cost of mitigation exceeds the desired results.

4.4.4.6 Northeast Development

The northeast development area is located north of Taxiway A between the Wings of Alaska hangar and Temsco. The area had been delineated wetlands during the EIS process. The area had been identified as an attractant to waterfowl, crows, ravens, gulls, owls, and raptors. JNU went through the process to properly mitigate the wetlands. The area was filled in per the design in the EIS during phase 1 of the RSA Expansion project with fill dirt from dredge operations, except for a square that has remained wetlands (by design) located west of Taxiway F1. JNU installed man holes and culverts for storm water drainage, and will continue to develop that area for the needs of the airport. At this time it is not in JNU's interest to pursue avenues to fill the remaining wetland in the northwest development area. The cost of mitigation exceeds the desired results.

4.4.5 Off-Site Wetlands

Wetlands are attractive to a variety of wildlife species that pose a hazard to aircraft. Waterfowl, wading birds, shorebirds, and raptors are the species associated with wetlands that are most often involved in damaging strikes. Wetlands, whether naturally occurring or man-made, provide a unique combination of food, water, and cover that attract species seasonally and year-round.

Because of their unique qualities, wetlands provide a stronger attractant for hazardous species than other land forms and are a priority for modification. The following off-site wetlands are as big of a hazard to safe aircraft movements as any of the on-site wetlands; however JNU's authority and capacity to manage these areas is bounded by different statutes and ownership. Members of the WHAG (Section 8) will strive to maintain a cooperative relationship with the owners to ensure that any modification/management activities do not increase the attractions within the vicinity of the aircraft movement areas.

4.4.5.1 Mendenhall Wetlands State Game Refuge

Juneau International Airport is surrounded on three sides by the Mendenhall Wetlands State Game Refuge (MWSGR) which is managed by ADF&G. According to the management plan for the MWSGR, the basic goal of ADF&G for the MWSGR is to manage the refuge to enhance fish and wildlife populations and their habitat. That plan also states that any practice on the wetlands shall not interfere with aircraft safety. For more information regarding the management of the MWSGR, refer to the MWSGR Management Plan that can be accessed by the following link: <http://www.adfg.alaska.gov/index.cfm?adfg=mendenhallwetlands.main>. JNU will continue a cooperative relationship with ADF&G to ensure involvement in the MWSGR Management Plan.

4.4.5.2 Miller/Honsinger Pond

The Miller/Honsinger Pond is located northeast of the Temsco helicopter ramp, approximately 1,000 feet north of the runway. The WHA identified, and follow up observations through the years have confirmed that large numbers of birds are attracted to the Miller/Honsinger pond. Many birds, but especially waterfowl, have been observed flying across the runway between the pond and MWSGR. JNU currently has permission to for the Wildlife Patrol to access the private property as part of regular airfield sweeps.

4.5 COVER MANAGEMENT

For the purpose of this WHMP, the management of vegetation to reduce available cover for hazardous wildlife species includes the management of non-vegetative sources of ground cover such as gravel areas. Reduction of vegetative cover frequently reduces available food sources for some species. The goal is to reduce the amount of food and cover available to hazardous species, thereby reducing the attractiveness of the airfield to those hazardous species.

JNU will ensure that areas which must be re-vegetated, following construction or improvement activities, are not planted with large seed, nut, or berry producing plants that are attractive to hazardous species. The following sections detail the management of remaining vegetated areas at JNU. JNU will consult with the Wildlife Coordinator to ensure that any seed choices do not have attractiveness of wildlife to the airport as the preferred choice over things like soil stabilization and regeneration rate.

4.5.1 Grass

Grass in general is a very attractive habitat type. Grass at varying heights can be attractive for different wildlife species such as geese and gulls at short lengths and crows, ravens, swallows, and sandhill cranes. Grass at longer lengths can be an area that worms and insects are present as the food source attractant. The longer grass at JNU is more attractive to species that are foraging on invertebrates, whereas the short grass is the food source attractant. The species that are attracted to the grassy areas of JNU are also seasonal in nature. The geese and other birds attracted to the short grass tend to occur at JNU in the fall, winter, spring, and the birds attracted to the long grass are present during summer. Short grass areas like golf courses and baseball fields generally attract geese. However, geese tend to find other areas than the Mendenhall wetlands and JNU airport during nesting and rearing season. JNU will manage the grass height for other species like swallows and song birds during those summer months. The grass at JNU will be mowed as needed to manage for the species that are attracted to JNU during the different times of the year. JNU will attempt to allow for grass heights to be between 7" and 14" during fall, winter, and the spring months, but cut it shorter than 7" during the summer months.

JNU recognizes that there are areas that are unsafe for the mower tractor or walk behind mowers due to the slope of the ground. The areas east of the float pond and the east half RSA area grass seed areas that are left to be overgrown throughout the year because they cannot be mowed. JNU will strive to acquire access, or purchase an articulated arm-mower boom for the existing mower tractor, or they'll strive to purchase the entire unit. JNU understands that it is essential to manage grass height on the airfield to reduce the attraction grass has on hazardous wildlife.

4.5.2 Shrubs and Brush

Alder and willow shrubs, as well as cottonwood and spruce saplings, provide loafing, feeding, and nesting cover for several hazardous species. Shrubs and saplings in the Duck Creek, Jordan Creek area, the drainage ditches parallel to taxiway A, and the woodlands south of the float pond area have provided perching and loafing sites from the presence of shrubs and brush. JNU will strive to remove brush and shrubs that are identified to be attractive perching/loafing areas but also recognizing that brush and shrubs in certain areas aid in soil stabilization and water filtration.

4.5.3 Gravel areas

JNU has placed rock and gravel (2" minus) on the east, west, and south portions of the RSA. The 2" minus rock was placed as an alternative to using topsoil and grass. The rock reduces dust that is blown from east to west by the Taku Winds during the winter months. The rock also reduces the amount of standing water during rain. And most importantly, the presence of the rock reduces the amount food/prey base attraction to the airport.

One negative to the gravel present in the RSA is that shorebirds may find the gravel as ideal nesting conditions. The 2" minus style rock that was placed generally does not have rock small

enough for shorebirds to utilize as nesting material. The Wildlife Coordinator will monitor the RSA for nesting shorebirds from April through May during regular airfield sweeps, and coordinate with JNU to drag the area in an attempt to destroy any new nests and/or discourage adults from creating nests. Frequent disruption at the ground surface should be enough to destroy eggs and deter adults from the area.

4.5.4 Landscaping

Landscaping practices on the airfield generally play a role in the creation of an attractive or unattractive environment for hazardous wildlife. The following practices will be avoided on landscaped portions of the airport:

- The use of berry, nut, or large seed producing plants (includes trees, shrubs, and vines).
- Vegetation which is likely to be used for nesting or perching by large birds (e.g., spruce trees).
- Any permanent surface water sources (e.g., ornamental ponds or streams).
- JNU will prohibit tenants from landscaping on field that may attract wildlife.

FAA AC 150/5320-14, Airport Landscaping for Noise Control Purposes (1/78), provides guidance to airport planners and operators in the use of tree and vegetation screens around airports and aircraft operating areas for noise control purposes. The circular discusses the advantages and disadvantages of the use of screens and also addresses bird hazard potentials. According to the AC, *"Prior to any decision to utilize tree or vegetation screens for noise control, their potential for creating a bird hazard to aircraft must be carefully weighed against the anticipated noise benefits. Wooded areas and vegetation often attract birds by providing feeding, nesting and/or roosting areas. This is particularly true at junctions of wooded areas and grasslands and where two distinctly different vegetative communities join. Hedgerows are also highly attractive as shelters for birds and small mammals and should be avoided. For the same reason, the planting of trees and shrubs is not recommended closer than 600 feet (180m) to the centerline of active runways and taxiways. In considering the use of tree and vegetation belts as noise screens, the following factors should be considered: the type, size, feeding, and migratory habits of the area bird population; the geometric relationship and proximity between local feeding and nesting grounds, the proposed noise screen, and aircraft operating areas; and the affinity of the trees and vegetation to attract birds."*

4.6 ARTIFICIAL HABITAT MANAGEMENT

Limiting or precluding access to artificial components in the environment is another important aspect of habitat management. The exclusion concept involves physical barriers placed on structures that birds frequently use as perching areas. Antennas, lights, buildings, bridges, fence posts, signs, power lines, railings, parked vehicles, aircraft, satellite dishes and other structures that can be used as perches for birds. An exclusion device is one that mechanically prohibits birds from using a particular perch, and can be an effective method for the long term to prevent

birds from loafing on specific structures or areas. Hazardous wildlife using airfield equipment as perches will be documented during daily wildlife control efforts so that the Wildlife Coordinator can determine if an exclusionary device should be placed to prevent further perching.

4.6.1 Security Fence

Fencing can significantly reduce mammal access to the airfield. The fencing at JNU excludes access to the airport from the land side of the airport, but not entirely from the MWSGR side. The fence will be routinely inspected by Wildlife Patrol personnel to ensure that there are no holes in or under the fence, and repaired as necessary. JNU mandates that all gates must be closed at all times, and the Wildlife Patrol will ensure this during routine airfield sweeps.

The area south of the woodlands, that are south of the float pond, has gaps in the fence. JNU recognizes that the large gaps in the fence is not just a security issue, but a wildlife issue as bear and deer have utilized the woodlands south of the float pond. The vicinity of the woodlands to the aircraft movement areas makes it easy for deer and bear to come onto the movement areas. JNU intends to work toward completing the security fence. The completion of the security fence on the southern border will connect the fence from gate A on the southwest corner of the airfield by the Mendenhall River all the way to gate V on the east end of the float pond. By completely encompassing the woodlands south of the float pond, the accessibility for deer and bear will be reduced.

4.6.2 Netting

Netting may be used in a variety of ways to prevent wildlife access to food, nesting, and/or roosting areas. Netting installed under the eaves of buildings, the underside of the rafters in hangars or other structures can exclude birds. Netting may not exclude all birds and will be evaluated in limited areas before any large scale installation is done at JNU.

4.6.3 Anti-perching Grid Wires

The use of fine wires strung along roosting, loafing, and feeding areas can be effective in deterring some birds. Wires strung along window ledges, exposed pipes, signs, gutters, hand rails, antenna foundations, NAVAIDs and roof peaks, can be used to exclude perching and roosting birds. JNU may attempt to utilize this technique when feasible.

4.6.4 Anti-perching Bird Spikes

These spikes are mechanical devices designed to prevent birds from perching on an area. These devices include sharp prongs or points extending outward at all angles and can be purchased or home-made. The spikes may be attached to window sills, eaves, ledges, signs, light fixtures, roof peaks, approach lights and many other surfaces where birds roost or perch. These attachments inflict temporary discomfort and cause birds to avoid landing on surfaces to which

they are affixed.

4.7 OFF-SITE ATTRACTANTS

Habitat components that exist outside the airport boundary can exert a large influence on wildlife hazards at JNU. The surrounding marine waters and coastal temperate rain forest provides suitable habitat for many hazardous species. While most of this habitat is the result of natural processes, some components are man-made. It is therefore desirable to manage these man-made wildlife attractants in ways that reduce their attractiveness to species known to be hazardous to aircraft at JNU. In some cases, it may significantly alter the potential for collisions between birds and aircraft on or in the vicinity of the airport. It is the responsibility of the Wildlife Coordinator, Airport Manager, Airport Deputy Manager and Airport Superintendent to maintain an awareness of land uses identified in FAA Advisory Circular 150/5200-33C. These land uses include waste disposal facilities, water treatment plants, and wetlands enhancement. Any changes at existing facilities or lands within five miles of the runway which are observed to have a significant effect on wildlife hazards at JNU will be documented. JNU will attempt to maintain a cooperative relationship with any business, land owner, and/or government agency who maintain land or facilities (surrounding the airport) in a manner which attracts or could attract hazardous species into the flight path at JNU. The airport in coordination with the CBJ (Community Development/Planning Commission) will attempt to participate in land use planning activities for land uses within five miles of the runway at JNU identified in FAA AC 150/5200-33C. The airport will convey that such land uses should be sited as far as possible from the runway.

4.7.1 Capital Landfill

The Capital Landfill is located within 2 miles of the approach end of Runway 26. Numerous gulls, eagles, and corvids have been observed foraging at the landfill during the fall, winter, and spring months. The presence of the spawning salmon and other fish creates a food source in the surrounding area that is more attractive than the landfill, so birds do not tend to be present at the landfill during the summer. Landfills that are located within 2 miles of the approach ends of a runway are mentioned in AC-5200-33B as incompatible with safe airport operations. The presence of birds at Capital Landfill led to a contract between Waste Management and WS. WS has a specialist located on-site at the Capital Landfill to deter birds from the area

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5.0 WILDLIFE MANAGEMENT

5.1 OVERVIEW

14 CFR Part 139.337 (a) states “in accordance with its Airport Certification Manual and the requirements of this section, each certificate holder must take immediate action to alleviate wildlife hazards whenever they are detected”. Wildlife management (also called wildlife control) is often necessary to address immediate hazards to human safety caused by wildlife. This section summarizes the procedures and techniques most commonly used to control wildlife activity at airports, all of which may be applied to hazardous wildlife at JNU.

The method or procedure used at any given time will be based on the target species, the number of animals present, current air traffic, and other factors including the relative safety of the method, given the location. *The goal of wildlife management at airports is to reduce the potential for a damaging collision between wildlife and aircraft on the airport by causing targeted wildlife to leave the airport environment.*

5.2 ROLES/RESPONSIBILITIES

All on-duty JNU Airfield Maintenance are at the airport are part of the Wildlife Patrol and are responsible for ensuring the safety of aircraft by keeping an active watch for wildlife on the airfield and reporting hazards to either a Wildlife Patrol team member or the Wildlife Coordinator.

5.2.1 Wildlife Coordinator

The Wildlife Coordinator has the following responsibilities, in addition to those outlined in Section 2 of this plan:

1. Supervise wildlife patrol team members and assign relevant duties as necessary. This includes ensuring that all patrol team members follow the procedures outlined in this section in a safe and efficient manner.
2. Conduct wildlife control activities as needed.
3. Issue an Advisory to ATCT during increased migratory periods and/or during short-term heavy wildlife activity requiring air carrier notification that is time/day specific. The Wildlife Coordinator will consult with the Superintendent for the issuance of a NOTAM for more general notices of wildlife hazards in the vicinity of JNU.
4. Maintain written records of all wildlife control activities and ensure that they are entered into the computer database on a regular basis. This task may be assigned to other personnel at the Wildlife Coordinator’s discretion.

5. Ensure all documented wildlife strikes are recorded in the JNU wildlife hazard database and the FAA's National Wildlife Strike Database online at <http://wildlife.faa.gov>.
6. Maintain an adequate supply of pyrotechnics, ammunition, firearms, propane cannons, and other equipment necessary to conduct daily wildlife control operations. Ensure that all equipment is maintained in working order.
7. Provide annual training of JNU Airfield personnel in wildlife hazard management per FAA AC 5200-36A appendix D (Section 7).

5.2.2 Wildlife Patrol

The Wildlife Patrol members are designated by the Wildlife Coordinator and consist of JNU Airfield Maintenance Personnel (who have received initial or recurrent training per AC5200-36A) and WS personnel. The Wildlife Patrol's primary role is to detect and disperse hazardous wildlife at JNU. The Wildlife Patrol also has the following responsibilities:

1. Identify, document, and mitigate any airfield conditions and/or habitat features that attract hazardous wildlife.
2. Conduct regular airfield sweeps for the purpose detecting and dispersing hazardous wildlife.
3. Report the following to the Wildlife Coordinator:
 - a. Any significant changes in airfield conditions, which result in a sudden increase in wildlife numbers on or near the airfield.
 - b. Any observations of new hazardous wildlife species not currently listed on state and federal wildlife control permits.
4. If unable to disperse detected wildlife in a timely manner, the hazard will be reported to another patrol member or the Wildlife Coordinator.
5. Remove carcasses or food debris that may attract wildlife.
6. Document all dispersal or removal activity on hazardous wildlife. If no hazardous wildlife is dispersed during a complete airfield sweep, a ZERO will be marked in the log and the action is airfield sweep.

5.3 WILDLIFE DETECTION

Wildlife hazards will be identified through routine airfield sweeps and during the course of field work conducted by members of the Wildlife Patrol. A wildlife hazard is defined as the potential for a damaging collision between wildlife and aircraft on or near an airport. This means that that wildlife present on the airfield for any length of time whose body mass is capable of causing damage to an aircraft in the event of a collision, or those in number that collectively may cause damage are a hazard.

5.3.1 Airfield Sweeps

At a minimum, one airfield sweep will be conducted a day. Additional airfield sweeps may be performed as needed based on hazardous wildlife activity observed. A full airfield sweep consists of one full-length vehicular survey of Runway 8/26, Runway Safety Areas, Taxiway A, the float pond and observations of the Jordan Creek corridor, Duck Creek corridor. All airfield sweeps will include observations of the adjacent ramps, taxiways, runway approaches, and infield areas. An attempt will be made to disperse all detected hazardous wildlife from the immediate vicinity of the airfield.

A record of each airfield sweep, detailing whether or not dispersal efforts and all hazardous wildlife observations made, will be kept in the airport's Wildlife Log. A blank copy of the Wildlife Log form can be found in Appendix C. If observed wildlife is deemed not to be a threat to aircraft, a notation detailing the location and behavior will be made in the Wildlife Log. Subsequent airfield sweeps will ensure that prior non-dispersed wildlife has not become a threat and is not attracting other hazardous wildlife to the area. Airfield sweeps which do not detect any wildlife activity will be documented.

Although hazards posed by mammals at JNU are much more infrequent than bird hazards, the potential for damage is much greater should a collision occur. The large body mass of most hazardous mammal species makes damage almost certain. Therefore, it is prudent to have an effective set of procedures for dealing with mammals.

The greater hazard at JNU, based on species abundance and diversity, is birds. In most cases, birds will be detected with the naked eye. After initial observation, the bird(s) may be identified to species with the aid of binoculars, spotting scopes, and field guides. There are always some habitat types around the airport that attract more birds than others.

Waterfowl can be found in all types of wetlands. At JNU, these areas include marine waters, creeks, Mendenhall River, drainage ditches, the intertidal zone, areas of temporary standing water, the float pond, and the grassy areas of the infield or approach ends of the runway. The tide change can act as an attractant depending on the heights of high tide.

Shorebirds are also found near wetlands, as well as short grass and gravel areas, which often surround runways and taxiways. At JNU during migration, shorebirds spend a great deal of time loafing and foraging in the intertidal area, and on the gravel areas of the RSA. Some shorebirds

have been observed nesting where small gravel allows for them to make a nest.

Eagles/Raptors can be found soaring, perching on the top of prominent trees, feeding on fish carcasses in intertidal areas, or flying at low altitudes in search of rodents. At JNU, eagles frequent the trees south of the float pond, man-made structures, hangars, the marshland areas of the MWSGR, and areas along the south RSA. Eagles have also been observed flying in and grabbing birds that have been shot during waterfowl hunting season on the MWSGR or during wildlife control actions by Wildlife Patrol. Providing eagles with a “free meal” by not immediately retrieving downed birds attracts other eagles and compounds the hazard.

Gulls are usually found near the shoreline or wherever there is some artificial food source, (e.g., open dumpster). At JNU, gulls frequently fly parallel to the runway on their way to the from Fritz Cove area toward Sunny Point. During those movements, gulls may fly along the tidal area and cross the runway. Flocks may roost on the runway in inclement weather. Gulls are most abundant, and hazardous during periods of time when salmon smolt are heading out to the salt water, and during the end of October and thru the winter if there are worms present on the airfield.

Corvids (ravens and crows) are scavengers and can be found feeding on carrion, out of open dumpsters, and will tear open accessible garbage bags, especially if garbage bags are left uncovered in the back of a pickup. Corvids also frequent the infield grass, hangar rooftops, equipment, terminal, light posts, and intertidal areas, especially at low tides.

5.4 DETERRENT TECHNIQUES

Not all possible methods for controlling hazardous wildlife are covered in this section. Only the methods most commonly used at JNU, and those proposed for future use, have been described in detail. State and federal permits will be consulted to ensure compliance with current regulations. Not all methods will be used all of the time, or even at the same time, and will only be used if they are determined to be effective. The Wildlife Coordinator and Wildlife Patrol will use methods necessary to fully implement an integrated wildlife damage management approach to the hazardous wildlife at JNU. The goal of all wildlife deterrence efforts at JNU is the alleviation of hazards to aircraft. Wildlife Patrol will adhere to this principal when dispersing wildlife from the airport environment.

5.4.1 Pyrotechnics

Wildlife Patrol at JNU have 18mm CAPA cartridges, 12 gauge cracker shells, 15mm screamer/whistlers, 15mm bangers, and 15mm silver comets available for use on a regular basis. Pyrotechnics will be chosen based on the distance from the Wildlife Patrol personnel to the hazardous wildlife, and the effectiveness of each pyrotechnic type on the species. The use of multiple rounds and a mixture of different types of pyrotechnics usually provide the best deterrent effect. Wildlife Patrol may use other pyrotechnic devices at its discretion, depending on the availability and cost at the time of purchase. Prior to patrol members discharging pyrotechnic rounds toward the runway or float lane, direct communication with ATCT of FSS

(when ATCT is closed) is mandatory to ensure aircraft are not moving in the vicinity (See Section 5.7).

Whenever necessary, Wildlife Patrol personnel will position themselves between the runway and the targeted wildlife before conducting dispersals. Caution will be used when deterring wildlife prior to aircraft movements. Wildlife, in many cases, need time to recover from their initial fright before they will leave. Additionally, extreme care will be exercised so that pyrotechnics do not inadvertently strike aircraft and are not fired near combustible materials.

Mammals may alter their course of action unpredictably when harassed with pyrotechnics. For those animals already moving through the airfield, pyrotechnics could cause them to cross the runway and taxiways. In some situations, it may be prudent to simply allow an individual or herd of mammals to continue along their natural course, so long as this course does not take them across aircraft movement areas and the mammal(s) appear to be only transiting through the airfield. In most cases however, the mammal(s) should be immediately dispersed using the most effective active deterrent method for that situation.

5.4.2 Vehicles

Vehicle harassment consists of using a vehicle to chase, herd, or scare wildlife by means of the vehicle or its lights, horn, siren, etc. This is a technique that can save time and reduce operating costs, such as those associated with pyrotechnic use. Wildlife previously dispersed with other methods tend to recognize the vehicle and disperse early due to the presence of the vehicle. When conducting vehicle harassment, care should be given to air traffic operating in the vicinity while driving up to hazardous wildlife so that it is not dispersed towards moving aircraft, increasing a hazard. Wildlife that has dispersed when a Wildlife Patrol member drives close to them should be documented in the wildlife log as a vehicle harass, even if the member did not intend to disperse with the vehicle.

5.4.3 Paintball Guns

Paintball guns can be an extremely effective, safe, and low-cost tool for wildlife harassment. The sound of the gun discharging, accompanied by the visible trajectory and resulting break of the paintball on a nearby surface, causes distress for most birds. The result is similar to other auditory harassment techniques. Paintball guns will be used in accordance with permit authorizations, and paintballs will not be fired directly at birds. Currently, paintball guns are not an authorized tool for deterring eagles.

Paintballs are frequently used to direct mammals away from high vehicular traffic areas and away from the security fence. When dispersing deer, paintballs will be directed at the hind quarters, feet, and the surrounding ground. Paintball guns are typically used in conjunction with vehicle harassment techniques, and may be safely fired from within a vehicle that is stopped.

5.4.4 Lasers

Handheld lasers are used as a visual harassment technique for bird dispersal, and may occasionally be used at JNU. These devices project a variable-width beam of light on distant objects near the target birds to cause agitation and invoke a flight response. This method is best used in low-light conditions. The laser will not be aimed at operating aircraft or used in a manner that would cause the laser to reflect into any operating aircraft. The use of lasers at airports is regulated by the FAA (AC 70-1 Outdoor Laser Operations and Order 7400.2F Procedures for Handling Airspace Matters). Lasers will be used in accordance with permit authorizations. Lasers will not be aimed at the eyes of wildlife or people, and care will be taken to mitigate the reflection from shining the beam on refractive surfaces. Currently, lasers are not an authorized tool for deterring eagles.

5.4.5 Dogs

Lethal removal is an effective tool for reinforcing non-lethal deterrent methods when birds become complacent or habituated. However, it has been observed that eagles are attracted to birds that have been lethally taken, whether those eagles are responding to waterfowl hunters on the MWSGR, or wildlife removal operations at JNU. Dogs can be an effective tool for reducing the attraction to eagles that a downed bird causes by quickly retrieving the downed bird, especially in areas (tidal) that are unsafe or impossible to retrieve on foot.

Dogs can also be an effective tool for dispersing wildlife from an airfield. Sending a trained dog towards a flock of foraging or loafing wildlife emphasizes a predator/prey relationship and causes wildlife to disperse. Casting a dog to run towards a flock of birds is also a cost effective tool for deterring wildlife.

JNU does not have trained dogs provided by the airport. Any Wildlife Patrol member that wants to use their personal dog for wildlife dispersal activities must get permission from the Airport Manager, Deputy Airport Manager, or the Superintendent of Operations. JNU recognizes that it takes a certain level of training for a dog to be used at an airport. Full time control of the dog is mandatory so that runway or taxiway incursions do not occur while the dog is dispersing or retrieving wildlife. Care must be taken so that neither the dispersed wildlife nor the casted dog becomes the hazard to aircraft. Dogs that are adverse in hand commands and whistle commands are preferred so that control of the dog can be displayed at a distance also.

5.4.6 Effigies

Effigies refer to the likeness of an animal, usually a predator of birds that frequent the airport. Effigies are a static deterrent designed to frighten or deter wildlife from a small specific area. Effigies may be used in open areas frequented by birds such as geese in the grass infield, during times of high bird activity. When used, effigies will be moved regularly to prevent desensitization by the target species. If effigies are observed attracting wildlife, such as ravens or gulls, appropriate adaptations will be made.

5.4.7 Propane Cannons

The use of propane cannons can be an effective complement to the regular hazing of wildlife, especially if lethal reinforcement is applied. Propane cannons should be placed in areas where bird concentrations are the greatest, but not where they could scare birds into the path of oncoming aircraft. Cannons will be used to target returning flocks of birds, such as waterfowl, during times of intense bird activity. Eye and ear protection will be worn while operating propane cannons.

Wind direction and speed need to be accounted for when using propane cannons. Wildlife can become desensitized (habituated) to propane cannons after repeated exposure. To prevent habituation, cannons should be moved frequently. The Wildlife Coordinator will determine how often this needs to be done. However, even with frequent changes, birds may still become accustomed to the sound. Individual birds may need to be lethally removed in order to reinforce the negative conditioning associated with the cannon blasts.

It has been observed the by Wildlife Coordinator that propane cannons used on-site at JNU have appeared to attract eagles to the airport. The sound of the cannon may resemble the sound of a shotgun and the eagles appear to come looking for a downed bird. If propane cannons are used to deter gulls or waterfowl, observations will be made by the Wildlife Patrol to ensure that the sound of the cannons going off is not creating an attractant.

5.5 REMOVAL METHODS

The following methods are part of the integrated wildlife damage management program and are intended to be used when deterrent techniques have been exhausted, or to remove immediate hazards in an emergency situation.

5.5.1 Relocation

Live trapping and relocation may be a viable removal option for species during migration periods (raptors), animals that have become trapped inside the perimeter fence (otter/mink/deer), or when it is more effective to capture and relocate than attempt to disperse (porcupine). A variety of live traps are commercially available, and all relocation efforts will be cleared by the Wildlife Coordinator to ensure that required permits or equipment are obtained or a different method is not preferred.

5.5.2 Trapping

The uses of trapping methods vary depending on the target species. All traps and trapping devices should be employed in accordance with Best Management Practices, and in a manner which minimizes the capture of non-target animals. All trapping efforts will be cleared by the Wildlife Coordinator before proceeding, and will be placed in secure areas, closed to the public and pets.

5.5.3 Management of Nesting Birds

The elimination of birds nesting on airports is an important hazard management consideration since fledgling birds are a common hazard to aircraft. Nest and egg removal are approved methods in the Depredation at Airports Permit and Public Safety Permit that can be found in Appendix A.

5.5.4 Shooting

Shooting can be effective in controlling problem animals that pose an immediate threat to airport safety. The use of lethal reinforcement in wildlife hazard mitigation is used as a means to reinforce the efficacy of non-lethal measures, and in some cases, to remove persistent individuals. Lethal control will be carried out in the most humane fashion possible and with recognition of public awareness. Only non-toxic shot (i.e., no lead shot allowed) will be used to lethally remove birds.

Eagles located around JNU have been observed flying in and grabbing birds that have been lethally taken by Wildlife Patrol members. Eagles that have acquired a carcass tend to either fly to the trees adjacent to the float pond or open pavement (like the ramp/taxiway/runway) to feed. This activity attracts other eagles. An increase in eagle activity on and around the airport can compound the original hazard that required the lethal action. When shooting as an action is chosen, Wildlife Patrol members will immediately retrieve downed birds to prevent eagles from being attracted. Care must be taken to ensure retrieval of the carcass prior to taking the shot.

Personal safety is of utmost importance when conducting all wildlife control operations. No personnel should initiate a wildlife control operation if they feel an unsafe condition exists. Immediate steps should be taken to make the situation safe before initiating the action. Furthermore, most firearm accidents can be avoided by adhering to these following safety rules:

- Always keep the gun pointed in a safe direction.
- Always keep your finger off the trigger until ready to shoot.
- Always keep the gun unloaded until ready to use.
- Always be sure of your target and what lies beyond it.

The State Public Safety Permit issued by ADF&G for the taking of wildlife at JNU stipulates that the edible meat of waterfowl shall be salvaged for human consumption. All birds not given to charity (when destroyed) or donated for scientific use will be double-bagged in plastic trash bags and placed in a dumpster with a tight fitting lid.

If lethal control of mammals is deemed necessary to alleviate a hazard to aircraft, the local ADF&G Area Wildlife Biologist must be contacted prior to taking action. The specific method chosen for lethal control will be based on practicality, safety, and the recommendations of the local Area Wildlife Biologist.

In order to ensure compliance with state and federal permits regarding lethal control, wildlife

control personnel will follow the conditions specified on these permits in Appendix A. Any questions regarding these permits and the included conditions should be directed to the following offices by the Wildlife Coordinator:

Permittee: (Airport Manager) – (907) 789-7821
State Public Safety Permit: (ADF&G, Permitting Office) - (907) 465-4148
Federal Depredation Permits: (USFWS, Division of Migratory Bird Management) - (907) 786-3693

All correspondence with the state and federal permitting agencies regarding the disposition of wildlife taken during lethal control actions will be noted in the Wildlife Log. Such notations will include the date, time, person contacted, and a brief summary of the correspondence.

5.6 RECORD KEEPING

The collection of reliable data is a critical step in identifying factors contributing to wildlife activity that threatens human safety. In addition, accurate data collection allows airport personnel to analyze wildlife trends and provide essential data to appropriate agencies (e.g., for permit reporting). The following outlines the record keeping procedures for wildlife hazard management at JNU.

5.6.1 Wildlife Log

All wildlife control actions and observations will be recorded on a Wildlife Log form; a blank copy and instructions for filling out an entry are provided in Appendix C. It is the responsibility of each Wildlife Patrol team member to accurately record every control action and/or observation involving hazardous wildlife. Each record will include the location of the dispersal/observation which corresponds to JNU's grid map (Appendix D). All airfield sweeps will be recorded on this form, including sweeps in which no wildlife is observed. All Wildlife Logs will be kept on-site with the Wildlife Coordinator.

5.6.2 Computer Database

In addition to the written record of wildlife hazard control efforts, the Wildlife Coordinator uses a computer database to maintain and analyze data. Data from the Wildlife Log is entered into the Wildlife Hazard Management Information System database and can be analyzed to continually assess the effectiveness of this WHMP. It is the responsibility of the Wildlife Coordinator or designee to ensure the accuracy and integrity of this computerized record keeping system.

5.6.3 Wildlife Strike Reporting

The accurate and timely reporting of wildlife strikes is of utmost importance to managing wildlife hazards effectively. It is the responsibility of Wildlife Patrol team members to document all wildlife strikes that meet the following criteria. Per AC 150/5200-32B, a wildlife strike is deemed to have occurred when:

1. A strike between wildlife and aircraft has been witnessed.
2. Evidence or damage from a strike has been identified on an aircraft.
3. Bird or other wildlife remains, whether in whole or in part, are found:
 - a. Within 250 feet of a runway centerline or within 1,000 feet of a runway end unless another reason for the animal's death is identified or suspected.
 - b. On a taxiway or anywhere else on or off the airport that you have reason to believe was the result of a strike with an aircraft. Examples might be:
 - i. A bird found in pieces from a prop strike on a taxiway.
 - ii. A carcass retrieved within 1 mile of an airport on the final approach or departure path after someone reported the bird falling out of the sky and a report of a probable wildlife strike.
4. The presence of birds or other wildlife on or off the airport had a significant negative effect on a flight (i.e., aborted takeoff, aborted landing, high-speed emergency stop, or the aircraft left pavement area to avoid collision with wildlife).

If a Wildlife Patrol team member is notified of a wildlife strike by an aircraft owner/operator immediately following an aircraft movement (either a take-off or landing), that member will perform a complete runway sweep to look for the carcass of the animal. Identifying the species of wildlife involved in strikes is crucial to managing wildlife hazards. Also, if a Wildlife Patrol team member discovers an animal carcass thought to have been involved in a wildlife strike, it will be reported. Further, that member will attempt to determine the aircraft involved, so that an inspection for damage can be performed if necessary. If the wildlife strike is thought to have involved an air carrier aircraft, the Operations Manager for that airline will be notified immediately. The occurrence of all damaging strikes will be relayed to the Superintendent and the Airport Manager within 24 hours of documentation.

All wildlife strikes will be reported to the FAA online at <http://wildlife.faa.gov>. Filing of this report online facilitates the accurate and timely addition of the strike report to the FAA's National Wildlife Strike Database. A unique report number will be assigned to the strike report at the time of filing which allows for the report to be edited online if further information becomes available (e.g., damage costs, identification of wildlife species). A hard copy of the blank report form, including instructions, is also included in Appendix E. Although it is the initial responsibility of the Wildlife Patrol team member who first documents a wildlife strike to collect all necessary information for the strike report, it is the Wildlife Coordinator's responsibility to ensure the accuracy of all information on the report before filing it with the FAA. In cases where a wildlife strike causes damage, it is important to obtain the best estimate for the Damage/Cost Information portion of the report. A report that has already been filed can be updated as new information is obtained. An entry will be made on the daily Wildlife Log sheet indicating the time, location, and any other information pertinent to the wildlife strike. A record of each wildlife strike report will be maintained in the Airport Manager's Office.

Any wildlife carcass found in accordance with AC 150/5200-32B will be assumed to have been the result of a wildlife strike unless another cause of death is determined. The FAA and the Smithsonian Institution have requested that feathers and some body parts for all wildlife strikes be submitted to the Smithsonian Institution's Feather Identification Lab. The necessary

information for submitting bird remains to the Feather Identification Lab is provided in Appendix E. If a strike is determined only by the identification of remains or damage on the aircraft and no carcass is found on the airfield a note should be made in the Remarks field documenting the points of origin and arrival of the aircraft.

5.6.4 Annual Permit Reporting

The Airport Manager is required to submit an annual report of wildlife control efforts to the USFWS by January 31, and ADF&G by January 20 of the following year. These reports will detail the number and type of species hazed and killed. Data will be queried from the computer database and summarized in the proper format to satisfy the requirement of each agency.

Along with submitting annual reports, the Airport Manager will send a request to the USFWS and ADF&G for a renewal of JNU’s wildlife control permits. The period covered by the Federal Depredation at Airports Permit is April of the current year through March of the following year, while the period covered by the State Public Safety Permit is mid-January through the end of January of the following year. A WS Form 37, which must be requested from WS, will accompany the permit application.

Below is a summary of wildlife control permit reporting and renewal dates, and how the reports and application are to be submitted:

Permit Type	Permitting Agency	Annual Report Due	Renewal Due	Form 37
Depredation at Airports	USFWS	January 31	January 31	Yes
Eagle Depredation	USFWS	January 31	January 31	Yes
Public Safety	ADF&G	January 20	January 20	No

U.S. Fish and Wildlife Service	Alaska Department of Fish and Game
Attn: Migratory Bird Permit Office U.S. Fish & Wildlife Service 1011 E. Tudor Road Anchorage, AK 99503-6199 Phone: 907-786-3693 <i>Original copy of report will be submitted by mail. Original copy of the application (renewal) and Form 37 will be submitted by mail.</i>	dfg.dwc.permits@alaska.gov 907-267-2253 <i>Reports and renewal requests will be submitted by e-mail.</i>

In addition, the Airport Manager will provide both agencies with the names of qualified subpermittees who have completed an approved training program. The Airport Manager will provide any additional information regarding the airport’s wildlife hazard management program to the appropriate agencies upon request.

5.7 COMMUNICATIONS

Proper communication is essential to the success of day-to-day operations. Communications refers to the radio communication between Wildlife Patrol members while conducting airfield sweeps and deterrent activities, as well as communication with Juneau Air Traffic Control Tower (ATCT) or the Flight Services Station (FSS) when the ATCT is closed. All communications shall be professional, courteous, and concise.

5.7.1 General Procedures

All Wildlife Patrol team members will be equipped with 2-way radios for communication with other members of the Wildlife Patrol and Airfield Maintenance, and radios for communication with ACTC. In most cases, one patrol team member will conduct airfield sweeps and carry out wildlife control actions. If necessary, Wildlife Patrol team members will enlist the help of additional patrol team members to aid in the dispersal of large flocks of birds or to disperse large mammals from the airfield. During these times, one patrol team member will be designated the lead for the duration of the control action. Additionally, patrol team members will use the designated radio frequency for communication. If a patrol team member must leave the vehicle during a wildlife control action for a significant period of time, they will take a portable 2-way radio to maintain contact with ACTC and other patrol team members.

5.7.2 Juneau Air Traffic Control Tower (FAA)

Communication with The Juneau Air Traffic Control Tower (ATCT), operated by the FAA is an essential part of wildlife hazard management at JNU. Communication with ATCT should be done prior to wildlife dispersal attempts where wildlife could disperse toward or across the runway or float lane or the approaches. ATCT should also be contacted when dispersal efforts involving ammunition is directed toward the runway or float lane. In some cases permission may be needed by ATCT for Wildlife Patrol to proceed with wildlife control due to the air traffic conditions, such as Wildlife Patrol members that are working on Taxiway Alpha likely do not know aircraft movements involving the runway or float lane.

An "Advisory" instead of a NOTAM should be issued by Wildlife Patrol team members to ATCT when wildlife are present in areas that they cannot be actively dispersed. An Advisory is a direct line of communication between Wildlife Patrol personnel and ATCT advising of a specific wildlife hazard that has been identified. Advisories are time and day specific and can be passed on at the discretion of the air traffic controller based on the air traffic at the time of the advisory. Communication should be done with ATCT and not with pilots directly. JNU's ACM only allows the JNU Airfield Maintenance personnel members of the Wildlife Patrol as being able to issue NOTAMs. WS personnel acting as Wildlife Patrol will only issue Advisories, and will not issue NOTAMs.

Just as the Wildlife Patrol members inform ATCT prior to wildlife dispersals, ATCT should inform airport personnel about hazardous wildlife activity they detect from observations in the control tower. Either Juneau Ground (121.9 MHz) or Juneau Tower (118.7 MHz) may, at any

time, inform the Wildlife Coordinator or Wildlife Patrol about observed wildlife hazards on the airfield. In some cases, the ATCT may simply relay the observations and/or concerns of pilots regarding a wildlife hazard. The Wildlife Coordinator and/or the Wildlife Patrol will respond as rapidly as possible to observations of wildlife hazards by the ATCT.

5.7.3 Public Relations

Wildlife control actions on an airport often entail very visible and audible indications of their use. Pyrotechnics and propane cannons may cause an unwary public some distress, partly due to the noise involved and other times because the noise is mistaken for gun blasts. In some cases, the use of lethal reinforcement is at odds with the personal views of some members of the public. When lethal reinforcement is conducted in view of the public, it will sometimes draw criticism of the Wildlife Patrol team members and even the wildlife hazard management program as a whole. It is therefore necessary that those conducting wildlife hazard control operations be aware of the different views people have regarding wildlife control work. Keeping this in mind, all wildlife control operations will be handled with discretion and a concern for the views of the general public. However, personnel should exercise this discretion in a way that does not compromise the efficacy of the control measure or the safety of aircraft operating at JNU.

If approached by a member of the public concerning wildlife hazard control work, the Wildlife Patrol team member will conduct themselves in a professional and courteous manner at all times. Patrol team members will refrain from engaging in debate and will speak about the work only in general terms (e.g., "We are here to reduce the safety hazard to aircraft by dispersing wildlife from the airfield"). Any detailed questions or concerns should be relayed to the Airport Manager. The general public will be informed that only written requests for information will receive a response. Any requests by the media for interviews or information regarding the wildlife control program will be directed to the Airport Manager.

6.0 RESOURCES

The following resources will be maintained by JNU and/or USDA-Wildlife Services for the mitigation of wildlife hazards. It is the responsibility of the Wildlife Coordinator to ensure that all the JNU equipment is maintained in good working order and that supplies are adequately stocked. JNU will have at least one person available for wildlife control at all times. During hours when there are no air carrier operations or wildlife control personnel are off-duty, JNU will provide for the immediate response to wildlife hazards via on-duty personnel. The following equipment and supplies will be available for wildlife management activities and may include, but are not limited to:

Equipment

- Vehicles equipped with radios for communication with JNU ATCT and field personnel
- Boat equipped with motor for Float Pond activity
- Firearms and pyrotechnic launchers
- Hearing and eye protection
- Propane Cannons
- Effigies
- Laser
- Binoculars
- Field guide for local bird identification
- Camera for documenting wildlife strikes
- Computer for data entry

Supplies

- Pyrotechnics and ammunition (non-toxic)
- Cleaning kits for all firearms
- Mylar tape
- Wildlife Log forms
- Airport grid map (copies can be made from the original in Appendix D)
- FAA Form 5200-7 for wildlife strike reporting

Each vehicle used during wildlife control efforts by the Wildlife Patrol will carry the following items:

- Adequate supply of Wildlife Logs
- FAA Form 5200-7 for wildlife strike reporting
- One copy each of federal and state wildlife control permits
- Bird identification book
- Binoculars
- Firearms
- Adequate supply of ammunition/pyrotechnics

USDA-Wildlife Services Assistance

Wildlife Services provides training and recommendations for the safe and efficient use of most wildlife deterrent tools. Under an annual Cooperative Service Agreement, WS provides a biologist to act as the Wildlife Coordinator and Wildlife Specialists as part of the Wildlife Patrol. All WS personnel have a duty to deter wildlife, reduce wildlife attractants, collect data for analysis and reporting, and work with the community to reduce wildlife attractants that exist outside the airport property

7.0 TRAINING

7.1 OVERVIEW

The training program to provide airport personnel with the knowledge and skills needed to successfully carry out this WHMP required under 14 CFR Part 139.337(f)(7) is addressed in this section.

Initial and every 12 months thereafter, recurrent training is required under 14 CFR Part 139.303. This training is mandatory for all personnel acting under the direction of this WHMP. The Airport Manager will ensure that all necessary personnel receive the appropriate training.

This training will at a minimum include the necessary and applicable elements as defined in AC 150/5200-36A. For reference to the specific guidance for the elements of the training course that satisfies the requirements AC 150/5200-36A (Appendix D) has been attached to this section starting on page 7-2.

7.2 USDA- WILDLIFE SERVICES TRAINING

JNU has a Wildlife Services (WS) qualified airport wildlife biologists (meeting the requirements set forth in AC 150/5200-36A) located on-site that teaches initial and recurrent training courses for personnel conducting wildlife hazard management activities at JNU.

An updated list of names and the date of the trained personnel is located in Appendix F.

7.3 Training Curriculum Outline - AC 150/5200-36A (Appendix D).

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

1. Training Curriculum Outline.

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

- a. General survey of wildlife hazards to aviation based on the most recent annual FAA National Wildlife Strike Database Serial Report
- b. Review of wildlife strikes, control actions, and observations at the airport over at least the past 12 months.
- c. Review of the airport's Wildlife Hazard Assessment is to include:
 - (1) Existing wildlife hazards and trends in wildlife abundance.
 - (2) Status of any open or unresolved recommended action items for reducing identified wildlife hazards to air carrier operations within the past 12 months.
- d. Review of the airport's Wildlife Hazard Management Plan, to include the following:
 - (1) Airport-specific wildlife attractants, including man-made and natural features and habitat management practices of the last 12 months.
 - (2) Review of the airport's wildlife permits (local, State, and Federal)
 - (3) Review of other airport-specific items:
 - (a) Wildlife hazard management strategies, techniques, and tools:
 - (i) Flight schedule modification
 - (ii) Habitat modification, exclusion
 - (iii) Repelling methods
 - (iv) Wildlife population management
 - (b) Responsibilities of airport personnel for
 - (i) Reporting wildlife strikes, control actions, and wildlife observations
 - (ii) Communicating with personnel who conduct wildlife control actions or who see wildlife hazards and air traffic control tower personnel and others who may require notification, such as airport operations or maintenance departments
 - (iii) Documenting and reporting wildlife hazards seen during patrols and inspections and follow-up control efforts

- (iv) Documenting and reporting when no hazards are seen during patrols and inspections
- e. Basic bird and mammal identification, stressing local hazardous and rare or endangered species of concern.
- f. For any airport personnel using pyrotechnic launchers or firearms, training on the following topics from a qualified individual:
 - (1) Safety, parts, and operation of pyrotechnic launchers
 - (2) Fundamentals of using pyrotechnics to safely and effectively disperse wildlife
 - (3) Personnel protective equipment
 - (4) Cleaning, storage, and transport of firearms and pyrotechnic launchers
 - (5) Applicable local, State, and Federal regulations on firearms, pyrotechnic launchers, and pyrotechnics³
 - (6) Live fire training with pyrotechnic launchers including strategies for dispersing wildlife away from runways and aircraft movement corridors
 - (7) For any airport personnel using firearms, live fire training. This training is highly recommended from a qualified individual but not a requirement for this training program.
- g. Any other training required by local, State, or Federal regulations

2. Recommendations.

- a. Exams or tests may be oral, written, practical demonstrations, or a combination of all three.
- b. The Trainer should retain passing grades/evaluations records.
- c. The Trainer should retain course attendance records for a period of three years.
- d. Airport personnel responsible for the airport's wildlife hazard management program should retain records of those to whom instruction in airport wildlife hazard management has been given for the period of time during which the employees conduct hazardous wildlife management activity on the airport and for six months after termination of employment.

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

² Airport personnel actively involved with the use of firearms for the mitigation of wildlife hazards should receive and maintain current firearms training from either a licensed National Rifle Association (NRA) instructor or other qualified individual. This training should include type and caliber of weapon used at the airport.

³ Bureau of Alcohol, Tobacco and Firearms provides information on Federal explosive requirements for explosive pest control devices at: <http://www.atf.gov/explosives/how-to/documents/epcd-flyer.pdf>.

8.0 ANNUAL REVIEW AND EVALUATION

Per 14 CFR 139.337 section (f)(6), this WHMP will be reviewed and evaluated every 12 consecutive months or following “triggering event” similar to the conditions outlined in 139.337 in sections (b)(1), (b)(2), or (b)(3). The Airport Manager, Wildlife Coordinator, and Superintendent may evaluate and make changes to the plan more frequently if conditions warrant.

The following are persons responsible for the review of this WHMP and are collectively referred to as the Wildlife Hazard Advisory Group (WHAG).

1. Airport Manager
2. Superintendent of Airfield Maintenance and Operations
3. Wildlife Coordinator (Wildlife Services' Qualified Airport Wildlife Biologist)
4. Wildlife Patrol (Field Maintenance Personnel and Wildlife Services Personnel)
5. Airport Engineer

To evaluate the effectiveness of the plan in reducing wildlife hazards, the following procedures will be used:

1. Conduct an annual review of the WHMP to determine if changes are needed.
2. Review the WHMP for consistency with airport projects, particularly those involving habitat management.
3. Participate in reviews of proposed land use changes for JNU and surrounding area to avoid the creation of hazardous wildlife attractants.
4. Provide advice for Wildlife Patrol Personnel regarding wildlife species identification, accurate data collection, proper use of control techniques, and wildlife strike reporting.
5. Review the wildlife strike history for the past year. Any new species appearing in the strike record will be evaluated for possible control procedures and appropriate habitat modifications. Wildlife strikes with previously identified species will also be reviewed.
6. Compare the wildlife strike history with summaries of control efforts. Comparing the amount of control efforts for each species with those species in the strike record will assist in determining the relative effectiveness of these efforts. More specifically, it should be determined whether control efforts are targeting those species causing strikes. Any new wildlife control procedures that have been instituted will be added, and the appropriate methodology for implementing the procedure will be described.

7. Compare wildlife use on the airfield before and after habitat modifications. On certain areas of the airfield where habitat attractants have been modified, an effort should be made to determine if the modification resulted in a decrease, increase, or no change in wildlife use. In some cases, habitat modification may result in the location becoming attractive to another species of hazardous wildlife. In these cases, appropriate alterations of the habitat will be considered. The habitat management timetable will be updated with the following: completed projects, necessary changes to forecasted completion dates, and new habitat management goals.

Additionally, the experiences and judgment of the wildlife patrol team will be taken into consideration when reviewing existing procedures and wildlife hazard levels. As many factors affecting wildlife use at JNU are beyond control, it is necessary to temper an evaluation of the WHMP with an understanding of the complex and dynamic nature of wildlife activity.

The Superintendent shall ensure that a revised copy of the WHMP is available in his office, and at the Airport Manager's office. In addition, the Wildlife Coordinator will maintain an electronic copy of the WHMP. Members of the review team will have access to the WHMP through the Superintendent or the Airport Manager. Copies of the WHMP annual review will be kept in Appendix G.