WILDLIFE HAZARD MANAGEMENT PLAN

SEATTLE-TACOMA INTERNATIONAL AIRPORT

Appendix 1 of the SEA Airport Certification Manual
FAR 139.337, as Amended

Developed by
Port of Seattle
Seattle-Tacoma International Airport
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Northwest Mountain Region Airports Division
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ACRONYMS

ADC	Animal Damage Control
ADM	Airport Duty Manager
ADO	Airports District Office
AGL	Above Ground Level
AMA	Aircraft Movement Area
AOA	Air Operations Area
AOS	Airport Operations Specialist
ATCT	Air Traffic Control Tower
ATIS	Automated Terminal Information Service
BMP	Best Management Practices
CFR	Code of Federal Regulations
CWB	Certified Wildlife Biologist
DCRDF	Des Moines Creek Regional Detention Facility
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulations
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
GSM	Global System for Mobile Communications
NEPA	National Environmental Policy Act
NOTAM	Notice to Air Missions
PHS	Priority Habitats and Species
PD	Police Department
POS	Port of Seattle
QAWB	Qualified Airport Wildlife Biologist
QWP	Qualified Wildlife Patrol
RCW	Revised Code of Washington
RHS	Relative Hazard Score
RSAP	Raptor Strike Avoidance Program
SEA	POS, Seattle-Tacoma International Airport
SIDA	Security Identification Display Area
SGT	Swedish Goshawk Trap
SOG	Standard Operating Guideline
USCOE	US Army Corp of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	WA Department of Fish and Wildlife
WDOE	Washington Department of Ecology
WHA	Wildlife Hazard Assessment
WHMP	Wildlife Hazard Management Plan
WHWG	Wildlife Hazard Working Group
USDA-WS	USDA, Wildlife Services
WA	Washington State
WSDOT	WA State Department of Transportation

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1.0 - INTRODUCTION

1.1 - OVERVIEW

A Wildlife Hazard Management Plan (WHMP) establishes the responsibilities, policies, resources, and procedures recommended by the Wildlife Hazard Working Group (WHWG) to reduce wildlife hazards at a given airport. Recognizing the potential hazards wildlife pose to aircraft and human lives, the Federal Aviation Administration (FAA) requires airports that incur wildlife-aircraft strikes implement a plan according to Code of Federal Regulations (CFR) Title 14 Federal Aviation Regulations (FAR) Part §139.337(f) as amended. Accordingly, this document must include required components. Each component is represented herein as separate chapter. Provisions in CFR Title 14 FAR Part §139.337 allow the WHMP to be promptly modified and updated to address new situations or changing circumstances. To augment compliance with these regulations, the FAA issued Advisory Circular 150/5200-38 as a resource to airports for developing their WHMP.

Figure 1. Airports located within a migratory bird flyway are more likely to have similar wildlife issues, however the timing of those issues by species may vary throughout the year.

1.2 - WILDLIFE HAZARD ASSESSMENT HISTORY

Original Ecological Study to Assess Wildlife Hazards - The Airport's first assessment of wildlife hazards is dated December 1, 1977. Animal Damage Control, a branch of the US Fish and Wildlife Service (USFWS), was contacted by the Port of Seattle (POS) because unsafe aircraft encounters with birds had been rising significantly. The POS requested an evaluation of bird populations be conducted to assess potential hazards to aviation safety at the Seattle-Tacoma International Airport (SEA). The European starling was the most hazardous and numerous species frequenting the airport, especially at the south end clear zone where there was a major roost. The population in August and September fluctuated from 25,000 to 60,000 birds and by mid-October through November the population peaked to 100,000 birds. The major attractants at that time were dense stands of red alder trees on the airport's westside that starlings used for roosting. The Tyee Valley Golf Course and its water hazards, at the south end of the airport, were favored by waterfowl. Crows were frequently observed on and near the airfield, whereas Canada geese and mallards were seen flying by the south clear zone, and swallows were common around the wastewater treatment plant. Control actions included and increased use of shell crackers, shotguns, starling distress calls, and the use of detonation cord to blowup a starling roost.

Ongoing Wildlife Hazard Assessments – When FAR 139 was amended on June 4, 2004, the POS was aware that FAA triggering events as defined by 139.337 (b), occurred more than once

annually. Given such an event would mean doing a formal WHA each year, the POS instead adopted a policy of conducting wildlife hazard monitoring surveys 8 times each month from 16 fixed survey points. Observations were made for 3-minutes from each point, four weeks per month, one before and after local apparent noon (midday sun). Survey points were designated on and off the airfield that were good vantage points for observing hazardous wildlife. This annual monitoring effort, along with the annual summaries of aircraft-wildlife strikes, control actions, and emerging wildlife attractants became the foundation of the annual review of the WHMP.

2013 Wildlife Hazard Assessment – A formal WHA was completed by the USDA-WS and approved by the FAA on February 27, 2013. A considerable effort was spent conducting wildlife hazard surveys from fixed monitoring points and several additional areas on POS property that were part of an ongoing wetland mitigation monitoring program. Wetland modification was one impact associated with the 3rd runway, runway 16R/34L construction. Environmental permits were required to relocate Miller Creek and alter a number of wetlands in the watershed. Wetland monitoring by a 3rd party agency, was necessary because there was a concern that the newly restored and enhanced wetland areas, and the relocated Miller Creek, might become a hazardous wildlife attract given spawning gravel for salmonids and other measures were being taken to increase fish populations. In addition, if the shrub-scrub plantings failed, open water might exist, and the area might become even more attractive to waterfowl than it had been before. Results of the study indicated the wetland mitigation sites had been performing very well and there was a substantial reduction in waterfowl numbers over time as vegetation densities increased and waterfowl and other hazardous birds were excluded. Most WHA recommendations were related to practices that the POS had already adopted. Some of those ongoing efforts such as increasing wildlife control by Airport Operations personnel was recommended. Exploring options to transform Lora Lake into shrub-scrub wetland as was done in the adjacent Vacca Farm area was also recommended.

2020 USDA WS Recommendations – One important recommendation was to change the location of several 18-point survey sites due to observational overlap. A greater emphasis was placed on monitoring the Air Movement Area (AMA) without losing observational coverage. These established points and night transect lines have become part of the SEA Continual Monitoring program. Other important recommendation included taking an even more aggressive, zero-tolerance, stance on some hazardous wildlife species. When a species habituates to pyrotechnics a limited amount of lethal removal is necessary to reinforce the intended harassment effect of the deterrent devices to the other birds in the flock.

Continual Monitoring Program – Rather than conducting additional and more costly WHA studies at 5-10 years in the future, the POS instead modified the Ongoing Wildlife Hazard Assessment to be in line with Advisory Circular (AC) 150/5200-38, Chapter 4, *Protocol For Continual Monitoring*. The data from these surveys, as well as other wildlife related observations, control work, and aircraft-wildlife strikes, should continue to be considered when reviewing the SEA WHMP annually. The most recent Continual Monitoring Annual Report was completed for

the 2019 calendar year by Dominique Viehoever, Qualified Airport Wildlife Biologist (See WHMP section *1.4 Problem Species*).

1.3 - PURPOSE AND SCOPE

Enhancing safe air carrier operations is a primary objective of the POS. Accomplishing this objective entails careful monitoring of all aspects of arriving and departing aircraft in the vicinity of SEA, including potential wildlife hazards on and around the airport. As part of its on-going safety efforts, SEA intends to implement and maintain a WHMP according to CFR Title 14 FAR part 139.337 to address potential wildlife hazards at SEA and surrounding areas, with a particular emphasis on hazards and wildlife attractants within approximately 2 miles of the airfield (Appendix A).

In addition to addressing general wildlife hazards, this plan discusses habitat modification, monitoring and responding to potential wildlife hazards associated with constructed wetland mitigation sites. A total of 8-wetland mitigation sites, occurring in two watersheds, were systematically monitored for hazardous wildlife near SEA (See Chapter 9). An additional site was the SR 509 Wetland Mitigation area south of Runway 16R/34L. Because it was a WSDOT project and the site was owned by the state, a formal agreement between the WSDOT and POS was for the state to monitor the site in perpetuity or until the site was no longer a safety concern. These wildlife hazard surveys were ended in 2021 because data showed a significant drop in hazards in all these areas, including the WSDOT site, with one exception. Lake Reba, protected waters of the state with no current plan of action, had not been altered but was being monitored regularly as a part of the Ongoing Wildlife Hazard Assessment. Lake Reba is of value because it serves as a control area for comparison to the other wetland sites that were enhanced to shrub-scrub and forested wetland habitat while it remained unaltered.

It is important to note that Part 139.337(f) underscores the need for a flexible plan that can be quickly adapted to changing circumstances. In some rare cases, however, immediate actions may be necessary that are not addressed in this plan to ensure the safety of airport patrons. This plan provides SEA with the discretion and capability to respond to these situations, while providing guidance for compliance with applicable federal, state, and municipal laws or regulations. The latitude afforded SEA management when administering this plan is discussed in CFR 14 - Part 139.113 Deviations, which states that:

> *In emergency conditions requiring immediate action for the protection of life or property, involving the transportation of persons by air carriers, the certificate holder may deviate from any requirement of Subpart D of this part to the extent required to meet that emergency. Each certificate holder who deviates from a requirement under this paragraph shall, as soon as practicable, but no later than 14 days after the emergency, report in writing to the Regional Airports Division Manger stating the nature, extent, and duration of the deviation.*

This plan will be valid until SEA management or FAA determines that the plan should be updated due to changed conditions or new needs for action. The plan will be reviewed at least annually to ensure it still pertains to conditions at the time of review, but it may also be revisited more often if a hazardous situation emerges that merits further evaluation.

1.4 - PROBLEM SPECIES AT SEA

Animals generally considered to present the greatest threats to aviation at SEA are birds, especially those that flock and/or are large bodied, such as waterfowl, gulls, rock pigeons, European starlings, and raptors. Coyotes and domestic dogs are also a hazard, but unlike most birds, they can often be kept off the active surfaces using a well-maintained deterrent perimeter fence. Juvenile and migratory animals may also pose higher risks for aviation because of their general unfamiliarity with the airport environment. For some species such as raptors, it may be advisable to mark resident adults and monitor their activities near the airfield. This non-flocking group of birds can be highly territorial. Attempts should be made to relocate or otherwise disperse all the young red-tailed hawks which are believed to be struck at a higher rate than adult birds. Other raptors, especially eagles, should be repeatedly harassed or relocated from the airport environment. Eagles habituate quickly to pyrotechnics and typically remain on the airfield when not harassed enough.

SEA 2005-2020 strike data was used to run a Safety Risk Assessment (SRA) model described by *DeVault et, al., 2018* to assess the proportion of strike risks and damaging strike risks presented by wildlife species at KSEA (Figure 2). Relative Hazard Scores (RHS) are derived from the likelihood and severity of a strike, by species. Likelihood was determined using SEA strike data to determine species struck the most and least frequently. If a RHS value was not provided for a particular species, a similar species' RHS rating was used.

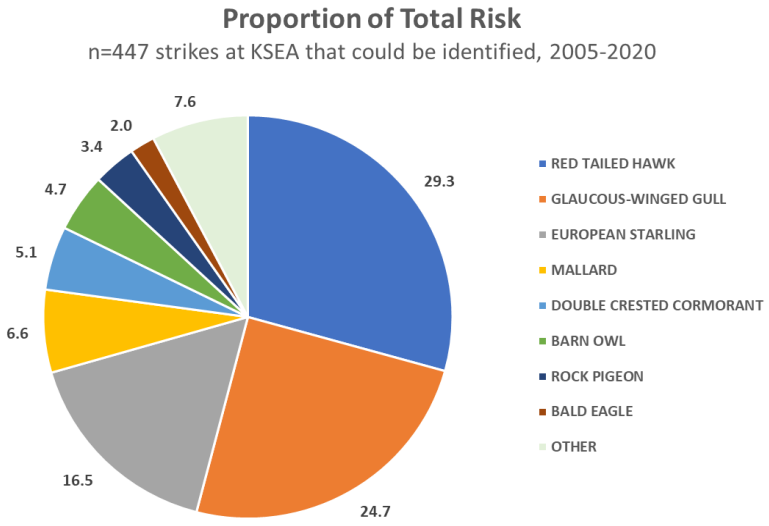

Figure 2. Proportion of Strike Risk by Species, 2005-2020.

DeVault, T.L., Blackwell, B.F., Seamans, T.W., Begier, M.J., Hougher, J.D., Washburn, J.E., Miller, P.R., and R.A. Dolbeer. 2018. Estimating Interspecific Economic Risk of Bird Strikes with Aircraft. Wildlife Society Bulletin (42): 94-101

2.0 - AUTHORITY

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

139.337(f)(5)(i) Designation of personnel responsibilities for implementing the procedures

2.1 - OVERVIEW

Each department and associated agencies have responsibilities outlined below and should incorporate them into their respective programs. Clear communication among airport personnel and these agencies is essential for the WHMP to effectively respond to emerging wildlife issues and succeed. Personnel working at the airport should communicate resource needs, recommendations, and progress to the Wildlife Coordinator. The Wildlife Coordinator, in conjunction with the Airfield Certification Manager will ensure that the WHMP is updated as needed and approved by the FAA. All updates must comply with federal, state, and local laws and regulations.

2.2 - WILDLIFE HAZARD WORKING GROUP

The Wildlife Hazard Working Group (WHWG) is responsible for reviewing the WHMP at least annually and following a triggering event. During this review, the responsible member from each group or agency should review their departmental duties, monitor their activities, and make recommendations to the WHWG. Changes to the WHMP will be made when needed and typically at the annual WHMP review meeting using the Airfield Operation's established Safety Risk Assessment (SRA) process. The Wildlife Hazard Working Group should be attended by a member or a representative from each of these groups below, especially a group member of each Qualified Wildlife Patrol (QWP) heading as designated below with a ֍:

Port of Seattle

1. Manager, Aviation Safety Management Systems - Wildlife Coordinator
2. ֍ Wildlife Biologist(s)
3. ֍ Airport Certification Manager
4. ֍ Airfield Operations Manger
5. ֍ Airport Duty Manager (ADM)
6. ֍ Airfield Operations Specialist (AOS)
7. ֍ Wildlife Support Contractor
8. Ramp Tower Controller - Contracted
9. Senior Operations Controller (SOC)
10. Air Cargo Operations and Development
11. POS Police

12. 911 Dispatch
13. Airfield Maintenance
14. Aviation Environmental
15. Facilities & Infrastructure (Planning, Project Mgmt, Engineering)
16. Airport Security
17. Finance
18. External Relations

Aircraft Operators

1. Airlines
2. Cargo
3. General Aviation

Federal Aviation Administration

1. Airport Certification Safety Inspector
2. Air Traffic Control Tower

Wildlife Agencies

1. US Fish and Wildlife Service
2. US Geological Survey
3. US Department of Agriculture, Wildlife Services
4. Washington Department of Fish and Wildlife

Other Agencies

1. Washington State Department of Transportation

2.3 - POSITIONS RESPONSIBLE FOR IMPLEMENTING THE PLAN

Implementation of the WHMP can only be effectively accomplished with the collective efforts of many individuals and several agencies. One important group responsible for maintaining aviation safety on a daily basis is the SEA Qualified Wildlife Patrol (denoted by above). They are trained to use firearms, pyrotechnics and animal capture techniques to control hazardous wildlife in accordance with the applicable POS Standard Operating Guideline (SOG). Each group outlined below should follow these general guidelines; all groups are encouraged to participate in WHMP meetings when requested:

2.3.1 - Port of Seattle, Airport Operations

2.3.1.1 - Manager, Aviation Safety Management Systems - Wildlife Coordinator

1. Provides general programmatic oversight and elevates aspects of the WHMP to the Director, Airport Operations especially aspects pertaining to resource needs to meet the intent of CFR Title 14 FAR part 139.337 and related FAA Advisory Circulars as amended.

2.3.1.2 - Wildlife Biologist(s)

1. Ensures the WHMP is consistent with the current CFR Title 14 FAR part 139.337 and related FAA Advisory Circulars as amended.
2. Chairs the Wildlife Hazard Working Group meetings to review the WHMP as required.
3. Implements the Wildlife Hazard Management Plan.
4. Reviews, approves, advocates and/or sponsors projects that mitigate a hazardous wildlife or what attracts them near or to the airport especially with respect to the items described in the Airport Landscape Standards, Airport Approved Plant List, and Rules and Regulations.
5. As Landscape Review Committee lead for Airport Operations, reviews, approves, or rejects aspects of projects that potentially create a hazardous wildlife attractant on and near the airport which may include architectural design that may attract hazardous birds near the airport (water features and areas favorable for roosting or nesting).
6. Provides primary External Relations support for the wildlife program through POS External Relations.
7. Disseminates information and assignments through the Wildlife Hazard Working Group points of contact.
8. Obtains and maintains permits for wildlife depredation, harassment, trapping, and other authorizations described in Chapter 4 of this plan from USFWS and/or Washington State agencies as described in this WHMP.
9. Conducts follow-up investigations of wildlife strikes and enters data into the SEA database and the National Wildlife Strike Database and forward reports to FAA as necessary.
10. Perform control actions that should be documented immediately and available for review. Conducts bird and mammal trapping including care of decoy (bait) species.
11. Trains and monitors activities of the Airport Duty Managers, Airport Operations Specialists, and contractors with respect to established standard operating guidelines.
12. Conducts Continual Monitoring Surveys per AC 150/5200-38 as amended and prepares annual reports of findings for the purpose of updating the WHMP and future planning.
13. Coordinates the issuance of Notices to Air Missions (NOTAM) through the Airport Duty Manager pertaining to wildlife hazards.
14. Monitors facilities and tenant concerns for wildlife problems (24-hour response).
15. Keeps a log of all wildlife strikes and control actions.
16. Makes wildlife strike reporting kits readily available to airfield operations and airlines for submission to a Wildlife Biologist and the FAA National Wildlife Strike Database.
17. Coordinates with airport environmental staff of all modifications planned in wetlands, streams, stormwater facilities, or on-site mitigation areas.
18. Reviews plans involving land use change(s) to avoid inadvertently attracting wildlife to the area.
19. Identifies and mitigates against hazardous wildlife and the features that attract them when deemed an imminent threat.
20. Once obtained, maintains credentials as a QAWB and a CWB.
21. Once obtained, maintains instructor qualifications for firearm or hunter safety training.
22. Manages the Raptor Strike Avoidance Program (RSAP), raptor protocols, and associated

support contractors.

23. Maintains USGS Banding/Marking Permit and Scientific Collection Permits necessary to capture, mark and relocate raptors.

2.3.1.3 - Airport Certification Manager

1. Ensures the WHMP complies with the SEA Airport Certification Manual for SEA per CFR Title 14 FAR part 139 and other mandates, procedures, guidelines, and regulations applicable for maintaining FAA Certification.
2. Ensures only properly trained and badged wildlife control personnel operate on the AMA in accordance with FAA regulations. Such training includes radio communications and driving on the AOA.
3. Ensures level of Airport Operation Specialist (AOS) staffing is sufficient for 24/7 coverage.

2.3.1.4 - Airport Operations Manager

1. Ensures level of Airport Duty Manager (ADM) staffing is sufficient for 24/7 coverage.

2.3.1.5 - Airport Duty Managers (ADMs)

1. Logs all known wildlife strikes on a strike report or the Port Daily Log.
2. Warns the air traffic control tower and pilots of imminent wildlife hazards.
3. Ensures wildlife-attracting refuse does not accumulate in fields and ditches on the airport.
4. Inspects critical areas for wildlife activity and strikes and maintain a record of the action, even if no wildlife was present.
5. Reduces wildlife hazards from critical areas when appropriate as outlined in Chapter 6.
6. Records hazardous wildlife activity and animals dispersed or euthanized on the Control Action form.
7. Assists with wildlife control activities involving mammal and bird abatement, and other programs.
8. Contacts POS PD when pyrotechnics, live rounds or other auditory harassment equipment is in use.
9. Verifies questions or concerns regarding personnel and items they are allowed to carry per the Airport Operations Approved Equipment List.

2.3.1.6 - Airport Operations Specialists (AOSs)

1. Assists ADMs with their above-described duties, especially
    - Conducting runway inspections for dead or injured animals.
    - Collecting snarge (wildlife remains) from the Air Movement Area and aircraft so the sample can be used to identify the species of wildlife struck.
    - Logging all known wildlife strikes on the Wildlife Strike/Animal Remains form.
2. Warns the air traffic control tower and pilots of imminent wildlife hazards.
3. Adds Part 139 discrepancies, as related to wildlife issues, once found and/or reported to them. AOSs will then monitor for the discrepancy to be corrected, where they will close

it out.
4. Ensures wildlife-attracting refuse does not accumulate in fields and ditches on the airport.
5. Surveys for wildlife activity and strikes and maintain a record of the action, even if no wildlife was present.
6. Hazes wildlife from critical areas when appropriate as outlined in Chapter 6.
7. Conducts wildlife surveys and records all observed hazardous wildlife activity, animals dispersed and/or removed in the Wildlife Report form.
8. Assists with other wildlife activities involving wildlife FOD walks, controlling prey such as mammal, bird abatement and other wildlife programs.

2.3.1.7 - Wildlife Support Contractor

Contractors may support many of the operational aspects of the wildlife program as needed such as, but not limited to:
1. Raptor trapping support and translocation.
2. Trapping starlings, pigeons, coyotes, and beaver.
3. Conducting Continual Monitoring Surveys.

2.3.1.8 - Ramp Tower Controller Contractor

1. Communicate details regarding hazardous wildlife to an AOS, ADM or another member of the QWP.

2.3.1.9 - Senior Operations Controller (SOC)

1. Communicate details regarding hazardous wildlife to an AOS, or another member of the QWP.

2.3.1.10 - Air Cargo Operations and Development

1. Oversee cargo area and facility tenants to ensure wildlife-attracting refuse is inaccessible to hazardous wildlife and reports of animal issues are sent to a Wildlife Biologist to follow up on.
2. Assist cargo aircraft operators understand their role in reporting all aircraft-wildlife strikes and hazardous wildlife observations to the POS by contacting 206.787.SAFE (7233), option 4.

2.3.1.11 - POS Police

1. Assists, as needed, with annual recurrent training of the QWP with respect to firearm and pyrotechnic safety.
2. Oversees firearm/ammunition asset tracking and that firearms are in good working condition.

2.3.1.12 - 911 Dispatch

1. Aid Wildlife Hazard Management Program by acting as the central contact point for the ADMs and other law enforcement agencies having jurisdiction near SEA when pyrotechnics and live rounds are in use. Discusses these activities in general terms with those calling and voicing concerns.

2.3.1.13 - Airfield Maintenance

1. Maintain ditches and fields to ensure that water flows properly to reduce pooling and the accumulation of refuse on the airport.
2. Minimize pooling formed by rain on tarmac; edge dams may need to be graded if necessary.
3. Assist with, or contract out habitat modifications addressed in the WHMP, such as vegetation maintenance along ditches, brush removal, and tree pruning. Coordination with airport environmental staff is required before work in wetlands or on-site mitigation areas is completed.
4. Repair netting, wire grids, or other exclusion devices, over ponds, ditches, and other water areas and areas where birds roost as determined necessary by the Wildlife Coordinator and after coordination with airport environmental and facilities staff.
5. Maintain the perimeter fence to exclude mammals such as deer and coyotes.
6. Inform a Wildlife Biologist of dead or injured wildlife and other hazardous wildlife found.
7. Rodent-proof buildings, dumpsters, and other refuse containers to the extent feasible to ensure wildlife-attracting refuse is inaccessible to hazardous wildlife.

2.3.1.14 - Aviation Environmental

1. Involve a Wildlife Biologist with project proposals that could potentially result in hazardous wildlife attractants within 5 miles of SEA.
2. Involve a Wildlife Biologist with land use planning and mitigation efforts/changes, especially SEPA document reviews.
3. Assist the Wildlife Coordinator in evaluating environmental permit requirements and determining when an evaluation is necessary with respect to activities in wetlands, streams, mitigation sites or other NEPA criteria as it relates to changes to this WHMP.

2.3.1.15 - Facilities & Infrastructure (Planning, Project Mgmt, Engineering)

1. For large projects that exceed Airfield Maintenance resources, plan, develop, and implement projects to maintain netting, wire grids, or other exclusion devices, over ponds, ditches, and other water areas and other substantial wildlife attractants as determined necessary by the Wildlife Hazard Working Group.

2.3.1.16 - Airport Security

1. Contact the Airport Duty Manager if there are questions or concerns related to the personnel identified on the Airport Operations Approved Equipment List.

2.3.1.17 - Finance

1. Remain aware of the emerging budgetary needs of the Wildlife Program, Table 1.
2. Keep the Wildlfie Coordinator aware of budget requests procedures and budgetary deadlines to obtain funds to support programmatic needs.

2.3.1.18 - External Relations

3. Assist the Wildlife Coordinator with making community contacts, especially in gaining community awareness of airport wildlife hazards and the importance of notification of their projects that are potential wildlife attractants.
4. For more consequential issues related to wildlife hazard management it may be appropriate for this group to work in the larger setting of the SEA Stakeholder Advisory Group.
5. Coordinate media requests pertaining to the program with the Wildlife Coordinator.

2.3.2 - Aircraft Operators

- Airline, Cargo and General Aviation aircraft operators and Ground Service Providers should report all aircraft-wildlife strikes and hazardous wildlife observations to the POS of Seattle by contacting 206.787.SAFE (7233), option 4.
- 206.787.SAFE (7233), option 4 can also be used to obtain more aircraft-wildlife strike reporting kits and to have the kits picked up after animal remains have been collected and the strike form has been fully completed.

2.3.3 - Federal Aviation Administration

2.3.3.1 - Airport Certification Inspectors

1. Review changes to, and approve, the WHMP when found to be satisfactory.
2. Provide information related to aircraft-wildlife strikes and other wildlife incidents to the Certification Manager.
3. Assist, when requested, in reviewing proposed land use changes, construction plans, and mitigation projects by the community for potential wildlife hazards to aircraft.

2.3.3.2 - Air Traffic Control Tower

1. Report significant, abnormal, or hazardous wildlife activities to pilots and QWP over radio frequency and established reporting requirements such as FAA Order 7110.65.
2. Adjust aircraft movements to avoid wildlife strikes, if necessary.

3. Report violations of the *No Feeding* policy.

2.3.4 - Wildlife Agencies

2.3.4.1 - US Fish and Wildlife Service

1. Assist the POS with obtaining the necessary permits, authorizations and/or permissions in a timely manner to help SEA adaptively manage risks and mitigate conflict between aviation safety and wildlife.

2.3.4.2 - US Geological Survey

1. Assist the POS with obtaining the necessary migratory bird banding permits, and other marking authorizations and/or permissions in a timely manner to help SEA adaptively manage risks and mitigate conflict between aviation safety and wildlife.

2.3.4.3 - US Department of Agriculture, Wildlife Services

1. Reviewing requests for certain federal permits and, when needed, issue Form 37 to allow SEA to adaptively manage risks and better resolve conflicts between aviation safety and wildlife.

2.3.4.4 - Washington Department of Fish and Wildlife

1. Assist the POS with obtaining the necessary permits, letters of authorizations and/or permissions in a timely manner to help SEA adaptively manage risks and mitigate conflict between aviation safety and wildlife.

2.3.5 - Other Agencies

2.3.5.1 - Washington State Department of Transportation

1. Monitor potentially hazardous wildlife attractants near the airport such as stormwater ponds or reconstructed wetlands owned by this agency through post-construction or until the area is known not to attract hazardous wildlife.

3.0 - HABITAT MANAGEMENT

FAR 139.337(f)(2) ***A list prioritizing the following actions …and target dates for completion.***

3.1 - OVERVIEW

Habitat management provides the most effective long-term remedial measure for reducing wildlife hazards on or near airports. Habitat management includes the physical removal, exclusion, or manipulation of areas that are attractive to wildlife. The goal is to make the environment uniform and unattractive to the species that are considered the greatest hazard to aviation. Habitat modifications should be monitored carefully to ensure that they reduce wildlife hazards and do not create new attractions for different wildlife. Table 2 lists a series of both habitat and non-habitat-based action items/priorities, with target dates for completion.

3.1.1 - Wildlife Attractants On and Near SEA

3.1.1.1 - General Zone

The *General Zone* for SEA Airport is defined as the area within a 5-mile radius of the AOA. Wildlife attractants in this area could potentially impact air traffic safety operating out of SEA, particularly those attractants that are close to the airport and result birds frequently crossing the airfield. The objective of this plan is to actively reduce attractive wildlife habitat on property under the control of the POS, while working cooperatively with adjacent property owners to discourage land-use practices that might increase wildlife hazards. One of the most prominent attractants is Puget Sound, two miles west of the airport, an area with substantial wildlife abundance, especially during migration.

3.1.1.2 - Critical Zone

The area within a 10,000-foot radius of the Air Operations Area (AOA) is delineated as the *Critical Zone* (see aerial in Appendix A). Control efforts will be primarily concentrated within this area because within 10,000 feet from the AOA fence-line is the area where arriving and departing aircraft are typically operating at or below 1000 feet AGL (above ground level); an altitude that also corresponds with the most bird activity. Over 75% of all civil bird-aircraft strikes occur within 10,000 feet of the airfield on departure or arrival. Some of the most prominent attractants on POS property include the Des Moines Creek Regional Detention Facility (NW Ponds), an old water hazard at the former Tyee Valley Golf Course, and Lake Reba. Off-site attractants include Angle Lake and Bow Lakes.

Table 1. Priority wildlife management action list.

ACTION	AIRPORT PROPERTY	NON-AIRPORT PROPERTY	INITIATION DATE	TARGET DATE	COMPLETION DATE
WILDLIFE POPULATION MANAGEMENT					
Maintain a zero-tolerance wildlife control program on airfield for hazardous species and events	AOA	NA	1977	1977	Ongoing
European starling live-trapping and control Summer/Fall Spring Winter	AOA	NA	 1998 2016 2018	 1998 2016 2023	 Ongoing Ongoing
Rock pigeon trapping and control	Garage & Term. Bldgs	NA	1998	1998	Ongoing
	NA	WSDOT	2019	2023	*In Progress*
Implement Raptor Strike Avoidance Program to trap, mark and translocate raptors away from the airport.	On & Near AOA	NA	2001 2011	2001 2011	2011 Ongoing
Move European starling roost east of terminal by hazing, tree removal, and thinning the tree canopy.	On & Near AOA	NA	1998 Fall	1998 Fall	Sep-1999 Aug-2001 Aug-2004 Aug-2017
Removal of rooftop gull nests on airport terminal buildings as needed.	On & Near AOA	NA	<2000	May through July	Ongoing
Participate in the Seattle Metropolitan Waterfowl (goose) Committee meetings and support the efforts of the USDA Wildlife Services in their efforts to maintain a stable resident Canada goose population.	On & Near AOA	Within at least 5-miles of AOA	2005 Mar-Aug	2005 Mar-Aug	Ongoing
Obtain more human resources to assist with raptor strike avoidance program and other trapping and hazard mitigation needs.	On & Near AOA	NA	2018	Jun-22	*In Progress*
HABITAT MODIFICATIONS AND LANDUSE CHANGES					
Grade, or fill tire ruts on infield caused by equipment.	AOA	NA	Ongoing	Ongoing	Ongoing
Clear and maintain ditches throughout airfield to enhance drainage	AOA	NA	Ongoing	Ongoing	Ongoing
Exclude identified perching areas (i.e. terminals, walkways, parking garage).	On & Near AOA	NA	Ongoing	Ongoing	Ongoing
Remove Scotch broom/ blackberry shrubs within 200 feet of all aircraft movement areas	AOA	NA	2000	Summer Ongoing	Summer Ongoing
Exclusion - Cover Port Stormwater and Industrial Waste Water/glycol ponds with netting, floating balls and other measures such as lined ponds to reduce emergent vegetation and to keep waterfowl and other birds from becoming habitual users of the area. Inspect wet areas for corroded tensioning wire	On & Near AOA	NA	1998	2008	Ongoing
Exclusion - Complete sections of coyote-deterrent AOA perimeter fence which is comprised of fence fabric buried at 45 degrees away from the AOA beginning at the base of the fence structure. Perimeter fence check of deturrent apron	AOA	NA	2003 2007 2017 2019	2005 2009 2018 2020	2005 2009 2019 2020 Ongoing
Remove fruit and nut bearing trees on SEA property (N. runway protection).	On & Near AOA	NA	2000	2001	2001
Update landscaping standards and landscaping zones that consider wildlife hazards and those measures to decrease the attractiveness of the wildlife Critical Area.	On & Near AOA	Some City of SeaTac	1998 2019	2006 2020	2006 2020
Monitor flooding at Miller Creek, Lora Lake & NW Ponds (now called: DesMoines Creek Regional Detention Facility or DCRDF) Wetland Mitigation Sites	On & Near AOA	NA	2000	2004	2005

Table 1. Priority wildlife management action list (continued).

ACTION	AIRPORT PROPERTY	NON-AIRPORT PROPERTY	INITIATION DATE	TARGET DATE	COMPLETION DATE
HABITAT MODIFICATIONS AND LANDUSE CHANGES (Continued).					
Plant scrub/shrub habitat on Vacca Farm and the western portions of the Tyee Valley Golf Course fairway.	On & Near AOA	NA	Fall 2000	Fall 2000 Winter 2006	Fall 2000 Winter 2007
End lease on the Tyee Valley Golf Course to discourages its use by hazardous birds	On & Near AOA	NA	2011	2014	2015
Convert the Tyee Valley Golf Course to shrub-scrub and other plants that promotes pollinators and discourages hazardous wildlife	On & Near AOA	NA	2015	2019	Replanted 2017, 2018 Dec 2020
Convert Lora Lake and adjacent open water areas to shrub-scrub habitat.	On & Near AOA	NA	2017	2019	2021
Work with City of SeaTac to alter mowing schedule to reduce open water areas at the Sea-Tac Community Center	Within 2 miles of AOA	NA	2021	2022	*In Progress*
Develop a plan and cost proposal with the Field Crew to enable them to cut airfield grass more frequently given the AOA is often too wet for mowing much of the year.	AOA	NA	2022	2023	*In Progress*
Develop a plan and cost proposal for airfield prey-based management to address invertabrate pests such as grasshoppers, chaffer beetles and/or earthworm control.	AMA	NA	2023	2024	*In Progress*
Develop a plan and cost proposal to install anti-perching devices on AMA markers and signage to reduce perch sites for hazardous birds.	AMA	NA	2024	2025	*In Progress*
OTHER HAZARD MITIGATION EFFORTS AND INITIATIVES					
Continual Monitoring, formally known as an Ongoing Wildlife Hazard Assessment - Evaluate potential wildlife hazards associated with land use changes, construction activities, and increasing wildlife population trends in relation to triggering events and other wildlife strikes.	On & Near AOA	Within 5-miles of AOA	2004	Annually	Ongoing
Train employees in the safe and effective application wildlife dispersal and incident reporting procedures.	NA	NA	Fall 1999	Annually	Annually
Develop a computerized record keeping system for wildlife strikes and hazing efforts	NA	NA	2001, 2003, 2009, 2019	2001, 2003, 2009, 2020	Nov 2020
Evaluate potential wildlife hazards associated with land use changes, construction activities, and increasing wildlife population trends in relation to triggering events and other wildlife strikes.	NA	NA	2004	Annually	Ongoing
MAINTAIN PERMITS, AUTHORIZATIONS, LICENSES AND CERTIFICATIONS					
Federal					
USFWS Bald Eagle Harassment Permit	NA	NA	2006	2007	Annually
USFWS Bald Eagle Translocation/Nest Intevention Permit	NA	NA	2018	2019	Annually
USGS Banding Permit for KSEA Station Permit (Raptor Biologist)	NA	NA	2019	2021	Annually
State					
WDFW Scientific Collection Permit	NA	NA	2003	2003	Annually
WDFW Letter of Authorization	NA	NA	2016	2016	Annually
Firearm/Hunter Safety Instructor Certification (Port Biologists)	NA	NA	2010	Varies by individual	3-Year Renewal
County - varies by residency of Qualified Wildlife Patrol member					
Concealed Pistol License (QWBs)	NA	NA	2017	Varies by individual	5-Year Renewal
Other					
Qualified Airport Wildlife Biologist Certification The Wildlife Society (Port Biologists)	NA	NA	2023	Varies by individual	5-Year Renewal

Federal Aviation Administration
Northwest Mountain Region Airports Division
APPROVED
Mar 29 2022
Inspector

3.2 - STRUCTURE MANAGEMENT

3.2.1 - Overview

Structures provide cover and hunting perches for wildlife. If wildlife use is considered when a building is being designed, costly control measures can frequently be avoided. Buildings should not provide nesting, perching, or roosting sites for birds and should inhibit access by mammals such as rodents and cats.

3.2.2 - Airfield Structures

Airfield structures such as runway lights, ramp and taxiway signs, ILS towers, and light poles are used as hunting and loafing perches for birds such as hawks, European starlings, and gulls. Lights attract insects a night, and in turn, bats, and nighthawks. Structures found to routinely attract birds in a hazardous manner may be fitted with wire coils or porcupine wire. Gulls are particularly attracted to the roof tops of flat buildings. As such, vegetated roofs are expected to make these areas even more attractive for gull nesting and should be discouraged unless the project agrees to a monitoring program and future steps to mitigate the attractiveness of the roof to preconstruction levels if problems are documented.

3.2.3 - Airport Building Projects

A Wildlife Biologist should participate in the initial phases of all SEA building projects to avoid an inadvertent increase in wildlife hazards resulting from architectural or landscape features. The FAA's Seattle Airports District Office (ADO) reviews proposed construction activities for potential wildlife attractions when the FAA Form 7460-1 application is submitted. The FAA may also solicit input from the USDA-WS.

3.2.4 - Abandoned Structures

Structures not pertinent to air operations and no longer in use should be removed, including abandoned houses, sheds, light poles, vehicles, baggage carts and other kinds of unused machinery. Such structures are attractive to rodents, small birds, and rabbits and, in turn, attract raptors and other predators that can become a significant aircraft-collision hazard. Structures used for crash-fire training are pertinent to air operations and are generally compatible with safe air operations.

3.2.5 - Nesting Platforms and Cellular Towers

Nesting platforms constructed specifically to benefit osprey or bald eagles within the Critical Area and should be discouraged by the POS. Similarly, cellular towers and other nearby structures such as light structures can also be attractive to these birds for nesting, osprey especially. When successful and the young will fledge from these structures and later in life will seek out similar

places to build a nest. This pattern of habituating to manmade structures for nesting is occurring in Florida and has enabled the osprey population to grow rapidly there. Because osprey are one of the last raptor species to nest each year, a previous year's osprey nest may appear vacant to other hazardous birds such as bald eagles that nest earlier. Consequently, the tendency for bald eagles to habituate to manmade structures for nesting should also be expected if the attractants are unmitigated (Guinn 2013[1]).

When nesting occurs, the property owner should be contacted, and the issue explained to them. It's also in the owner's best interest to keep raptors from building nests on their structures. Nests built on cell towers have caught fire resulting in a damaged tower and unnecessary bird mortalities. The POS should encourage cell tower owners to install exclusionary devices to keep osprey from nesting on their structure. Nest excluders have been erected on several towers around SEA that had had an active osprey nest on them. Those excluders have successfully prevented osprey from nesting there again. Other towers are still available to raptors for nesting that have not been excluded around SEA and these should be monitored. New nests should be added to the raptor nest monitoring list.

3.2.6 - Non-airport Land-use Projects

Whenever possible, a Wildlife Biologist should actively participate in land-use decisions and landscape changes to avoid inadvertent wildlife hazards to aircraft within the General Zone and Critical Zone boundaries. This participation will be done by working with the local planning authorities with the intent of reviewing proposed land-use changes. If projects cannot be reasonably modified before construction to mitigate wildlife hazards, the project should be monitored following construction for hazardous wildlife activity so as to offer recommendations on how these hazards might be reduced.

The FAA's Seattle Airports District Office and Safety and Standards Branch of the FAA Northwest Mountain Region can provide technical guidance to SEA in addressing land-use compatibility issues. If FAA requests assistance from USDA-WS per the Memorandum of Understanding between FAA and USDA-WS, then USDA-WS can provide technical and/or operational assistance in addressing issues or concerns associated with a large-scale proposed project or land-use change. Proposed projects that can likely increase bird numbers within flight zones should be discouraged or mitigated to a safe level. Incompatible land uses may include developments such as landfills/waste management facilities, water reservoirs, parks with artificial ponds, wetland mitigation sites, and wildlife refuges/sanctuaries where design modifications such as netting, dense vegetation and liners, for example, cannot be employed to mitigate the attractiveness of the site. More information on hazardous wildlife attractants on and near airports can be found in AC 150/5200-33, as amended.

[1] Guinn, J. E., 2013. Generational habituation and current bald eagle populations. Human-Wildlife Interactions 7(1):69-76, Spring 2013. p. 69-76

3.3 - WATER MANAGEMENT

3.3.1 - Overview

SEA has small lakes, stormwater detention facilities, and wetlands on and near airport property. In addition, small drainage ditches can be found on the airfield that attract a moderate number of birds and mammals throughout the year, especially during the winter when migratory waterfowl pass through the area. Open water on SEA property should be netted, covered, and/or planted wherever possible and monitored closely to ensure hazardous species do not acclimate to these sites. Temporary open water areas may need to be monitored by a Wildlife Biologist. A plan might be needed to cover or remove this attractant if deemed necessary[2]. Water sources outside of SEA property, but within the critical area of SEA, should be monitored, and SEA should work with local agencies and landowners to help deter hazardous wildlife.

3.3.2 - Wetlands

Several small streams and wetlands naturally occur on and near the airport and are attractive to wildlife. Wetland mitigation for impacts resulting from the Master Plan Update construction projects , including mitigation at Des Moines Creek, the former Vacca Farms, Walker Creek, and Miller Creek have been implemented according to the Natural Resources Mitigation Plan and pertinent Section 404 and Section 401 (Appendix F) permit conditions. Modification of vegetation in mitigation areas could be subject to agency review as discussed in Chapter 4.

Mitigation for other future projects, if required, should occur as far away from the airfield as possible, unless it can be demonstrated with reasonable certainty that the mitigation would not likely increase wildlife hazards and will comply with criteria described in FAA Advisory Circular 150/5200-33 as amended. The golf course fairway adjacent to the Des Moines Creek Regional Detention Facility site (aka NW Ponds), Industrial Wastewater Lagoon No. 3, and the runways was planted with a shrub/scrub plant association to deter waterfowl. Any future wetland mitigation plans will also need to be reviewed by a Wildlife Biologist.

3.3.3 - Lakes

Lora "Lake" Shrub-scrub Wetland – Its conversion was completed in 2020. This project was significant with respect to mitigating a substantial wildlife attractant that was located near the north end of Runway 16R/34L. SEA should continue to closely monitor wildlife activity in this shrub-scrub floodplain (see Chapter 9). As wetland mitigation plantings mature they are expected to both meet regulatory compliance specifications and exclude waterfowl from the area like was

[2] Temporary open water may be covered with nets or obscured by vegetation. For example, nylon mesh nets, suspended one to several feet above the water's surface have been installed over several ponds associated with stormwater treatment facilities. The proposed mitigation on the golf course and Vacca farm will use vegetation to obscure floodwaters from birds.

the case with the adjacent and former Vacca Farms site.

Lake Reba should be monitored for hazardous wildlife activity because of its proximity to the runways even though it lies far below the elevation of the AMA. Lake Reba is a highly productive open-water wetland area that harbors many species of waterfowl. Regular site visits and wildlife control activities should continue at this site. In 2006, this water feature was designated waters of the state, meaning it is a jurisdictional and protected wetland area.

Bow Lake and Angle Lake should also be monitored because both are situated within SEA's critical area. Wildlife movement between these lakes and SEA has been observed. If wildlife associated with any of these lakes becomes noticeably hazardous to airport operations, the Wildlife Coordinator should work cooperatively with the adjacent property owners to deter and/or remove the problem animals that threaten aircraft safety. The USDA-WS' resident Canada goose removal effort which is largely funded by the Seattle Metropolitan Waterfowl Committee, including the POS, is a successful example of that cooperation. Angle Lake is one of those waterbodies where that work is conducted and has been very effective at minimizing aviation-wildlife conflicts with this large and flocking waterfowl species.

Stormwater Detention Ponds

The management of airport stormwater detention ponds had been a topic of considerable discussion for many decades due to their attractiveness to waterfowl for loafing, feeding and nesting. At SEA, a combination of environmental regulations, including those needed to protect spawning habitat for state and federally protected fishes, requires substantial volumes of runoff to be detained on site. During the 2004 WHWG meeting it was stated that the POS had already taken all reasonable steps to minimize the retention times, dead storage, and pond surface areas of these facilities. Consequently, over 20 detention ponds were constructed to support SEA Master Plan Update Projects.

Monitoring results from 2000 to 2006 indicate netting over event temporary construction ponds is extremely effective during the first several years, but as vegetation grows and eventually through the net, the netting often becomes damaged and in need of frequent repairs. This monitoring, in conjunction with an extensive evaluation of all known wildlife hazard mitigation techniques, enabled SEA to develop a Wildlife-Stormwater BMP where a combination of liners and surface netting is employed. This BMP was developed during a multi-year decision matrix process, where the following mitigation options, either separately or in combination with one another, were evaluated:

- Liners (to prevent vegetation growth, food resources, and edge effect)
- Netting
- Floating balls
- Floating covers
- Geodesic domes

- Underground Vaults

In 2012, avian radar was used to compare waterbodies without mitigations with those stormwater ponds that had been netted and lined to prevent the highly attractive state of an open-water/vegetation mix. The study results indicated unmitigated water bodies were several more times attractive to bird flyovers than were the mitigated sites. Netting prevents habitual use of these sites by birds. Reducing repetitive use is key to them keeping their flyover visits short if they do return and not decoying in more birds if they were to access a pond. In 2020 floating balls replaced the netting on some of the lined ponds because bird balls, though costly, are longer lasting and maintenance free.

As agreed by the FAA, the POS will continue to evaluate the long-term effectiveness of lined and netted ponds for abating hazardous wildlife hazards in accordance with the WHMP and the most recent *SEA Stormwater Facilities Inspection, Maintenance, and Operation Procedures Manual*. Temporary construction ponds should be discouraged or netted to prevent their use by waterfowl, herons, and other hazardous wildlife.

3.3.4 - Temporary Pools and Ditches

During the wetter winter and spring months, small depressions and tire ruts created by vehicles operating within the infield areas fill up with water and can attract dabbling ducks and shorebirds. This situation may become particularly problematic during periods of heavy construction activity. SEA should discourage driving on the infield during periods of high precipitation to avoid ruts in the soil. Where ruts are found, Maintenance should fill and/or grade the damaged area. In areas where there are larger pools, the land should be filled or graded such that water consistently drains into ditches. Ditches[3] should be appropriately sloped so that water does not pool and leaves the airfield in a reasonably short amount of time. Ditches that pool and attract hazardous wildlife may be covered, in whole or part, using a wire grid system or other barrier (e.g., netting or floating balls).

Because site conditions, wetland regulations, and jurisdictional determinations change over time, the regulatory status and distinctions between ditches and Waters of the U.S. must be considered on a case-by-case basis. Wetlands and other *Waters of the U.S*. are identified on the wetland delineation maps completed for the Master Plan Update projects. On-site conditions must be evaluated for all areas prior to management actions that may require permit approval.
Temporary open water that ponds in non-wetland locations and outside of mitigation sites may be removed by improving drainage (through excavation or maintenance of ditches, trenches, French drains etc.) or filling of shallow depressions. In Waters of the U.S., the above activities

[3] Some ditches adjacent to runways, roads, and taxiways are designed as biofiltration swales to treat stormwater runoff. Modification of these ditches must be made using accepted engineering designs for water quality treatment, or alternative treatment measures.

require careful review by POS Environmental staff to determine regulatory requirements as they could be subject to review and approval by federal and/or state agencies.

3.4 - VEGETATION MANAGEMENT

3.4.1 - Overview

SEA contains diverse vegetation types, some of which are highly attractive to wildlife. The most effective approach to reducing this attraction in the critical zone is to remove all unnecessary trees, shrubs, weeds, and plants, and establish non-seeding or small-seeded grass, especially within 200 feet of the runway. A Wildlife Biologist should emphasize that any plantings on SEA property must comply with the Airport Approved Plant List, as amended and the landscaping zones of the recent Port Landscape Standards Map (Appendix B).

3.4.2 - Mitigating Edge-Effect

Feature boundaries, or edges, are places where different habitat types meet and are often the most attractive places for wildlife because an animal's biological needs can typically be met in a relatively small area. Much of the *edge* at SEA consists of a forest-grassland, shrub-grassland or pavement-grassland edge. The grassland-pavement edge is preferred over a direct transition to taller vegetation such as shrubs and is already the focus of SEA maintenance who keep the area several hundred feet from the runway free of blackberry and dense scotch broom growth. In most instances, monotypic plant communities on and around the airfield should be encouraged.

3.4.3 - Grass Management

With few exceptions, grass will be the only vegetation planted inside the perimeter security fence. FAA CERTALERT No. 98-05 advises that *airport operators should ensure that grass species and other varieties of plants attractive to hazardous wildlife are not used on the airport*. In addition, grasses that produce large seeds and are known to be attractive to wildlife should be avoided when planting new areas. Given grass cover plays an important role in slowing the speed that water runs off the airfield, it must be maintained to encourage infiltration in to the ground first rather than to stormwater receiving ponds.

3.4.3.1 - Grass Type

The type of grass used within the perimeter fence and between the runways should produce small or no seeds, but still be able to generate new growth or re-seed itself to provide a thick, monotypic stand and prevent erosion. The selected ground cover should withstand drought, flooding, and other normal climatic conditions, and be somewhat unpalatable to grazers such as waterfowl. The grasses should harbor relatively few insects and rodents that may attract crows, hawks, owls, European starlings, and other hazardous wildlife species. Several varieties of tall fescue (*Festuca arundinacea*), if allowed to grow to a height of 8-14 inches, have been found to

be unattractive to Canada geese because of a fungus harbored by the plant. Fescue should generally preclude other more attractive grass species from invading the airfield as well.

The approved SEA grass-seed mix is comprised of Perennial Rye (60%), Chewings Fescue (25%) and Creeping Fescue (15%). This hydroseed specification was found to grow quickly and have beneficial soil stabilization properties that are in compliance with the Washington Department of Ecology's erosion control standards and objectives.

3.4.3.2 - Grass Height & Mowing

Canada geese populations are managed near SEA through the efforts of the Seattle Waterfowl Committee and therefore invertebrates found on the airfield as grasshoppers, chaffer beetles and worms are currently more concerning as a wildlife attractant than are geese. Consequently, grass height should be cut between 6-10 inches to reduce grasshopper abundance, an attractant of especially crows and some raptor species. Around runway and taxiway marker lights, the grass should be cut to 6 inches for purposes of visibility. Short grass below 6 inches however can make it easier for small flocking birds like starlings to forage more easily. Tall grass over 14 inches creates nesting habitat for some birds such as short-eared owls. Grass height should be maintained throughout the year, with the first mowing activities beginning when the infield is firm enough to allow equipment access and the grass is sufficiently long to merit cutting.

When possible, grass should be mowed at night when many birds are typically inactive and air traffic is reduced. Mowing is attractive to several species of birds and mammals because it exposes food sources such as rodents, insects, and seeds. If cutting is being conducted during the day and birds are attracted to the activity, the mowing should stop until the birds have been successfully hazed from the area. Mowing activities should be coordinated with the QWP to help disperse the animals and in coordination with the Airport Duty Manager.

3.4.4 - Tree and Shrub Management

The woody growth of trees and shrubs can offer a year-around benefit to some hazardous wildlife species, unlike herbaceous vegetation such as grasses and sedges which become less persistent with age. Trees and shrubs can be ideal for perching and are preferred areas for roosting and nesting due to the protection from predators and poor weather. Woodland thinning to reduce tree densities and pruning to remove branches to open a tree's canopy may be required to make woody vegetation less attractive to these species. In some cases, complete tree removal may be necessary to prevent hazardous birds from nesting nearby. Wildlife hazard management is not the only reason for modifying vegetation around the airport, however.

Tree-height modification may also be required by Federal Regulation 49 CFR Part 77. Part 77 establishes standards and notification requirements for objects affecting navigable airspace

depending on their proximity to the runways and imaginary surfaces[4]. Also known as *obstructions*, trees are one of the most common obstructions that will need periodic removal to prevent their encroachment into this protected airspace. Trees should be completely removed and not topped. Topping trees can produce ideal nesting conditions and should be discouraged by the POS. Cellular tower platforms offer some similar benefits to nesting birds like raptors and they are already a feature of concern as is discussed earlier in this chapter.

3.4.5 - Streamside Vegetation

Herbaceous vegetation growing on the edge of a stream or other wetland may provide preferred habitat for species considered most hazardous to aircraft. The vegetation that grows alongside ditches[5] on SEA property may be removed or maintained so that habitat is not provided for waterfowl, herons, blackbirds, rabbits, and other wildlife that could present a direct or indirect hazard to aviation. Rock (e.g., quarry spalls, rip-rap), and in some instances, trees, shrubs or grass, can be used to replace undesirable plants, slow erosion, and conceal water from wildlife. Each situation will need to be examined on a case-by-case basis to avoid worsening the hazards. SEA should identify where existing streamside conditions attract wildlife and develop an appropriate plan to reduce the hazard. Modification of streamside vegetation in mitigation areas should be consistent with mitigation plans and Section 404 and 401 permit conditions (see Appendix F). Modification of streamside vegetation outside of mitigation areas may be subject to other environmental regulations (see Chapter 4).

3.4.6 - Ornamental Landscaping

Landscaping at the airport can affect tourism, business, and the overall impression of the area to visitors; therefore, landscaping should be aesthetically pleasing. It must, however, coincide with the airport's greater responsibility of air safety. In some instances, trees and bushes offer hunting perches, roosting, and loafing sites, nesting cover, food for birds and other wildlife and therefore they should be removed. Ornamental trees and bushes used to enhance airport aesthetics will be kept to a minimum unless they are on the *Airport Approved Plant List* which is available online at the POS' Wildlife Management website. Species of particular concern are fruit, nut, and berry producers because they can attract wildlife and in some instances provide escape cover. SEA maintenance will continue to monitor and maintain the blackberry and scotch broom that grows within 200 feet of the runways. SEA should continue to monitor ornamental trees to prevent

[4] The removal of a nest tree for a bald eagle will be done in conjunction with the USFWS and other applicable agencies such as the WDFW before such actions would be taken by the Port. The modification of trees or shrubs in designated wetland and/or protected areas will follow established procedures (Chapter 4).

[5] Some ditches may be jurisdictional wetlands under Section 404 of the Clean Water Act and require review by the Army Corps of Engineers prior to modification. Placement of riprap along streams must be consistent with environmental regulations, the Natural Resource Management Plan for the Master Plan Update (including associated Section 404 and 401 conditions (see Appendix I and J, respectively).

communal roosting by European starlings and crows. Such trees should be thinned or removed if necessary.

3.5 - FOOD/PREY-BASE MANAGEMENT

3.5.1 - Overview

Fish, rodents, rabbits, insects, earthworms, and other invertebrates such as grubs lying just below the grass surface are highly attractive to many species of birds and mammals and should be controlled where feasible. Handouts, trash, and scattered debris also provide food for wildlife. The modification or management of a wide variety of habitats such as wildlife-attracting vegetation and removal of abandoned structures will reduce populations of potentially hazardous wildlife by limiting shelter, food, and prey availability.

3.5.2 - Fish

Several fish species occur at SEA and attract some avian species to the area that are commonly associated with bird strikes. One species, the Great-blue Heron, uses wetland and riparian habitats adjacent to the airfield. It is important that future activities at SEA preserve and enhance riparian and wetland functions associated with water quality. It is also important to avoid unnecessary enhancement of fish habitat that will increase the attractiveness of this high-energy food source to wildlife. Access to fish by avian predators can be reduced by decreasing open water foraging areas. Problematic wildlife might be effectively excluded by increasing the amount of vegetative cover over open water (e.g., shrub-scrub habitat). Alternatively, exclusion may require the use of a more costly and maintenance-intensive approach by netting these open-water reaches. The carcasses of spawned-out salmon should be viewed as a wildlife attractant even if some species of wildlife can be physically excluded from this resource with the creative employment of vegetation and netting. High populations of mammalian fish predators, such as river otters are not considered to be problematic species.

3.5.3 - Rodents

Voles and other small rodents at SEA appear to be the primary attractants of hawks and coyotes but will occasionally attract herons and other predators. Historically, rodent populations at SEA have been relatively low, but SEA should continue to monitor populations and should conduct a control program if rodent abundance increases to a level where hazardous wildlife is attracted.

3.5.4 - Insects and Other Invertebrates

Insects (grasshoppers) and other invertebrates (e.g., earthworms, spiders, chafer beetle grubs, winter cutworm caterpillars) may attract many species of wildlife at SEA, particularly crows, gulls, American kestrels, and European starlings . Insect populations should be monitored periodically by SEA to determine if they are present in sufficient numbers to attract wildlife. If control is

deemed necessary, the Washington State University Cooperative Extension agent (see Chapter 10) can help select the best pesticide or control method. Habitat management should keep much of the prey population in check, but the airport should continue to monitor for populations upticks which will occur occasionally. POS Environmental will be consulted prior to any chemical treatments. The POS was certified as Salmon Safe in 2016 by Stewardship Partners, an independent 501(c)3 non-profit organization that conducts third party assessment and certification for land and water management within the urban realm. An application to seek a formal exemption and approval from Stewardship Partners is necessary before applying a pesticide to control invertebrate numbers on the airfield.

3.5.5 - Trash, Debris, and Handouts

Trash and debris are often responsible for attracting species such as gulls and crows. SEA maintenance should continue to conduct trash and FOD (foreign object debris/damage) collection sweeps on the airfield, especially after high winds. The public or airport employees should not be allowed to feed birds or mammals around the airport. When people are observed feeding birds, SEA should discuss the problems that are caused by feeding wildlife, and if necessary, signs should be posted to educate the general public. The POS Rules and Regulations already prohibit the unauthorized feeding. Leaving a dumpster lid open when the receptacle is not in use is one common example of feeding wildlife even though it may not be intentional. Airport tenants and/or others who feed wildlife and do not comply with the SEA Rules and Regulations should be cited and assessed a monetary fine.

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4.0 - LAWS AND REGULATIONS

FAR 139.337(f)(3) ***Requirements for and, where applicable, copies of local, State, and Federal wildlife control permits.***

4.1 - OVERVIEW

Federal, state, and local governments administer laws and regulations that protect wildlife and their habitat. Most wildlife control actions identified in the Wildlife Hazard Management Plan require prior authorization (permission) from applicable regulatory agencies. A number of laws affect wildlife control at airports and SEA. Wildlife control personnel should be educated about these regulations to ensure compliance. In general, harassing and/or taking most types of wildlife is regulated through a permit process overseen by federal or state agencies. Permits are necessary for a successful control program and are obtained annually, or as needed.

4.2 - FEDERAL AVIATION ADMINISTRATION GUIDANCE AND REGULATIONS

The FAA is the federal agency responsible for developing and enforcing air transportation safety regulations, including this WHMP that is regulated under FAR 139.337. The FAA also publishes a series of guidelines for airport operators to follow called Advisory Circulars (ACs). Advisory Circulars in the 150 series deal with airport safety issues, including wildlife hazards. In addition to FARs and ACs, the FAA periodically issues CERTALERTs for internal distribution and to provide recommendations on specific issues for inspectors and airport personnel. All of the above-mentioned regulations, Advisory Circulars, and CERTALERTs are frequently changed or updated, and their current status should be verified on a regular basis. This may be accomplished visiting the FAA website: www.faa.gov.

4.3 - BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES REGULATIONS

The Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) is a domestic law enforcement agency within the United States Department of Justice. Its responsibilities include the investigation and prevention of federal offenses involving the unlawful use, manufacture, and possession of firearms and explosives.

4.3.1 - Firearms

This WHMP recognizes the QWP as aviation-security personnel with respect to RCW 9.41.300. Federal Gun Control Act of 1968 Title 18 - Lautenberg Amendment, 1996. The Lautenberg Amendment prohibits anyone convicted of a felony and anyone subject to a domestic violence protective order from possessing a firearm and handling ammunition. The intended effect of this legislation is to extend the firearms ban to anyone convicted of a misdemeanor crime of domestic

violence. Typical background checks during an airport security badging process do not screen for misdemeanor convictions, however. Consequently, all members of the QWP must possess a valid Concealed Pistol License (CPL). This more detailed background check must be conducted again at the time of CPL renewal which is every 5 years.

4.3.2 - Pyrotechnics

SEA purchases, stores, and uses a variety of pyrotechnic devices to produce loud noise in an attempt to harass wildlife away from runways and taxiways. Although airports must still comply with storage requirements for explosives, no additional federal or state licenses or permissions are required. The exemption is codified by 27 CFR § 555.141.

U.S. Department of Justice

Bureau of Alcohol, Tobacco,
Firearms and Explosives

Washington, DC 20226
www.atf.gov

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DEC 2 2 2010

Mr. Brian Rushforth
Manager, Airport Safety and Operations Division
Office of Airports Safety and Standards, Federal Aviation Administration
800 Independence Avenue, SW.
Washington, D.C. 20591

Dear Mr. Rushforth:

This is in response to your e-mail dated December 10, 2010, to the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). You wanted clarification on ATF's explosives licensing and storage requirements for State and local municipal airports purchasing explosives for pest control and mitigation purposes.

The Federal Explosives Laws (Title 18, U.S.C., Chapter 40) and the implementing regulation at 27 CFR 555.141(a)(3) exempt from the provisions of 27 CFR, Part 555, "The transportation, shipment, receipt, or importation of explosive materials for delivery to any agency of the United States or to any State or its political subdivision." This exemption extends to contractors and subcontractors who have a current and valid contract with a state or local municipality to conduct explosives operations.

Therefore, the distribution to and receipt of explosives by municipal airports or their explosives contractors and subcontractors are exempt from the explosives licensing requirements in 27 CFR 555, Subpart D—Licenses and Permits. However, States and their political subdivisions (e.g. municipal airports) must still comply with explosives storage regulations in 27 CFR 555, Subpart K—Storage.

We trust the foregoing has been responsive to your request. If you have additional questions, please contact the Explosives Industry Programs Branch at 202-648-7120.

Sincerely yours,

William J. Miller
Chief, Explosives Industry
Programs Branch

Federal Aviation Administration
Northwest Mountain Region Airports Division
APPROVED
Mar 29 2022
Inspector

4.4 - ENVIRONMENTAL PROTECTION REGULATIONS

4.4.1 - National Environmental Policy Act

The *National Environmental Policy Act* (NEPA) was one of the first laws written that establishes the broad national framework for protecting our environment. NEPA's basic policy is to assure that all branches of government give proper consideration to the environment prior to undertaking any major federal action that significantly affects the environment. FAA Advisory Circular 150/5200-38 provides specific guidance for full or partial approval of a WHMP. FAA approval of a WHMP normally falls within the scope of a categorical exclusion under NEPA, as implemented by *FAA Order 1050.1F, Environmental Impacts*, and *FAA Order 5050.4B, Implementing Instructions for Airport Projects*. For a categorical exclusion, the FAA must determine whether the measures in the WHMP involve extraordinary circumstances. For example, extraordinary circumstances include significant impacts on federally protected species, species of state concern, or habitat for such species. The FAA may categorically exclude approval of the WHMP itself under FAA Order 1050.1F. In addition, however, the specific measures within the WHMP must be examined for extraordinary circumstances. If specific measures within the WHMP involve extraordinary circumstances, the FAA may still approve the WHMP as a whole but must clearly delineate which specific measures may be implemented without further coordination or permitting from those that may need additional review.

4.4.2 - State Environmental Protection Act

The *State Environmental Policy Act* (SEPA) is intended to ensure that environmental values are considered during decision-making by state and local agencies. The environmental review process in SEPA is designed to work with other regulations to provide a comprehensive review of a proposal. Like at the Federal level, additional environmental considerations will be needed for the POS's WHMP if, for example, impacts might be expected to *Washington State Priority Habitats and Species (PHS)* or harm the environment at a level of significance.

Activities related to the construction of SEA's western most runway, runway 16R/34L, and the associated wetland impacts were reviewed by many federal, state, and local agencies from the perspective of both environmental protections and aviation safety. Wetland site monitoring for 15 years is required to ensure wetland mitigation standards and conditions will be met as intended. It is also understood that these sites will not become a significant attractant to hazard wildlife species.

4.4.3 - Chemical Use Regulations

4.4.3.1 - Federal Insecticide, Fungicide, and Rodenticide Act

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) is the Federal statute that governs the registration, distribution, sale, and use of pesticides in the United States. With certain

exceptions, a pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant, or any nitrogen stabilizer.

The POS was certified as Salmon Safe in 2016 by Stewardship Partners and will need to apply for exemption if an allowable pesticide can be found to treat the airfield or portions of it to control prey and reduce the use of the airfield by hazardous wildlife for foraging.

4.4.3.2 - Washington Pesticide Control Act

The use of chemicals for the control of insects, fungicides, rodents and vegetation is addressed in the Revised Code of Washington (RCW) Chapters 15.58 and 17.21 along with Washington Administrative Code (WAC), Chapter 16-202-1001 through 16-233 and should be checked regular for updates.

4.5 - PROTECTED HABITAT

Impacts to stream, wetland, and other environmental resources may require permits from various agencies, including the USFWS, U.S. Army Corps of Engineers (USCOE), Washington Department of Ecology (WDOE), and local municipalities. Potential impacts are also subject to NEPA and SEPA environmental review. Mitigation for development impacts may be required for issuance of a permit. The FAA has outlined guidelines on wetland mitigation (see 40 CFR 1505 developed for Master Plan Update Projects stating projects should be consistent with Clean Water Act Section 404 and Section 401 conditions). In Washington, wetlands that may not be regulated by the Clean Water Act may still be regulated under the state's Water Pollution Control Act and Growth Management Act.

4.5.1 - Wetland Regulations

Table 3. lists federal, state, and local laws protecting wetlands or streams. Additional summary information for permits required by these laws is available in the WDOE Wetland Regulations Guidebook. The detailed regulatory requirements can be obtained from the responsible agency. These laws may be applicable to some wildlife management actions taken at SEA.

This plan recognizes that permitted mitigation often requires conservation easements to protect sites in perpetuity and will need to be maintained in perpetuity. These covenants may include certain and potential allowances for vegetation management for flight safety The POS is currently undertaking a new master plan with development projects that may require new mitigations. These covenants should also include potential allowances for vegetation management for flight safety (Appendix F). Other mitigation actions have been necessary as a result of the NEPA and SEPA process. Pursuant to these laws, permits and processes, approvals have been and will be issued to the POS for various development activities at SEA. These permits and approvals include

certain mitigation projects to avoid, reduce, or compensate for the impacts of the development activities on streams, wetlands, and other environmental resources. Wildlife hazard management at SEA should be designed and implemented in a manner that is consistent with the goals of these mitigation projects.

These goals include the restoration of streams, wetlands, and their buffers to improve aquatic habitat, floodplain, and water quality functions. Enhancement and restoration of these functions will improve ecological conditions in Miller Creek and Des Moines Creek for fish and wildlife. Mitigation areas adjacent to the airport generally do not include habitat for avian species that pose aircraft safety concerns[5]. A critical need of the mitigation projects is to restore stream, wetland, and buffer functions in a manner that avoids creating new avian wildlife hazards and reduces existing avian wildlife hazards.

As discussed in this plan, airport property is subject to a variety of potential wildlife management actions (regulations affecting wildlife management are explained in Chapter 4, Table 2 and wildlife management control is discussed in Chapter 6). In nearly all cases, these management actions can be successfully implemented without interfering with the ability of the on-site mitigation projects to provide the planned ecological functions. In nearly all cases, management actions at the on-site mitigation will involve the hazing or removal of wildlife and minor habitat modification. These actions are consistent with the planned mitigation and require no wetland-related permits or approvals.

Wildlife management control actions presented in this Plan attempt to balance the POS's and FAA's responsibilities aviation-safety concerns with stream, wetland, and buffer mitigation and enhancement efforts that could attract hazardous wildlife if done incorrectly. Although the POS must retain ultimate authority to identify and respond to wildlife threats to aviation safety, the Plan requires that: (a) the POS secure permits and approvals for any control actions that would result in a significant reduction in mitigation functions, except where immediate action is required to ensure air safety; and (b) any control action that results in a significant reduction in mitigation functions must be compensated for and mitigation functions must be restored as soon as practicable.

Two levels of wildlife management actions are contemplated: those that may have a de minimis reduction in mitigation functions, and those that may cause a significant reduction in mitigation functions.

[5] Creating and restoring wetland habitats at an off-site location in Auburn will replace much of the avian habitat functions lost at SEA. Non-avian wildlife using mitigation sites are generally not a hazard to aircraft safety unless they attract avian predators or move onto active runways. Additional information on this project can be found in the *Natural Resources Mitigation Plan for the Master Plan Update*.

Table 3. Wetland and other regulations potentially applicable to wildlife hazard management at SEA.

Law	Implementation	Jurisdiction	Implementing Agency
National and State Environmental Policy Acts	Requires assessment of the environmental effects (including streams and wetlands) of proposed actions prior to making decisions		Port of Seattle, Federal Aviation Administration, and other agencies
Clean Water Act Section 404	Permit required for placement of dredge or fill materials in Waters of the U.S.	Wetlands and other Waters of the U.S.	Army Corps of Engineers/ Environmental Protection Agency
Clean Water Act Section 401	Certification that the proposed project will meet state water quality standards is a condition of federal permit approvals	Federal permits affecting Waters of the U.S., including wetlands	Washington Department of Ecology
Coastal Zone Management Act	A notice of consistency with the state coastal zone management plan is a condition of federal activities, federal license and permit approval, and federal support of local activities		Washington Department of Ecology
Water Pollution Control Act	Permit (Hydraulic Project Approval) required for work that affects the natural flow or bed of Waters of the State	Activities affecting Waters of the state, including wetlands that are important to fish life	Washington Department of Fish & Wildlife; Washington Department of Ecology
Washington Growth Management Act	Requires all cities and counties in Washington to adopt regulations protecting *critical areas* in order to preserve the natural environment, wildlife habitats, and sources of fresh drinking water.	Streams, wetlands, their buffers, and other environmentally sensitive areas	Local Municipalities (Cities of SeaTac, Burien, and Des Moines)
Forest Practices Act	Permit required for tree harvest	Restricts harvest activities in and around wetlands	Washington Department of Natural Resources
Critical Areas Ordinances associated with communities adjacent to SEA	Approval for placement of fill material into wetlands and other activities affecting critical areas (subject to Interlocal Agreement between Port of Seattle and City)	Critical areas are defined in the City's ordinance	City of SeaTac
Endangered Species Acts	Consultation triggered by federal and/or state actions, including permit, planning, or funding decisions.	Activities that directly or indirectly affect federally listed endangered or threatened species and their critical habitat.	National Marine Fisheries Service (marine anadromous fish). USFWS for other species. WDFW for state listed species.

This level includes vegetation management activities in mitigation sites that would not result in a significant reduction of mitigation functions, would not require a permit, and would not require a change to an existing permit condition. As a rule of thumb, this would generally include actions that do not alter the ability of a mitigation site to meet performance standards for vegetation, as identified in the mitigation plan. These actions would be exempt from pre-consultation with the permitting agencies. Examples of such management actions include:

- **Selective trimming of vegetation**. If selective trimming of vegetation within mitigation sites is required, it can occur without disruption of the desired functions of the mitigation. Removal of small quantities of vegetation can also occur when mitigation functions are not significantly altered.

- **Increase vegetation density.** Adding new non-attractive native plants to mitigation sites would increase plant density and reduce open/poorly vegetated areas. This action would reduce hazardous wildlife use of more open areas and increase the rate of canopy closure over periodically flooded floodplain areas.

- **Replant or replace one type of vegetation with another native plant species**. If one vegetation type is observed to be a wildlife attractant, it shall be replaced with another type. Replacement could occur through physical removal (cutting, uprooting, etc.) or by replanting areas with faster growing species that may out-compete the undesirable plant. Generally, replacement can occur without significant soil disturbance and without affecting the planned wetland functions.

- **Removal of channel obstructions.** Various debris blockages (including beaver dams) could increase the presence of standing water at the mitigation sites. To reduce standing water areas and habitat for waterfowl, it will be necessary to remove these obstructions. (The laws listed in Table 3 above generally include exemptions and/or expedited review procedures for emergency actions and for maintenance activities.)

The above vegetation management actions, if performed, will be reported to regulatory agencies as necessary according to the conditions of conservation easements recording on the property title. If required, reporting would include a description of the action taken, an explanation of why the action was taken, an analysis of the effect of the action on the mitigation site properties, performance standards, and ecological functions. Photographs of the mitigation site prior to and following the management action will be included. An analysis of the effectiveness of the management action in eliminating or reducing the wildlife hazard will also be reported.

4.5.1.2 - Potentially Significant Management Activities

This level includes wildlife management activities that require permits from agencies regarding Clean Water Act Section 404 and Section 401 compliance, Endangered Species Act review, Hydraulic Project Approval review, and other applicable laws, or changes to conditions of existing permits and approvals. In the unlikely event that wildlife management activities result in significant modifications to non-habitat wetland functions, the POS would apply for the required permits or permit changes prior to conducting these activities, unless immediate action was required to ensure air safety.

If the POS determines that immediate action was required to ensure air safety, the POS will notify the Department of Ecology and other agencies with permitting jurisdiction at the earliest practicable date to consult with them on the actions taken and to be taken and to determine the appropriate mitigation to restore the lost or impaired mitigation functions. Recognizing that actions resulting in a significant reduction in mitigation functions should be employed only as a last resort, the POS will be required to restore the lost or impaired mitigation functions at a ratio of at least 1.5 to 1.0 and to secure any required permits for the mitigation. Examples of such management activities include:

- **Netting of habitat**. A potential management strategy to reduce bird use is to use a pole-supported net system that would reduce bird access to habitat. Placement of physical structures in wetlands, such as support posts, cable anchors, etc. could be subject to HPA and Section 404 permitting.

- **Drainage of wetlands**. Alteration of soil saturation or the extent of jurisdictional wetlands on mitigation sites through excavation of drainage channels, grading, or other hydrologic modification.

- **Significant removal and replacement of vegetation** such that planned mitigation functions could be altered. This could occur if larger scale removal/replanting affected riparian conditions, reduced shading of creeks, or changed other factors important to the mitigation function. As a rule of thumb, significant removal/replacement of vegetation would generally include actions that result in removal of vegetation cover in a mitigation area such that the vegetation performance standards for the mitigation site cannot be met.

4.6 - PROTECTED WILDLIFE

4.6.1 - Wildlife Conservation

USFWS and WDFW are responsible for species conservation and recovery plans. These plans require the identification of critical habitat when it is associated with the decline of a species. Habitat alterations and developments may be prohibited in areas where critical habitat has been designated or where such changes could result in the inadvertent take of an endangered species. On a case-by-case basis, consultations with USFWS' and WDFW' Biologists will help determine whether critical habitat is affected by airport projects and how mitigation measures should be implemented.

While the idea of wildlife conservation at airports is often viewed with skepticism, if done correctly, habitat alterations can result in areas less attractive to hazardous wildlife species and more attractive to species that are a much lower risk to aviation safety. Those new features, however, should not attract other hazardous wildlife. The former Tyee Valley Golf Course Conversion Project at SEA is a successful example of this strategy. That project transformed much of the golf course, a hazardous wildlife attractant per AC 150/5200-33, to a pollinator friendly plant mix. Continual monitoring survey data support this successful transformation/conservation effort which was primarily done to reduce wildlife hazards at the south end of the airfield. This area was attractive to gulls and geese and now it attracts more insect pollinators with no observed increases in other hazardous wildlife species.

4.6.2 - Federal and State Listed Species

The *Federal Endangered Species Act* (Sec. 2 [16 U.S.C. 1531]) and *Washington Endangered Species Act* (RCW 77.12.020; WAC 232-12-297) both protects animal and plant species potentially threatened with extinction. These acts classify species as endangered or threatened. An *Endangered Species* is defined as *any species or subspecies which is in danger of extinction throughout all or a significant portion of its range*. A *Threatened Species* is defined as *any species or subspecies which is in danger of becoming an endangered species within the foreseeable future throughout or over a significant portion of its range.* Once listed, a threatened or endangered species cannot be lethally taken or harassed without a special permit. In Washington, several additional species are given special protection by being listed as state threatened or endangered species. The USFWS and WDFW maintain updated lists of endangered and threatened species. A current listing of these specially protected species can be readily found by searching internet using these terms: *USFWS* or *WDFW* and *endangered species.* Habitat critical to listed species is regulated by the USFWS or WDFW and these regulations should be reviewed to determine their potential effect on SEA's habitat modification plans to reduce wildlife hazards.

4.6.2.1 - Avoiding Impacts to Threatened and Endangered Species

SEA should review a listing of threatened, endangered, and sensitive species prior to implementing construction projects that may adversely affect these listed species, such as some species of salmon. If a significant hazard exists with a listed species that jeopardizes air safety, either the USFWS or WDFW, depending on the species involved, should be contacted for assistance.

No endangered or threatened bird species are known to occur at SEA. However, the marbled murrelet, northern spotted owl, and the streaked horned lark are federally listed species and may occur in or near King County. Because the state endangered and federally threatened streaked horned lark can be attracted to airfields, two monitoring studies have been conducted at SEA to determine their presence or absence. In 2014 and 2017, during May, June, and July an independent consultant, the Center for Natural Lands Management and other trained observers from the WDFW conducted surveys that began before dawn to observe this species. Both studies concluded that no evidence of this sub-species was observed at SEA during their breeding period.

Listed salmon species have affected the design of construction projects at SEA. A Wildlife Biologist should work closely with federal, state, and local agencies to ensure that protected salmon species are not adversely affected in the future and that salmon enhancement projects do not inadvertently result in increased wildlife hazards to aircraft. Salmon habitat improvement and/or mitigation projects should be carefully reviewed by the Airport Wildlife Biologist and if necessary, the USDA-WS and the FAA, to ensure the project does not result in hazardous wildlife attractions.

4.6.3 - Federal Wildlife Regulations

Federal wildlife laws are primarily administered by the U.S. Fish and Wildlife Service (USFWS) and involve primarily migratory birds and threatened and endangered species. The United States Geological Survey (USGS), however, is responsible for administering permits for marking migratory birds which includes leg bands and wing markers. Title 50 of the Code of Federal Regulations (CFR): Wildlife and Fisheries is the set of rules and regulations related to wildlife and fisheries. Title 16 of the United States Code (USC): Conservation codifies conservation laws related to wildlife. Title 16 of the USC includes the protection of migratory birds, eagles, and threatened and endangered species with the Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and the Endangered Species Act. Other USC including the Lacey Act, the Clean Water Act, the National Environmental Policy Act, and the Federal Insecticide, Fungicide, and Rodenticide Act may be applicable on proposed hazardous wildlife attractant mitigation activities.

4.6.4 - State Wildlife Regulations

Several Washington State government agencies have regulations that affect wildlife control at airports. Pertinent regulations can be found in the Washington Administrative Code (WAC) and the Revised Code of Washington (RCW). King County and municipality regulations can also affect SEA's wildlife management efforts. State wildlife laws involving resident (non-migratory) birds, mammals, reptiles, and amphibians, as well as state threatened, and endangered species generally are administered by the WDFW.

4.7 - WILDLIFE CATEGORIES

CFR Title 50, RCW Chapter 77, and WAC Chapter 232-12 define the categories of wildlife and regulations for them. For the purposes of this document, feral and free roaming dogs, cats and other domestic animals are considered *wildlife* because of the hazards they may pose to aircraft, but they are mostly regulated under other municipal laws. Table 2 lists Federal and State permits required by wildlife category to conduct hazardous wildlife control actions identified in the WHMP. Wildlife control personnel should know the category for the species that they intend to control, so that they can determine the relevant laws and necessary permits.

4.8 - GENERAL REGULATIONS FOR WILDLIFE CONTROL

Several regulations and permits apply to wildlife management activities at airports in King County. Many of these regulations relate to safety, methods, and special considerations or restrictions that are usually specified on the depredation permits issued by the responsible agency.

4.9 - BIRDS

4.9.1 - Migratory Birds

Migratory birds are regulated under federal law by the USFWS. These regulations permit hazing of migratory birds when the birds are damaging property, but a permit is required for lethal take. Separate permits for lethal take and harassment are necessary for eagles and threatened and endangered species.

A report of the animals taken and, in some instances those hazed annually, will need to be submitted to the USFWS to fulfill the requirements of their issued permits. The annual reports of takes and applications, including those for renewal are now processed online.

4.9.1.1 - Migratory Bird Depredation Permit (CFR 50, Part 13)

A depredation permit to take federally protected migratory birds can be obtained by completing a Federal Fish and Wildlife License/Permit Application. The USFWS may also require

that a Migratory Bird Damage Project Report completed by USDA-WS accompany the permit application. SEA has a federal permit to take all migratory birds except eagles or threatened or endangered species. Washington Department of Fish and Wildlife allows the take of migratory birds under the federal permit without obtaining an additional authorization. Migratory birds that occur in King County include all birds except house sparrows, European starlings, feral pigeons (rock pigeon), pheasant, and domestic ducks, geese, and other exotic birds. A Wildlife Biologist will be responsible for the required annual renewal of the depredation permit and should submit a report to the USFWS within 30 days of the expiration date detailing the species and number of animals taken under the permit. Federally listed threatened and endangered migratory birds include marbled murrelets and northern spotted owls. Peregrine falcons were removed from both the federal and state endangered species lists during the late 1990's and early 2000, respectively, but special reporting requirements remain as a condition of the USFWS Depredation Permit. Bald eagles were removed from the Endangered Species List in August 2007.

4.9.1.2 - Eagle Permit

The *Bald and Golden Eagle Protection Act* (16 U.S.C. 668-668c), enacted in 1940, and amended several times since, prohibits anyone, without a permit issued by the Secretary of the Interior, from *taking* bald or golden eagles, including their parts, nests, or eggs. The Act defines *take* as *pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb*. *Disturb* means: *to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.*

On May 8, 2006, a USFWS email POS stated the POS should harass (aka disturb) eagles as needed while a determination could be made on how best to proceed with acquiring a formal permit under this *Act*. Based on USDA-WS' statements in ADC Form 37, the USFWS asked the POS to apply for a permit to harass eagles for the protection of aviation safety and eagles. A harassment permit was issued to the POS on March 15, 2007. The bald eagle was removed from the Federal Endangered Species List on June 28, 2007, however harassing eagles can still only be done with a valid permit. Disturbance events must still be reported annually to the USFWS. Permits are issued at 5-year intervals, unlike the Migratory Bird Depredation Permit which must be renewed annually. The POS's current permit allows for the capture and relocation of bald eagles but it has limitations that depend on the birds age and time of year it is captured.

Washington State has designated bald eagles as a fully protected species with regard to its habitat, especially nest trees. In 2018, two active eagle nests were found within 10,000 ft of SEA. Eagle nests should be monitored, and new ones added to the raptor nest monitoring list as they are discovered (also see *3.2.5 - Nesting Platforms and Cellular Towers*).

Table 2. Wildlife categories in King County and permits for lethal control. With exception of threatened, and endangered species, RCW 77.36.030 allows for lethal removal by property owners without state permits, if wildlife is damaging property or posing a threat to human life. RCW 77.15.194 and WAC 232-12-142 allows the use of certain body-gripping traps when they have a Letter of Authorization from the WDFW Director.

Category	Species	State Permit Required[1]	State Permit Obtained	Federal Permit Required	Federal Permit Obtained
Resident Game Birds	Quail, ring-necked pheasant, grouse, partridge, and turkey	Yes	Yes	N/A	N/A
Predatory Birds	European starlings, house sparrows	Yes	Yes	N/A	N/A
Feral Domestic Birds[2]	Marked rock pigeons and domestic poultry	Protected	N/A	No	N/A
Migratory Game Birds	Ducks, geese, coots, gallinules, snipe, and mourning doves	Yes	Yes	Yes	Yes
Migratory Nongame Birds	All birds, except game, domestic and exotic birds, resident Canada Geese	No	No	Yes	Yes
Raptors (Trap and Relocate)	All species except bald eagles. Relocations are restricted to sites within Washington State.	Yes	Yes	Yes	Yes
Depredation Order Birds[3]	Crows, magpies, blackbirds, and cowbirds	No	N/A	No	N/A
Game Mammals	Mule deer, white and black-tailed deer, elk, white and black-tailed jackrabbits, other rabbits	Yes	No	No	N/A
Furbearers	Mink, river otter, fox, raccoon, beaver, badger, muskrat	Yes	Yes	No	N/A
Nongame Mammals	All species of mammals, including coyotes, except game, furbearers, other mammals	Yes	Yes	No	N/A
Feral Domestic Mammals	Dogs, cats, rabbits, livestock	No	N/A	No	N/A
Reptiles And Amphibians	All reptiles and amphibians	Yes	Yes	No	N/A
Fully Protected Wildlife	Threatened and Endangered species.	Yes	No	Yes	No
Bald Eagles	Harassment	No	No	Yes	Yes
	Translocation of young	Yes	Yes	Yes	Yes

[1] State classified wildlife requires a valid permit or a *Letter of Authorization*.
[2] Marked Rock Pigeons (aka racing, messenger, homing, or carrier pigeons and white doves) are protected.
[3] May be taken without permits *when concentrated in such numbers and manner as to constitute a health hazard or other nuisance* (50 CFR §21.43).

4.9.1.3 - Control Order for Resident Canada Geese at Airports and Military Airfields

The airport control order authorizes managers at commercial, public, and private airports and their employees or their agents to establish and implement a control and management program when necessary to resolve or prevent threats to public safety from resident Canada geese. Canada geese at SEA are defined as those present from March 1st through August 30th. Control activities include trapping and relocation, nest and egg destruction, culling programs, or other lethal and non-lethal control strategies.

4.9.1.4 - Depredation Order for Blackbirds, Cowbirds, Crows, Grackles, and Magpies

The blackbird control order authorizes private citizens to take certain migratory bird species without a federal permit if the birds are causing serious injuries to agricultural or horticultural crops or to livestock feed, causing a health hazard or structural property damage, causing harm to endangered, threatened, or candidate species in any county in which it occurs, or to protect a species recognized as an federally endangered or threatened species; or to protect a species recognized by a State or Tribe as endangered, threatened, candidate, or of special concern if the control takes place within that State or on the lands of that tribe, respectively. The species found at SEA that fall under this depredation order include American crows, red-winged blackbirds, brown-headed cowbirds, and the less common, common raven.

4.9.2 - Predatory Birds

European starlings, rock pigeons, and house sparrows are non-game birds that are classified as predatory by the WDFW. Because classified wildlife requires permission from the state to control these species, the POS receives a *Letter of Authorization* (LOA) each year to cover the control of these birds, and some mammals, that may create conflicts.

4.9.3 - Feral Domestic Birds

Domestic waterfowl may become a problem when found on airport property. Only wildlife personnel trained to distinguish the differences between domestic and wild waterfowl should be allowed to take these species. If other species of feral poultry or exotic birds are observed at SEA, a Wildlife Biologist should be contacted for assistance with control methods.

Marked rock pigeons, sometimes referred to as racing, messenger, homing, or carrier pigeons and marked white doves are protected in Washington. It is illegal to harm, remove or alter any stamp, leg band, ring, or other mark of identification attached to them.

4.10 - MAMMALS

4.10.1 - Game Mammals

Game mammals are defined primarily as those species that are hunted for sport, recreation, or meat. Deer have historically frequented the edge of the airfield and will require control if they enter the AOA. Normally a state permit is required to control deer and elk, but RCW 77.36.030 provides for the trapping or killing of wildlife by properties owners, without licenses or permits, if the wildlife is damaging property or posing a threat to human life. Threatened or endangered animals are not covered under this provision.

4.10.2 - Furbearers

Furbearers such as beaver will occasionally need to be removed from POS property. Although it is unlikely beaver will cause a direct hazard to aircraft, their presence frequently results in indirect impacts that attract detrimental species because of extensive flooding that they cause in the short term and the creation of open-water wetlands if the dams are allowed to remain. Under the provisions of RCW 77.15.194 and WAC 232-12-142, certain body-gripping traps (padded leghold, underwater conibear, and foot snare) can be employed provided a Letter of Authorization or a 30-day Special Permit To Trap Problem Animals has been obtained from the WDFW.

4.10.3 - Non-game Mammals

Several species of non-game mammals are present at SEA and may need to be controlled. Of these, coyotes present the greatest threat to aviation at any time of the year. Permits are not required to take this species when they could damage property.

4.10.4 - Feral Domestic Mammals

Domestic cats, dogs, and rabbits may become a problem when found on airport property. If they are observed at SEA, a Wildlife Biologist should be contacted for assistance with control methods.

4.11 - REPTILES & AMPHIBIANS

Unprotected reptiles and amphibians can be taken with a permit or the appropriate state fishing license. At their current abundance, these species, such as the American bullfrog, are not attracting hazardous wildlife to an appreciable degree and therefore their numbers currently do not need to be reduced.

4.12 - INVERTEBRATES

Authorization to use non- and restricted-use pesticides for the removal of hazardous wildlife or a prey-base (e.g., blackbirds, European starlings, rodents, rabbits, insects, earthworms, and weeds) should be limited to Certified Pesticide Operators or persons under their direct supervision. To obtain the necessary license to apply restricted-use pesticides, a person must pass an exam administered by the Washington State Department of Agriculture. All SEA personnel that use restricted-use chemicals must first obtain a pesticide applicator's license or be under the direct supervision of an applicator. Use of all pesticides will strictly adhere to the pesticide label and will follow U.S. EPA, Ecology, and King County guidelines.

5.0 - RESOURCES

FAR 139.337(f)(4) Identification of resources to be provided by the certificate holder for implementation of the plan.

5.1 - OVERVIEW

Habitat Management and wildlife control supplies can be purchased from several companies. An adequate supply of equipment will be kept on hand at SEA for use by trained personnel.

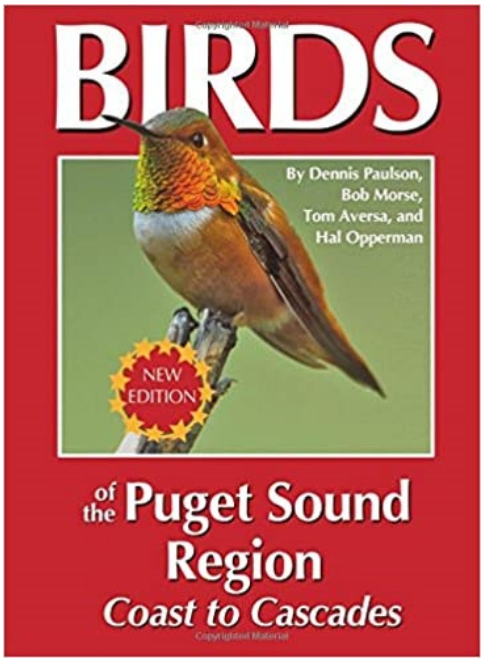
5.2 - AUTHORIZED AIRPORT SUPPLIES

- Binoculars
- Infrared/night vision scopes
- Spotting scope
- Tablet for reporting/documentation
- PPE
  - Eye Protection
  - Hearing protection
  - Protective gloves
- Fire extinguisher
- Wildlife Strike Reporting Kits
  - Durable large Ziplock bags
  - Paper wildlife strike/animal remains forms
  - Cotton Swabs
  - Alcohol wipes
  - Disposable gloves
- Pyrotechnic ammunition and launchers to including screamers, bangers, whistlers, flares and shotgun shellcrackers
- Shotguns and ammunition
- Target thrower and clay targets
- 308 caliber launcher, nets, and ammunition
- Mist net
- Immobilization gun & chemical immobilants
- 17 HMR (.17 caliber) rifle and ammunition
- Range finder
- Cleaning kits for all firearms
- Pellet rifle and pellets
- Freezer & refrigerator
- Necropsy laboratory supplies
- USGS banding supplies
- Swedish Goshawk Traps
- Trap covers (blankets)
- Conibear underwater traps
- Bal-chatri trap
- Foot snare
- Padded leghold traps
- Suitcase beaver traps
- Remote controlled airboat
- Mylar tape
- Snappy snare/catch pole
- Bull whip
- Small-mammal live and snap traps
- Cage traps for small to large mammals
- Bottled gas for humane euthanasia

5.3 - QUALIFIED WILDLIFE PATROL VEHICLES

Vehicles should be stocked with the supplies listed below to facilitate an immediate response to wildlife hazards. They are responsible for searching for hazardous wildlife and responding to emergency calls from the SEA tower or Airport Operations to disperse animals from the runways. They should maintain radio communications with the tower if there is a situation within the AOA, and the patrols must operate within the air movement areas according to FAA guidelines. At a minimum, supplies to be maintained in their vehicles should include:

- Binoculars
- iPad for reporting/document reference.
- PPE
  - Eye Protection
  - Hearing protection
  - Protective gloves
- Fire extinguisher
- Wildlife Strike Reporting Kits
  - Durable large Ziplock bags
  - Paper wildlife strike/animal remains forms
  - Cotton Swabs
  - Alcohol wipes
  - Gloves (latex or vinyl)
- Pyrotechnic ammunition and launchers including screamers, bangers, whistlers, and 12-gauge shellcrackers
- 12-gauge shotgun and ammunition
- Bore snake
- Garbage bags
- Goshawk Trap Covers (blankets)
- Field guide for local bird identification
  - Birds of the Puget Sound Region (any addition)



6.0 - WILDLIFE CONTROL PROCEDURES

FAR 139.337(f)(5) ***Procedures to be followed during air carrier operations that at a minimum includes—***

139.337(f)(5)(ii) ***Provisions to conduct physical inspections of the aircraft movement areas and other areas critical to successfully manage known wildlife hazards before air carrier begin;***

139.337(f)(5)(iii) ***Wildlife hazard control measures;***

6.1 - OVERVIEW

A member of the Qualified Wildlife Patrol (QWP; Chapter 2) should conduct regular and opportunistic physical inspections of movement areas and other areas critical to wildlife hazard management as part of the daily protocol. Responders should document all observed wildlife and record the data on a *Wildlife Report, Control Action* form. One opportunistic (random) 3-minute wildlife survey should be conducted each day when on the airfield using the *AvOps 3-minute Survey* form (Appendix C). In cases where no animals are seen, it should be indicated that an inspection was conducted and that no animals were observed. Wildlife Biologist should also conduct physical inspections of critical areas and report wildlife activity on the Control Action form or Raptor form as appropriate. During periods of exceptionally heavy wildlife activity (e.g., migratory periods, outbreaks of insects, etc.), the Airport Duty Managers works with a Wildlife Biologist to broadcast an appropriate verbal statement over the Automated Terminal Information Service (ATIS). SEA will consider submitting a Notice to Air Missions (NOTAM) advising pilots when hazardous or abnormal wildlife activity is observed within the vicinity of SEA.

Wildlife that is identified as hazardous during and after the completion of the recommended habitat modifications may still need to be controlled using accepted direct control techniques. Wildlife hazards at airports are extremely variable and complex, therefore, it is essential to adopt a flexible, innovative, and adaptive approach to managing such hazards. Wildlife identification guides and handbooks should be available for use by the Qualified Wildlife Patrol at SEA. Of particular value is the *Prevention and Control of Wildlife Damage* manual jointly produced by the University of Nebraska, USDA-WS, and the Great Plains Agricultural Council. This publication details species-specific examples of damage and includes an in-depth discussion of methods of dispersal for each species. Airport personnel should be trained to identify hazardous wildlife at SEA and should select dispersal methods that are appropriate to the type of animal causing the hazard.

6.2 - QUALIFIED WILDLIFE PATROL

6.2.1 - Port of Seattle

The QWP consists of the Airport Duty Managers, Airfield Operations Specialists, Wildlife Biologists and other personnel, such as the wildlife support contractors, that are trained to use firearms, pyrotechnics or trapping techniques to control hazardous wildlife. The patrol should monitor and respond to wildlife hazards on the airfield and should coordinate their activities through a Wildlife Biologist to ensure a secure environment is maintained for safe airport operations.

The crew should be trained in wildlife identification, proper control techniques, and safe operations as outlined in the next chapter. The crew should have a radio-equipped vehicle and adequate wildlife control supplies (Chapter 5). The patrol should maintain clear communications with Airport Duty Managers and tower, in accordance with FAA radio protocols.

The QWP should report wildlife activity and control activities on the *Wildlife Report > Control Action* form. Airfield condition reports with respect to wildlife hazards should be documented on the *Daily 139 Inspection Checklist* when wildlife hazards persist and additional planning and efforts will likely be needed to manage these persistent risks more appropriately. These decisions hazard-mitigation plans can be made in a Wildlife Hazard Working Group meeting at any time and more frequently than once annually if warranted.

Routine runway sweeps should be conducted at least once per day, and the presence of any dead animals found from strikes or suspected strikes should be recorded online to the National Wildlife Strike Database (Appendix C) by a Wildlife Biologist. In cases where no wildlife hazards were seen, it should be indicated that an inspection was conducted and that no hazards were observed on the electronic 24-Hr Airfield Inspection Report form.

Other wildlife-related activities (e.g., notable hazards, animals euthanized or dispersed, unusual wildlife behavior, etc.) should be documented on the *Wildlife Report > Control Action* form. All dead birds found on runways will be reviewed by a Wildlife Biologist to determine if it be considered an aircraft-wildlife strike or if another cause of death can be determined. Any bird remains that are found should be bagged, labeled on paper *5200-7 - BIRD / OTHER WILDLIFE STRIKE REPORT FORM*, and placed in a freezer for later inspection and identification. Each bag of remains should have a completed paper Wildlife Strike/Animal Remains Form accompany it. If determined to be a strike, a Wildlife Biologist submitting the details of the event to the FAA.

6.2.2 - Wildlife Support Contractor

The POS has contracted wildlife support services to work at SEA several days each week. Those efforts include trapping European starlings, rock pigeons, and dispersing and removing gulls,

some raptors, and other hazardous birds from the airfield. That contractor is also available to assist the POS with other wildlife control activities including those involving coyote, rabbit and beaver removal.

6.2.2.1 - Raptor Strike Avoidance Program

In June 2001, the POS contracted a Raptor Biologist to trap and relocate raptors to areas with a richer prey base. Although most species of raptors, can be captured in a Swedish Goshawk Trap (SGT), the target species are red-tailed hawks and barn owls as they get struck most frequently. American kestrels are rarely caught in these traps and require a more active trapping method such as the use of al Bal Chitri trap.

The program goal is to reduce raptor densities at SEA, especially to reduce the number of young and migrating birds that may be at higher risk of being struck by aircraft. Over 1,500 raptors comprised of a dozen and a half species have been relocated to northwest Washington where prey densities are thought to be considerably higher than SEA. All raptors trapped at SEA, even mature birds, are relocated with the exception of bald eagles. Eagles thought to be nesting nearby need to be released where captured based on current permit conditions. Captured red-tailed hawks believed to nest in one of the half a dozen or so territories adjacent to SEA are leg banded and marked with a yellow tag on each wing for easy identification if resighted. Red-tailed hawks that are immature or are believed not to be associated with the airport on long term basis are marked with a blue wing tag after banding. All tags are labeled with an alphanumeric code so the bird can be identified if it returns to the airport. In some instances, VHF or UHF radio transmitters may be attached to these birds to better understand their movement patterns and to help locate nests near the airport. Mobile communications (GSM) transmitters, however, is another option that could provide wildlife biologists with more location data and may be preferred.

Another method of keeping red-tailed hawk densities lower at the airport is nest intervention. When young hawks, eyases, are about 4-weeks old, they are removed from their nest and raised elsewhere. Although this method is labor intensive for the person caring for the birds it is highly effective. Of the 100 or so young birds raised in Skagit County, none of these banded birds are known to have returned to SEA.

6.3 - KING COUNTY ANIMAL CONTROL

King County Animal Control maybe available to help with free-roaming dogs and cats. If animal control assistance is needed on the airfield, call (206) 296-PETS or the other resources listed in Chapter 10. If the animal poses an immediate threat to aviation, wildlife control personnel should attempt to catch, disperse, or lethally remove it.

6.4 - GENERAL WILDLIFE CONTROL MEASURES

CFR 14 – Part 139.337 (a) …each certificate holder shall take immediate measures to alleviate wildlife hazards whenever they are detected.

Wildlife hazards observed at SEA will be analyzed by members of QWP to determine a practical solution that will be employed in a timely manner, commensurate with the perceived risk(s). The initial response for most species will be to haze them with frightening devices, followed by other direct control methods, including lethal removal, when necessary.

As a wildlife population near the airfield increases in abundance, so does likelihood that individual members of the population will enter critical airspace used by arriving and departing aircraft. However, wildlife abundance is not the sole indicator for assessing the strike hazards, rather species abundance, body size, and behavioral attributes must be evaluated in combination. Notable attributes of wildlife behavior that should be examined to properly assess the risk to aircraft include direction and altitude of wildlife movements in relation to aircraft, flocking characteristics, frequency of visits to a given site, duration of visit, and activity while on site (e.g., nesting, loafing, feeding, soaring, etc.), to name a few.

A primary key to successful wildlife control is persistence, innovation, and a clear understanding of the risks associated with certain species, that either by their location, size, behavior and/or number create a hazardous situation for the current state of the airfield. Most control techniques retain their effectiveness when used judiciously and in conjunction with other methods. Some methods such as pesticides or leg-hold traps are only effective and legal for certain species and situations. Therefore, the methods chosen will depend largely on the situation and the species involved. Finally, personnel involved in direct control should be aware of the potential diseases that wildlife can carry and should take appropriate precautions.

6.4.1 - Bird Control

Over 50 species of birds may occur at SEA and several of these represent a highly significant threat to aviation safety. Although European starlings are of great concern, migratory species, especially geese and other species of flocking waterfowl are also a great concern. Juvenile birds may also constitute an unusual wildlife hazard because of their general unfamiliarity with the airport environment at SEA. It's important to reemphasize that an integration of multiple methods should be employed for maximum effectiveness. If properly applied, the techniques discussed in the *Prevention and Control of Wildlife Damage* should reduce most hazards involving species of concern at SEA.

6.4.2 - Mammal Control

Potential hazards from the majority of mammalian species at SEA have been reduced through habitat modifications and the construction of fencing and other exclusionary devices. Large mammals such as deer have already been excluded from using the airfield by the perimeter fence. However, smaller mammals still exist on the airfield and can provide an attraction to larger predators and raptors. A Wildlife Biologist should monitor these rodent and rabbit populations and take steps to keep their numbers reduced.

6.5 - APPROACH FOR IMPLEMENTING CONTROL MEASURES

6.5.1 - Control Methods

It is anticipated that wildlife hazards associated with sites under conservation easements can be effectively reduced using known control methods described in this chapter without compromising site objectives. However, it is conceivable that some habitat alterations such as adding or clearing vegetation or altering hydrologic regimes on a site may become necessary. Alteration of hydrology or vegetative habitat would only be used as a last resort if all other methods fail to abate wildlife hazards to a safe level.

6.5.2 - Decision Model for Implementing Control Methods

To facilitate SEA's effort in assessing and responding to hazards, a flow chart for assessing the wildlife hazard and implementing control methods was developed (Figure 3, Chapter 6). Given the extremely variable and complex nature of wildlife hazards at airports, it is essential to adopt a flexible, innovative, and adaptive approach to managing unexpected hazards that may result from the airfield environment, especially the mitigation sites.

If it is determined that a wildlife hazard exists due to one or more of the risk factors (species, location, behavior, number, and/or airfield conditions) that were identified through monitoring, then the observer takes direct action immediately to resolve the situation. The methods used to reduce the hazard(s) will become increasingly more aggressive and used in combination with one another until wildlife responds favorably, or the hazard is abated. In those cases where the animals are non-respondent or situation is becoming increasingly more hazardous, lethal removal will be necessary.

Concurrent with the immediate action required to resolve a given situation at a given moment is the long-term management approach required to resolve reoccurring problems that have been observed with frequency. This long-term approach is comprised primarily of managing people (e.g., training, public education, reviewing proposed construction plans) and managing habitat/prey (e.g., modify vegetation, exclude/remove attractants). If the frequency of these hazardous situations and/or the risks to aviation increase, more aggressive actions must be

proposed, planned, reviewed, and implemented. For example, the POS may first start with selective thinning of vegetation and increasing the intensity of the modifications as needed to include replanting new species and/or removing certain undesirable ones.

An extreme scenario would include reducing or eliminating larger areas of vegetation where conditions suggest the use of proactive management approach. Proactive management includes evaluating POS data and records of communication to develop creative, effective, cost-efficient solutions to reduce the degree to which direct control actions are needed in the future. The amount of effort and planning required to implement more aggressive project plans is expected to increase with the environmental significance of the proposed action. Therefore, a dramatic change to the habitats near the airfield, such as significantly altering hydrology at the mitigation sites, is highly unlikely.

In the most extreme scenario, the water level may have to be reduced or eliminated, or the wildlife-attracting vegetation removed and replaced with another type. The model outlined in Figure 3 provides a systematic and incremental approach for determining whether this scenario is necessary to ensure air traffic safety. Prior to altering hydrology at these sites, SEA will consult with all appropriate regulatory agencies to identify alternative forms of vegetation that meet wildlife abatement efforts without compromising the mitigation objectives. Given the variable and complex nature of wildlife hazards at airports, it is essential to adopt a flexible, innovative, and adaptive approach to managing unexpected hazards that may result from the airfield environment, especially the mitigation sites. SEA will consult with the appropriate regulatory agency to identify alternative means to rectify recurring problems well before modifying the hydrology of wetlands or riparian areas is considered.

Flow Chart for Resolving Wildlife Hazards Near Seattle-Tacoma International Airport

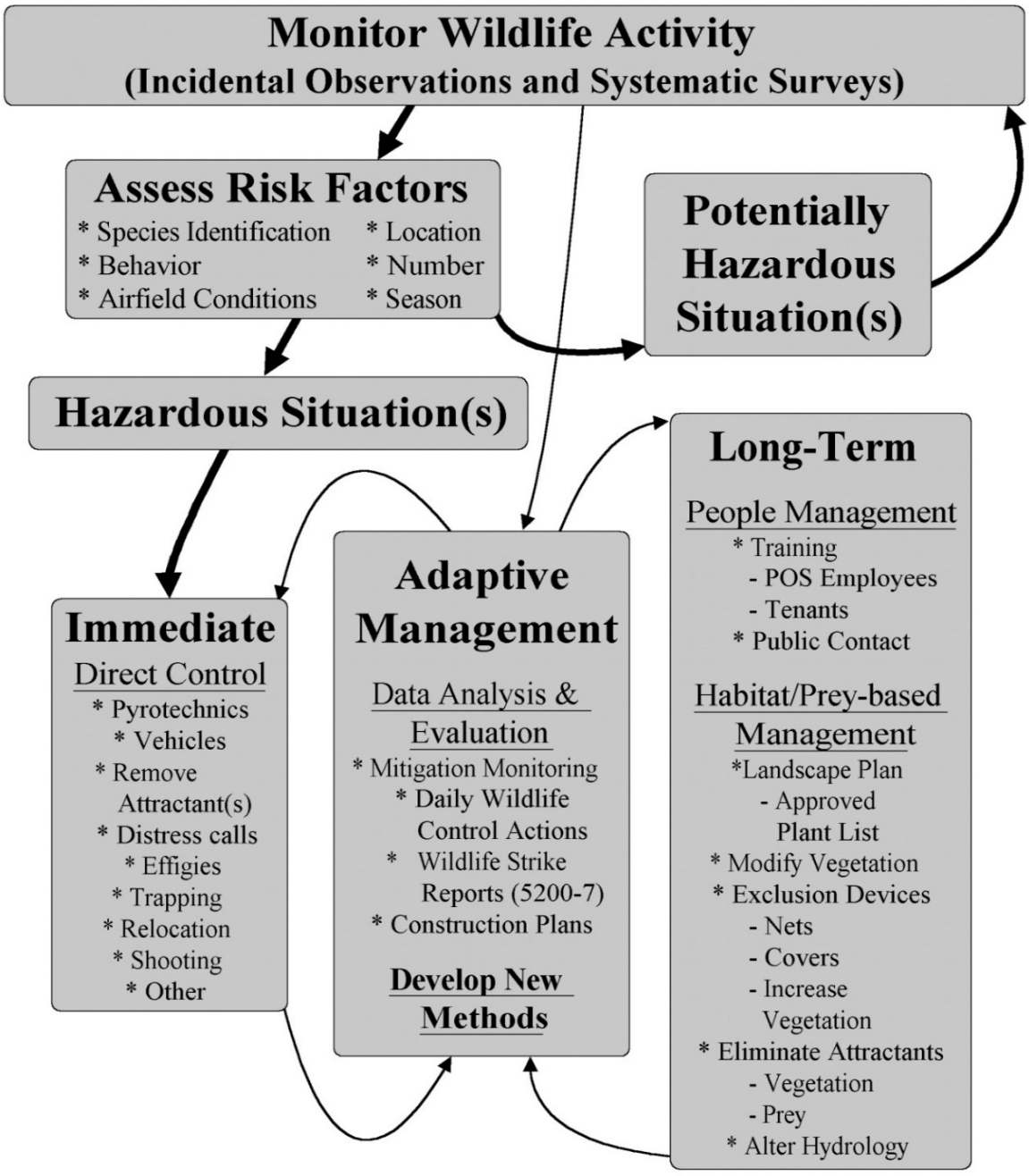


Figure 3. Habitat management actions will be consistent with Section 404/401 mitigation conditions and other agency requirements, including those discussed in this plan.

6.6 - AIRFIELD COMMUNICATION

139.337(f)(5)(iv) Ways to communicate effectively between personnel conducting wildlife control or observing wildlife hazards and the air traffic control tower;

All wildlife control personnel should be equipped with radios and have proper training to contact the air traffic control tower (ATCT). If an immediate hazard exists that might compromise the safety of air traffic at SEA, the Airport Duty Manager should coordinate with the air traffic control tower, and if necessary, detain arriving or departing air traffic until the hazard is eliminated. In extreme cases, the runway may need to be closed temporarily at the discretion of the QWP or the ATCT. Although the ATCT cannot be expected to monitor all wildlife hazards on the airfield and still direct air traffic, tower personnel should notify the QWP immediately if pilots report hazards or any such hazards are observed from the tower.

7.0 - EVALUATION

7.1 - OVERVIEW

The WHMP will be evaluated at least annually. The Wildlife Hazard Working Group will evaluate the effectiveness of the WHMP at reducing wildlife strikes at SEA and monitor the status of hazard reduction projects, including their completion dates as provide in Table 1, Chapter 3. Although not a FAA requirement, a Safety Risk Assessment (SRA)-like process has been used for conducing the annual review of this document.

Step 1 of the SRA process was added as the first part of our WHMP review effort, to put an emphasis on the data that is critical for evaluating wildlife trends and to better identify hazardous wildlife attractants before they became problematic. These data can come from AvOps 3-minute each day and the continual monitoring surveys (Appendix D). The annual Continual Monitoring Report contributes to this review. Steps 2 through 6 are based on the industry standard 5-Step Risk Assessment process and these too can also be conducted quickly if the analysis is done prior to the meeting. Consequently, the evaluation steps typically follow this order:

Step 1. Monitoring (an additional step added for reviewing the WHMP at SEA)
Step 2. Define the System
Step 3. Identify the Hazards
Step 4. Analyze the Risk (consequences),
Step 5. Assess the Risk (through use of a Risk Matrix),
Step 6. Treat the Risk (mitigation).

Following this evaluation, the Wildlife Hazard Management Plan Annual Review form, page F-2 of AC 150/5200-38 should be completed and signed by the Wildlife Coordinator or their designee.

7.2 - WHMP REVIEWS FOLLOW A TRIGGER EVENT

The Wildlife Hazard Working Group should meet more frequently as needed if situations warrant, as determined by the POS Wildlife Coordinator. The triggering event review will be a more rapid review to focus on the specific event(s) for meeting earlier. Following this evaluation, the *WHMP Review Following a Triggering Event* Form, page F-3 of AC 150/5200-38 as amended is typically completed and signed by the Wildlife Coordinator or their designee.

7.3 - WILDLIFE DATABASE SOFTWARE

A Wildlife Biologist should maintain a database of reported wildlife strikes, control actions, survey results and mitigation efforts conducted on the airfield and surrounding areas. Information from this database will be used to identify trends and to monitor any increases in wildlife hazards on

the airfield. If unacceptable increases in wildlife populations are observed, the cause should be determined and the WHMP modified to address the problem. In 2020 Veoci was fully deployed as the software system to collect data for Airport Operations. The Wildlife Program has a separate set of forms that are accessible to the QWP and others as needed (Appendix C). The forms can be tailored to each specific task that is conducted and the results can be easily summarized for the WHA meetings and permit reports.

7.4 - AIRPORT EXPANSION

Airport expansion plans should be reviewed within the WHWG when necessary to ensure that new developments do not inadvertently result in increased wildlife hazards to aircraft operations. If appropriate, they will coordinate designs with the FAA who may request assistance from USDA-WS.

7.5 - FAA INVOLVEMENT

FAA Regional Certification Inspectors and personnel from the Seattle Airports District Office (ADO) should be invited to make comments on the WHMP and to attend annual meetings on WHMP modifications.

8.0 - TRAINING

8.1 - OVERVIEW

Training is essential for the Qualified Wildlife Patrol (QWP). An Airport Wildlife Biologist should ensure that all personnel that might be working in a wildlife deterrence capacity are trained annually in the proper selection and application of control methods, including species identification, and reporting procedures as recommended by the FAA. A variety of POS Standard Operating guidelines (SOGs) pertaining to wildlife hazard management that are a part of the annual reoccurring training program. Training should also include a description of special procedures for wildlife control management actions in wetland mitigation sites, wetlands, streams, and ditches. The SEA wildlife training program generally follows AC 150/5200-36, as amended, and consists of these efforts:

- **Training Center** – Up to 2-hours of communication procedures for operating on the AOA and AMA which is typically conducted in the Airport Training Center during the badge renewal process.
- **Classroom** - Up to 4-hours of wildlife hazard management awareness, environmental laws, bird identification and safe/effective firearm/pyrotechnic use in the classroom, and
- **Field** - Up to 3-hours at the Wildlife Safety Training Area where a QAWB, who is also firearm safety instructors, concentrate on the safe use of pyrotechnics and live rounds.

8.2 - STANDARD TRAINING

Wildlife control personnel should receive training in mitigating wildlife hazards at airports, including an overview of laws associated with wildlife control (including Section 404 of the Clean Water Act, State Hydraulics Code, Endangered Species Act, and Local Sensitive Areas Codes). Training should also include techniques used for prey-base reductions, firearm and pyrotechnic safety including hands-on training, and wildlife identification and dispersal techniques. Airport communications and driving should also be provided to all employees involved in wildlife control operations that may require them to operate on the AMA.

8.3 - WILDLIFE SUPPORT CONTRACTOR TRAINING

Wildlife support contractors may also help with annual training. The purpose of this contractor integration is to provide knowledge and expertise to the other less familiar QWP about the wildlife work they do with trapping and relocating raptors, for example. These contractors often instruct the basic bird and mammal identification training sessions or other aspects under the direction of a POS QAWB.

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9.0 - MONITORING WILDLIFE HAZARDS

Sec. 139.337 (b) In a manner authorized by the Administrator, each certificate holder [must] ensure that a wildlife hazard assessment is conducted when any of the following events occurs on or near the airport:

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

(2) An air carrier aircraft experiences substantial damage from striking wildlife.

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

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

9.1 - OVERVIEW

Although it is impossible to accurately predict exactly how wildlife population dynamics will change over time or will be altered by the modifications to existing on-site wetland habitat, changes should be anticipated. Long-term monitoring will be necessary to ensure that a hazardous situation does not develop. One objective of the mitigation projects is to eliminate habitat already known to be attractive to hazardous wildlife. Therefore, acceptable hazard levels will not be based on existing wildlife populations, but rather on population trends of hazardous wildlife on and near SEA.

9.2 - CONTINUAL MONITORING

FAR 139.337 (b) states an assessment should be conducted after anyone of four triggering events occurs. Because one or more of these triggering events occurs at irregular intervals at SEA, it is most prudent for the POS to conduct an Ongoing Wildlife Hazard Assessment, now known as Continual Monitoring (see AC 150/5200-38). This ongoing assessment is comprised of several fixed-point surveys each month, throughout the year. One survey is conducted in the morning each month, another during midday and the last of the three-monthly surveys is done so it can be completed near sundown. Night transects with an emphasis on small mammals and other hazardous wildlife potentially missed during daylight hours are conducted on a quarterly basis while driving a designated path when dark. A night-vision scope or infrared scope is used to aid detections. The locations of these three-minute survey stations are illustrated in Appendix E.

The goal of this monitoring program is to detect and immediately abate wildlife hazards. In the event wildlife is observed that poses a threat to air safety, appropriate control methods will be immediately implemented, even though such actions may bias the survey data. This approach helps ensure aviation safety and yet still provides valuable data. The behavioral response exhibited by each species to a given control method will be recorded, and where possible factored into the final analysis.

9.3 - MITIGATION SITE MONITORING

The current mitigation plan allows the POS to split wetland functions by creating new wetlands for wildlife in Auburn, WA while restoring wetlands for hydrologic functions on SEA property. Hydrologic functions have been restored in-basin adjacent to the AOA by creating scrub-scrub wetland habitat. The goal is to create a density of vegetation so extreme that it discourages the hazardous wildlife species from using these sites. The POS' wetland mitigation site in the City of Auburn is located just over 5-miles from SEA. Although the on-site mitigation projects are actually expected to result in decreased wildlife use of the sites, USDA-WS and the FAA recognize the potential for unexpected wildlife hazards associated with projects. The monitoring and control program discussed in this chapter was designed to detect and respond to any unforeseen wildlife hazards at the on-site mitigation sites.

A total of 10 wetland sites, occurring in two watersheds, were being systematically monitored by the USDA-WS for hazardous wildlife near SEA (Appendix E). The following wetland mitigation sites and the associated Miller Creek and Des Moines Creek flood plains are scrub/shrub wetland habitat to physically exclude waterfowl and other large hazardous wildlife from using these areas. The single exception is Lake Reba, an area where no wetland mitigation enhancements have been conducted but data is being collected on the same routine schedule to serve as a study control for this sampling regiment.

1. Miller Creek Watersheds (north and west of runways)
    a. Creek Relocation and Flood Plane Enhancement (Vacca)≠
    b. Lora Lake Wetland Mitigation Enhancements (Lora)
        i. Post filling monitoring
    c. Nursery Wetland Mitigation Enhancements (Nursery)≠
    d. Wetland A-17a≠
    e. Wetland A-17b≠
    f. Lake Reba (the study control site with no enhancements)
2. Des Moines Creek Watershed (south of the runways)
    a. WSDOT Wetland Mitigation Site (SR509)≠
    b. Des Moines Creek Regional Detention Facility (formally Northwest Ponds)(Tyee)
    c. Creek Relocation and Wetland Enhancements (Tyee)≠
    d. Tyee Valley Golf Course Wetland Enhancement (Tyee)≠

Another wetland mitigation site, associated with future SR509 improvements, is located 1,600 feet south of the airport and is considered the headwaters of Des Moines Creek. Per a formal agreement between the State of Washington and the POS, the SR 509 Wetland Mitigation Site, owned by WSDOT, should be monitored by the state in perpetuity. This shrub/scrub wetland area, however, is no longer considered a potential hazardous wildlife attractant. The 2013 WHA indicated the site infrequently attracted hazardous birds. The shrub-scrub vegetation had

matured considerably since the mitigation site's creation indicating that the habitat modifications had been effective at keeping hazardous wildlife from using them at levels that might be concerning. Even so, the surveys continued to gain additional certainty that the site would not become an attractant later as the site matured further. In 2020 the USDA-WS stated in the final *Wetland Mitigation Monitoring Report* that the shrub-scrub plantings in the SR50 site and the other sites marked with superscript "≠" above were successful.

> *The overall conclusion regarding these mitigation wetland treatments and the ongoing monitoring surveys is that the exclusionary vegetation treatments are highly successful at eliminating or reducing hazardous wildlife at these sites. Reiterating the success at achieving multiple use goals for these land parcels. The conversion of open water wetland features to flood tolerant scrub shrub habitat has been successful at meeting environmental mandates with respect to water quality, erosion control, flood buffering, and vegetation survivorship, while simultaneously meeting wildlife hazard mitigation goals.*

The three remaining wetland sites in **bold** above are still being monitored today but under the Continual Monitoring Program.

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10.0 - RESOURCES

10.1 - FAA RESOURCES

CertAlerts

- CertAlert 87-09: Wildlife Hazard Management Plan Outline
- CertAlert No. 98-05: Grasses Attractive to Hazardous Wildlife
- CertAlert No. 04-09: Relationship Between FAA And Wildlife Services
- CertAlert No. 06-07: Requests by State Wildlife Agencies to Facilitate and Encourage Habitat for State-Listed Threatened and Endangered Species and Species of Special Concern on Airports
- CertAlert 08-01: AC 150/5200-28 as amended Notices to Air Missions (NOTAMs) for Airport Operators

Advisory Circulars (as amended)

- AC 150/5200-32, Reporting Wildlife Aircraft Strikes
- AC 150/5200-33, Hazardous Wildlife Attractants On Or Near Airports
- AC 150/5200-34, Construction or Establishment of Landfills Near Public Airports
- AC 150/5200-36, Qualifications for Wildlife Biologist Conducting Wildlife Hazard Assessments and Training Curriculums for Airport Personnel Involved in Controlling Wildlife Hazards on Airports
- 150/5200-38 - Protocol for the Conduct and Review of Wildlife Hazard Site Visits, Wildlife Hazard Assessments, and Wildlife Hazard Management Plans
- AC 150/5220-24 - Foreign Object Debris Detection Equipment
- AC 150/5220-25 - Airport Avian Radar Systems

Memorandum of Agreement and Understanding

- Memorandum of Understanding between the United States Department of Transportation, Federal Aviation Administration and the United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services.
- Memorandum of Agreement between the Federal Aviation Administration, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the U.S. Department of Agriculture to Address Aircraft-Wildlife Strikes.
- GCA-4419 Agreement for Wildlife Hazard Management between the Washington State Department of Transportation and the Port of Seattle referencing SR 509 Wetland Mitigation Site Monitoring, May 11, 2006

10.2 - REGULATORY AGENCIES

Federal Aviation Administration (FAA)
2200 S 216th St, Des Moines, WA 98198

Safety and Standards Branch
(425) 227-1621 - Certification Officer
(425) 227-2607 - Certification Officer

Seattle Airports District Office (ADO)
(425) 227-2657 - Supervisor
(425) 227-2653 - Environmental Specialist

FAA Staff Wildlife Biologists
FAA Airport Safety and Compliance
FAA-AA5-317
800 Independence Ave., SW
Washington, DC 20591
(202) 267-3389

Migratory Bird and Eagle Permits
U.S. Fish and Wildlife Service (Permitting)
Migratory Bird Permits
911 NE 11th Ave.
Portland, OR 97232-4181
(503) 872-2715

National Eagle Repository
6550 Gateway Road, RMA, Bldg 128
Commerce City, CO 80022
(303) 287-2110
repository@fws.gov

Threatened And Endangered Species
U.S. Fish and Wildlife Service (T&E Species)
North Pacific Coast Ecoregion
Western Washington Office
510 Desmond Drive SE, Suite 102
Lacey, WA 98503
(360) 753-9440

Migratory Bird Enforcement
U.S. Fish and Wildlife Service (Law Enforcement)
(425) 883-8122

State Wildlife Enforcement (King Co.)
Washington State Department of Fish and Wildlife
Law Enforcement - Region 4
16018 Mill Creek Blvd.
Mill Creek, WA 98012
(425) 775-1311 ext. 115

State Permits – Body Gripping Traps
Washington State Department of Fish and Wildlife
Enforcement Program – All regions
600 Capitol Way North
Olympia, WA 98501-1091
(360) 902-2515 - Main Switchboard
FAX (360) 902-2155

State Threatened & Endangered
T&E Section, NRB Office - 5th floor
600 Capitol Way North
Olympia, WA 98501-1091
(360) 902-2694

10.3 - MUNICIPAL AGENCIES

10.3.1 - Animal Control

Primary
King County Animal Control (206) 296-PETS
21615 64th S.
Kent, WA 98

Secondary

Seattle Animal Control	206.386.7387
Des Moines Animal Control	206.870.6549
Normandy Park Animal Control	206.248.7600
Renton Animal Control	425.430.7550

10.3.2 - Law Enforcement

King County Sheriff's Department
SE 22300 231st
Maple Valley, WA 98038
(206) 296-3883

City of SeaTac
17900 International Blvd. S., Suite 401
SeaTac, WA. 98188
(206) 241-9100

City of Burien
14905 6th Ave SW
Burien, WA 98168
(206) 296-3333

City of Tukwila
6200 South Center Blvd
Tukwila, WA 98188
(206) 433-1804

City of Normandy
801 SW 174th St
Normandy Park, WA 98166
(206)248-7600

City of Des Moines
21900 11th Ave S
Des Moines, WA 98198
(206) 878-3301

10.4 - TECHNICAL ASSISTANCE

U.S. Department of Agriculture, Wildlife Services
720 O'Leary St., NW
Olympia, WA 98502
(360) 753-9884 - Olympia

Washington State University Cooperative Extension of King County
700 5th Ave. Swt. 3700
Seattle, WA 98104-5037
(206) 296-3900

Washington State Department of Agriculture (Pesticides Management)
P.O. Box 42589
Olympia, WA 98584
(360) 902-2010

Washington State Department of Transportation (Maintenance)
26620 S 266th St
Kent, WA 98032
(253) 372-3900

10.5 - PORT OF SEATTLE DOCUMENTS

SEA Stormwater Facilities Inspection, Maintenance, and Operation Procedures Manual [Internal link]

SEA Rules and Regs No. 5

SEA Approved Plant List

10.6 - RELATED INFORMATION

Prevention and Control of Wildlife Damage
https://digitalcommons.unl.edu/icwdmhandbook/

Federal Aviation Administration (FAA) Wildlife Hazard Mitigation
https://www.faa.gov/airports/airport_safety/wildlife

U.S. Department of Agriculture, Wildlife Services
https://www.aphis.usda.gov/aphis/ourfocus/wildlifedamage/sa_program_overview/ct_wd_program_overview

Washington State Department of Fish and Wildlife Listed Species List
https://wdfw.wa.gov/species-habitats/at-risk/listed

Washington State Department of Ecology
https://ecology.wa.gov/

Wetland Regulations Guidebook
https://apps.ecology.wa.gov/publications/documents/8805.pdf

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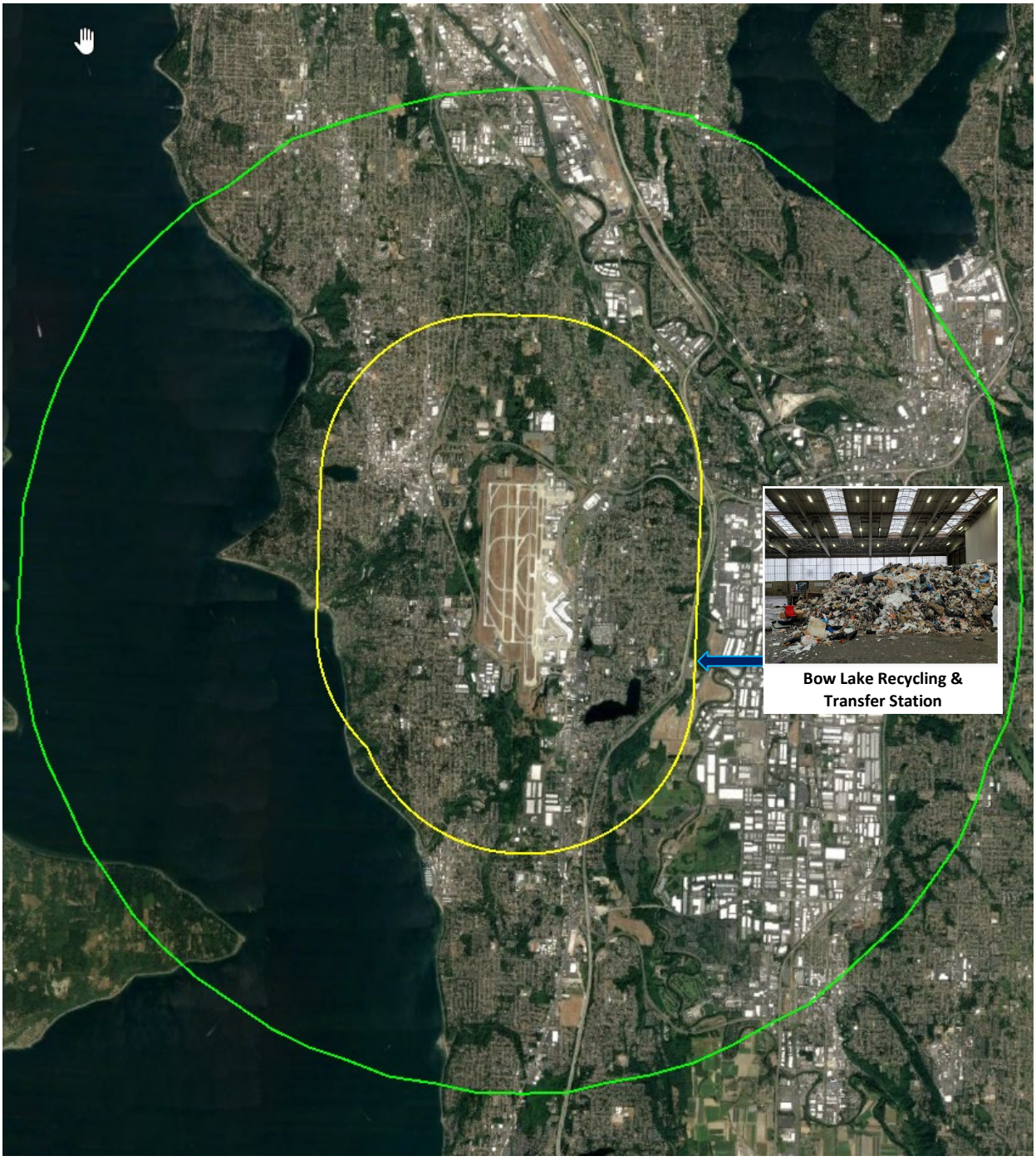

The Bow Lake Recycling and Transfer station is 10,000' from SEA. The enclosed facility has been compatible with safe airport operations.

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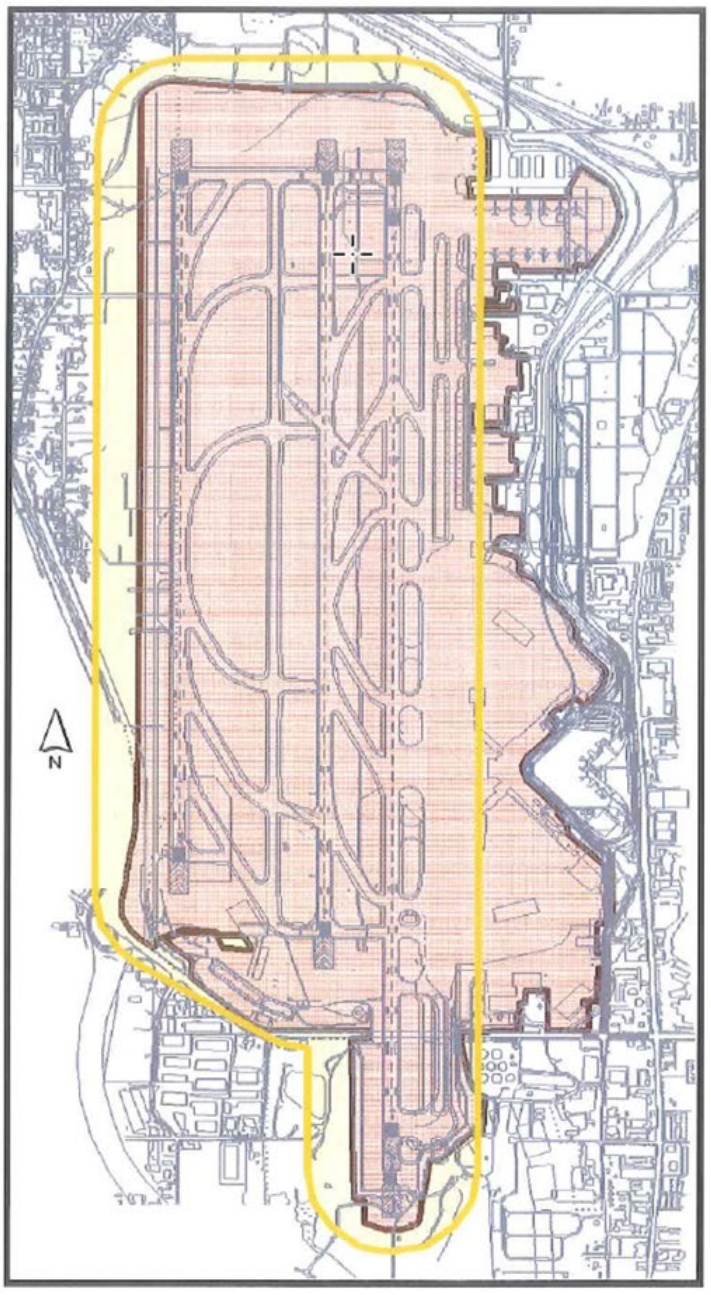
LANDSCAPING ZONES AT STIA

Seattle-Tacoma International Airport

rev. 2/18/05

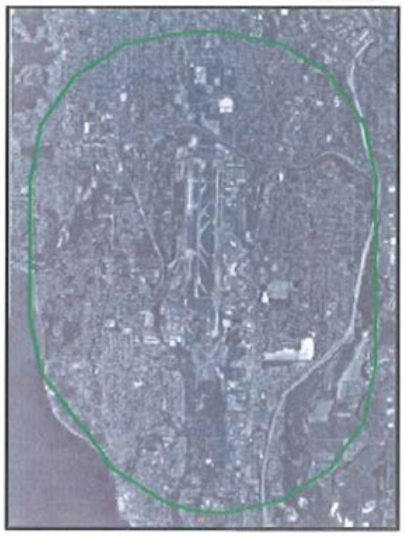
Landscaping Zones at STIA



***Delineated by the Port to comply with:**

1. **CFR Part 139.337 Wildlife**
2. **FAA Advisory Circular 150/5200-33, as amended**
3. **Airport Rules and Regulations, as amended**
4. **This Plan.**

NOTE: Outside these landscaping zones, Landscape Standards and the *Airport Approved Plant List* applies



The *Critical Zone*, located 10,000' from the AOA perimeter fenceline is where ~75% of bird strikes occur at airports

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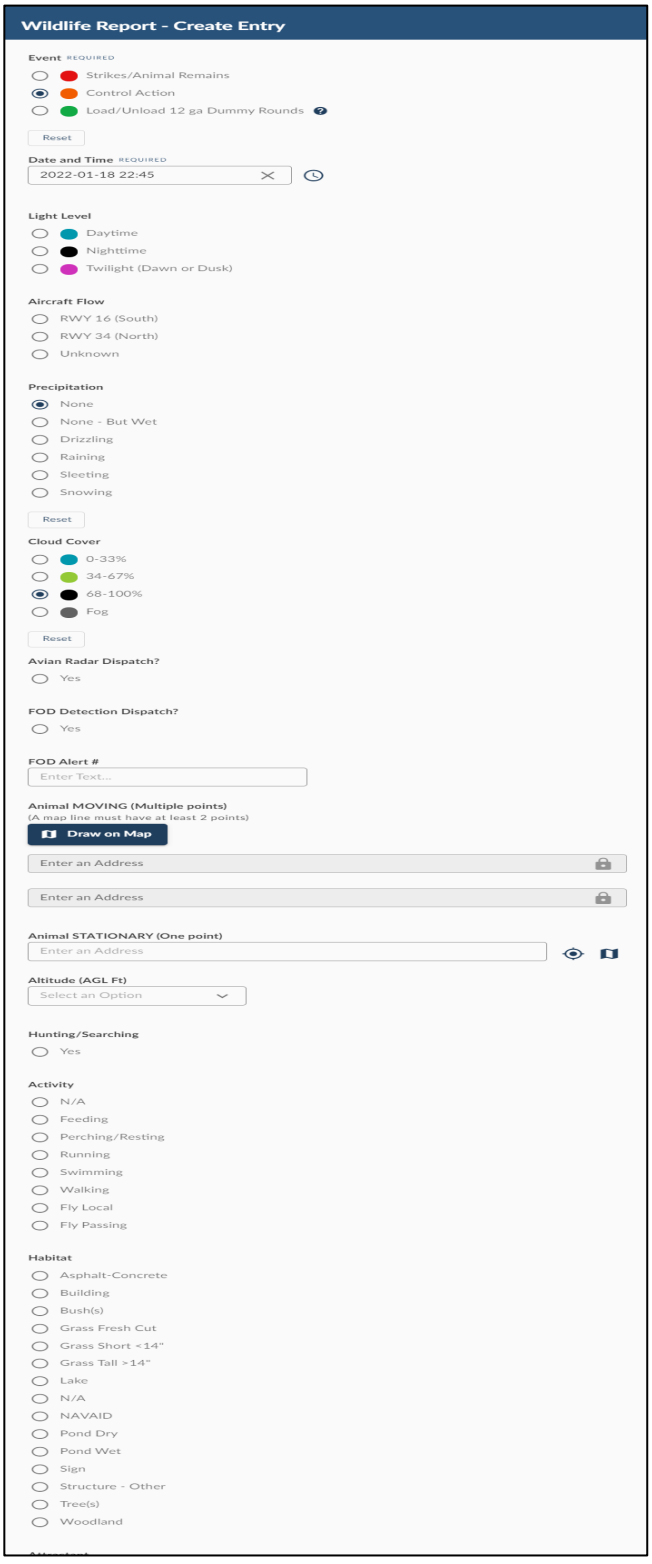

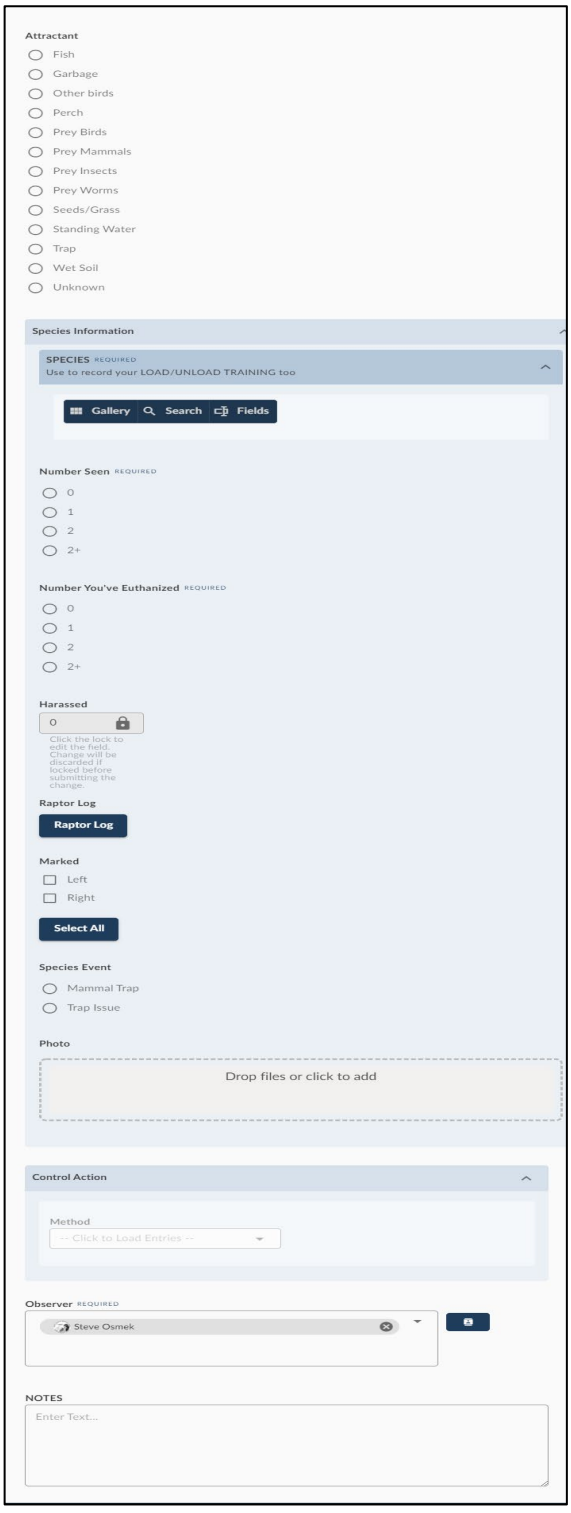

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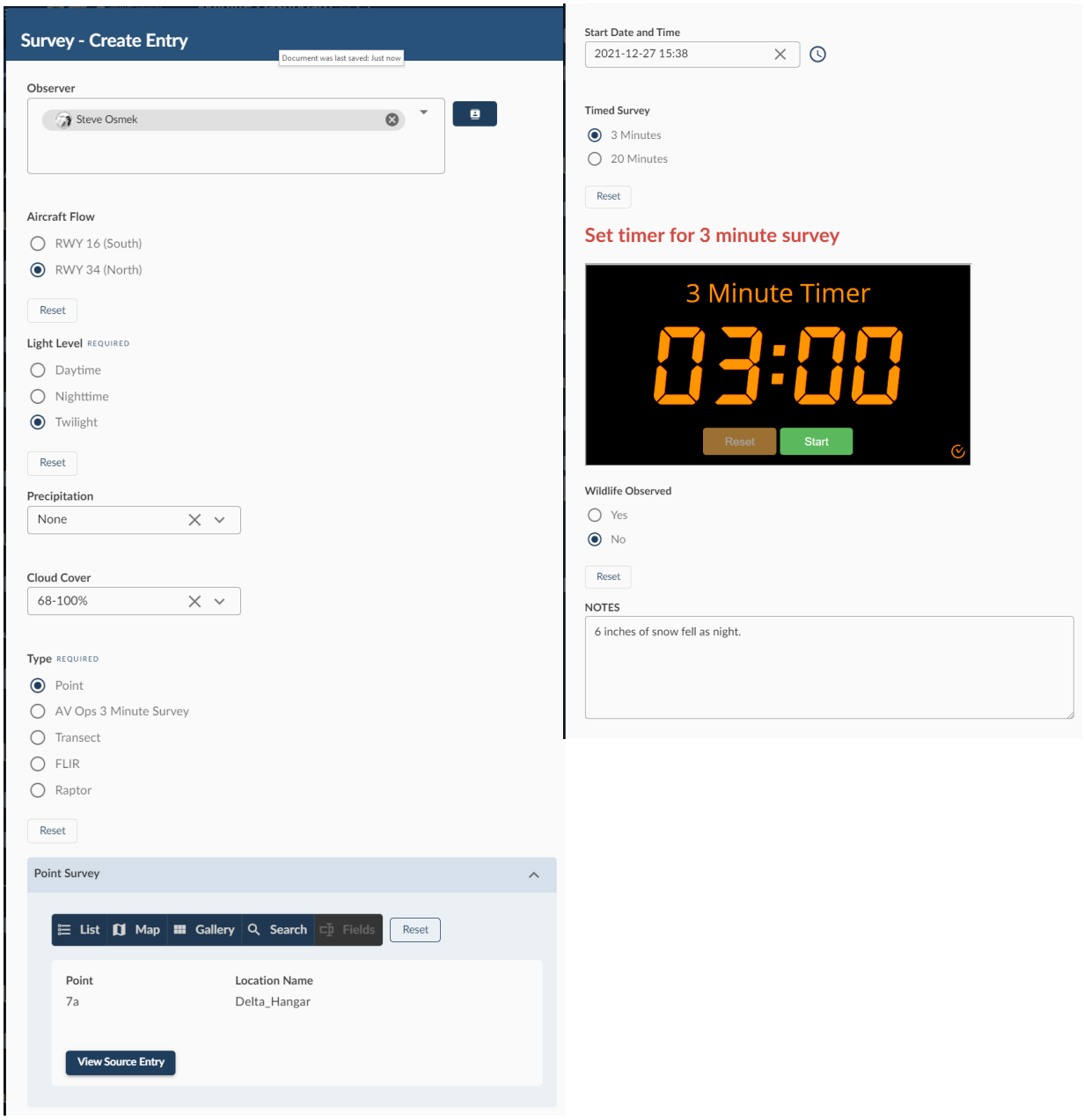
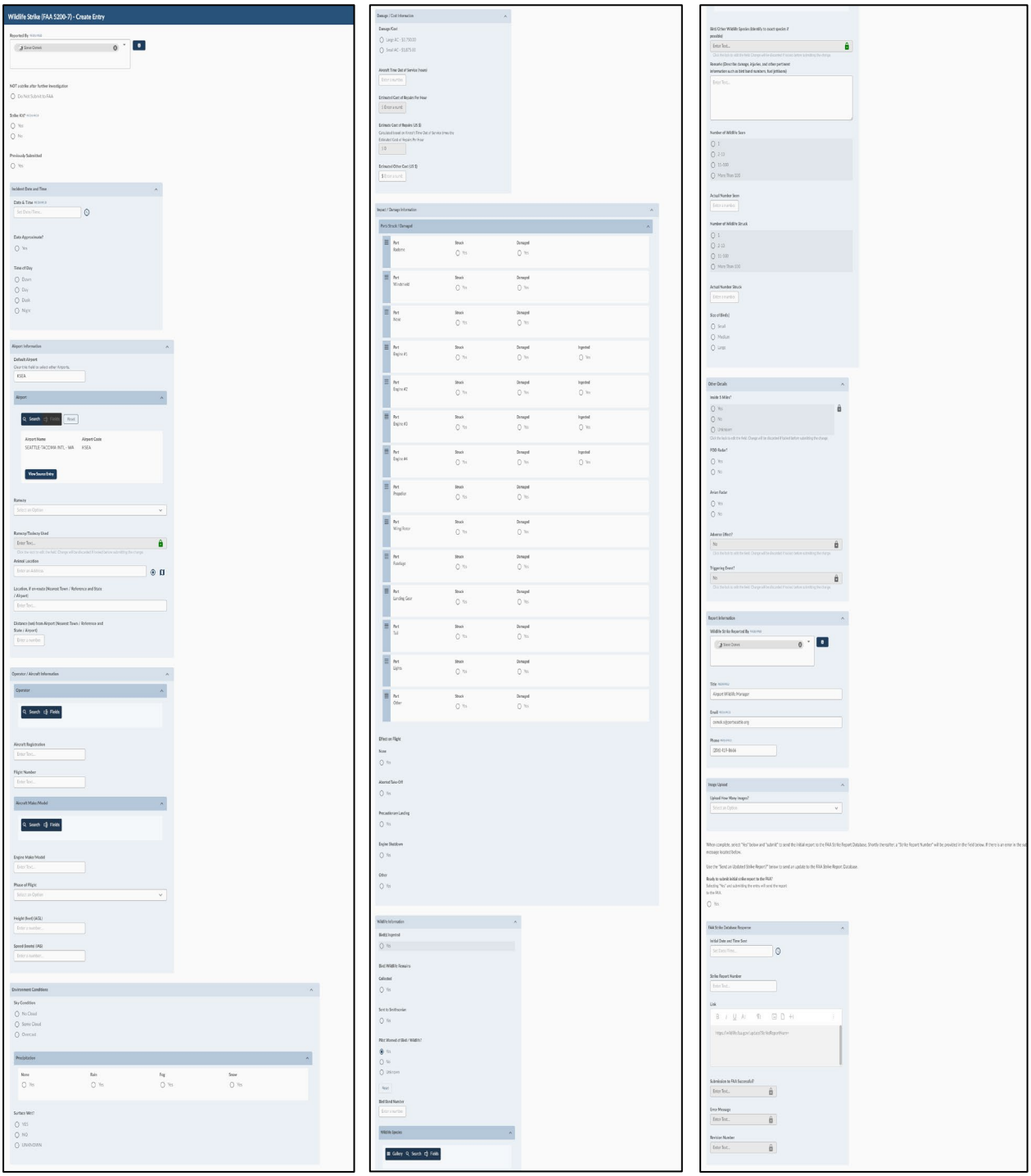

Survey - Create Entry
Document was last saved: Just now
Observer
Steve Osmek
Aircraft Flow
RWY 16 (South)
RWY 34 (North)
Reset
Light Level REQUIRED
Daytime
Nighttime
Twilight
Reset
Precipitation
None
Cloud Cover
68-100%
Type REQUIRED
Point
AV Ops 3 Minute Survey
Transect
FLIR
Raptor
Reset
Point Survey
List
Map
Gallery
Search
Fields
Reset
Point
7a
Location Name
Delta_Hangar
View Source Entry
Start Date and Time
2021-12-27 15:38
Timed Survey
3 Minutes
20 Minutes
Reset
Set timer for 3 minute survey
3 Minute Timer
03:00
Reset
Start
Wildlife Observed
Yes
No
Reset
NOTES
6 inches of snow fell as night.



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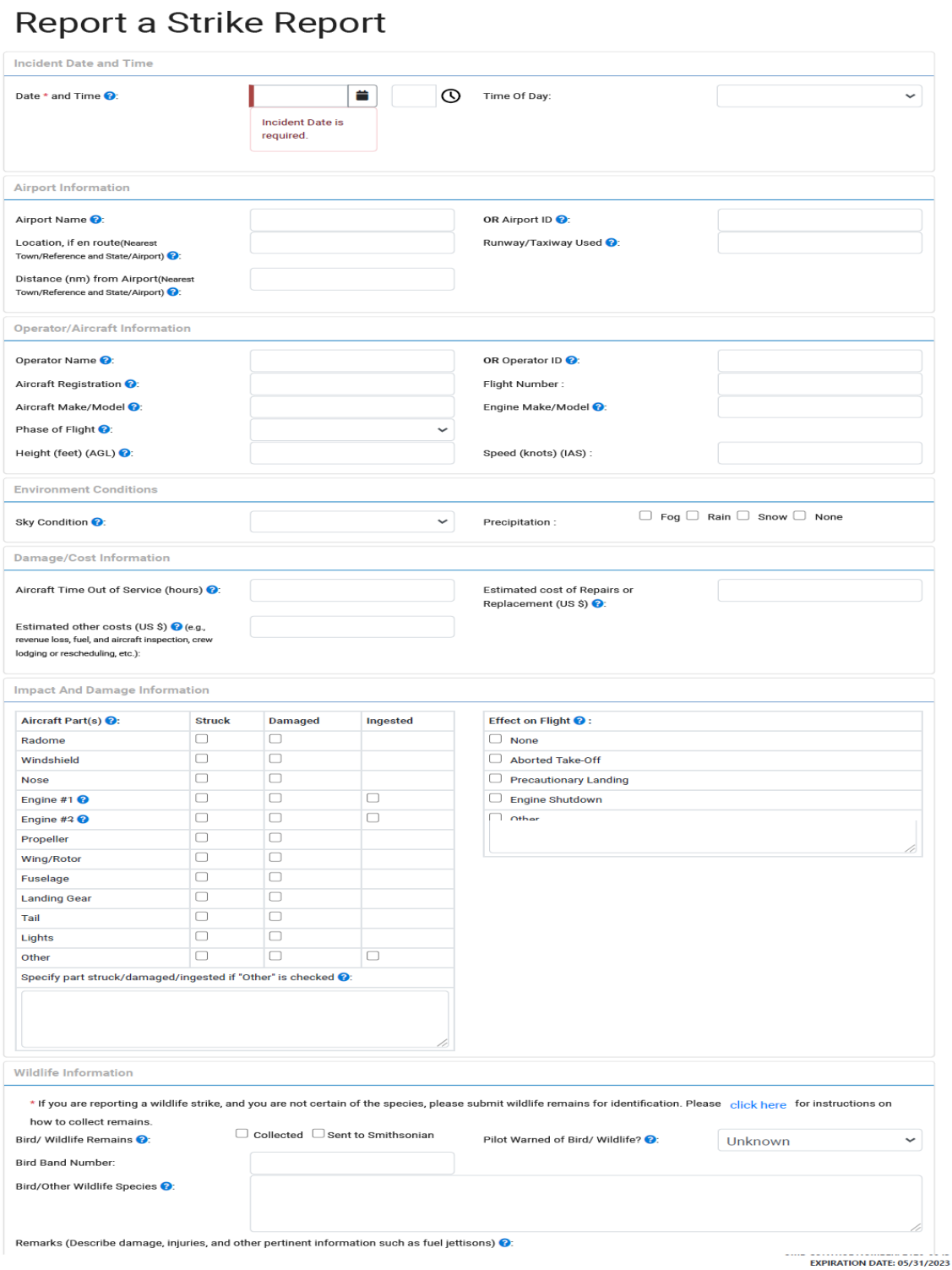
Electronic Filing of Bird/Other Wildlife Strikes https://wildlife.faa.gov/add



Report a Strike Report

Incident Date and Time

Date * and Time: Incident Date is required. Time Of Day:

Airport Information

Airport Name: OR Airport ID:
Location, if en route(Nearest Town/Reference and State/Airport): Runway/Taxiway Used:
Distance (nm) from Airport(Nearest Town/Reference and State/Airport):

Operator/Aircraft Information

Operator Name: OR Operator ID:
Aircraft Registration: Flight Number :
Aircraft Make/Model: Engine Make/Model:
Phase of Flight:
Height (feet) (AGL): Speed (knots) (IAS) :

Environment Conditions

Sky Condition: Precipitation : Fog Rain Snow None

Damage/Cost Information

Aircraft Time Out of Service (hours): Estimated cost of Repairs or Replacement (US $):
Estimated other costs (US $) (e.g., revenue loss, fuel, and aircraft inspection, crew lodging or rescheduling, etc.):

Impact And Damage Information

Aircraft Part(s):	Struck	Damaged	Ingested
Radome	☐	☐	
Windshield	☐	☐	
Nose	☐	☐	
Engine #1	☐	☐	☐
Engine #2	☐	☐	☐
Propeller	☐	☐	
Wing/Rotor	☐	☐	
Fuselage	☐	☐	
Landing Gear	☐	☐	
Tail	☐	☐	
Lights	☐	☐	
Other	☐	☐	☐

Specify part struck/damaged/ingested if "Other" is checked:

Effect on Flight :
☐ None
☐ Aborted Take-Off
☐ Precautionary Landing
☐ Engine Shutdown
☐ Other

Wildlife Information

* If you are reporting a wildlife strike, and you are not certain of the species, please submit wildlife remains for identification. Please click here for instructions on how to collect remains.

Bird/ Wildlife Remains: ☐ Collected ☐ Sent to Smithsonian
Pilot Warned of Bird/ Wildlife?: Unknown
Bird Band Number:
Bird/Other Wildlife Species:
Remarks (Describe damage, injuries, and other pertinent information such as fuel jettisons):

EXPIRATION DATE: 05/31/2023

Original Date: _____

Revision Date: _____

FAA Approval: _____

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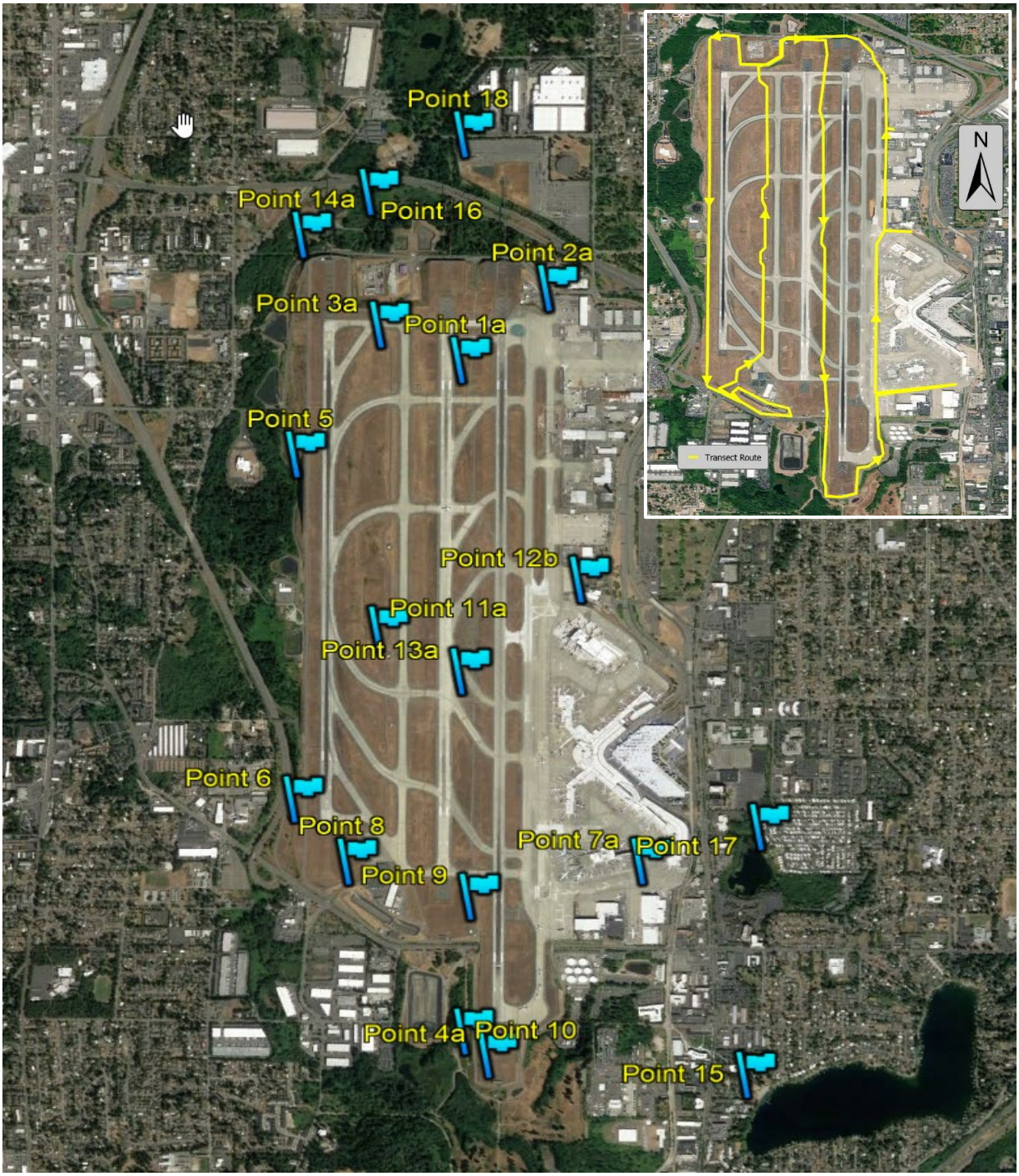

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Most wetland sites no longer need to be monitored because hazardous wildlife use has declined over more than a decade. Vegetation has grown to cover open water that once existed in these most of these areas. Only the former Lora Lake, Lake Reba, and Tyee (aka *Des Moines Creek Regional Detention Facility*) sites, marked with a ▭ are monitored as a part of the Continual Monitoring Program (see Appendix D).

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Appendix F

Section 401 and Section 404 Permit Conditions

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