Transport Canada Transports Canada

Penticton Airport
Airport Wildlife Management Plan

Penticton Airport
Penticton BC, 109 - 3000 Airport Road V2A 8X1

Telephone: (250) 770-4414

September 10, 2024
To be reviewed a minimum of every two (2) years

RDIMS #14472675

Page intentionally blank

Distribution List

(Updates to the Airport Wildlife Management Plan will be circulated to this list.)

Name and Title	Agency	Copies
Penticton Airport Manager Office	Transport Canada	Electronic & Paper
Penticton Airport Maintenance and Operations Supervisor Office	Transport Canada	Electronic & Paper
Airfield Maintenance Reference Library	Transport Canada	Paper
Programs, Accountable Executive	Transport Canada	Electronic
Programs, Regional Safety Management Systems Officer	Transport Canada	Electronic
Civil Aviation Aerodrome Inspector for Penticton Airport	Transport Canada	If requested, or if any of the conditions in CARs 302.305 (6) is met.

Amendment Procedures

The Airport Manager is responsible for the development, issuance, and control of amendments to this plan. All amendments will be properly inserted by the person in the position indicated on the distribution list. All manual holders will be responsible for the safe custody and maintenance of their Airport Wildlife Management Plan (AWMP).

a. Each page will show the amendment number and date at the bottom;
b. All amendments will be shown by providing a vertical black line in the right margin where changes in paragraphs or wording are made; and
c. Airport Manager will email a copy of the Airport Wildlife Management Plan (AWMP) and the amendments, from time to time, to those on the distribution list.

Corrigenda

Minor changes/revisions can be made and recorded as a corrigenda until an amendment is issued. Distribution of the changes will be the same as above and a record of these changes will be recorded in the corrigenda in the same format as the "Record of Amendments".

Record of Review and Amendments

Amendment No.	Date	Reviewed Sections	Revised Sections	Data Entered	Entered By
Original RDIMS 14462675, V1	August 4, 2009		Appendix H - Extracted from YYF AOM, March 2016, Amendment #11		Kerri Haybittle-Raffel
Amendment 1	October 27, 2021	All	All sections	October 29, 2021	Amanda Hazelton
Amendment 2	September 8, 2022	All	Distribution List; Section 3; Section 4; Section 5; Section 6; Section 8; Section 9; Section 10; Section 11; Section 13; Section 18; Section 19; Section 20; Appendix A; Appendix C.	September 8, 2022	Lance Duncan
Amendment 3	September 22, 2022		Section 9; Section 10; Section 11; Appendix C	September 22, 2022	Amanda Hazelton
Amendment 4	October 20, 2022	All	Appendix C	October 20, 2022	Brian Bramah
Amendment 5	July 21, 2023		Record of Review and Amendments; Table of Contents; Section 4; Section 10.1; Appendix C	July 21, 2023	Simon Barbour
Amendment 6	August 21, 2023		Record of Review and Amendments; Table of Contents, Section 10.1; Appendix C	September 5, 2023	Lance Duncan
Amendment 7	October 5, 2023		Amendment procedures; Record of Review and Amendments; Table of Contents; Section 4.1 – Table 1 & 2; Section 7; Section 10.1; Section 11 – Table 10 & 12; Section 14.1; Section 19; Section 20 – Table 15; Appendix A; deleted Appendix B, renamed Appendix C to B	October 6, 2023	Simon Barbour
Amendment 8	September 10, 2024		Section 15.1, Section 15.3; Renamed Section 21, Added Section 22; Appendix B; Record of Strike Review as per CARs 302.305(6)(b)	September 10, 2024	Rich Olson, Simon Barbour, Lance Duncan

**The Penticton Airport Wildlife Management Plan is reviewed as per CARs 302.305(5). Column "Reviewed Sections" will indicate "All" when the entire WMP that has been reviewed, although not necessarily revised.*

Corrigenda

No.	Date	Section	Data Entered	Entered By
1	Sept 17, 2024	Section 10.1 Amended Hazard table – Sept 3, 2 sparrows struck	Sept 17, 2024	Lance Duncan

Table of Contents

List of Figures

List of Tables

Page left blank intentionally

SECTION A: RISK ASSESSMENT

1. Introduction

In 2005, Transport Canada introduced the addition of a *Wildlife Planning and Management Regulation to the Canadian Aviation Regulations* (CARs), *Part III, Subpart 2 – Airports*. The reasons for the need for these new regulations are discussed in the following paragraphs.

- ***The populations of some wildlife species that are particularly hazardous to aircraft are increasing at a rapid rate.***

This includes species such as: White-Tailed Deer, Canada Goose, Snow Goose, Mallard, gulls, coyotes, owls and other large raptors, cranes, and herons. Many of these species are also urban-tolerant, finding suitable habitat in close proximity to human activity, including airports.

- ***There is an increasing number of aircraft flying today, particularly turbine-powered aircraft that are most susceptible to damaging bird strikes.***

Although, like many other industrial sectors, aircraft movements are likely to go through cycles of activity, overall, the number of aircraft movements is increasing worldwide. Dramatic shifts in aircraft movements can occur in airports of all sizes. It has been estimated that globally, the number of aircraft flying hours will double between 1996 and 2016.

- ***Airport operators play a key role in the management of risks associated with wildlife.***

Approximately 80% of all bird strikes take place in the landing or takeoff phases of flight. Airport operators, therefore, have a key role to fulfill in reducing exposure to hazards and managing wildlife strike risk. They also have a role to play in increasing general awareness of the wildlife hazard issue and influencing land use policies and practices in the vicinity of airports.

- ***New information and management techniques are now available and all airports that meet the criteria should establish well-conceived, well-managed, wildlife management programs of consistent approach across Canada.***

Much has been learned over the past few decades regarding the management of wildlife, the kinds of hazards that exist and the technique of risk assessment. Airports now have the knowledge to prepare a systematic, science-based approach to airport wildlife management.

2. Screening for the Application of the Wildlife Planning and Management Regulation

Not all airports are required to prepare an Airport Wildlife Management Plan. However, the new regulations will apply to any certified site in Canada that meets one of the criteria below.

The following is a list of conditions under which the regulations apply. An "**X**" has been placed to the conditions that apply to Penticton Airport.

X ***Receives commercial passenger-carrying aircraft*** **operating under Subpart 4 or 5 of Part VII of the CARs** ***with more than 2,800 movements (a movement is defined as a takeoff or landing) annually.***

Commercial passenger-carrying aircraft include aeroplanes (multi-engine and turbojet powered) certified under Canadian Aviation Regulations to carry more than ten passengers, e.g., regular commercial flights, commuter operations, sightseeing operations.

X ***Airport has had an incident where a turbine-powered aircraft collided with wildlife other than a bird and suffered damage, collided with more than one bird, or ingested a bird through an engine****.*

A wildlife strike has occurred when:

1. A pilot reports a strike;
2. Maintenance personnel report that aircraft damage is due to a wildlife strike;
3. Airport personnel report seeing a wildlife strike; or
4. Airport personnel find wildlife remains on airside areas within 200 ft of a runway centre line and no other cause of death is identified

Multiple strikes are any single bird strike incident involving more than one bird.

X ***Where the presence of wildlife hazards, including those referred to in section 322.302 of the*** **Airport Standards—Airport Wildlife Planning and Management*, has been observed in an airport flight pattern or movement area*.**

The list ranks wildlife from most hazardous to least hazardous by species group and as such, identifies the species that should be of primary concern for the operator. The list provided in Standard 322.302 is as follows:

a) Deer
b) Geese
c) Gulls
d) Hawks
e) Ducks
f) Coyotes
g) Owls
h) Rock doves and pigeons
i) Bald and golden eagles
j) Sandhill cranes
k) Sparrows and snow buntings
l) Shorebirds
m) Blackbirds and starlings
n) Crows and ravens
o) Swallows
p) Mourning doves
q) Herons
r) Turkey vultures
s) American kestrels
t) Wild turkeys
u) Cormorants

X ***Has a waste disposal facility within 15 km of the geometric centre of the airport.***

Included as waste disposal facilities are: landfill sites, garbage dumps, waste transfer and sorting facilities, recycling and composting facilities and commercial fish processing plants.

X ***Is located in a built-up area.***

3. Goals and Objectives

The goal of this Airport Wildlife Management Plan (WMP) is to promote aviation safety for passengers and flight crews by reducing wildlife hazards and associated risks to aircraft and airport operations caused by wildlife activities on and in the vicinity of the airport. The AWMP is developed in accordance with *Canadian Aviation Regulations 302.302, 322.305 and Advisory Circular 342.305 requirements.* The WMP was developed after consultation with Penticton Airport air operators in order to capture an overall list of wildlife hazards that could pose a risk to passengers, airport tenants and staff.

The purpose of Section A of this report is to establish, through a risk assessment procedure, and a screening process, whether the requirements of the *Canadian Aviation Regulations (CARs), Part III, Subpart 2 – Airports, Section 302.304 – Airport Wildlife Planning and Management* apply to this airport.

When a WMP is required, the results of the risk assessment will be used to guide and inform the plan, and as a tool to measure future changes in the hazard and risk assessments.

The objectives of Section A of the WMP are to:

1. Identify and review existing sources of wildlife information for the area;
2. Identify wildlife hazards on and near the airport;
3. Identify seasonal patterns related to hazards; and
4. Undertake a risk assessment and prioritize wildlife management efforts.

4. Description of Airport Operations

The Penticton Airport (IATA: YYF, ICAO: CYYF), is located 1.8 nautical miles (3.3 km; 2.1 mi) southwest of Penticton, British Columbia, a city in the Okanagan region of Canada. It is owned and operated by Transport Canada, serving the South Okanagan, Similkameen and West Kootenay areas.

The coordinates for the airport are Latitude N49° 27’ 45”, Longitude W119° 36’ 08”, and the airport is at 339.55m elevation. The airport is owned and operated by Transport Canada and is managed by the Penticton Airport Manager.

It has one 6,000 ft x 149 ft (1,828.71 m x 45.4 m) Runway 16-34. The airport is a point of entry for international flights on occasion, with Canada Border Services Agency providing service on airport grounds.

The airport is located on the traditional territory of the Penticton Indian Band and is within the city limits of City of Penticton, with the wider airport area also being located within the Regional District of Okanagan Similkameen. The airport is walking distance to Skaha Lake beach, and it has seen two accidents and incidents throughout its history.

The airport has on average, three to six daily scheduled inbound and outbound flights that operate to and from Vancouver, BC and Calgary, AB. Air Canada Express, WestJet Encore, and Pacific Coastal are the primary air operators that service the Penticton Airport.

Current land use activities on-site include aviation, administration, retail, commercial operations, fuel storage areas, airport maintenance and technical support operations. Specifically, the airport has a NAV CANADA Flight Service Station (FSS), car rental vendors, BC Wildfire Service and Air Tanker bases, Helicopter and Fixed Wing Flight Training Schools, the Penticton

Flying Club, Administrative Buildings and other tenants and stakeholders. Outdoor car parking is available near the Airport Terminal Building.

For the purpose of this WMP, the current land use is considered to continue indefinitely.

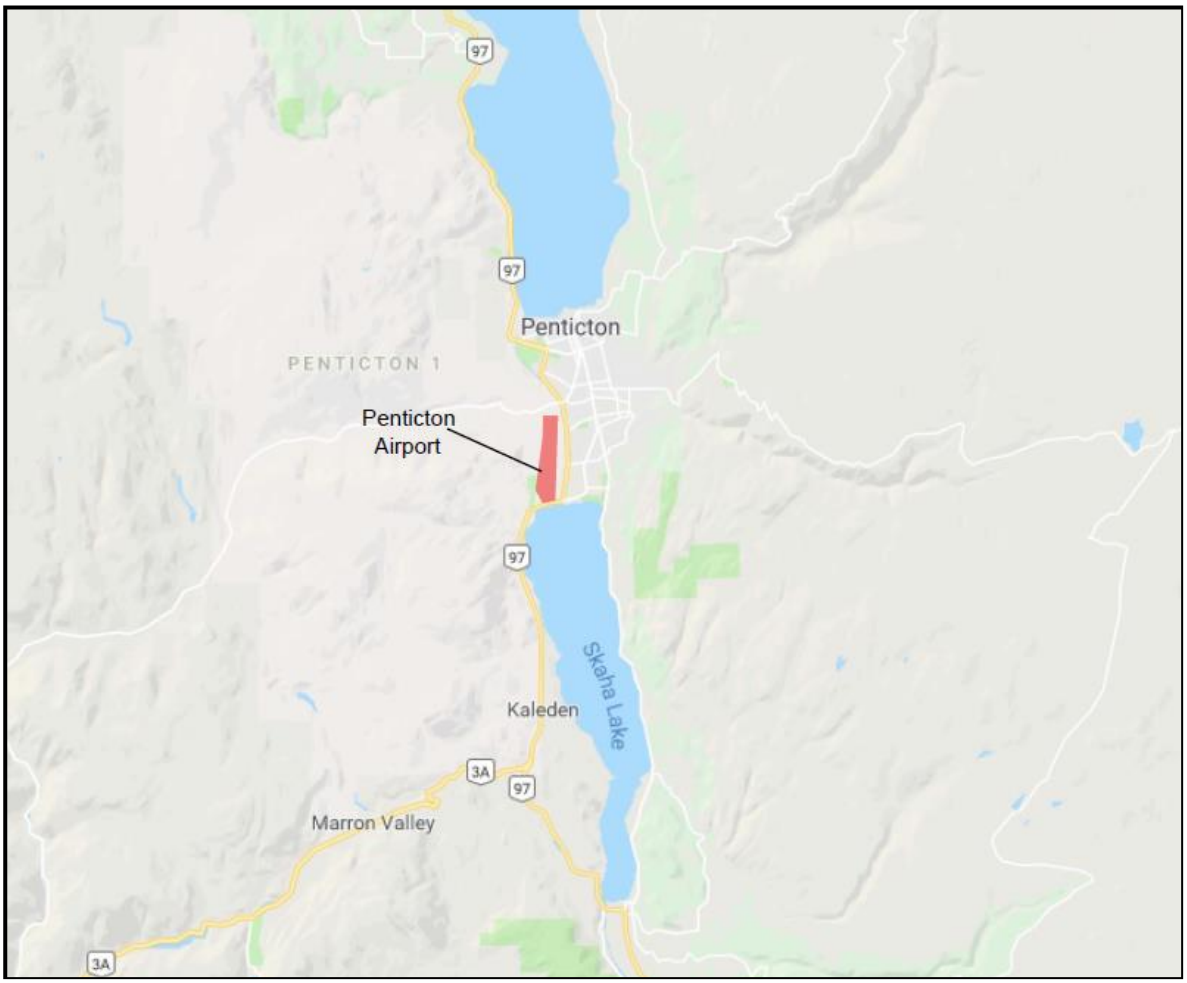

Figure 1. Location Map

4.1 Aircraft Movements and Types

The different patterns of flight operation between scheduled commercial flights, with local and itinerant traffic may affect exposure to wildlife hazards and should be considered in the risk assessment.

Without an effective WMP, at any given airport, wildlife strikes are likely to increase as air traffic movements increase. Therefore, the risk assessment process needs to consider the number of aircraft movements currently and, to the extent that forecasts are available, in the future.

Aircraft are not equally susceptible to having a damaging strike occur. For example, relatively slow-moving piston aircraft are not as likely to strike wildlife as are faster moving jet aircraft.

Aircraft also vary greatly in their susceptibility to damage from a wildlife strike. For example, turbofan engines, especially when mounted under-wing with their large, intake areas, are at greater risk due to damage from a bird strike than turboprop and turboshaft engines.

To facilitate the risk assessment process Table 4 provides recent aircraft movements and types at this airport. From 2017 to June 2022, Local, Civil and Military air traffic consisted of 184,884 flights. In 2017, 27,630 movements were observed, in 2018, 32,420 movements were observed, in 2019, 35,616 movements were observed, in 2020, 29,160 movements were observed, in 2021, 37,114 movements were observed, and in 2022 up to June, 22,904 movements of air traffic were recorded. On average this results in approximately 31,314 flights per year over the five and a half years.

Total itinerant movements, by type of power plant are presented in Table 5. Since 2017 to June 2022, itinerant movements consisted of 2,722, jet engine flights, 20,406 turbo-propeller, 31,669 piston engine, 36,039 helicopter flights, and 0 glider flights.

Changes in traffic profile, such as an increase in jet powered aircraft, large increases in traffic volume or special events such as air shows, can result in significant shifts in risk and would require a re-assessment of risk.

Table 1: Aircraft Movements and Types at Penticton Airport

Aircraft Movements and Types at Penticton Airport												
Class of Operation	**Jan-17**	**Feb-17**	**Mar-17**	**Apr-17**	**May-17**	**Jun-17**	**Jul-17**	**Aug-17**	**Sep-17**	**Oct-17**	**Nov-17**	**Dec-17**
Local movements	638	584	883	1,376	2,034	1,386	950	472	992	1,528	1,642	1,330
Civil local movements	638	584	883	1,376	2,026	1,386	944	466	992	1,528	1,642	1,328
Military local movements	0	0	0	0	8	0	6	6	0	0	0	2
Aircraft Movements, by Class of Operation (2018)												
Class of Operation	**Jan-18**	**Feb-18**	**Mar-18**	**Apr-18**	**May-18**	**Jun-18**	**Jul-18**	**Aug-18**	**Sep-18**	**Oct-18**	**Nov-18**	**Dec-18**
Local movements	766	1,048	1,286	1,674	1,568	1,432	954	900	990	1,988	2,274	1,330
Civil local movements	766	1,048	1,286	1,674	1,568	1,432	954	892	990	1,988	2,274	1,330
Military local movements	0	0	0	0	0	0	0	8	0	0	0	0
Aircraft Movements, by Class of Operation (2019)												
Class of Operation	**Jan-19**	**Feb-19**	**Mar-19**	**Apr-19**	**May-19**	**Jun-19**	**Jul-19**	**Aug-19**	**Sep-19**	**Oct-19**	**Nov-19**	**Dec-19**
Local movements	936	734	1,454	1,760	1,608	1,400	1,362	1,334	1,858	2,098	1,748	1,516
Civil local movements	936	734	1,454	1,760	1,608	1,400	1,358	1,330	1,858	2,098	1,748	1,516
Military local movements	0	0	0	0	0	0	4	4	0	0	0	0
Aircraft Movements, by Class of Operation (2020)												
Class of Operation	**Jan-20**	**Feb-20**	**Mar-20**	**Apr-20**	**May-20**	**Jun-20**	**Jul-20**	**Aug-20**	**Sep-20**	**Oct-20**	**Nov-20**	**Dec-20**
Local movements	1,162	1,388	1,368	1,356	912	717	1,086	636	690	1,794	1,560	1,910
Civil local movements	1,162	1,388	1,368	1,356	912	717	1,086	636	690	1,790	1,558	1,910
Military local movements	0	0	0	0	0	0	0	0	0	4	4	0
Aircraft Movements, by Class of Operation (2021)												
Class of Operation	**Jan-21**	**Feb-21**	**Mar-21**	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**
Local movements	1,306	1,066	1,403	930	1,536	1,401	1,242	2,254	2,683	1,622	1,588	1,526
Civil local movements	1,306	1,066	1,403	930	1,534	1,399	1,242	2,254	2,683	1,622	1,588	1,524
Military local movements	0	0	0	0	2	2	0	0	0	0	0	2

Aircraft Movements, by Class of Operation (2022)												
Class of Operation	**Jan-22**	**Feb-22**	**Mar-22**	**Apr-22**	**May-22**	**Jun-22**	**Jul-22**	**Aug-22**	**Sep-22**	**Oct-22**	**Nov-22**	**Dec-22**
Local movements	1,128	1,972	1,748	1,878	2,440	2,286	2,078	1,272	1,702			
Civil local movements	1,128	1,972	1,740	1,878	2,440	2,286	2,078	1,272	1,702			
Military local movements	0	0	8	0	0	0	0	2	0			

Table 2: Itinerant Movements, by Type of Power Plant, at Penticton Airport

Itinerant Movements, by Type of Power Plant												
Type	**Jan-17**	**Feb-17**	**Mar-17**	**Apr-17**	**May-17**	**Jun-17**	**Jul-17**	**Aug-17**	**Sep-17**	**Oct-17**	**Nov-17**	**Dec-17**
Jet engines	20	16	35	50	36	64	79	118	62	43	23	19
Turbo-propellers	323	244	294	291	399	439	718	681	569	319	252	249
Piston engines	151	182	314	462	652	772	687	479	534	451	200	160
Helicopters[1]	288	351	510	560	677	659	401	313	671	497	372	225
Gliders	0	0	0	0	0	0	0	0	0	0	0	0
Type	**Jan-18**	**Feb-18**	**Mar-18**	**Apr-18**	**May-18**	**Jun-18**	**Jul-18**	**Aug-18**	**Sep-18**	**Oct-18**	**Nov-18**	**Dec-18**
Jet engines	16	16	36	24	49	50	78	98	63	37	35	24
Turbo-propellers	213	274	297	307	489	440	994	711	431	353	283	279
Piston engines	113	176	293	433	708	492	724	415	582	569	367	186
Helicopters[1]	314	363	468	666	646	623	1,047	650	581	735	639	273
Gliders	0	0	0	0	0	0	0	0	0	0	0	0
Type	**Jan-19**	**Feb-19**	**Mar-19**	**Apr-19**	**May-19**	**Jun-19**	**Jul-19**	**Aug-19**	**Sep-19**	**Oct-19**	**Nov-19**	**Dec-19**
Jet engines	12	11	21	29	24	44	85	108	37	26	24	21
Turbo-propellers	234	241	263	282	443	397	482	522	370	287	258	259
Piston engines	191	172	543	518	669	705	896	849	553	605	480	238
Helicopters[1]	408	415	381	507	643	469	559	561	558	583	495	253
Gliders	0	0	0	0	0	0	0	0	0	0	0	0
Type	**Jan-20**	**Feb-20**	**Mar-20**	**Apr-20**	**May-20**	**Jun-20**	**Jul-20**	**Aug-20**	**Sep-20**	**Oct-20**	**Nov-20**	**Dec-20**
Jet engines	27	13	22	6	22	56	51	65	44	46	36	4
Turbo-propellers	235	226	203	42	95	98	173	409	162	125	97	97
Piston engines	245	382	449	417	443	578	896	637	526	642	527	366
Helicopters[1]	253	406	404	186	165	221	339	2,248	1,213	548	322	233
Gliders	0	0	0	0	0	0	0	0	0	0	0	0
Type	**Jan-21**	**Feb-21**	**Mar-21**	**Apr-21**	**May-21**	**Jun-21**	**Jul-21**	**Aug-21**	**Sep-21**	**Oct-21**	**Nov-21**	**Dec-21**
Jet engines	16	16	20	32	64	56	182	64	61	55	48	22
Turbo-propellers	86	84	83	75	135	274	819	713	312	248	205	230
Piston engines	368	345	547	559	762	649	522	361	581	619	398	282
Helicopters[1]	219	303	520	357	423	582	1,788	1,555	919	483	567	259
Gliders	0	0	0	0	0	0	0	0	0	0	0	0

Type	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
Jet engines	12	12	26	38	52	75	98	77	77	18	24	24
Turbo-propellers	179	166	177	196	260	315	483	623	420	283	196	180
Piston engines	244	383	512	489	782	903	1,012	836	915	747	402	228
Helicopters[1]	351	426	578	541	616	653	732	862	788	572	605	247
Gliders	0	0	0	0	0	0	0	0	0	0	0	0
Type	**Jan-23**	**Feb-23**	**Mar-23**	**Apr-23**	**May-23**	**Jun-23**	**Jul-23**	**Aug-23**	**Sep-23**	**Oct-23**	**Nov-23**	**Dec-23**
Jet engines	12	18	26	30	40	42	64					
Turbo-propellers	185	160	215	197	293	417	586					
Piston engines	343	359	550	682	772	742	978					
Helicopters[1]	345	360	405	498	569	539	712					
Gliders	0	0	0	0	0	2	0					

1: Helicopters include both piston and turboshaft engines.

5. Identification of Sources for Existing Information on Wildlife

The hazard and risk assessment in this document is based on existing information sources and/or on wildlife inventories that have been undertaken expressly for the purpose of developing this WMP. Data from information sources listed here will be used in Section 7 of the Plan, which is a description of wildlife habitat resources.

Table 3. Sources for Wildlife Information – On the Airport

Document/Source	*Type of Information*	*Located*
N/A	*Flora and fauna of airport; wildlife hazards, review wildlife management actions taken*	*As part of this report*
Wildlife Management database	*Detailed information on White-tailed Deer and Coyote occurrence and location data. Also, data on wildlife kills conducted under permits*	*Airport office*
VORTEX	*Provide wildlife reports and trend analysis*	*Located in airport's digital files*
AIM (Airfield Information Management) World	*Collect data and generate wildlife reports*	*Located in airport's digital files*
Site visit by Keystone's biologist Libor Michalak	*Provided onsite observations and conducted interviews; offsite observations of land use*	*Within WMP*

Table 4. Sources for Wildlife Information – Outside the Airport

Document/Source	*Type of Information*	*Located*
Environmental Issues and Options For the South Okanagan Regional Growth Strategy Volume 1: Background	*General Okanagan environmental issues for management. It provides an overview of the region's environmental attributes and unique ecological values; discusses emerging environmental issues; and provides recommendations for environmental management policies and practices, including performance indicators and monitoring programs.*	*http://www.rdosmaps.bc.ca/min_bylaws/planning/rgs/ReportsAndStudies/RGSVol1EnvIssuesOptionFinal06.pdf (accessed October 2018)* • *Okanagan Environmental Advisory Committee*
National Audubon Christmas Bird Counts (CBC), Okanagan Annual Summaries of the Christmas Bird Count, 1901-Present	*Provides bird species and numbers observed*	*https://www.audubon.org/conservation/science/christmas-bird-count*
Ministry of Forests, Lands and Natural Resource Operations and Rural Development (Region 8)	*Limited available information*	

Document/Source	Type of Information	Located
South Okanagan naturalist club	Some information on birds, and other wildlife and plants of the site, reported in existing documents	https://southokanagannature.com/
Bird Studies Christmas Bird Count (CBC) data	Several CBCs in area providing information on typical winter birds in area	https://www.birdscanada.org/bird-science/christmas-bird-count/
Bird Studies Breeding Bird Surveys (BBS) data	Several BBSs in area providing information on typical breeding birds in area	https://www.birdscanada.org/volunteer/bbs/
Conservation Data Center (CDC)	Compilation of species and ecosystems in the area	https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/conservation-data-centre

Table 5. Sources for Information on Wildlife Species of Conservation Concern

Document/Source	Type of information	Located
Ministry of Environment Conservation Data Centre website	Maintains computerized database on status, locations, and levels of protection for at risk species and ecosystems in British Columbia	www.env.gov.bc.ca/cdc/
Environment Canada Species at Risk website	Maintains computerized database on status, locations, and levels of protection for at risk species belonging to SARA Schedule 1.	www.speciesatrisk.gc.ca/map/default_e.cfm

6. Strike Data

All strikes include near misses and suspected strikes. See Appendix B for strike data from 2006.

7. Description of Wildlife Habitats and Resources

It is important to understand the wildlife communities in as much detail as is practical so that consequences of management actions might be considered prior to implementation.

Using existing sources of information and including any wildlife studies undertaken for the purpose of this WMP, the following sections will describe the functions (e.g., roosts, feeding habitat, breeding colonies, yarding areas) and attributes (e.g., species) associated with wildlife at three landscape categories: the airport, nearby lands, and hazardous land use practices within a 15 km radius of the airport. Particular interest is in determining the movement patterns, spatially and through time, of wildlife within the airport itself and across the landscape. In terms of wildlife hazards, habitat extends to buildings and agricultural lands as well as more typical

wetlands, forests, and meadows. All species known to be an issue at the airport should be described as some may not be direct hazards however, they may attract hazards (such as voles providing food for coyotes and hawks). It is important to note that based on the season, species that are not typical to the area may appear due to environmental incidents such as wildfires in the immediate and surrounding area. Various species may be appear as they may have been displaced from their typical habitat.

The first category is the airport itself, where habitats and the wildlife using them will be described in detail. This will rely on site-specific field work and standard techniques for describing vegetation communities (e.g., Ecological Land Classification) and wildlife communities, their use patterns and seasonal variations that have been observed or that might be expected.

The second category is the nearby lands that are not under direct control of the airport. The physical area included in this category generally includes lands up to 8 km from the airport reference point, which should include an area of sufficient size to provide an adequate picture of wildlife movements through the airspace identified later in this document. This assessment is largely based on existing information and remotely sensed habitat analysis rather than site-specific field work. It will describe the location of moderately hazardous land use practices such as wastewater discharge plants and sewage lagoons, crop production, recreational sites and managed or created wildlife habitats. There is no requirement under the regulation to manage these lands however it is important to be aware of potentially hazardous off airport land uses.

The third category is the determination of the presence of extremely hazardous land use practices that may be many kilometres from the airport. At a minimum, food waste disposal sites, outdoor composting and commercial fish plants will be mapped when they occur within 15 km of the airport reference point. Such features may be mapped at greater distances where wildlife associated with them may become a hazard to aircraft using the airport.

The following sections of the WMP provide the findings of these three categories.

8. On the Airport

Figure 2. Primary Habitats Found on the Airport Lands

The Penticton Airport is dominated by a short grass meadow, surrounded by a deciduous forest along the west. Buildings comprise the center along with mowed grass and the runway. Skaha Lake Road borders the south along with the beach of Skaha Lake.

The airport is located in the provincial Bio geoclimatic area of the Bunch Grass Zone (BG); very dry valley bottoms of the southern interior (BGxh1). This area has a semi-arid climate with evaporation rates in excess of precipitation. The summers are long, warm to hot, and very dry. Winters are cold with very little to no snowpack. Summer precipitation, which often falls in high intensity storms, evaporates too quickly to replenish soil water stores. Where summer drought is exacerbated by high evaporation grassland and shrub-steppe vegetation develops and dominates the landscape.

The lower BGxh subzone is warm and generally dry and warm. The mean annual temperature, annual precipitation and summer precipitation for the BG zone is 5.9°C, 337 mm, and 163 mm respectively.

The bunchgrass habitat zone of the airport zone supports a diversity and density of wildlife. This is partly due to the wide range of habitats created by the juxtaposition of grasslands, shrub-steppe, riparian areas, and forest. Species such as the Pallid Bat, Burrowing Owl, and Short-Horned Lizard reach their northern breeding limit in this zone. Northern species that rarely move further south, such as the Snowy Owl and Gyrfalcon, can be found on open fields like the airport in winter.

Vegetation

The airport airfield is comprised of several paved surfaces for aircraft landing/takeoff and taxiing as well as vehicle access, gravel roads composed of unconsolidated grave, and grass fields dominated by invasive species such as cheatgrass (*Bromus tectorum)*, bull thistle (*Cirsium vulgare),* clover (*Trifolium pretense),* and domestic grasses. Some native vegetation characteristics of wet, sandy, or disturbed sites, such as horsetail (*Equisetum spp.)*, were observed along the site perimeters. It is understood that the grassed areas within the airport property are regularly mowed to discourage growth. Historically, hydro-seeding has taken place throughout the grassed area, the success of which is unknown. Other vegetation observed within the airport property included a strip of ornamental shrubs and trees along the western property perimeter outside of the airfield, adjacent to the main terminal building. Low-lying areas within the airfield become inundated during portions of the year, and a drainage ditch that conveys water from the center of the airfield to the eastern site perimeter was identified. It was reported that ditch is nearly always dry.

Figure 3. Coarse Wildlife Habitat Mapping

Nesting Bird Habitat

The site was assessed for its potential to support nesting birds, including ground and tree nesters, raptors, and birds that may utilize anthropogenic features for nesting (e.g., buildings, old barns). To identify habitat that may support nesting birds, a Biologist conducted a site visit in the fall of 2018 and documented existing raptor nests as well as the availability of potential nesting habitat on or immediately adjacent to the site. Also, a review of federal Breeding Bird Survey Data[1] was conducted to identify species that are considered common in the general vicinity of the airport and that may utilize on-site habitat features.

Potential tree nesting habitat observed on-site or immediately adjacent to the site was limited to the ornamental trees and shrubs located near the main terminal building as well as several trees located off-site and adjacent to the property fence, which may provide nesting habitat for a diverse spectrum of songbirds such as chickadees (Family Paridae), Wrens (Family Troglodytidae), Thrashers (Family Mimidae), starlings (Family Sturnidae), and sparrows (Family Emberizidae). An inactive small bird nest was observed in one of the ornamental trees adjacent to the main building terminal. It is understood that songbirds have repeatedly been observed nesting within the ornamental trees located on site and are likely also utilizing the treed areas adjacent to the northern property fence for nesting. Several buildings were observed on site, which were assessed for their potential to provide habitat for birds that may nest on structures. In general, the buildings appeared to be in good structural condition (e.g., small openings into attic spaces etc. were not observed).

Potential ground nesting habitat was limited to the grassed areas within the airfield. It is understood that predators (e.g., raptors, coyotes) are occasionally observed within the airfield, and the grassed area is frequently mowed, limiting the utility of the airfield for ground nesting. A series of earth mounds characteristic of small mammal burrows were observed throughout the property, which may be utilized by some ground nesting birds. Evidence of historic ground nests were not observed on site.

Suitable raptor nesting habitat (e.g., tall trees, poles) was not observed on site. Two raptor nests were observed off-site and immediately adjacent to the airfield: a nest located on a nesting platform along the western property fence (approx. 10 m from site), and a nest on crane scaffolding located northeast of the property (approx. 50 m from site). Although raptors were not observed within the nests at the time of the survey, it is understood that ospreys (*Pandion haliaetus)* have utilized the raptor nests in previous years (most frequently in 2018).

All birds recorded during the breeding window of March 15 to August 20 of any year are assumed to be breeding species at or near the airport. Based on the Canadian Breeding Bird Survey Data collected for the Southern Okanagan and the habitat present at the site, Table 7 presents a list of 17 potential breeding birds for the site.

[1] https://www.birdatlas.bc.ca/bcdata/maps.jsp (accessed November 2018)

Table 6. Potential Breeding Birds on Site

Common Name	Latin Name	Habitat for Breeding
California Quail	*Callipepla californica*	Urban garden and shrubs around houses
American Kestrel	*Falco sparverius*	Telephone poles with cavities along site perimeter
Killdeer	*Charadrius vociferus*	Gravel parking areas
Rock Pigeon	*Columba livia*	Buildings and structures with shelter
Mourning Dove	*Zenaida macroura*	Trees in urban areas
Common Nighthawk	*Chordeiles minor*	Roof tops
Black-billed Magpie	*Pica hudsonia*	Trees along perimeter of site along road
American Crow	*Corvus brachyrhynchos*	Trees along perimeter of site along road
Tree Swallow	*Tachycineta bicolor*	Cavities in trees around site
Barn Swallow	*Hirundo rustica*	Buildings and structures with shelter
American Robin	*Turdus migratorius*	Trees and tall shrubs
European Starling	*Sternus vulgaris*	Cavities in buildings and structures
Song Sparrow	*Melospiza melodia*	Dense shrub vegetation along perimeter of site
White-crowned Sparrow	*Zonotrichia leucophrys*	Garden areas with shrubs
Dark-eyed Junco	*Junco hyemmalis*	Ground by scant covered vegetation
House Finch	*Haemorhous mexicanus*	Shrubs along houses (Ornamental shrubs)
House Sparrow	*Passer domesticus*	Cavities in buildings and structures
Barn Owl	*Tyto alba*	Barns, old buildings, or other covered structures (e.g., bridges), hollow trees, large nest boxes or other suitable cavities.
Ospreys	*Pandion haliaetus*	Forage over open fields (e.g., grass and grazing area habitats on-site).

Habitat for Migrant and Resident Birds

In addition to nesting, the site may provide habitat suitable for various life requisites of migrant and resident birds, including migrating, foraging, and overwintering habitat. Migrating birds include those species that may occupy the airfield during biannual migrations to and from breeding habitats and may be observed during the spring months of March to June, and the fall months of August to October. Resident birds include those that utilize the general area for all of their life requisites and may be observed throughout the year.

The primary habitat for migrant and resident birds includes the grass fields within the airspace, which may be used for foraging, or resting. Goose feces were considered abundant throughout the grass field during the fall 2018 site visit. Based on discussions with airport staff, it is understood that geese most frequently utilize the northern and southern-most sections of the airfield, adjacent to where the pavement terminates. In addition to geese, the grass field may be used for foraging and resting by a diversity of other migratory and resident bird species, including species such as raptors, crows, and ravens. It is understood that raptors (e.g., bald eagles, ospreys) are occasionally perched on the light posts and signs distributed throughout the airfield and will make forays into the airspace or across the airspace to access off-site habitat. During the field visit in 2018, extensive whitewash (bird feces) was observed on these features. Other habitat features for migrant and resident birds observed on site include the treed areas near the main terminal building, which may be used for foraging and perching birds.

Amphibians and Reptiles

The Species at Risk Act Schedule 1 Endangered Western Painted Turtles (*Chrysemys picta*) are known to breed and access the airport from the Oxbow lakes east of the site (Figure 5). It is understood from local airport staff that the painted turtles migrate between a small pond located on a golf course adjacent to and west of the airport and the Oxbow lakes east of the site. Several small openings have been installed in the airport perimeter fencing to facilitate turtle movement across the airfield. Inventory and strike data has not been collected for the painted turtles; however, anecdotal records suggest there have been a few turtle-motor vehicle collisions on Airport Road, immediately east of the airport. Information on amphibians and reptiles has historically not been collected as part of known inventories.

Mammals

Based on the life requisites of mammals occurring in the southern Okanagan area and the habitat present at the site, Table 7 presents a list of 15 potential mammals that may occur as regulars at the airport. Mammals that have been reported on site include bobcats, coyotes, deer (mule deer, white tailed, black tailed) and small mammals. During the 2018 field visit, a suspected coyote den was identified in an open bottom concrete culvert near the centre of the airfield in an irrigation ditch. A grated metal cover that had previously been in place in front of the culvert had been damaged. Additionally, several small mammal burrows were observed throughout the site. Historically, in several months of 2016 horses that escaped from the local First Nations land had to be herded back to the reserve.

Table 7. Wildlife Species Potentially to Occur on the Airport

Common Name	Latin Name
Raccoon	*Procyon lotor*
Muskrat	*Ondatra zibethicus*
Striped skunk	*Mephitis mephitis*
Coyote	*Canis latrans*
Deer	*Odocoileus hemionus*
Deer mouse	*Peromyscus maniculatus*
Meadow vole	*Microtus pennsylvanicus*
Black rat	*Rattus rattus*
Brown rat	*Rattus norvegicus*
Yellow-bellied Marmot	*Marmota flaviventris*
Eastern gray squirrel	*Sciurus carolinensis*
European rabbit	*Oryctolagus cuniculus*
Snowshoe hare	*Lepus americanus*
American Badger	*Taxidea taxus*
Wild horses	*Equus caballus*
Barn Owl	*Tyto alba*
Painted Turtles*	*Chrysemys picta*
Magpie	*Pica*
Bobcats	*Lynx rufus*
Ospreys	*Pandion haliaetus*

**Painted Turtles (Endangered species) – As identified in the Best Management Practices for Western Painted Turtle Encounters held by the Transport Canada Environmental Programs Team, painted turtles are protected.*

8.1 Adjacent Lands and Extremely Hazardous Land Use Practices

Hazardous areas identified within 8 km of the airport include: the field adjacent to the airport, the two oxbow lakes, a golf course with a small pond feature, Skaha Lake, Okanagan Lake, and the Penticton Canal (Figure 4).

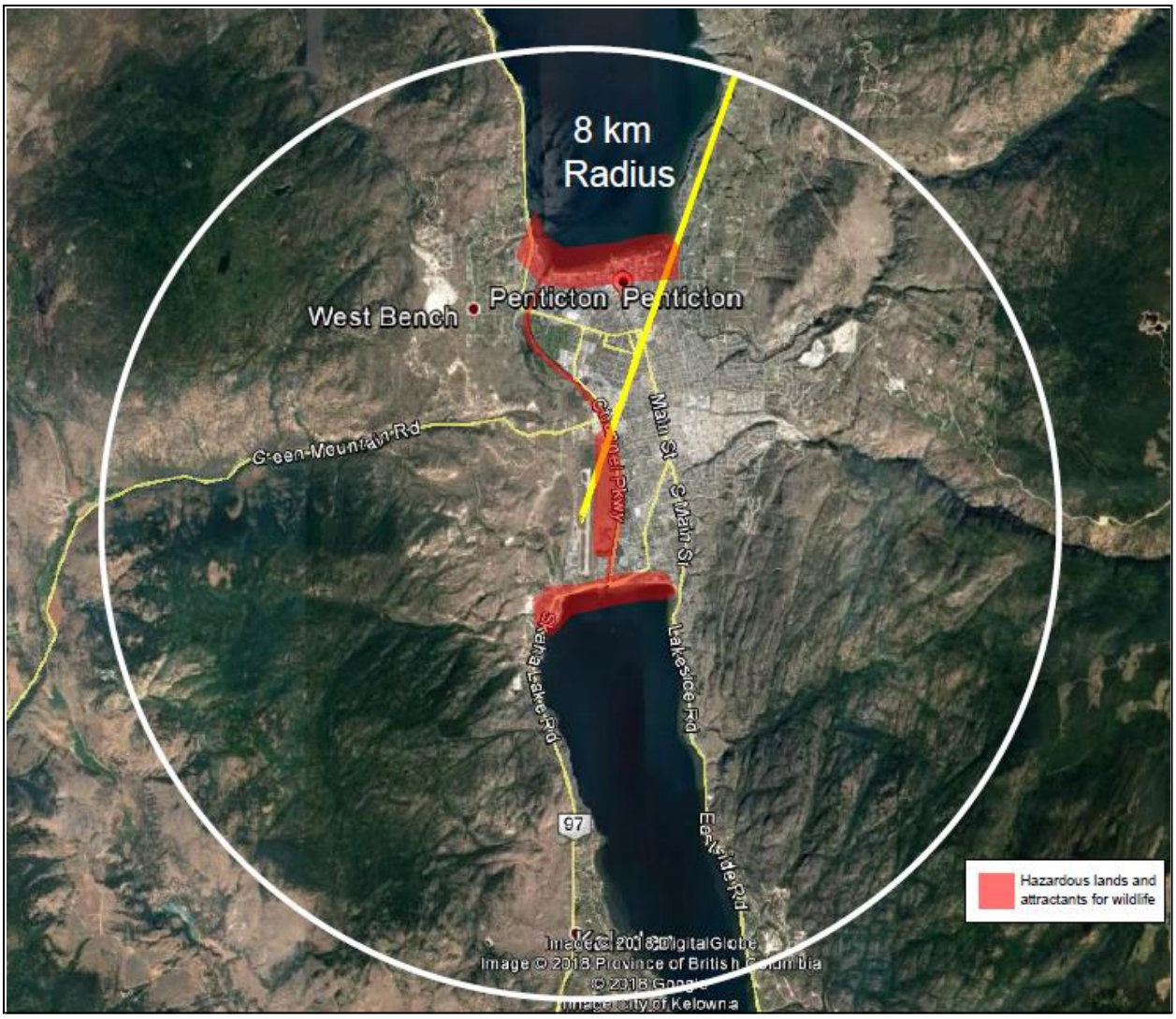

Figure 4. Hazardous Land Use Practices Within 8 km of Penticton Airport

The City of Penticton is located within the 8 km hazardous zone for the airport and contains many attractants for birds especially associated with Okanagan Lake in the north to Skaha Lake in the south where birds congregate in large numbers around quiet and hospitable areas throughout the year. Large populations of birds are generally found along the canal (Channel Highway) that joins the two lakes making this area one of the richest for bird

movement and the potential to interact with air traffic. The open fields associated with the airport along the east are attractants for numerous bird species. Mammals like deer and other wildlife like raccoons and coyote use the surrounding urban habitat for food and shelter throughout the year due to the abundance of habitat and food.

9. Summary of Key Wildlife Hazards

The previous steps of the WMP have identified most of the wildlife species found in and around the airport environment. Not all of these species are particularly hazardous to airport operations. Some species are more hazardous because they are large; others because they flock, or yet others because they soar at higher altitudes. A few are particularly hazardous because they fit all three of these descriptors (e.g., gulls and geese). Occasionally, an unusual food resource (e.g., insect hatch) causes birds to concentrate near the airport environment that might not otherwise be considered a hazard (e.g., swallows).

The *Wildlife Control Procedures Manual* (Transport Canada, 2002) and the resource *Sharing the Skies* (Transport Canada, 2001b) provides information on the most effective management techniques for hazardous wildlife species in the airport environment.

Table 8 provides details of the key wildlife hazards, in no specific order, and Figure 5 identifies hazardous locations based on the previous steps in this WMP.

Table 8. Key Wildlife Hazards at Penticton Airport

Species	On-site Issue	Off-site Issue
Geese (all primarily Canada Goose)	Yes	Yes
Swans (all)	Yes	Yes
Gulls (all)	No	Yes
Hawks (all)	Yes	Yes
Ducks (all)	Yes	Yes
Rock Dove	Yes	Yes
Eagles (both)	Yes	Yes
Sparrows (all)	Yes	Yes
Shorebirds (all)	Yes	Yes
Blackbirds/Starlings (all)	Yes	Yes
Swallows (all)	Yes	Yes
Mourning Dove	Yes	Yes
Herons	Yes	Yes
Turkey Vulture	Yes	Yes
American Kestrel	Yes	Yes
Deer/Ungulates	Yes	Yes
Crow/Raven	Yes	Yes
Marmots	Yes	Yes
Osprey	Yes	Yes
Wildhorse	No	Yes
Coyotes	Yes	Yes
Black Bears	No	Yes

Figure 5. Location of Key Hazardous Land Uses

10. Discussion of Key Hazards

Each of the species (e.g., Turkey Vulture) or groups of similar species (e.g., gulls) appearing in Table 8 are discussed in this section.

This detailed discussion uses habitat information from Section 7 and addresses flight lines, flocking behaviour and use of seasonal food sources or other attractants. Seasonal, temporal (time of day) and spatial patterns of habitat use (where they are and why) will also be discussed.

This section also reviews observed or known behavioural characteristics of the species (e.g. flocking) and identifies the reasons for the presence of these species and their movement patterns or particular behaviour that has led to their designation as key hazards at this airport. This summary relies on information already presented in this document and other reports (e.g., Transport Canada, 2001b; 2002).

Each species or group of species is addressed in the following tabular pattern, which is presented with one species per page.

10.1 Hazard Assessments

The mass/flocking rank is a scale of 1 to 6 that considers the mass and flocking characteristics of a species. Those with the most mass that also flock are ranked 1 (highest) while the smallest non-flocking is ranked 6 (lowest). See Section 11 (Risk Assessment) for more details.

Wildlife Management Plan must include all hazard and risk assessment for species listed in CARs 322.302 (although all species may not be on-site) and any other wildlife noted airside/groundside. New species as they are discovered will be added to the Wildlife Management Plan and also reflected in VORTEX.

Deer¶*(White-tailed deer)*	
Mass/Flocking Rank: *1*	**Species Protection Status:** *BC Wildlife Act* *Canada National Parks Act*
Seasonality (time of year): *Year-round, less active mid-winter and rarely on the airside at that time.*	
Temporal (time of day): *Often active at dawn and particularly dusk.*	
Spatial (where in the area the hazard exists, hotspots): *Move from hill side lands to forage airside and urban areas. Also use wetland ponds and oxbow lake areas east for feeding. Most common on-site along the grass unit and the grazing or grass and garden areas of urban locations with buildings. Especially along open exposed grass patches with tender forage close to houses for protection/shelter habitat from predators and thermal protection.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Groups encroaching on runway in poor light conditions (e.g., dusk and dawn) and at night. Move along open areas from location to location moving from one forage area to another. Can cross the runway in transition during these movements.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *No counts available.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Feeding on forbs and house and wetland plants, movement between habitats. Game trails with deer tracks and scat in hillside areas west of the airport property.*	
Sources of Information for Species in this Area (list reports and other sources): *Local hunters.*	
Strike Summary: *No strikes reported.*	
Other Comments: *Chase deer off site with culling options.*	

Geese *Canada Goose*	
Mass/Flocking Rank: *4*	**Species Protection Status:** *Migratory Bird Convention Act (MBCA)* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *March and December; October; during migration. All year*	
Temporal (time of day): *Not known. Generally, tends to be more active just before dusk and after dawn.*	
Spatial (where in the area the hazard exists, hotspots): *On-site: Grass primarily the northeast and southern end of the airstrip. Will forage on airfield and grass area. May overfly airport.* *Off-site: Beach, open water, grazing area. Uses open golf course fields in fall, flooded fields in spring, attempts to nest in ponds (usually shot under permit). Frequently on streams beach and shore open water within high-risk zone*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Flocks, slow evasive actions, feeding in high-risk zones, flying thorough high-risk zones, but most do tend to be lower than 100 m above ground level (AGL). Local roost site(s) and flight lines are common in the southern end of airport and along the grass habitat of the runway and beach habitat.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Migration and transition during migration events larger numbers and flocks may fly through and stop along the fields and edges of the airport along south.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Feeding on turf and on fresh grasses in sheltered areas. Nesting and attraction to nest sites in wetlands and on structures. Fresh grass along runway and warm asphalt on runway during summer periods.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *2018 – Feb 28 (1 Canada Goose)* *2019 – Aug 14 (6 Canada Geese)*	
Other Comments: *If there are any breeding geese then they should be controlled by killing, hazing works for visitors, but special concerns remain for fly-throughs.*	

Gulls	
Mass/Flocking Rank: *3*	**Species Protection Status:** *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)*
Seasonality (time of year): *February to November, less common from late April to late July, most common in spring and fall. Most common in later fall through winter into spring. Summer is lowest period.*	
Temporal (time of day): *Move from roosts to feeding areas daily. Early morning and dusk.*	
Spatial (where in the area the hazard exists, hotspots): *Concentrate at wet fields, grass while being cut, or if applicable, ploughing operations, and at landfill. Forage on runway for worms (especially during and after wet weather) or on carcasses, short and mown grass for invertebrates. May move across high-risk zones, follow water levels and tide levels for opportune forage and when moving from landfill to airport. Mostly present in canal and on beach of Skaha Lake.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Flocking, use of airside areas, flightlines may be crossed in high-risk areas moving from one end of Skaha Lake to Okanagan Lake.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak through late fall through winter and recede through to the end of spring. Low numbers are common through the summer when many individuals are on breeding grounds but increase during natal disbursal in the late fall.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food sources as listed above, loafing on runway, flightlines to roost and feeding areas (not well known).*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data. North of runway.*	
Strike Summary: *2020 – Jul 29 (1 Herring Gull)*	
Other Comments: *Need information on flightlines, numbers and movements to and from the local landfill site. Requires further research if required.*	

Hawks *Common Nighthawk, Red-Tailed Hawk*	
Mass/Flocking Rank: *2*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act* *Species at Risk Act (SARA)*
Seasonality (time of year): *Migration period of late summer (August to October) and again in spring (March to May)*	
Temporal (time of day): *During mid-morning to late afternoon. Follow thermals on open pavement areas and grass fields.*	
Spatial (where in the area the hazard exists, hotspots): *Forage over open fields (e.g., grass and grazing area habitats on-site). Likely present during mid-morning hunting over fields at airport. Raptors are known to perch on structures within the airfield (e.g., light poles, signs). Additional roosts may be found along edges of forested blocks south of airport along trees associated with Skaha Lake. Towers and fence posts may be used as hunting perches.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Higher flights but may fly along shoreline areas foraging or in transition from ground to higher elevation points to gain altitude for forage attempts. Very territorial and can exemplify conspecific interactions. May forage for small mammals and birds within the airfield.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Foraging over open fields for rodents and along shorelines for opportunistic prey items.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts, Breeding Bird Survey Data, eBird Canada*	
Strike Summary: *2016 – Aug 5 (1 Sharp-Shinned Hawk); Aug 11 (1 hawk)* *2020 – Jun 17 (1 Red-Tailed Hawk)* *2022 – Jun 10 (1 Common Nighthawk)*	
Other Comments:	

Ducks *Mallard Duck*	
Mass/Flocking Rank: *2/3*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)*
Seasonality (time of year): *Late summer (September) through to early spring (March) contain higher numbers*	
Temporal (time of day): *Early morning and evening during transitions also during tide fluctuations moving to dendritic channel locations for forage opportunities.*	
Spatial (where in the area the hazard exists, hotspots): *Foreshore areas and beach habitat and interaction with canal from Okanagan Lake following water flows that do not freeze in winter. Oxbow lakes and canal waters utilized for roost and forage. Both day and night.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Low flying ducks along shoreline areas and in transition over land areas to forage locations, especially during tidal fluctuations. Fly in small to med. size groups direct paths of somewhat predictable flights but fast.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers increase and peak through the fall migration and into winter. Ares of roosting like alcove, sheltered bay area of canal and Skaha Lake calm areas that do not freeze as well as low wind sites associated with weather fronts account for highest numbers; especially during inclement weather. Movements can be in large numbers moving from the southern end of the runway (spit) to the east for the canal or the oxbow lakes.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Foreshore area vegetation associated with canal and oxbow lakes east of the airport. Forage on plants and move with corresponding sea elevations seeking food and shelter locations from inclement weather in canal or Skaha lake area.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *2007 – Sept 10 (1 duck)* *2022 – Jun 14 (1 Mallard Duck)*	
Other Comments:	

Coyotes	
Mass/Flocking Rank: *1*	**Species Protection Status:** *BC Wildlife Act*
Seasonality (time of year): *Throughout the year*	
Temporal (time of day): *Throughout the day*	
Spatial (where in the area the hazard exists, hotspots): *General airfield areas*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Crossing active maneuvering areas.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Stealthy and usually remain undetected. However, points of entry (digs under fence) suggest that several individuals hunt within airport grounds.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Frequent on the airport grounds to prey on small mammals and birds, primarily Canada Geese which are abundant on airport grounds.*	
Sources of Information for Species in this Area (list reports and other sources): *Transport Canada Wildlife Bulletins, Sharing the Skies, Canadian Wildlife Services*	
Strike Summary: *No strikes reported.*	
Other Comments: *The allowance of coyotes to enter the airfield for hunting presents the risk of strike by an aircraft. The presence of coyotes on the airfield decreased the number of geese congregating in critical areas that could potentially impact aircraft safety. Coyotes on airfield during flight operations could create the potential for an incursion with an aircraft. However, the risk of damage or injury is significantly less than an aircraft striking birds such as geese in flight.*	

Owls *Barn Owl*	
Mass/Flocking Rank: *1*	**Species Protection Status:** *Federal Migratory Bird Treaty Act* *Species at Risk Act (SARA)*
Seasonality (time of year): *Migration period of late summer (August to October) and again in spring (March to May)*	
Temporal (time of day): *During mid-morning to late afternoon. Follow thermals on open pavement areas and grass fields.*	
Spatial (where in the area the hazard exists, hotspots): *Forage over open fields (e.g., grass and grazing area habitats on-site). Likely present during mid-morning hunting over fields at airport. Two osprey nests occur within a 50 m radius of the airport, along the eastern and western perimeter. Raptors are known to perch on structures within the airfield (e.g., light poles, signs). Additional roosts may be found along edges of forested blocks south of airport along trees associated with Skaha Lake. Towers and fence posts may be used as hunting perches.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Higher flights but may fly along shoreline areas foraging or in transition from ground to higher elevation points to gain altitude for forage attempts. Very territorial and can exemplify conspecific interactions. May forage for small mammals and birds within the airfield.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Foraging over open fields for rodents and along shorelines for opportunistic prey items.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *Strike reported:* *2009 – Aug 10 (1 owl)* *2018 – Apr 27 (1 Barn Owl)*	
Other Comments:	

Rock Doves and Pigeons	
Mass/Flocking Rank: *3*	**Species Protection Status:** *BC Wildlife Act – Schedule C*
Seasonality (time of year): *Year-round*	
Temporal (time of day): *Day-time hours*	
Spatial (where in the area the hazard exists, hotspots): *Urban areas, farmland, and rocky cliffs. May gather in large flocks in urban parks where people feed them. Pigeons may nest in stairwells, in rooms of abandoned buildings, or rain gutters.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Forages mostly by walking on the ground. Sometimes forages on trees. When alarmed, the flock may suddenly fly into the air and circle several times before coming down again. Flocking behavior, particularly active at dawn and dusk when moving to and from roost sites.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *High. Associated with agricultural and urban areas.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Forage in flocks walking or running on the ground, pecking for food. Attracted to open areas where they can find food on the ground.*	
Sources of Information for Species in this Area (list reports and other sources): *National Audubon Society, The Cornell Lab, eBird, Penticton Christmas Bird Count (Dec 2017)*	
Strike Summary: *2019 – May 12 (1 pigeon)*	
Other Comments:	

Eagles *Bald and Golden Eagles*	
Mass/Flocking Rank: *1*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Year-round with higher occurrence during migration period for area (Oct. and March)*	
Temporal (time of day): *During mid-morning to late afternoon. Follow thermals on open pavement areas and grass fields.*	
Spatial (where in the area the hazard exists, hotspots): *Forage over open fields (e.g., grass and grazing area habitats on-site). Likely present during mid-morning hunting over fields at airport. Also follow flocks of ducks. Roosts may be found along edge of Skaha Lake south of airport. Towers a fence post may be used as hunting perches*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *High flights but may fly along shoreline areas foraging or in transition from ground to higher elevation points to gain altitude for forage attempts. If focuses on prey item, will settle onto airstrip and associated grass habitat. Uses thermals for advancement of flight pattern.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Multiple food sources on and adjacent to the airport. Primarily along areas where ducks roost and forage.*	
Sources of Information for Species in this Area (list reports and other sources): *Forage as Hawks*	
Strike Summary: *2023 – Apr 6 (1 Eagle suspected strike)*	
Other Comments:	

Sandhill Cranes	
Mass/Flocking Rank: *2*	**Species Protection Status:** *Federal Migratory Bird Treaty Act* *Migratory Birds Convention Act (MBCA)*
Seasonality (time of year): *May (late spring during migration).*	
Temporal (time of day): *During mid-morning to late afternoon. Follow thermals on open pavement areas and grass fields. Transition of tide levels, e.g., low tide primarily.*	
Spatial (where in the area the hazard exists, hotspots): *Grass areas and grazing habitat on-site. Also follow the tide areas of beach and foreshore*.	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Move along airport from open grass areas with weather patterns seeking shelter and tidal fluctuations. Flights are in groups and are slow on take-off. Slow direct flight and not very maneuverable.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Forage along open fields and wet meadow areas.*	
Sources of Information for Species in this Area (list reports and other sources): *Breeding Bird Survey Data*	
Strike Summary: *No strikes reported.*	
Other Comments: *Sandhill cranes has not been observed at Penticton Airport.*	

Sparrows, Finches, and Snow Buntings	
Mass/Flocking Rank: *6*	**Species Protection Status:** *BC Wildlife Act – Schedule C (For House Sparrow)* *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)*
Seasonality (time of year): *Migration of spring and fall (Aug to Oct.)*	
Temporal (time of day): *All. Some nocturnal movements at higher elevations during migration periods of spring and fall.*	
Spatial (where in the area the hazard exists, hotspots): *Shrub thicket locations and areas of tall grass in association with forest three-dimensional structure areas of cover and thermal security. May fly across airstrip in transition to forage areas surrounding the airport.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Sole individuals flying across as individuals over air taxi and take o/land locations. Flocking is not common unless s in groups of e.g., finches. Flocks are highly maneuverable and small.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration. Breeding of some species may be present along the buildings or edge of airport areas.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food, breeding and roost areas.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *Strike reported for sparrows:* *2006 – Sept 7 (2 House Sparrows); Sept 22, (2 sparrows)* *2007 – Sept 6 (11 sparrows)* *2008 – Sept 9 (2 sparrows); Sept 10 (2 sparrows); Sept 16 (1 sparrow); Sept 29 (1 sparrow)* *2012 – Aug 30 (1 sparrow)* *2014 – Sept 2 (1 sparrow)* *2016 – Sept 16 (1 sparrow)* *2017 – Sept 4 (1 House Sparrow)* *2019 – Apr 20 (1 House Sparrow)* *2020 – Sept 24 (10 House Sparrows)* *2021 – Sept 22 (1 sparrow)* *2022 – Sept 24 (5 Sparrows)* *2023 – Aug 9 (2 Sparrows); Sept 6 (11 Sparrows); Oct 5 (5 Sparrows)* *2024 – Sept 3 (2 Sparrows)*	
Other Comments:	

Shorebirds	
Mass/Flocking Rank: *4*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Late spring (May) and early to late summer (July – August)*	
Temporal (time of day): *Morning and evening especially during tide transitions following low tide areas and in conjunction with dendritic channel formation during low tide. Follow forage opportunity for benthic during tide fluxes.*	
Spatial (where in the area the hazard exists, hotspots): *Follow tide level rises and dendritic channel formations. Along beach shorelines in areas of plant accumulation and forage for benthic in shrub/tidal marsh areas. Roost along rocky riprap areas and inlet locations that provide shelter and cover from elements.*	
Behaviours of Concern (e.g. flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Large flocks move in transition for available and opportune forage locations primarily dependent on tidal fluctuations and weather patterns. Highly mobile and very agile during forays. May cross airstrip from one end of site to another. Mobile along the beach shoreline and edge of water areas at lower elevations. Most likely times for impact may include the early morning, late day, and tidal flux areas where shoreline habitat is exposed and opportune for feeding.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Peak numbers are likely during the fall migration (August) and once again in the spring (May). Times with raptor movements (e.g., peregrine falcons), low numbers are most likely throughout the summer periods while this family is breeding in the northern areas of Canada.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Foreshore area vegetation (e.g., tidal marshes) and dendritic channel formations associated with tidal fluxes. Forage on plants and move with corresponding sea elevations seeking food and shelter locations from inclement weather.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Blackbirds/Starlings *European Starling, Brewer's Blackbird*	
Mass/Flocking Rank: *4*	**Species Protection Status:** *BC Wildlife Act – Schedule C (For starlings)* *Federal Migratory Bird Treaty Act (except starlings – Not protected)*
Seasonality (time of year): *February to December larger numbers and common in flocks. Migration periods sporadic but higher concentrations during late summer into fall with onset of natal disbursal.*	
Temporal (time of day): *All day, no details on daily timing of flocking behaviour but most common in late summer and fall.*	
Spatial (where in the area the hazard exists, hotspots): *Over and around the runway, grass areas, shrub thickets and in association with buildings. Close to open field transition areas. Mass flocking in areas of exposed tilled soil and food opportune locations of grass habitat.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Flocking in fall, low flying, often crossing airfield. Flocks will also perch in trees and circle around any raptors in area. Most likely to be associated with areas of the grass habitat.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *No counts available, some flocks can number hundreds of birds and are common throughout outside or breeding season and in through fall to following spring.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Seeds and short turf for feeding. Feeding on long and short grass. Some nesting, mainly in long buildings. Primary roost locations not known but possible locations may be associated with residential areas.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *Strikes reported:* *2010 – Jul 31 (1 starling); Dec 29 (1 starling)* *2012 – Aug 8 (2 starlings)* *2018 – Sept 17 (1 European Starling)* *2021 – Aug 15 (1 starling)*	
Other Comments:	

Crows and Ravens	
Mass/Flocking Rank: *6*	**Species Protection Status:** *BC Wildlife Act – Schedule C* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Year-round*	
Temporal (time of day): *All*	
Spatial (where in the area the hazard exists, hotspots): *Various locations. Primarily along the beach and building areas to open locations along grass and runway locations. Search for "roadkill" and opportunistic locations for food (omnivores).*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Solitary or in small groups commonly of 3-4. May land on airstrip in search of "roadkill" as a result of the impact of small mammals with planes or along the grass fields in search of small mammals and other items of prey. Roost and congregate in areas of forest adjacent to open field areas.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *No information*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Forage and movement.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Swallows	
Mass/Flocking Rank: *5*	**Species Protection Status:** *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)* *Species at Risk Act (SARA)*
Seasonality (time of year): *August through September. Breeding period (approx. May to Aug.). Higher abundances in late summer (July through to Aug.).*	
Temporal (time of day): *Throughout day. Mid-morning to late afternoon.*	
Spatial (where in the area the hazard exists, hotspots): *Along buildings associated with the airport, fence rows in areas for insect forage such as grass and grazing areas, common in the east. Over runway, canal field and beach habitats that congregate insect abundances (e.g., open water and pond/wet meadow areas). Terminal buildings an around grass areas of buildings.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Fly over grass areas of airstrip and low flying seeking opportunity for aerial forage for insects. Especially in areas of high insect abundance such as the exposed fields and grazing field areas defined on-site. Flocking common and includes numbers of individuals foraging in same locations. Because they likely nest on buildings and structures forage occurs over the runway and grass areas when insects such as crane flies (Tipula sp.) gestate in late summer.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Breed on site and establish territories along the edges of the runway and fence areas. Some breed in the building areas but forage throughout the entire site at low elevation in areas of takeoff and landing. Peak numbers occur after breeding in late July and August.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food sources associated with area, in particular, crane flies and potential breeding areas adjacent to airport.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *2008 – Jun 18 (1 swallow)* *2016 – May 27 (1 Barn Swallow)* *2017 – May 16 (1 Barn Swallow)* *2018 – May 26 (1 Barn Swallow)* *2022 – Jul 19 (1 Barn Swallow)* *2023 – May 25 (1 swallow); May 26 (1 swallow)*	
Other Comments:	

Mourning Doves	
Mass/Flocking Rank: *3*	**Species Protection Status:** *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)*
Seasonality (time of year): *Year-round. Breeding period approximately May to September.*	
Temporal (time of day): *Diurnal*	
Spatial (where in the area the hazard exists, hotspots): *Primarily a bird of open country, scattered trees, and woodland edges, but large numbers roost in woodlots during winter.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Ground forager. They peck or push aside ground litter. Feed on mainly seeds. Also feeds on cultivated grains, peanuts, wild grasses, weeds, herbs, occasionally berries, and sometime snails. Typically nests on trees, and sometimes on the ground. Avoids unbroken forest.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Some remain through winter over most of breeding range, but many move south from northern areas in fall. Migration is mostly by day, in flocks. May see 3 mourning doves flying tight in one formation, one after another.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Feeds on ground in grasslands, agricultural fields, backyards, roadsides, and in the open. Found in almost any kind of open or semi-open habitat. Most common for edge habitats with both trees and open ground.*	
Sources of Information for Species in this Area (list reports and other sources): *National Audubon Society, The Cornell Lab, eBird, Penticton Christmas Bird Count (Dec 2017)*	
Strike Summary: *No strikes reported.*	
Other Comments: *Mourning Doves has not been observed in Penticton Airport.*	

Great Blue Heron	
Mass/Flocking Rank: *2*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act* *Migratory Bird Convention Act (MBCA)*
Seasonality (time of year): *February to November. Higher concentration during late fall through winter and early spring.*	
Temporal (time of day): *All day but higher possibility during dusk and dawn during forage movements.*	
Spatial (where in the area the hazard exists, hotspots): *Hotspots include the runway strip, foreshore area of Skaha Lake, open field and oxbow lakes east of runway for foraging. Also found along roadside ditches and wet margins foraging for small mammals and herpetifauna. May be found along edge of beach and grass areas at site.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *May fly low and slow flight path across but primarily around airfield moving from feeding locations during tide level fluctuations, low maneuverability.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Usually present in low numbers (one to several) except during fall migration when numbers can peak for foraging.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Oxbow lakes in east and canal, wetlands provide important forage and over-wintering habitat.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *2012 – Jun 24 (1 Great Blue Heron)* *2019 – Jul 9 (1 Great Blue Heron)* *2022 – Jul 18 (1 Great Blue Heron)*	
Other Comments:	

Turkey Vultures	
Mass/Flocking Rank: *3*	**Species Protection Status:** *BC Wildlife Act*
Seasonality (time of year): *March to September. Breeding period May to August.*	
Temporal (time of day): *On sunny days, aloft as early as 9AM; in colder weather and at night, they roost in trees, on rocks, and other high secluded spots.*	
Spatial (where in the area the hazard exists, hotspots): *Common around open areas such as roadsides, suburbs, farm fields, countryside, and food sources such as landfills, trash heaps, and construction sites.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Glides relatively low while sniffing for carrion or riding thermals to higher vantage points. Also huddles around roadkill or dumpsters. Turkey vultures almost never attack living prey.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *May soar in small groups and roost in larger numbers. Migrating flocks can number in the thousands.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Food sources are landfills, trash heaps, and construction sites. They nest in rock crevices, fallen trees, abandoned hawk/heron nests, abandoned buildings, and isolated from human traffic or disturbance. Open fields at and near airport.*	
Sources of Information for Species in this Area (list reports and other sources): *National Audubon Society, The Cornell Lab, eBird*	
Strike Summary: *2011 – Aug 14 (1 Turkey Vulture)*	
Other Comments:	

American Kestrels	
Mass/Flocking Rank: *5*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Year-round. Breeding period from May to August.*	
Temporal (time of day): *Day and night.*	
Spatial (where in the area the hazard exists, hotspots): *Favours open areas with short ground vegetation, and sparse trees. Found in meadows, grasslands, deserts, parks, farm fields, cities, and suburbs. Sometimes perching on telephone wires along roadsides.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Snatch victims from the ground. Eats mostly insects and other invertebrates, as well as small rodents and birds. Watches for prey from tall perches, such as trees, wires, telephone poles, and towers within airport grounds.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Early in the pairing-up process, groups of four or five birds may congregate.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Hunts for insects and other small prey in open territory.*	
Sources of Information for Species in this Area (list reports and other sources): *National Audubon Society, The Cornell Lab, eBird, Penticton Christmas Bird Count (Dec 2017)*	
Strike Summary: *2021 – Aug 9 (1 American Kestrel)* *2022 – Feb 5 (1 American Kestrel)* *2022 – Sep 7(1 American Kestrel)*	
Other Comments:	

Wild Turkeys	
Mass/Flocking Rank: *1*	**Species Protection Status:** *N/A*
Seasonality (time of year): *Year-round*	
Temporal (time of day): *Day and night. Forage actively during early mornings and evenings.*	
Spatial (where in the area the hazard exists, hotspots): *Live year-round in open forests.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Ground forager. Travel in flocks and search on the ground for nuts, berries, insects, and snails. At night, they fly up into trees and roost in groups.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Not migratory. Usually roost in flocks, but sometimes individually.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Live year-round in open forests, including a mixture of woodlands and open clearings.*	
Sources of Information for Species in this Area (list reports and other sources): *National Audubon Society, The Cornell Lab, eBird*	
Strike Summary: *No strikes reported.*	
Other Comments: *Wild Turkeys have not been observed in Penticton Airport.*	

Cormorants	
Mass/Flocking Rank: *4*	**Species Protection Status:** *BC Wildlife Act* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *All year. Most common during late summer through winter and into early spring. Lower numbers throughout summer period.*	
Temporal (time of day): *Mid-morning to late afternoon. Especially during tidal fluctuations. Search for forage opportunities.*	
Spatial (where in the area the hazard exists, hotspots): *Open water habitat. Foreshore areas. Congregate along rocks and exposed rock outcrops along shoreline and some open water. Roost an open water structures and rocks.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *May fly across the runway and open field areas to move from one side of the airport to the other in search of new forage areas. Usually (commonly) fly as individuals with direct and straight flight pattern. Flocking is common on structures and in preparation for roosting.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Peak numbers occur during late fall and through winter. Breeding may take place along structures associated with offshore locals.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Movement to and from forage areas associated with shelter areas and protected sites.*	
Sources of Information for Species in this Area (list reports and other sources): *Breeding Bird Survey Data*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Bobcats	
Mass/Flocking Rank: *1*	**Species Protection Status:** *Conservation Status: BC List - Yellow*
Seasonality (time of year): *Year-round. Breeds mid-year to spring.*	
Temporal (time of day): *More active during the day in cold weather.*	
Spatial (where in the area the hazard exists, hotspots): *Various habitats including woodlands and forest edge, hardwood forests, swamps, forested river bottomlands, brushlands, deserts, mountains, and other areas with thick undergrowth. Large tracts of habitat are most favourable. Primarily terrestrial.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Prefers small mammals, especially lagomorphs. Occasionally birds, other vertebrates, and carrion. Bobcat numbers are generally low in areas where coyote numbers are high, even if suitable habitat is present.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Breeds mid-winter through spring, or possibly at any time of year in some areas.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Adapt well to diverse habitats as forests, swamps, deserts, and suburban areas.*	
Sources of Information for Species in this Area (list reports and other sources): *BC Conservation Data Centre, National Geographic, NatureServe Explorer*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Marmots	
Mass/Flocking Rank: *1*	**Species Protection Status:** *BC Wildlife Act*
Seasonality (time of year): *Most active during summer and hibernate in burrows for 4-9 months.*	
Temporal (time of day): *Diurnal, can also be active at night.*	
Spatial (where in the area the hazard exists, hotspots): *Farm, garden, crop, golf course, sport field, and around the building.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Burrow openings can be a hazard for livestock and farm machinery, and grass near airport.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Live in colonies of 10-20 individuals. Males will defend one to four mates at the same time. While females tend to remain with the maternal colony, males may leave to establish a new colony elsewhere.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Feed on green plants and can become pests in vegetable gardens. Airport has wide variety of campsites along the city, it brings marmots interested in eating around fields and human food.*	
Sources of Information for Species in this Area (list reports and other sources): *Wild Safe BC, The Canadian Encyclopedia.*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Painted Turtles *Western Painted Turtles*	
Mass/Flocking Rank: *1-4*	**Species Protection Status:** *Species at Risk Act (SARA)*
Seasonality (time of year): *May - July*	
Temporal (time of day): *Begin to become active around sunrise; diurnal*	
Spatial (where in the area the hazard exists, hotspots): *Inhabit shallow water bodies including streams, wetlands, oxbows, and small ponds. In the winter, they hibernate in soft mud at the bottom of wetland habitats (COSEWIC 2016).*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *May have turtle passage structures along the base of the perimeter fence line. Omnivorous generalist, consuming almost any kind of animal or vegetable matter available.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Breed and access the airport from the Oxbow lakes east of the site.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Migrate between a small pond located on a golf course adjacent to and west of the airport and the Oxbow lakes east of the site. Travel and nesting purposes.*	
Sources of Information for Species in this Area (list reports and other sources): *Best Management Practices for Western Painted Turtles (Transport Canada Environmental Programs Team); National Geographic*	
Strike Summary: *No strikes reported.*	
Other Comments: *Several small openings installed in the airport perimeter fence to facilitate turtle movement across the airfield. Refer to Section 8 of this Wildlife Management Plan for details.*	

Trumpeter Swan	
Mass/Flocking Rank: *1*	**Species Protection Status:** *Migratory Birds Convention Act (MBCA)* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Early fall through winter to late summer.*	
Temporal (time of day): *Late morning to late evening.*	
Spatial (where in the area the hazard exists, hotspots): *Open marsh areas along beach and foreshore. Prefer marsh and open wet field locations that have wet meadow forage opportunities.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *May cross runways and open field areas in transition for migration and in search of new forage locations. Flocking may occur, especially during migration. Some encounters may be in movements in upper altitude locations.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Common during early winter flocking on fields.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Forage along open fields and wet meadow areas.*	
Sources of Information for Species in this Area (list reports and other sources): *Breeding Bird Survey Data, Penticton Christmas Bird Count (Dec 2017)*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Wildhorse	
Mass/Flocking Rank *1*	**Species Protection Status:** *Protected*
Seasonality (time of year): *Year-round.*	
Temporal (time of day): *Diurnal, and can also be active at night. Basically, they spend their days searching for food and their nights sleeping.*	
Spatial (where in the area the hazard exists, hotspots): *Wildhorse in western Canada are found primarily in forested areas, dry grassland, shrubland and sedge meadows.*	
Behaviours of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *All horses are herbivores, which means that they eat plants. Most herds consist of 5-10 animals*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *The stallion in a herd breed with the adult females. The gestation period lasts between 11 and 12 months.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *All horses are herbivores, which means that they eat plants. Penticton Airport is surrounded by natural ecosystem and has wide of campsite along the city, it brings Wildhorse interested in eating human food or crops.*	
Sources of Information for Species in this Area (list reports and other sources): *Animals Network; The Canadian Encyclopedia*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Ospreys	
Mass/Flocking Rank: *2*	**Species Protection Status:** *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *May through September. Breeding period (approx. June to July)*	
Temporal (time of day): *Early morning till late evening.*	
Spatial (where in the area the hazard exists, hotspots): *Forage over open fields (e.g., grass and grazing area habitats on-site). Likely present during mid-morning hunting over fields at airport. Two osprey nests occur within a 50 m radius of the airport, along the eastern and western perimeter. Raptors are known to perch on structures within the airfield (e.g., light poles, signs). Additional roosts may be found along edges of forested blocks south of airport along trees associated with Skaha Lake. Towers and fence posts may be used as hunting perches.*	
Behaviour of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Higher flights but may fly along shoreline areas foraging or in transition from ground to higher elevation points to gain altitude for forage attempts. Very territorial and can exemplify conspecific interactions. May forage for small mammals and birds within the airfield.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Numbers peak during the fall migration.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Foraging over open fields for rodents and along shorelines for opportunistic prey items.*	
Sources of Information for Species in this Area (list reports and other sources): *Christmas Bird Counts & Breeding Bird Survey Data*	
Strike Summary: *2017 – Aug 4 (1 osprey)* *2021 – Aug 25 (1 osprey)*	
Other Comments:	

Black Bears	
Mass/Flocking Rank: *1*	**Species Protection Status:** *BC Wildlife Act*
Seasonality (time of year): *Warmer Months*	
Temporal (time of day): *Throughout the day.*	
Spatial (where in the area the hazard exists, hotspots): *General off airfield areas.*	
Behaviour of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Potential access to airfield.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *No systematic counts available. Breeding occurs in June-July.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *Black Bears are rarely seen around the airport.* *Mainly passing through the area*	
Sources of Information for Species in this Area (list reports and other sources): *Observations by airport operations staff.*	
Strike Summary: *No strikes reported.*	
Other Comments:	

Yellow Rumped Warbler	
Mass/Flocking Rank: *6*	**Species Protection Status:** *Migratory Bird Convention Act (MBCA)* *Federal Migratory Bird Treaty Act*
Seasonality (time of year): *Spring, Summer, Fall*	
Temporal (time of day): *Yellow-rumped warblers are active during the day except when it migrates. During migration, it flies by night, as is the case with many migratory birds.*	
Spatial (where in the area the hazard exists, hotspots): *In summer, Yellow-rumped warblers are birds of open coniferous forests and edges, and to a lesser extent deciduous forests. In fall and winter, they move to open woods and shrubby habitats, including coastal vegetation, parks, and residential areas.*	
Behaviour of Concern (e.g., flocking, loafing on apron, flightlines, feeding in grass, crossing runway): *Breeds locally. Will flock with other species during spring and fall. Prefers to migrate through scrub habitats.*	
Discussion of Numbers (peak counts, low counts, breeding pairs): *Yellow-rumped warblers live in pairs and build their nests on horizontal perches in pine trees. In wintertime, they often travel in large flocks.*	
Reasons Why Species is Present in Area (e.g., food source, landfill, roost): *They eat mainly insects and berries. The yellow-rumped warbler has two distinct subspecies in eastern U.S. and Canada's boreal forest. Intermediate forms occur where the two subspecies' breeding ranges overlap, such as in the Canadian Rockies.*	
Sources of Information for Species in this Area (list reports and other sources): *Observation by airport operations staff.* *All About Birds & Audubon Organization & Smithsonian's National Zoo & Conservation Biology Institute*	
Strike Summary: *2023 – Sep 21 (1 Yellow-rumped warbler)*	
Other Comments:	

11. Risk Assessment

In the context of the WMP, a hazard is a condition (e.g., the presence of gulls) with the potential to cause injury to personnel or damage to equipment or structures. Reducing exposure to hazards is a component of risk management.

Risk is the likelihood of injury or loss occurring, which is a function of exposure to the hazards, as well as the likelihood of a strike occurring and the magnitude or severity of the strike. It follows then, that high risk species are those that are most frequently involved in strikes, as well as those that cause the greatest damage.

Risk assessment is an important part of this plan because it serves to ensure that wildlife management activities are directed at the species that create the highest risk, in a prioritized fashion.

Risk is strongly influenced by the type of aircraft and their operations. The likelihood of a catastrophic wildlife strike accident occurring with a small piston-powered aircraft is much less than with turbine powered aircraft.

Table 9 summarizes airport traffic into three broad risk-categories based on their vulnerability to damaging wildlife strikes. All classes have been retained in the risk assessment matrix in case use patterns should change in the future. In addition, the severity or consequences are much less.

Table 9. Airport Traffic

Aircraft Classification		Strike Susceptibility Level	Approximate Annual Movements	Other Considerations
1	**Turbofan & Turbojet**	High	2017 – 565 2018 – 526 2019 – 442 2020 – 392 2021 – 636	-
2	**Helicopter and Turboprop**	Moderate	2017 – 10,302 2018 – 12,076 2019 – 9,870 2020 – 8,500 2021 – 11,239	-
3	**Piston under 5700 kg**	Low	2017 – 5,044 2018 – 5,058 2019 – 6,419 2020 – 6,108 2021 – 5,993	-

In addition to the immediate airport environment, the risk assessment considers the area outside of the airport. For this reason, the typical approach and takeoff routes for all the runway and both types of air traffic (e.g., local and itinerant) are considered. Figure 6 shows the approach and takeoff areas and the area where 90% of flights at this airport are typically below 500 to 600-ft AGL and typical circling patterns where those patterns approach 500-ft AGL.

The following are general characteristics of high-risk species or behavior that consider biomass which has the ability to affect safe flight:

a) Larger species which tend to cause greater damage due to higher impact forces (e.g., geese, gulls, and hawks);
b) Flocking of birds (e.g., gulls, swallows, geese) or herds of animals;
c) Large, slow-flying birds that are less maneuverable (e.g., herons, hawks);
d) Species that habitually hunt or forage on or over the airfield, especially inexperienced animals (e.g., hawks and owls); and
e) Birds that habitually fly or soar into airspace used by aircraft (e.g., gulls and eagles soaring on flight lines).

If a hazardous species is particularly numerous (e.g., Rock Dove), then they may be considered a high risk. Conversely, one or two pairs of doves nesting on the airport property might be considered a hazard, but one with a low associated risk.

Figure 6 overlays Figure 5 with likely wildlife pathways of connectivity and presents potential gull flight lines. The figure provides some insight into the interaction of off-site land use and the presence of hazardous species within high-risk zones.

For the species considered to represent an elevated risk at Penticton Airport, Table 10 provides several risks assessments tools. These are described in the following paragraphs.

Mass/Flocking Hazard Rank

This ranking system uses flocking characteristics and mass to provide a relative index of risk should an aircraft strike the species. Examples are provided in Table 9.

Figure 6. Elevated Risk Zones

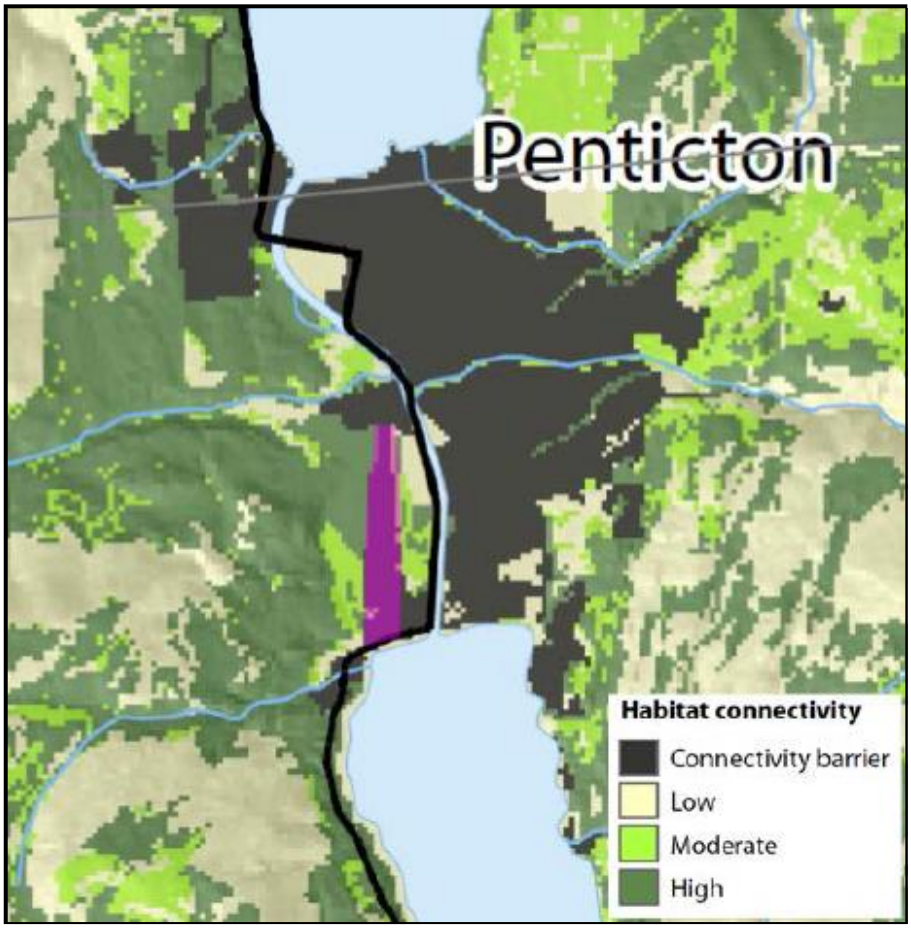

Figure 7. Habitat Connectivity

Table 10. Risk Assessment Using Flocking Characteristics and Mass

Level of Risk	Characteristics	Example Species
Level 1	Very large (>1.8 kg), flocking and solitary	Geese, Swans
Level 2	Very large (>1.8 kg), solitary or Large (1-1.8 kg), flocking	Great Blue Heron Gulls, Mallard, Turkey Vulture
Level 3	Large (1-1.8 kg), solitary or Medium (300g –1 kg), flocking	Red-tailed Hawk, Turkey Vulture Teals, Rock Dove
Level 4	Medium (300g –1 kg), solitary or Small (50 g – 300 g), flocking	Northern Harrier European Starling, blackbirds
Level 5	Small (50 g – 300 g), solitary or Very small (<50g), flocking	American Kestrel Snow Bunting, swallows
Level 6	Very small (<50g), solitary	Sparrow, Yellow-Rumped Warbler

Note: Based on Kelly, 2004

Relative Hazard Score

In a study by Dolbeer *et al.* (2000), strike data were analyzed and assessed for relative risk associated with 21 different species groups. This analysis examined damage to aircraft, major damage, effects on flight, and from these data determined a composite ranking. It is important to remember that this assessment is entirely based on recorded strikes. That is, all of these species' present proven risks to aircraft. They effectively occupy the top portion of a list of potentially hazardous species that occur on airfields in Canada.

Transport Canada Hazard Rank

Transport Canada rank for most hazardous wildlife 1 through 20, with 1 being the highest hazard. as presented in *Airport Wildlife Management and Planning Standard 322.321*. This list ranks wildlife from most hazardous to least hazardous by species group and as such, identifies the species that should be of primary concern for the operator. All listed species are thought to be hazardous, and the status of some species may have changed since the ranks were established (e.g., Turkey Vulture is an increasing hazard in many areas of Canada, however it is yet to become a strike risk at most airports).

Two columns are also provided for specific assessments for this airport for relative abundance (H-M-L) and hazardous behaviour (H-M-L) based on the previous sections of this report. The following criteria are used to help assess the risk levels at this airport.

Relative Abundance

- *High* **Frequently** present in conflict areas; may be seasonal; multiple daily observations; often numerous;
- *Medium* **Occasionally and regularly** present in conflict areas; not present daily, but present weekly; sporadically numerous; and,
- *Low* **Occasionally and infrequently** present; usually not numerous.

Hazardous Behaviour

- *High* **Frequently** flocking in conflict areas; regular flightlines through conflict zone; unpredictable response to aircraft (e.g., inexperienced birds); frequently active in poor light;
- *Medium* **Sporadic** flocking in conflict areas (e.g., when food supplies dictate); sometimes active in poor light; and,
- *Low* **Rarely** or never flocking; seldom feeding close to conflict zone; usually active only in daytime.

The final three columns in the risk matrix represent qualitative assessments based on air traffic type and volume at this airport (using the three categories provided in Table 11). The following criteria are used to help determine risk by aircraft type and traffic volume:

- *Severe* Frequent **high risk** aircraft movements coinciding with high values for other risk factors (e.g., relative abundance, hazardous behaviour, risk/hazard rankings);
- *High* Frequent **high or moderate risk** aircraft movements coinciding with high or moderate values for other risk factors;
- *Moderate* Occasional or **regular moderate risk** aircraft movements coinciding with moderate or sometimes high values for other risk factors; and,
- *Low* All other categories.

The risk assessment matrix does not provide numerical computations and none of these values are absolute. Therefore, the purpose of the table below is to draw attention to high-risk species for management purposes and to guide management priorities rather than absolutely quantify the risk.

Table 11. Risk Assessment Matrix for Penticton Airport

Species Group	General Risk and Hazard Ranking Tools			For this airport		*Risk Assessment by Aircraft Type[4] and (volume*		
	Mass/ Flocking Rank[1]	Relative Risk Score[2]	TC Hazard Rank[3]	Relative Abundance	Hazardous Behaviour	*1 (Turbofan & Turbojet)*	*2 (Helicopter and Turboprop)*	*3 (Piston under 5700 kg)*
Deer	1	100	1	***L***	***M***	***L***	***L***	***L***
Geese	4	52	2	***M***	***M***	***H***	***M***	***M***
Gulls	3	22	3	***H***	***M***	***H***	***M***	***M***
Hawks	2	25	-	***M***	***L***	***H***	***M***	***M***
Ducks	2/3	37	5	***L***	***L***	***L***	***L***	***L***
Coyote	1	20	6	***L***	***L***	***L***	***L***	***L***
Owls	1	16	-	***L***	***L***	***L***	***L***	***L***
Rock Doves and Pigeons	3	24	8	***M***	***L***	***L***	***L***	***L***
Bald and Golden Eagles	1	31	-	***L***	***L***	***L***	***L***	***L***
Sandhill Cranes	2	47	10	***L***	***M***	***H***	***H***	***H***
Sparrows and Snow buntings	6	4	11	***L***	***L***	***L***	***L***	***L***
Shorebirds	4	10	10	***H***	***H***	***H***	***M***	***M***
Blackbirds	4	9	13	***L***	***M***	***M***	***L***	***M***
Starlings	4	9	13	***H***	***H***	***H***	***M***	***M***
Crows and Ravens	6	16	12	***M***	***H***	***M***	***M***	***M***
Swallows	5	2	15	***M***	***M***	***M***	***M***	***M***
Mourning Doves	3	24	8	***M***	***L***	***L***	***L***	***L***
Herons	2	22	17	***L***	***L***	***M***	***L***	***L***
Turkey Vulture	3	63	18	***L***	***L***	***M***	***L***	***L***
American Kestrels	5	-	19	***L***	***M***	***L***	***L***	***L***
Wild Turkeys	1	-	20	***L***	***M***	***L***	***L***	***L***
Cormorants	4	54	-	***L***	***M***	***M***	***M***	***M***
Ospreys	2	25	-	***M***	***L***	***H***	***M***	***M***

Species Group	General Risk and Hazard Ranking Tools			For this airport		*Risk Assessment by Aircraft Type[4] and (volume*		
	Mass/ Flocking Rank[1]	Relative Risk Score[2]	TC Hazard Rank[3]	Relative Abundance	Hazardous Behaviour	*1 (Turbofan & Turbojet)*	*2 (Helicopter and Turboprop)*	*3 (Piston under 5700 kg)*
Killdeer	3	12	12	***L***	***L***	***L***	***L***	***L***
Bobcats	1	-	-	***L***	***L***	***L***	***L***	***L***
Marmots	1	-	-	***H***	***L***	***L***	***L***	***L***
Painted Turtles	1-4	-	-	***L***	***L***	***L***	***L***	***L***
Trumpeter Swan	1	47	10	***L***	***M***	***H***	***H***	***H***
Wildhorse	1	-	-	***M***	***L***	***L***	***L***	***L***
Black Bear	3	-	-	***M***	***M***	***M***	***M***	***M***

NOTE:

1. *This mass/flocking score is based on mass and the propensity of a species to flock. The scale is based on being the highest hazard and 6 the lowest hazard*
2. *The Dolbeer Ranking System for relative risk; 100 is the highest, 2 the lowest.*
3. *Transport Canada hazard list;1 is the highest, 20 the lowest, all are considered to be hazardous, and the status of some species has changed since the ranks were established.*
4. *This summary risk rank is based on the three aircraft categories listed in Table 11 and considers the type and number of traffic movements. The scale is based on: Severe, High, Moderate and Low.*

Table 12 presents the wildlife which pose a High, Moderate and Low value to aircraft at the site based on the habitat, the animal's behaviour, presence in the area as well as the effect interactions would result in with aircraft. These rankings do not consider how manageable the species might be. It addresses current assessment of priority for this airport.

Table 12. Wildlife Management Priorities for Penticton Airport

Management Priority	Species Group
High	*Canada Goose*
	Gulls
	Hawks and Eagles
	Blackbirds and Starlings
	Great Blue Herons
Moderate	*Turkey Vulture*
	Swallows
	American Kestrels
Low	*Deer*
	Ducks
	Doves
	Coyote
	Owls
	Killdeer
	Sparrows

In summary, this assessment has:

- Screened out those species not considered to be an elevated risk;
- Considered the type and volume of air traffic movements at the airport;
- Applied a risk assessment matrix to hazardous species; and
- Identified management priorities based on the risk assessment.

However, any wildlife species (even those not considered to be an elevated risk) may still from time to time represent a risk to aircraft safety or may increase in abundance or change their behaviour and become an immediate concern.

From 2016 to 2018 none of the risk assessments by aircraft type were considered to be severe, primarily due to the aircraft types and volumes using the airport and existing management activities.

Of those identified to represent an elevated risk, eight are considered low priority, four moderate and high priority (Table 12).

SECTION B: AIRPORT WILDLIFE MANAGEMENT PLAN

12. Goals and Objectives

The goal of this Airport Wildlife Management Plan (WMP) is to promote aviation safety for passengers and flight crews by reducing wildlife hazards and associated risks to aircraft and airport operations caused by wildlife activities on and in the vicinity of the airport.

The purpose of Section B is to identify management techniques that will be implemented to address the hazards and risks identified in Section B of this document.

The objectives of Section B of the WMP are to:

1. Determine and implement wildlife management actions for the airport;
2. Identify required actions around the airport;
3. Establish a monitoring program for all aspects of the WMP, including performance monitoring and annual reporting;
4. Establish communication procedures with respect to wildlife hazards;
5. Describe a training program, roles, and responsibilities; and
6. Identify research needs that would assist the improvement of the Penticton Airport Wildlife Management Plan.

13. Review of Available Wildlife Management Measures

Generally, there are tools and techniques available to manage wildlife hazards associated with airports at an acceptable risk level. Approaches to minimizing the potential for serious strikes at airports have focused on five primary areas (after Jackson, 2001).

These are:

1. Manipulating habitat and access to habitat at or near the airport (“passive”);
2. Dispersing, removing, or excluding wildlife from the airport (“active”);
3. Influencing land use decisions around the airport where they may increase the hazard to aircraft;
4. Development of systems to warn of bird strike potential; and
5. Development of aircraft and engines able to withstand bird strikes.

In this WMP, the concern is related to the first three approaches

Critical to the success of any wildlife management program is the human factor and the development of a Safety Management Systems approach (see Transport Canada, 2001a). This encourages the application of the three “Cs” of leadership. These are:

- **Commitment:** Wildlife management requires commitment at all levels from Senior Management to technical field staff. The available tools must be made to work effectively;
- **Cognizance:** Recognizing the hazards and risks and what needs to be done, when, and how, are key to wildlife successful wildlife management; and
- **Competence:** Having adequately trained staff that have the ability to "out-think" the wildlife, identify and properly apply the appropriate tools is critical to successful wildlife management. For example, this may involve considering any consequential effects of managing one species on the abundance of another.

In this Section of the WMP a brief overview of wildlife management techniques is provided in tabular format, based primarily on the *Wildlife Control Procedures Manual* (Transport Canada, 2002). The Manual provides much more detail on these techniques and should be consulted directly. However, they are repeated here to provide a ready summary of available techniques to compare against the hazard and risk assessments for this airport. It is important to link the actions being taken back to the hazard and risk assessment, as these prioritize the actions to be undertaken.

The active methods are primarily directed at the immediate airport environment. Additional techniques may be available for specific off-site applications (e.g., over-wiring active landfill facilities).

13.1 Passive Techniques

These techniques are generally those that alter habitat or permanently exclude entry (Table 13). Experienced wildlife managers know very well that measures to deter or exclude one species (e.g., short grass) will inevitably attract another species. There is an overriding principle that should be followed with habitat alteration: the minimization of habitat diversity. More diverse habitat means more diverse wildlife species. Managing one particular group of wildlife species can be easier than addressing a mosaic of species attracted by a variety of habitats through the seasons**.**

Table 13. Passive Wildlife Management Techniques

Examples	Suggested Approaches (see Wildlife Control Procedures Manual for more details)
Cropland	• Generally, none within 365 m of a runway • Limit to: hay, alfalfa, fall rye, not corn or oats • Avoid ploughing – require night-time ploughing, haying; other harvesting controls and no standing bales
Grass	• Manage height according to hazards at the airport • Adaptive management, experimental manipulation at individual airports • Avoid allowing grass to set seed, seed-head suppression
Buildings	• Ensure entry holes/crevices blocked, screened, netting • Influence design of new buildings, slope ledges • Porcupine wire, electric shocking, sticky caulking
Open water, ponds, ditches, storm water ponds, poorly drained areas	• Typically, none on the Airport Property. Any standing water in the proximity is outside our Perimeter. • Turtle gates installed so as not to impede the turtle's migratory route across the airfield per an agreement with the local Indian Band.
Shrubs, trees, brush, hedges, woodland	• Remove, including undergrowth and understory layers along the perimeter of the runway and take-off locations • Reduce biodiversity, habitat niches along the perimeter of the runway to discourage birds from congregating
Infield perching features	• Remove • Apply spikes when required
Waste storage	• All disposal containers must be wildlife proof • Eliminate dumps on the airport
Outdoor picnic areas	• Signage • Provide wildlife proof garbage containers
All remaining habitats, airport perimeter	• Chain-link fencing, high-tensile fixed knot fencing, • Buried fences • One-way gates, cattle gates.
Aircraft	• Ensure that bird nesting does not occur within parked aircraft and within 150 feet of runway edges through mowing and monitoring, generally from March 15 to August 20.

13.2 Active Techniques

Active techniques fall into two major subgroups. These are:

1. Dispersal (various kinds of deterrents, hazing); and
2. Removal (live capture, killing).

In the following table (Table 14), the relative efficacy of various techniques is also indicated. Many of these techniques are effective when used as part of an integrated program (e.g., playback of distress calls), but can be markedly ineffective when used incorrectly. For example, birds easily habituate to the playback call in the absence of other management techniques.

Because wildlife species often habituate to non-lethal threats within a few weeks, in the long-term, dispersal techniques are seldom effective unless a clear and present danger is presented to the target species (e.g., with a dog, raptor or live gunshot). The management challenge is to keep wildlife guessing when the threat is real, and when it is not.

Table 14. Active Wildlife Management Techniques

	Technique	Primary Targets	Potential Efficacy as Part of an Integrated Program
Non-lethal	Pyrotechnics	Birds, some mammals	High
	Gas cannons	Birds, especially migrants	Moderate
	Report Shells	Soaring birds (e.g., gulls)	High
	Live trapping	Birds, some mammals	Low to moderate
	Dead specimen birds	Birds	Moderate
Lethal	Earthworm sweeping	Earthworms on hard surfaces	Moderate to high
	Live-ammunition shooting	Birds, some mammals	High

The advantages and disadvantages of each of these techniques, and the different forms of these techniques, are discussed and reviewed in the *Wildlife Control Procedures Manual* (Transport Canada, 2002b) and in Aerodrome Safety Circular 98-004- TP13029- *Evaluation of the Efficacy of Products and Techniques for Airport Bird Control* (1998).

13.3 Firearms

Firearms are heavily restricted and special permits are required. Special training is required before they are used in or around this airport.

In addition, the use of firearms in Canada (e.g., shotguns, but not typical pyrotechnic launchers) requires the possession of a PAL (Possession and Acquisition Licence). To obtain this licence it is necessary for the individual licence holder to undertake the Canadian Firearms Safety Course. A Business Firearms License is also required for business organizations or museums, to apply for a firearms business license under the Firearms Act to possess or acquire firearms, ammunition, restricted weapons, prohibited weapons, prohibited ammunition, or prohibited devices. The PAL and the Business Firearms License must be renewed every 5 years. More information can be accessed at: Firearms forms | Royal Canadian Mounted Police (rcmp-grc.gc.ca)

When using firearms, empty casings shall be recovered; they can cause serious damage when ingested into turbine aircraft engines.

13.4 Other Permit Requirements

Wildlife management personnel must ensure that all appropriate permits are in place and current prior to operations commencing. This should include the following.

Migratory Birds – *Migratory Birds Convention Act*

Regulations under this Act protect most bird species, including gulls (but excluding, for example, crows and blackbirds) and permits are required for active scaring as well as killing. Therefore, an application should be made for both a scare permit and a kill permit. The kill permit application will need to carefully establish the need for a kill permit, explain the limited use to which the permit will be put and the manner in which lethal reinforcement and other alternate deterrents will be used. The permits are issued by the Pacific and Yukon Region Canadian Wildlife Service Environment and Climate Change Canada office located at 5421 Robertson Road Delta BC V4K 3N2.

Provincial and Territorial Regulations

Provincial and Territorial regulations may require a Small Game License, or similar, to hunt or trap crows, selected blackbirds, and most mammals. In BC, the licensed individual will also require a BC Trapping Permit. The use of some chemicals may also be controlled, and provincial regulations should be consulted at Okanagan Shuswap Natural Resource District (DOS) 2501 - 14th Avenue Vernon, B.C. V1T 8Z1. Currently Penticton Airport does not use chemicals.

Local By-Laws – Discharge of Firearms

Many urban and suburban municipalities have discharge of firearm By-laws in place that restrict the use of firearms. In these cases, it may be necessary to apply to the local authority for an exemption from a firearm discharge By-law, for wildlife management purposes. Regulations should be consulted at Okanagan Shuswap Natural Resource District (DOS) 2501 - 14th Avenue Vernon, B.C. V1T 8Z1.

13.5 Outside Airport Boundaries

Although most wildlife management activities detailed in this plan will take place within the airport limits, where most wildlife strikes occur, the immediate surroundings of airports are increasingly being scrutinized as critical sources for wildlife species that either visit the airport or pass-through conflict zones.

In some circumstances, airports may extend their active or passive wildlife management activities beyond the airport boundary. However, the typical tool kit for influencing land use activities outside of the airport may include a combination of: regulation, outreach, education (wildlife hazard awareness program), discussion and persuasion. The following approaches may be used to influence activities outside the airport.

Airport Zoning Regulations

Airport Zoning Regulations that are established under the Authority of the *Aeronautics Act*, Section 5.4(2) could be enacted to prohibit land use activities that have been identified as hazardous to aircraft operations. As of July 2004, 55 airports across Canada have a Waste Disposal Clause contained within their zoning regulations.

Government Planners

Engagement in the local planning process is critical to influencing land use change around the airport. The airport operator can open a dialogue with planners, provide materials and copies of the WMP, and provide a presentation every two years or so on land use issues that affect the airport. It is important to keep this information current and to include all planning partners (e.g., in the case where the airport zone of influence straddles two jurisdictions or where there are two or more tiers of planning authority). In some cases, local Official Plans refer applicants to seek consultation with the Airport Managers when certain changes in land use activities are proposed near the airport.

Local Government

Providing an occasional presentation on wildlife issues at the airport to local, city or regional council is an important step in influencing future land use change applications, many proponents will “test the water” with local politicians prior to launching a full-scale development application. Having wildlife concerns identified at the earliest possible stage will help encourage positive outcomes.

Land Users
The users of lands around the airport can be engaged in a dialogue with the airport. This may be more easily facilitated when these landowners have a direct interest in the airport (e.g., a local farmer who also crops hay within the airport boundary). However, this does not mean that other land users should be excluded. An open house to discuss hazard issues, safety, potential liability, what land users can do to help and how the airport might be able to assist the land users is a useful start. Specific problems may indicate a need to contact individual land users.

Regulatory Agencies
Regulatory agencies may influence a variety of projects from wildlife habitat creation to the design of stormwater management facilities. Without knowledge within the agency of wildlife strike issues, proponents of land use change may find themselves pulled in two different directions. The kinds of agencies that need to be regularly updated on airport wildlife issues include federal, provincial, and municipal authorities such as: Federal Department of Fisheries and Oceans, provincial ministries responsible for natural heritage and land and water resources and Conservation Authorities (or other flood and fill-oriented agencies).

Non-Governmental Organizations (NGOs)
Some of the larger national or provincial NGOs may be involved in habitat creation initiatives and maybe included in a stakeholder group (e.g., Ducks Unlimited Canada). Others, such as natural history groups or humane societies, may become important to the airport if wildlife control, especially lethal control, is included as part of the WMP. Organized public opposition can influence a variety of permit applications, it is therefore important to ensure that these groups are included when appropriate.

In some circumstances the striking of a stakeholder committee (a “Wildlife Management Committee”) may help foster awareness and support for management actions and the airport will consider establishing such a committee should the need arise.

14. Determination of Wildlife Management Activities for Penticton Airport

Section A of this WMP has presented detailed information on:

a) Aircraft movement statistics, including types;
b) Wildlife hazards and their habitats and movements; and
c) A risk assessment for this airport.

In Section B typical management tools that can be used on and off the airport have been discussed. In the following chapters, management activities that are intended to remove or manage the hazards and mitigate risks created by those hazards are detailed.
This section has been broken into first, second and third priority. The planned activities have been developed from a review of the problem species, what attracts them into the conflict zone (whether on or off the airport) and steps taken to address both the attractants (e.g., short grass, open water, small mammals, or worms as food) and the species themselves (e.g., dispersal of gulls and starlings).

It is important to note that steady improvement in wildlife management at the airport does not mean that all activities need to be undertaken in the first instance. It is intended that this plan will provide guidance on management priorities. Progress will be made towards plan objectives, as amended from time to time, over the next several years.

14.1 First Priority

WILDLIFE FOOD CONTROL
Wildlife is attracted by the presence of food therefore eliminate:

- Garbage (exposed edible waste),
- Bushes on and along the perimeter of the airport lands,
- Seed-producing vegetation via mowing or other means,
- Green weeds,
- Grass (maintained by mowing regularly),
- Large numbers of rodents or small birds (standard clean site practices will eliminate this problem most effectively), and
- Large numbers of insects and earthworms.

WILDLIFE SHELTER AREAS
Shelter habitat includes safe areas where wildlife loaf, perch, roost, and nest. Depending on the species, birds will find natural or man-made shelter in the following areas:

- Forested areas around the airport in the west;
- Dense brush along roadsides and border areas;
- Dead trees in the east and along the shoreline of Skaha Lake;
- Brush piles associated with shrub areas;
- Water bodies along the south and east lakes of the site;
- Drainage ditches;
- Remnant oxbow lakes in the east;
- Open short-grass fields that remain unmowed;
- Building roof ledges, crevices, and holes;
- Overhead wires;
- Towers; and
- Building vents and ducts.

General methods of control for the above may be implemented at the discretion of the airport manager as they deem appropriate, but should include options through the following practices:

- Apply worm repellent along runway edges;
- Weeds can be selectively controlled with a variety of herbicides, which should be applied in the spring;
- Eliminate posts, lights, and markers. Individual posts can be made less attractive by embedding a single large nail in the top of the post. Other techniques include the application of commercial products that leave a sticky residue which makes perching uncomfortable. Applying these materials should be continually repeated, however, as exposure to sun, rain and dust reduces their effectiveness. Furthermore, these products can interfere with routine maintenance activities on lighting fixtures etc.;
- Work diligently to ensure the runway and taxiways are kept clean on either side of the airport. Inspections should be routine, and all materials that might attract birds, such as carrion, spilled crops, and refuse should be removed immediately as they are noticed;
- Long-grass areas (or unmowed grasses over an extended period of time) such as the open fields surrounding the airport should be eliminated because it harbours ground-nesting and foraging birds (ducks and hawks), numerous small mammals (mice, voles, hares, rabbits), and large numbers of insects can be present in these areas. This is a bird attractant;
- Brush and bushy vegetation should be eliminated to within 150 metres of runway ends and runway centre lines. Cutting, clearing and herbicide treatments can be employed for this purpose;
- If tree cutting is not feasible, undergrowth should be removed from these areas (e.g., along Skaha Lake and eastern sections of the airport associated with the wetlands/ponds. Within the forested areas to reduce the raptor of general bird use, the edges of trees can be thinned at their tops to make them less attractive as roosting sites. Trees should be frequently inspected for colonies of nesting birds, like crows, and for roosts of such species as starlings. Trimming of trees in the areas in the north, east and south of the runway could detour roosting of birds. While airport crow and raven or even starling colonies rarely go unnoticed, starlings are relatively inconspicuous, leaving their roosts at dawn and returning at dusk. Dense, tall shrubbery should be separated from the runway only by a narrow strip of grass. Clearing this shrubbery could solve roosting problems;
- Around the terminal and buildings of the airport control of bird species may be performed by screening holes and openings in hangars is a first step in denying birds access to these buildings;
- Fine parallel wires can be attached to antennae, towers, and overhead wires to discourage birds from perching and roosting; and
- Spiked material such as porcupine wire can also be installed, although this is generally an expensive alternative.

Canada Goose

Highest Airport Risk Ranking: High
Management Priority: High

Summary:

This species was ranked high priority because it is frequently seen at the airport, and can fly across aircraft approaches in the afternoons, when they move to a frequently used portion south of the runway and may sit on the apron for warmth and closeness to food (e.g., grassed areas). Geese occasionally forage on the airport grass and annually attempt to nest at ponds or safe structures. It is a large-sized bird, has flocking habits and a relatively slow flight.

The following steps are presently employed to assist with mitigating geese at the airport:

- A zero-tolerance policy has been adopted for geese through multiple airside observations and inspections;
- Seed-producing vegetation is controlled via mowing as required or other means;
- Green weeds are eliminated using regular mowing;
- Grass is maintained by mowing regularly and fertilizers are not part of the grass management regime;
- Any future redesign of drainage features will minimize waterfowl habitat, steep sides (4 to 1), hard edges and no vegetation where possible, pipes should be used where possible;
- While shooting local (regularly occurring) geese at the airport is an option to prevent nesting, it is rarely used due to the proximity of the airport to residential and commercial buildings;
- Pyrotechnics (reinforced with live shooting) are used as required whenever geese are seen during wildlife patrols or reported by staff or pilots. Regular chasing and patrols specifically for geese should be increased during times of presence when geese begin to occur at the airport again after their flightless period in late summer;
- A hazard awareness program may be developed for geese;
- The awareness program may be presented to: a) the local municipality to seek assistance with management and the adjacent golf course to the west should be notified to see if there is mutual interest in goose management;
- Forb-rich grass management techniques are not an objective at this time, as this may increase use by small mammals, deer, eagles, and raptors;
- Vehicle wildlife use management is in effect;
- Possible dog deterrent options may be investigated as they are effective means of dispersing waterfowl at a number of airports around the world.

- During peak migratory periods (March to May and September to November), pyrotechnics are effective for clearing birds. Multiple scare tactics are combined, as a range of products as geese can become habituated to the same tactic. i.e., gas cannons reinforced with live ammunition, and screamer shells have also proven both effective and cost-efficient in dispersing Canada Geese.
- Distress and alarm calls are highly recommended for the dispersal of geese, however there are none deployed at the Penticton Airport. There is a strong biologically based link between alarm calls and escape responses in birds. Furthermore, birds habituate slower to distress and alarm calls than to pyrotechnics.
- Extremely long grass up to 75 centimetres high has been proven to be effective in keeping both geese and ducks off airport lands. This may be tried in goose and duck loafing preferred areas at the airport.
- Lethal-control programs are often required in areas where geese take up permanent residence. Although not as effective as lethal control programs, some airports remove geese using trap-and-relocation programs.

Gulls

Highest Airport Risk Ranking: High
Management Priority: High

Summary:

Tend to concentrate at wet fields, grass while being cut, or if applicable, ploughing operations, and along the shoreline of Skaha Lake. They prefer to forage on the runway for worms (especially during and after wet weather) or on carcasses, short and mown grass for invertebrates. May move across high-risk zones (Figure 6), follow water levels for opportune forage and when moving through the area. For flocking, use of airside areas, flightlines may be crossed in high-risk areas moving from one end of the shoreline along Skaha Lake to other. Numbers peak through late fall through winter and recede through to the end of spring. Low numbers are common through the summer when many individuals are on breeding grounds but increase during natal disbursal in the late fall. Based on observation, gulls do not normally congregate on the airfield.

The following steps should be undertaken:

- In the spring and fall, precipitation events that cause worms to emerge onto the runway and taxi surfaces in great numbers will result in mechanical sweeping to remove the worms;
- Generally, short grass length at the airport will be increased to 12 cm and cut to a minimum of 9 cm. Gulls find it difficult to observe predators in long grass. These birds also have difficulty accessing small invertebrates—convenient sources of food—in long grass;
- Gulls could be selectively shot at the airport to reinforce deterrents;

- Pyrotechnics and report shells (reinforced with live shooting) could be used whenever gulls are seen during wildlife patrols. Patrols specifically for gulls should be increased when monitoring shows increased use of the airport;
- All garbage bins on site should be wildlife proof;
- There should be an airport policy to ban feeding of wildlife by staff and visitors. This should be posted and initiated;
- A hazard awareness program for gulls should be developed and presented to the golf course manager in the west;
- If deemed necessary, the airport will formally request a risk assessment for the gull problem, citing safety concerns;
- Scare tactics and persistent harassment are effective in reducing the number of gulls. Shell crackers and flares should be reinforced with live ammunition, and distress-cry tapes; these should also be modified regularly to prevent habituation, and used in conjunction with habitat modification techniques;
- Target gulls flying at the head of flocks to best demonstrate the danger to other birds;
- Placing dead birds at strategic locations and in agony postures also reduces the likelihood that other gulls will return;
- Store garbage indoors, or in well-sealed outdoor dumpsters.
- Scare tactics and persistent harassment are effective in reducing the number of gulls.

Hawks and Eagles

Highest Airport Risk Ranking: High
Management Priority: High

Summary:

Forage over open fields (e.g., grass and grazing area habitats on-site). Likely present during mid-morning hunting over fields at airport. Roosts may be found along edge of forested blocks south of airport in the forest and areas in the east. Towers and signs may be used as hunting perches. High flights but may fly along shoreline areas foraging or in transition from ground to higher elevation points to gain altitude for forage attempts. If they focus on prey item, they will settle onto airstrip and associated grass habitat. Use thermals for advancement of flight pattern.

The following steps should be undertaken:

- The hawk is a perching bird, removal or modification of perching sites is recommended. Sharp projections of porcupine wire or a single spike both placed on post tops effectively discourage perching;
- Cut off known perching branches of trees along the perimeter of the field to discourage roosting and sitting;
- Minimize food supplies by reducing small-animal populations through vegetation and water-body management;

- Eliminate perch sites and replace them with perch barriers and tactile repellents;
- Options should be reviewed to live-trap and relocate birds that have become comfortable at the airport (if applicable);
- Clean up garbage. Although they do not feed on garbage or agricultural products, owls are attracted by rodents that favour such food sources;
- Eliminate perch sites, replace them with perch barriers, or treat them with tactile repellents;
- Given the broad diet of hawks and the difficulty managing all their food sources—food-supply management should be considered only one aspect of an overall control program.

Blackbirds/Starlings

Highest Airport Risk Ranking: High
Management Priority: High

Summary:

These birds occur over and around the runway, grass areas, shrub thickets along the perimeter of the airport. Also close to forest and open field transition areas. Mass flocking in areas of exposed tilled soil and food opportune locations of grass habitat, especially after grass cutting. Flocking in fall, low flying, and often crossing airfield. Flocks will also perch in trees and circle around any raptors in area. They are most likely to be associated with wildlife tree areas of the east and along the shoreline of Skaha Lake habitat. They use seeds and short turf for feeding. Feed on long and short grass as well. Some nest, mainly in buildings of residential units and cavities surrounding the airport. Possible roost locations may be associated with residential areas.

The following steps should be undertaken:

- Remove all nests found in airport buildings and prevent future nesting by sealing cracks and holes and placing screen vents over other openings;
- Discourage roosting by closing buildings and placing porcupine wire on ledges, rooftops, and rafters. Netting or wires can also be placed over indoor roosting areas;
- Cut back or remove trees used for perching;
- Clear grass and vegetation along fence rows;
- Keep grass long to decrease the ability of small birds to see prey and find food. As European starlings feed on insects, aerial spraying of insecticides is effective in conjunction with long-grass programs;
- Use scare tactics, such as shell crackers and distress-cry tapes, to disperse birds. Scare tactics should be modified and varied frequently to avoid habituation. This technique is best employed in the early morning and late afternoon when blackbirds are actively feeding; scare tactics should also be modified and varied frequently to limit habituation

- Lethal controls include the use of earthworm sweeping and live-ammunition shooting;
- Trapping is largely ineffective against the high numbers of European starlings;
- In late summer and fall, reduce standing weeds, particularly adjacent to the runway, through cutting or a seasonal-herbicide application;
- Eliminate vegetation surrounding permanent wetlands, such as ponds and ditches; and

Great Blue Heron

Highest Airport Risk Ranking: High
Management Priority: High

Summary:
Hotspots include the runway strip, foreshore area of Skaha Lake, open field and oxbow lakes east of runway for foraging. Also found along roadside ditches and wet margins foraging for small mammals such as mice and voles and herpetofauna (e.g. frogs and lizards). May be found along edge of beach and grass areas at site. May fly low and slow flight path across but primarily around airfield moving from feeding locations during tide level fluctuations, low maneuverability.

The following steps should be undertaken:

- Crews should actively scare off birds from the area.
- Pyrotechnics should be used whenever herons are seen during wildlife patrols.
- Maintain short grass to maximize visibility and reduce rodent food supply.

14.2 Second Priority

Turkey Vulture

Highest Airport Risk Ranking: Moderate
Management Priority: Moderate

Summary:

Turkey Vultures tend to roost in large numbers on rock ledges, cliff faces, like those to the west of the airport, hollow trees, and even in abandoned buildings. Although vultures are not known to attack aircraft, the slow speed of these birds contributes to their involvement in many serious strikes due to its large size and soaring behaviour. Turkey Vulture populations are on the increase, and the birds are now found in southern Canada, where they are likely to pose problems at airports in the near future.

Although presently a low-risk bird in Canada, Turkey Vultures have been involved in only three reported strikes between 1993 and 2000; the Turkey Vulture population in Canada continues to increase. The large body mass and low-level soaring behaviour of these birds makes them an increasing strike threat.

The following steps should be undertaken:

- Turkey Vultures feed primarily on carrion and are often found at landfills and road carrion. Several options for turkey vulture control exist, all of which fall under two categories, lethal and non-lethal control. Non-lethal control and/or habitat modification do not necessarily require a permit (depending upon the method chosen), however, lethal control methods will require a federally issued permit to allow for removal of this species.

- NON-LETHAL CONTROL:
  Non-lethal controls are methods that are devised to alter the animal's habitat to deter it from returning to the area. These methods range from habitat modification to direct hazing, which may require a special permit.
- HABITAT MODIFICATION
  Turkey vultures are associated with a broad array of habitat types and are likely in search of food and (pending the time of year) nesting habitat. One can modify a habitat by minimizing preferred food sources and habitat type; doing this should create a habitat that would likely not attract turkey vultures. Promptly remove and dispose of vertebrates struck by aircraft or ground vehicles.

- Utilizing roosting deterrents such as bird spiders ™ and spikes is another method to make potential roosting areas (such as dead trees and roofs) less attractive to turkey vultures.

- Some studies have shown that a dead turkey vulture (freeze-dried taxidermy mount with wings spread), hung by its feet in a vulture roosting or perching area, will cause vultures to abandon the site.

- FRIGHTENING DEVICES:
  Pyrotechnics may be a suitable way to frighten turkey vultures but may however be rather ineffective. Repeated exposure to loud sounds or stressful situations such as yelling, or chasing could frighten turkey vultures and if repeated could deter their return.

- REMOVAL/RELOCATION:
  Turkey vultures are federally protected under the BC Wildlife Act and can thus not be trapped for removal without a special permit allowing one to do so. This method can also be expensive, labor intensive, and potentially dangerous.

- PREVENTING FEEDINGS:
  A simple method to make land less attractive to turkey vultures is to identify and remove any carrion from the property. Turkey vultures feed almost exclusively on

carrion; removal of such matter would create an environment virtually devoid of any food source.

- LETHAL CONTROL:
  Turkey vultures are federally protected under the Migratory Bird Treaty Act and cannot be removed in a lethal fashion without a permit to do so. Lethal methods should be used only as a last resort if other non-lethal methods and habitat modification methods fail.

Swallows

Highest Airport Risk Ranking: Moderate
Management Priority: Moderate

Summary:

Fly over grass areas of airstrip and low flying seeking opportunity for aerial forage for insects. Especially in areas of high insect abundance such as the exposed fields and grazing field areas defined on-site. Flocking is common and may include numbers of individuals foraging in same locations. Because they likely nest on buildings and structures forage occurs over the runway and grass areas when insects such as crane flies (*Tipula* sp.) gestate in late summer.

The following steps should be undertaken:

- Building roof ledges should be inspected during May and June on a regular weekly basis for the presence of nests. These should be removed outside of the breeding season (September 1 to April 30 of any year). Active nests (e.g., occupied by a bird or its egg) are protected by the Migratory Birds Convention Act, therefore, permits will be required to eliminate these nests from the CWS/Env. Can. (see Section 13.4);
- Possibly install spike strips;
- Nest removal is the most effective way to control swallows at airports. Airport buildings and structures should be checked regularly for nests, which should be removed immediately. Hidden nests can be located by watching the ground in preferred nesting areas for accumulated bird droppings and straw;
- Block and screen holes, cavities, vents, and ledges to prevent access to the interiors of airport hangars and buildings. The application of screen and plastic or metal sheeting prevents nests from adhering to the underside of eaves;
- Eliminate insect-breeding areas through vegetation management;
- Consult with golf course to determine effective aerial spays for eliminating insects.
- Eliminate insect-breeding areas—such as slow-moving water—through vegetation management.
- When using pyrotechnics, vary the sounds and locations daily to avoid habituation.

14.3 Third Priority

Deer

Highest Airport Risk Ranking: Low
Management Priority: Low

Summary:

This species is ranked moderate, rather than high, because the numbers are low in association with the airport. Deer causes significant damage when they are struck by aircraft. They are also particularly active at dawn and dusk and during the night when low light conditions make them hard to see. They frequent the grass fields and grazing edges of the airport, especially in summer, as well as long grass area, they use to frequently cross the airport area. They are infrequent or absent in typical winters.

The following steps should be undertaken:

- A zero-tolerance policy for deer incursions will be continued;
- Once weekly during the growing season, vegetation will be cut along the entire electric fence with a trimmer to avoid short circuits;
- Interference by deep snow should be monitored and appropriate actions taken, this may mean the turning off of one or two strands, or the entire fence unless tracks indicate deer activity; and
- Long grass areas of the grazing area and along the forest will be maintained at a height not exceeding 50 cm.
- Remove any broad-leaved vegetation, such as trees and shrubs inside the airport and in association with the perimeter fencing;
- One-way gates may be used in conjunction with perimeter fencing to allow deer to exit fenced area of the field. As they permit deer to escape on their own, these gates reduce the dangers to deer posed by trapping and handling procedures. The gates should be installed in areas of highest deer traffic. One-way gates require regular maintenance; and
- The live capture of deer for relocation could be performed and relocation.

15. Monitoring

Monitoring is a critically important wildlife management tool. Monitoring provides information to assist the Wildlife Management Officer (WMO) in adjusting the program in response to shifts in hazard and risk. It also provides a tool to demonstrate, to regulators and others what the airport has been doing to minimize risks, and to maximize safety for its staff and the traveling public. This can be particularly important should a litigious situation arise.

15.1 Daily Wildlife Management Log

The first step in a good monitoring program is good record–keeping. Penticton Airport utilizes VORTEX, a digital record management system, and AIM World, an online record-keeping tool used to inspect airfield and wildlife activities. The two systems are integrated so that Bird and Wildlife sightings and activities are captured in the inspection vehicle and logged into both programs. Inspections for Birds and Wildlife are also logged in the AIM program. Any identified Species at Risk are categorized as such within VORTEX for correct inventory of sightings or strikes. Reports can be generated within VORTEX to track inventory.

15.2 Monthly Summary

VORTEX has the capabilities to generate monthly and annual wildlife reports on bird strikes, wildlife encounters, strike locations, dispersants used, and species summaries. These summaries provide a discussion of wildlife interactions to help focus the need for future changes to the WMP. For example, success in managing one species that leads to a sharp increase in another species should be noted, even if the evidence is largely circumstantial and anecdotal. The “best judgement” of experienced WMOs on the ground will be given careful consideration.

The monthly summary provides an opportunity for any new information on policies, new laws, changes in the status of rare species known to frequent the airport, training programs or management reviews to be written and stored in a readily accessible location.

15.3 Wildlife Strikes

The regulations require airport management to report all wildlife strikes to Transport Canada as they occur or to file an annual report detailing all wildlife strikes by March 01 of the following year or for each wildlife strike within 30 days of its occurrence. Penticton Airport has chosen to report wildlife strikes to Transport Canada as they happen. When reporting a wildlife strike, the Transport Canada form titled Bird/Wildlife Strike Report number #51-0272 can be used and is available on-line at:

http://wwwapps.tc.gc.ca/saf-sec-sur/2/bsis/s_r.aspx?lang=eng

Any information that the airport operator has, that is outlined on the form, should be included. If strike data become increasingly reliable sources of information, they will also assist in the risk analysis procedure for this airport and future updates to this WMP. This is in accordance with the "Advisory Circular Subject: Wildlife Strike Reporting Issuing Office: Civil Aviation, Standards Document No.: AC 302-028 File Classification No.: Z 5000-34 Issue No.: 01 RDIMS No.: 14239260-V4 Effective Date: 2018-09-25."

Wildlife strikes are now defined by Transport Canada as occurring when:

a) A pilot reports the striking of wildlife;

b) Aircraft maintenance personnel identify damage to an aircraft as having been caused by a wildlife strike;

c) Personnel on the ground report seeing an aircraft strike wildlife; or

d) Wildlife remains that are found within 200 feet of a runway or an airside pavement area are presumed to be the result of a wildlife strike, unless another cause of death is identified.

Strike data will be entered into the wildlife management database with the required fields of information provided (see Appendix 3 of the *Wildlife Control Procedures Manual*). The software discussed in the preceding section includes a data entry window for wildlife strikes.

At this airport, regular wildlife patrols will note any dead wildlife found within 200 m of the runway centreline, for struck wildlife species. Notation will also be made of any animal remains that are considered non-strikes, prior to their removal.

Where the identity of remains of wildlife species that have been struck is in doubt, parts will be preserved for identification. After taking a digital photograph for the Wildlife Log, remains will be bagged in zip-lock bags (e.g., bones, fur, feathers of different types, bill, and feet, but not soft tissues). Specialists may be able to identify a bird from a single small feather, so even if they look unidentifiable, remains should be recovered. Specimen material can be sent by courier to: Ms. Carla J. Dove, Division of Birds, Smithsonian Institution PO Box 37012 National Museum of Natural History Room E 607 MRC 116 Washington, DC 20013-7012 USA. (Email: dove.carla@nmnh.si.edu). The form can be found on-line at:

http://www.tc.gc.ca/CivilAviation/Aerodrome/SafetyCirculars/SpeciesIdent.htm

WMOs should also consider the collection of any strikes (even those identified) should stomach contents or bird age be a factor for future consideration (e.g., what food source was attracting the bird to airport?).

In addition to any studies, research, or other new information that is available, the Daily Wildlife Management Log and the Monthly Summaries will be carefully examined for information that will assist the required two-year update to this WMP.

16. Establishment of Performance Indicators and Self-Assessment

The establishment of performance indicators is critical to help determine the need for enhancement or modification. It is also very necessary because actions to reduce one wildlife hazard will inevitably result in improved conditions for some other wildlife species. When inadvertent effects such as these result in an increase in hazards, this must be recognized and addressed.

The seven primary measurements of performance in this plan are:

1. The number of wildlife strikes;
2. Strike rate;
3. Damage associated with strikes;
4. Individual species' hazard assessments;
5. Feedback from airport users;
6. Risk rankings for this airport; and
7. The status of action items that have been recommended in the plan.

Strike data are generated from the monitoring program and the annual strike report that are filed with the Minister prior to March 01 of each following year and with the Migratory Birds permit. Although this airport is interested in reducing the overall strike rate independent of air traffic movements, it is true that more strikes are likely when air traffic increases. Therefore, the strike rate will also be measured per 10,000 air traffic movements. A discussion of damage related to strikes are provided, as strikes that do not produce much or any damage may not be treated with the same level of concern as damaging strikes.

The hazard and risk assessment will be updated and compared to the previous assessments in the WMP every two years (or earlier if there is a significant change in hazards or risk). A discussion of any changes will be provided.

Feedback from airport users will be sought and reported in time for each two-year update this will help determine if the wildlife program is being responsive to their needs.

The final performance measurement will be the extent to which action items in the plan have been instigated. Taken together, these seven measurements will form an effective and objective measurement of performance of the WMP for this airport.

17. Summary of Activities and Approaches

Several of the proposed management techniques in the previous sections are duplicated. For example, the removal of a particular habitat feature, cutting grass, will reduce the hazard and risk associated with several groups of species (e.g., geese, ducks, and blackbirds).

In this section, a brief bullet point summary of activities is provided, along with other requirements such as permits.

- A zero-tolerance policy should be implemented for geese at the airport;
- Seed-producing vegetation control via mowing or other means;
- Green weeds should be eliminated using methods identified above;
- Grass should be maintained by mowing regularly and fertilizers should not be part of the grass management regime;
- Any future redesign of drainage features will minimize waterfowl habitat, steep sides (4 to 1), hard edges and no vegetation where possible, pipes should be used where possible;
- Local geese at the airport should be shot to prevent nesting and, in the fall, to reinforce deterrents;
- Pyrotechnics (reinforced with live shooting) should be used whenever geese are seen during wildlife patrols or reported by staff or pilots. Patrols specifically for geese will be increased during times of presence when geese begin to occur at the airport again after their flightless period;
- A hazard awareness program will be developed for geese;
- The awareness program will be presented to: a) the local municipality to seek assistance with management and the adjacent golf course should be notified to see if there is mutual interest in goose management;
- Forb-rich grass management techniques should not be an objective at this time, as this may increase use by small mammals, deer, eagles, and raptors;
- Vehicle wildlife use management should be implemented/continued; and
- Building roof ledges be inspected during May and June on a regular weekly basis for the presence of nests. These should be removed;
- Nest removal is the most effective way to control swallows at airports. Airport buildings and structures should be checked regularly for nests, which should be removed immediately. Hidden nests can be located by watching the ground in preferred nesting areas for accumulated bird droppings and straw;
- Block and screen holes, cavities, vents, and ledges to prevent access to the interiors of airport hangars and buildings. The application of screen and plastic or metal sheeting prevents nests from adhering to the underside of eaves;
- Eliminate insect-breeding areas through vegetation management; and.
- Consult with golf course to determine effective aerial spays for eliminating insects.
- Scare tactics, such as shell crackers, and gas cannons could be used in peak migratory periods;

- Maintain long grass, as sandpipers prefer short grass or gravel along the beach and areas that provide clear views of predators and better access to food;
- Pyrotechnics, such as screamers and whistlers have proven effective in dispersing Dunlins;
- Propane cannons to drive birds upwards rather than out of the area; and
- The hawk is a perching bird, removal or modification of perching sites is recommended. Sharp projections of porcupine wire or a single spike both placed on post tops effectively discourage perching;
- Minimize food supplies by reducing small-animal populations through vegetation and water-body management;
- Eliminate perch sites and replace them with perch barriers and tactile repellents;
- Options should be reviewed to live-trap and relocate birds that have become comfortable at the airport (if applicable);
- Modify agricultural practices and clean up garbage. Although they do not feed on garbage or agricultural products, owls are attracted by rodents that favour such food sources;
- Eliminate perch sites, replace them with perch barriers, or treat them with tactile repellents; and
- Grade and eliminate low mounds and rubble heaps to reduce available perches.
- In the spring and fall, precipitation events that cause worms to emerge onto the runway and taxi surfaces in great numbers will result in mechanical sweeping to remove the worms;
- Generally, short grass length at the airport will be increased to 12 cm and cut to a minimum of 9 cm;
- Gulls could be selectively shot at the airport to reinforce deterrents;
- Pyrotechnics and report shells (reinforced with live shooting) could be used whenever gulls are seen during wildlife patrols. Patrols specifically for gulls should be increased when monitoring shows increased use of the airport;
- All garbage bins on site should be wildlife proof;
- There should be an airport policy to ban feeding of wildlife by staff and visitors. This should be posted and initiated;
- A hazard awareness program for gulls should be developed and presented to the golf course manager;
- If deemed necessary, the airport will formally request a risk assessment for the gull problem, citing safety concerns;
- Cutting airport grasses no shorter than 10 centimetres reduces the attraction to gulls. Gulls find it difficult to observe predators in long grass. The airport manager should constantly monitor grass management programs to gauge their effectiveness;
- Store garbage indoors, or in well-sealed outdoor dumpsters;
- Scare tactics and persistent harassment are effective in reducing the number of gulls. Shell crackers and flares should be reinforced with live ammunition, and distress-cry tapes;
- Scare tactics should also be modified regularly to prevent habituation, and used in conjunction with habitat modification techniques;

- Target gulls flying at the head of flocks to best demonstrate the danger to other birds;
- Placing dead birds at strategic locations and in agony postures also reduces the likelihood that other gulls will return;
- Wires should be suspended at 36-centimetre intervals approximately 18 centimetres above water pool areas on land; and
- Pyrotechnics and report shells (reinforced with live shooting) could be used whenever they are seen during wildlife patrols. Patrols specifically for crows and ravens should be increased when monitoring shows increased use of the airport;
- If deemed necessary, the airport will formally request a risk assessment for a crow and raven problem, citing safety concerns;
- Store garbage indoors, or in well-sealed outdoor dumpsters;
- Scare tactics and persistent harassment are effective in reducing the number of crows and ravens. Shell crackers and flares should be reinforced with live ammunition, and distress-cry tapes.
- Scare tactics should also be modified regularly to prevent habituation, and used in conjunction with habitat modification techniques;
- Target crows and ravens flying at the head of flocks to best demonstrate the danger to other birds; and
- Placing dead birds at strategic locations and in agony postures also reduces the likelihood that others will return.
- A zero-tolerance policy for deer incursions will be continued;
- Once weekly during the growing season, vegetation will be cut along the entire electric fence with a trimmer to avoid short circuits;
- Interference by deep snow should be monitored and appropriate actions taken, this may mean the turning off of one or two strands, or the entire fence unless tracks indicate deer activity; and
- Long grass areas of the grazing area and along the forest will be maintained at a height not exceeding 50 cm.
- Remove all nests found in airport buildings and prevent future nesting by sealing cracks and holes and placing screen vents over other openings;
- Discourage roosting by closing buildings and placing porcupine wire on ledges, rooftops, and rafters. Netting or wires can also be placed over indoor roosting areas;
- Cut back or remove trees used for perching;
- Keep grass long to decrease the ability of small birds to see prey and find food. As European starlings feed on insects, aerial spraying of insecticides is effective in conjunction with long-grass programs;
- Use scare tactics, such as shell crackers and distress-cry tapes, to disperse birds. Scare tactics should be modified and varied frequently to avoid habituation. This technique is best employed in the early morning and late afternoon when blackbirds are actively feeding; scare tactics should also be modified and varied frequently to limit habituation;
- Trapping is largely ineffective against the high numbers of European starlings;
- In late summer and fall, reduce standing weeds, particularly adjacent to the runway, through cutting or a seasonal-herbicide application;

- Eliminate vegetation surrounding permanent wetlands, such as ponds and ditches; and
- During peak migratory periods, pyrotechnics are effective for clearing birds from airports. Scare tactics work best when they combine a range of products, such as gas cannons reinforced with live ammunition. Screamer shells have also proven both effective and cost-efficient in dispersing birds;
- During peak migratory periods, scare tactics, such as shell crackers have proven effective in clearing ducks from the runway and taxiways.

Equipment, Contract Requirements and Permits

- An equipment list will be prepared for the WMP.
- A mowing device appropriate for cutting long grass in wet areas will be required.
- A pest control specialist will be contracted for baiting (if nesting occurs).
- Federal firearm permits and federal kill permits for migratory birds will be updated to include the additional species (kill permits for gulls, geese, mallard, and nest destruction permits for Killdeer, Mallard, Canada Geese and Swallows).
- Provincial/territorial hunting licences, trapping permits and kill permits will be updated.

18. Communications Procedures

The following communication procedures have been established for the purposes of wildlife management at this airport:

1. Information will be provided directly from the field staff on duty to Flight Service Station (FSS) via radio contact.
2. Field staff will be responsible for ensuring that updated wildlife information is provided to FSS immediately if an urgent situation arises and on a regular basis depending on the current conditions, or when requested by FSS. FSS will also relay any information received regarding wildlife observations to field staff in a timely manner.
3. FSS will provide information to pilots on current wildlife hazards and will ask pilots to report any wildlife observations to FSS, especially those observed while taxiing.
4. Wildlife activity will be regularly updated on the Automatic Terminal Information Service (ATIS).
5. Entry in the Canada Flight Supplement (CFS) to warn pilots of hazardous wildlife.
6. When wildlife hazards are observed, FSS will alert the pilots through voice advisory.

19. Training Program

The Wildlife Management and Planning Regulation requires that a training program be established for the WMP in accordance with the airport standards. Properly trained staff to implement the plan, to reassess risks and to provide updates to this plan every two years, is an essential and required part of the regulation.

All maintenance staff must complete the Wildlife Control Course every five years. Canadian Firearms Safety Course; Possession & Acquisition License must be renewed every five years for all maintenance staff, and this permit is optional for the Airport Manager. The Airport Manager is required to maintain a record of training for a period of 5 years and provide the Minister with a copy upon request. Records of trainings are documented in Vortex – Training Module.

Effective wildlife management is critically dependent on staff with the tools, knowledge, and motivation to complete the task at hand. Staff must be trained at least once every five years.
The program will address the following:

- Nature and Extent of the Wildlife Management Problem;
- Regulations, Standards and Guidance Material Related to Airport Wildlife Management Programs;
- Bird Ecology and Biology;

- Bird Identification, including the use of Field Guides;
- Mammal Ecology and Biology;
- Mammal Identification, including the use of Field Guides;
- Any Matter Covered in the Wildlife Control Procedures Manual (TP 11500);
- Any Matter Covered in the Sharing the Skies – An Aviation Industry Guide to the Management of Wildlife Hazards document (TP 13549);
- Rare and Endangered Species and Species of Special Concern, including Related Regulations and Policies;
- Habitat Management;
- Off-Airport Land Use Issue;
- Active Wildlife Control Measures;
- Wildlife Removal Techniques;
- Firearm Safety;
- Wildlife Management Planning; and
- Development of Awareness Programs.

In addition to training directly associated with wildlife behaviour and the application of management techniques as part of the WMP, it is essential that safety requirements are fully reviewed and addressed.

This should include at a minimum:

- Safe use and storage of pyrotechnics;
- Safe use, storage, and maintenance of pyrotechnic launchers; and
- Identification and mandatory use of safety equipment.

Wildlife Awareness Program consist of airport staff reviewing the Airport Wildlife Management Plan (multiple copies retained in the Maintenance Library) and the posting of wildlife awareness posters in the Maintenance Building.

20. Amendment Schedule and Responsibilities

Senior airport staff will be responsible for the implementation of the WMP. This includes the acquisition of the various permits, the provision of training and awareness programs, submission of the annual strike reports, and review and update of the WMP a minimum of two years.

As per CARs 302.305 (6), an amendment is required for the WMP and submitted to the Minister within 30 days of the amendment if:

1. The amendment is necessary as a result of the review of WMP conducted every 2 years;
2. An incident has occurred in which:
    - A turbine-powered aircraft collided with wildlife other than a bird and suffered damage

- Collided with more than one bird; or
- Ingested a bird through an engine.

3. A variation in the presence of wildlife hazards, including those referred to in Section 322.302 of the Airport Standards-Airport Wildlife Plan and Management, has been observed in an airport flight pattern or movement area;
4. There has been a change:
    - In the wildlife management procedures or in the methods used to manage or mitigate wildlife hazards;
    - In the types of aircraft at the airport; or
    - In the types of aircraft operations at the airport.

Senior management, or their designate, will be responsible for coordinating, supervising and the overall management of the WMP on a long-term and a daily basis at the site-specific level. This will include the nomination of the key Wildlife Management Officer, co-ordination of training, safety assurance and ensuring that the necessary equipment is available.

The Wildlife Management Officer will be responsible for:

a) Establishment and maintenance of the Wildlife Management Log (e.g., including strike data, details on wildlife numbers and activity; WMP measures undertaken, firearm use details; details on the use of lethal reinforcement and monthly summaries);
b) Co-ordination of the entire monitoring program;
c) Preparation of the annual strike report;
d) Ensuring that airport operations are consistent with the requirements of the WMP;
e) Ensuring that the appropriate permits are current and present on-site;
f) Undertaking deterrent activities;
g) Ensuring all activities are undertaken following standard practices and safety protocols; and
h) The identification of equipment, resource, and training needs.

The following table identifies the key roles and responsibilities under this plan.

Table 15. Key Roles and Responsibilities

Name and Contact Telephone Number	Title	Key WMP Responsibilities
(250) 770-4414	**Airport Manager**	• Writing in the form of a manual, updating every two years, and implementation of this WMP • Keep a copy of the plan at the airport, submit the AWMP in the form of a manual and in duplicate to the Minister upon request; • Acquisition of the various permits • Provision of training and awareness programs • Review and submission of the annual strike reports and two-year updates • Amend the WMP and submit it to the Minister within 30 days when the amendment is required • Make the risk analysis available to the Minister • Coordinating, supervising and the overall management of the WMP. Nomination of the key Wildlife Management Officer (WMO) • Ensuring that the necessary equipment is available • Amend the AWMP and submit the written report to the Minister within 30 days when: o The amendment is necessary as a result of the review conducted every 2 years; o An incident has occurred in which a turbine-powered aircraft collided with wildlife other than a bird and suffered damage, collided with more than one bird, or ingested a bird through an engine; o A variation in the presence of wildlife hazards, including those referred to in CARS 322.302, has been observed in an airport flight pattern or movement area; or o There has been a change in the wildlife management procedures, the methods used to manage or mitigate wildlife hazards, the types of aircraft at the airport, or types of aircraft operations at the airport.

Name and Contact Telephone Number	Title	Key WMP Responsibilities
(250) 770-4404	**Wildlife Management Officer (WMO); Airport Maintenance and Operations Supervisor** **Airport Maintenance and Operations Specialists**	• Co-ordination of training, safety assurance, and monitoring program; • Maintenance of the VORTEX Wildlife Management Module (e.g., enter strike data, details on wildlife numbers and activity; • Preparation of the annual strike report; • Ensuring that Airport operations are consistent with the requirements of the WMP; • Ensuring that the appropriate permits are current and present on-site; • Undertaking deterrent activities; • Participate in trend analysis, observations, and species identification; • Ensuring all activities are undertaken following standard practices and safety protocols; and, • The identification of equipment, resource, and training needs.
Canadian Wildlife Service / Environment and Climate Change Canada *Eec.scfpacpermitscwspacpermits.ec@canada.ca*	Permit Officer	• Issuing Airport Permit and Damage or Danger Permit for wildlife management.

21. Airport Policy That Prohibits The Feeding Of Wildlife

As per CAR 302.306(e), an airport policy regarding a ban on feeding of birds/Wildlife by staff and visitors should be posted at the terminal as well as outside of the fence where the public often watch aircraft takeoffs and departures. All waste disposal containers should be covered and signs should be posted making the public aware of the hazards associated with feeding the birds/Wildlife.

22. Research Projects

Occasionally a research need will be identified. This may be related to a proposed change in habitat management. A good example is changes to grass height, which are very much airport specific. When a target grass height is increased for infield grass to dissuade certain species (e.g., European Starlings and Killdeer), this may increase habitat opportunities for other species (e.g., Sandhill Cranes and deer). A small-scale research project may be needed to determine which option works best in the overall framework of wildlife management.

Any necessary studies to ensure that unacceptable effects of the proposed habitat change do not outweigh the benefits, will be documented in this section in future updates to this WMP. Documentation will include a summary of the purpose and objectives of any initiatives, the methods to be employed to satisfy the objectives, and timelines for the project. Future updates or special reports (e.g., to Bird Strike Committee Canada) will provide the results of the research.

Current priorities for research at this airport are:

1. Gull movements and behaviours associated with the landfill site and other gull attractants in the vicinity;
2. Deterrent for geese roosting and foraging and solutions to deter geese from resting on the runway, taxiways, and apron for warmth;
3. Starlings flocking;
4. Swallows at terminal and proximity nesting;
5. Gulls' congregation at north end or runway in low depression areas, and the hazardous behavior of gulls dropping shellfish on the runway; and
6. Consider other wildlife management techniques such as the usage of dog, falcon and/or drones/RV planes to scare wildlife off the airport.

Appendix A: Bibliography

Canada. Transport Canada 2001. Aerodrome Safety Circular (ASC) No.2000-003. Evaluation of the Efficacy of Various Deer Exclusion Devices and Deterrent Techniques for Use at Airports. Ottawa: Transport Canada.

Canada. Transport Canada. 2001a. Safety Management Systems (TP13739E). Ottawa: Transport Canada.

Canada. Transport Canada. 2001b. Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards (TP13549E). Ottawa: Transport Canada.

Canada. Transport Canada. 2002. Wildlife Control Procedures Manual (TP11500E). Ottawa: Transport Canada.

Canada. Transport Canada. Aerodrome Safety Circular 98-004. 1998. Evaluation of the Efficacy of Products and Techniques for Airport Bird Control (TP13029). Ottawa: Transport Canada.

Canada. Transport Canada. 2013/2014. Land Use In The Vicinity of Aerodromes. (TP1247E). Ottawa: Transport Canada

Dolbeer, R. A., S. A. Wright and E. C. Cleary. 200. Ranking the Hazard Level of Wildlife Species to Aviation. Wildlife Soc. Bull. 28 (2), 2000.

Jackson, J. A..2001. Understanding Bird-Strike Potential: Niche Concepts, Birds and Airports. Proceedings and Papers, Joint Meeting of the Canada/USA Bird Strike Committees, Calgary. 243 - 253.

ICAO. 2020. Airport Services Manual Part 3 – Wildlife Hazard Management Fifth Edition, 2020. Montreal: International Civil Aviation Organization

Appendix B: Strike Data

All strikes include near misses and suspected strikes.

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
03 Sept 2024	160525	2024-0249	Unknown	2	-	None	2 Sparrows – Suspected strike or downdraft- Remainsfound
07 Aug 2024	160227	2024-0234	DHC-8-400	1/0	Landing Roll	None	Strike Suspected- No Remains Found
22 July 2024	160326	2024-0235	Eurocopter 120	1/1	Takeoff Run	Rejected Takeoff	No notification to Airport Ops. Later investigation found no remains
21 July 2024	160036	2024-0222	DHC-8-400	1/0	Landing Roll	None	Reported possible strike with Marmot-No remains found
02 July 2024	159846	2024-0211	Cessna 172	1/1	Climb	None	Remains of 1 Osprey retrieved
06 June 2024	159740	2024-0163	Unknown	1	-	None	Remains of 1 Magpie found on Rwy-No report of Strike from Aircraft
04 June 2024	159730	2024-0159	DHC-8-400	1/0	Landing Roll	None	Strike Suspected/No remains found
30 May 2024	159718	2024-0154	Embraer Legacy	1/1	Takeoff Run	None	1 Barn Swallow retrieved
24 May 2024	159682	2024-0143	Saab 340	?/0	Takeoff Run	None	Unknown bird / Suspected strike – No remains found
03 Nov 2023	158016	2023-0245	DHC-8-400	1	Landing Roll	None	Starboard Propeller Struck

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
05 Oct 2023	157017	2023-0241	DHC-8-400	5	Takeoff run	None	Sparrow
21 Sept 2023	156491	2023-0225	Unknown	1	-	None	Yellow-Rumped Warbler
06 Sept 2023	156025	2023-0216	Piper Comanche	11/11	Landing Roll	None	4 House Sparrows struck by Aircraft various locations, 7 killed by down draft from aircraft.
09 Aug 2023	154917	2023-0204	DHC-8-400	2/2	Landing Roll	None	House Sparrow – Struck Nose – Remains retrieved
18 Jun 2023	152893	2023-0177	DHC-8-400	1/0	Takeoff run	None	Unknown bird / Suspected strike – No remains found
31 May 2023	152093	2023-0169	DHC-8-400	2/0	Takeoff run	None	Unknown bird / Near miss – No remains found
26 May 2023	151953	2023-0165	DHC-8-400	1	Takeoff run	None	Swallow – Struck engine 2
25 May 2023	152613	2023-0173	DHC-8-400	3/0	Landing roll	None	Unknown bird / Suspected strike – No remains found
	151913	2023-0161	DHC-8-400	1	Climb	None	Swallow
6 Apr 2023	150313	2023-0122	DHC-8-400	1/0	Climb	None	Eagle / Suspected strike – No remains found
3 Oct 2022	146580	2022-0309	DHC-8-400	-	Climb	None	No remains found
24 Sept 2022	146153	2022-0304	DHC-8-400	15/5	Descent	None	House Sparrow
17 Sept 2022	145975	2022-0292	DHC-8-400	1	Descent	None	No remains found
7 Sept 2022	145613	2022-0282	Cessna 172M	1	Landing Roll	Other	American Kestrel
29 Aug 2022	145335	2022-0278	DHC-8-400	20/1	Takeoff Run	None	House Sparrow
13 Aug 2022	144914	2022-0219	DHC-8-400	-	Landing Roll	None	No remains found
3 Aug 2022	144334	2022-0209	Lockheed C-130	-	Landing	None	No remains found
19 Jul 2022	143593	2022-0190	BE-1900D	1	Landing Roll	None	Barn swallow – Near miss
18 Jul 2022	143575	2022-0185	CL-600	1	Landing	None	Great Blue Heron

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
10 Jul 2022	143213	2022-0180	DHC-8-400	-	-	None	No remains found
14 Jun 2022	142255	2022-0136	-	1	-	None	Mallard Duck
10 Jun 2022	142175	2022-0132	-	1	-	None	Common Nighthawk
5 Feb 2022	139473	2022-0032	-	1	-	None	American Kestrel
22 Sep 2021	136954	2021-0161	DHC-8-400	1	Approach	None	Sparrow
16 Sep 2021	136912	2021-0160	DHC-8-400	-	Takeoff Run	None	No remains found
9 Sep 2021	136691	2021-0158	DHC-8-400	-	Approach	None	No remains found
25 Aug 2021	136473	2021-0156	-	1	-	None	Osprey
15 Aug 2021	136072	2021-0154	DHC-8-400	1	Landing	None	Starling – Near miss
9 Aug 2021	135519	2021-0152	DHC-8-402	1	Rollout	None	American Kestrel
19 Nov 2020	131783	2020-0188	Cessna 172	-	Approach	None	Unknown – Near miss
24 Sep 2020	130363	2020-0169	Cessna 172M	10/1	Landing	None	House Sparrow
10 Sep 2020	130072	2020-0160	DHC-8-402	1	Landing	None	Unknown
29 Jul 2020	129585	2020-0145	-	1	-	None	Herring Gull
11 Jul 2020	129351	2020-0139	AEROSTAR 601	-	Takeoff Run	None	Unknown
17 Jun 2020	129083	2020-0115	Cessna 172N	1	Climb	None	Red Tailed Hawk – Near miss
14 Aug 2019	125528	2019-0108	Dash 8-400	6	Approach	Other	Canada Goose
3 Aug 2019	125343	2019-0104	DHC-8-300	1	Takeoff Run	None	Unknown – Near miss
9 Jul 2019	124957	2019-0079	Dash 8-400	1	Takeoff	None	Great Blue Heron
12 May 2019	124164	2019-0060	Convair 580	1	Takeoff Run	None	Pigeon
20 Apr 2019	123881	2019-0054	Dash 8-300	1	Takeoff	None	Tree Sparrow
29 Sep 2018	121898	2018-0056	DHC-8-300	-	Landing Roll	None	Unknown
23 Sep 2018	121740	2018-0055	DHC-8-400	-	Approach	None	Unknown
23 Sep 2018	121739	2018-0054	DHC-8-300	-	Approach	None	Unknown
17 Sep 2018	121600	2018-0051	Cessna-560 ULTRA	1	Descent	None	European Starling
16 Aug 2018	120800	2018-0007	DHC-8-400	-	Landing Roll	None	Unknown
20 Jun 2018	118773	2018-0001	DHC-8-300	-	Takeoff	None	Unknown
4 Jun 2018	118507	2018-0002	DHC-8-400	-	Takeoff	None	Unknown
26 May 2018	118168	2018-0003	DHC-8-400	1	Landing	None	Barn Swallow
27 Apr 2018	117809	2018-0005	DHC-8-300	1	Landing	Other	Barn Owl – Damage to Engine 2
28 Feb 2018	116489	2018-0004	DHC-8-300	1	Approach	None	Canada Goose

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
27 Feb 2018	116448	2018-0006	-	-	-	None	Unknown
26 Sep 2017	113228	2018-0017	SONEX XENOS	-	Approach	None	Unknown
04 Sep 2017	112149	2018-0018	DHC-8-300	1	Landing	None	House Sparrow
6 Aug 2017	110732	2018-0016	DHC-8-400	-	Takeoff	None	Unknown
4 Aug 2017	110650	2018-0015	Conair CV-580	1	Takeoff	None	Hawk-Osprey
29 Jun 2017	108908	2018-0014	DHC-8-300		Takeoff Run	None	Unknown
11 Jun 2017	108228	2018-0013	DHC-8-300	1	Landing	None	Unknown
5 Jun 2017	107950	2018-0012	DHC-8-300		Takeoff	None	Unknown
16 May 2017	107468	2018-0011	DHC-8-300	1	Landing	None	Barn Swallow
21 Apr 2017	106749	2018-0010	DHC-8-300	-	Roll Out	None	Unknown
16 Mar 2017	106730	2018-0009	DHC-8-300	-	Approach	None	Unknown
1 Mar 2017	106729	2018-0008	DHC-8-400	-	Landing	None	Unknown
16 Sep 2016	105903	2022-0250	WestJet	1	Descent	None	Sparrow from runway
1 Sep 2016	105003	2022-0249	Water Bomber	2	-	None	RWY 16/34 South of Bravo Taxiway
11 Aug 2016	105649	2022-0248	Piper PA-31-350	1	Takeoff Run	None	Hawk – Damage to radome
5 Aug 2016	105609	2022-0247	DHC-8-300	1	Landing	None	1800ft mark of RWY 16. Sharp Shinned Hawk
27 May 2016	105284	2022-0243	DHC-8-400	1	Landing Roll	None	Barn Swallow
26 May 2016	105281	2022-0242	DHC-8-300	-	Landing Roll	None	Unknown
30 Aug 2015	84035	2022-0241	B-737-700	1	Landing	None	Unknown
16 Jun 2015	78371	2022-0240	DHC-8-300	1	Landing	None	Unknown
15 May 2015	77489	2022-0239	DHC-8-400	1	Takeoff	None	Unknown
13 Sep 2014	70308	2022-0238	DHC-8-300	-	Landing	None	Unknown
2 Sep 2014	69972	2022-0237	DHC-8-300	1	Takeoff	None	Sparrow
1 Sep 2014	69971	2022-0236	DHC-8-300	-	Takeoff	None	Unknown
27 Jun 2014	64973	2022-0235	DHC-8-300	1	Takeoff	None	Falcon
2 Jun 2014	63291	2022-0234	DHC-8-300	2	Takeoff	None	Unknown
14 Apr 2014	61993	2022-0233	DHC-8-300	1	Approach	None	Unknown – Engine 2 struck
4 Apr 2014	61871	2022-0232	DHC-8-300	1	Takeoff	None	Unknown
16 Sep 2013	58098	2022-0231	PC-12 47E	100	Takeoff	Aborted takeoff	Unknown – Propeller and wing struck

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
7 Jan 2013	56037	2022-0230	Cessna 680	2	Descent	None	Unknown – Wing struck
1 Oct 2012	55823	2022-0229	CC-115 BUFFALO	2	Approach	Precautionary Landing	Unknown – Windshield struck
30 Aug 2012	55334	2022-0228	-	1	-	-	Sparrow
8 Aug 2012	54914	2022-0227	DHC-6	2	Takeoff	Aborted takeoff	Starlings
24 Jun 2012	54405	2022-0226	AERO COM 500S	1	Takeoff	None	Great Blue Heron – Landing gear struck
17 May 2012	54165	2022-0221	BELL-206	1	Approach	None	Unknown
14 Aug 2011	51921	2022-0275	DHC-8-300	1	Takeoff	-	Turkey Vulture
30 Apr 2011	50810	2022-0274	DHC-8-300	-	Descent	None	Unknown – Engine 1 and landing gear struck
29 Dec 2010	49265	2022-0273	DHC-8-300	1	Landing	None	Starling
28 Sep 2010	47404	2022-0272	DHC-8-100	-	Takeoff	None	Unknown
31 Aug 2010	46888	2022-0271	DHC-8-300	1	Takeoff	None	Unknown – Canopy nose struck
31 Jul 2010	46184	2022-0270	DHC-8-300	1	Takeoff	None	Starling
30 Jull 2010	46052	2022-0269	DHC-8-300	1	-	None	Unknown – Wings struck
17 Jul 2010	45948	2022-0268	DHC-8-300	1	Takeoff	None	Unknown – Radome struck
11 Jul 2010	45718	2022-0267	RKWLTRBO 690	1	Takeoff	Forced landing	Unknown
11 May 2010	44454	2022-0266	-	1	-	None	Peregrine Falcon
17 Aug 2009	39594	2022-0265	HAWKER 800	1	Climb	None	Engine 2 - Struck Wings – Struck Unknown bird
10 Aug 2009	39177	2022-0264	DHC-8-300	1	Approach	None	Owls
29 Jul 2009	39017	2022-0263	AEROS 350	1	Enroute	Precautionary Landing	Unknown bird Canopy nose – Struck
29 Sep 2008	33163	2022-0262	DHC-8-300	1	Takeoff	None	Sparrows
26 Sep 2008	32737	2022-0261	DHC-8-300	1	Landing	None	Canopy nose – Struck Unknown bird
17 Sep 2008	32431	2022-0260	-	1	Unknown	None	Sandpipers
16 Sep 2008	32371	2022-0259	CONVAIR 600	1	Approach	None	Sparrows
10 Sep 2008	32191	2022-0258	DHC-8-300	2	Takeoff	None	Sparrows

Date	TC Strike ID	Vortex ID	Aircraft Model	Number Encountered / Struck	Phase of Operation	Effect on flight	Comments
09 Sep 2008	32134	2022-0257	DHC-8-300	2	Landing	None	Sparrows
29 Jun 2008	29932	2022-0256	DHC-8-300	2	Landing	None	Unknown bird
18 Jun 2008	29632	2022-0255	-	1	Takeoff	None	Swallows
30 Apr 2008	28424	2022-0254	DHC5	2	Approach	Precautionary Landing	Unknown bird Canopy nose – Struck Windshield - Struck
10 Sep 2007	23845	2022-0253	AEROSTAR 600	1	Approach	None	Ducks Canopy nose – Struck
06 Sep 2007	23736	2022-0252	DHC-8-300	11	Takeoff	None	Sparrows Pitot - Damaged
09 Jun 2007	22436	2022-0251	DHC-8-300	-	Landing	None	Unknown bird
30 May 2007	21891	2022-0225	SW3	-	Takeoff	None	Unknown bird
03 Apr 2007	21352	2022-0224	DHC-8-300	1	Approach	None	Unknown bird
02 Oct 2006	18253	2022-0223	-	1	Unknown	None	Sandpipers
22 Sep 2006	18115	2022-0222	-	2	Unknown	None	Sparrows
07 Sep 2006	17834	2022-0220	CONVAIR 580	2	Unknown	None	House Sparrows

Record of Strike Review as per CARs 302.305(6)(b)

(Revised YYF WMP to be submitted to TCCA within 30 days of strike)

Vortex / TCID	Strike Date	Review	Revisions	Date Revised / WMP Submitted to TCCA
Vortex ID: 2023-0173 TCID: 152613	2023-05-25	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix C: Strike Data	Revised July 21, 2021 Amendment 5 issued
Vortex ID: 2023-0169 TCID: 152093	2023-05-31	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix C: Strike Data	Revised August 21, 2023 Amendment 6 issued
Vortex ID: 2023-0204 TCID: 154917	2023-08-09	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix C: Strike Data	Revised August 21, 2023 Amendment 6 issued
Vortex ID: 2023-0216 TCID: 156025	2023-09-06	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix B: Strike Data	Revised September 7, 2023 Amendment 7 issued
Vortex ID: 2023-0241 TCID: 157017	2023-10-05	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix B: Strike Data	Revised October 5, 2023 Amendment 7 issued
Vortex ID: 2024-0249 TCID: 160525	2024-09-03	Reviewed wildlife management methods and runway inspection frequency. No changes in wildlife management methods. Increased wildlife inspections.	Record of Review and Amendments Appendix B: Strike Data	Revised September 10, 2024 Amendment 8 issued